Greinargerð fyrir Skipulagsstofnun

Efni: Eldi á senegalflúru *(solea senegalensis)* við Reykjanesvirkjun HS Orku, Reykjanesbæ, apríl 2011.

11. apríl 2011

Stolt Sea Farm

Um þessa greinargerð

Þessi greinargerð inniheldur kynninga á fyrirhuguðu verkefni Stolt Sea Farm S.A. vegna eldis á senegalflúru við Reykjanesvirkun HS Orku. Þessi greinargerð er tekin saman og send Skipulagsstofnun vegna umfjöllunar stofnunarinnar um þetta verkefni. Við samantekt þessarar greinargerðar var einnig haft til hliðsjónar að mögulegt væri fyrir aðra hagsmunaaðila að lesa þessa kynningu og því er hún aðeins víðtækari heldur en það sem eingöngu snýr að umfjöllun Skipulagsstofnunar.

Íslenska þýðingin senegalflúra á latneska heiti fisksins *solea senegalenses* er notuð í þessari greinargerð.

Efnisyfirlit

Myndalisti

Töflulisti

1 Fyrirtækið – kynning

Stolt Sea Farm[1] er dótturfélag Stolt-Nielsen Limited[2] og hefur stundað fiskeldi á fyrsta flokks afurðum síðustu 30 ár. Stærð fyrirtækisins hefur breyst í áranna rás en markmiðið hefur alltaf verið hið sama, það að framleiða heilnæman, hágæða eldisfisk á sjálfbæran og vistvænan hátt. Í dag framleiðir fyrirtækið sandhverfu, styrju (bæði fisk og styrjuhrogn „caviar“) ásamt senegalflúru. Fyrirtækið er leiðandi í heiminum í framleiðslu á fyrrnefndum tegundum. Stolt Sea Farm hefur stjórn á öllum stigum framleiðsluferlisins frá klaki, seiðum, áframræktun, vinnslu, gæðaeftirliti, sölu og markaðssetningu afurða. Stjórn fyrirtækisins á öllum ferlum framleiðslunnar, hefur gert því kleift að verða fyrsta fiskeldisfyrirtækið í Evrópu til að hljóta ISO 14001:2004 vottun fyrir umhverfisstjórnun (sjá viðauka 12.1 og 12.3). Stolt Sea Farm hefur einnig hlotið ISO 9001:2008 vottun á gæðastjórnun (sjá viðauka 12.2). Fyrirtækið starfar að fullu eftir ofangreindum ISO stöðlum.

Fyrirtækið rekur níu eldisstöðvar, þar af eru sex staðsettar á Spáni, en þar að auki eru fiskeldisstöðvar fyrirtækisins starfandi í Frakklandi, Portúgal og í Noregi. Samanlögð framleiðsla þessara eldisstöðva nemur 4.000 tonnum af sandhverfu,og 300 tonnum af senegalflúru. Að auki á og rekur fyrirtækið fjórar styrjueldisstöðvar í Kaliforníu fylki í Bandaríkjunum, þar sem framleidd eru rúm15 tonn af kavíar og 350 tonn af styrjukjöti (fiski). Hjá fyrirtækinu starfa um 300 starfsmenn og árið 2009 námu rekstrartekjur fyrirtækisins 60 milljónum Bandaríkjadala.

Tafla 1.1 Yfirlit um eldi Stolt Sea Farm

	Sandhverfa	**Senegalkoli**	**Styrja**	**Samtals**
Seiði (í milljónum)	3,2	1,3	0,2	4,7
Áframeldi (í tonnum)	4000	350	350	4700
Kavíar (í tonnum)			11	11
Eldisstöðvar	6 á Spáni 1 í Portúgal 1 í Noregi	1 í Frakklandi	4 í Kaliforníu	9 í Vestur-Evrópu 4 í Bandaríkjunum
Starfsmenn	225	15	25	265

Stolt Sea Farm hefur stundað fiskeldi í meir en 30 ár, en í upphafi níunda áratugsins vann fyrirtækið brautryðjanda starf í framleiðslu á laxaseiðum, sem það sérhæfði sig í. Á þessum árum hefur fyrirtækið vaxið fiskur um hrygg og sú reynsla og þekking, sem það hefur öðlast, hefur gert því kleift að þróa tækni og framleiðsluferla, sem er grunnurinn að velgengni fyrirtæksins. Í dag býr fyrirtækið yfir árangursríkri stjórnun á framleiðslu á mjög flóknum ferlum, er skilað hafa sér í arðbærri framleiðslu. Þessi þekking á bæði líffræði og

[1] Sjá heimasíðu fyrirtækisins www.stoltseafarm.com
[2] Sjá heimasíðu fyrirtækisins www.stoltnielsen.com

iðnaðarframleiðslu hefur gert Stolt Sea Farm mögulegt að þróa framleiðslu á senegalflúru, tegund sem að margir hafa reynt að rækta en aðeins Stolt Sea Farm hefur tekist að framleiða. Fjárshaglegt bolmagn gerir fyrirtækinu fært að geta ráðist í uppbyggingu á senegalflúru eldi með klak- og seiðastöð og endanlega framleiðslugetu upp að 2.000 tonnum á ársgrundvelli.

Árið 1999 hóf Stolt Sea Farm rannsókn og tilraunir með eldi á senegalflúru. Í upphafi voru ýmsar tegundir kola og flúru rannsakaðar og notaðar í tilraunir, en brátt kom í ljós að flúrutegundin, sem hér hefur verið kölluð senegalflúra (lat. *solea senegalensis*), reyndist henta best til fiskeldis. Í kjölfarið byggði fyrirtækið upp hrygningarstofn ásamt því sem tilraunir voru gerðar á lirfueldi og þróun sérstaks fóðurs fyrir þessa tegund. Árið 2004 hófst síðan framleiðsla á seiðum í tilraunaeldi með árlegri framleiðslugetu á 40 tonnum. Eftir því sem þekking og skilningur á þessari tegund jókst, var framleiðslan á seiðum aukin og árið 2008 var eldisstöð með árlegri framleiðslugetu upp á 300 tonn komið á fót í Frakklandi. Stolt Sea Farm býr í dag yfir nægjanlegri þekkingu, tækni og framleiðsluferlum, sem geta gert fyrirtækinu mögulegt að reisa og reka fiskeldisstöðvar fyrir senegalflúru með 2.000 tonna framleiðslugetu.

Að framangreindu er ljóst að fyrirtækið hefur yfir að ráða þekkingu, reynslu og getu til að ráðast í svo umfangsmikið, viðkvæmt og vandasamt verkefni sem fiskeldisstöð við Reykjanesvirkjum mun vera. Byggir þetta m.a. á þeirri staðreynd að rannsóknardeild Stolt Sea Farms hefur stundað rannsóknir og tilraunir á sjávardýrum allt frá árinu 1989. Deildin hóf sjálf rannsóknir á senegalflúru og hefur hún gegnt veigamiklu hlutverki í velgengni eldis og framleiðslu á senegalflúru sem og á sandhverfu. Rannsóknardeildin brúar bilið milli rannsóknarsamfélagsins og framleiðslunnar sem fer fram í eldisstöðvunum. Þetta samstarf eykur tryggingu fyrir því að árangur verkefna náist og starfsfólk sé til staðar til að vinna að lausn vandamála, þegar þau koma upp. Rannsóknar- og þróunardeildin er skipuð þremur sjávarlíffræðingum og tveimur örverufræðingum með meira en 10 ára reynslu í fiskeldi.

Stolt Sea Farm gerði í janúar mánuði s.l. 6 mánaða samning við Hafrannsóknarstofnun Íslands til að rannsaka vatnsgæði þess vatns sem notað yrði til eldisins. Stolt Sea Farm hefur verið þátttakandi í 20 rannsóknaverkefnum í alþjóðlegu, innlendu og svæðisbundnu samstarfi og í samstarfi við spænska og evrópska háskóla og rannsóknarsetur og verkefnin hafa fengið opinbera fjármögnun. Einstök verkefni varðandi senegalflúru eru allt frá því að þróa arðsemi fyrirtækisins, s.s. “Optimization of juvenile production of *Solea senagalensis”*, PGDIT 04 RMA 003E, til verkefna sem hafa það markmið að bæta velferð fisksins, “Influence of ambient and nutritional factors on the development of sole (*Solea Senegalensis)* skeletons“, IN.CI.TE.10MMA020E. Auk samstarfs við viðurkenndar rannsóknarstofnanir þá vinnur rannsóknar- og þróunardeildin með stuðningsfyrirtækjum s.s. fóðurframleiðendur og bóluefna-framleiðendum.

2 Fyrirhugaður rekstur

2.1 Laga og regluumhverfi

Við undirbúning, framkvæmd og rekstur fyrirhugaðar fiskeldisstöðvar á Íslandi, verður öllum lögum og reglugerðum sem við eiga um starfssemina fylgt. Til viðbótar verður starfssemin að fullu í samræmi við gildandi skattalög auk regluverks samningsins um evrópska efnahagssvæðið.

2.1.1 Umhverfisáhrif og skipulag

Hér að neðan eru tilgreind helstu lög og reglugerðir sem varða framkvæmdina að því sem snýr að umhverfisáhrifum og skipulagi:

1. Lög nr. 106/2000 um mat á umhverfisáhrifum.
2. Reglugerð nr. 1123/2005 um mat á umhverfisáhrifum.
3. Framkvæmda-, starfs- og rekstrarleyfi: skipulagslög nr. 123/2010.
4. Lög nr 7/1998 um hollustuhætti og mengunarvarnir.
5. Lög um náttúruvernd nr 44/1999.
6. Lög nr. 71/2008 um fiskeldi.
7. Reglugerð nr. 758/1999 um starfsleyfi fyrir atvinnurekstur sem getur haft í för með sér mengun.

2.1.2 Heilbrigðismál og mengunarvarnir

Hér að neðan eru tilgreind helstu lög og reglugerðir sem varða framkvæmdina að því sem snýr að heilbrigðismálum og mengunarvörnum:

1. Lög nr. 7/1998 um hollustuhætti og mengunarvarnir.
2. Lög nr. 33/2004 um varnir gegn mengun hafs og stranda.
3. Lög nr. 60/2006 um varnir gegn fisksjúkdómum.
4. Reglugerð nr. 403/1986 um varnir gegn fisksjúkdómum og heilbrigðiseftirlit með fiskeldisstöðvum.
5. Reglugerð nr. 786/1999 um mengunarvarnareftirlit.
6. Reglugerð nr. 796/1999 um varnir gegn mengun vatns.
7. Reglugerð nr. 798/1999 um fráveitur og skólp.
8. Reglugerð nr. 179/2008 um framkvæmd reglugerða nr. 446/2005 og nr. 511/2005, að því er varðar ráðstafnir gegn tilteknum sjúkdómum í eldisdýrum.

2.2 Fiskeldi

Senegalflúra hefur líkt og aðrir fiskar kalt blóð og fer efnaskiptahlutfall og vöxtur fisksins eftir hitastigi vatns, en ákjósanlegasta hitastigið er frá 19 °C gráðum til 22 °C gráður. Það hitastig

sjávar er meðfram strandlengjum víðs vegar um heim. Hins vegar geta árstíðabundnar sveiflur vetrar og sumars valdið því að hitastigið falli niður fyrir 19°C. Með því að nota heitt afrennslisvatn frá jarðhitavirkjun er mögulegt að ná ákjósanlegasta hitastiginu stöðugu 12 mánuði á ári. Þessi vistvæna framleiðsla, sem nýtir náttúrulega orku, stuðlar þar með að hröðum vexti fisksins.

Með því að blanda 35°C frárennslisvatni Reykjanesvirkjunar[3] við 9°C kaldan sjó, sem dælt yrði úr sjótökuholum, sem boraðar yrðu, væri hægt að tryggja kjörhita fyrir senegalflúru, þ.e.a.s. stöðugu hitastigi af 19°C til 22°C heitu sjóvatni allt árið í kring.

Til að nýta þessa ónýttu auðlind, hefur stjórn Stolt Sea Farm hug á að reisa fiskeldisstöð í næsta nágrenni raforkuvirkjunar HS Orku á Reykjanesi, sem hefði samtímis í för með sér að nýting jarðvarma á svæðinu yrði hámörkuð.

Í þeim tilgangi yrði fyrsta skrefið að reisa seiðastöð með framleiðslugetu á allt að 2 milljónum af 10 gramma seiðum. Fyrirtækið myndi flytja inn hrygningarstofn frá stöðvum sínum á Spáni, en gert er ráð fyrir að aðlögunartíminn fyrir fiskana hér á landi gæti verið allt að 2 ár. Þannig yrðu lirfur komnar á þurrfóður senegalflúru sendar frá Spáni til þess að hægt yrði að hefja seiðaframleiðslu eins fljótt og auðið er. Fiskeldisstöðvar Stolt Sea Farms og það svæði, þar sem eldisstöðvar Stolt Sea Farms eru, í Galiciu fylki Norður Spánar, eru vottuð og viðurkennd „2003/623/EC, Directive 91/67/EEC and Directive 2006/88/CE“ (sjá viðauka 12.5 og 12.7). Áframrækunarstöð með 500 tonna ársframleiðslugetu yrði byggð til þess rækta seiði upp í 350 g sölustærð fisks. Bæði seiðastöð og áframræktunarstöð yrðu byggð í einingum svo að bæta megi við mannvirkjum með skömmum fyrirvara þegar hrygningarstofn fer að skila reglulegu framboði eggja. Gert er ráð fyrir að á seinni stigum yrði hægt að auka seiðaframleiðslu í 7,2 milljónir seiða og í framhaldinu með byggingu eldis fyrir 2.000 tonna ársframleiðslu, sem yrði endanleg stærð, og samkvæmt reikningum fyrirtæksins, ákjósanlegasta stærð verkefnisins. Það myndi taka u.þ.b. 5 til 7 ár að ná slíkri fullri framleiðslu. Áætlaður lífmassi í kerjum miðað við 2.000 tonna ársframleiðslu nemur 850 tonnum.

[3] Þetta er hitastig sjóvatns eftir að það hefur verið notað til kælingar hverfla virkjunarinnar, en vatnið yrði leitt beint úr virkjunni inn í eldisstöðina.

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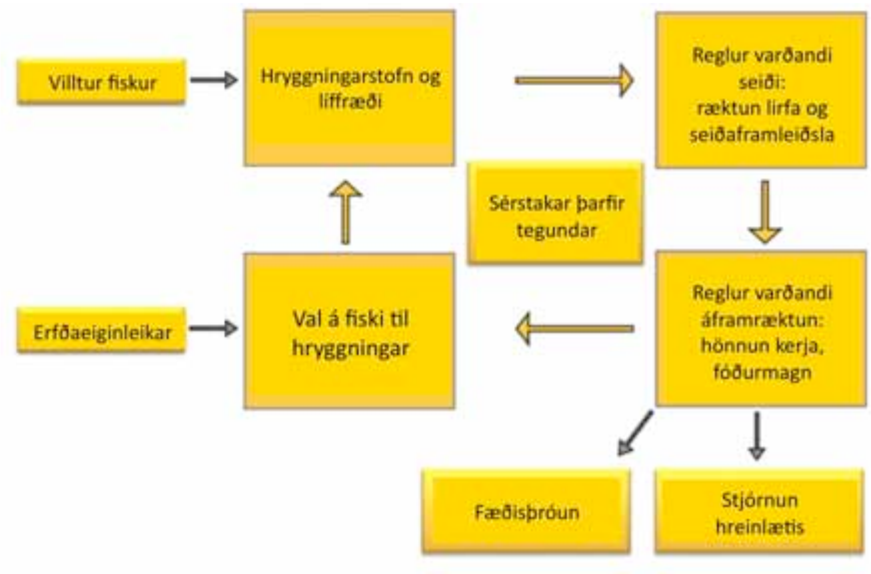

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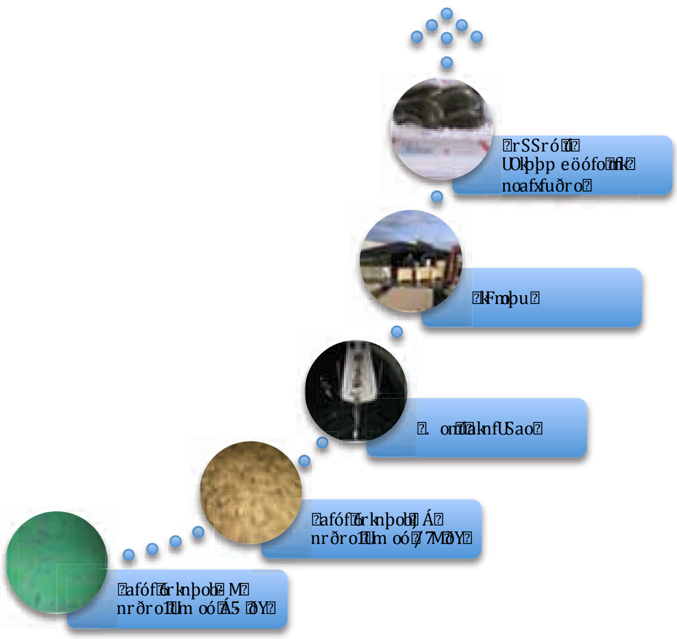

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meltanleiki fóðursins þýðir að fóðurnýting er mjög góð og meðaltal nýtingarhlutfalls fóðurs er 1:1 sem þýðir að hvert 1 kg af fóðri skilar sér í 1 kg þyngdaraukningu í fiski (sjá nánar viðauka 12.9).

Tafla 2.1 Samsetning fóðurs

Samsetning fóðurs	Fiskimjöl:	55%
	Hveiti glúten:	15%
	Soja prótín:	10%
	Fiskiolía:	10%
	Baunaprótín:	5%
	Baunamjöl:	3%
	Repjuolía:	2%

Tafla 2.2 Aukaefni

Aukaefni	Þráavarnarefni:	BHT
	Vítamín A:	5000 U.l./kg
	Vítamín D3:	750 U.l./kg
	Vítamín E:	250 mg/kg
	Kopar:	7.5 mg/kg

Í janúar mánuði s.l. kynntu starfsmenn Stolt Sea Farm sér framleiðslu fóðurverksmiðjunnar Laxá á Akureyri, og í framhaldinu hófust viðræður við fyrirtækið um kaup á fóðri frá því fyrir fiskeldi Stolt Sea Farms í Noregi. Með tilliti til sérstakra fóðurþarfa senegalflúru, eins og lýst er í greinagerð þessari, er ljóst að þróa þarf sérstaklega fóðrið til eldisins og hefur Stolt Sea Farm fullan hug á að kanna þann möguleika hér á Íslandi með íslenskum fóðurframleiðendum. Ákjósanlegast væri ef hægt yrði að vinna fóðrið alfarið á Íslandi og nota íslenskt hráefni í það. Það yrði bæði fjárhagslega hagstæðara, sem og gera alla umsýslu með aðföng auðveldari.

2.2.1.2 Fóðrun

Senegalflúru er gefið hágæða fóður unnu úr sjávarafurðum, en yfir 60% þess er unnið úr fiski, fiskolíu og fiskimjöli. Senegalflúra, líkt og annar flatfiskur, krefst mikils meltanleika fóður og því er einungis notað hágæða fiskimjöl og framleiðslu þess, annað hvort LT eða Super Prime[4]. Fiskimjölið er unnið úr fiski, sem veiddur er á fiskimiðum, þar sem stundaðar eru viðurkenndar sjálfbærar, umhverfisvænar fiskveiðar og þar sem PCB (polychlorinated byphenyl) mælist í litlu magni, s.s. eins í lögsögu Perú og Chile.

Senegalflúra er botnæta og alæta[5], og því er neðanverðri aðferð beitt við fóðrun hans:

1. Senegalflúra er skilgreind sem alæta, sem étur stöðugt lítið magn af fóðri, og því þarf að fóðra hana reglulega allan sólarhringinn.

[4] LT stendur fyrir Low Temperature og er nánari skýring á því þurrkunarferli sem á sér stað þegar verið er að þurrka fisk við lágt hitastig. Síðan er unnið fiskimjöl úr þessu hráefni. Super Prime annað nafn fyrir sömu þurrkunaraðferð.
[5] Enska „grazer“: botnæta, sem étur stöðugt litlar lífverur, þörunga og þess háttar.

2. Fiskurinn nærist helst að nóttu til eða við lítið ljósskin, af þeim sökum er breitt yfir kerin þannig að hægt sé að fóðra fiskinn stöðugt allan sólarhringinn;
3. Fiskurinn er fóðraður með sjálfvirkum fóðurgjöfum, sem reikna út magn fóðurs miðað við stærð fisks og hitastig vatns;
4. Til að meta fóðurþörf fisksins sem best, er um 20% af fóðrinu gefið af reyndu starfsfólki með handfóðrun.
5. Senegalflúra sækir fóðrið í botn kersins með því að renna á lyktina af því. Lyktarefni fóðursins er því mikilvægur eiginleiki þess. Fóðrað er í smáum skömmtum til að tryggja að fóðrið sé ávallt ferskt, og til að tryggja að engin steinefni eða vítamín glatist.

2.2.2 Fisksjúkdómar

Í öllu eldi, hvort sem er á búfénaði eða fiski, er sýkingarhætta ætíð til staðar, hvort sem sýklar koma utan að frá eða úr framleiðslunni sjálfri. Í fyrirhuguðu fiskeldi Stolt Sea Farms við Reykjanesvirkjun mun stöðin vera þannig úr garði gerð, að fiskurinn verði fyrir sem minnstu streituálagi, en við það minnkar áhætta á sýkingu. Ef fiskurinn er ræktaður við ákjósanlegustu aðstæður með réttri næringu, við rétt hitastig og með aðgengi að nægu súrefni, þá getur ónæmiskerfi hans brugðist við og unnið á flestum sýkingum. Það er stefna Stolt Sea Farms að hanna fiskeldisstöðvar þannig að slík vandamál eru leyst með bústjórninni á stöðinni sjálfri í stað þess að beita lyfjameðferð. Með öðrum orðum er framleiðsluferlið sjálfbært og byggist á því að ala fiskinn upp í réttu umhverfi og með sem minnstu áreiti.

En eins og fyrr segir, það er hættan á sjúkdómum alltaf fyrir hendi og því hefur Stolt Sea Farm rannsóknardeild innan fyrirtækisins, sem sér alfarið um og ber ábyrgð á heilbrigði fiska. Deildin sem hefur meira en 20 ára reynslu á þessu sviði, hefur þróað ferla innan fyrirtæksins, sem hafa skilað þeim árangri að engin sýklalyf er notuð í dag í fiskeldisstöðvum Stolt Sea Farms og afföll er innan við 5% í áframeldi sandhverfu. Fyrirtækið mun leitast við að ná þessum glæsilega árangri í flúrueldi sínu á Íslandi. Fyrrnefnd deild hefur nú þegar yfir 10 ára reynslu að ráða við eldi á senegalflúru og bóluefni fyrir helsta sýkil flúrunnar hefur verið þróað. Senegalflúra getur þjást af roðsjúkdómi, sem sýkillinn *Tenacibaculum Maritimum* veldur. Bóluefni hefur verið þróað fyrir þennan sjúkdóm, en fisknum er dýft ofan í efnið, þegar hann er í klakstöð, og sprautaður með því, þegar hann er í áframeldi.

Einn helsti kosturinn við staðsetningu eldisins við Reykjanesvirkjun er sá að allt frárennslisvatn frá eldinu rennur út bunustokk með 75 °C heitu vatni, sem mun drepa alla sýkla (sjá töflu 3.2). Þetta verndar ekki einungis umhverfið og náttúruna, heldur einnig fiskinn í eldisstöðinni, þar sem sýklar munu ekki geta komist inn í stöðina aftur.

Eldisstöðvar Stolt Sea Farm eru vottaðir sjúkdómalausar (VHS og IHN) samkvæmt úrskurði Evrópusambandsins (sjá nánar viðhengi 12.14).

2.2.2.1 Smithætta vegna eldisáforma og innflutningur á eldisstofni

Bernharð Laxdal fisksjúkdómafræðingur hefur tekið saman greinargerð um smithættu vegna eldisáforma Stolt Sea Farm (sjá viðhengi 12.12). Í greinargerðinni kemur m.a. fram að allur innflutningur á lifandi hrognum/fiski hefur í för með sér ákveðna áhættu á að smit berist til landsins. Hins vegar er fylgt Evrópureglum um flutning á lifandi lagardýrum innan Evrópu og unnið samkvæmt tilteknu áhættumati og vinnuferlum því tengdu er lágmarka áhættuna á að ný og jafnvel óþekkt smitefni dreifist frá einum stað til annars. Bernharð Laxdal telur að hverfandi líkur á því að smit geti borist með frárennsli úr eldisstöð út í náttúruna og að lykilatriði sé að frá upphafi eldisins sé unnið skv áhættugreiningu/áhættumati, þar sem vinnuferlar tengdir hreinlæti og smithættu fái notið sín og að smitvarnir stöðvarinnar séu virkar. Jafnframt nefnir hann að reynsla Stolt Sea Farms í eldi á senegalflúru skipti höfuðmáli í framgangi eldisins hérlendis og að reynsla fyrirtækisins og áherslur í heilbrigðismálum séu sannarlega til fyrirmyndar. Með vísan til þess sem fram kemur í greinargerðinni í heild þá telur hann að væntanlegt senegalflúrueldi við Reykjanesvirkjun skapi ekki smithættu umfram annað fiskeldi hérlendis, sé öllum kröfum varðandi innflutning eldisstofnsins fylgt í þaula og almennar smitvarnir í hávegum hafðar.

Sótt verður um innflutningsleyfi fyrir innflutningi á seiðum og hrygningarstofnsfiski senegalflúru frá fiskeldisstöð Stolt Sea Farms á Spáni. Leyfið verður sótt um til Sjávarútvegs- og landbúnaðarráðuneytisins, skv ákvæðum 5. gr. Laga nr. 54/1990 *um innflutning dýra*. Við innflutning á seiðum og hrygningarstofnsfiski verður farið eftir þar að lútandi lögum og reglum íslenskra yfirvalda. Auk þess hefur Fisksjúkdómanefnd bent á mikilvægi þess að fram komi upplýsingar um sýnitöku á fiskinum, sögu hans og einnig að heilbrigðisvottorð þarlendra yfirvalda verði lagt fram. Þar eð innflutningur á seiðum og fiski er háður leyfisveitingu opinberra yfirvalda á Íslandi og fæst ekki útgefið nema að öll skilyrði hafi verið uppfyllt, er hægt að útloka að fiskurinn sem hingað til lands kemur sé sýktur.

Stolt Sea Farm sendir töluvert af lirfum og lifandi fiski innan Evrópu til eldis, þ.á.m. til Noregs. Við þann flutning er farið eftir hjálagðri evrópsku reglugerð (sjá viðhengi 12.5). Fiskeldið, þaðan sem lirfurnar koma, starfar undir eftirliti spænska dýralæknisembættisins, skv. 2003-623 EC Directive (sjá viðhengi 12.5). Allar sendingar innan Evrópu, þ.m.t. Noregs, falla undir Traces-kerfið (sjá viðhengi 12.5). Stolt Sea Farm mun fara eftir þessari reglugerð, og einnig notast við Traces-kerfið, sem er, eins og kunnugt er, einnig notað fyrir innflutning til Íslands.

Innan Evrópusambandsins rannsaka óháðir dýralæknar eða dýralæknar, sem ráðnir eru af opinberum aðilum, fiska í fiskeldisstöðvum og þá sérstaklega hvort veirusýkingin VHS[6] eða IHN[7] sé til staðar. Fiskeldisstöðvar eru flokkaðir eftir því, hvort sú sýking er til staðar. Fiskeldisstöðvar Stolt Sea Farms, þaðan sem hrygningarfiskur og seiði verða send, eru sýkingarlausar (sjá viðhengi 12.13 og 12.14).

2.3 Slátrun

Slátrun á fiskinum fer þannig fram að hann er settur á ís í 500 kg fiskikör og honum ekið til pökkunarstöðvar. Fiskurinn er hvorki látinn blæða út, né er hann meðhöndlaður á neinn annan hátt í eldisstöðinni sjálfri, og því myndast enginn lífrænn úrgangur við slátrun. Fiskurinn fer í dá við snöggkælingu á ísnum.

2.4 Markaðssetning og sala

Stolt Sea Farm hefur víðtæka reynslu í bæði framleiðslu og markaðssetningu á sandhverfu framleiddri í fiskeldi. Stolt Sea Farm hefur óumdeilanlega verið leiðandi fyrirtæki á þessu sviði frá árinu 1993. Þessari stöðu hefur fyrirtækið haldið með sölumagni upp á meira en 4.000 tonnum af sandhverfu á ári. Fyrir nokkrum árum hóf Stolt Sea Farm framleiðslu á senegalflúru og selur nú í dag að meðaltali 340 tonn á ári.

2.4.1 Vörumerki

Stolt Sea Farm dreifir vörum sínum undir merkinu "Prodemar". Stolt Sea Farm hefur byggt viðskiptastefnu sína á því að bjóða hágæða sjávarafurðir og veita viðskiptavinum sínum frábæra þjónustu. Til að ná þessu markmiði, notar Stolt Sea Farm ISO 9001:2008 staðla við bæði framleiðslu og markaðssetningu (sjá nánar viðauka 12.2).

Vegna ofantaldra þátta, er merkið „Prodemar“ vel þekkt um alla Evrópu sem tákn um góð gæði. Þökk sé viðskiptastefnu fyrirtækisins, þá var Stolt Sea Farm kosið opinber birgir Bocuse d'Or 1993, "Académie Culinaire de France Trophée Passion" og hefur einnig verið valið styrktaraðili "Madrid Fusion" fyrir 2010, 2011 og 2012. Fyrirtækið hefur einnig innleitt ISO 14001:2004 (sjá nánar viðauka 12.3) sem ber glöggan vott um þá virðingu og umhyggju, sem fyrirtækið ber fyrir umhverfisvænni starfssemi. Þökk sé þessari stefnu fyrirtækins hefur sandhverfa þess hlotið vottorð Friends of the Sea fyrir „Umhverfisvæna og Sjálfbæra Starfssemi“ (sjá nánar viðauka 12.4).

[6] Viral hemorrhagic septicemia
[7] Infectious hematopoietic necrosis

2.4.2 Sölustarfsemi

Á undanförnum árum hefur Stolt Sea Farm ráðið í vinnu reynt og öflugt teymi sölufólks, sem eru í stöðugu og nánu sambandi, oft daglega, við viðskiptavini fyrirtækisins. Þetta nána samband gerir fyrirtækinu kleift að greina þarfir viðskiptavina og vinna úr þeim fljótt og örugglega. Það er því hægt að finna Prodemar sandhverju á bestu veitingastöðum Evrópu, allt frá Rússlandi til Portúgals, frá Grikklandi til Svíþjóðar.

Sem leiðandi fyrirtæki í sínum geira og með forréttindastöðu í markaðsmálum, hefur Stolt Sea Farm tekist að afla sér gríðarlegrar reynslu og þekkingar á öllum söluaðilum og sölumörkuðum í Evrópu fyrir flatfisk.

Í gagnagrunni Stolt Sea Farm er að finna meira en 500 virka viðskiptavini, allt frá stórum dreifikeðjum til lítilla heildsala, staðreynd, sem rennur stoðum undir hina miklu þekkingu fyrirtækisins á flatfiskmarkaðnum.

Hin hraða aukning í sölu á senegalflúru á skýringu sína í þeirri viðtæku þekkingu, sem fyrirtækið hefur á þessum markaði. Senegalflúra er mjög eftirsótt vara, mörgum sinnum eftirsóttari en sandhverfa, sem þýðir að þau 340 tonn sem Stolt Sea Farm framleiðir í dag, nægja engan veginn til að uppfylla þarfir kaupenda. Af þessum ástæðum, þarf Stolt Sea Farm minnst að framleiða 4.000 tonn af senegalflúru til að geta tryggt viðskiptavinum sínum a.m.k. sama magn og það býður af sandhverfu.

3 Hráefnisnotkun og förgun

3.1 Heildarvatnsnotkun

Heildarvatnsþörf fiskeldisins fyrir fulla og endanlega framleiðslu á 2.000 tonnum, nemur 4.000 lítrum á sekúndu af 20 °C til 22 °C heitu vatni. 2.000 sekundulítrum af 35 °C heitu affallsvatni frá Reykjanesvirkjun verður blandað saman við 2.000 sekúndulítra af 9 °C heitu sjóvatni úr þremur sjótökuholum, sem fyrirtækið mun láta gera.

Áætluð vatnsþörf á ferskvatni er talin nema 1.500 m^3 á mánuði. Það vatn er hugsað til almennrar notkunar, s.s. fyrir salerni, sturtur, þrif o.þ.h.

Tafla 3.1 Áætluð vatnsnotkun til eldis

9 °C heitt sjóvatn úr sjótökuholum:	2000 l/s
35 °C heitt affallsvatn:	2000 l/s
Heildarvatnsþörf:	4000 l/s

Affallsvatn Reykjanesvirkjunar, sem notað verður í eldið, er sjóvatn, sem dælt er úr sjótökuholum og notað er til kælingar á hverflum Reykjanesvirkjunar. Vatnið verður því leitt frá virkjuninni sjálfri til eldisins, þ.e.a.s. áður en það blandast við pækilvatn virkjunarinnar eins og það gerir í dag. Nánari skýring á vatnsmagni og hitastigi þess er að finna hér í töflunum að neðan. Með því að taka 2.000 sekúndulítra af kælisjó frá virkjunni, mun hitastig þess vatns sem rennur frá virkjunni að frárennsli eldisins hækka upp í 75°C gráður frá þeim 50°C gráður, sem það er í dag. Hitastig affallsvatns til sjávar, þ.e.a.s. þess blandaðs vatns frá fiskeldi og affallsvatns virkjunar, mun þó verða um 3°C gráðum lægra en það er í dag.

Tafla 3.2 Yfirlit yfir magn vatns og hitastig á affallsvatni Reykjanesvirkjunar

Magn affallsvatns í dag (l/s)	Hitastig vatns í bunustokki (°C)	Orka (KCAL/H)
3200	50.00	176000
	Samtals orka í dag	176000

Heildarvatnsmagn til fiskeldis (l/s)	Hitastig vatns í lögnum til fiskeldis (°C)	Orka (KCAL/H)
2000	35.00	70000

Afgangur vatns út í bunustokk (l/s)	Hitastig vatns milli virkjunar og móttökustaðar frárennslis fiskeldis í bunustokki (°C)	Orka (KCAL/H)
1200	75.00	106000
	Samtals orka eftir blöndun	176000

Útskýring á orkumun til útreikningar á hitastigi í bunustokki.

- Orka í dag = Orka áður 1200*X+2000*35=3200*55
- X= Hitastig í bunustokki=(3200*50-2000*35)/1200=75°C (+/- 5 °C, þar sem hitastig pækils getur sveiflast frá 48°C til 55°C).

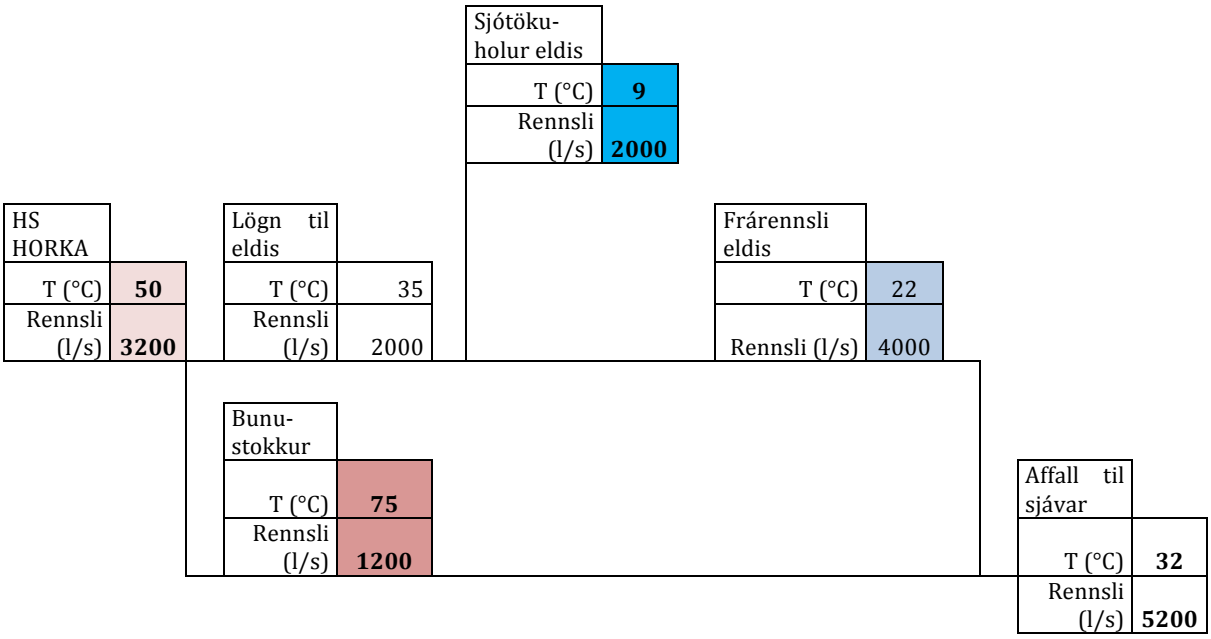
Tafla 3.3 Frárennsli frá fiskeldi, magn og hitastig

HS ORKA (l/s)	HS ORKA (°C)	Fiskeldi (l/s)	**Fiskeldi (°C)**	**Samtals (l/s)**	T (°C)
2000	35.00	2000	**9**	**4000**	22

Tafla 3.4 Heildarrennsli til sjávar

Bunustokkur frá HS Orku (l/s)	Bunustokkur (°C)	Fiskeldi (°C)	Frá fiskeldi (°C)	**Samtals (l/s)**	T (°C)
1200	75.00	4000	22	**5200**	32

Tafla 3.5 Yfirlit yfir rennsli frá virkjun og hitastig vatns



Neðanverðir útreikningar miðast við áformaða stækkun Reykjanesvirkjunar og áhrif hennar á vatnsmagn og hitastig vatns.

Tafla 3.6 Útreikningar (hitastig í bunustokki eftir frávetu til eldis upp að 200 l/s af 35°C

Heildaraffall frá virkjun (l/s)	**Hitastig í bunustokki (°C)**	Orka (KCAL/H)
6400	**37.00**	236800
	Orka	236800[8]

Heildarrennsli til eldis (l/s)	Hitastig í lögn til eldis (°C)	Orka áður (KCAL/H)
2000	35.00	70000

Afgangur í bunustokki (l/s)	**Hitastig vatns milli virkjunar og móttökustaðar frárennslis fiskeldis í bunustokki (°C)**	Orka áður (KCAL/H)
4400	**37.91**	166800
	Samtals orka eftir	236800

Útskýring á orkumun til útreikningar á hitastigi í bunustokki.

[8] Samkvæmt áætlun HS Orku.

- Orka í dag = Orka áður
- 4400*X+2000*35=6400*37
- X=Hitastig í bunustokki =(6400*37-2000*35)/6400=37.91°C

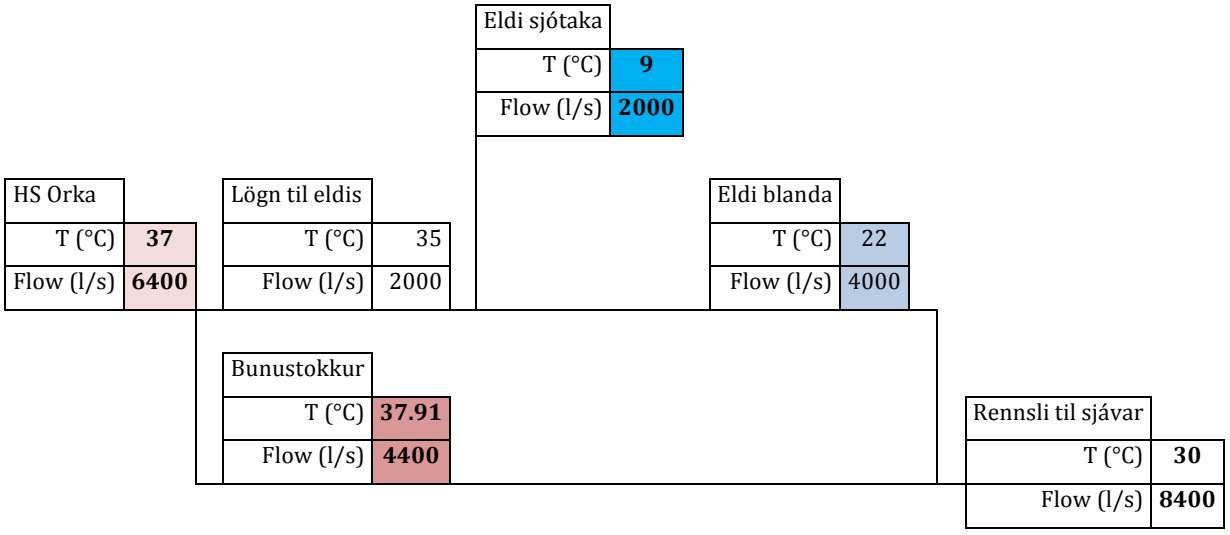
Tafla 3.7 Útreikningur áf fiskeldisvatni (Lögn til eldis + sjótökuholur)

HS ORKA (l/s)	HS ORKA (°C)	Fiskeldi (l/s)	**Fiskeldi (°C)**	**Samtals (l/s)**	T (°C)
2000	35.00	2000	**9**	**4000**	22

Tafla 3.8 Útreikningur á heildarafalli (Fiskeldi + HS Orka) til sjávar

Bunustokkur (l/s)	Bunustokkur (°C)	Fiskeldi blanda (l/s)	Fiskieldi blanda (°C)	**Samtals (l/s)**	T (°C)
4400	37.91	4000	22	**8400**	30

Tafla 3.9 Yfirlit yfir rennsli frá virkjun og hitastig vatns eftir stækkun



3.1.1 Dæling úr sjótökuholum

Áætlað er að dæla 2.000 lítrum á sekúndu úr þremur sjótökuholum. Miðað við 30 MWC (meter water column) þrýsting, rennsli upp að 2.000 m^3/s, er áætluð orkuþörf við dælingu 7.358.400 kilóvatt stundir á ári (kwh/year). Orkuþörf því til viðbótar fyrir áframeldi er 436 kw, eða 3.819.360 kwh/á ári. Orkuþörf við dælingu fyrir klakstöð er 225 kw, 1.974.504 kwh/á ári og önnur orkuþörf fyrir klakstöð 410 kw, eða 3.591.600 kwh/á ári. Samtals orkuþörf eldisstöðvarinnar er áætluð 16.743.864 kwh/á ári.

Tafla 3.10 Skipting rafmagnsnotkunar i 2000 tonna eldi

Rafmagnsnotkun í áframeldi				
Dæling á kælivatni				
MWC	**Flæði m^3/s**	**Nýtingarhlutfall**	**KW**	**kwh/á ári**
30	2.000	0,7	840	7358400
Viðbótarþörf vegna áframeldis			436	3819360
Rafsmagnsnotkun klakstöð				
Rafmagnsnotkun vegna dælingar fyrir klakstöð			225	1974504
Önnur rafmagnsnotkun vegna klakstöðvar			410	3591600
Heildar rafmagnsnotkun fiskeldis kwh/á ári				16743864
Heildar tengiþörf fyrir rafmagns í 2000 tonna eldi			3000	

3.2 Vatnsgæði og efnainnihald

Varðandi eldisverkefnið við Reykjanesvirkjun yrði tekið tilllit til þeirra laga og reglugerða sem eiga við á Íslandi varðandi vatnsgæði og efnainnihald (sjá nánar kafla 2.1). Lög varðandi gæði vatns sem skilað er til sjávar frá stöðvum á Norður-Spáni (sem eru af svipaðri stærð og verkefnið við Reykjanesvirkjun) eru eftirfarandi:

1. Lög 8/2001, RD 1341/2007 (http://aguasdegalicia.xunta.es) sem skilgreina vatnsgæði í lokuðum árósum og vatn þar sem hægt er að stunda sund.
2. Evrópsk tilskipun 2006/7/CE eða tilskipun 2006/113/CE (http://eur-lex.europa.eu) sem skilgreinir gæði vatns við framleiðslu lindýra til manneldis.

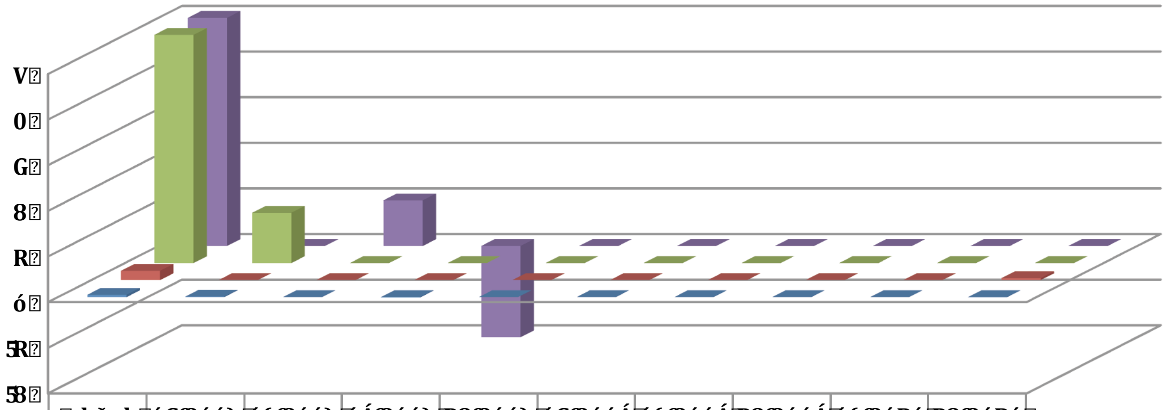
Hér fyrir neðan í mynd 3.1. eru niðurstöður sem sýna greinilega að vatnsgæði eldisstöðva Stolt Sea Farms eru innan þeirra viðmiðunarmarka tilgreind eru. Þessar niðurstöður yrðu hliðstæðar fyrir eldisverkefnið við Reykjanesvirkjun.

tyþf tk5 i Ei i y 7meMpRóóð rj	Róó	ó	ó	ó	ó	ó	ó		ó	ó
Myi kng5 sþym y 7meMpRóóð rj	Róó	ó	ó	RG	ó	G	ó		0	ó
ð t rl i kn Sþym y 7meMpRóóð rj	Vóó	V	G	RG	Á	ó	ó		ó	ó

. kfuðro LVur eoaámfuðþ gpF fuumSf fk öm mSU ea5 uafSÞ. óro p . kfuðro aopp Oðþlaðro 6Ue o5 p áun/5Ú5Y aero lap Þrmufó Þro oafuur öm mSf aero lap eÞúÞro h. kngpF lmÓófuuf auÞfó fuumS Um Ó Þrofuuro5

Stolt Sea Farm

[illegible] áun[illegible]/5Ú[illegible]. kfuðro[illegible]rmU[illegible]. ópp b[illegible]p rðu[illegible] ð[illegible]gurfuuf rkn[illegible]



	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0.4V	0.5R	0	50.5R	0	0	0	0	0	50.50G
[illegible]	0.8	0	0	0	0	0	0	0	0	0.00
[illegible]	V	R.R	0	0	0	0	0	0	0	0
[illegible]	V	0	R	58	0	0	0	0	0	0

[illegible]

[illegible]

[illegible]

Stolt Sea Farm

3.3 Frárennsli

Frárennsli frá fyrirhuguðu fiskeldi yrði beint inn í afrennslislagnir (bunustokk) HS Orku, sem eru nú þegar til staðar, og því ekki hafa veruleg áhrif á hitastig þess, en 55 °C heitt vatn hefur um árabil runnið úr virkjunni út í sjó. Mjög ólíklegt að nokkrar breytingar verði þar á með tilkomu fiskeldis á svæðinu, þar sem magn svifagna er mjög lágt og mikil þynning á frárennslisvatni fiskeldisstöðvarinnar á sér stað, þegar það rennur saman við afrennslisvatn virkjunarinnar. Allar leifar eða lífræn efni renna með öðrum orðum inn í 75 °C heitt afrennslivatn, en við þennan snögga hitamun munu allar lífverur drepast (sjá nánar um áhrif hitastigs á lífverur í viðauka 12.15 „The Question of the Existence of Specific Marine Bacteria“ og viðauka 12.16 „Studies on the thermal sensitivity of the marine bacteria“). Við stækkun Reykjanesvirkjunar er áætlað að hitastig vatns muni fara niður í 35 til 40 gráður (37,91°C eins og skýrt er að framan). Við blöndunina munu allar lífverur drepast vegna hitamismunar og efnasamsetningu vatns í bunustokk. Með þessu er greinilega tryggt að strandlengjan er vernduð frá mögulegri mengun af völdum lífvera, sem eiga sér uppruna annars staðar en við strendur Íslands. Það vatn, sem rennur í gegnum fiskeldisstöðina, er súrefnisbætt, og á upptök sín úr sjótökuholum, sem boraðar hafa verið niður á töluvert dýpi í hrauninu á landinu. Vegna hinnar náttúrulegu síunar eru því engar svifagnir í því vatni. Í vanalegu sjóvatni mælist magn svifagna á bilinu frá 2 til 10 mg/l, en það magn getur farið upp í 40 mg/l í miklu ölduróti (há ölduhæð). Fiskeldisstöðin mun einungis hækka magn svifagna[9] um 1 til 3 mg/l og vatnið sjálft er súrefnisbætt líkt og vatn er í úthöfum. Ákveðið magn fosfórs, ammóniaks og níturs kemur frá eldinu vegna fóðrunar, en þar sem rennslið er það mikið, eða um 5.600 l/s (4.000 l/s frá eldisstöðinni og 1.600 l/s frá HS Orku), verður þynning það mikið að magn þessa mun mælast á bilinu frá 0 til 2 mg/l.

[9] Svifagnir eru úrgangur og saur úr kerjum fiskeldisins. Útreikningurinn á svifögnum er byggður á því magni svifagna, sem koma frá sandhverfueldisstöðvum fyrirtækisins á Spáni, sem eru af svipaðri stærð og fyrirhugað fiskeldi við Reykjanesvirkjun.

3.4 Úrgangur

Hér að neðan er yfirlit yfir magn úrgangs frá 2.000 tonna eldisstöð Stolt Sea Farms á Spáni. Þessi stöð er af svipaðri stærð og fyrirhuguð eldisstöð á Reykjanesi og áætlar Stolt Sea Farm að magn úrgangs verði svipað frá fyrirhugaðri eldisstöð við Reykjanesvirkjun. Þessar tölur því lagðar hér til grundvallar:

Tafla 3.11 Magn úrgangs frá 2000 tonna stöð

Flokkur	**Úrgangsefni**	**Magn í kg**
Fiskidauði	Fiskúrgangur	16.507
Rotþrær	Úrgangur úr rotþrám	6.060
Iðnaðarúrgangur	Plastflöskur	450
	Plast	150
	Fóðurpokar	1.920
	Timbur	1.650
	Pappakassar	60
	Föt	250
Hættuleg efni	Notuð olía	559
	Sprautur	9
	Járnpakningar	38
	Plastikpakningar	40
	Flúórsent ljós	88
	Litarefni í prentara	3
	Olíuklútar	175
	Rafhlöður	15

3.4.1 Förgun og losun

Sérstaklega verður hugað að viðurkenndum frágangi og eyðingu dauðs eldisfiskar frá upphafi rekstrar. Farið verður með allan úrgang til Sorpeyðingarstöðvar Suðurnesja í Helguvík.[10]

[10] Aron Jóhannsson, umhverfisfulltrúi hjá Kalka, hefur staðfest að starfsleyfi Sorpeyðingarstöðvar Suðurnesja nái yfir förgun á þeim úrgangi sem myndi falla til við rekstur fiskeldisstöðvarinnar.

4 Staðarval

Hagstæðasta stærðareining fyrir fiskeldi á Íslandi fyrir senegalflúru reiknast vera 2.000 tonna ársframleiðsla. Miðað við þá stærð, þarf fiskeldið að fá rennsli af hámarks 4.000 sekúndulítrum af 20 °C til 22 °C stiga heitu sjóvatni.

Ein af ástæðunum fyrir valinu á svæðinu hjá Reykjanesvirkjun er sú að þetta vatnsmagn er fáanlegt þar við rétt hitastig. Okkur er ekki kunnugt um aðra staða á Íslandi, þar sem þetta magn sjávarvatns á þessu hitastigi er fyrir hendi.

Aðrir þættir sem höfðu áhrif á staðarvalið var nálægð þess við alþjóðarflugvöll, en talsvert magn fisksins mun verða sent út með flugi. Auk þess er greiður aðgangur að mörgum höfnum í næsta nágrenni. Eins og fram kemur í kafla 8.9 greinagerðar þessarar, þá er fiskeldi af þessu tagi, mannfrekt, en okkur virðist staðsetningin bjóða upp á gott aðgengi að fólki, bæði frá Reykjanesbæ, Grindavík og af höfuðborgarsvæðinu. Vinnsluhúsnæði fyrir pökkun á fiski er nægjanlegt í nágranna sveitafélögunum.

Enn frekari ástæða fyrir staðsetningunni er sú að í aðalskipulagi Reykjanesbæjar fyrir svæðið er sérstaklega gert ráð fyrir fiskeldi á þessu svæði.

Eins og fyrr segir þá yrði stöðin reist í landi Reykjanesvirkjunar HS Orku til að nýta ávinninginn af ónýttu heitu affallsvatni (35 °C) eftir kælingu hverfla í virkjuninni. Þess vegna er nauðsynlegt að byggja í námunda við þær leiðslur sem þegar eru fyrir hendi. Sjá nánar um staðsetningu í kafla 6.1.

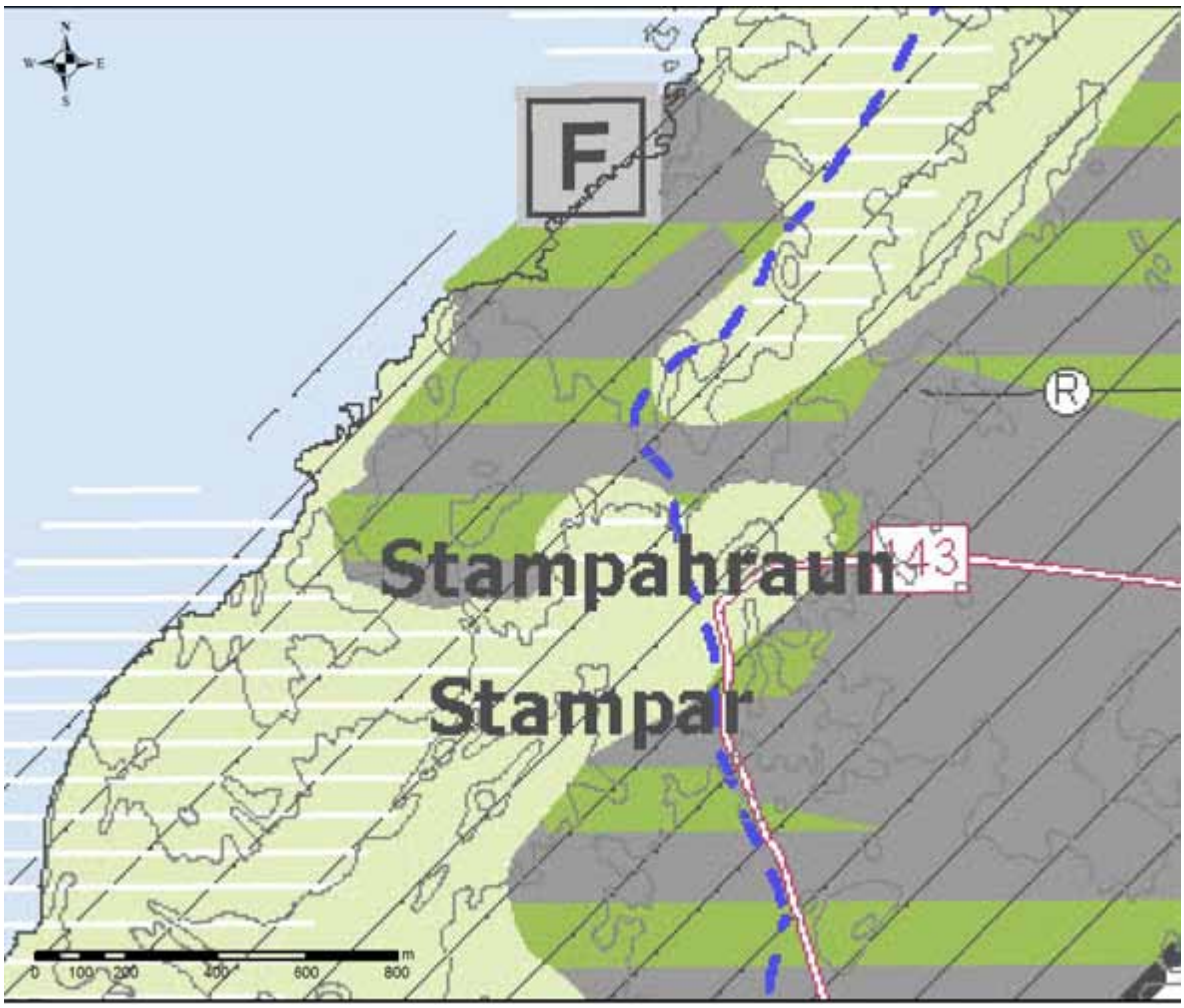
5 Samræmi við skipulag

Í þessum kafla er fjallað um samræmi við aðal- og deiliskipulag svæðisins. Þessi kafli er unnin í samvinnu við verkfræðistofuna Verkís.

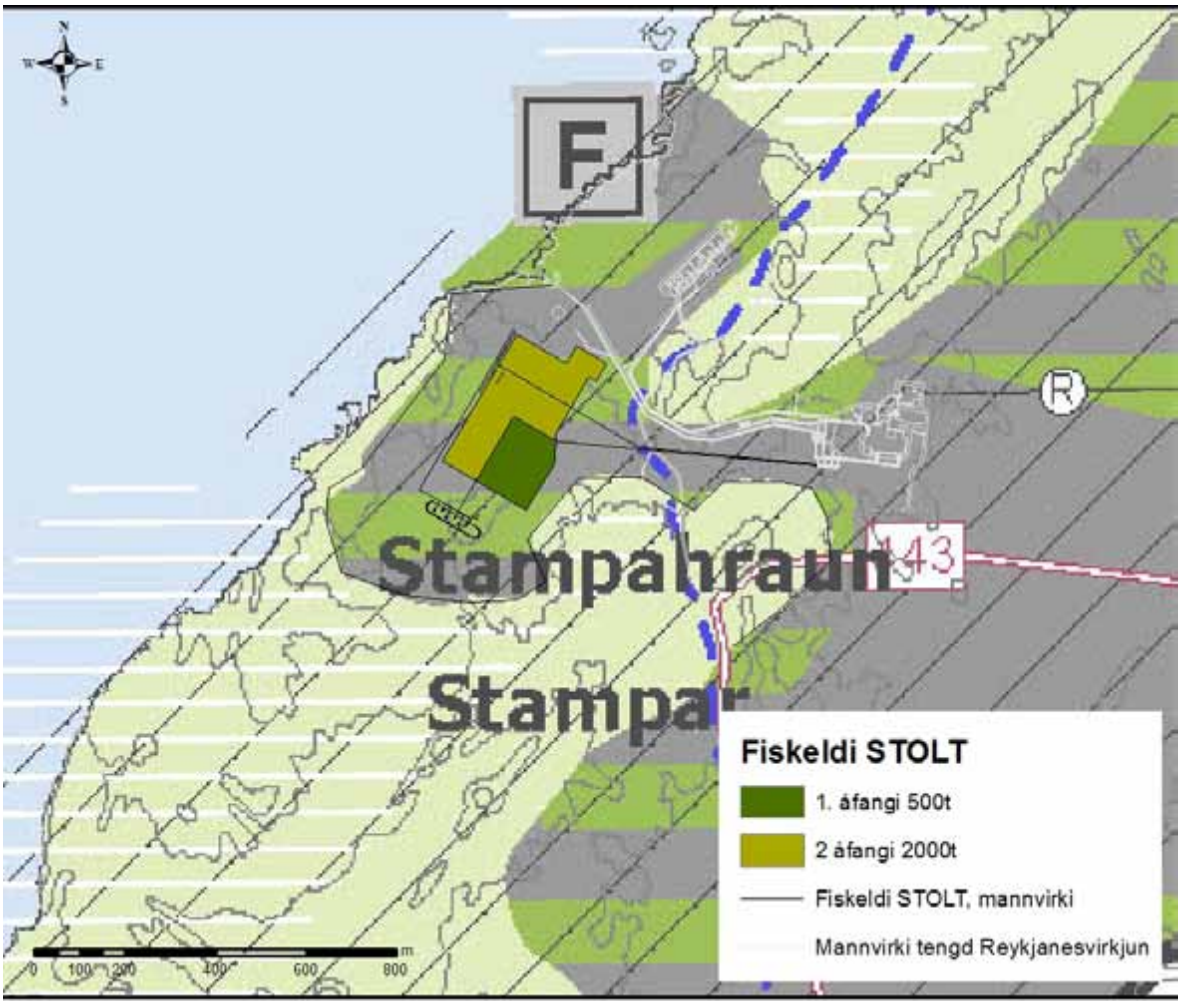
5.1 Aðalskipulag Reykjanesbæjar 2008 – 2024

Aðalskipulag Reykjanesbæjar 2008-2024 var staðfest af umhverfisráðherra þann 23. nóvember 2010. Þar er gert ráð fyrir möguleika á fiskeldi innan orkuvinnslusvæðis á Reykjanesi. Fyrirhugað fiskeldi er innan þess svæðis sem afmarkað er í aðalskipulagi sem blandað svæði fyrir iðnað og opið svæði til sérstakra nota. Fyrirhuguð framkvæmd er því í samræmi við aðalskipulag Reykjanesbæjar.

Mynd 5.1 Aðalskipulag Reykjanesbæjar 2008-2024



Mynd 5.2 Byggingarreitur felldur inn í hluta aðalskipulags Reykjanesbæjar 2008–2024

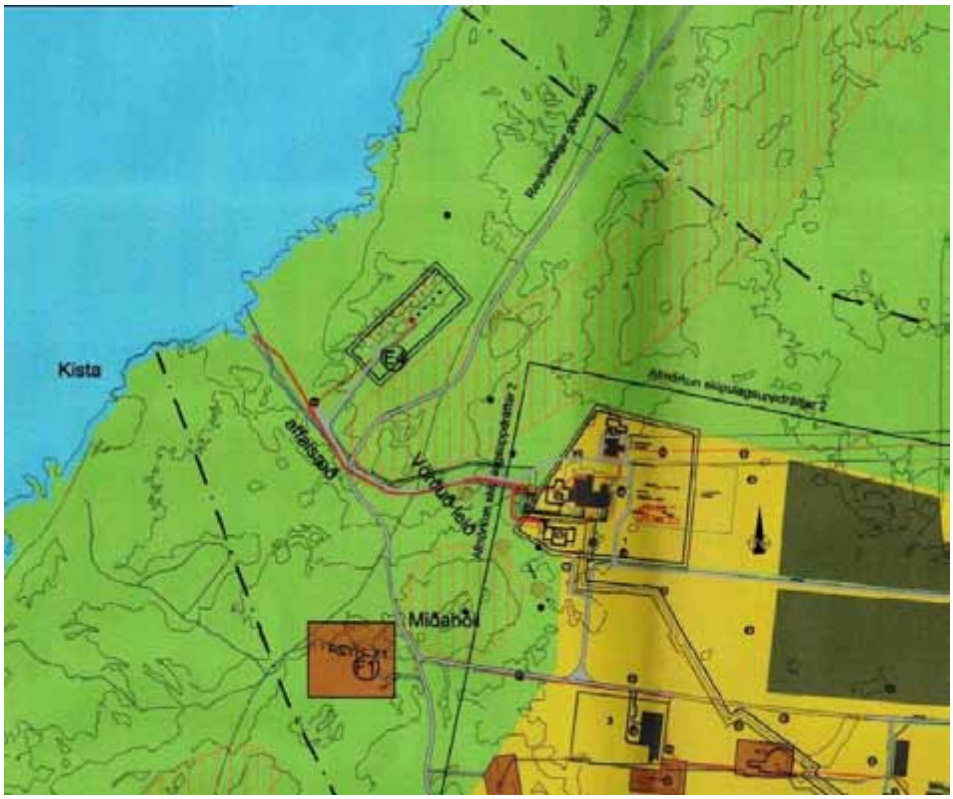


5.2 Deiliskipulag Reykjanesbæjar

Ekkert deiliskipulag er í gildi þar sem áætlað er að fiskeldið rísi. Hins vegar er í gildi deiliskipulag á nálægu iðnaðarsvæði þar sem Reykjanesvirkjun er starfrækt[11]. Áformað er að fiskeldið nýti sér affallsvatn frá virkjuninni og þarf því að leggja veitulögn frá virkjuninni að fiskeldinu sem teygir sig inn á deiliskipulagða svæðið. Hluti af deiliskipulaginu er sýndur á Mynd 5.3 Deiliskipulag iðnaðar- og orkuvinnslusvæðis.

[11] Deiliskipulag. Iðnaðar- og orkuvinnslusvæði á Reykjanesi. Staðfest 2004 m.s.br. Reykjanesbær og Grindavík.

Mynd 5.3 Deiliskipulag iðnaðar- og orkuvinnslusvæðis



Mynd 5.4 Byggingarreitur felldur inn í hluta deiliskipulags iðnaðar- og orkuvinnslusvæðis

Deiliskipulagða svæðið er afmarkað með fjólublárri línu. Utan þess svæðis er í dag sjótökusvæði fyrir Reykjanesvirkjun. Helstu mannvirki fyrirhugaðs fiskeldis hafa verið sett ofan á teikninguna.

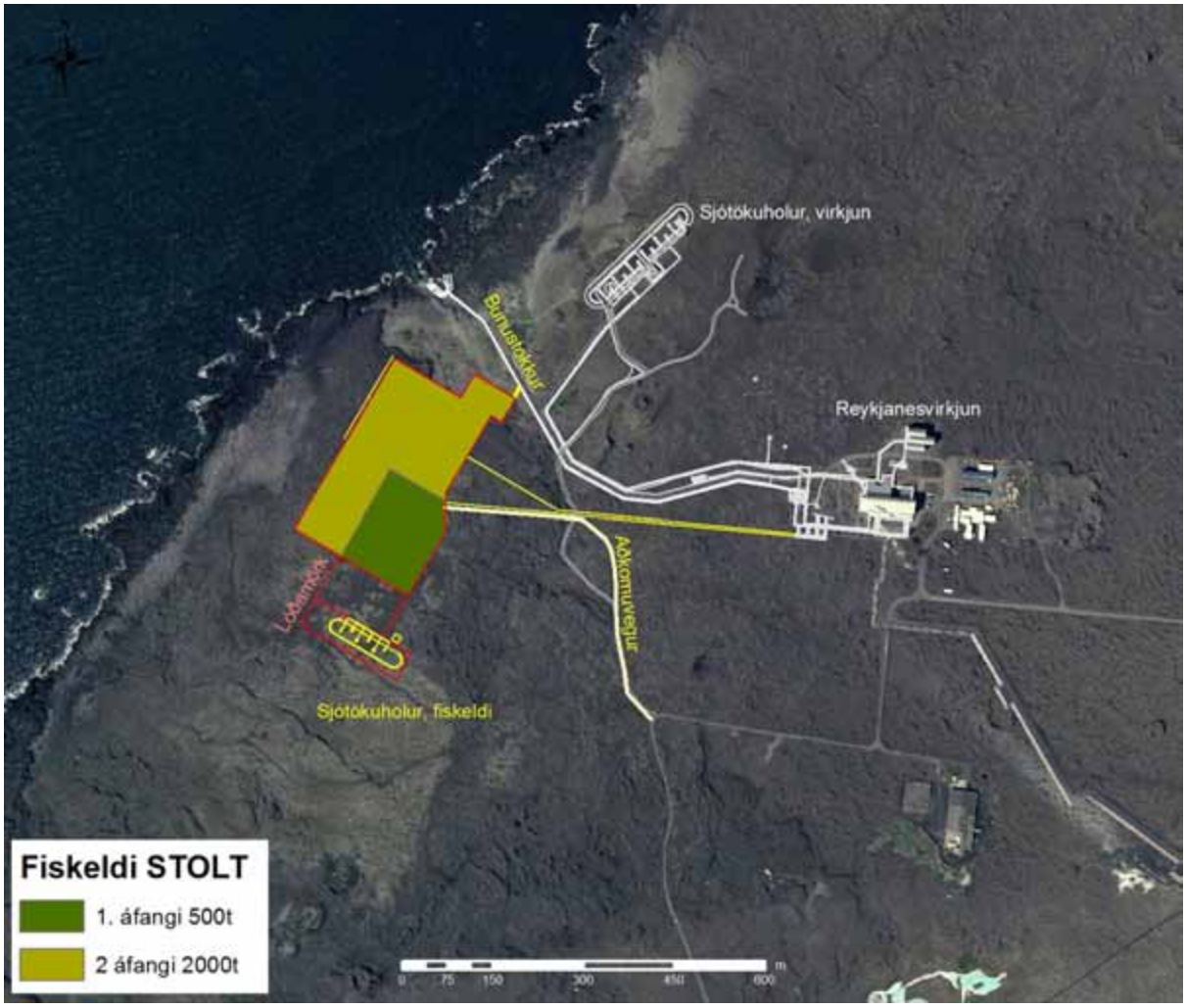
6 Fyrirhuguð mannvirki

Í þessum kafla er fjallað um fyrirhuguð mannvirki fyrir fiskeldisstöðvar. Þessi kafli er að hluta til byggður á samantekt Verkís.

6.1 Staðsetning mannvirkja

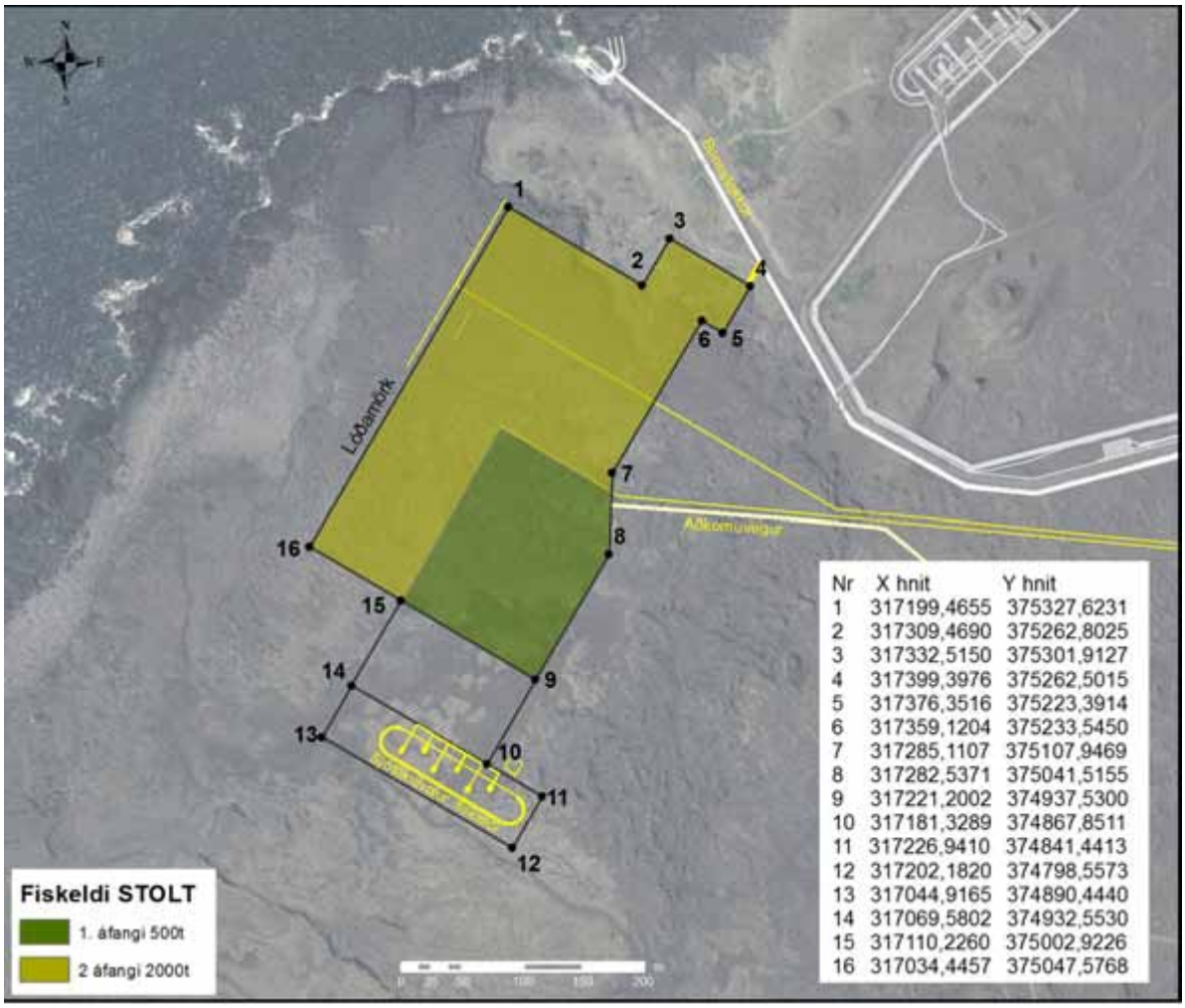
Fyrirhugað er að reisa fiskeldisstöðina í landi Reykjanesvirkjunar sem er í eigu HS Orku. Ávinningur af byggingu fiskeldisstöðvar á þessum stað felst í því að nýta heitt affallsvatn (35 °C) frá virkjuninni sem í dag er skilað ónýttu í bunustokk eftir að það hefur verið notað til kælingar á hverflum hennar. Bunustokkurinn mun hæglega geta tekið á móti því magni frárennslis eldisstöðvarinnar, sem fyrirhugað er. Eftir stækkun Reykjanesvirkjunar og þegar fiskeldið hefur náð 2.000 tonna framleiðslu gæti þurft að hækka veggi bunustokksins lítillega. Fiskeldisstöðin yrði reist í námunda við þær lagnir sem fyrir hendi eru frá Reykjanesvirkjun (sjá nánar Mynd 6.1).

Mynd 6.1 Yfirlitsmynd er sýnir helstu mannvirki fiskeldisstöðvar og áfanga framkvæmda



Staðarhnit lóðar eru skilgreind í Mynd 6.2 hér að neðan og hæð lands er 9,50 m y.s. Stærðin á lóðinni ásamt fletinum sem tengir saman sjótökureitinn og reitinn með hinum byggingunum er alls 87.845 m^2 og skiptist í aðal reit sem er 68.482 m^2, milli reit sem er 10.416 m^2 og sjótöku reit sem er 8.946 m^2.

Mynd 6.2 Hnit bygginga og lóðamörk



Nr	X hnit	Y hnit
1	317199,4655	375327,6231
2	317309,4690	375262,8025
3	317332,5150	375301,9127
4	317399,3976	375262,5015
5	317376,3516	375223,3914
6	317359,1204	375233,5450
7	317285,1107	375107,9469
8	317282,5371	375041,5155
9	317221,2002	374937,5300
10	317181,3289	374867,8511
11	317226,9410	374841,4413
12	317202,1820	374798,5573
13	317044,9165	374890,4440
14	317069,5802	374932,5530
15	317110,2260	375002,9226
16	317034,4457	375047,5768

Hnitin sem koma fram í Mynd 6.2 hér að ofan er eru í ÍSN93 hnitakerfinu.

6.2 Framkvæmdir og helstu mannvirki

Stöðin verður byggð í tveimur áföngum (sjá Mynd 6.1). Helstu mannvirki sem um ræðir eru fiskeldisstöð, sjótökuholur á sérstöku sjótökusvæði fyrir stöðina, lagnir, bílastæði og starfsmannahús

Í fyrri áfanga framkvæmda verður reist seiðastöð auk lítillar eldisstöðvar fyrir framleiðslu ungfisks með framleiðslugetu allt að 500 tonnum á ári. Megin markmiðið á þessu stigi er að koma á fót seiðastofni og byrja seiðaframleiðslu. Seiðaframleiðsla úr villtum stofnum

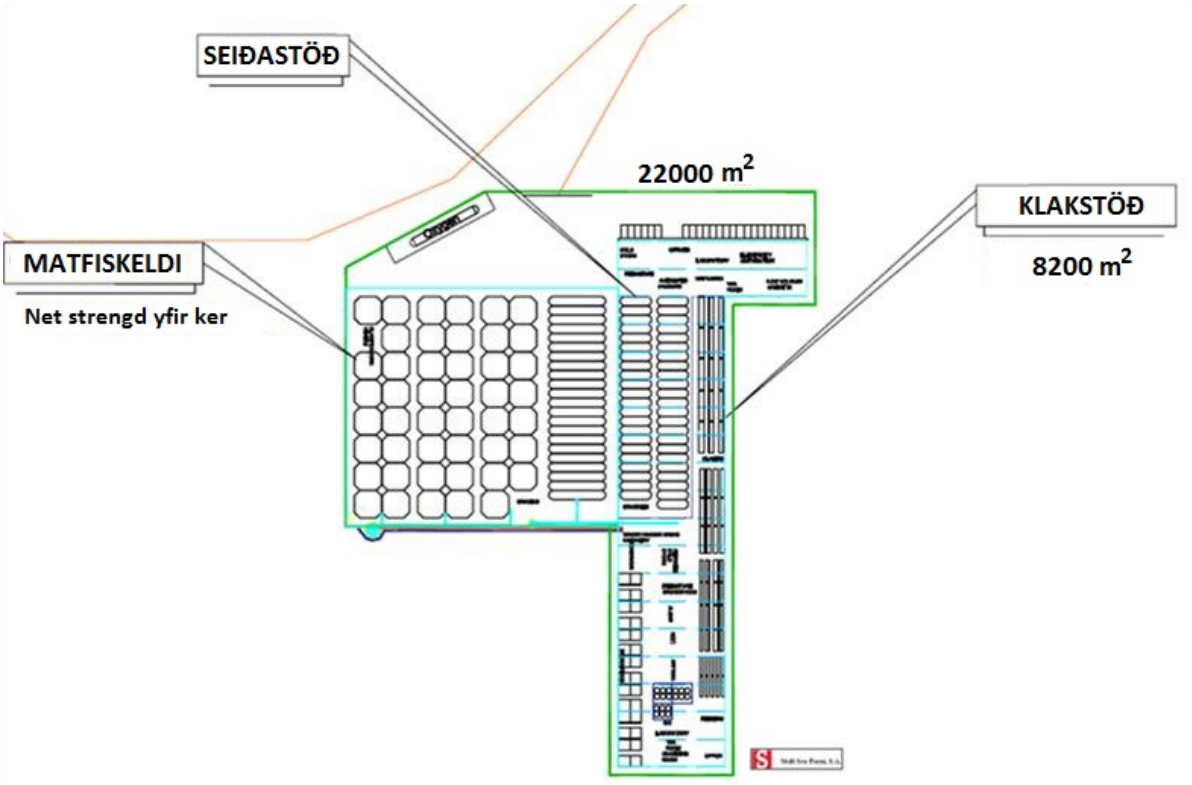
er flókið ferli og mun taka meira en tvö ár að ljúka fyrsta umgangi þess. Stærð stöðvar í fyrsta áfanga verður 22.000 m² (sjá nánar í töflu 6.1).

Tafla 6.1 Yfirlit yfirframkvæmdir og framleiðslu í 1. áfanga (500 tonn)

Hlutar	Fiskistærð	Vatn	Hitastig	Ker	Fjöldi	Stærð	m²
1. Klakstöð	1-5g		22 °C	Seiði og hrygningar-stofn			2510
2. Seiðastöð	5-70g	Gegnumflæði	22 °C	D lögun 12x2	42	34	1428
3. Fiskeldi ungfiskur	70-120g	Gegnumflæði	22 °C	D lögun 21x3	24	65	1560
4. Matfisk-eldi	120-350g	Gegnumflæði	22 °C	Átthyrnt 10x10	46	92	4232
						Samtals áframeldi	**5792**
						Samtals án seiðastöðvar	**7220**
						Samtals	**9730**

Á Mynd 6.3 eru sýndar helstu einingar fiskeldisstöðvarinnar, þ.e. klakstöð, seiðaeldi og matfiskeldi í fyrsta áfanga framkvæmda.

Mynd 6.3 Fyrsti áfangi framkvæmda



Framkvæmdir annars áfanga munu hefjast þegar framleiðsla seiða er orðin trygg og komin vel á veg. Þessi hluti verkefnisins snýr að stækkun seiðastöðvar og áframræktun, þar sem

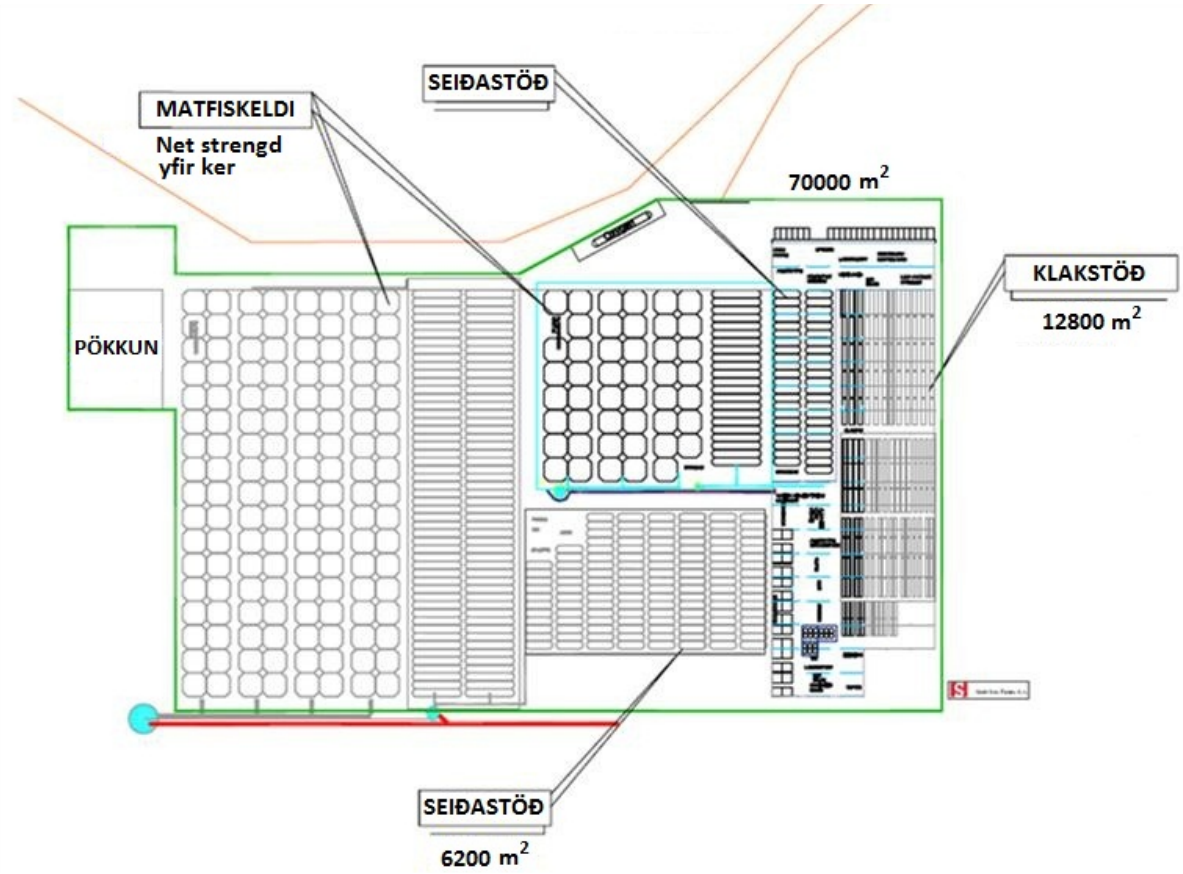
aðaláherslan verður á áframeldi. Byggingarnar verða í einingum þannig að stækkun mun taka skamman tíma (sjá nánar töfluTafla 6.2). Eftir stækkun stöðvarinnar mun árleg framleiðslugeta verða allt að 2.000 tonn. Stærð svæðis er færi undir fiskeldisstöð og tilheyrandi mannvirki er áætluð um 70.000 m².

Tafla 6.2 Yfirlit yfir framkvæmdir og framleiðslu í 2. áfanga (2000 tonn)

Hlutar	Fiskistærð	Vatn	Hitastig	Ker	Fjöldi	Stærð	m²
1. Klakstöð	1-5g		22 °C	Seiði og hrygningar-stofn			2935
2. Seiðastöð	5-70g	Gegnumflæði	22 °C	D lögun 12x3	165	34	5610
3. Fiskeldi ungfiskur	70-120g	Gegnumflæði	22 °C	D lögun 21x3	182	64	6144
4. Matfisk-eldi	120-350g	Gegnumflæði	22 °C	Átthyrnt 10x10	184	92	16928
						Samtals fiskeldi	**23072**
						Samtals án seiðastöðvar	**28682**
						Samtals	**31617**

Á Mynd 6.4 eru sýndar helstu einingar fiskeldisstöðvarinnar í öðrum áfanga framkvæmda.

Mynd 6.4 Annar áfangi framkvæmda



Stærð einstakra mannvirkja er tekin saman í töflu 6.3.

Tafla 6.3 Samantekt á stærð mannvirkja (m^2)

Mannvirki	**Nýting**	**Stærð mannvirkja**
Byggingar:	Klakstöð:	12.800 m^2
	Fiskeldi ungfiskur:	6.200 m^2
	Pökkunarstöð:	2.000 m^2
	Samtals byggingar:	**21.000 m^2**
	Matfiskeldi (ker yfirbyggð með neti):	40.000 m^2
	Heildarlandsvæði undir byggingar, áframeldi, vegi og bílastæði:	**70.0000 m^2**

Þak seiðastöðvar verður bogadregið og mun ná 6 m hæð þar sem það verður hæst og hæð veggja verður 4 m (sjá Mynd 6.5).

Mynd 6.5 Myndin sýnir byggingar sambærilegar þeim sem reistar yrðu

Eldisker sem byggð verða fyrir matfiskeldið eru átthyrnd og eru steinsteypt.

6.2.1 Yfirlit yfir eldisstöðina

Stöðin verður byggð með tveggja þrepa seiðastöð og eldisrými einum metra hærri en seiðastöðin til að tryggja hreyfingu fisks og dreifingu vatns. Undirstöður fiskeldisins munu fylgja að svo miklu leyti sem kostur er hæðarlínum landslags, en 1 m hæðarmunur verður á milli framleiðslueininga. Þetta þýðir að engin jarðefni verða flutt af byggingarsvæðinu sjálfu, en hins

vegar þarf að færa til jarðefni til að ná réttri hæð bygginga. Mynd 6.6 sýnir yfirlistsmynd af fiskeldisstöð á Spáni af sömu stærð og þeirri sem fyrirhugað er að byggja við Reykjanesvirkjun.

Mynd 6.6 Yfirlitsmynd af fiskeldisstöð á Spáni af sömu stærð og þeirri sem byggð yrði

[12]

6.3 Vatns- og raflagnir

Raf- og vatnslagnir verða lagðar í jörðu eins og kostur er.

6.4 Áhrif veðurfars á mannvirki

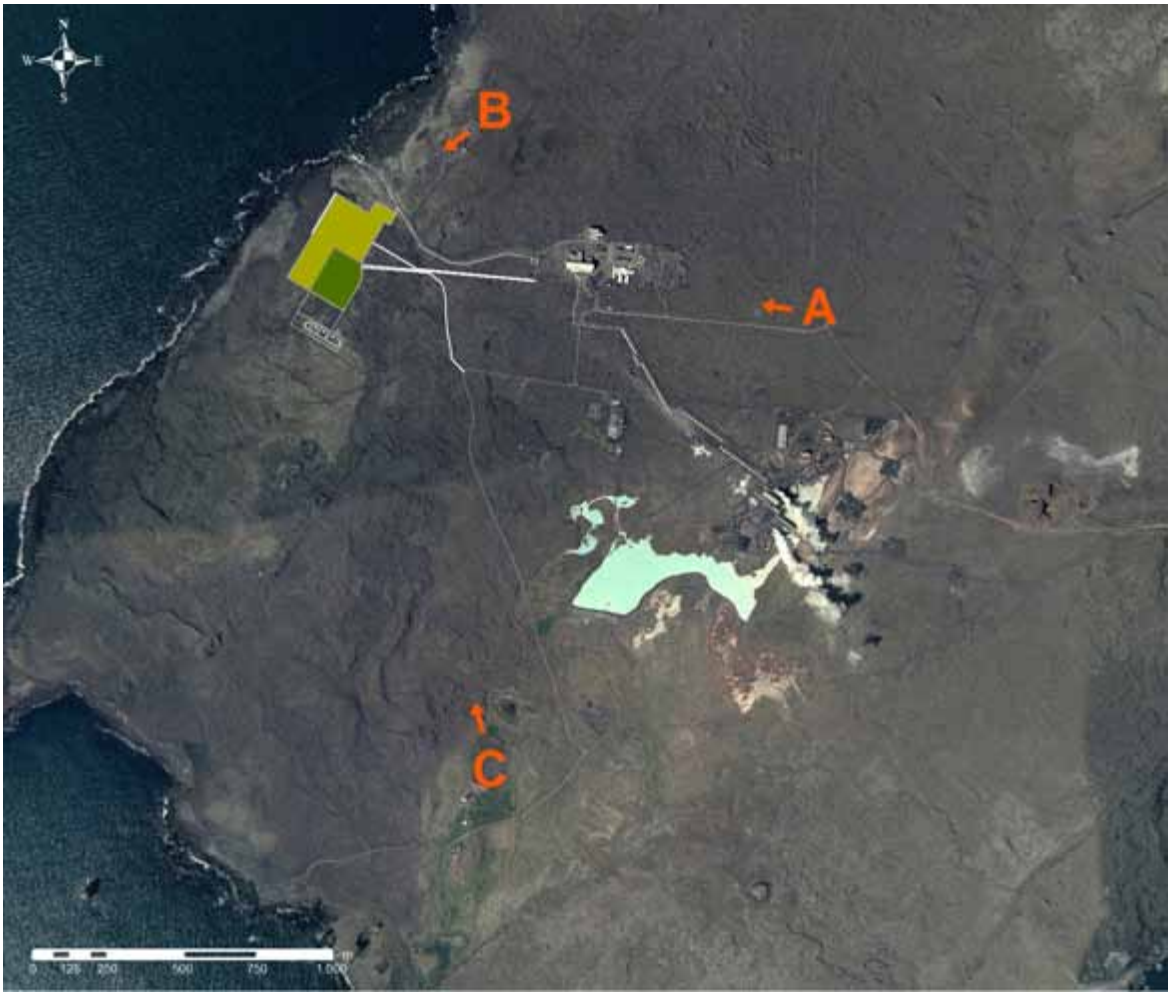
Við hönnun mannvirkja verður tekið mið af veðurfari á svæðinu og mannvirki verða þannig úr garði gerð að þau standist þau veðurskilyrði sem þar ríkja. Starfsmannahús og fiskeldisker verða steinsteypt. Byggingarefni og efni í klæðningu verða valin þannig að þau standist það vatns- og vindálag, sem ríkir á svæðinu, auk mögulegrar efnaveðrunar eða tæringar frá gufu Reykjanesvirkjunar. Öll mannvirki verða hönnuð samkvæmt íslenskum stöðlum.

[12] Útskýringar á enskum myndatexta:
South Conservation Area Syðra verndarsvæði
Pipes out Staðsetning affalls leiðslna

6.5 Yfirlitsmynd yfir staðsetningu mannvirkja

Á Mynd 6.7 er sýnd staðsetning fyrirhugaðra mannvirkja svo sem fiskeldisstöðvar, sjótökuhola og lagna að og frá stöðinni. Ennfremur eru merktar inn á Mynd 6.7 staðsetningar ljósmynda A, B og C sem fjallað er um hér að neðan. Ljósmyndirnar eiga að gefa hugmynd um staðsetningu og ásýnd mannvirkja í landinu eða nánar tiltekið frá þjóðvegi, sjótökusvæði Reykjanesvirkjunar og frá norðurhlíð Vatnsfells þar sem Reykjanesviti stendur. Byggingar fiskeldisstöðvar eru flestar lágreistar með hámarkshæð 6 metra. Starfsmannahús mun þó ná 7 metra hæð. Landslag á þessu svæði einkennist af grófu og mishæðóttu hrauni.

Mynd 6.7 Yfirlitsmynd af staðsetningu mannvirkja og ljósmynda tekna af vettvangi



13

[13] HS Orka hefur góðfúslega veitt heimild fyrir notkun myndina í þessari greinargerð.

6.5.1 Sjónarhorn (A) frá Nesvegi (425) í átt að Reykjanesvirkjun

Á Mynd 6.8 er horft frá þjóðvegi til vesturs í átt að Reykjanesvirkjun. Myndin er tekin upp á hól skammt frá vegamótunum, sjónarhornið er rúmlega 3 hærra en vegurinn, kóti u.þ.b. 25 m yfir sjávarmáli. Landslagið á svæðinu er hæðótt hraunyfirborð þar sem landinu hallar ekki jafnt niður að strönd, kóti svæðis þar er á milli 5 og 10 m yfir sjávarmáli. Frá þessu sjónarhorni hindrar bæði landslagið og mannvirki Reykjanesvirkjunar sýn til fiskeldisstöðvarinnar. Vegurinn frá þjóðveginum út að Reykjanesvita eltir lágpunkta landsins nokkuð. Þar sem mannvirki fiskeldis eru ekki mjög há, eru sjónarhorn frá veginum þar sem sést til þeirra ekki mörg. Sjást mun til þeirra frá nokkrum stöðum og oft þá aðeins lítillega.

Mynd 6.8 Sjónarhorn (A) frá Nesvegi (425) að Reykjanesvirkjun

6.5.2 Sjónarhorn frá sjótökusvæði Reykjanesvirkjunar

Á Mynd 6.9 er horft frá sjónámssvæði Reykjanesvirkjunar til suðvesturs í átt að norðurhlið fiskeldisstöðvar, sjónarhornið er 2-3 metrum hærra en landið í forgrunni, kóti u.þ.b. 11 m yfir sjávarmáli. Fiskeldisstöðin verður staðsett skammt frá og í áþekktri hæð og sjónámssvæði HS Orku. Mannvirki verða vel sýnileg frá þessu sjónarhorni og frá strandsvæði.

Mynd 6.9 Sjónarhorn (B) frá sjótökusvæði Reykjanesvirkjunar í átt að framkvæmdasvæði

6.5.3 Sjónarhorn (C) frá Vatnsfelli við Reykjanesvita í átt að framkvæmdasvæði

Á Mynd 6.10 er horft frá norðurhlíð Vatnsfells við Reykjanesvita til norðurs í átt að fiskeldsstöð, efst til hægri sjást mannvirki Reykjanesvirkjunar, sjónarhornið er a.m.k. 30 metrum hærra en undirlendið forgrunni, kóti u.þ.b. 51 m yfir sjávarmáli. Mannvirki hafa verið sett inn á myndina. Efst til hægri á myndinni sjást mannvirki Reykjanesvirkjunar. Sjónarhornið er a.m.k. 30 metrum hærra en undirlendið í forgrunni, kóti u.þ.b. 51 m y.s. Mannvirki verða vel sýnileg frá norðurhlíð Vatnsfells. Leiða má líkur að því að meginþorri ferðamanna hafi meiri áhuga á svæðinu til suðvesturs frá Reykjanesvita í átt að Karli og að Eldey. Mörg mannvirki eru til staðar á svæðinu ef horft er til norðurs frá Reykjanesvita og því er ekki reiknað með að mannvirki fiskeldisstöðvarinnar muni draga frekar að sér athygli en önnur.

Mynd 6.10 Sjónarhorn (C) frá Reykjanesvita

6.6 Framkvæmdaráætlun – tímaáætlun

Tafla 6.4 sýnir helstu verkþætti og tímaáætlun verkefnisins. Gert er ráð fyrir að framkvæmdir hefjist á árinu 2011 og að fiskeldisstöðin verði komin í fullan rekstur á árinu 2017.

Tafla 6.4 Tímaáætlun framkvæmda og helstu verkþættir

Tími	**Verkefni**
2011	Jarðvinna hefst og bygging seiðastöðvar.
2012	Fyrsta tilraunaframleiðsla á seiðum og bygging 500 tonna einingar.
2013	Seiðaframleiðsla er hafin, áframræktun á fyrstu seiðum og lok byggingaframkvæmda.
2014	Sala hefst á fiski, hryggningarstofn hefur hrygningu (seiði).
2015	Í árslok hefst bygging 2000 tonna einingar.
2016	Lok byggingar 2000 tonna einingar og fullum hryggningarafköstum er náð.
2017–	Vonast er til að á árinu 2017 muni stöðugri framleiðslu vera náð.

7 Staðarval fyrir sjóholur fyrir áformaða fiskeldisstöð á Reykjanesi

Íslenskar orkurannsóknir (ÍSOR) hafa tekið saman þennan kafla að beiðni Stolt Sea Fram. Kaflanúmerum hefur verið breytt til samræmis við aðra kafla í þessari greinargerð.

7.1 Inngangur

Áður en ráðist verður í framkvæmdir við nýja fiskeldisstöð þarf að ákvarða stað fyrir jarðsjávartöku. Áætlað er að sá staður verði í landi Reykjanesvirkjunar. Þarna er ætlunin að dæla upp afar miklu magni af jarðsjó eða um 1,5 m^3/s, sem notaður verður við fiskeldið. Frárennsli verður til sjávar um sömu lögn og er nú þegar frá virkjuninni. Sjórinn þarf að vera hreinn og ómengaður af efnum frá Reykjanesvirkjun.

Fyrirhuguð sjótaka mun taka mið af þeirri reynslu, sem er á stórfelldu jarðsjávarnámi fyrir Orkuver Reykjanesvirkjunar (Þórólfur H. Hafstað, Sigurður G. Kristinsson 2007. Þar er sjór notaður til kælingar og útþynningar á háhitavatni. Kælivökvinn, sem að jafnaði er um 3,5 m^3/s, fæst úr tólf sjóholum, sem eru um 200 m frá sjó. Þetta er fullsaltur jarðsjór, en hér hagar svo til að ofan á jarðsjónum er þunn og verulega sjómenguð ferskvatnslinsa. Hiti í jarðsjónum er um 8 °C og seltan rúmlega 34 ‰. Sjávarfalla gætir mikið í holunum á svæðinu, enda eru jarðlög nærri strönd vel leiðandi. Þær eru ákaflega afkastamiklar og í þeim er mjög lítill niðurdráttur við úrdælingu.

Úr nýjum sjótökuholum á að afla jarðsjávar til fiskeldis og það gerir það að verkum að vanda þarf frágang þeirra umfram það sem gert er við vinnslu kælivökva. Þess vegna verða þær líkast til dýpri en sjóholur orkuversins (>60 m) og fóðringar lengri en þar.

7.2 Jarðfræði

Jarðfræðikortið á mynd 7.1 er hluti af stærra korti og sýnir aðstæður undir fyrirhugaðri fiskeldisstöð (Kristján Sæmundsson o.fl. 2010). Líkast til mun hún alfarið rísa á Yngra Stamphrauni, sem er frá þrettándu öld. Undir því er Eldra Stampahraun, en það er um 2000 ára gamalt. Bæði eru þessi hraun mjög vel lek og úr þeim er hægt að vinna óhemju mikinn jarðsjó. Á svæðinu hefur verið boruð ein könnunarhola vegna jarðsjávarleitar, LS-01 (Magnús Ólafsson, Þórólfur H. Hafstað 2004).

Samkvæmt jarðlagagreiningum úr LS-01 má ætla að neðan við 40 m dýpi sé komið í stafla af grágrýtishraunum með þunnum sjávarsetlögum inni á milli (mynd 7.2). Þau eru álitin vera þétt. Neðan þeirra er svo allþykkt sandlag, og er ekki vitað um vatnsleiðnieiginleika í því. Ef einnig er tekið mið af svarfgreiningu úr efsta hluta háhitaholunnar RN-29, sem nýlega hefur verið boruð í grennd við Miðahól, er hægt að spá um jarðlagaskipan á meira dýpi. Á um 80 m er

búist við stafla af dyngjuhraunum, sem talin eru vera vel vatnsgefandi. Einnig er gert ráð fyrir að í 120 m dýpi sé komið í grágrýtisstafla, sem nær líklega niður fyrir 150 m dýpi (mynd 7.5). Taldar eru töluverðar góðar líkur á að úr þessum lögum megi vinna jarðsjó og ef til vill ekki síður úr gjalli og gjósku, sem eru inni á milli basaltlaganna.

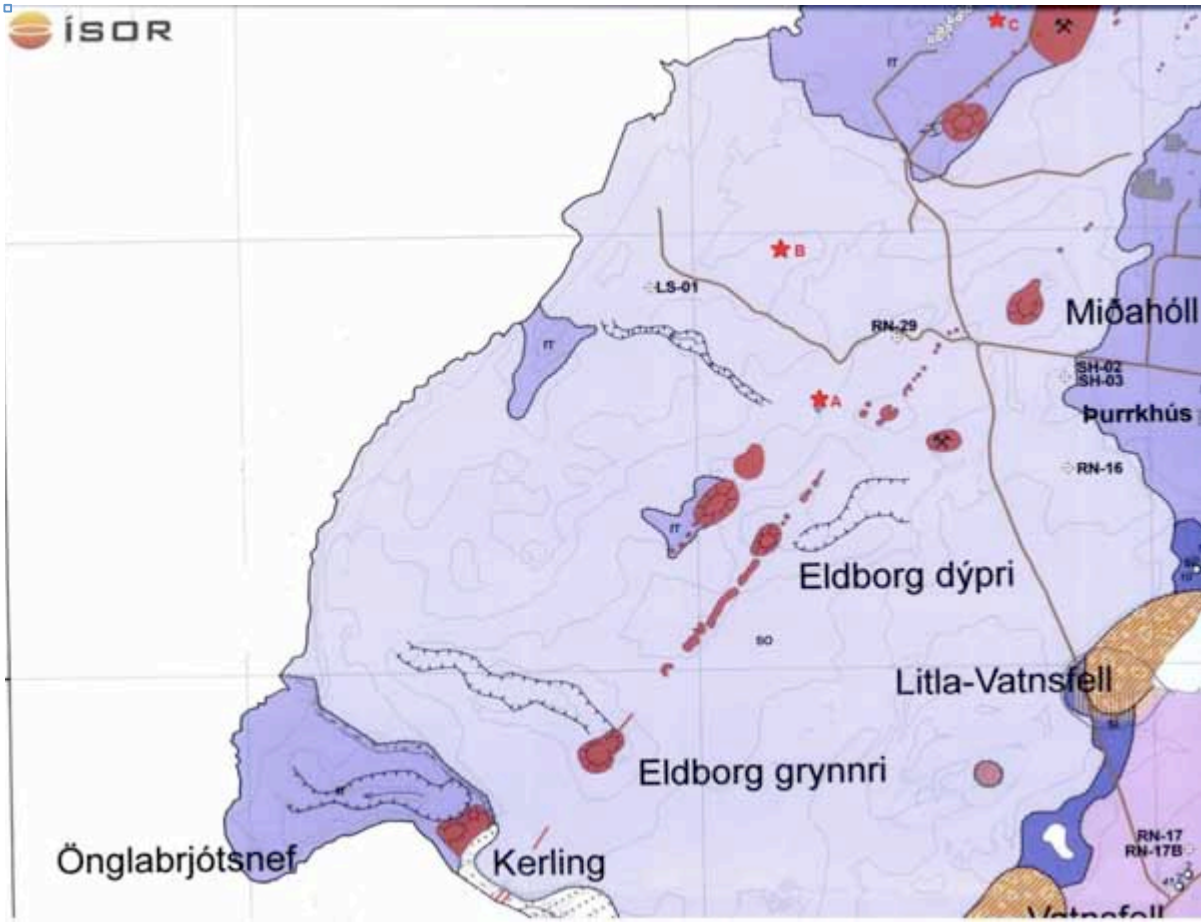
7.3 Jarðsjór

Víðast hvar á Reykjanesskaga flýtur fersk grunnvatnslinsa ofan á allt að fullsöltum jarðsjó. Úti á Reykjanesi skekkist þessi mynd dálítið því þar er grunnvatnið verulega sjóblandað. Það getur verið vegna þess að þar gætir særoks meira en ekki síður vegna afar velleiðandi jarðlaga, sem ganga í sjó fram þar sem brim og sjávarföll blanda stöðugt sjó inni í grunnvatnslinsuna. Afleiðingin er sú að almennilega ferskt vatn er vandfengið nærri sjó milli Hafna og Grindavíkur en gægð er hins vegar af ísöltum vökva.

Fullsaltur jarðsjór er nú numinn í stórum stíl fyrir Reykjanesvirkjun (á svæðinu við stjörnu C á mynd 7.1). Eins og kemur fram á mynd 7.2 er hálfsaltur vökvi efst í holu LS-01 en um eiginlega ferskvatnslinsu er ekki að ræða hér. Á 25 m dýpi undir vatnsborði er fullsaltur jarðsjór og líklegt er að fullsaltur jarðsjór fengist ef úr holunni yrði dælt rösklega, það hefur alla vega verið reyndin á sjóöflunarsvæði orkuversins. Í holunni kemur fram þykkt gosmalarlag á 16 - 40 m dýpi. Þetta jarðlag er án efa mjög vel vatnsleiðandi og má telja líklegt að það flytji sjó tiltölulega greiðlega frá fjöru og til vinnsluholu, sem í það yrði boruð. Hér verður hins vegar reynt að ná í jarðsjóinn neðar.

Vart hefur orðið við örlitla hitamengun (1½-2 °C) í efstu 20 m undir vatnsborði Sigurður G. Kristinsson og Þórólfur H. Hafstað 2011. Þetta er sýnt á mynd 7.3. Þessi hitnun er rakin til frárennslis Reykjanesvirkjunar, sem þarna er skammt norðan við (í fjöru efst á mynd 7.1). Þessi frárennslisvökvi leggst gjarnan í fjöruborðið, einkum á flóði, þrátt fyrir mikið öldurót sé við ströndina. Sífelldar vatnshæðarbreytingar vegna sjávarfalla valda síðan því að þessi vökvi blandast við jarðsjóinn (Þórólfur H. Hafstað o.fl. 2004).

Mynd 7.1 Hluti jarðfræðikorts af Reykjanesi

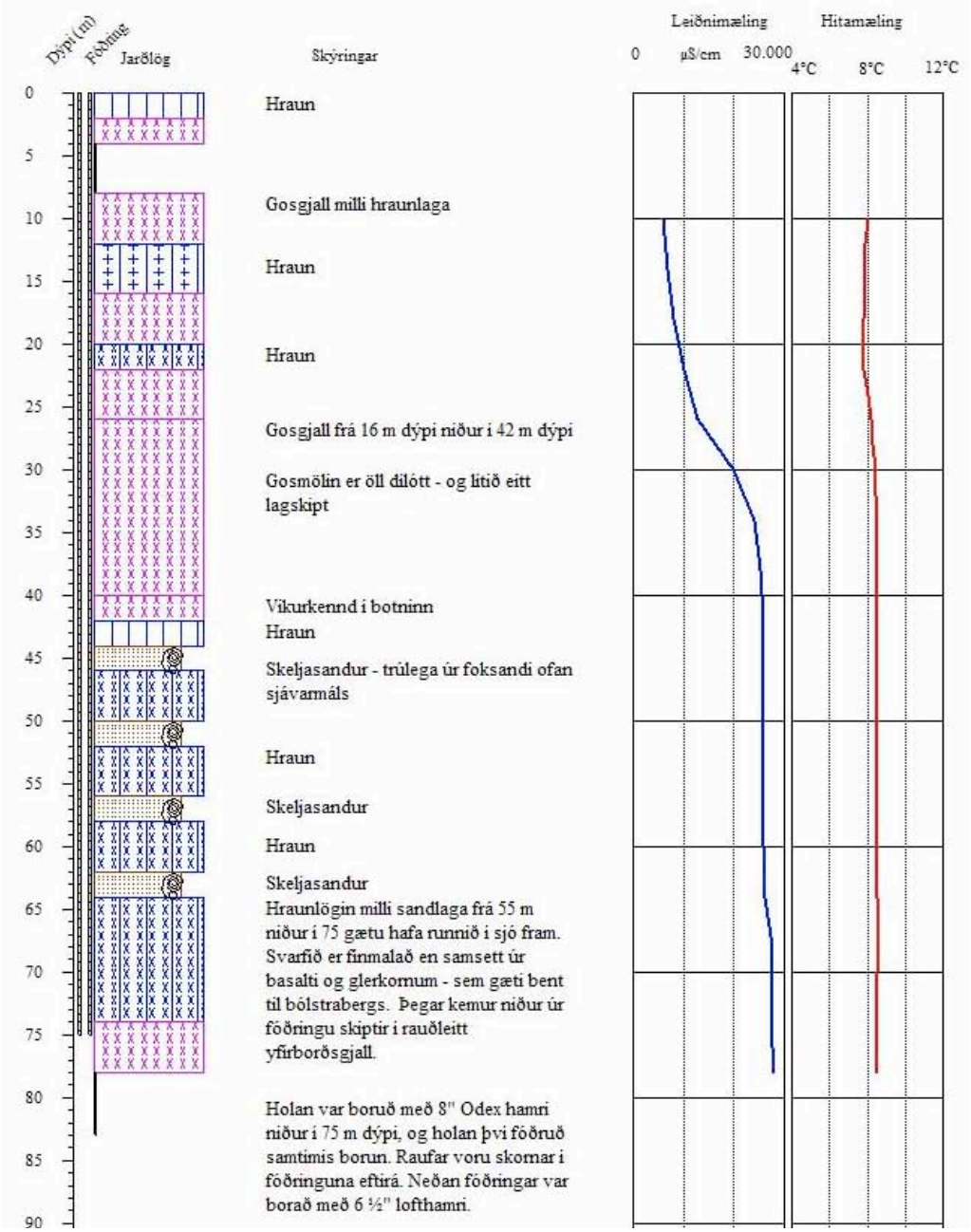


Staðsetning á sjótökusvæði fyrir áformaða fiskeldisstöð tekur helst mið af jarðfræðisniðum úr borholunum RN-29 og LS-01. Stöðin á að rísa í Yngra Stampahrauni (so), sem brann á 13. öld. Undir því er Eldra Stampahraun (rr), sem er um 2000 ára gamalt. Í það eru sjóvinnsluholur Reykjanesvirkjunar boraðar. Könnunarsvæði eru sýnd með rauðri stjörnu.

Búast má við að þessi hitamengun aukist ef boraðar yrðu grunnar ófóðraðar vinnsluholur nærri sjó; dæling úr þeim mundi draga að og ísalt vatnið úr efstu 20 metrunum og sjó frá fjörunni. Afrennslisvökvinn inniheldur efnaríkt skiljuvatn frá orkuverinu og þó að um verulega útþynningu sé að ræða er talið öruggast að reyna að haga málum þannig að jarðsjávartaka fiskeldisstöðvarinnar verði alveg laus við hana. Það verður að gera með greiningu á efnasýnum af sjó úr rannsóknarholunum og úr afrennslislinu, líkt og gert er vegna orkuversins (Ester Eyjólfsdóttir o.fl. 2010).

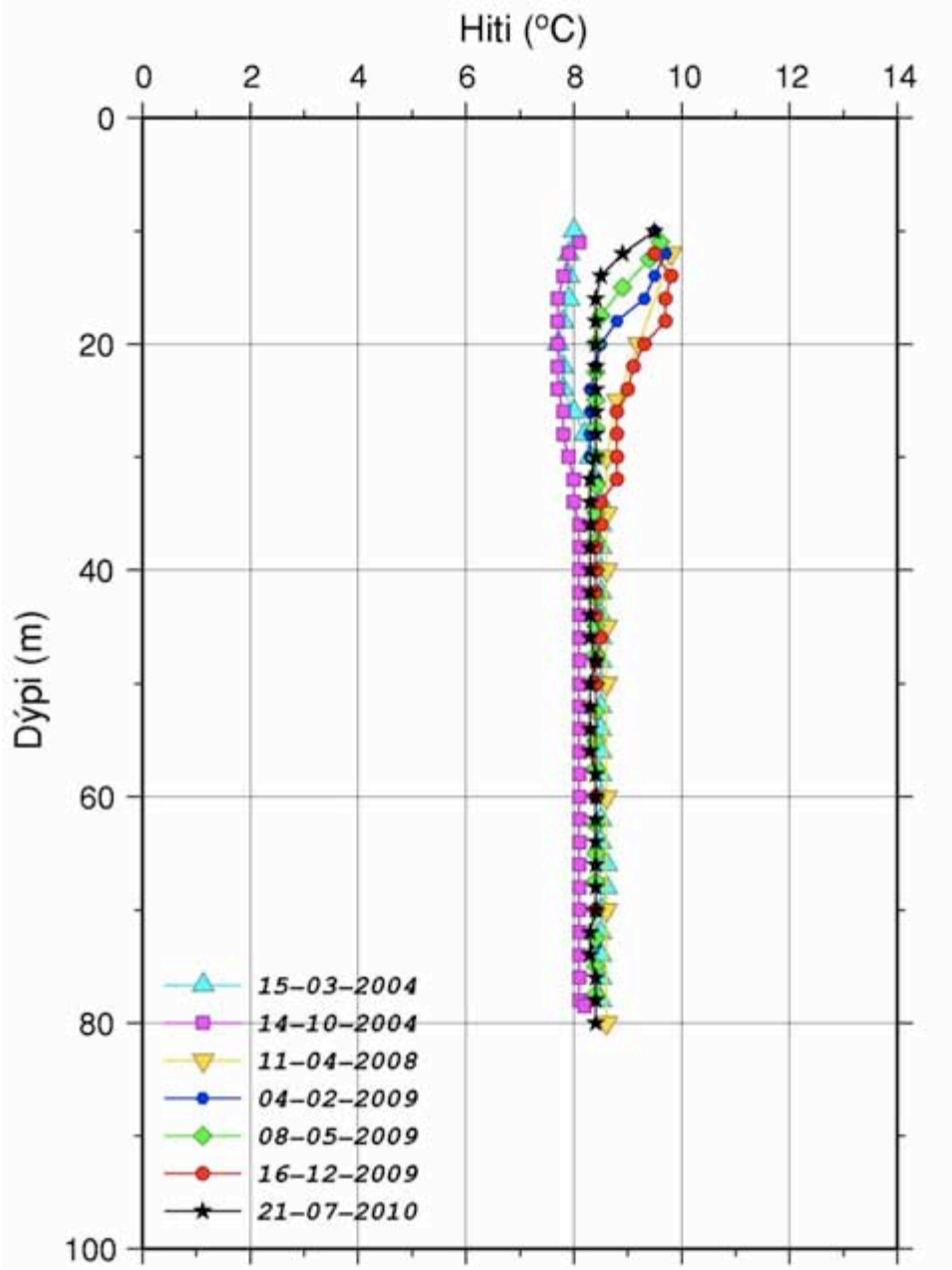
Það má gera á tvennan hátt. Annars vegar með því að staðsetja vinnsluholur það langt frá útfallinu að ekki verði vart neinna hitaáhrifa. Hins vegar að taka jarðsjóinn af meira dýpi og heilfóðra vinnsluholur dýpra niður en gert hefur verið í vinnsluholum orkuversins. Rannsóknarholum er ætlað að skera úr um hvernig þetta sé best gert.

Mynd 7.2 Jarðlagasnið af tilraunaholunni LS-01



Míglek gjall- og gosmalarlög eru ráðandi niður á um 40 m dýpi. Þar neðan við eru jarðlög þéttari, a.m.k. niður í 75 m. Vatnsborð er á um 10 m dýpi og er komið í fullsaltan jarðsjó á um 35 m.

Mynd 7.3 Hitamælingar úr rannsóknarholunni LS-01.



Efsti hluti sjóblandaða grunnvatnsins hitnaði eftir að Reykjanesvirkjun tók til starfa og fór að hleypa volgum affallsvökva í sjóinn skammt norður af holunni. Þessara breytinga virðist gæta niður á um 35 m dýpi.

7.4 Nýjar rannsóknarholur

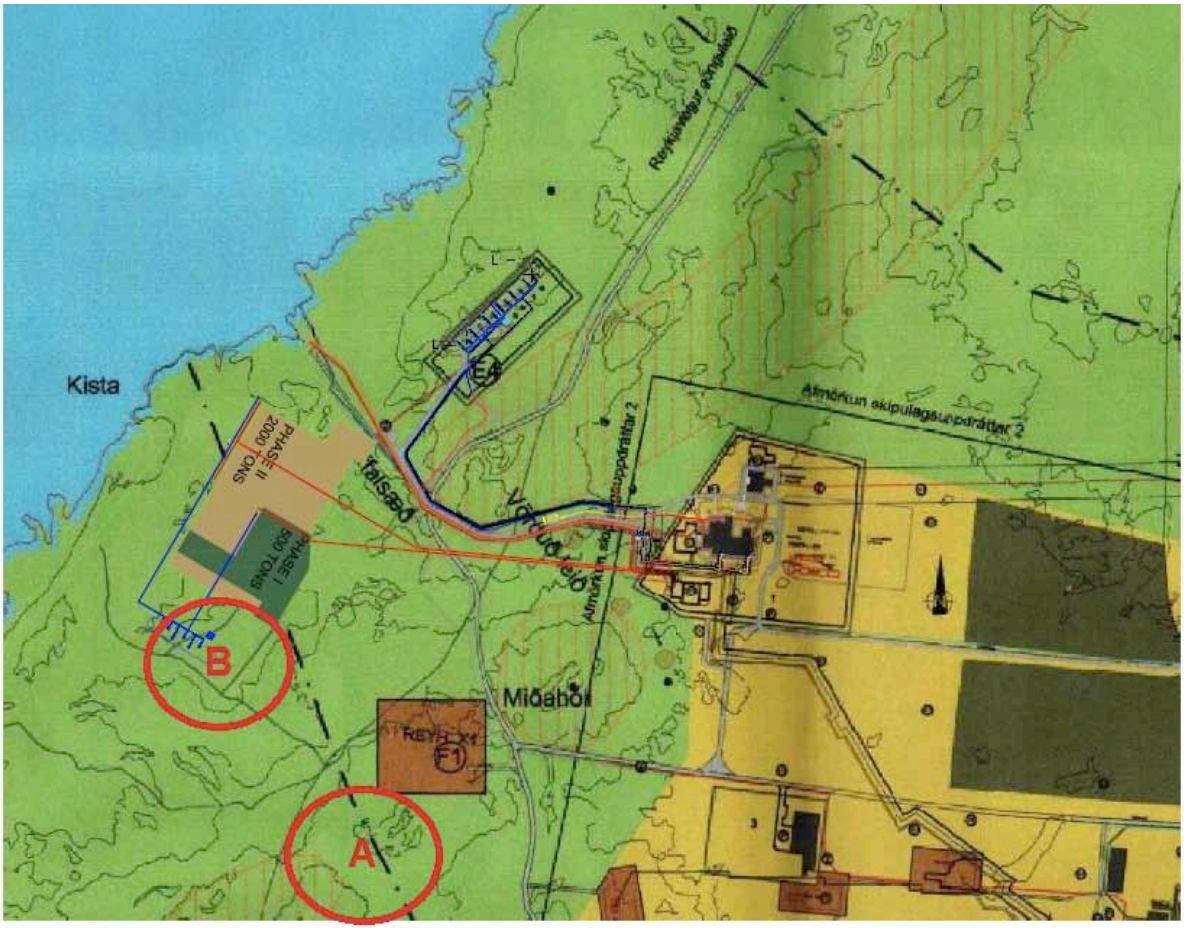
Bent er á tvo staði þar sem áhugavert er að kanna möguleika á jarðsjávarvinnslu. Þeir eru auðkenndir með hring á Mynd 7.4 og stjörnum á mynd 7.1. Þriðji staðurinn, C, er þar sem núverandi sjóvinnsla orkuversins er og á þeim slóðum verður enn frekari jarðsjávarvinnsla,

þegar það verður stækkað (Sigurður G. Kristinsson og Þórólfur H. Hafstað 2008). Hann kemur síst til greina vegna fjarlægðar frá áformuðu fiskeldi.

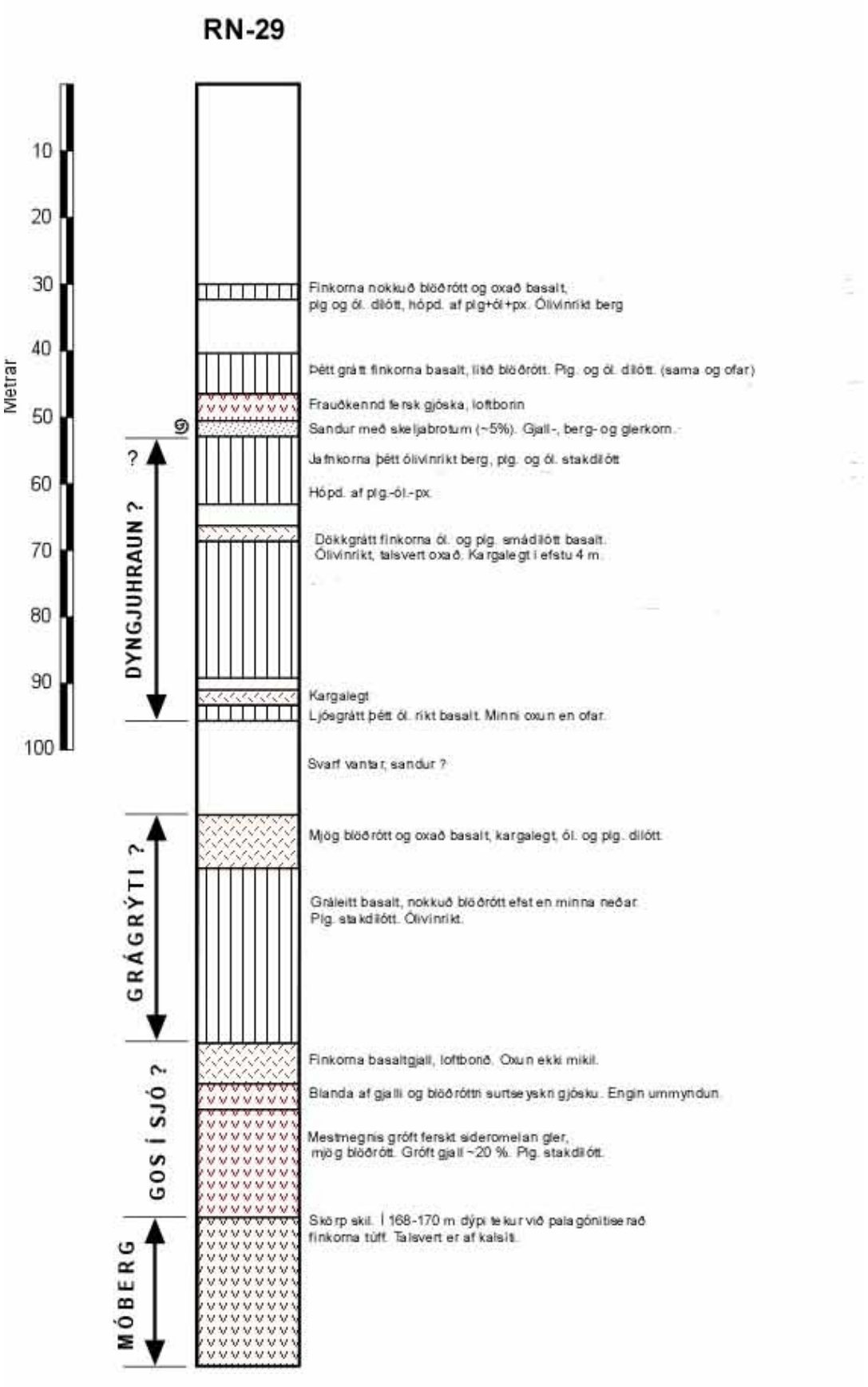
Staður A er í stefnu gossprungu og er þess vænst að karga- og vikurlög við hana geti reynst gjöful. Þarna hefur verið gert ráð fyrir að boruð yrði ein eða tvær grannar könnunarholur, allt að 100 m djúpar. Svæðið er talið vera það langt frá sjó að hugsanlega sé jarðsjórinn þar undir laus við yfirborðhlýnunina fá fjörunni. Þarna eru líklega um 15 m niður að vatnsborði.

Staður B er nær sjó norðaustur af könnunarholunni LS-01. Jarðlagaskipan ofan 80 m er því sæmilega vel þekkt (mynd 7.2). Einnig þarna er gert ráð fyrir nýjum könnunarholum; hugsanlega aðeins einni en þá þyrfti hún að vera a.m.k. 150 m djúp. Þarna gætir hitnunar frá affallssjónum en markmiðið er að ná ferskum sjó af meira en 60 m dýpi. Heil fóðring mundi með öðrum orðun ná þangað niður. Þarna eru minna en 10 m niður að vatnsborði.

Mynd 7.4 Hugsanleg staðsetning á könnunarholum A og B vegna sjótöku fyrir fiskeldisstöðina



Mynd 7.5 Jarðlagasnið af efstu 200 m, eins og þeir birtast í háhitaholunni RN-29



Á mynd 7.5 er gerð tilraun til tengingar jarðlaga, sem fram koma í RN-29 (mynd 7.1) við LS-02, sem er við sjótökusvæðið beint norður af henni. Ef vel tekst til ætti að fást gnótt jarðsjávar úr grágrýti og gjalli neðan við ca. 100 m (ÍSOR, Magnús Sigurgeirsson, óbirt gögn). Vonast er til að skeljalög á um 50 m dýpi séu þétt og komi þannig í veg fyrir stórfellt niðurrennsli.

7.5 Vinnsluholur

Vinnsluholur yrðu svo boraðar á öðrum hvorum þessara staða, **A** eða **B**. Vídd þeirra, dýpi og lengd fóðringa, sem og annar frágangur yrði hannaður með hliðsjón af upplýsingum, sem fást með mælingum í könnunarholunum. Miðað er við að þarna fáist sem mest af hreinum jarðsjó úr hverri holu með eins litlum niðurdrætti og kostur er og það án þess að draga að vökva úr efsta hluta sjóblandaða grunnvatnsins. Þannig er gert ráð fyrir að áhrif sjóvinnslu á grunnvatn verði hverfandi.

8 Grunnástand og áhrif framkvæmda

Í þessum kafla er fjallað um grunnástand framkvæmdasvæðis m.t.t. helstu umhverfisþátta s.s. jarðfræði, gróðurs, sjávar, fugla- og dýralífs auk annarra þátta svo sem áhrifa á ferðamennsku í nágrenninu og áhrif framkvæmda á grunnástand. Þessi kafli hefur að hluta til verið tekinn saman af Verkís.

8.1 Jarðmyndanir og landslag

Á Reykjanesi er svokallað brunalandslag sem gjarnan var notað um nýrunnið hraun sem einkennist af hrauni, gígum og hellum. Helstu einkenni þessarar landslagsgerðar á Reykjanesi er ógróið eða lítt gróið hraun sem er svart á að líta. Ströndin er stórgrýtt og klettótt og verulegt brim við ströndina. Fjaran er víðast hvar aðgengileg. Strandsvæðið nýtur ekki sérstakrar verndar en Reykjanesbær hyggst setja hverfisvernd á strönd Reykjaness samkvæmt drögum að aðalskipulagi 2008-2024.

Landslag svæðisins í nágrenni fiskeldisstöðvarinnar einkennist af stórbrotinni jarðfræði. Nútímahraun þekur svæðið og er það klofið af ungum misgengjum og opnum gjám. Framkvæmdasvæðið er innan svæðis á Náttúruminjaskrá, Reykjanes, Eldvörp og Hafnaberg og er tilgreint sem svæði til friðlýsingar í Náttúruverndaráætlun 2004-2008. Einnig njóta jarðmyndanir á svæðinu sérstakrar verndar skv. 37. gr. náttúruverndarlaga nr. 44/1999.

Fyrirhugaðar framkvæmdir vegna fiskeldisstöðvarinnar eru á landi sem er í eigu HS Orku og hefur verið skilgreint sem iðnaðarsvæði í aðalskipulagi Reykjanesbæjar 1995-2015, iðnaðarsvæði, orkuvinnsla á Reykjanesi. Þegar hefur farið fram ítarleg rannsókn á áhrifum á framkvæmda á svæðinu í nágrenninu vegna fyrirhugaðar stækkunar Reykjanesvirkjunar og er stuðst við þær athuganir í þessari umfjöllun.

8.1.1 Áhrif á jarðmyndanir

Talið er að rask á jarðmyndunum innan lóðar vegna framkvæmda verði mikið. Hluti fyrirhugaðs framkvæmdasvæðis er þakið tveimur hraunum misgömlum, sbr. kafla 7.3. og mynd 7.1. hér að framan, sem mun skerðast eða verða fyrir röskun við byggingu mannvirkja. Heildarstærð lóðar er 8,78 ha og er lóð að mestu þakin hrauni en bein skerðing á hrauni er þó nokkru minni en lóðarstærð. Áhrif á jarðmyndanir innan lóðar verða verulega neikvæð en óveruleg utan lóðar.

8.1.2 Áhrif á landslag og ásýnd lands

Landslag í nálægð við fyrirhuguð mannvirki einkennist af jarðfræðilegri fjölbreytni. Framkvæmdir verða á afmörkuðu svæði þar sem fyrir er nútímahraun og gróður sem einkennist af grösum, smárunnum og melgresi. Svæðinu í nágrenninu hefur að hluta til þegar verið raskað vegna Reykjanesvirkjunar, en sá hluti sem tilheyrir fyrirhuguðu framkvæmdasvæði er

óraskaður og að mestu þakinn hrauni, sbr 8.1.1. hér að framan. Ný mannvirki geta aukið andstæður í landslaginu en byggingar er tengjast fiskeldisstöðinni verða bæði léttar og lágreistar þannig að þær verða ekki mjög sýnilegar í landinu eins og sjá má á myndum 6.9, 6.10 og 6.11 hér að framan. Einnig eru fyrir í nágrenninu byggingar og lagnir Reykjanesvirkjunar sem ráða því að andstæður verða minni en ella ef stöðin hefði staðið þar ein og sér. Fyrirhugaðar framkvæmdir eru innan skilgreinds iðnaðar- og orkuöflunarsvæðis samkvæmt aðalskipulagi og hafa ekki áhrif á verndargildi svæðisins. Svæðið er á náttúruverndaráætlun 2004-2008 meðal annars vegna landslags en iðnaðarsvæðið telst ekki til verndarsvæðisins.

Byggingar fiskeldisins verða að öllum líkindum nokkuð sýnilegar frá Reykjanesvita og Reykjanesvirkjun. Landið er hins vegar mishæðótt á svæðinu í nálægð við fyrirhuguð mannvirki og því ólíklegt að þau sjáist víða að á leið eftir þjóðveginum að Reykjanesvita. Mannvirkin verða nálægt strandsvæðum og því mun verða breyting á ásýnd frá fjöru til lands miðað við núverandi aðstæður.

Hvað varðar frárennsli frá fiskeldisstöðinni er ekki gert ráð fyrir að verulegar breytingar verði á ásýnd fjörunnar miðað við núverandi ástand. Affallsvatn frá Reykjanesvirkjun er nú þegar leitt til sjávar um bunustokk og frárennsli frá fiskeldisstöðinni mun tengjast þeim lögnum.

Í heildina litið má reikna með að framkvæmdir muni hafa nokkuð áhrif á landslag.

8.2 Gróðurfar

Gróður í nágrenni við fyrirhugað framkvæmdarsvæði einkennist af graslendi og mosagróðri með smárunnun og gróðurþekja er víða skert. Gróður á framkvæmdasvæðinu er mjög svipaður því sem gerist í nágrenninu. Á framkvæmdasvæðinu er gróðurþekja víðast hvar ekki samfelld af náttúrulegum ástæðum og ekki er um að ræða sjaldgæf gróðurhverfi eða plöntutegundir á válista (sjá nánar Mynd 8.1).

8.2.1 Áhrif á gróður

Beint rask verður á gróðri við byggingu fiskeldisstöðvar, byggingu sjótökuhola/sjótökusvæðis, vegalagningar og gerð bílastæðis. Svæði vegna frárennslislagna frá Reykjanesvirkjun hefur þegar verið raskað og mun það lagnasvæði ekki stækka frá því sem fyrir er og skerða gróðurlendi. Gróðurfar á framkvæmdasvæði einkennist af grösum, smárunnum og melgresi. Gróðurþekja á framkvæmdasvæði er rýr og þar er ekki um að ræða sjaldgæf gróðurhverfi eða tegundir á válista. Naðurtunga sem finnst á hverasvæði við Gunnuhver er á válista Náttúrufræðistofnunar Íslands. Vaxtarsvæði naðurtungu er utan þess svæðis sem raskað verður. Áhrif á gróður eru staðbundin innan lóðar en utan lóðar verða áhrif á gróðurfar óveruleg.

Mynd 8.1 Gróðurfar á framkvæmdasvæðinu

Tafla 8.1 Gróðurlykill með Mynd 8.1

GRÓIÐ LAND	
Mosi	
A1	Mosi
A4	Mosi með smárunnum
A5	Mosi með grösum
A8	Mosi með grösum og smárunnum
A9	Hélumosi
A21	Tildur- og skrautmosar með blóðbergi
Kvistlendi	
B1	Krækilyng - fjalldrápi - bláberjalyng
B3	Krækilyng - víðir
B4	Beitilyng - krækilyng - bláberjalyng
Graslendi	
H1	Grös
H3	Grös með smárunnum
H4	Melgras
H7	Graslendi með elftingu
Fléttumói	
J1	Fléttur og smárunnar
J2	Grábreyskingur
Blómlendi	
L1	Hávaxnar blómjurtir
L2	Lágvaxnar blómjurtir
L3	Alaskalúpína
Ræktað land	
R1	Garðlönd
R5	Uppgræðsla
GRÓÐULAUST EÐA LÍTT GRÓIÐ LAND	
fl	Flag
fj	Fjara
hvl	Hveraleir
gt	Stórgrýtt land
hr/h	Hraun
me	Melar
ma	Moldir
n	Náma
ra	Rask
sa	Sandar
by	Byggð, mannvirki
av	Vatn
AÐRAR SKÝRINGAR	
Skert gróðurþekja	
x	Gróðurþekja að meðaltali 75%
z	Gróðurþekja að meðaltali 50%
þ	Gróðurþekja að meðaltali 25%
a	Nokkurt grjót í gróðri
b	Talsvert grjót i gróðri

8.3 Fugla- og dýralíf

Fyrri rannsóknir í tengslum við byggingu Reykjanesvirkjunar sýna að almennt er fuglalíf í nágrenni framkvæmdasvæðisins fáskrúðugt og eru algengir mófuglar í litlum þéttleika. Þó er sérstakt kríuvarp og stórt varp sílamávs í nágrenni þess svæðis sem skilgreint hefur verið sem iðnaðarsvæði. Mávavarp hefur verið í hrauninu norðan og austan við Gráa lónið og sunnan við Reykjanesvirkjun hefur verið stórt kríuvarp. Kría er algengust fugla á svæðinu. Megin varpsvæði kríu er sunnan Gráa lónsins. Kría er ábyrgðartegund en það teljast íslenskir fuglastofnar sem eru í háu hlutfalli af Evrópu- eða heimsstofni viðkomandi tegundar. Við rannsókn á fuglalífi svæðisins fundust 2 tegundir fugla sem eru á válista Náttúrufræðistofnunar en þær voru stormmávur og svartbakur (Náttúrufræðistofnun Íslands 2002).

8.3.1 Áhrif á fugla- og dýralíf

Framkvæmdasvæði er utan megin varpsvæðis kríunnar en reikna má með að einhverjir mófuglar verpi þar, en í lágum þéttleika þó. Varpfuglar á nálægum svæðum, svo sem kríur og sílamávar geta orðið fyrir truflun af hávaða og umferð vegna framkvæmda fari þær fram á varptíma. Möguleg truflun á fuglalíf er einkum vegna hávaða á framkvæmdatíma og vegna umferðar um svæðið. Jafnframt yrðu áhrif framkvæmda vegna umsvifa í tengslum við boranir. Þó er talið með hliðsjón af fyrirliggjandi upplýsingum að heildaráhrif á fluglalíf á svæðinu séu óveruleg.

8.4 Lífríki sjávar og fjöru

Eins og greint hefur verið frá þá er fyrirhugað að nýta affallsvatn Reykjanesvirkjunar við fiskeldið. Við núverandi aðstæður rennur affallsvatn virkjunarinnar til sjávar án síunar. Affall virkjunarinnar er ríkt af efnum sem eru uppleyst í jarðhitavökvanum. Mælingar á vatnsgæðum og tilraunaeldi á vegum Hafrannsóknarstofnunar með notkun á jarðhitavatni frá Reykjanesvirkjun gefur til kynna að vatnið sé nær sterílt og henti vel til fiskeldis. Tilraunaeldið gefur einnig til kynna að uppsöfnun óæskilegra efni sé óveruleg og ekki séu líkur á uppsöfnun efna í lífverum. Vegna þessa er því ekki gert ráð fyrir sérstökri hreinsun á affallsvatni frá fiskeldinu.

8.4.1 Úrgangur og frárennsli (áhrif á sjó og lífríki fjöru)

Affallsvatn frá Reykjanesvirkjun samanstendur af skiljuvatni, þéttivatni, kælisjó og ferskvatni og er það leitt frá stöðvarhúsi í bunustokki til sjávar. Gert er ráð fyrir að frárennsli frá fyrirhugaðri fiskeldisstöð verði leitt beint í frárennslisstokk virkjunarinnar. Fóðurnýting í eldinu er mjög góð þannig að lítið magn lífrænna leifa mun skila sér í frárennsli. Hlutfall svifagna í frárennsli frá stöðinni mun hækka mjög lítið umfram það sem fyrir er í sjóvatni sem nýtt verður eða um 1-3

mg/l. Mælingar munu fara fram á vatnsgæðum og verður ákvæðum starfleyfis frá Umhverfisstofnun fylgt svo og ströngum viðmiðunarmörkum evrópskra tilskipana um gæði vatns við fiskframleiðslu og vatnsgæða í árósum í samræmi við rekstur fiskeldisstöðva Stolt Sea Farms. Hiti affallsvatns yrði um 75 °C eftir að kælivatninu hefur verið beint í eldið, eins og fyrr greinir, og með því er tryggt að allar lífverur frá fiskeldinu eins og hrogn og seiði drepist. Mikið rennsli yrði frá eldisstöðinni og Reykjanesvirkjun eða um 5.600 l/s sem mun tryggja blöndun efna sem berast frá eldinu vegna fóðrunar. Þetta eru efni eins og fosfór, ammóníak og nítur. Mjög hröð þynning verður einnig á affallinu þegar það rennur í sjóinn vegna þungra strauma. Litlar líkur eru taldar á að frárennsli frá fiskeldisstöð muni hafa neikvæð áhrif lífríki sjávar og fjöru eða hafa í för með sér breytingar frá núverandi ástandi. Áhrif frárennslis eru því talin óveruleg.

8.4.2 Veirusýkingar/bakteríusýkingar

Í starfsleyfi Reykjanesvirkjunar sem gefið er út af Heilbrigðiseftirliti Suðurnesja 17. apríl 2008 er kveðið á vöktun á affallsvatni frá virkjuninni. Vöktun fer fram á áhrifum efnainnihalds affallsvatns á umhverfi við sjávarsíðuna og áhrif á sjávarlíf. Mælingar fara á styrk og magni efna í affallsvatni auk hitadreifingar við útfall.

8.5 Jarðvatn og jarðhiti

Við fiskeldið verður notað affallsvatn sem fellur til við rekstur Reykjanesvirkjunar og því mun fiskeldið ekki hafa nein áhrif á vatnsstöðu jarðhitavatns. Einnig er gert ráð fyrir því að áhrif sjóvinnslu á grunnvatn verði hverfandi þar sem miðað er við að ná hreinum jarðsjó úr hverri holu með eins litlum niðurdrætti og kostur er og það án þess að draga að vökva úr efsta hluta sjóblandaða grunnvatnsins sbr. umfjöllun í kafla 7.5.

8.6 Loftgæði og hljóðvist

Svæðið í nágrenni framkvæmdasvæðisins er vinsælt útivistarsvæði og ferðamannastaður en er þó ekki í skipulagi skilgreint sem kyrrlátt svæði. Iðulega er mikið brimhljóð á svæðinu næst ströndinni.

8.6.1 Áhrif á loftgæði og hljóðvist

Ekki er gert ráð fyrir breytingum á loftgæðum vegna fiskeldisins. Varðandi hljóðvist þá hafa framkvæmdir í för með sér aukinn hávaða, einkum á framkvæmdatíma. Um væri að ræða tímabundinn hávaða vegna borunar. Á framkvæmdatíma mun umferð aukast um svæðið og einhver hávaði mun skapast tímabundið vegna vinnuvéla en gert er ráð fyrir að hljóðstig verði innan viðmiðunarmarka reglugerðar nr. 933/1999 um hávaða og verður ekki meiri en frá núverandi iðnaðarsvæði Reykjanesvirkjunar. Þá er þess að geta engin búseta er í nágrenni

svæðisins. Áhrif á hljóðvist á framkvæmdatíma verða því óveruleg. Þegar framkvæmdum lýkur, er ekki gert ráð fyrir áhrifum á hljóðvist.

8.7 Fornleifar

Fornleifar hafa verið skráðar í nágrenni framkvæmdasvæðis eða nánar tiltekið á svæðum í nálægð við frárennslislagnir frá Reykjanesvirkjun. Þessar minjar eru vörður sem geta verið hluti leiðar milli Reykjaness og Hafna (sjá nánar mynd 8.2). Samkvæmt þjóðminjalögum nr. 107/2001 eru allar fornleifar friðaðar sem eru eldri en 100 ára. Merking minja í samráði við Fornleifavernd ríkisins kæmi í veg fyrir röskun eða skemmdir á minjum á meðan framkvæmdum stæði (sbr. mynd 8.2).

8.7.1 Áhrif á fornleifar

Ekki er vitað um neinar fornleifar á framkvæmdasvæðinu. Fram hefur komið í samtali við Agnesi Stefánsdóttur hjá Fornleifavernd ríkisins að svæðið nálægt sjónum hafi í rauninni ekki verið skoðað þar sem framkvæmdasvæðið liggur og mögulegt er að einhvers staðar á þessu svæði (eða nær Reykjanesvita) sé gjá þar sem landað var vistum úr skipum til vitavarðarins á Reykjanesvita. Ítarleg úttekt á fornleifum á svæðinu var gerð vegna mats á stækkun Reykjanesvirkjunar og við gerð rammaáætlunar, en ekki kemur fram í þeim gögnum að fornleifar séu á því svæði sem skilgreint hefur verið sem framkvæmdasvæði. Talið er að neikvæð áhrif framkvæmda á fornleifar á svæðinu séu óveruleg ef tryggt verður að minjum verði ekki raskað.

Mynd 8.2 Dreifing skráðra fornminja í nágrenni framkvæmdasvæðisins

[14]

[14] Heimild Náttúrufræðistofnun

8.8 Ferðamennska og útivist

Reykjanes er vinsælt svæði og sótt heim af útivistarfólki, ferðaþjónustuaðilum, innlendum og erlendum ferðamönnum og er þar að finna merkilegar jarðfræði- og menningarminjar. Með vinsælli ferðamannastöðum á svæðinu eru Reykjanesviti, svæðið við Gunnuhver og Reykjanesvirkjun. Talið er að um 90 þús. manns hafi heimsótt Reykjanes á árinu 2007 og er náttúruskoðun vinsæl meðal ferðamanna sem heimsækja svæðið.

8.8.1 Áhrif á útivist og ferðamennsku

Umsvif vegna framkvæmdar á framkvæmdatíma eins og byggingarframkvæmdir, umferð og hávaði geta haft áhrif á upplifun ferðamanna á svæðinu en þau áhrif eru tímabundin og staðbundin. Tryggt verður að gönguleið til sjávar verði aðgengileg á framkvæmdatíma.

Með tilkomu fiskeldisstöðvar mun ásýnd svæðisins breytast með frá því sem nú er. Helstu áhrif framkvæmda er vegna ásýndarbreytinga sem ný mannvirki hafa í för með sér. Fiskeldisstöð verður sýnileg ferðamönnum er koma í Reykjanesvirkjun og göngufólki á fjöru og strandsvæði. Mögulegt væri að minnka sjónræn áhrif með því að leggja nýjar lagnir samhliða núverandi lögnum í þeim tilvikum sem það er hægt. Ef starfsemi yrði lögð niður væru sjónræn áhrif að fullu endurkræf með því að fjarlægja byggingar á framkvæmdasvæðinu.

Þegar stöðin verður komin í rekstur verður göngufólki um svæðið og strandsvæði tryggður greiður aðgangur að strandlengju við stöðina og gönguleiðum þar í kring.

Áhrif mannvirkja og reksturs fiskeldisstöðvar á útivist og ferðamennsku á svæðinu gæti verið nokkur, einkum á framkvæmdartíma, en ekki er reiknað með að þau verði veruleg umfram þau áhrif sem núverandi virkjun hefur.

8.9 Samfélag, þekking og reynsla

Við uppbyggingu, þróun og rekstur fiskeldisstöðvarinnar verður til mikil þekking og reynsla á fjölmörgum þáttum sem tengjast fiskeldi á landi og nýtingu jarðhita við fiskeldi. Meðal áhrifa eru að styrkari stoðir verða lagðar undir fjölbreytt atvinnulíf á Suðurnesjum og er það sérstaklega mikilvægt í ljósi stöðu atvinnumála á svæðinu. Því má ætla að töluverð jákvæð áhrif verði af þessari uppbyggingu fyrir samfélagið. Þegar fullri framleiðslugetu hefur verið náð í lok fimm ára tímabils munu samtals um 80 starfsmenn starfa við fiskeldisstöðina. Þörf er á starfsmönnum með mismunandi menntun og reynslu, sbr. skiptingu hér að neðan:

Tafla 8.2 Skipting starfa

Starfssvið	**Hlutfall**
Verkstjórar/stjórnendur:	10%
Tæknimenn:	20%
Þjálfaðir starfsmenn:	70%

Stolt Sea Farm hefur skýra hugmyndafræði hvað starfsmenn varðar. Áframhaldandi þjálfun tryggir bestan árangur og starfsánægju. Með þessu hefur Stolt Sea Farm tryggt stöðugt vinnuafl með meðal starfsaldur 10,5 ár og 20% starfsmanna með meira en 20 ára starfsreynslu hjá fyrirtækinu. Stolt Sea Farm hefur einnig stefnu varðandi „engin slys“, sem er sérstaklega erfitt að ná í þessari grein en slys hjá fyrirtækinu eru þó nokkuð undir meðaltali fyrir í þessari grein.

8.9.1 Áhrif á samfélag

Eins og fyrr segir er heildarkostnaður verkefnisins í dag er áætlaður í kringum 30 milljónir evra. Ljóst er að verkefni af þessari stærðargráðu mun hafa jákvæð áhrif á samfélagið með bæði fjölgun beinna og óbeinna starfa. Mörg önnur afleidd störf verða til á öðrum sviðum, s.s. við flutninga, pökkun, verkstæði, hótel o.fl. Áætlað er að fjöldi afleiddra starfa verði um 50.

Einnig má ekki gleyma því að á 2-3 ára byggingartíma er ljóst að mörg afleidd störf við uppbyggingu verkefnisins. Á meðan framkvæmdum stendur munu skapast störf fyrir tugi manna eins og verktaka, iðnaðarmenn og fleiri á Suðurnesjum einkum vegna byggingar mannvirkja, efnisflutninga og jarðvinnu í tenglsum við framkvæmdirnar.

Rekstur fiskeldisstöðvar við Reykjanesvirkjun mun skapa, eins og fyrr segir, störf tengd fiskeldinu fyrir tugi starfsmanna á Suðurnesjum. Þá verða einnig til afleidd störf við vinnslu afurða og ýmsa þjónustu. Reikna má með verulega jákvæðum samfélagslegum áhrifum vegna framkvæmda við fyrirhugaða fiskeldisstöð bæði með beinum og óbeinum hætti. Bygging og rekstur fiskeldisstöðvar á svæðinu er því talin hafa verulega jákvæð samfélagsleg áhrif.

8.10 Áhrif framkvæmdarinnar á grunnástand framkvæmdasvæðis

Núverandi ástand framkvæmdasvæðisins er að ekki eru nein mannvirki né byggingar á svæðinu sjálfu að undanskildum vegi sem liggur samhliða affallslögnum HS Orku.

8.10.1 Framkvæmdir/mannvirkjagerð

Mannvirki sem byggð verða í tengslum við fyrirhugaða framkvæmd eru fiskeldisstöð og eru helstu einingar stöðvarinnar klakstöð, seiðastöð, pökkunarstöð og áframeldisstöð. Auk þess verða sjótökuholur aðrennslislagnir, frárennslislagnir, vegur að stöðinni og bílastæði. Stærð lóðar fyrirhugaðs framkvæmdasvæðis er áætlað 87.845 m^2 og af því eru mannvirkin við lok annars áfanga framkvæmdana um 70.000 m^2. Framkvæmdirnar munu hafa áhrif á jarðmyndanir og breyta núverandi landslagi. Reikna má með að nær allt svæðið innan lóðarinnar raskist, bæði jarðmyndanir, gróður og dýralíf. Svæðið er hins vegar afmarkað í aðalskipulagi Reykjanesbæjar frá 2008-2024 sem blandað svæði fyrir iðnað og opið svæði til sérstakra nota. Fyrirhuguð framkvæmd er í samræmi við aðalskipulag Reykjanesbæjar.

8.10.2 Efnistaka og haugsetning

Efnistaka og flutningur jarðefna vegna fyrirhugaðra framkvæmda mun fara fram innan framkvæmdasvæðis. Laus jarðefni verða nýtt sem fyllingarefni til að jafna undirstöður og við frágang svæðis. Gert er ráð fyrir að steypuefni vegna undirstaða fyrir fiskeldisstöð verði flutt á staðinn.

8.10.3 Umferð

Við byggingu fiskeldisstöðvar verður flutningur á byggingarefni, kerum og búnaði vegna mannvirkja um veg að framkvæmdasvæði. Umferð um svæðið mun aukast tímabundið vegna byggingarframkvæmda.

8.10.4 Samantekt umhverfisáhrifa á framkvæmdatíma

Helstu áhrif framkvæmdarinnar á grunnástand framkvæmdasvæðis eru dregin saman hér að neðan (sjá Tafla 8.3).

Tafla 8.3 Samantekt umhverfisáhrifa á framkvæmdatíma

Umhverfisþættir	**Framkvæmdaþættir**	**Áhrif framkvæmda**						
		Veruleg jákvæð	**Talsverð jákvæð**	**Nokkuð jákvæð**	**Óveruleg áhrif**	**Nokkuð neikvæð**	**Talsverð neikvæð**	**Veruleg neikvæð**
Jarðmyndanir	Efnistaka og haugsetning					**X**		
Landslag	Efnistaka og haugsetning					**X**		
Gróður	Efnistaka og haugsetning				**X**			
Fugla- og dýralíf	Mannvirkjagerð og umferð				**X**			
Hljóðvist	Mannvirkjagerð				**X**			
Fornleifar	Efnistaka og haugsetning				**X**			
Útivist og ferðamennska	Mannvirkjagerð				**X**			
Samfélag	Allir þættir		**X**					

8.11 Áhrif framkvæmdarinnar á rekstrartíma

Helstu áhrif framkvæmdarinnar á rekstrartíma þegar framkvæmdum lýkur eru dregin saman hér að neðan.

8.11.1 Helstu áhrif á rekstrartíma

Helstu umhverfisáhrif framkvæmdarinnar á rekstrartíma eru:

- Sjónræn áhrif bygginga/mannvirkja (sjá kafla 6.5.)
- Úrgangur og frárennsli frá fiskeldisstöð (sjá kafla 3.3. og 3.4.)
- Útivist og ferðamennska (sjá kafla 8.8.)
- Umferð (sjá kafla 8.11.2)
- Samfélag (sjá kafla 8.9.)

8.11.2 Umferð

Á rekstrartíma mun umferð vegna rekstur stöðvarinnar vera lítil. Fyrst og fremst verður um að ræða akstur starfsfólks til og frá vinnu auk flutnings seiða og fisks til útflutnings og við úrgangslosun frá stöðinni.

8.12 Áhrif við lokun

Þegar á heildina er litið þá eru áhrif bygginga og starfsemi fyrirhugaðar fiskeldisstöðvar óveruleg og á það við um áhrif allra umhverfisþátta. Það eru einkum umhverfisþættir eins og hljóðvist og ásýnd lands sem verða fyrir mestum áhrifum af framkævmdum og þessi þættir eru endurkræfir.

8.12.1 Helstu umhverfisáhrif vegna lokunar fiskeldisstöðvarinnar

Verði rekstri fiskeldisstöðvar hætt verða öll mannvirki fiskeldisstöðvarinnar fjarlægð af svæðinu. Eftir mun standa malarplan sem gert er ráð fyrir grói upp með tímanum eða þá að lóðin verði nýtt undir aðra starfsemi. Hugsanlega væri einnig hægt að nýta áfram sjótökuholur fiskeldisstöðvarinnar fyrir aðra atvinnustarfsemi.

9 Umhverfisstefna Stolt Sea Farm

9.1 Umhverfisstefna

Fiskeldi á landi (ker, leiðslur o.fl. byggt á landi) er venjulega tengt framleiðslu á silungi, karpa-tegundum, steinbít og öðrum ferskvatns tegundum. Stolt Sea Farm hefur þróað tækni á síðustu 25 árum sem hefur gert það mögulegt framleiða á arðbæran hátt flatfisk í kerjum reistum á landi. Þetta felur meðal annars í sér byggingu á vatnsinntaki sem dælir á land sjó sem notaður er til framleiðslu á fiski. Í verkefninu við Reykjanesvirkjun þá mun vatnið koma bæði frá borholum og frá virkjuninni sjálfri, eins og áður var lýst. Stolt Sea Farm hefur þróað sjálfbært framleiðslukerfi, þar sem sandhverfa er framleidd á arðbæran hátt í slíkum mannvirkjum.

Skuldbinding Stolt Sea Farms við umhverfisvæna stefnu hefst á því að allir starfsmenn geri sér grein fyrir hugmyndfræði fyrirtækisins. Þjálfun starfsmanna og upplýsingar eru veittar varðandi endurvinnslu, rétta og skilvirka orkunotkun, rétt viðhald véla og hagkvæmasta notkun þeirra. Löng reynsla og víðtæk þekking gerir Stolt Sea Farm einnig kleift að viðhalda stöðugri áætlun um endurbætur. Með réttri fóðrun þá hefur fóðurnýtingarhlutfallinu 1:1 verið náð með nánast engum lífrænum leifum. Þessi einstaka fóðurstjórnun hefur hlotið viðurkenningu samtakanna Friends Of The Sea, sem veitt hafa Stolt Sea Farm vottun samtakanna fyrir sjálfbærni (No 0095-2009-A).

9.2 Umhverfistengdir þættir fiskeldisins

Eins og fram kemur hér að ofan er vatni dælt á land frá svæði sem valið hefur verið m.t.t. hitastigs og gæða. Þetta vatn er auðgað með súrefni og er síðan leitt í gegnum fiskikerin. Þetta ferli tekur 90 mínútur og er endurtekið ferli. Súrefninu er dælt til þess að fiskinum séu tryggð bestu skilyrði, sem einnig hefur í för með sér að súrefnisbættu vatni er skilað til sjávar. Gæði vatns sem skilað er aftur til umhverfisins er stjórnað daglega og þarf að standast gæðastaðla þá, sem mælt er fyrir um í reglugerðum þar að lútandi innan Evrópusambandsins. Stolt Sea Farm rekur framleiðslueiningar á Spáni, Frakklandi og Portúgal sem hafa s.l. 20 ár starfað samkvæmt þessum lögum. Svipaðar framleiðslueiningar eru einnig staðsettar í Noregi og starfa þar í fullu samræmi við norsk lög og reglugerðir.

Fiskieldi á landi auðveldar og tryggir fulla stjórnun á öllum þáttum framleiðslunnar. Þessi stjórnun og virðing fyrir umhverfinu gerði Stolt Sea Farm kleift að verða fyrsta spænska fiskeldisfyrirtækið til að fá ISO 14001:2004. Ólíkt því sem gerist í fljótandi kvíum þá er hægt að meðhöndla iðnaðarleifar fiskeldisstöðva, sem eru á landi, (fóður, bretti og almennt rusl) á réttan og skilverkan hátt með því að senda slíkan úrgang til endurvinnslu og sorpúrvinnslu.

Í verkefninu hjá Reykjanesvirkjun verður vatnið frá fiskeldinu leitt aftur til sjávar í gegnum lagnir frá virkjun HS Orku. Þar sem hitastig þessa vatns er 55 °C gráðu heitt, þá drepast

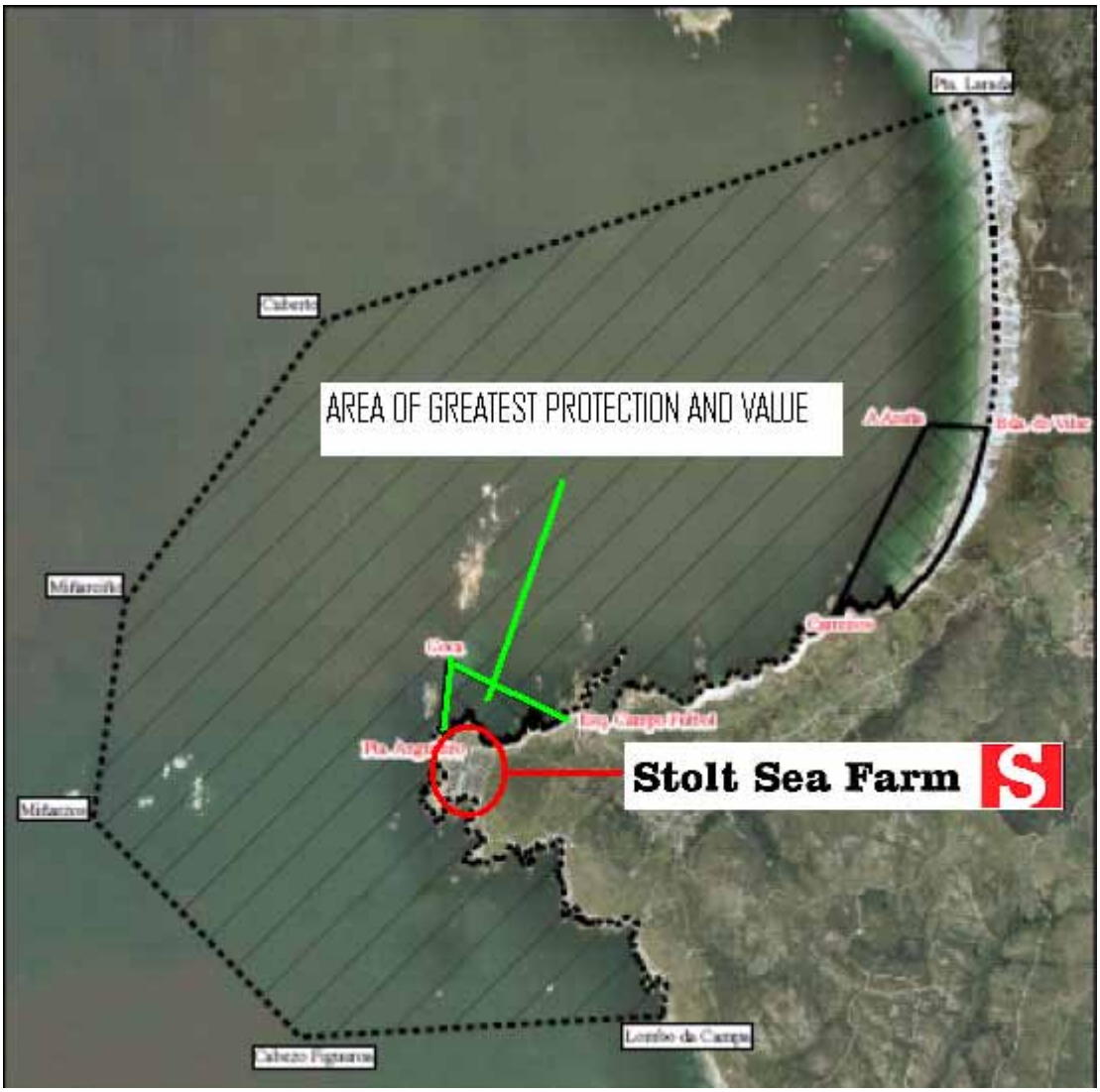
allir sýklar sem tengjast senegalflúru, og verndar þar með villta fiskistofna á svæðinu. Einnig munu allar lífverur frá fiskeldinu, egg, lifrur, og fiskisvif drepast við þetta hitastig og vernda þannig enn frekar umhverfið frá lífrænni mengun. Efnamengun er nánast engin og aðeins sótthreinsunarefni eins og ammóníak eða formalín eru notuð og hafa þá mjög útþynnt í heildar útflæði. Fiskar eru bólusettir í seiðastöð og í áframræktun þannig að það er engin notkun á sýklalyfjum.

Sem skýrt dæmi um umhverfisvæna stefnu fyrirtækisins má nefna þátttöku Stolt Sea Farms í hinum ýmsu umhverfisverkefnum, s.s. eins og hreinsun stranda, uppbyggingu og viðhaldi á göngu- og hjólastígum, gróðursetningu á trjám og stuðning við menntun og fræðslu heimamanna um náttúru og sjálfbærar fiskveiðar. Samningar hafa verið gerðir um slík verkefni á þeim stöðum, þar sem Stolt Sea Farm er með starfssemi, t.d. eins og verkefnið „Aukning á verndaraðgerðum til styrktar umhverfinu“ („Increase of protective action to benefit the environment“) (2005).

Annað dæmi um langtíma skuldbindingu Stolt Sea Farms við umhverfisvæna stefnu fyrirtækisins er að finna við eldisstöðina á Lira á Norður Spáni, nánar tiltekið við „Punta de los Remedios“, þar sem sandhverfa hefur verði framleidd frá árinu 1990. Árið 2009 voru framleidd þar 1.400 tonn af sandhverfu. Þar er einnig að finna vinnslustöð, sem getur afkastað pökkun á 4.000 tonnum af flatfisk á ári og skrifstofubyggingu, en samtals starfa þar 50 manns. Árið 2007 var fyrsta friðaða sjávarsvæðið afmarkað í Galicia, en svæðið þekur 2,074 ha við strandlengjuna. Svæðið varð fyrir valinu vegna „hinnar miklu líffjölbreytni svæðisins“, og var sérstaklega tekið fram að suður helmingur svæðisins væri „mjög áhugaverður“. Afrennsli fiskeldisstöðvar Stolt Sea Farms liggur beint fyrir miðju þess svæðis, sem nýtur mestu friðunar, sem staðfestir að fiskeldisstöðin sjálf hefur engin neikvæð áhrif á lífríki svæðins. Þetta sannar augljóslega að ábyrgur og sjálfbær rekstur stöðvarinnar í yfir 20 ár hefur ekki haft nein skaðleg áhrif á nánasta umhverfi hennar.

Á vefsíðu WWF er svæðið skilgreint sem „sjávarparadís í Galicia“; fiskistofnar endurnýja sig hratt og vel á þessu svæði, sem kemur þeim 75 fjölskyldum, sem stunda þar fiskveiðar, til góða. Nánari upplýsingar og umfjöllun um þetta svæði er að finna á heimasíðu WWF (http://www.wwf.es/que_hacemos/mares_y_costas/nuestrs_soluciones/pesca_sostenible/reserva_de_lira_galicia/un_paraiso_marino_en_galicia.cfm).

Mynd 9.1 Stolt Sea Farm á Spáni



15

15 Útskýringar á enskum texta
AREA OF GREATEST PROTECTION AND VALUE Svæði sem skilgreint er sem verðmætasta verndarsvæðið

Mynd 9.2 Hið friðaða svæði Os Miñarzos á Lira, Spáni.

[16]

Svæðið, sem nýtur mestu friðunar og hefur hæsta verndargildi, var valið af WWF vegna fjölbreyts umhverfis, mikillar vaxtar sjóþangs og klettóttar sjávarbotns, sem er kjörinn fyrir fjölgun fiska og skeldýra.

Með vaxandi vitund og auknum kröfum neytenda, leitast fiskeldisfyrirtæki í dag við að markaðssetja hágæða fiskafurðir. Augljóslega krefst það stjórnunar á öllum þáttum framleiðslunnar, en helsta markmiðið verður þó alltaf að nálgunin taki mið af sjálfbærni og réttri umhverfisstefnu. Fiskeldi er háð gæðum þess vatns, sem það er stundað í. Því er það helsta skylda fiskeldisaðila að vernda þessa verðmætu og viðkvæmu auðlind.

9.3 Stefna Stolt Sea Farm

Innan Stolt Sea Farms er deild með tveimur starfsmönnum, sem hefur það hlutverk að tryggja að umhverfisstefnu fyrirtækisins sé fylgt eftir. Þessir starfsmenn njóta stuðnings og aðstoðar bæði yfirstjórnar sem og miðstjórnar fyrirtækisins, þar sem allir stjórnendur hafa í samningum sínum við fyrirtækið ákvæði um að þeir beri að fylgja eftir í hvívetna umhverfisstefnu fyrirtækisins. Það eru skýrar leiðir innan fyrirtækisns um það hvernig umhverfisstefnu þess er fylgt eftir:

1. Í byrjun starfsferils síns hjá fyrirtækinu, fá allir starfsmenn fyrirtækisins kennslu og þjálfun í umhverfisstefnu fyrirtækisins. Sérhver nýráðinn starfsmaður fær í hendur við starfsbyrjun upplýsingarit um Stolt Sea Farm og stefnu þess í vistvænni framleiðslu.

[16] Útskýringar á enskum texta
OUTLET Frárennsli

Þjálfun starfsmanna er haldið við með reglulegum heimsóknum í eldisstöðvar, þar sem þeim eru veittar upplýsingar, sem og hlýtt yfir öll atriði, sem lúta að umhverfisstefnu fyrirtæksins;

2. Meðlimir innri gæðadeildar fyrirtækisins gera reglulega prófanir og úttekt á öllum ferlum innan fyrirtækisins til að tryggja að farið sé eftir reglum fyrirtækisins;
3. Skýrar leiðbeiningar eru til staðar um hvernig farið skuli með leifar og í öllum eldisstöðvum fyrirtækisins eru sérstök svæði, þar sem leifar og úrgangur er flokkaður, og þar sem því er við komið, þar sem úrgangur er endurunninn. Allir starfsmenn fyrirtæksins hafa hlotið þjálfun í að bregðast við mengunarslysum, t.a.m. olíuleka;
4. Orkuneysla er í stöðugri skoðun og yfirmanni hverrar eldisstöðvar eru gefin árleg markmið, sem miðast við að halda neyslu í lágmarki;
5. Vatnsgæði frárennslis eru bæði rannsökuð af starfsmönnum fyrirtækisins sem og af viðurkenndum rannsóknarstofum til að tryggja að gæðin séu innan viðmiðunarmarka bæði yfirvalda viðkomandi sveitafélaga, sem og Evrópusambandsins;
6. Starfsmenn hljóta sérstaka þjálfun bæði í meðferð fóðurs sem og í fóðrun fisksins sjálfs. Þessi þjálfun sem og há gæði fóðursins, sem notað er, tryggir fóðurnýtingarhlutfallið 1:1. Þetta er veigamikill þáttur í að viðhalda réttu hlutfalli svifagna og til að ná viðmiðunarmörkum þeim, sem minnst er á í lið 5 hér að ofan;
7. Stolt Sea Farm tekur einnig þátt í umhverfisverkefnum utan þeirra svæði, þar sem eldisstöðvar fyrirtækisins eru, t.a.m. með því að leggja göngu- og hjólaleiðir. Stolt Sea Farm hefur stutt og styður verkefni eins og hreinsun stranda, trjásetningar og endurheimtur á námum.
8. Stolt Sea Farm tekur virkan þátt í að koma á kynningarfundum með yfirvöldum um umhverfismál og vistvæna starfssemi.

Skuldbinding Stolt Sea Farms við umhverfisvæna stefnu hefst á því að allir starfsmenn fyrirtækisins hljóti þjálfun og verði meðvitaðir um hvernig umhverfisvæn neyslu er hámörkuð, að starfsmenn beri virðingu fyrir umhverfinu og náttúrunni, öðlist skilning og reynslu í endurvinnslu og geri sér fulla grein í hvað felst í vistvænni og endurnýjanlegri framleiðslu. Fyrirtækið leitast enn frekar við að styðja við náttúruna. Þökk sé þessari umhverfisstefnu fyrirtæksins, þá hefur fyrirtækið öðlast ISO 14001:2004 vottun sem og viðkenningu frá Friends of The Sea Sustainable Aquaculture.

9.4 Grænt bókhald

Stolt Sea Farm myndi með vísan til reglugerðar nr. 851/2002, þar sem kemur fram hvaða upplýsingar eiga að koma fram í grænu bókhaldi, halda grænt bókhald og veita upplýsingar um stöðu fyrirtækisins í umhverfismálum. Stolt Sea Farm myndi leggja fram greinargerð þar sem

lykiltölur sem lýsa frammistöðu fyrirtækisins í umhverfismálum; meginnotkun fyrirtækisins á hráefnum, orku, jarðhitavatni, köldu vatni á bókhaldstímabilinu, ásamt helstu tegundum og magni efna sem valda mengun í og greina frá helstu frávikum á sviði umhverfismála í rekstri fyrirtækisins á viðkomandi bókhaldsári t.d. aukin framleiðsla, breyting á samsetningu framleiðslu, bilanir í tæknibúnaði, mengunaróhöpp, uppfærslur og breytingar á tæknibúnaði.

9.5 Umhverfisáhrif á fyrirhuguðu byggingarsvæði

Ekki er gert ráð fyrir að framkvæmdir hafi veruleg áhrif á jarðmyndanir eða umhverfi byggingarsvæðisins umfram það sem gera má ráð fyrir framkvæmdir af þeirri stærðargráðu hafa og greint hefur verið frá hér að framan (sjá nánar kafla 8). Byggingarnar sem rýma eldið verða svipaðar öðrum byggingum sem byggðar eru þar sem er yfirbyggt fiskeldi á landi. Eins og lýst er í kafla 2.2 þyrfti að blanda afrennslisvatn virkjunar við vatn úr nýjum sjótökuholum, sem sýndar eru á Mynd 7.4. Fyrirhugað er að sjótökuholurnar yrðu unnir í samvinnu við HS Orku og þekking þess fyrirtækis nýtt við gerð þeirra. Mannvirki við holurnar, sem og framkvæmd við borun þeirra og leiðslur, yrðu í samræmi við þær holur, sem nú þegar eru fyrir. Framkvæmdir þessar geta valdið beinu raski á landslagi á meðan á þeim stendur.

10 Samráð

10.1 Umhverfisstofnun

Verkefnið var kynnt Umhverfisstofnun hinn 8. mars síðast liðinn[17]. Á fundinum var starfssemi Stolt Sea Farm kynnt og gert grein fyrirhuguðum áætlanum fyrirtækisins um uppbyggingu á eldi á senegalflúru. Starfsmenn Umhverfisstofnunar bentu á að skoða þyrfti sérstaklega þætti s.s. fisksjúkdóma er væru einkennandi fyrir senegalflúru (sjá nánar kafla 2.2.2), frágang á frárennsli (sjá nánar kafla 3.3), áhrif á grunnvatn eftir borun sjótökuhola (sjá nánar kafla 7.5), fóðurnýtingarhlutfall (sjá nánar kafla 2.2.1), frágang mannvirkja legðist starfssemi af (sjá nánar kafla 8.12) og áhrif á gróðurfar (sjá nánar kafla 8.2).

10.2 Fiskistofa

Hinn 24. febrúar s.l. var verkefnið kynnt í heild sinni fyrir Áslaugu Eir Hólmgeirsdóttur, deildarstjóra hjá Fiskistofu. Fiskistofu var reyndar fyrst kynnt verkefnið í maí 2010, þegar forkönnun hófst á fýsileika þess að byggja eldi á Íslandi. Tekið hefur verið tillit til sjónarmiða Fiskistofu, sem fram komu á fundinum, við gerð þessarar greinagerðar.

10.3 Hafrannsóknastofnun

Hinn 12. janúar s.l. hófst formlegt samstarf milli Hafrannsóknarstofunar og Stolt Sea Farm, þegar fulltrúar fyrirtæksins sóttu fund hjá stofnunni[18]. Samstarfið við Hafrannsóknarstofnun felst í því að stofnunin hóf rannsóknir á gæðum affallsvatns frá Reykjanesvirkjun um miðjan janúar. Rannsóknirnar felast í því að ala m.a. fisk, lirfur, hjóldýr í vatni frá virkjunni til að ganga úr skugga um, hvort nokkur skaðleg efni eru að finna í vatninu. Rannsóknir hafa gengið vel og niðurstöður hafa verið ásættanlegar. Haldið verður áfram með rannsóknir í apríl, en þá verða seiði úr þorski ræktuð í vatninu. Miðvikudaginn 23. mars s.l., var forstjóra Hafrannsóknastofnunar, Jóhanni Sigurjónssyni og Birni Björnssyni, sérfræðingi í fiskeldi, greint frá stöðu verkefnisins og að þessi greinagerð væri í undirbúningi.[19]

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[17] Fundinn sátu fyrir hönd Umhverfisstofnunar Kristján Geirsson, deildarstjóri, svið umhverfisgæða, Sigurður Ingason, sérfræðingur, svið umhverfisgæða, Aðalbjörg Birna Guttormsdóttir, sérfræðingur, náttúruvernd, Gísli Jónsson, sérfræðingur, umhverfisvernd, fyrir hönd Verkís Arnór Þórir Sigfússon, deildartjóri, dýravistfræðingur og Hugrún Gunnarsdóttir, fiskifræðingur. Fyrir hönd Stolt Sea Farm, Eyþór Eyjólfsson

[18] Fundinn sátu fyrir hönd Hafrannsóknastofnunar Jóhann Sigurjónsson, forstjóri, Björn Björnsson, Matthís Oddgeirsson, Agnar Steinarsson og Tómas Árnason, fyrir hönd Stolt Sea Farm James Hall, Oscar Iglesias og Eyþór Eyjólfsson.

[19] Fundinn sátu fyrir hönd Hafrannsóknastofnunar Jóhann Sigurjónsson, forstjóri, Björn Björnsson, sérfræðingur í fiskeldi, og fyrir hönd Stolt Sea Farm, James Hall, framleiðslustjóri Stolt Sea Farm og Eyþór Eyjólfsson.

10.4 Reykjanesbær

Árna Sigfússyni, bæjarstjóra, og Guðlaugi H. Sigurjónssyni, framkvæmdastjóra umhverfis og skipulagssviðs, var kynnt verkefnið þann 24. nóvember s.l.

10.5 Fisksjúkdómanefnd

Gísla Jónssyni, dýralækni fisksjúkdóma, hjá Fisksjúkdómanefnd, hefur verið kynnt verkefnið, umfang þess og eðli, í fjölmörgum tölvupóstum frá því að forkönnun hófst á því í maí 2010. Miðvikudaginn 23. mars var Gísla Jónssyni gerð grein fyrir stöðu verkefnisins á fundi með James Hall, framleiðslustjóra Stolt Sea Farm og Eyþór Eyjólfssyni. Á fundinum voru rædd öll helstu atriði er varða fiskeldið, innflutning á seiðum og hrygningarfiski vegna fyrirhugaðs eldisins, auk þess sem Gísla Jónssyni var kynnt starfssemi og saga Stolt Sea Farms.

10.6 Umhverfisráðuneytið

Svandísi Svavarsdóttur, umhverfisráðherra, var kynnt verkefnið af forstjóra Stolt Sea Farm, hinn 25. nóvember s.l.

10.7 Sjávar- og landbúnaðarráðuneytið

Jóni Bjarnasyni, sjávarútvegs- og landbúnaðarráðherra Íslands var jafnframt kynnt verkefnið hinn 25. nóvember s.l.

10.8 Náttúrustofa Reykjaness

Verkefnið var ljóslega kynnt Dr. Sveini Kára Valdimarssyni, forstöðumanni Náttúrustofu Reykjaness og hann beðinn álits á umfjöllun um þá þætti sem falla undir umsagnarsvið Náttúrustofunnar og fjallað er um í greinargerð þessari.

10.9 Fornleifavernd ríkisins

Ekki er kunnugt um fornleifar á framkvæmdasvæðinu. Í samskiptum við Kristinn Magnússon og Agnesi Stefánsdóttur kemur fram að áhrifasvæðið hefur ekki verið skoðað með tilliti til fornleifa. Fornleifaskráning sem farið hefur fram í nágrenninu var miðuð við þau svæði þar sem framkvæmdir hafa verið fyrirhugaðar á hverjum tíma og því telur Fornleifavernd að fá þurfi fornleifafræðing til að skrá fornleifar á svæðinu, ef einhverjar eru. Í framhaldinu þyrfti að gera Fornleifavernd Ríkisins grein fyrir staðsetningu forneleifa, áhrifum fyrirhugaðar framkvæmdar á fornleifar og mótvægisaðgerðum sem gripið yrði til vegna fornleifa.

10.10 HS Orka

Verkefni þetta hefur verið unnið í nánu samstarfi við HS Orku frá því að viðræður hófust í júni 2010. HS Orka og Stolt Sea Farm hafa undirritað minnisblað („Memorandum of Understanding“), þar sem öll grundvallaratriði hafa verið reifuð og samþykkt. HS Orka hefur samþykkt að leigja það land, sem tilgreint er í greinagerð þessari, fyrir fiskeldi Stolt Sea Farms sem og að veita fiskeldinu affallsvatn virkjunarinnar og það rafmagn, sem það þarf á að halda.

11 Heimildir

11.1 Heimildir kafla 1

Stolt Sea Farm (ódagsett). *Ýmsar upplýsingar frá fyrirtækinu varðandi starfsemi og rekstur.*

11.2 Heimildir kafla 2

Alþingi (2011). *Lagasafn* sbr. nánari tilvitnanir í kafla.

Bernharð Laxdal (2011). *Greinargerð um smithættu vegna eldisáforma Stolt Sea Farm.*

Skipulagsstofnun (2010). *Drög að leiðbeiningum um fiskeldi.*

Stjórnartíðindi (2011). *Reglugerðasafn* sbr. nánari tilvitnanir í kafla.

Stolt Sea Farm (ódagsett). Ýmsar upplýsingar frá fyrirtækinu varðandi starfsemi og rekstur.

11.3 Heimildir kafla 3

European Union (2011). Laga- og reglugerðasafn Evrópubandalagsins sbr.nánari tilvitnanir í kafla. (http://europa.eu/documentation/index_en.htm).

Gísli Jónsson (2011). Umhverfisstofnun. Efni: upplýsingar um losunarmörk fyrir fiskeldi á landi. tölvupóstur dagsettur 22. mars.

HS Orka (ódagsett). *Ýmsar upplýsingar.*

Skretting (ódagsett). *Upplýsingar um fóður og samsetningu fóðurs.*

Stolt Sea Farm (ódagsett). *Ýmsar upplýsingar frá fyrirtækinu varðandi starfsemi og rekstur.*

11.4 Heimildir kafla 4

Stolt Sea Farm (ódagsett). *Ýmsar upplýsingar frá fyrirtækinu varðandi starfsemi og rekstur.*

11.5 Heimildir kafla 5

Reykjanesbær (1996). Aðalskipu*lag Reykjanesbæjar 1995–2015, iðnaðarsvæði á Reykjanesi* með síðari breytingum.

Reykjanesbær (2008). Aðalskipu*lag Reykjanesbæjar 2006–2021.* Drög að greinargerð frá 30.6.

Reykjanesbær (2004). *Deiliskipulag iðnaðar- og orkuvinnslusvæði á Reykjanesi* með síðari breytingum.

11.6 Heimildir kafla 6

Stolt Sea Farm (ódagsett). *Ýmsar upplýsingar frá fyrirtækinu varðandi starfsemi og rekstur.*

11.7 Heimildir kafla 7

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12 Viðaukar

12.1 Umhverfis- og gæðastefna Stolt Sea Farm

Meðfylgjandi fylgiskjal skjal inniheldur nánari lýsingu á umhverfis- og gæðastefnu Stolt Sea Farm.

Stolt Sea Farm, S.A.

Sociedad Unipersonal
Grupo
Stolt-Nielsen

Lira
15292 Carnota
La Coruña
España

Tlf. +34 902 195 966
Fax +34 981 761 031
www.stoltseafarm.com

STOLT SEA FARM QUALITY AND ENVIRONMENT POLICY

Since its constitution, **Stolt Sea Farm, S.A.** has rendered its services in the fields of both production and commercialization, its main priorities being professionalism, product quality and service.

The general guidelines and objectives with respect to quality and environmental management are manifested in this Integrated quality control system policy, and are defined as follows:

- To fulfil the legal and statutory requirements which are of application to the company, including those of an environmental nature.
- To attend to the needs and expectations of our clients, both current and potential. Our main purpose is to offer an appealing product which will facilitate the economical growth of our clients and distributors, and ensure that their expectations are met when they purchase our product.
- To guarantee client satisfaction with regards to deadlines, product quality, etc., and be environmentally friendly. We will endeavor to provide consumers with the appropriate information regarding our product.
- To guarantee efficiency in both customer service and in any situation which may be harmful to the environment.
- To research and improve the quality and processing of our product, within a system orientated towards the continuous improvement of all our services.
- To use procedures and practices which prevent, reduce or control contamination and client dissatisfaction. We will reduce, whenever possible, and correctly coordinate our waste products, atmospheric pollution and any other waste generated by our activities. We will carry out a contamination prevention policy and also forward this information on to our subcontracts.
- To encourage teamwork so as to combine efforts and achieve these goals in an agile and effective way. We will provide our employees with the necessary training and awareness so that they may develop good productive and environmental habits.
- To maintain good relations and collaborate with the authorities, with our neighbours and with other groups interested in our activities.

The Presidency of Stolt Sea Farm, S.A. is completely committed to this policy, to quality management and pollution prevention, and hereby guarantees the human, technical and economic resources necessary for this purpose.

Taking this policy as a starting point, these challenging and quantifiable objectives regarding quality and environmental management are hereby defined. They will be annually evaluated to confirm the level of efficiency and the necessary measures be taken to guarantee success.

This policy will be periodically reviewed so it may be constantly adapted to the particular needs of the environment.

Pablo Garcia, President Stolt Sea Farm.

C.I.F. A-28682987 Reg. Merc. de La Coruña, Tomo 565 del Archivo, Libro 313, Secc. 3.ª de Sociedades, Folio 185 Vto. Hoja 3.374

12.2 ISO 9001:2008 vottun

Certificado del Sistema de Gestión de la Calidad

AENOR
ER
Empresa Registrada
UNE-EN ISO 9001

ER-0518/2010

AENOR, Asociación Española de Normalización y Certificación, certifica que la organización

STOLT SEA FARM, S.A.

dispone de un sistema de gestión de la calidad conforme con la Norma UNE-EN ISO 9001:2008

para las actividades: La cría y producción de rodaballo.

que se realizan en: PUNTA DE LOS REMEDIOS. 15292 - LIRA - CARNOTA (A CORUÑA)

VER DIRECCIONES INDICADAS EN EL ANEXO

Fecha de emisión: 2010-05-12
Fecha de expiración: 2013-05-12

AENOR Asociación Española de Normalización y Certificación
El Director General de AENOR

AENOR Asociación Española de Normalización y Certificación | Génova, 6. 28004 Madrid. España Tel. 902 102 201 – www.aenor.es

Entidad acreditada por ENAC con nº 01/C-SC003

IQNet – AENOR es miembro de la RED IQNet (Red Internacional de Certificación)

Certificado del Sistema de Gestión de la Calidad

ER-0518/2010

Anexo al Certificado

Establecimientos:	MEREXO. 15128 - MUXIA - CORUÑA (A CORUÑA) VILAN. 15146 - CAMARIÑAS - A CORUÑA (A CORUÑA) PALMEIRA. 15950 - RIVEIRA - A CORUÑA (A CORUÑA) COUSO. 15965 - RIVEIRA - A CORUÑA (A CORUÑA) QUILMAS. 15292 - CARNOTA - A CORUÑA (A CORUÑA)
Fecha de emisión:	2010-05-12
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THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and
AENOR
hereby certify that the organization

STOLT SEA FARM, S.A.

PUNTA DE LOS REMEDIOS
15292 - LIRA - CARNOTA(A CORUÑA)
ESPAÑA

SEE ADDRESSES SPECIFIED IN ANNEX

for the following field of activities

The farming and production of turbot.

has implemented and maintains a

Quality Management System

which fulfills the requirements of the following standard

ISO 9001:2008

Issued on: 2010-05-12 Validity date: 2013-05-12

Registration Number: **ES-0518/2010**

René Wasmer
President of IQNet

Ramón NAZ
General Manager of AENOR

IQNet Partners*:
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THE INTERNATIONAL CERTIFICATION NETWORK

Annex to IQNet Certificate Number ES-0518/2010

STOLT SEA FARM, S.A.

MEREXO
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Issued on: 2010-05-12 Validity date: 2013-05-12

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12.3 ISO 14001:2004 vottun

Certificado del Sistema de Gestión Ambiental

AENOR

Gestión Ambiental

UNE-EN ISO 14001

GA-2010/0286

AENOR, Asociación Española de Normalización y Certificación, certifica que la organización

STOLT SEA FARM, S.A.

dispone de un sistema de gestión ambiental conforme con la norma UNE-EN ISO 14001:2004

para las actividades: La cría y producción de rodaballo.

que se realiza/n en: PUNTA DE LOS REMEDIOS. 15292 - LIRA - CARNOTA (A CORUÑA)

VER DIRECCIONES INDICADAS EN EL ANEXO

Fecha de emisión: 2010-05-12
Fecha de expiración: 2013-05-12

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El Director General de AENOR

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Entidad acreditada por ENAC con nº 01/C-MA001

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Certificado del Sistema de Gestión Ambiental

GA-2010/0286

Anexo al Certificado

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THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and
AENOR
hereby certify that the organization

STOLT SEA FARM, S.A.

PUNTA DE LOS REMEDIOS
15292 - LIRA - CARNOTA(A CORUÑA)
ESPAÑA

SEE ADDRESSES SPECIFIED IN ANNEX

for the following field of activities

The farming and production of turbot.

has implemented and maintains a

Environmental Management System

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ISO 14001

Issued on: 2010-05-12 Validity date: 2013-05-12

Registration Number: **ES-2010/0286**

René Wasmer
President of IQNet

AENOR
Asociación Española de Normalización y Certificación
Ramón NAZ
General Manager of AENOR

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THE INTERNATIONAL CERTIFICATION NETWORK

Annex to IQNet Certificate Number ES-2010/0286

STOLT SEA FARM, S.A.

MEREXO
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ESPAÑA

Issued on: 2010-05-12 Validity date: 2013-05-12

This annex is only valid in connection with the above-mentioned certificate.

René Wasmer
President of IQNet

Ramón NAZ
General Manager of AENOR

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12.4 Vottun frá Friends of the Sea

FRIEND OF THE SEA

Sustainable

PRODUCT CERTIFICATE

Certificate No. 0095-2009-A

This is to Certify that the product

Turbot (*Scopthalmus maximus*)

farmed by **Stolt Sea Farm**

is farmed in conformity with

Friend of the Sea Criteria for Sustainable Aquaculture

Original certification date:

25th of November 2009

Compliance of the certified product to the Friend of the Sea Criteria has been verified by:

Oscar Vidal – Bureau Veritas Español

This Certificate is valid until:

25th of November 2012

FRIEND OF THE SEA

Paolo Bray – *Director*

Lack of fulfilment of conditions as set out in the Licensing Agreement may render this Certificate invalid

Associazione Friend of the Sea – Via Felice Casati, 12 – 20124 – Milano – I – www.friendofthesea.org Fax: 0039.02.58215400 Tel: 0039.02.582151

12.5 Evróputilskipun 2003/623/EC – Traces

Meðfylgjandi skjal inniheldur tilskipun Evrópusambandsins varðandi Traces.

COMMISSION DECISION

of 19 August 2003

concerning the development of an integrated computerised veterinary system known as Traces

(notified under document number C(2003) 2983)

(2003/623/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Directive 90/425/EEC of 26 June 1990 concerning the veterinary and zootechnical checks applicable in intra-Community trade in certain live animals and products with a view to the completion of the internal market (1), as last amended by Directive 2002/33/EC of the European Parliament and of the Council (2) and in particular Article 20(3) thereof,

Having regard to Council Decision 92/438/EEC of 13 July 1992 on computerisation of veterinary import procedures (Shift project), amending Directives 90/675/EEC, 91/496/EEC, 91/628/EEC and Decision 90/424/EEC, and repealing Decision 88/192/EEC (3), as last amended by Regulation (EC) No 806/2003 (4), and in particular Article 12 thereof,

Having regard to Council Decision 90/424/EEC of 26 June 1990 on expenditure in the veterinary field (5), as last amended by Regulation (EC) No 806/2003, and in particular Articles 37(2) and 37a(2) thereof,

Whereas:

(1) Commission Decision 91/398/EEC of 19 July 1991 on a computerised network linking veterinary authorities (Animo) (6), defines the principles governing the communications network linking veterinary units.

(2) Commission Decision 92/563/EEC of 19 November 1992 on the database covering the Community's import requirements, envisaged by the Shift project (7), lays down that the Commission must develop the relevant databases.

(3) Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures (8) seeks to guarantee the security of and confidence in electronic communication media and facilitate their use by the national and Community authorities to communicate both among themselves and with citizens and economic operators.

(4) Point 123 of European Parliament report A5-0405/2002 on measures to control foot-and-mouth disease in the European Union in 2001 and future measures to prevent and control animal diseases in the European Union stipulates that the Commission should, without delay, take measures to improve the existing system for monitoring the movement of live animals within the EU (Animo system).

(5) Commission Decision 2003/24/EC of 30 December 2002 concerning the development of an integrated computerised veterinary system (9) lays down that in a second phase, the Commission is to develop the new Animo system.

(6) In order to optimise the functions and user interfaces, the Member States need to be closely involved in developing an integrated computerised veterinary system.

(7) The measures provided for in this Decision are in accordance with the opinion of the Standing Committee on the Food Chain and Animal Health,

HAS ADOPTED THIS DECISION:

Article 1

In connection with the establishment provided for in Decision 2003/24/EC, of the single architecture known as Traces, combining the functions of the Animo and Shift systems, the Commission shall develop the new Animo system and make it available to the Member States.

Article 2

For the development of the new Animo system referred to in Article 1 the Commission shall have a budget of EUR 300 000.

Article 3

The Director-General of the Directorate-General for Health and Consumer Protection shall be authorised to sign on behalf of the Commission the contracts needed to implement this Decision.

(1) OJ L 224, 18.8.1990, p. 29.
(2) OJ L 315, 19.11.2002, p. 14.
(3) OJ L 243, 25.8.1992, p. 27.
(4) OJ L 122, 16.5.2003, p. 1.
(5) OJ L 224, 18.8.1990, p. 19.
(6) OJ L 221, 9.8.1991, p. 30.
(7) OJ L 361, 10.12.1992, p. 45.
(8) OJ L 13, 19.1.2000, p. 12.
(9) OJ L 8, 14.1.2003, p. 44.

Article 4

This Decision is addressed to the Member States.

Done at Brussels, 19 August 2003.

For the Commission
David BYRNE
Member of the Commission

12.6 Staðfesting á innri viðskiptum í Evrópusambandinu

Meðfylgjandi skjal inniheldur staðfestingarskjal vegna innri viðskipta sem falla undir Traces (Intra trade certificate).

EUROPEAN COMMUNITY

Intra trade certificate

Part I : Details of dispatched consignment

I.1. Consignor
Name
Address
Country

I.2. Certificate reference number

I.2.a.Local reference number::

I.3. Central Competent Authority

I.4. Local Competent Authority

I.5. Consignee
Name
Address
Country

I.6. No.(s) of related original certificates

No.(s) of accompanying documents

I.7. Dealer
Name
Approval number

I.8.Country of origin ISO code

I.9. Region of origin Code

I.10. Country of destination ISO code

I.11. Region of destination Code

I.12. Place of origin/Place of harvest
Holding ☐ Assembly centre ☐ Dealer's premise ☐
Approved body ☐ Semen centre ☐ Approved aquaculture holding ☐
Embryo team ☐ Establishment ☐ Other ☐
Name
Approval number
Address
Postal code / Region

I.13. Place of destination
Holding ☐ Assembly centre ☐ Dealer's premise ☐
Approved body ☐ Semen centre ☐ Approved aquaculture holding ☐
Embryo team ☐ Establishment ☐ Other ☐
Name
Approval number
Address
Postal code / Region

I.14. Place of loading
Postal code / Region

I.15. Date and time of departure

I.16. Means of transport
Aeroplane ☐ Ship ☐ Railway wagon ☐
Road vehicle ☐ Other ☐
Identification::
Number(s):

I.17. Transporter
Name
Approval number
Address
Postal code / Region Member state

I.18. Animal species/Product

I.19. Commodity code (CN code)

I.20. Number/Quantity

I.21 Temperature of products
Ambient ☐ Chilled ☐ Frozen ☐

I.22. Number of packages

I.23. Identification of container/Seal number

I.24.Type of packaging

I.25. Animals certified as/products certified for::
Breeding ☐ Fattening ☐ Slaughter ☐ Transhumance ☐ Approved bodies ☐
Artificial reproduction ☐ Registered equidae ☐ Game restocking ☐ Pets ☐
Human consumption ☐ Animal feedingstuff ☐ Pharmaceutical use ☐ Technical use ☐ Other ☐

I.26. Transit through 3rd country ☐
3rd country ISO code
Exit point Code
Entry point BIP unit no.:

I.27. Transit through Member states ☐
Member state ISO code
Member state ISO code
Member state ISO code

I.28. Export ☐
3rd country ISO code
Exit point Code

I.29. Estimated journey time

I.30. Route plan
Yes ☐ No ☐

I.31. Identification of the animals
Species(scientific name) Quantity

Part II: Certification

II. Health information	II.a. Certificat reference number	II.b.Local reference number:

II.1 General requirements

I, the undersigned official inspector, hereby certify that the aquaculture animals referred to in Part I of this certificate:

II.1.1 either (1)[have been inspected within (1)(2)[72] (1) [24] hours of loading, and showed no clinical signs of disease]

or (1)[in the case of eggs and molluscs, come from a farm or mollusc farming area where, according to the records of the farm or mollusc farming area, there is no indication of disease problems]

or (1)(3)[in the case of wild aquatic animals, according to the best of my knowledge and belief are clinically healthy];

II.1.2 are not subject to any prohibitions due to unresolved increased mortality;

II.1.3 are not intended for destruction or slaughter for the eradication of diseases;

II.1.4 comply with the requirements for placing on the market laid down in Council Directive 2006/88/EC;

II.1.5 (1)[in the case of molluscs, were subject to an individual visual check of each part of the consignment, and no molluscs species other than those specified in Part I of the certificate were detected.]

II.2 (1)(4)(5)[Requirements for species susceptible to Viral haemorrhagic septicaemia (VHS), Infectious haematopoietic necrosis (IHN), Infectious salmon anaemia (ISA), Koi herpes virus (KHV), Marteilia refringens, Bonamia ostreae, and/or White spot disease

I, the undersigned official inspector, hereby certify that the aquaculture animals referred to above:

either (1)(6)[originate from a Member State, zone or compartment declared free from (1)[VHS] (1)[IHN] (1)[ISA] (1)[KHV] (1)[Marteilia refringens] (1)[Bonamia ostreae] (1)[White spot disease] in accordance with Chapter VII of Directive 2006/88/EC.]

or (1)(5)(6)[in the case of wild aquatic animals, have been subject to quarantine in accordance with Commission Decision 2008/946/EC].]

II.3 (1)(5)(7)[Requirements for vector species to Viral haemorrhagic septicaemia (VHS), Infectious haematopoietic necrosis (IHN), Infectious salmon anaemia (ISA), Koi herpes virus (KHV), Marteilia refringens, Bonamia ostreae, and/or White spot disease

I, the undersigned official inspector, hereby certify that the aquaculture animals referred to above which are to be regarded as possible vectors to (1)[VHS] (1)[IHN] (1)[ISA] (1)[KHV] (1)[Marteilia refringens] (1)[Bonamia ostreae] (1)[White spot disease] as they are of species listed in Column 2 and fulfil the conditions set out in Column 3 of the table in Annex I to Commission Regulation (EC) No 1251/2008 :

either (1)(6)[originate from a Member State, zone or compartment declared free from (1)[VHS] (1)[IHN] (1)[ISA] (1)[KHV] (1)[Marteilia refringens] (1)[Bonamia ostreae] (1)[White spot disease] in accordance with Chapter VII of Directive 2006/88/EC.]

or (1)(5)(6)(7)[have been subject to quarantine in accordance with Commission Decision 2008/946/EC].]

II.4 Transport and labelling requirements

I, the undersigned official inspector, hereby certify that:

II.4.1 the aquaculture animals referred to above,

(i) are placed under conditions, including with a water quality, that do not alter their health status,

(ii) as appropriate, comply with the general conditions for the transport of animals laid down in Article 3 of Council Regulation (EC) No 1/2005;

II.4.2 the transport container or well boat prior to loading is clean and disinfected or previously unused; and

II.4.3 the consignment is identified by a legible label on the exterior of the container, or when transported by well boat, in the ship's manifest, with the relevant information referred to in boxes I.8 to I.13 of Part I of this certificate, and the following statement:

either (1)[" (1)[Wild] (1)[Fish] (1)[Molluscs] (1)[Crustaceans] intended for farming in the Community"],

or (1)[" (1)[Wild] (1)[Molluscs] intended for relaying in the Community"],

or (1)[" (1)[Wild] (1)[Fish] (1)[Molluscs] (1)[Crustaceans] intended for put and take fisheries in the Community"],

or (1)[" (1)[Wild] (1)[Ornamental fish] (1)[Ornamental molluscs] (1)[Ornamental crustaceans] intended for open ornamental facilities in the Community"],

or (1)[" (1)[Fish] (1)[Molluscs] (1)[Crustaceans] intended for restocking in the Community"],

or (1)[" (1)[Wild] (1)[Fish] (1)[Molluscs] (1)[Crustaceans] intended for quarantine in the Community"],

II.5 (1)(8)[Attestation for consignments originating from an area subject to disease control measures as provided for in Section 3 to 6 of Chapter V of Directive 2006/88/EC

I, the undersigned official inspector, hereby certify that:

II.5.1 the animals referred to above originate from an area subject to disease control measures regarding (1)[Epizootic ulcerative syndrome (EUS)] (1)[Epizootic haematopoietic necrosis (EHN)] (1)[Viral haemorrhagic septicaemia (VHS)] (1)[Infectious haematopoietic necrosis (IHN)] (1)[Infectious salmon anaemia (ISA)] (1)[Koi herpes virus (KHV)] (1)[Bonamia exitiosa] (1)[Perkinsus marinus] (1)[Mikrocytos mackini] (1)[Marteilia refringens] (1)[Bonamia ostreae] (1)[Taura syndrome] (1)[Yellowhead disease] (1)[White spot disease] (1)(9)[the following emerging disease:] ;

II.5.2 the animals referred to above are allowed to be placed on the market according to the control measures laid down; and

II.5.3 the consignment is identified by a legible label on the exterior of the container, or when transported by well boat, in the ship's manifest, with the relevant information referred to in boxes I.8 to I.13 of Part I of this certificate, and the following statement:

" (1)[Wild] (1)[Fish] (1)[Molluscs] (1)[Crustaceans] originating from an area subject to disease control measures".]

Notes

Part I:

Box I.12: If appropriate, use the authorisation number for the farm or mollusc farming area in question. Use "other" if wild aquatic animals.

Box I.13: If appropriate, use the authorisation number for the farm or mollusc farming area in question. Use "other" if intended for restocking.

Box I.19: Use the appropriate HS codes: 0301, 0306, 0307, 030110 and 03027000.

Box I.20 and 1. 31: As regards quantity, give the total number.

Box I.25: Use the option "Breeding" if intended for farming, "Relaying" if intended for relaying, "Pets" if intended for open ornamental facilities, "Game restocking" if intended for restocking, "Quarantine" if the aquaculture animals are intended for a quarantine facility, and "Other" if intended for put and take fisheries.

Part II:

(1) Keep as appropriate.

(2) The 24-hour option applies only to consignments of aquaculture animals which according to Article 8 of Regulation (EC) No 1251/2008 must be accompanied by a certificate and which in compliance with the placing on the market requirements of Directive 2006/88/EC are allowed by the competent authority to leave an area subject to control provisions provided for in Sections 3 to 6 of Chapter V of Directive 2006/88/EC or a Member State, zone or compartment with an eradication programme approved in accordance with Article 44 (2) of that Directive. In all other cases the 72-hour option applies.

(3) Only applicable to consignments of aquaculture animals caught in the wild and immediately transported to a farm or mollusc farming area without any temporary storage.

(4) Part II.2 of this certificate applies to species susceptible to one or more of the diseases referred to in the title. Susceptible species are listed in Part II of Annex IV to Directive 2006/88/EC.

(5) Consignments of wild aquatic animals may be placed on the market regardless of the requirements in part II.2 of this certificate if they are intended for a quarantine facility complying with the requirements laid down in Commission Decision 2008/946/EC.

Part II: Certification

II. Health information	II.a. Certificat reference number	II.b.Local reference number:

(6) To be authorised into a Member State, zone or compartment declared free from VHS, IHN, ISA, KHV, Marteilia refringens, Bonamia ostreae, or Whitespot disease or with a surveillance or eradication programme established in accordance with Article 44(1) or (2) of Directive 2006/88/EC, one of these statements must be kept if the consignment contain susceptible or vector species to the disease(s) for which disease freedom or programme(s) apply(ies). Data on the disease status of each farm and mollusc farming area in the Community are accessible at http://ec.europa.eu/food/animal/liveanimals/aquaculture/index_en.htm

(7) Part II.3 of this certificate applies to vector species to one or more of the diseases referred to in the title. Possible vector species and the conditions, under which consignments of such species are to be considered vector species, are listed in Annex I to Regulation (EC) No 1251/2008. Consignments of possible vector species may be placed on the market regardless of the requirements in part II.3 if the conditions set out in Column 4 of the table in Annex I to Regulation (EC) No 1251/2008 are not fulfilled or they are intended for a quarantine facility complying with the requirements laid down in Commission Decision 2008/946/EC.

(8) Part II.5 of this certificate applies to consignments of aquaculture animals which according to Article 8 of Regulation (EC) No 1251/2008 must be accompanied by a certificate and which in compliance with the placing on the market requirements of Directive 2006/88/EC are allowed by the competent authority to leave an area subject to control provisions provided for in Sections 3 to 6 of Chapter V of Directive 2006/88/EC or a Member State, zone or compartment with an eradication programme approved in accordance with Article 44(2) of that Directive.

(9) Applicable when measures are taken in accordance with Article 41 of Directive 2006/88/EC.

Official veterinarian or official inspector

Name (in Capital): Qualification and title:

Local Veterinary Unit: LVU N°:

Date: Signature:

Stamp

Part III: Control

III.1. Date of the inspection

III.2. Certificate Reference Number::

III.3. Documentary Check:: No Yes

EU Standard Satisfactory Not satisfactory

Additional guarantees Satisfactory Not satisfactory

National requirements Satisfactory Not satisfactory

III.4. Identity Check:: No Yes

Satisfactory Not satisfactory

III.5. Physical Check:: No Total animals checked

Satisfactory Not satisfactory

III.6. Laboratory Tests:: No Yes

Date:

Tested for::

Random Suspicion

Results:: Pending Satisfactory Not satisfactory

III.7. Welfare check No Yes

Satisfactory Not satisfactory

III.8.Infringement of welfare regulation::

III.8.1.Transporter authorisation invalid

III.8.2.Non-compliance of the means of transport

III.8.3.Stocking density exceeded Average space

III.8.4.Travel times exceeded

III.8.5.Watering and feeding not fulfilled

III.8.6.Mishandling or negligence to the animals

III.8.7.Supplementary measures for the journeys of long duration

III.8.8.Certificate of proficiency of the driver

III.8.9.Data registered in the log book

III.8.10.Other

III.9. Infringement of health legislation

III.9.1. Absence/Invalid certificate

III.9.2. Mis-match with documents

III.9.3. Non authorised country

III.9.4. Non approved region/ zone

III.9.5. Prohibited species

III.9.6. Absence of additional guarantee

III.9.7. Non approved holding

III.9.8. Diseased or suspect animals

III.9.9. Unsatisfactory tests

III.9.10. Absence or non legal identification

III.9.11.National requirements not fulfilled

III.9.12. Address of destination invalid

III.9.13. Other

III.10. Impact of the transport on animals

Number of dead animals:: Estimation:

Number of unfit animals :: Estimation:

Number of birth or abortion:

III.11. Corrective action

III.11.1. Delayed departure

III.11.2. Transfer procedure

III.11.3. Quarantine

III.11.4. Humane killing/Euthanasia

III.11.5. Destruction of carcasses/products

III.II.6. Return of consignment

III.11.7. Treatment of products

III.11.8.7. Use of products for other purpose

Identification:

III.12. Follow-up of quarantine

III.12.1.Humanely killing/Euthanasia

III.12.2.Release

III.13. Place of inspection

Establishment Holding Assembly centre

Dealer's premise Approved body Semen centre

Port Airport Exit point

Enroute Other

III.14. Official veterinarian or official inspector

Local Veterinary Unit LVU N°

Name (in Capital):

Qualification and title

Date: Signature:

PLANNING

1.1. ORGANISER name and address (a) (b)	1.2. Name of the person in charge of the journey
	1.3. Telephone / Fax

2. TOTAL EXPECTED DURATION (hours / days)	
3.1. Place and country of DEPARTURE	4.1. Place and country of DESTINATION

3.2. Date	3.3. Time	4.2. Date	4.3. Time

5.1. Species	5.2. Number of animals	5.3. Veterinary certificate(s) number(s)

5.4. Estimated total weight of the consignment (in kg)	5.5. Total space foreseen for the consignment (in m²)

6. LIST OF FORESEEN RESTING, TRANSFER OR EXIT POINTS

6.1. Name of the places where animals are to be rested, or transferred (including exit points)	6.2. Arrival		6.3. Length (in hours)	6.4. Transporter name and authorisation N (if different from the organiser)	6.5 identification
	Date	Time			

7. I, the organiser, hereby declare that I am responsible for the organisation of the above-mentioned journey and I have made suitable arrangements to safeguard the welfare of the animals throughout the journey in accordance with the provisions of Council Regulation 1/2005
8. Signature of the organiser

(a) Organiser: see definition laid down in Article 2(q) of Council Regulation 1/2005

(b) If the organiser is a transporter the authorisation number shall be specified

12.7 Evróputilskipun 2006/88/EC

Meðfylgjandi skjal inniheldur tilskipun Evrópusambandsins vegna sjúkdómavarna sem snýr að fiskeldi.

COUNCIL DIRECTIVE 2006/88/EC

of 24 October 2006

on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 37 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the European Economic and Social Committee [1],

Whereas:

(1) Aquaculture animals and products fall under the scope of Annex I to the Treaty as live animals, fish, molluscs and crustaceans. The breeding, rearing and the placing on the market of aquaculture animals and products thereof constitutes an important source of income for persons working in this sector.

(2) In the context of the internal market, specific animal health rules were laid down for the placing on the market and introduction from third countries of the products concerned by Council Directive 91/67/EEC of 28 January 1991 concerning the animal health conditions governing the placing on the market of aquaculture animals and products [2].

(3) Outbreaks of diseases in aquaculture animals could cause severe losses to the industry concerned. Minimum measures to be applied in case of outbreaks of the most important diseases in fish and molluscs were established by Council Directive 93/53/EEC of 24 June 1993 introducing minimum Community measures for the control of certain fish diseases [3] and Council Directive 95/70/EC of 22 December 1995 introducing minimum Community measures for the control of certain diseases affecting bivalve molluscs [4].

(4) Existing Community legislation was drafted mainly to take into account the farming of salmon, trout and oysters. Since that legislation was adopted, the Community aquaculture industry has developed significantly. A number of additional fish species, particularly marine species, are now used in aquaculture. New types of farming practices involving other fish species have also become increasingly common, particularly following the recent enlargement of the Community. Furthermore, farming of crustaceans, mussels, clams and abalones is becoming increasingly important.

(5) All disease control measures have an economic impact on aquaculture. Inadequate controls may lead to a spread of pathogens, which may cause major losses and compromise the animal health status of fish, molluscs and crustaceans used in Community aquaculture. On the other hand, over-regulation could place unnecessary restrictions on free trade.

(6) The Communication from the Commission to the Council and the European Parliament dated 19 September 2002 sets out a strategy for the sustainable development of European aquaculture. That Communication outlined a series of measures designed to create long-term employment in the aquaculture sector, including promoting high animal health and welfare standards, and environmental actions to ensure a sound industry. Those measures should be taken into account.

(7) Since the adoption of Directive 91/67/EEC, the Community has ratified the World Trade Organisation (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). The SPS Agreement refers to the standards of the World Organisation for Animal Health (OIE). The animal health requirements for placing live aquaculture animals and products thereof on the market within the Community set out in Directive 91/67/EEC are more stringent than those standards. Therefore, this Directive should take into account the Aquatic Animal Health Code and the Manual of Diagnostic Tests for Aquatic Animals of the OIE.

(8) In order to ensure the rational development of the aquaculture sector and to increase productivity, aquatic animal health rules should be laid down at Community level. These rules are necessary, *inter alia*, in order to contribute to the completion of the internal market and to avoid the spread of infectious diseases. Legislation should be flexible to take into account the continuing developments in and diversity of the aquaculture sector, as well as the health status of aquatic animals within the Community.

[1] OJ C 88, 11.4.2006, p. 13.

[2] OJ L 46, 19.2.1991, p. 1. Directive as last amended by Regulation (EC) No 806/2003 (OJ L 122, 16.5.2003, p. 1).

[3] OJ L 175, 19.7.1993, p. 23. Directive as last amended by the 2003 Act of Accession.

[4] OJ L 332, 30.12.1995, p. 33. Directive as last amended by the 2003 Act of Accession.

(9) This Directive should cover aquaculture animals, and those environments which may affect the health status of such animals. In general the provisions of this Directive should only apply to wild aquatic animals where the environmental situation may impinge on the health status of aquaculture animals, or where necessary in order to fulfil the purpose of other Community legislation, such as Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora [1] or to protect species referred to in the list drawn up by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This Directive should not prejudice the adoption of more stringent rules on the introduction of non-native species.

(10) The competent authorities designated for the purpose of this Directive should perform their functions and duties in accordance with the general principles laid down in Regulation (EC) No 854/2004 of European Parliament and of the Council of 29 April 2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption [2] and Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules [3].

(11) It is necessary for the development of aquaculture in the Community to increase the awareness and preparedness of the competent authorities and aquaculture production business operators with respect to the prevention, control and eradication of aquatic animal diseases.

(12) The competent authorities of Member States should have access to and apply state-of-the-art techniques and knowledge in the fields of risk analysis and epidemiology. This is of increasing importance because international obligations now focus on risk analysis in relation to the adoption of sanitary measures.

(13) It is appropriate to introduce at Community level a system of authorisation of aquaculture production businesses. Such authorisation would enable the competent authorities to establish a complete overview of the aquaculture industry, which would assist in the prevention, control and eradication of aquatic animal diseases. Furthermore, authorisation allows the laying down of specific requirements that should be fulfilled by the aquaculture production business in order to operate. Such authorisation should, where possible, be combined with or included in an authorisation regime which the Member States may already have established for other purposes, for example under environmental legislation. Such authorisation should therefore not be an extra burden to the aquaculture industry.

(14) Member States should refuse to issue an authorisation if the activity in question would pose an unacceptable risk of spreading diseases to other aquaculture animals or to wild stocks of aquatic animals. Before deciding to refuse an authorisation, consideration should be given to risk mitigation measures or alternative siting of the activity in question.

(15) The rearing of aquaculture animals for the purpose of human consumption is defined as primary production in Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs [4]. Obligations imposed on individual aquaculture production businesses under this Directive, such as record keeping, and internal systems enabling the aquaculture production business to demonstrate to the competent authority that the relevant requirements of this Directive are being fulfilled, should, where possible, be combined with the obligations laid down in Regulation (EC) No 852/2004.

(16) More attention should be paid to preventing disease occurrence than to controlling the disease once it has occurred. It is therefore appropriate to lay down minimum measures of disease prevention and risk mitigation which should be applied to the whole production chain in aquaculture, from fertilisation and hatching of eggs to the processing of aquaculture animals for human consumption, including transportation.

(17) In order to improve general animal health and assist in the prevention and control of animal disease through improved traceability, the movement of aquaculture animals should be recorded. Where appropriate, such movements should also be subject to animal health certification.

(18) In order to have an overview of the disease situation, to facilitate a rapid reaction in the case of a suspicion of disease and to protect farms or mollusc farming areas having a high animal health standard, a risk-based animal health surveillance should be applied in all such farms and mollusc farming areas.

(19) It is necessary to ensure that the main aquatic animal diseases at Community level do not spread. Harmonised animal health provisions for placing on the market should therefore be laid down with specific provisions applicable to species susceptible to those diseases. Therefore a list of such diseases and species susceptible thereto should be laid down.

[1] OJ L 206, 22.7.1992, p. 7. Directive as last amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).

[2] OJ L 139, 30.4.2004, p. 206, corrected by OJ L 226, 25.6.2004, p. 83. Regulation as last amended by Commission Regulation (EC) No 2076/2005 (OJ L 338, 22.12.2005, p. 83).

[3] OJ L 165, 30.4.2004, p. 1, corrected by OJ L 191, 28.5.2004, p. 1. Regulation as last amended by Commission Regulation (EC) No 776/2006 (OJ L 136, 24.5.2006, p. 3).

[4] OJ L 139, 30.4.2004, p. 1, corrected by OJ L 226, 25.6.2004, p. 3.

(20) The prevalence of such aquatic animal diseases is not the same throughout the Community. Reference should therefore be made to the concept of Member States declared disease free, and when dealing with parts of the territory concerned, to the concept of zones or compartments. General criteria and procedures for the granting, maintenance, suspension, restoration and withdrawal of such status should be laid down.

(21) Without prejudice to Council Directive 90/425/EEC of 26 June 1990 concerning veterinary and zootechnical checks applicable in intra-Community trade in certain live animals and products with a view to the completion of the internal market [1], in order to maintain and improve the general aquatic animal health status in the Community, Member States, zones or compartments declared free of one or more of the diseases listed should be protected against the introduction of such disease.

(22) Where necessary, Member States may take interim protective measures in accordance with Article 10 of Directive 90/425/EEC and Article 18 of Council Directive 91/496/EEC of 15 July 1991 laying down the principles governing the organisation of veterinary checks on animals entering the Community from third countries and amending Directives 89/662/EEC, 90/425/EEC and 90/675/EEC [2].

(23) In order to avoid the creation of unnecessary trade restrictions, the exchange of aquaculture animals between Member States, zones or compartments where one or more of such diseases are present should be allowed, provided that appropriate risk mitigation measures are taken, including during transport.

(24) The slaughter and processing of aquaculture animals which are subject to disease control measures may spread the disease, *inter alia* as a result of the discharge of effluents containing pathogens from processing plants. It is therefore necessary for the Member States to have access to processing establishments that have been duly authorised to undertake such slaughter and processing without jeopardising the health status of farmed and wild aquatic animals, including in respect of the discharge of effluents.

(25) The designation of Community and national reference laboratories should contribute to the high quality and uniformity of diagnostic results. That objective can be achieved by activities such as the application of validated diagnostic tests and the organisation of comparative testing and training of staff from laboratories.

(26) Laboratories involved in the examination of official samples should work in accordance with internationally approved procedures or criteria based on performance standards and should use diagnostic methods that have, as far as possible, been validated. For a number of activities related to such examination, the European Committee for Standardisation (CEN), and International Organisation for Standardisation (ISO) have developed European Standards (EN Standards) and International Standards (ISO Standards) respectively, appropriate for the purpose of this Directive. Such standards relate in particular to the operation and assessment of laboratories and to the operation and accreditation of control bodies.

(27) In order to ensure early detection of any possible outbreak of an aquatic animal disease, it is necessary to oblige those in contact with aquatic animals of susceptible species to notify any suspect case of disease to the competent authority. Routine inspections should be carried out in the Member States to ensure that aquaculture production business operators are familiar with, and apply, the general rules on disease control and biosecurity laid down in this Directive.

(28) It is necessary to prevent the spread of non-exotic but serious diseases in aquaculture animals as soon as an outbreak occurs by carefully monitoring movements of live aquaculture animals and products thereof, and the use of equipment liable to be contaminated. The choice of the measures to be used by the competent authorities should depend on the epidemiological situation in the Member State concerned.

(29) In order to advance the animal health status of the Community, it is appropriate that epidemiologically based programmes to control and eradicate certain diseases are submitted by Member States for recognition at Community level.

(30) For diseases not subject to Community measures, but which are of local importance, the aquaculture industry should, with the assistance of the competent authorities of the Member States, take more responsibility for preventing the introduction of or controlling such diseases through self regulation and the development of 'codes of practice'. However, it may be necessary for the Member States to implement certain national measures. Such national measures should be justified, necessary and proportionate to the goals to be achieved. Furthermore, they should not affect the trade between the Member States unless this is necessary in order to prevent the introduction of or to control the disease, and should be approved and regularly reviewed at Community level. Pending the establishment of such measures under this Directive, the additional guarantees granted in Commission Decision 2004/453/EC of 29 April 2004 implementing Council Directive 91/67/EEC as regards measures against certain diseases in aquaculture animals [3] should remain in force.

[1] OJ L 224, 18.8.1990, p. 29 Directive as last amended by Directive 2002/33/EC of the European Parliament and of the Council (OJ L 315, 19.11.2002, p. 14).

[2] OJ L 268, 24.9.1991, p. 56. Directive as last amended by the 2003 Act of Accession.

[3] OJ L 156, 30.4.2004, p. 5, as corrected by OJ L 202, 7.6.2004, p. 4. Decision as last amended by Commission Decision 2006/272/EC (OJ L 99, 7.4.2006, p. 31.).

(31) There is a continuous development in knowledge with respect to hitherto unknown diseases in aquatic animals. It may therefore be necessary for a Member State to apply control measures in the case of such emerging disease. Such measures should be swift and adapted to each individual case, but should not be maintained longer than necessary to achieve their goal. As such emerging diseases may also affect other Member States, all Member States and the Commission should be informed of the presence of an emerging disease and any control measures taken.

(32) It is necessary and appropriate for the achievement of the basic objective of maintaining and, in the event of an outbreak, returning to a disease-free status in Member States, to lay down rules on the measures to increase disease preparedness. Outbreaks should be controlled as speedily as possible, if necessary by emergency vaccination, in order to limit the adverse effects on the production of, and trade in, live aquaculture animals and products thereof.

(33) Directive of the European Parliament and of the Council 2001/82/EC of 6 November 2001 on the Community code relating to veterinary medicinal products [1] and Regulation (EC) No 726/2004 of the European Parliament and of the Council of 31 March 2004 laying down Community procedures for the authorisation and supervision of medicinal products for human and veterinary use and establishing a European Medicines Agency [2] require that, with only minor exceptions, all veterinary medicinal products that are placed on the market within the Community are to hold a marketing authorisation. In general, all vaccines used in the Community should have a marketing authorisation. However, the Member States may permit the use of a product without a marketing authorisation in the event of a serious epidemic subject to certain conditions, in accordance with Regulation (EC) No 726/2004. Vaccines against exotic and emerging diseases in aquaculture animals may qualify for such derogation.

(34) This Directive should lay down provisions to ensure the necessary level of preparedness to effectively tackle the emergency situations related to one or more outbreaks of serious exotic or emerging diseases affecting aquaculture, in particular by drawing up contingency plans to combat them. Such contingency plans should be reviewed and updated regularly.

(35) Where the control of a serious aquatic animal disease is subject to harmonised Community eradication measures, Member States should be allowed to make use of financial contribution from the Community under Council Regulation (EC) No 1198/2006 of 27 July 2006 on the European Fisheries Fund [3]. Any application for Community support should be subject to scrutiny as regards compliance with control provisions laid down in this Directive.

(36) Live aquaculture animals and products thereof imported from third countries should not present an animal health hazard for aquatic animals in the Community. To that end, this Directive should set out measures for the prevention of the introduction of epizootic diseases.

(37) It is necessary in order to safeguard the aquatic animal health situation in the Community to further ensure that consignments of live aquaculture animals transiting through the Community comply with the relevant animal health requirements applicable to the species concerned.

(38) The placing on the market of ornamental aquatic animals involves a wide variety of species, often tropical species, solely for ornamental purposes. Those ornamental aquatic animals are normally kept in private aquariums or ponds, garden centres, or in exhibition aquariums, not in direct contact with Community waters. Consequently, ornamental aquatic animals held under such conditions do not pose the same risk to other sectors of Community aquaculture or to wild stocks. It is therefore appropriate to lay down special provisions applicable to the placing on the market, transit and import of ornamental aquatic animals, kept under such conditions.

(39) However, where ornamental aquatic animals are kept outside closed systems or aquariums, in direct contact with the natural waters of the Community, they could pose a significant risk to Community aquaculture or wild stocks. That is particularly the case for the populations of carp (*Cyprinidae*), as popular ornamental fish such as koi carp are susceptible to some diseases affecting other carp species farmed in the Community or found in the wild. In such cases, the general provisions of this Directive should apply.

(40) The setting up of electronic means of information exchange is vital for simplification, for the benefit of the aquaculture industry and of the competent authorities. In order to meet that obligation, common criteria need to be introduced.

(41) Member States should lay down rules on penalties applicable to infringements of the provisions of this Directive and ensure that they are implemented. Those penalties must be effective, proportionate and dissuasive.

[1] OJ L 311, 28.11.2001, p. 1. Directive as last amended by Directive 2004/28/EC (OJ L 136, 30.4.2004, p. 58).

[2] OJ L 136, 30.4.2004, p. 1.

[3] OJ L 223, 15.8.2006, p. 1.

(42) In accordance with paragraph 34 of the Interinstitutional agreement on better law-making [1], Member States are encouraged to draw up, for themselves and in the interest of the Community, their own tables, which will, as far as possible, illustrate the correlation between this Directive and the transposition measures and to make them public.

(43) Since the objectives of this Directive, namely to provide for the approximation of the concepts, principles and procedures forming a common basis for aquatic animal health legislation in the Community, cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale and effects of this Directive, be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives.

(44) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission [2].

(45) It is appropriate to update Community animal health legislation concerning aquaculture animals and products thereof. Accordingly, Directives 91/67/EEC, 93/53/EEC and 95/70/EC should be repealed and replaced by this Directive,

HAS ADOPTED THIS DIRECTIVE:

CHAPTER I

SUBJECT MATTER, SCOPE AND DEFINITIONS

Article 1

Subject matter

1. This Directive lays down:

(a) the animal health requirements to be applied for the placing on the market, the importation and the transit of aquaculture animals and products thereof;

(b) minimum preventive measures aimed at increasing the awareness and preparedness of the competent authorities, aquaculture production business operators and others related to this industry, for diseases in aquaculture animals;

(c) minimum control measures to be applied in the event of a suspicion of, or an outbreak of certain diseases in aquatic animals.

2. Member States shall remain free to take more stringent measures in the field covered by Article 13 of Chapter II, and Chapter V, provided that such measures do not affect trade with other Member States.

Article 2

Scope

1. This Directive shall not apply to:

(a) ornamental aquatic animals reared in non-commercial aquaria;

(b) wild aquatic animals harvested or caught for direct entry into the food chain;

(c) aquatic animals caught for the purpose of production of fishmeal, fish feed, fish oil and similar products.

2. Chapter II, Sections 1 to 4 of Chapter III, and Chapter VII shall not apply where ornamental aquatic animals are kept in pet shops, garden centres, garden ponds, commercial aquaria, or with wholesalers:

(a) without any direct contact with natural waters in the Community;

or

(b) which are equipped with an effluent treatment system reducing the risk of transmitting diseases to the natural waters to an acceptable level.

3. This Directive shall apply without prejudice to provisions on the conservation of species or the introduction of non-native species.

Article 3

Definitions

1. For the purposes of this Directive, the following definitions shall apply:

(a) 'aquaculture' means the rearing or cultivation of aquatic organisms using techniques designed to increase the production of those organisms beyond the natural capacity of the environment and where the organisms remain the property of one or more natural or legal persons throughout the rearing or culture stages, up to and including harvesting;

[1] OJ C 321, 31.12.2003, p. 1. Corrected version in OJ C 4, 8.1.2004, p. 7.

[2] OJ L 184, 17.7.1999, p. 23. Decision as last amended by Decision 2006/512/EC (OJ L 200, 22.7.2006, p. 11).

(b) 'aquaculture animal' means any aquatic animal at all its life stages, including eggs and sperm/gametes, reared in a farm or mollusc farming area, including any aquatic animal from the wild intended for a farm or mollusc farming area;

(c) 'aquaculture production business' means any undertaking, whether for profit or not and whether public or private, carrying out any of the activities related to the rearing, keeping or cultivation of aquaculture animals;

(d) 'aquaculture production business operator' means any natural or legal person responsible for ensuring that the requirements of this Directive are met within the aquaculture production business under their control;

(e) 'aquatic animal' means:

(i) fish belonging to the superclass *Agnatha* and to the classes *Chondrichthyes and Osteichthyes*;

(ii) mollusc belonging to the Phylum *Mollusca*;

(iii) crustacean belonging to the Subphylum *Crustacea*;

(f) 'authorised processing establishment' means any food business approved in accordance with Article 4 of Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for food of animal origin [1], for processing aquaculture animals for food purposes, and authorised in accordance with Articles 4 and 5 of this Directive;

(g) 'authorised processing establishment operator' means any natural or legal person responsible for ensuring that the requirements of this Directive are met within the authorised processing establishment under their control;

(h) 'farm' means any premises, enclosed area, or installation operated by an aquaculture production business in which aquaculture animals are reared with a view to their being placed on the market, with the exception of those where wild aquatic animals harvested or caught for the purpose of human consumption are temporarily kept awaiting slaughter without being fed;

(i) 'farming' means the rearing of aquaculture animals in a farm or in a mollusc farming area;

(j) 'mollusc farming area' means a production area or relaying area in which all aquaculture production businesses operate under a common biosecurity system;

(k) 'ornamental aquatic animal' means an aquatic animal which is kept, reared, or placed on the market for ornamental purposes only;

(l) 'placing on the market' means the sale, including offering for sale or any other form of transfer, whether free of charge or not, and any form of movement of aquaculture animals;

(m) 'production area' means any freshwater, sea, estuarine, continental or lagoon area containing natural beds of molluscs or sites used for the cultivation of molluscs, and from which molluscs are taken;

(n) 'put and take fisheries' means ponds or other installations where the population is maintained only for recreational fishing by restocking with aquaculture animals;

(o) 'relaying area' means any freshwater, sea, estuarine or lagoon area with boundaries clearly marked and indicated by buoys, posts or any other fixed means, and used exclusively for the natural purification of live molluscs;

(p) 'wild aquatic animal' means an aquatic animal which is not an aquaculture animal.

2. For the purposes of this Directive, the following definitions shall also apply:

(a) the technical definitions laid down in Annex I;

(b) as appropriate, the definitions laid down respectively in:

(i) Articles 2 and 3 of Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety [2];

(ii) Article 2 of Regulation (EC) No 852/2004;

(iii) Article 2 of Regulation (EC) No 853/2004;

(iv) Article 2 of Regulation (EC) No 882/2004.

CHAPTER II

AQUACULTURE PRODUCTION BUSINESSES AND AUTHORISED PROCESSING ESTABLISHMENTS

Article 4

Authorisation of aquaculture production businesses and processing establishments

1. Member States shall ensure that each aquaculture production business is duly authorised by the competent authority in accordance with Article 5.

[1] OJ L 139, 30.4.2004, p. 55.

[2] OJ L 31, 1.2.2002, p. 1.

Where appropriate, such authorisation may cover several aquaculture production businesses for molluscs in a mollusc farming area.

However, dispatch centres, purification centres or similar businesses located inside a mollusc farming area shall have an individual authorisation.

2. Member States shall ensure that each processing establishment slaughtering aquaculture animals for disease control purposes in accordance with Article 33 of Chapter V is duly authorised by the competent authority in accordance with Article 5.

3. Member States shall ensure that each aquaculture production business and authorised processing establishment has a unique authorisation number.

4. By way of derogation from the authorisation requirement in paragraph 1, Member States may require only the registration by the competent authority of the following:

(a) installations other than aquaculture production businesses, where aquatic animals are kept without the intention of being placed on the market;

(b) put and take fisheries;

(c) aquaculture production businesses which place aquaculture animals on the market solely for human consumption in accordance with of Article 1(3)(c) of Regulation (EC) No 853/2004.

In those cases, the provisions of this Directive shall apply *mutatis mutandis*, taking into account the nature, characteristics and situations of the installation, put and take fishery or business concerned and the risk of spreading aquatic animal diseases to other populations of aquatic animals as a result of its operation.

5. In the case of non-compliance with the provisions of this Directive, the competent authority shall act in accordance with Article 54 of Regulation (EC) No 882/2004.

Article 5

Authorisation conditions

1. Member States shall ensure that authorisations, as provided for in Article 4(1) and (2), are only granted by the competent authority if the aquaculture production business operator or authorised processing establishment operator:

(a) fulfils the relevant requirements of Articles 8, 9 and 10;

(b) has a system in place which enables the operator to demonstrate to the competent authority that those relevant requirements are being fulfilled;

and

(c) remains under the supervision of the competent authority, which shall perform the duties laid down in Article 54(1).

2. Authorisation shall not be granted if the activity in question were to lead to an unacceptable risk of spreading diseases to farms, mollusc farming areas or to wild stocks of aquatic animals in the vicinity of the farm or mollusc farming area.

However, before a decision to refuse authorisation is taken, consideration shall be given to risk-mitigation measures, including possible alternative siting of the activity in question.

3. Member States shall ensure that the aquaculture production business operator or authorised processing establishment operator submits all relevant information in order to allow the competent authority to assess that the conditions for authorisation are fulfilled, including the information required in accordance with Annex II.

Article 6

Register

The Member States shall establish, keep up to date and make publicly available a register of aquaculture production businesses and authorised processing establishments containing at least the information set out in Annex II.

Article 7

Official controls

1. In accordance with Article 3 of Regulation (EC) No 882/2004, official controls on aquaculture production businesses and authorised processing establishments shall be carried out by the competent authority.

2. The official controls provided for in paragraph 1 shall at least consist of regular inspections, visits, audits, and where appropriate, sampling, for each aquaculture production business, taking account of the risk the aquaculture production business and authorised processing establishment poses in relation to the contracting and spreading of diseases. Recommendations for the frequencies of such controls, depending on the health status of the concerned zone or compartment, are laid down in Part B of Annex III.

3. Detailed rules for the implementation of this Article may be adopted in accordance with the procedure referred to in Article 62(2).

Article 8

Recording obligations - Traceability

1. Member States shall ensure that aquaculture production businesses keep a record of:

(a) all movements of aquaculture animals and products thereof into and out of the farm or mollusc farming area;

(b) the mortality in each epidemiological unit as relevant for the type of production;

and

(c) the results of the risk-based animal health surveillance scheme provided for in Article 10.

2. Member States shall ensure that authorised processing establishments keep a record of all movement of aquaculture animals and products thereof into and out of such establishments.

3. Member States shall ensure that when aquaculture animals are transported, transporters keep a record of:

(a) mortality during transport, as practicable for the type of transport and the species transported;

(b) farms, mollusc farming areas and processing establishments visited by the means of transport;

and

(c) any water exchange during transport, in particular the sources of new water and site of release of water.

4. Without prejudice to specific provisions on traceability, Member States shall ensure that all movements of animals recorded by the aquaculture production business operators as provided for in paragraph 1(a) are registered in such a way that the tracing of the place of origin and destination can be guaranteed. Member States may require such movements to be recorded on a national register and kept in a computerised form.

Article 9

Good hygiene practice

Member States shall ensure that aquaculture production businesses and authorised processing establishments implement good hygiene practice, as relevant for the activity concerned, to prevent the introduction and spreading of diseases.

Article 10

Animal health surveillance scheme

1. Member States shall ensure that a risk-based animal health surveillance scheme is applied in all farms and mollusc farming areas, as appropriate for the type of production.

2. The risk-based animal health surveillance scheme referred to in paragraph 1 shall aim at the detection of:

(a) any increased mortality in all farms and mollusc farming areas as appropriate for the type of production;

and

(b) the diseases listed in Part II of Annex IV, in farms and mollusc farming areas were species susceptible to those diseases are present.

3. Recommendations for the frequencies of such animal health surveillance schemes, depending on the health status of the concerned zone or compartment, are laid down in Part B of Annex III. This surveillance shall apply without prejudice to the sampling and surveillance carried out in accordance with Chapter V or Article 49(3), Article 50(4) and Article 52.

4. The risk-based animal health surveillance scheme referred to in paragraph 1 shall take account of guidelines to be drawn up by the Commission in accordance with the procedure referred to in Article 62(2).

5. In the light of the outcome of official controls carried out in accordance with Article 7 and of the outcome of Community controls carried out in accordance with Article 58, and of any other relevant information, the Commission shall submit to the Council a report on the overall operation of risk-based animal health surveillance in Member States. This report may, where appropriate, be accompanied by an appropriate proposal, in accordance with the procedure referred to in Article 62(2) laying down detailed rules for the implementing of this Article.

CHAPTER III

ANIMAL HEALTH REQUIREMENTS FOR PLACING ON THE MARKET OF AQUACULTURE ANIMALS AND PRODUCTS THEREOF

SECTION 1

General Provisions

Article 11

Scope

1. Unless otherwise provided, this Chapter shall apply only to the diseases and the species susceptible thereto listed in Part II of Annex IV.

2. Member States may allow the placing on the market for scientific purposes of aquaculture animals and products thereof, which do not comply with this Chapter under the strict supervision of the competent authority.

The competent authority shall ensure that such placing on the market does not jeopardise the health status with regard to the diseases listed in Part II of Annex IV of aquatic animals at the place of destination or at places of transit.

Any such movements between Member States shall not take place without prior notification of the competent authorities of the Member States concerned.

Article 12

General requirements for the placing of aquaculture animals on the market

1. Member States shall ensure that the placing on the market of aquaculture animals and products thereof does not jeopardise the health status of aquatic animals at the place of destination with regard to the diseases listed in Part II of Annex IV.

2. Detailed rules on the movement of aquaculture animals are laid down in this Chapter, in particular relating to movements between Member States, zones and compartments with different health statuses, as referred to in Part A of Annex III.

Article 13

Disease prevention requirements in relation to transport

1. Member States shall ensure that:

(a) the necessary disease prevention measures are applied during the transport of aquaculture animals in order not to alter the health status of those animals during transport, and to reduce the risk of spreading diseases;

and

(b) aquaculture animals are transported under conditions which neither alter their health status nor jeopardise the health status of the place of destination, and where appropriate, of places of transit.

This paragraph shall also apply to diseases and the species susceptible thereto not listed in Part II of Annex IV.

2. Member States shall ensure that any water exchanges during transport are carried out at places and under conditions which do not jeopardise the health status of:

(a) the aquaculture animals being transported;

(b) any aquatic animals at the place of water exchange;

and

(c) aquatic animals at the place of destination.

Article 14

Animal health certification

1. Member States shall ensure that the placing on the market of aquaculture animals is subject to animal health certification when the animals are introduced into a Member State, zone or compartment declared disease-free in accordance with Articles 49 and 50 or subject to surveillance, or eradication programme in accordance with Article 44(1) or (2) for:

(a) farming and restocking purposes;

or

(b) further processing before human consumption, unless:

(i) as regards fish, they are slaughtered and eviscerated before dispatch;

(ii) as regards molluscs and crustaceans, they are dispatched as unprocessed or processed products.

2. Member States shall also ensure that the placing on the market of aquaculture animals is subject to animal health certification when the animals are allowed to leave an area subject to the control provisions provided for in Sections 3, 4, 5 and 6 of Chapter V.

This paragraph shall also apply to diseases and the species susceptible thereto not listed in Part II of Annex IV.

3. The following movements shall be subject to notification under the computerised system provided for in Article 20(1) of Directive 90/425/EEC:

(a) movements of aquaculture animals between Member States where animal health certification is required in accordance with paragraphs 1 or 2 of this Article;

and

(b) all other movements of live aquaculture animals for farming or restocking purposes between Member States where no animal health certification is required under this Directive.

4. Member States may decide to use the computerised system provided for in paragraph 3 to trace movements taking place entirely within their territory.

SECTION 2

Aquaculture animals intended for farming and restocking

Article 15

General requirements for the placing of aquaculture animals on the market for farming and restocking

1. Without prejudice to the provisions laid down in Chapter V, Member States shall ensure that aquaculture animals placed on the market for farming are:

(a) clinically healthy;

and

(b) do not come from a farm or mollusc farming area where there is any unresolved increased mortality.

This paragraph shall also apply in relation to diseases and the species susceptible thereto not listed in Part II of Annex IV.

2. By way of derogation from paragraph 1(b), Member States may allow such placing on the market, based on an assessment of risk, provided that the animals originate from a part of the farm or mollusc farming area independent of the epidemiological unit where the increased mortality has occurred.

3. Member States shall ensure that aquaculture animals intended for destruction or slaughter in accordance with the disease control measures provided for in Chapter V are not placed on the market for farming and restocking purposes.

4. Aquaculture animals may only be released into the wild for restocking purposes or into put and take fisheries if they:

(a) comply with the requirements in paragraph 1;

and

(b) come from a farm or mollusc farming area with a health status as referred to in Part A of Annex III, at least equivalent to the health status of the waters in which they are to be released.

However, Member States may decide that the aquaculture animals shall come from a zone or compartment declared disease-free in accordance with Articles 49 or 50. Member States may also decide to apply this paragraph to programmes drawn up and applied in accordance with Article 43.

Article 16

Introduction of aquaculture animals of species susceptible to a specific disease into areas free of that disease

1. In order to be introduced for farming or restocking into a Member State, zone or compartment declared free of a specific disease in accordance with Articles 49 or 50, aquaculture animals of species susceptible thereto shall originate from another Member State, zone or compartment also declared free of that disease.

2. Where it can be scientifically justified that species susceptible to the specific disease at certain life stages do not transmit that disease, paragraph 1 shall not apply to those life stages.

A list of species and life stages to which the first subparagraph may apply shall be adopted and when necessary amended to take account of scientific and technological developments in accordance with the procedure referred to in Article 62(2).

Article 17

Introduction of live aquaculture animals of vector species into disease-free areas

1. Where scientific data or practical experience substantiates that species other than those referred to in Part II of Annex IV may be responsible for the transmission of a specific disease by acting as vector species, Member States shall ensure that where introduced for farming or restocking purposes into a Member State, zone or compartment declared free of that specific disease in accordance with Articles 49 or 50, such vector species shall:

(a) originate from another Member State, zone or compartment declared free of that specific disease;

or

(b) be held in quarantine facilities in water free of the pathogen in question, for an appropriate period of time, where, in the light of the scientific data or practical experience provided, this proves to be sufficient to reduce the risk of transmission of the specific disease to a level acceptable for preventing the transmission of the disease concerned.

2. A list of vector species and life stages of such species to which this Article applies and, where appropriate, the conditions under which those species can transmit a disease shall be adopted, and when necessary amended taking into account scientific and technological developments in accordance with the procedure referred to in Article 62(2).

3. Pending the possible inclusion of a species on the list referred to in paragraph 2, the Commission may decide in accordance with the procedure referred to in Article 62(3), to allow Member States to apply the provisions provided for in paragraph 1.

SECTION 3

Aquaculture animals and products thereof intended for human consumption

Article 18

Aquaculture animals and products thereof placed on the market for further processing before human consumption

1. Member States shall ensure that aquaculture animals of species susceptible to one or more of the non-exotic diseases listed in Part II of Annex IV, and products thereof, may only be placed on the market for further processing in a Member State, zone or compartment declared free of those diseases in accordance with Articles 49 or 50, if they comply with one of the following conditions:

(a) they originate from another Member State, zone or compartment declared free of the disease in question;

(b) they are processed in an authorised processing establishment under conditions which prevent the spreading of diseases;

(c) as regards fish, they are slaughtered and eviscerated before dispatch;

or

(d) as regards molluscs and crustaceans, they are dispatched as unprocessed or processed products.

2. Member States shall ensure that live aquaculture animals of species susceptible to one or more of the non-exotic diseases listed in Part II of Annex IV which are placed on the market for further processing in a Member State, zone or compartment declared free of those diseases in accordance with Articles 49 or 50, may only be temporarily stored at the place of processing if:

(a) they originate from another Member State, zone, or compartment declared free of the disease in question;

or

(b) they are temporarily kept in dispatch centres, purification centres or similar businesses which are equipped with an effluent treatment system inactivating the pathogens in question, or where the effluent is subject to other types of treatment reducing the risk of transmitting diseases to the natural waters to an acceptable level.

Article 19

Aquaculture animals and products thereof placed on the market for human consumption without further processing

1. This section shall not apply where aquaculture animals of species susceptible to one or more of the diseases listed in Part II of Annex IV, or products thereof, are placed on the market for human consumption without further processing, provided that they are packed in retail-sale packages which comply with the provisions for packaging and labelling provided for in Regulation (EC) No 853/2004.

2. Where live molluscs and crustaceans of species susceptible to one or more of the diseases listed in Part II of Annex IV are temporarily relayed in Community waters, or introduced into dispatch centres, purification centres or similar businesses, they shall comply with Article 18(2).

SECTION 4

Wild aquatic animals

Article 20

Release of wild aquatic animals in Member States, zones or compartments declared disease-free

1. Wild aquatic animals of species susceptible to one or more of the diseases listed in Part II of Annex IV caught in a Member State or zone or compartment not declared disease-free in accordance with Articles 49 or 50 shall be placed in quarantine under the supervision of the competent authority in suitable facilities, for a period of time sufficient to reduce to an acceptable level the risk of transmission of the disease, before they may be released into a farm or mollusc farming area situated in a Member State, zone, or compartment declared free from that disease in accordance with Articles 49 or 50.

2. The Member States may allow traditional extensive lagoon aquaculture practice, without the quarantine provided for in paragraph 1, provided a risk assessment is undertaken and that the risk is considered not higher than what is expected from the application of paragraph 1.

SECTION 5

Ornamental aquatic animals

Article 21

Placing on the market of ornamental aquatic animals

1. Member States shall ensure that the placing on the market of ornamental aquatic animals does not jeopardise the health status of aquatic animals with regard to the diseases listed in Part II of Annex IV.

2. This Article shall apply also in relation to diseases not listed in Part II of Annex IV.

CHAPTER IV

INTRODUCTION OF AQUACULTURE ANIMALS AND PRODUCTS THEREOF INTO THE COMMUNITY FROM THIRD COUNTRIES

Article 22

General requirements for introduction of aquaculture animals and products thereof from third countries

Member States shall ensure that aquaculture animals and products thereof are introduced into the Community only from third countries or parts of third countries that appear on a list drawn up and updated in accordance with the procedure referred to Article 62(2).

Article 23

Lists of third countries and parts of third countries from which introduction of aquaculture animals and products thereof is permitted

1. A third country, or a part of a third country, shall appear on the list provided for in Article 22 only if a Community assessment of that country, or that part of a third country, has demonstrated that the competent authority provides appropriate guarantees as regards compliance with the relevant animal health requirements of Community legislation.

2. The Commission may decide if an inspection as referred to in Article 58(2) is necessary to complete the assessment of the third country, or part of the third country, provided for in paragraph 1.

3. When drawing up or updating the lists provided for in Article 22, particular account shall be taken of:

(a) the legislation of the third country;

(b) the organisation of the competent authority and its inspection services in the third country, the powers of these services, the supervision to which they are subject, and the means at their disposal, including staff capacity, to apply their legislation effectively;

(c) the aquatic animal health requirements in force that apply to the production, manufacture, handling, storage and dispatch of live aquaculture animals intended for the Community;

(d) the assurances which the competent authority of the third country may give regarding compliance or equivalence with the relevant aquatic animal health conditions;

(e) any experience of marketing live aquaculture animals from the third country and the results of any import controls carried out;

(f) the results of the Community assessment, in particular the results of the assessment carried out by the competent authorities of the third country concerned or, where the Commission so requests, the report submitted by the competent authorities of the third country on any inspections carried out;

(g) the health status of farmed and wild aquatic animals in the third country, with particular regard to exotic animal diseases and any aspects of the general aquatic animal health situation in the country which might pose a risk to aquatic animal health in the Community;

(h) the regularity, speed and accuracy with which the third country supplies information on the existence of infectious or contagious aquatic animal diseases in its territory, particularly the notifiable diseases, listed by the World Organisation for Animal Health (OIE);

and

(i) the rules on the prevention and control of aquatic animal diseases in force in the third country and their implementation, including rules on imports from other countries.

4. The Commission shall arrange for all lists to be drawn up or updated in accordance with Article 22 and made available to the public.

5. Lists drawn up in accordance with Article 22 may be combined with other lists drawn up for animal and public health purposes.

Article 24

Documents

1. All consignments of aquaculture animals and products thereof shall be accompanied by a document containing an animal health certificate upon their entry into the Community.

2. The animal health certificate shall certify that the consignment satisfies:

(a) the requirements laid down for such commodities under this Directive;

and

(b) any special import conditions established in accordance with Article 25(a).

3. The document may include details required under other provisions of Community public and animal health legislation.

Article 25

Detailed rules

Where necessary, detailed rules for the application of this Chapter may be established in accordance with the procedure referred to in Article 62(2). These rules may concern in particular:

(a) special import conditions for each third country, parts thereof or group of third countries;

(b) the criteria for classifying third countries and parts thereof with regard to aquatic animal diseases;

(c) the use of electronic documents;

(d) model animal health certificates and other documents;

and

(e) procedures and certification for transit.

CHAPTER V

NOTIFICATION AND MINIMUM MEASURES FOR CONTROL OF DISEASES OF AQUATIC ANIMALS

SECTION 1

Disease notification

Article 26

National notification

1. Member States shall ensure that:

(a) when there are any reasons to suspect the presence of a disease listed in Part II of Annex IV, or the presence of such disease is confirmed in aquatic animals, the suspicion and/or the confirmation is immediately notified to the competent authority;

and

(b) when increased mortality occurs in aquaculture animals, the mortality is immediately notified to the competent authority or a private veterinarian for further investigations.

2. Member States shall ensure that the obligations to notify the matters referred to in paragraph 1 are imposed on:

(a) the owner and any person attending aquatic animals;

(b) any person accompanying aquaculture animals during transport;

(c) veterinary practitioners and other professionals involved in aquatic animal health services;

(d) official veterinarians, senior staff of veterinary or other official or private laboratories;

and

(e) any other person with an occupational relationship to aquatic animals of susceptible species or to products of such animals.

Article 27

Notification of the other Member States, the Commission and EFTA Member States

Member States shall notify the other Member States, the Commission and EFTA Member States within 24 hours in case of confirmation of:

(a) an exotic disease listed in Part II of Annex IV;

(b) a non-exotic disease listed in Part II of Annex IV where the Member State concerned, zone, or compartment has been declared free of that disease.

SECTION 2

Suspicion of a listed disease – Epizootic investigation

Article 28

Initial control measures

Member States shall ensure that, in the case of a suspicion of an exotic disease listed in Part II of Annex IV or, in the case of suspicion of a non-exotic disease listed in Part II of Annex IV in Member States, zones or compartments with a health status of either category I or III as referred to in Part A of Annex III, for that disease:

(a) appropriate samples are taken and examined in a laboratory designated in accordance with Article 57;

(b) pending the result of the examination provided for in point (a):

(i) the farm, or mollusc farming area, in which the disease is suspected, is placed under official surveillance and relevant control measures are implemented to prevent the spreading of the disease to other aquatic animals;

(ii) no aquaculture animals are allowed to leave or enter the affected farm or mollusc farming area in which the disease is suspected, unless authorised by the competent authority;

(iii) the epizootic investigation provided for in Article 29 is initiated.

Article 29

Epizootic investigation

1. Member States shall ensure that the epizootic investigation initiated in accordance with Article 28(b)(iii) is carried out where the examination provided for in Article 28(a) shows the presence of:

(a) an exotic disease listed in Part II of Annex IV in any Member State;

or

(b) a non-exotic disease listed in Part II of Annex IV in Member States, zones or compartments with a health status of either category I or III, as referred to in Part A of Annex III, for the disease in question.

2. The epizootic investigation provided for in paragraph 1 shall be aimed at:

(a) determining the possible origin and means of contamination;

(b) investigating whether aquaculture animals have left the farm or mollusc farming area during the relevant period preceding the notification of the suspicion provided for in Article 26(1);

(c) investigating whether other farms have been infected.

3. Where the epizootic investigation provided for in paragraph 1 shows that the disease may have been introduced into one or more farms, mollusc farming areas or unenclosed waters, the Member State concerned shall ensure that the measures provided for in Article 28 are applied in such farms, mollusc farming areas or unenclosed waters.

In the case of extensive water catchment areas or coastal areas, the competent authority may decide to limit the application of Article 28 to a less extensive area in the vicinity of the farm or the mollusc farming area suspected of being infected, where it considers that such less extensive area is sufficiently large to guarantee that the disease does not spread.

4. Where necessary, the competent authority of neighbouring Member States or third countries shall be informed of the suspected case of disease.

In that event, the competent authorities of the Member States involved shall take appropriate action to apply the measures provided for in this Article within their territory.

Article 30

Lifting restrictions

The competent authority shall lift the restrictions provided for in Article 28(b) where the examination provided for in point (a) of that Article fails to demonstrate the presence of the disease.

SECTION 3

Minimum control measures in the case of confirmation of exotic diseases in aquaculture animals

Article 31

Introductory provision

This Section shall apply in the case of confirmation of an exotic disease listed in Part II of Annex IV in aquaculture animals.

Article 32

General measures

Member States shall ensure that:

(a) the farm or mollusc farming area is officially declared infected;

(b) a containment area appropriate to the disease in question is established, including a protection zone and surveillance zone, around the farm or mollusc farming area declared infected;

(c) no restocking takes place and no aquaculture animals are moved into, within, and out of the containment area unless authorised by the competent authority;

and

(d) any additional measures necessary to prevent the further spread of the disease are implemented.

Article 33

Harvesting and further processing

1. Aquaculture animals which have reached commercial size and show no clinical sign of disease may be harvested under the supervision of the competent authority for human consumption, or for further processing.

2. Harvesting, introduction into dispatch centres or purification centres, further processing and any other related operations involved in the preparation of the aquaculture animals for entry into the food chain shall be carried out under conditions which prevent the spread of the pathogen responsible for causing the disease.

3. Dispatch centres, purification centres or similar businesses shall be equipped with an effluent treatment system inactivating the pathogen responsible for causing the disease, or the effluent shall be subject to other types of treatment reducing the risk of transmitting diseases to the natural waters to an acceptable level.

4. Further processing shall be performed in authorised processing establishments.

Article 34

Removal and disposal

1. Member States shall ensure that dead fish and crustaceans, as well as live fish and crustaceans showing clinical signs of disease, are removed and disposed of under the supervision of the competent authority in accordance with Regulation (EC) No 1774/2002 of the European Parliament and of the Council of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption [1], as soon as possible in accordance with the contingency plan provided for in Article 47 of this Directive.

2. Aquaculture animals which have not reached commercial size and do not show clinical signs of disease shall, in an appropriate timeframe taking into account the type of production and the risk such animals pose for further spread of the disease, be removed and disposed of under the supervision of the competent authority in accordance with Regulation (EC) No 1774/2002, and the contingency plan provided for in Article 47 of this Directive.

Article 35

Fallowing

Where possible, infected farms or mollusc farming areas shall undergo an appropriate period of fallowing after being emptied and, where appropriate, cleansed and disinfected.

For farms or mollusc farming areas rearing aquaculture animals not susceptible to the disease in question, decisions on fallowing shall be based on a risk assessment.

Article 36

Protection of aquatic animals

Member States shall take the necessary measures to prevent the spreading of diseases to other aquatic animals.

[1] OJ L 273, 10.10.2002, p. 1. Regulation as last amended by Commission Regulation (EC) No 208/2006 (OJ L 36, 8.2.2006, p. 25).

Article 37

Lifting measures

The measures provided for in this Section shall be maintained until:

(a) the eradication measures provided for in this Section have been carried out;

(b) sampling and surveillance as appropriate for the disease in question and the types of aquaculture production businesses affected has been carried out in the containment area with negative results.

SECTION 4

Minimum control measures in the case of confirmation of non-exotic diseases in aquaculture animals

Article 38

General provisions

1. In the case of confirmation of a non-exotic disease listed in Part II of Annex IV in a Member State, zone or compartment declared free of that disease, the Member State concerned shall either:

(a) apply the measures provided for in Section 3 in order to regain such disease-free status,

or

(b) draw up an eradication programme in accordance with Article 44(2).

2. By way of derogation from Article 34(2), where a Member State decides to apply the measures provided for in Section 3, it may allow clinically healthy animals to be raised to market size before slaughter for human consumption or to be moved to another infected zone or compartment. In such cases, measures shall be taken to reduce and as far as possible, prevent the further spreading of the disease.

3. Where the Member State concerned does not wish to regain disease-free status, Article 39 shall apply.

Article 39

Containment measures

In the case of confirmation of a non-exotic disease listed in Part II of Annex IV in a Member State, zone or compartment not declared free of that disease, the Member State concerned shall take measures to contain the disease.

Those measures shall at least consist of:

(a) declaring the farm or mollusc farming area to be infected;

(b) establishing a containment area appropriate to the disease in question, including a protection zone and surveillance zone around the farm or mollusc farming area declared infected;

(c) restricting the movement of aquaculture animals from the containment area to the effect that such animals may only be:

(i) introduced into farms or mollusc farming areas in accordance with Article 12(2);

or

(ii) harvested and slaughtered for human consumption in accordance with Article 33(1);

(d) the removal and disposal of dead fish and crustaceans, under the supervision of the competent authority in accordance with Regulation (EC) No 1774/2002, in an appropriate timeframe taking into account the type of production and the risk such dead animals pose for further spread of the disease.

SECTION 5

Minimum control measures in the case of confirmation of diseases listed in Part II of Annex IV in wild aquatic animals

Article 40

Control of diseases listed in Part II of Annex IV in wild aquatic animals

1. Where wild aquatic animals are infected or suspected of being infected with exotic diseases listed in Part II of Annex IV, the Member State concerned shall monitor the situation, and take measures to reduce and, as far as possible, to prevent the further spreading of the disease.

2. Where wild aquatic animals are infected or suspected of being infected with non-exotic diseases listed in Part II of Annex IV in a Member State, zone or compartment declared free of that disease, the Member State shall also monitor the situation and take measures to reduce, and as far as possible, to prevent the further spreading of the disease.

3. Member States shall inform the Commission and the other Member States within the Committee referred to in Article 62(1) of the measures they have taken in accordance with paragraphs 1 and 2.

SECTION 6

Control measures in case of emerging diseases

Article 41

Emerging diseases

1. Member States shall take appropriate measures to control an emerging disease situation and prevent that disease from spreading, where the emerging disease in question has the potential to jeopardise the health situation of aquatic animals.

2. In the case of an emerging disease situation, the Member State concerned shall inform the Member States, the Commission and EFTA Member States without delay thereof, where the findings are of epidemiological significance to another Member State.

3. Within four weeks of informing the other Member States, the Commission and EFTA Member States as required in paragraph 2, the matter shall be brought to the attention of the Committee referred to in Article 62(1). The measures taken by the Member State concerned pursuant to paragraph 1 of this Article may be extended, amended or repealed in accordance with the procedure referred to in Article 62(2).

4. Where appropriate, the list set out in Part II of Annex IV shall be amended in accordance with the procedure referred to in Article 62(2) to include the emerging disease in question or a new susceptible host species to a disease already listed in that Annex.

SECTION 7

Alternative measures and national provisions

Article 42

Procedure for adoption of ad hoc epidemiological measures for diseases listed in Part II of Annex IV

A decision may be adopted in accordance with the procedure referred to in Article 62(2) to authorise the implementation of ad hoc measures for a limited period of time, under conditions appropriate to the epidemiological situation where:

(a) the measures provided for in this chapter are found not to be suited to the epidemiological situation;

or

(b) the disease appears to be spreading despite the measures taken in accordance with this chapter.

Article 43

Provisions for limiting the impact of diseases not listed in Part II of Annex IV

1. Where a disease not listed in Part II of Annex IV constitutes a significant risk for the animal health situation of aquaculture or wild aquatic animals in a Member State, the Member State concerned may take measures to prevent the introduction of or to control that disease.

Member States shall ensure that these measures do not exceed the limits of what is appropriate and necessary to prevent the introduction of or to control the disease.

2. Member States shall notify to the Commission any measures referred to in paragraph 1 that may affect trade between Member States. Those measures shall be subject to approval in accordance with the procedure referred to in Article 62(2).

3. Approval referred to in paragraph 2 shall only be granted where the establishment of intra-Community trade restrictions is necessary to prevent the introduction of or to control the disease, and shall take into account the provisions laid down in Chapters II, III, IV and V.

CHAPTER VI

CONTROL PROGRAMMES AND VACCINATION

SECTION 1

Surveillance and eradication programmes

Article 44

Drawing up and approval of surveillance and eradication programmes

1. Where a Member State not known to be infected but not declared free (category III as referred to in Part A of Annex III) of one or more of the non-exotic diseases listed in Part II of Annex IV draws up a surveillance programme for achieving disease-free status for one or more of those diseases, it shall submit that programme for approval in accordance with the procedure referred to in Article 62(2).

Such programmes may also be amended or terminated in accordance with that procedure.

The specific requirements for surveillance, sampling and diagnostic shall be those provided for in Article 49(3).

However, where a programme provided for in this paragraph is to cover individual compartments or zones, which comprise less than 75 % of the territory of the Member State, and the zone or compartment consists of a water catchment area not shared with another Member State or third country, the procedure referred to in Article 50(2) shall apply for any approval, or amendment or termination of such programme.

2. Where a Member State known to be infected (category V as referred to in Part A of Annex III) by one or more of the non-exotic diseases listed in Part II of Annex IV, draws up an eradication programme for one or more of those diseases, it shall submit that programme for approval in accordance with the procedure referred to in Article 62(2).

Such programmes may also be amended or terminated in accordance with that procedure.

3. An overview of the programmes approved in accordance with paragraphs 1 and 2 of this Article shall be made available at Community level in accordance with the procedures provided for in Article 51.

4. From the date of approval of the programmes referred to in this Article, the requirements and measures provided for in Article 14, Sections 2, 3, 4 and 5 of Chapter III, Section 2 of Chapter V, and Article 38(1) in relation to areas declared disease-free shall apply to the areas which are covered by the programmes.

Article 45

Content of programmes

Programmes shall not be approved unless they contain at least the following:

(a) a description of the epidemiological situation of the disease before the date of commencement of the programme;

(b) an analysis of the estimated costs and the anticipated benefits of the programme;

(c) the likely duration of the programme and the objective to be attained by the completion date of the programme;

and

(d) a description and demarcation of the geographical and administrative area in which the programme is to be applied.

Article 46

Period of application of programmes

1. Programmes shall continue to be applied until:

(a) the requirements laid down in Annex V have been fulfilled, and the Member State, zone or compartment is declared free of the disease;

or

(b) the programme is withdrawn, namely if it no longer fulfils its purpose, by the competent authority of the Member State concerned, or by the Commission.

2. If the programme is withdrawn as provided for in paragraph 1(b), the Member State concerned shall apply the containment measures in Article 39 from the date of withdrawal of the programme.

SECTION 2

Contingency plan for emerging and exotic diseases

Article 47

Contingency plan for emerging and exotic diseases

1. Each Member State shall draw up a contingency plan specifying the national measures required to maintain a high level of disease awareness and preparedness and to ensure environmental protection.

2. The contingency plan shall:

(a) provide the competent authority with the authority and means to access all facilities, equipment, personnel and other appropriate materials necessary for the rapid and efficient eradication of an outbreak;

(b) ensure coordination and compatibility with neighbouring Member States and encourage cooperation with neighbouring third countries;

and

(c) where relevant, give a precise indication of the vaccine requirements and vaccination conditions considered necessary in the event of emergency vaccination.

3. Member States shall comply with the criteria and requirements laid down in Annex VII when drawing up contingency plans.

4. Member States shall submit the contingency plans for approval in accordance with the procedure referred to in Article 62(2).

Every five years, each Member State shall update its contingency plan and submit the updated plan for approval in accordance with that procedure.

5. The contingency plan shall be implemented in the event of an outbreak of emerging diseases and of exotic diseases listed in Part II of Annex IV.

SECTION 3

Vaccination

Article 48

Vaccination

1. Member States shall ensure that vaccination against the exotic diseases listed in Part II of Annex IV is prohibited unless such vaccination is approved in accordance with Articles 41, 42 or 47.

2. Member States shall ensure that vaccination against the non-exotic diseases listed in Part II of Annex IV is prohibited in any parts of their territory declared free of the diseases in question in accordance with Article 49 or 50, or covered by a surveillance programme, approved in accordance with Article 44(1).

Member States may allow such vaccination in parts of their territory not declared free from the diseases in question, or where vaccination is a part of an eradication programme approved in accordance with Article 44(2).

3. Member States shall ensure that the vaccines used are authorised in accordance with Directive 2001/82/EC and Regulation (EC) No 726/2004.

4. Paragraphs 1 and 2 shall not apply to scientific studies for the purpose of developing and testing vaccines under controlled conditions.

During such studies, Member States shall ensure that the appropriate measures are taken to protect other aquatic animals from any adverse effect of the vaccination carried out within the framework of the studies.

CHAPTER VII

DISEASE-FREE STATUS

Article 49

Disease-free Member State

1. A Member State shall be declared free of one or more of the non-exotic diseases listed in Part II of Annex IV in accordance with the procedure referred to in Article 62(2), if paragraph 2 of this Article is complied with and:

(a) none of the species susceptible to the disease(s) in question is present in its territory;

or

(b) the pathogen is known not to be able to survive in the Member State, and in its water source;

or

(c) the Member State meets the conditions laid down in Part I of Annex V.

2. Where neighbouring Member States, or water catchment areas shared with neighbouring Member States, are not declared disease-free, the Member State shall establish appropriate buffer zones in its territory. The demarcation of buffer zones shall be such that they protect the disease-free Member State from passive introduction of the disease.

3. The specific requirements for surveillance, buffer zones, sampling and diagnostic methods that shall be used by Member States to grant disease-free status in accordance with this Article shall be adopted in accordance with the procedure referred to in Article 62(2).

Article 50

Disease-free zone or compartment

1. A Member State may declare a zone or a compartment within its territory free of one or more of the non-exotic diseases listed in Part II of Annex IV, where:

(a) none of the species susceptible to the disease(s) in question is present in the zone or compartment, and where relevant in its water source;

or

(b) the pathogen is known not to be able to survive in the zone or compartment, and where relevant in its water source;

or

(c) the zone or compartment complies with the conditions laid down in Part II of Annex V.

2. A Member State shall submit the declaration referred to in paragraph 1 to the Standing Committee on Food Chain and Animal Health in accordance with the following procedure:

(a) the declaration shall be supported by evidence in a form to be determined in accordance with the procedure referred to in Article 62(2) and be accessible by electronic means to the Commission and Member States, in accordance with the requirements of Article 59;

(b) the Commission shall add the notification of the declaration to the agenda of the next meeting of the Committee referred to in Article 62(1) as an information point. The declaration shall take effect 60 days after the date of the meeting;

(c) within this period, the Commission or Member States may seek clarification or additional information on the supporting evidence from the Member State making the declaration;

(d) where written comments are made by at least one Member State, or the Commission, within the period referred to in point (b) indicating significant objective concerns related to the supporting evidence, the Commission and the Member States concerned shall together examine the submitted evidence in order to resolve the concerns. In that case, the period referred to in point (b) may be prolonged for 30 days. Such comments shall be submitted to the declaring Member State and to the Commission;

(e) if the arbitration referred to in point (d) fails, the Commission may decide to make an on-the-spot inspection in accordance with Article 58 to verify the compliance of the declaration submitted with the criteria set out in paragraph 1, unless the declaring Member State withdraws its declaration;

(f) where necessary in the light of the results achieved, a decision in accordance with the procedure referred to in Article 62(2) shall be taken, to suspend the self-declaration of the disease-free status of the zone or compartment concerned.

3. Where the zone(s) or compartment(s) referred to in paragraph 1 comprise more than 75 % of the territory of the Member State, or if the zone or compartment consists of a water catchment area shared by another Member State or third country, the procedure referred to in paragraph 2 shall be replaced by the procedure referred to in Article 62(2).

4. The specific requirements of the surveillance, sampling and diagnostic methods used by Member States to obtain disease-free status in accordance with this Article shall be laid down in accordance with the procedure referred to in Article 62(2).

Article 51

Lists of disease-free Member States, zones or compartments

1. Each Member State shall establish and maintain an updated list of zones and compartments declared disease-free in accordance with Article 50(2). Such lists shall be made publicly available.

2. The Commission shall draw up and update a list of Member States, zones or compartments declared disease-free in accordance with Articles 49 or 50(3), and shall make the list publicly available.

Article 52

Maintenance of disease-free status

A Member State that is declared free from one or more non-exotic diseases listed in Part II of Annex IV in accordance with Article 49 may discontinue targeted surveillance and maintain its disease-free status provided that the conditions conducive to clinical expression of the disease in question exist, and the relevant provisions of this Directive are implemented.

However, for disease-free zones or compartments in Member States not declared disease-free, and in all cases where conditions are not conducive to clinical expression of the disease in question, targeted surveillance shall be continued in accordance with the methods provided for in Articles 49(3) or 50(4) as appropriate, but at a level commensurate with the degree of risk.

Article 53

Suspension and restoration of disease-free status

1. Where a Member State has reason to believe that any of the conditions for maintaining its status as a disease-free Member State, zone or compartment have been breached, that Member State shall immediately suspend trade in susceptible species and vector species to other Member States, zones or compartments with a higher health status for the disease in question as laid down in Part A of Annex III and apply the provisions of Sections 2 and 4 of Chapter V.

2. Where the epizootic investigation provided for in Article 29(1) confirms that the suspected breach has not taken place, the disease-free status of the Member State, zone or compartment shall be restored.

3. Where the epizootic investigation confirms a significant likelihood that infection has occurred, the disease-free status of the Member State, zone or compartment shall be withdrawn, in accordance with the procedure under which that status was declared. The requirements laid down in Annex V shall be complied with before the disease-free status is restored.

CHAPTER VIII

COMPETENT AUTHORITIES AND LABORATORIES

Article 54

General obligations

1. Each Member State shall designate its competent authorities for the purposes of this Directive and notify the Commission thereof.

The competent authorities shall operate and perform their duties in accordance with Regulation (EC) No 882/2004.

2. Each Member State shall ensure that effective and continuous cooperation based on the free exchange of information relevant to the implementation of this Directive is established between the competent authorities it designates for the purposes of this Directive and any of its other authorities involved in regulating aquaculture, aquatic animals, and food and feed of aquaculture origin.

Information shall also, to the extent necessary, be exchanged between the competent authorities of the different Member States.

3. Each Member State shall ensure that the competent authorities have access to adequate laboratory services and state-of-the-art know-how in risk analysis and epidemiology, and that there is a free exchange of any information relevant to the implementation of this Directive between the competent authorities and laboratories.

Article 55

Community reference laboratories

1. Community reference laboratories for the aquatic animal diseases relevant to this Directive shall be designated in accordance with the procedure referred to in Article 62(2) for a period to be defined in accordance with that procedure.

2. Community reference laboratories for aquatic animal diseases shall comply with the functions and duties laid down in Part I of Annex VI.

3. The Commission shall review the designation of the Community reference laboratories by the end of the period referred to in paragraph 1 at the latest, in the light of their compliance with the functions and duties referred to in paragraph 2.

Article 56

National reference laboratories

1. Member States shall arrange for the designation of a national reference laboratory for each of the Community reference laboratories referred to in Article 55.

Member States may designate a laboratory situated in another Member State or EFTA Member State, and a single laboratory may be the national reference laboratory for more than one Member State.

2. Member States shall communicate the name and address of each designated national reference laboratory to the Commission, the relevant Community reference laboratory and other Member States, including any updates hereto.

3. The national reference laboratory shall liaise with the relevant Community reference laboratory provided for in Article 55.

4. In order to ensure an efficient diagnostic service throughout the territory of a Member State in accordance with the requirements of this Directive, the national reference laboratory shall collaborate with any laboratory designated in accordance with Article 57 situated in the territory of the same Member State.

5. Member States shall ensure that any national reference laboratory on their territory is adequately equipped and staffed with the appropriate numbers of trained personnel to carry out the laboratory investigations required in accordance with this Directive and to comply with the functions and duties laid down in Part II of Annex VI.

Article 57

Diagnostic services and methods

Member States shall ensure that:

(a) laboratory examinations for the purposes of this Directive are carried out in laboratories designated for such purpose by the competent authority;

(b) laboratory examinations in the case of suspicion and to confirm the presence of the diseases listed in Part II of Annex IV are carried out by diagnostic methods to be established in accordance with the procedure referred to in Article 62(2);

and

(c) laboratories designated for diagnostic services in accordance with this Article shall comply with the functions and duties laid down in Part III of Annex VI.

CHAPTER IX

INSPECTIONS, ELECTRONIC MANAGEMENT AND PENALTIES

Article 58

Community inspections and audits

1. Experts from the Commission may carry out on-the-spot inspections, including audits, in cooperation with the competent authorities of the Member States, insofar as they are necessary for the uniform application of this Directive.

The Member States in the territory of which such inspections and audits are made shall provide the experts with all the assistance necessary for carrying out their duties.

The Commission shall inform the competent authority of the results of any such inspections and audits.

2. Experts from the Commission may also carry out on-the-spot inspections, including audits, in third countries, in cooperation with the competent authorities of the third country concerned, in order to verify conformity with or equivalence to Community aquatic animal health rules.

3. Where a serious animal health risk is identified during a Commission inspection, the Member State concerned shall immediately take all measures necessary to safeguard animal health.

Where such measures are not taken, or where they are considered to be insufficient, the measures necessary to safeguard animal health shall be adopted in accordance with the procedure referred to in Article 62(3) and the Member State concerned shall be informed thereof.

Article 59

Electronic management

1. Member States shall, by 1 August 2008 at the latest, ensure that all procedures and formalities relating to making the information provided for in Article 6, Article 50(2) Article 51(1) and Article 56(2) available by electronic means are in place.

2. The Commission shall, in accordance with the procedure referred to in Article 62(2), adopt detailed rules for the implementation of paragraph 1 in order to facilitate the interoperability of information systems and use of procedures by electronic means between Member States.

Article 60

Penalties

The Member States shall lay down the rules on penalties applicable to infringements of the national provisions adopted pursuant to this Directive and shall take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive. The Member States shall notify those provisions to the Commission by the date specified in Article 65(1) at the latest and shall notify it without delay of any subsequent amendment affecting them.

CHAPTER X

AMENDMENTS, DETAILED RULES AND COMMITTEE PROCEDURE

Article 61

Amendments and detailed rules

1. Article 50(2) may be amended in accordance with the procedure referred to in Article 62(2).

2. The Annexes to this Directive may be amended in accordance with the procedure referred to in Article 62(2).

3. The measures necessary for the implementation of this Directive shall be adopted in accordance with the procedure referred to in Article 62(2).

Article 62

Committee procedure

1. The Commission shall be assisted by the Standing Committee on the Food Chain and Animal Health (hereinafter referred to as the Committee).

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at 15 days.

4. The Committee shall adopt its Rules of Procedure.

CHAPTER XI

TRANSITIONAL AND FINAL PROVISIONS

Article 63

Repeal

1. Directives 91/67/EEC, 93/53/EEC and 95/70/EC shall be repealed as from 1 August 2008.

2. References to the repealed Directives shall be construed as references to this Directive and shall be read in accordance with the correlation table laid down in Annex VIII.

3. However, Commission Decision 2004/453/EC shall continue to apply for the purpose of this Directive pending the adoption of the necessary provisions in accordance with Article 43 of this Directive, which shall be adopted not later than 3 years after the entry into force of this Directive.

Article 64

Transitional provisions

Transitional provisions may be adopted in accordance with the procedure referred to in Article 62(2) for a period of four years from 14 December 2006.

Article 65

Transposition

1. Member States shall adopt and publish, not later than 1 May 2008, the laws, regulations and administrative provisions necessary to comply with this Directive before 14 December 2008 They shall forthwith inform the Commission thereof.

They shall apply those provisions from 1 August 2008.

When they are adopted by Member States, these measures shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 66

Entry into force

This Directive shall enter into force on the 20th day following its publication in the *Official Journal of the European Union*.

Article 67

Addressees

This Directive is addressed to the Member States.

Done at Luxembourg, 24 October 2006.

For the Council

The President

J. KORKEAOJA

ANNEX I

DEFINITIONS

In addition to the definitions in Article 3, the following technical definitions shall apply:

(a) 'compartment' means one or more farms under a common biosecurity system containing an aquatic animal population with a distinct health status with respect to a specific disease;

(b) 'common biosecurity system' means that the same aquatic animal health surveillance, disease prevention, and disease control measures are applied;

(c) 'containment area' means an area around an infected farm or mollusc farming area where disease control measures are applied with the purpose of preventing the spread of the disease;

(d) 'disease' means a clinical or non-clinical infection with one or more aetiological agents in aquatic animals;

(e) 'disease-free zones or compartments' means zones or compartments declared disease-free in accordance with Articles 49 or 50;

(f) 'emerging disease' means a newly identified serious disease, the cause of which may or may not yet be established, that has the potential to be spread within and between populations, such as by way of trade in aquatic animals and/or aquatic animal products. It also means a listed disease identified in a new host species not yet included in Part II of Annex IV as a susceptible species;

(g) 'epidemiological unit' means a group of aquatic animals that share approximately the same risk of exposure to a disease agent within a defined location. This risk may be because they share a common aquatic environment, or because management practices make it likely that a disease agent in one group of animals would quickly spread to another group of animals;

(h) 'fallowing' means, for disease management purposes, an operation where a farm is emptied of aquaculture animals susceptible to the disease of concern or known to be capable of transferring the disease agent, and, where feasible, of the carrying water;

(i) 'further processing' means processing of aquaculture animals before human consumption by any type of measures and techniques affecting anatomical wholeness, such as bleeding, gutting/evisceration, heading, slicing and filleting, which produces waste or by-products and could cause a risk of spreading diseases;

(j) 'increased mortality' means unexplained mortalities significantly above the level of what is considered to be normal for the farm or mollusc farming area in question under the prevailing conditions. What is considered to be increased mortality shall be decided in cooperation between the farmer and the competent authority;

(k) 'infection' means the presence of a multiplying, or otherwise developing, or latent disease agent in, or on, a host;

(l) 'infected zone or compartment' means zones or compartments where the infection is known to occur;

(m) 'quarantine' means maintaining a group of aquatic animals in isolation with no direct or indirect contact with other aquatic animals, in order to undergo observation for a specified length of time and, where appropriate, testing and treatment, including proper treatment of the effluent waters;

(n) 'susceptible species' means any species in which infection by a disease agent has been demonstrated by natural cases or by experimental infection that mimics the natural pathways;

(o) 'vector' means a species that is not susceptible to a disease but which is capable of spreading infection by conveying pathogens from one host to another;

(p) 'zone' means a precise geographical area with a homogeneous hydrological system comprising part of a water catchment area from the source(s) to a natural or artificial barrier that prevents the upward migration of aquatic animals from lower stretches of the water catchment area, an entire water catchment area from its source(s) to its estuary, or more than one water catchment area, including their estuaries, due to the epidemiological link between the catchment areas through the estuary.

ANNEX II

Information required in the official register of aquaculture production businesses and authorised processing establishments

PART I

Authorised aquaculture production business

1. The following minimum information on each aquaculture production business shall be kept by the competent authority in a register, as provided for in Article 6:

   (a) the name and addresses of the aquaculture production business, and contact details (telephone, facsimile, e-mail);

   (b) the registration number and particulars of the authorisation delivered, (i.e. dates for specific authorisations, identification codes or numbers, specified conditions for production, any other matter relevant to the authorisation(s));

   (c) the geographical position of the farm defined by a suitable system of coordinates of all farm-sites (if possible, GIS coordinates);

   (d) the purpose, type (i.e. type of culture system, or facilities such as land-based facilities, sea cages, earth ponds) and maximum volume of production where this is regulated;

   (e) for continental farms, dispatch centres and purification centres, details on the farm's water supply and discharges;

   (f) the species of aquaculture animals reared at the farm (for multi-species farms or ornamental farms, it shall as a minimum be registered whether any of the species are known to be susceptible to diseases listed in Part II of Annex IV, or known vectors of such diseases);

   (g) updated information on the health status (i.e. if the farm is disease-free (located in a Member State, zone or compartment), where the farm is under a programme with a view of achieving such status, or where the farm is declared infected by a disease referred to in Annex IV).

2. Where an authorisation is granted to a mollusc farming area in accordance with the second subparagraph of Article 4(1), the data required pursuant to point 1(a) of this part shall be recorded for all aquaculture production businesses which operate within the mollusc farming area. The data required pursuant to points 1(b) to 1(g) of this part shall be recorded at mollusc farming area level.

PART II

Authorised processing establishments

The following minimum information on each authorised processing establishment shall be kept by the competent authority in a register, as provided for in Article 6:

(a) the name and addresses of the authorised processing establishment, and contact details (telephone, facsimile, e-mail);

(b) the registration number and particulars of the authorisation delivered (i.e. dates for specific authorisations, identification codes or numbers, specified conditions for production, any other matter relevant to the authorisation(s));

(c) the geographical position of the processing establishment defined by a suitable system of coordinates (if possible GIS coordinates);

(d) details on the authorised processing establishment's water effluent treatment systems;

(e) the species of aquaculture animals handled in the authorised processing establishment.

ANNEX III

PART A

Health status of aquaculture zones or compartments to be considered for the application of Article 12

Aquaculture animals for farming and restocking

Category	Health status	May introduce animals from	Health certification		May dispatch animals to
			Introduction	Dispatching	
I	Disease-free (Articles 49 or 50)	Only category I	YES	NO when dispatched to category III or V YES when dispatched to categories I, II or IV	All categories
II	Surveillance Programme (Article 44(1))	Only category I	YES	NO	Categories III and V
III	Undetermined (not known to be infected but not subject to a programme for achieving disease-free status)	Categories I, II, or III	NO	NO	Categories III and V
IV	Eradication Programme (Article 44(2))	Only category I	YES	YES	Only category V
V	Infected (Article 39)	All categories	NO	YES	Only category V

PART B

Recommended surveillance and inspections on farms and mollusc-farming areas

Species present	Health status as referred to in Part A	Risk level	Surveillance	Recommended inspection frequency by the competent authority (Article 7)	Recommended inspection frequency by qualified aquatic animal health services (Article 10)	Specific requirements for inspections, sampling and surveillance necessary to maintain the health status	Comments
No species susceptible to the diseases listed in Annex IV	Category I Declared disease-free in accordance with Article 49(1)(a) or (b) or Article 50(1)(a) or (b).	Low	Passive	1 every 4 years	1 every 4 years	Specific requirements for the maintenance of the disease-free status in accordance with Article 52.	The recommended inspection frequencies shall apply without prejudice to the specific requirements mentioned for each health status. However, where possible, such inspections and sampling should be combined with the inspections required pursuant to Articles 7 and 10. The aim of inspections by the competent authority is to check compliance with this Directive in accordance with Article 7. The aim of inspections by qualified aquatic animal health services is to check the health status of the animals, to advise the aquaculture production business operator on aquatic animal health issues, and where necessary, undertake the necessary veterinary measures.
Species susceptible to one or more of the diseases listed in Annex IV	Category I Declared disease-free in accordance with of Article 49(1)(c) or of Article 50(1)(c).	High	Active, targeted or passive	1 every year	1 every year		
		Medium		1 every 2 years	1 every 2 years		
		Low		1 every 4 years	1 every 2 years		
	Category II Not declared disease-free but subject to a surveillance programme approved in accordance with Article 44(1).	High	Targeted	1 every year	1 every year	Specific requirements in accordance with Article 44(1).	
		Medium		1 every 2 years	1 every 2 years		
		Low		1 every 4 years	1 every 2 years		
	Category III Not known to be infected but not subject to surveillance programme for achieving disease-free status.	High	Active	1 every year	3 every year		
		Medium		1 every year	2 every year		
		Low		1 every 2 years	1 every year		
	Category IV Known to be infected but subject to an eradication programme approved in accordance with Article 44(2).	High	Targeted	1 every year	1 every year	Specific requirements in accordance with Article 44(2).	
		Medium		1 every 2 years	1 every 2 years		
		Low		1 every 4 years	1 every 2 years		
	Category V Known to be infected. Subject to minimum control measures as provided for in Chapter V.	High	Passive	1 every 4 years	1 every year	Specific requirements in accordance with Chapter V.	
		Medium		1 every 4 years	1 every 2 years		
		Low		1 every 4 years	1 every 4 years		

Risk levels

A high-risk farm or mollusc farming area is a farm or mollusc farming area which:

(a) has a high risk of spreading diseases to or contracting diseases from other farms or wild stocks;

(b) operates under farming conditions which could increase the risk of disease outbreaks (high biomass, low water quality), taking into account the species present;

(c) sells live aquatic animals for further farming or restocking.

A medium-risk farm or mollusc farming area is a farm or mollusc farming area which:

(a) has medium risk of spreading diseases to or contracting diseases from other farms or wild stocks;

(b) operates under farming conditions which would not necessarily increase the risk of disease outbreaks (medium biomass and water quality), taking into account the species present;

(c) sells live aquatic animals mainly for human consumption.

A low-risk farm of mollusc farming area is a farm or mollusc farming area which:

(a) has a low risk of spreading diseases to or contracting diseases from other farms or wild stocks;

(b) operates under farming conditions which would not increase the risk of disease outbreaks (low biomass, good water quality), taking into account the species present;

(c) sells live aquatic animals for human consumption only.

Types of health surveillance

Passive surveillance shall include mandatory immediate notification of the occurrence or suspicion of specified diseases or of any increased mortalities. In such cases investigation in accordance with Section 2 of Chapter V shall be required.

Active surveillance shall include:

(a) routine inspection by the competent authority or by other qualified health services on behalf of the competent authorities;

(b) examination of the aquaculture animal population on the farm or in the mollusc farming area for clinical disease;

(c) diagnostic samples to be collected on suspicion of a listed disease or observed increased mortality during inspection;

(d) mandatory immediate notification of occurrence or suspicion of specified diseases or of any increased mortalities.

Targeted surveillance shall include:

(a) routine inspection by the competent authority or by other qualified health services on behalf of the competent authorities;

(b) prescribed samples of aquaculture animals to be taken and tested for specific pathogen(s) by specified methods;

(c) mandatory immediate notification of occurrence or suspicion of specified diseases or of any increased mortalities.

ANNEX IV

Disease listing

PART I

Criteria for listing diseases

A. Exotic diseases shall meet the following criteria laid down in point 1 and either point 2 or 3.

1. The disease is exotic to the Community, i.e. the disease is not established in Community aquaculture, and the pathogen is not known to be present in Community waters.

2. It has potential for significant economic impact if introduced into the Community, either by production losses in Community aquaculture or by restricting the potential for trade in aquaculture animals and products thereof.

3. It has potential for detrimental environmental impact if introduced into the Community, to wild aquatic animal populations of species, which are an asset worth protecting by Community law or international provisions.

B. Non-exotic diseases shall meet the following criteria laid down in points 1, 4, 5, 6, 7, and 2 or 3.

1. Several Member States, or regions in several Member States, are free of the specific disease.

2. It has potential for significant economic impact if introduced into a Member State free of the disease, either by production losses, and annual costs associated with the disease and its control exceeding 5 % of the value of the production of the susceptible aquaculture animal species production in the region, or by restricting the possibilities for international trade in aquaculture animals and products thereof.

3. The disease has shown, where it occurs, to have a detrimental environmental impact if introduced into a Member State free of the disease, to wild aquatic animal populations of species that is an asset worth protecting under Community law or international provisions.

4. The disease is difficult to control and contain at farm or mollusc farming area level without stringent control measures and trade restrictions.

5. The disease may be controlled at Member State level, experience having shown that zones or compartments free of the disease may be established and maintained, and that this maintenance is cost-beneficial.

6. During placing on the market of aquaculture animals, there is a risk that the disease will establish itself in a previously uninfected area.

7. Reliable and simple tests for infected aquatic animals are available. The tests must be specific and sensitive and the testing method harmonised at Community level.

PART II

Listed diseases

EXOTIC DISEASES		
	DISEASE	SUSCEPTIBLE SPECIES
FISH	Epizootic haematopoietic necrosis	Rainbow trout (*Oncorhynchus mykiss*) and redfin perch (*Perca fluviatilis*)
	Epizootic ulcerative syndrome	*Genera: Catla, Channa, Labeo, Mastacembelus, Mugil, Puntius and Trichogaster.*
MOLLUSCS	Infection with *Bonamia exitiosa*	Australian mud oyster (*Ostrea angasi*) and Chilean flat oyster (*O. chilensis*)
	Infection with *Perkinsus marinus*	Pacific oyster (*Crassostrea gigas*) and Eastern oyster (*C. virginica*)
	Infection with *Microcytos mackini*	Pacific oyster (*Crassostrea gigas*), Eastern oyster (*C. virginica*), Olympia flat oyster (*Ostrea conchaphila*) and European flat oyster (*O. edulis*)
CRUSTACEANS	Taura syndrome	Gulf white shrimp (*Penaeus setiferus*), Pacific blue shrimp (*P. stylirostris*), and Pacific white shrimp (*P. vannamei*)
	Yellowhead disease	Gulf brown shrimp (*Penaeus aztecus*), Gulf pink shrimp (*P. duorarum*), Kuruma prawn (*P. japonicus*), black tiger shrimp (*P. monodon*), Gulf white shrimp (*P. setiferus*), Pacific blue shrimp (*P. stylirostris*), and Pacific white shrimp (*P. vannamei*)

NON-EXOTIC DISEASES		
	DISEASE	SUSCEPTIBLE SPECIES
FISH	Spring viraemia of carp (SVC)	Bighead carp (*Aristichthys nobilis*), goldfish (*Carassius auratus*), crucian carp (*C. carassius*), grass carp (*Ctenopharyngodon idellus*), common carp and koi carp (*Cyprinus carpio*), silver carp (*Hypophthalmichthys molitrix*), sheatfish (*Silurus glanis*) and tench (*Tinca tinca*)
	Viral haemorrhagic septicaemia (VHS)	Herring (*Clupea spp.*), whitefish (*Coregonussp.*), pike (*Esox lucius*), haddock (*Gadusaeglefinus*), Pacific cod (*G. macrocephalus*), Atlantic cod (*G. morhua*), Pacific salmon (*Oncorhynchus spp.*) rainbow trout (*O. mykiss*), rockling (*Onos mustelus*), brown trout (*Salmo trutta*), turbot (*Scophthalmus maximus*), sprat (*Sprattussprattus*) and grayling (*Thymallus thymallus*)
	Infectious haematopoietic necrosis (IHN)	Chum salmon (*Oncorhynchus keta*), coho salmon (*O. kisutch*), Masou salmon (*O. masou*), rainbow or steelhead trout (*O. mykiss*), sockeye salmon (*O. nerka*), pink salmon (*O. rhodurus*) chinook salmon (*O.tshawytscha*), and Atlantic salmon (*Salmo salar*)
	Koi herpes virus (KHV) disease	Common carp and koi carp (*Cyprinus carpio*).
	Infectious salmon anaemia (ISA)	Rainbow trout (*Oncorhynchus mykiss*), Atlantic salmon (*Salmo salar*), and brown and sea trout (*S. trutta*).
MOLLUSCS	Infection with *Marteilia refringens*	Australian mud oyster (*Ostrea angasi*), Chilean flat oyster (*O. chilensis*), European flat oyster (*O. edulis*), Argentinian oyster (*O. puelchana*), blue mussel (*Mytilus edulis*) and Mediterranean mussel (*M. galloprovincialis*)
	Infection with *Bonamia ostreae*	Australian mud oyster (*Ostrea angasi*), Chilean flat oyster (*O. chilensis*), Olympia flat oyster (*O. conchaphila*), Asiatic oyster (*O. denselammellosa*), European flat oyster (*O. edulis*), and Argentinian oyster (*O. puelchana*).
CRUSTACEANS	White spot disease	All decapod crustaceans (order *Decapoda*).

ANNEX V

Requirements for declaring a Member State, zone or compartment disease-free

PART I

Disease-free Member State

1. On historical grounds

1.1. A Member State where susceptible species are present, but where there has not been any observed occurrence of the disease for at least for a period of 10 years before the date of application for the disease-free status despite conditions that are conducive to its clinical expression may be considered disease-free where:

(a) basic biosecurity measure conditions have been in place continuously for at least a period of 10 years before the date of application for the disease-free status;

(b) infection is not known to be established in wild populations;

(c) the implementation of trade and imports conditions to prevent the introduction of the disease into the Member State is effective.

A Member State wishing to benefit from a disease-free status, shall submit an application in accordance with Article 49 before1 November 2008. After this date, disease-free status may only be granted in accordance with Part I.2.

1.2. The basic biosecurity measures referred to in point 1.1(a) shall consist, as a minimum, of the following:

(a) the disease is compulsorily notifiable to the competent authority, including notification of suspicion;

(b) an early detection system is in place throughout the Member State, enabling the competent authority to undertake effective disease investigation and reporting, and ensuring in particular:

(i) the rapid recognition of any clinical signs consistent with the suspicion of a disease, emerging disease, or unexplained mortality in farms or molluscs farming areas, and in the wild;

(ii) the rapid communication of the event to the competent authority with the aim to activating diagnostic investigation with minimum delay.

1.3. The early detection system referred to in point 1.2(b) shall include at least the following:

(a) broad awareness, among the personnel employed in aquaculture businesses or involved in the processing of aquaculture animals, of any signs consistent with the presence of a disease, and training of veterinarians or aquatic animal health specialists in detecting and reporting unusual disease occurrence;

(b) veterinarians or aquatic animal health specialists trained in recognising and reporting suspicious disease occurrence;

(c) access by the competent authority to laboratories with the facilities for diagnosing and differentiating listed and emerging diseases.

2. Based on targeted surveillance

A Member State where the last known clinical occurrence was within 10 years before the date of application for the disease-free status or where the infection status prior to targeted surveillance was unknown, for example because of the absence of conditions conducive to clinical expression, may be considered free of the specific disease where:

(a) the Member State meets the basic disease control conditions laid down in point 1.2;

and

(b) targeted surveillance in accordance with methods adopted pursuant to Article 49(3), has been in place for at least a period of two years without detection of the disease agent on farm, or in mollusc farming areas that rears any of the susceptible species.

Where there are parts of the Member State in which the number of farms, or molluscs farming areas is limited, and consequently targeted surveillance in these parts do not provide sufficient epidemiological data, but in which there are wild populations of any of the susceptible species, those wild populations shall be included in the targeted surveillance.

PART II

Disease-free zone or compartment

1. Zones

1.1. A zone may comprise:

(a) an entire water catchment area from its source to its estuary;

or

(b) part of a water catchment area from the source(s) to a natural or artificial barrier that prevents the upward migration of aquatic animals from lower stretches of the water catchment area;

or

(c) more than one water catchment area, including their estuaries, due to the epidemiological link between the catchment areas through the estuary.

The geographical demarcation of the zone shall be clearly identified on a map.

1.2. Where a zone extends over more than one Member State, it may not be declared a disease-free zone unless the conditions outlined in points 1.3, 1.4 and 1.5 apply to all areas of that zone. In that case both Member States concerned shall apply for approval for the part of the zone situated in their territory.

1.3. A zone where susceptible species are present, but where there has not been any observed occurrence of the disease for at least a period of 10 years before the date of application for the disease-free status, despite conditions that are conducive to its clinical expression, may be considered disease-free if it complies *mutatis mutandis* with the requirements laid down in Part I.1.

A Member State wishing to benefit from a disease-free status shall notify its intention in accordance with Article 50(2) before 1 November 2008. After this date, disease-free status may only be granted in accordance with Part I.2.

1.4. A zone where the last known clinical occurrence was within a period of 10 years before the date of application for the disease-free status or where the infection status prior to targeted surveillance was unknown, for example because of the absence of conditions conducive to clinical expression, may be considered disease-free where it complies *mutatis mutandis* with the requirements laid down in Part I.2.

1.5. A buffer zone in which a monitoring programme is carried out shall be established, as appropriate. The demarcation of the buffer zones shall be such that it protects the disease-free zone from passive introduction of the disease.

2. Compartments comprising one or more farms or mollusc farming areas where the health status regarding a specific disease is dependent on the health status regarding that disease of surrounding natural waters

2.1. A compartment may comprise one or more farms, a group or cluster of farms or a mollusc farming area that may be considered as one epidemiological unit due to its geographical localisation and distance from other groups or clusters of farms or mollusc farming areas, provided that all farms comprising the compartment fall within a common biosecurity system. The geographical demarcation of a compartment shall be clearly identified on a map.

2.2. A compartment where susceptible species are present, but where there has not been any observed occurrence of the disease for at least a period of 10 years before the date of application for the disease-free status despite conditions that are conducive to its clinical expression, may be considered disease-free if it complies *mutatis mutandis* with the requirements in Part I.1 of this Annex.

Member States wishing to benefit from this provision shall notify their intention in accordance with Article 50(2) before 1 November 2008. After this date, disease-free status may only be granted in accordance with Part I.2.

2.3. A compartment where the last known clinical occurrence was within 10 years before the date of application for the disease-free status, or where the infection status in the compartment or in the waters surrounding the compartment prior to targeted surveillance was unknown, for example because of the absence of conditions conducive to clinical expression, may be considered disease-free if it complies *mutatis mutandis* with the requirements laid down in Part I.2.

2.4. Each farm or mollusc farming area in a compartment shall be subject to additional measures imposed by the competent authority, when considered necessary to prevent the introduction of diseases. Such measures may include the establishment of a buffer zone around the compartment in which a monitoring programme is carried out, and the establishment of additional protection against the intrusion of possible pathogen carriers or vectors.

3. Compartments comprising one or more individual farms where the health status regarding a specific disease is independent of the health status regarding that disease of the surrounding natural waters.

3.1. A compartment may comprise:

(a) an individual farm which may be considered a single epidemiological unit, as it is not influenced by the animal health status in the surrounding waters;

or

(b) more than one farm where each farm in the compartment complies with the criteria laid down in point 3.1(a) and points 3.2 to 3.6, but, due to extensive movement of animals between farms, shall be considered as a single epidemiological unit, provided that all farms are under a common biosecurity system.

3.2. A compartment shall be supplied with water:

(a) through a water treatment plant inactivating the relevant pathogen in order to reduce the risk of the introduction of the disease to an acceptable level;

or

(b) directly from a well, a borehole or a spring. Where such water supply is situated outside the premises of the farm, the water shall be supplied directly to the farm, and be channelled through a pipe.

3.3. There shall be natural or artificial barriers that prevent aquatic animals from entering each farm in a compartment from the surrounding watercourses.

3.4. The compartment shall, where appropriate, be protected against flooding and infiltration of water from the surrounding watercourses.

3.5. The compartment shall comply, *mutatis mutandis*, with the requirements laid down in Part I.2.

3.6. A compartment shall be subject to additional measures imposed by the competent authority, when considered necessary to prevent the introduction of diseases. Such measures may include the establishment of additional protection against the intrusion of possible pathogen carriers or vectors.

3.7. Implementing measures concerning point 3.2(a) shall be laid down in accordance with the procedure referred to in Article 62(2).

4. Special provisions for individual farms which commence or recommence their activities

4.1. A new farm, which meets the requirements referred to in points 3.1(a) and 3.2 to 3.6, but which commences its activities with aquaculture animals from a compartment declared disease-free may be considered disease-free without undergoing the sampling required for approval.

4.2. A farm which recommences its activities after a break with aquaculture animals from a compartment declared disease-free, and meets the requirements referred to in points 3.1(a) and 3.2 to 3.6, may be considered disease-free without undergoing the sampling required for approval, provided that:

(a) the health history of the farm over the last four years of its operation is known to the competent authority; however, if the farm concerned has been in operation for less than four years, the actual period in which it has been in operation will be taken into account;

(b) the farm has not been subject to animal-health measures in respect of the diseases listed in Part II of Annex IV and there have been no antecedents of those diseases on the farm;

(c) prior to the introduction of the aquaculture animals, eggs or gametes, the farm is cleaned and disinfected, followed, as necessary, by a period of fallowing.

ANNEX VI

Functions and duties of laboratories

PART I

Community reference laboratories

1. In order to be designated as a Community reference laboratory in accordance with Article 55, laboratories shall fulfil the following requirements. They must:

   (a) have suitably qualified staff with adequate training in diagnostic and analytical techniques applied in their area of competence, including trained personnel available for emergency situations occurring within the Community;

   (b) possess the equipment and products needed to carry out the tasks assigned to them;

   (c) have an appropriate administrative infrastructure;

   (d) ensure that their staff respect the confidential nature of certain subjects, results or communications;

   (e) have sufficient knowledge of international standards and practices;

   (f) have available, as appropriate, an updated list of available reference substances and reagents and an updated list of manufacturers and suppliers of such substances and reagents;

   (g) take account of research activities at national and Community level.

2. However, the Commission may designate only laboratories that operate and are assessed and accredited in accordance with the following European Standards, account being taken of the criteria for different testing methods laid down in this Directive:

   (a) EN ISO/IEC 17025 on 'General requirements for the competence of testing and calibration laboratories';

   (b) EN 45002 on 'General criteria for the assessment of testing laboratories';

   (c) EN 45003 on 'Calibration and testing laboratory accreditation system — General requirements for operation and recognition'.

3. The accreditation and assessment of testing laboratories referred to in paragraph 2 may relate to individual tests or groups of tests.

4. For one or more of the diseases under their responsibility, the Community reference laboratories may take advantage of the skills and capacity of laboratories in other Member States or EFTA Member States, provided that the laboratories concerned comply with the requirements laid down in points 1, 2 and 3 of this Annex. Any intention to take advantage of such cooperation shall be part of the information provided as a basis for the designation in accordance with Article 55(1). However, the Community reference laboratory shall remain the contact point for the National reference laboratories in the Member States, and for the Commission.

5. The Community reference laboratories shall:

   (a) coordinate, in consultation with the Commission, the methods employed in the Member States for diagnosing the disease concerned, specifically by:

      (i) typing, storing and, where appropriate, supplying strains of the pathogen of the relevant disease to facilitate the diagnostic service in the Community,

      (ii) supplying standard sera and other reference reagents to the national reference laboratories in order to standardise the tests and reagents used in each Member State, where serological tests are required,

(iii) organising periodic comparative tests (ring tests) of diagnostic procedures at Community level with the national reference laboratories designated by the Member States, in order to provide information on the methods of diagnosis used and the results of tests carried out in the Community;

(iv) retaining expertise on the relevant disease pathogen and other pertinent pathogens to enable rapid differential diagnosis;

(b) assist actively in the diagnosis of outbreaks of the relevant disease in Member States by receiving pathogen isolates for confirmatory diagnosis, characterisation and epizootic studies;

(c) facilitate the training or retraining of experts in laboratory diagnosis with a view to harmonising diagnostic techniques throughout the Community;

(d) collaborate, as regards methods of diagnosing animal diseases falling within their areas of competence, with the competent laboratories in third countries where those diseases are prevalent;

(e) collaborate with the relevant OIE reference laboratories with regard to exotic diseases listed in Part II of Annex IV under their responsibility;

(f) collate and forward information on exotic and endemic diseases, that are potentially emerging in Community aquaculture.

PART II

National reference laboratories

1. The national reference laboratories designated pursuant to Article 56 shall be responsible for coordinating the diagnostic standards and methods within their field of responsibility in the Member State concerned. These national reference laboratories shall:

(a) undertake to notify, without delay, the competent authority whenever the laboratory is aware of a suspicion of any of the diseases referred to in Annex IV;

(b) coordinate, in consultation with the relevant Community reference laboratory, the methods employed in Member States for diagnosing the diseases concerned under their responsibility;

(c) assist actively in the diagnosis of outbreaks of the relevant disease by receiving pathogen isolates for confirmatory diagnosis, characterisation and epizootic studies;

(d) facilitate the training or retraining of experts in laboratory diagnosis with a view to harmonising diagnostic techniques throughout the Member State;

(e) ensure confirmation of positive results of all outbreaks of exotic diseases listed in Part II of Annex IV, and of primary outbreaks of non-exotic diseases listed in that Annex;

(f) organise periodic comparative tests (ring tests) of diagnostic procedures at national level with the laboratories designated by the Member States in accordance with Article 57, in order to provide information on the methods of diagnosis used and the results of tests carried out in the Member State;

(g) cooperate with the Community reference laboratory referred to in Article 55 and participate in the comparative tests organised by the Community reference laboratories;

(h) ensure a regular and open dialogue with their national competent authorities;

(i) operate and be assessed and accredited in accordance with the following European Standards account being taken of the criteria for different testing methods laid down in this Directive:

(i) EN ISO/IEC 17025 on 'General requirements for the competence of testing and calibration laboratories';

(ii) EN 45002 on 'General criteria for the assessment of testing laboratories';

(iii) EN 45003 on 'Calibration and testing laboratory accreditation system — General requirements for operation and recognition'.

2. The accreditation and assessment of testing laboratories referred to in point 1(i) may relate to individual tests or groups of tests.

3. The Member States may designate national reference laboratories which do not comply with the requirements referred to in point 1(i)(i) of this Part, where operation under EN ISO/IEC 17025 is practically difficult, provided the laboratory operates under quality assurance in line with the guidelines in ISO 9001.

4. Member States may authorise a national reference laboratory situated on their territory to take advantage of the skills and capacity of other laboratories designated pursuant to Article 57, for one or more of the diseases under their responsibility, provided that these laboratories comply with the relevant requirements of this Part. However, the national reference laboratory shall remain the contact point for the central competent authority of the Member State, and for the Community reference laboratory.

PART III

Designated laboratories in Member States

1. The competent authority of a Member State shall designate only laboratories for diagnostic services pursuant to Article 57 that fulfil the following requirements. They must:

   (a) undertake to notify, without delay, the competent authority whenever a laboratory is aware of a suspicion of any of the diseases referred to in Annex IV;

   (b) undertake to participate in comparative tests (ring-tests) of diagnostic procedures arranged by the national reference laboratory;

   (c) operate and be assessed and accredited in accordance with the following European Standards account being taken of the criteria for different testing methods laid down in this Directive:

      (i) EN ISO/IEC 17025 on 'General requirements for the competence of testing and calibration laboratories';

      (ii) EN 45002 on 'General criteria for the assessment of testing laboratories';

      (iii) EN 45003 on 'Calibration and testing laboratory accreditation system — General requirements for operation and recognition'.

2. The accreditation and assessment of testing laboratories referred to in paragraph 1(c) may relate to individual tests or groups of tests.

3. The Member States may designate laboratories which do not comply with the requirements referred to in point 1(c)(i) of this Part, where operation under EN ISO/IEC 17025 is practically difficult, provided that the laboratory operates under quality assurance in line with the guidelines in ISO 9001.

4. The competent authority shall cancel the designation where the conditions referred to in this Annex are no longer fulfilled.

ANNEX VII

CRITERIA AND REQUIREMENTS FOR CONTINGENCY PLANS

Member States shall ensure that contingency plans meet at least the following requirements:

1. Provision must be made to ensure the legal powers needed to implement contingency plans and put into effect a rapid and successful eradication campaign;

2. Provision must be made to ensure access to emergency funds, budgetary means and financial resources in order to cover all aspects of the fight against exotic diseases listed in Part II of Annex IV;

3. A chain of command must be established to guarantee a rapid and effective decision-making process for dealing with exotic diseases listed in Annex IV or emerging diseases. A central decision-making unit must be in charge of the overall direction of control strategies;

4. Detailed plans must be available for Member States to be prepared for the immediate establishment of local disease control centres in the event of an outbreak of exotic diseases listed in Part II of Annex IV or emerging diseases and to implement disease control and environment protection measures at a local level;

5. Member States must ensure cooperation between the competent authorities and competent environmental authorities and bodies in order to ensure that actions on veterinary and environmental safety issues are properly coordinated;

6. Provision must be made for adequate resources to ensure a rapid and effective campaign, including personnel, equipment and laboratory capacity;

7. An up-to-date operations manual must be available, with a detailed, comprehensive and practical description of all the actions, procedures, instructions and control measures to be employed in handling exotic diseases listed in Part II of Annex IV or emerging diseases;

8. Detailed plans must be available for emergency vaccination, where appropriate;

9. Staff must be regularly involved in training in clinical signs, epidemiological enquiry and control of epizootic diseases, in real-time alert exercises, and in training in communication skills to provide ongoing disease awareness campaigns for authorities, farmers and veterinarians;

10. Contingency plans must be prepared that take into account the resources needed to control a large number of outbreaks occurring within a short period of time;

11. Without prejudice to the veterinary requirements laid down in Regulation (EC) No 1774/2002, contingency plans must be prepared to ensure that, in the event of an outbreak of diseases, any mass disposal of aquatic animal carcases and aquatic animal waste is done without endangering animal and human health, using processes or methods which prevent damage to the environment and in particular:

    (i) with minimum risk to soil, air, surface and groundwater, and to plants and animals;

    (ii) with minimum nuisance caused by noise or odours;

    (iii) with minimum adverse effects on the nature or places of special interest;

12. Such plans must include the identification of appropriate sites and undertakings for the treatment or disposal of animal carcasses and animal waste in the event of an outbreak in accordance with Regulation (EC) No 1774/2002.

ANNEX VIII

CORRELATION TABLE

This Directive	Repealed Directives		
	91/67/EEC	93/53/EEC	95/70/EC
Article 1(1)(a)	Article 1, first subparagraph	—	—
Article 1(1)(b)	—	—	—
Article 1(1)(c)	—	Article 1	Article 1
Article 1(2)	—	Article 20(2)	Article 12(2)
Article 2(1)	—	—	—
Article 2(2)	—	—	—
Article 2(3)	Article 1, second subparagraph	—	—
Article 3	Article 2	Article 2	Article 2
Article 4	—	—	—
Article 5	—	—	—
Article 6	—	—	—
Article 7	—	—	—
Article 8(1)	—	Article 3(2)	Article 3(2)
Article 8(2)	—	—	—
Article 8(3)	—	—	—
Article 8(4)	—	—	—
Article 9	—	—	—
Article 10	—	—	Article 4
Article 11	—	—	—
Article 12	—	—	—
Article 13(1)	Article 4, first paragraph	—	—
Article 13(2)	Article 4, second paragraph	—	—
Article 14(1)(a)	Article 7(1), Article 8(1)	—	—
Article 14(1)(b)	—	—	—
Article 14(2)	Article 16(1)	—	—
Article 14(3)	Article 16(1),	—	—
Article 14(4)	—	—	—
Article 15(1)	Article 3(1)(a) and (2)	—	—
Article 15(2)	—	—	—
Article 15(3)	Article 3(1)(b) and (2)	—	—
Article 15(4)	—	—	—

This Directive	Repealed Directives		
	91/67/EEC	93/53/EEC	95/70/EC
Article 16(1)	Article 7(1)(a), first sentence Article 7(1)(b) Article 8(1)(a) Article 8(1)(b)	—	—
Article 16(2)	—	—	—
Article 17	—	—	—
Article 18(1)	Article 9	—	—
Article 18(2)	—	—	—
Article 19(1)	—	—	—
Article 19(2)	Article 9(2)	—	—
Article 20	Article 14(3)	—	—
Article 21	—	—	—
Article 22	Article 19(1)	—	—
Article 23(1)	—	—	—
Article 23(2)	Article 22	—	—
Article 23(3)	Article 19(2)	—	—
Article 23(4)	Article 19(3)	—	—
Article 23(5)	—	—	—
Article 24	Article 21	—	—
Article 25(a)	Article 20	—	—
Article 25(b)	—	—	—
Article 25(c)	—	—	—
Article 25(d)	Article 21(2)	—	—
Article 25(e)	—	—	—
Article 26	—	Article 4	Article 5(1)
Article 27	—	—	Article 5(5)
Article 28(a)	—	Article 5(1) Article 10(1)(a)	Article 5(2)(a)
Article 28(b)	—	Article 5(2)(b) Article 10(1)(c)	Article 5(2)(b)
Article 29(1)	—	Article 5 (2)(h) Article 6(a), seventh indent Article 8(1) Article 9(1), first sentence Article 10(1)b	Article 4(1), third subparagraph, third indent Article 5(4), first and fourth subparagraph

This Directive	Repealed Directives		
	91/67/EEC	93/53/EEC	95/70/EC
Article 29(2)	—	Article 5(2)(i)	Article 5(4), second and fourth subparagraph
Article 29(3)	—	Article 6(b) Article 6(d) Article 8(2) Article 8(3) Article 9(2)	—
Article 29(4)	—	Article 5(2)(i), second indent	—
Article 30	—	Article 5(4)	Article 5(3)
Article 31	—	—	—
Article 32	—	Article 5(2), Article 6	Article 4(1), third sub-paragraph, second indent, Article 5(2)(b), Article 5(4), third and fourth subparagraph
Article 33(1)	Article 3(3)	Article 6(a) fourth indent	—
Article 33(2)	—	Article 6(a), fourth indent	—
Article 33(3)	—	—	—
Article 33(4)	—	—	—
Article 34(1)	—	Article 5(2)(c) Article 6(a), first and third indent	—
Article 34(2)	—	Article 6(a), fourth indent	—
Article 35	—	Article 6(a), second, fifth and sixth indent	—
Article 36	—	—	—
Article 37(a)	—	—	—
Article 37(b)	—	—	Article 5(3)
Article 38(1)	—	Article 9(1), second sentence	—
Article 38(2)	—	Article 9(3)	—
Article 38(3)	—	—	—
Article 39(a)	—	Article 10(1)(c)	Article 4(1), third paragraph, first indent
Article 39(b)	—	—	—
Article 39(c)	—	Article 10(1)(c)	—
Article 39(d)	—	—	—
Article 40	—	Article 7	—

This Directive	Repealed Directives		
	91/67/EEC	93/53/EEC	95/70/EC
Article 41	—	—	—
Article 42	—	—	—
Article 43	—	—	—
Article 44(1)	Article 10	Article 10(2)	—
Article 44(2)	Article 10	Article 10(2)	—
Article 45	Article 10(1)	—	—
Article 46	—	—	—
Article 47	—	Article 6(a), first indent Article 15	—
Article 48(1)	—	Article 14(1)	—
Article 48(2)	—	Article 14(1)	—
Article 48(3)	—	—	—
Article 48(4)	—	—	—
Article 49(1)	Article 5(1)	—	—
Article 49(2)	—	—	—
Article 49(3)	Article 15	—	—
Article 50(1)	Article 5(1) Article 6(1)	—	—
Article 50(2)	—	—	—
Article 50(3)	Article 5(1)	—	—
Article 50(4)	Article 15	—	—
Article 51(1)	—	—	—
Article 51(2)	Article 5(2)	—	—
Article 52	—	—	—
Article 53(1)	—	—	—
Article 53(2)	—	—	—
Article 53(3)	—	Article 9(1), second sentence	—
Article 54(1)	—	—	—
Article 54(2)	—	Article 6(d) Article 8(3)	—
Article 54(3)	—	—	—
Article 55(1)	—	Article 13(1)	Article 7(1)
Article 55(2)	—	Article 13(2)	Article 7(2)
Article 55(3)	—	—	—
Article 56(1)	—	Article 12(1) Article 12(4)	Article 6(2) Article 6(3)
Article 56(2)	—	—	—
Article 56(3)	—	Article 12(6)	Article 6(5)
Article 56(4)	—	—	—
Article 56(5)	—	Article 12(1) Article 12(3)	Article 6(2)

This Directive	Repealed Directives		
	91/67/EEC	93/53/EEC	95/70/EC
Article 57(a)	—	Article 11(2)	—
Article 57(b)	—	Article 11(1)	Article 6(1)
Article 57(c)	—	—	—
Article 58(1)	Article 17	Article 16	Article 8
Article 58(2)	Article 22	—	—
Article 58(3)	Article 17	—	—
Article 59	—	—	—
Article 60	—	—	—
Article 61(1)	—	—	—
Article 61(2)	Article 25	Article 18	Article 9
Article 61(3)	Article 9(3) Article 17(2)	Article 18a	Article 4(2) Article 5(4), fourth sub-paragraph Article 8(4)
Article 62	Article 26 Article 27	Article 19	Article 10
Article 63	—	—	—
Article 64	—	—	—
Article 65	Article 29	Article 20	Article 12
Article 66	—	—	Article 13
Article 67	Article 30	Article 21	Article 14

12.8 Fóður samsetning

Meðfylgjandi skjal sýnir samsetningu fóðurs.

Ficha de Especificaciones

110107 LE-2 STOLT Estado ACTIVO

Atributos del Producto

Especie	SOLE	Idioma Original	Español
Clase	AQUACULTURE	Formula granel	112916 LEN-STOLT 2-7
Origen	PRODUCED	Formula suplementacion	
Rango	STOLT	Formula medicada	

Especificacion

Definicion	Complete extruded feed for SOLE	N° especificacion	02007
		N° revision	12
	Contains fishmeal do not feed to ruminants	F. última rev.	27/01/2011
Producto base	According to feeding tables	Aprobada por	Raul Andres Grijalbo
Presentacion	Served as Bags 25 Kgs.	F. aprobación:	27/01/2011

MATERIAS PRIMAS

Fish meal	55 %
Wheat gluten	15 %
Concentrated soya protein	10 %
Fish oil	10 %
Pea protein	5 %
Peas Meal	3 %
Rapeseed oil	2 %

CONSTITUYENTES ANALITICOS

	(T-)	Referencia	(T+)
Protein	54 %	57	63 %
Oil	15,8 %	18	22,4 %
Ash	9 %	10	12 %
Fibre	0,8 %	1,6	3,2 %
Phosphorus		1,7	

ADITIVOS

Antioxidant	BHT
Vit A	5000 U.I./kg
Vit D3	750 U.I./kg
Vit E (alfa-tocoferol)	250 mg/kg
Copper	7.5 mg/kg

CARACTERISTICAS FISICAS

Tabla tamaño STANDARD Tamaño 2

	Mínimo	Referencia	Máximo
Diametro (mm)	1,70	2,00	2,30
Longitud (mm)	2,00	2,40	2,80
Flotabilidad %	0,00	0,00	5,00
Rotos %	0,00	0,00	5,00
Densidad (Kg./L.)	0,58	0,60	0,63

CARACTERISTICAS MICROBIOLOGICAS

Salmonela	Absence in 25 g.
E.Coli	Absence in 1g.
Coliformes Totales	Absence.
Estafilococos	Maximum 10 cfu in 1g.
Análisis micológico	Maximum 30.000 cfu.
An. sulfitoreductores	Maximum 500 cfu.

REQUISITOS DE ALMACENAMIENTO - MODO DE EMPLEO

Store in cool, dry place
Best use before expiry date
Made 9 months before expiry date.

DOCUMENTACION APLICABLE

12.9 Fóður nýting

Meðfylgjandi grein er endurrit greinar um fóðrun og fóðurnýtingu senegalflúru sem birt er á vefsíðunni: http://www.mispeces.com/estudios/lenguado/lenguado-1.htm

ONGROWING FEED FOR SENEGAL SOLE
(*Solea senegalensis* Kaup)

P. Coutteau[1], R. Robles[2] and W. Spruyt[1]

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Introduction

Sole (Solea solea and Solea senegalensis) are regarded as promising new flatfish species for European fish farming. Recent advances in the hatchery techniques and the availability of specific weaning diets, will result in more dependable supply and quality of sole fry in the near future (Howell et al., 1997; Dinis et al., 1999). However, the knowledge about ongrowing sole is still very limited, especially with regard to rearing technology and husbandry conditions, feeding behavior, and nutritional requirements. Since specific sole feed is not commercially available, commercial turbot feeds are often used for sole. The present study aimed at the evaluation of a specific sole formulation in comparison with a commercial turbot feed for ongrowing Senegal sole Solea senegalensis.

Feeds

A sinking extruded feed (“INVE Sole”) was formulated for sole ongrowing taking into account the specific requirements of sole, i.e. high protein/energy ratio (crude protein/crude fat 55/16), enhanced palatibility (using a mixture of selected attractants) and high digestibility (using absolutely fresh raw materials, marine oils with POV<5 and digestibility enhancers). A standard commercial turbot feed (“COMM Turbot”; crude protein/crude fat 52/20) served as a reference. A pellet size of 2 mm was used for both treatments.

EVALUATION AT LABORATORY SCALE

Experimental design

Juvenile sole S. senegalensis (13-15 g initial weight) were reared for 8 weeks in rectangular flat-bottom tanks of 0.5 m² tank surface (35 fish per 50 L; triplicate tanks per treatment) in a partial recirculation system using borehole water (800% total water exchange/day; temperature 18.7 ± 0.6 °C; dissolved oxygen 5-7 mg/L; salinity 40 g/L). The fish were fed daily two to three times to apparent satiation which resulted in very similar amounts of feed distributed to both treatments. Fish were group weighed every two weeks.

Experimental setup for the lab scale evaluation (triplicate tanks of 0.5 m2 per treatment) (pic 2 a +b)

Results

- Overall performance of the sole in the present growth trial was excellent (Table 1; Fig. 1): - no mortality - growth rate of 1.6-1.8%/day - food conversion around 1
- The specific sole formulation performed significantly better than the turbot feed in terms of growth (12% higher daily growth rate) and food conversion (20% lower FCR). Average daily feed consumption, expressed as % of average body weight per day, was 12% lower for the sole feed. Table 1: Growth and feed utilization in Senegal sole fed a specific sole formulation (INVE Sole) in comparison with a standard commercial turbot feed (COMM Turbot). Data represent averages of three tanks; different letters denote significant differences (t-test; P< 0.05)

•	• COMM • Turbot feed	• INVE • Sole feed	• % difference • INVE/COMM
• Survival (%)	• 100 ± 0	• 100 ± 0	• 0
• Initial weight (g)	• 14.1 ± 1.1 a	• 14.7 ± 0.6 a	• +4
• Final weight (g)	• 34.4 ± 2.8 b	• 39.8 ± 0.7 a	• +16
• Weight gain/ind (g)	• 20.3 ± 1.9 b	• 25.1 ± 1.2 a	• +24
• Specific growth rate (%/d)	• 1.56 ± 0.07 b	• 1.75 ± 0.09 a	• +12
• Total feed/ind (g)	• 21.7 ± 0.8 a	• 21.6 ± 0.3 a	• 0
• Feed intake (%ABW/d)*	• 1.58 ± 0.08 b	• 1.39 ± 0.01 a	• -12
• FCR	• 1.07 ± 0.06 b	• 0.86 ± 0.05 a	• -20

- *ABW=average body weight = (initial weight + final weight)/2

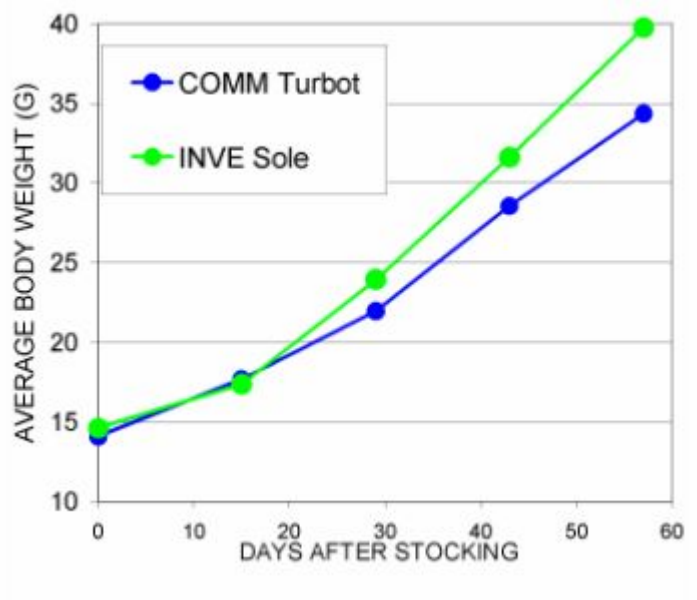


Fig. 1: Growth curves for Senegal sole fed a specific sole formulation (INVE Sole) in comparison with a standard commercial turbot feed (COMM Turbot). Data represent averages of triplicate tanks.

EVALUATION AT PILOT SCALE

Experimental design

Sole S. senegalensis (48 g average initial weight) were reared for 8 weeks in a rectangular raceway (500 fish per 1000 L; 5m2) using borehole water (400% water exchange/h; temperature 18.5-19.5°C; dissolved oxygen 6-7 mg/L obtained by a packed column and additional aeration in the tank; salinity 40 g/L). The fish were fed INVE Sole at a daily ration of 1.25% of fish biomass using automatic feeders and under natural photoperiod conditions (12h light). The total fish population was group weighed every two weeks.

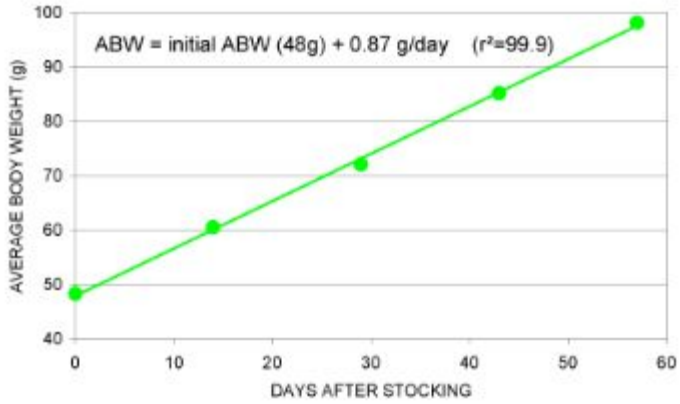
Experimental setup for the pilot scale evaluation (5 m2 raceway)

Results

Sole growth in the pilot trial was linear during the 2-month culture period (0.87 g/day from 48 g to 98 g individual body weight, Fig. 2). Food conversion rate was slightly higher than in the lab trial as a result of the automatic feeding (FCR 1.06; Table 2). Table 1: Growth and feed utilization in Senegal sole fed a specific sole formulation (INVE Sole): comparison of results obtained at lab scale (see Table 1) and pilot scale.

	UPSCALED	**LAB-scale**
Scale (nº fish/tank surface)	500/5m^2	35/0.5m^2
Duration (weeks)	8	8
Initial-Final density (Kg/m^2)	5-10	1-3
Survival (%)	100	100
Initial weight (g)	48	15
Final weight (g)	98	40
Weight gain/ind (g)	50	25
Total feed/ind (g)	53	22
Feed intake (%ABW/d)	1.27	1.39
Food conversion ratio	1.06	0.86
Specific growth rate (%/d)	1.25	1.75
Daily weight gain/ind (g/d)	0.87	0.45

Fig. 2: Growth curve for Senegal sole fed a specific sole formulation (INVE Sole) in pilot scale evaluation (5-10 kg/m2; 5 m2 tank).



Conclusions

- Juvenile sole S. senegalensis (15-40 g body weight; 1-3 kg/m2 culture density) exhibited an excellent growth performance (1.56-1.75 %/day) and food utilization efficiency (FCR 0.86-1.07) in a growth trial at laboratory scale.
- A standard commercial turbot feed was not fully adequate to satisfy the nutritional requirements of S. senegalensis. Improved growth (increase of daily growth rate with 12%) and food conversion (with 20%) was obtained using a specific sole formulation instead of a standard turbot feed in a laboratory trial.
- The preliminary pilot scale trial (48-98 g body weight; 5-10 kg/m2 culture density) confirmed the interesting growth potential of S. senegalensis fed the specific sole formulation in tank culture (growth 0.87 g/day; FCR 1.06) Acknowledgements We wish to thank the technical staff of the ITECH Test Center at the University of Cadiz for their hard work: Carmen López Hernández; Alberto Galán González, and F. Javier Zamorano Castilla. References Howell, B.R. 1997. A re-appraisal of the potential of the sole, Solea solea (L.), for commercial cultivation. Aquaculture 155: 355-365. Dinis, M.T., Ribeiro L., Soares, F., Sarasquete, C. 1999. A review on the cultivation potential of Solea senegalensis in Spain and in Portugal. Aquaculture 176: 27-38.

Acknowledgements

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References

Howell, B.R. 1997. A re-appraisal of the potential of the sole, Solea solea (L.), for commercial cultivation. Aquaculture 155: 355-365. Dinis, M.T., Ribeiro L., Soares, F., Sarasquete, C. 1999. A review on the cultivation potential of Solea senegalensis in Spain and in Portugal. Aquaculture 176: 27-38.

- Ú5 Á rp Uamufuð Uagurfuuf rknU ooðruðU

aógálðyrunf nkgr fuuf aknþo Uþunþokóþu F Urp Uamufuð agurfuuf rkn ooðruðU USÞ5p . kfuðþp

Soamfuð5

Wastes Summary		SKRETTING
Danish Environmental Agency Model		
Protein content of feed,%		57,0
Nitrogen content of feed, %		9,12
Nitrogen content of fish, %		3
FCR		0,950
Phosphorus content of feed, %		1,5
Phosphorus content of fish, %		0,55
Nitrogen discharge, kg per ton fish produced	Tot N	**56,64**
Phosphorus discharge, kg per ton fish produced	Tot P	**6,75**

12.11 Niðurstöður mælinga á gæðum vatns

Mælingar á vatns og efnainnihaldi.

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CENTRO TÉCNICO NACIONAL DE CONSERVACION DE PRODUCTOS DE LA PESCA

Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca

E C
ENSAYOS
Nº 96/1230
Nº 96/1144/0

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : Acceso web

Muestra : AGUA DE MAR

Informe nº : 1100213

Nº Muestra: 1017471

Registro muestra : 16/12/2010
Inicio análisis : 16/12/2010
Fin análisis : 29/12/2010

Referencia : AVE12/10

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Recuento de Coliformes totales(Filtración de membrana)	0 ufc/100 ml		PEE/2/141
*	Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
	Recuento de *Escherichia coli*(Filtración de membrana)	0 ufc/100 ml		PEE/2/142
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/4/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos (Espectrofotometría UV-VIS)	0.06 mg/ l		PEE/4/91
*	Nitritos (Espectrofotometría UV-VIS)	0.028 mg/ l		PEE/4/88

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

Observaciones : LA MUESTRA HA SIDO RECOGIDA POR TÉCNICO DE ANFACO-CECOPESCA EN EL FOSO DE BOMBAS DONDE ENTRA EL AGUA A LA GRANJA

Pág. 1 / 2

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ENSAYOS
Nº 96/1230
Nº 96/1140

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 1100213

Nº Muestra: 1017471

Muestra : AGUA DE MAR

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 10 de Enero de 2011

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

ANA GARCÍA CABADO

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CENTRO TÉCNICO NACIONAL DE CONSERVACIÓN DE PRODUCTOS DE LA PESCA

Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : Acceso web

Muestra : AGUA DE MAR

Informe nº : 1100214

Nº Muestra: 1017473

Registro muestra : 16/12/2010
Inicio análisis : 16/12/2010
Fin análisis : 29/12/2010

Referencia : AVS-12/10

Determinación/Técnica	Resultado	Com.	Método de ensayo
Recuento de Coliformes totales(Filtración de membrana)	0 ufc/100 ml		PEE/2/141
* Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
Recuento de *Escherichia coli*(Filtración de membrana)	0 ufc/100 ml		PEE/2/142
* *Streptococcus* fecales	<1 ufc/ml		Recuento en placa
Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/4/80
* Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
* Fosfatos (Espectrofotometría UV-VIS)	0.10 mg/ l		PEE/4/91
* Nitritos (Espectrofotometría UV-VIS)	0.025 mg/ l		PEE/4/88

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

Observaciones : LA MUESTRA HA SIDO RECOGIDA POR TÉCNICO DE ANFACO-CECOPESCA EN EL CANAL DE DESAGÜE DONDE SALE EL AGUA DE LA GRANJA

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Nº 9/1230
Nº 9/11440

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Informe nº : 1100214

Nº Muestra: 1017473

Muestra : AGUA DE MAR

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El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
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Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 10 de Enero de 2011

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36.625.309

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Nº 96/1.218
Nº 96/1.148

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Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVE06/10

Informe nº : 1008581

Nº Muestra: 1007363

Registro muestra : 16/06/2010
Inicio análisis : 16/06/2010
Fin análisis : 21/06/2010

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Recuento de Coliformes totales(Filtración de membrana)	0 ufc/100 ml		PEE/2/141
*	Recuento de Coliformes fecales	0 ufc/100 ml		Filtración de membrana
	Recuento de *Escherichia coli*(Filtración de membrana)	0 ufc/100 ml		PEE/2/142
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/4/80
*	Carbono Orgánico Total en aguas (COT)	3 mg C/ l		UNE-EN 1484
	Fosfatos (Espectrofotometría UV-VIS)	< 0.15 mg/ l		PEE/4/91
	Nitritos (Espectrofotometría UV-VIS)	< 0.03 mg/ l		PEE/4/88
*	Nitrógeno Total	1 mg/ l		Mét. 4500-N Standard Methods

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

***Observaciones :** LA MUESTRA HA SIDO RECOGIDA POR TÉCNICO DE ANFACO EN EL FOSO DE BOMBAS DONDE ENTRA EL AGUA A LA GRANJA

Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente.

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36625.309

E C
E N S A Y O S
N.º 9 6 / L 3 1 0
N.º 9 8 / L 1 1 4 0

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 1008581

Nº Muestra: 1007363

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar

VIGO, 07 de Julio de 2010

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

JORGE LAGO ALVARADO

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF : G-36.625.389

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Informe nº : 1008582

Nº Muestra: 1007365

Registro muestra : 16/06/2010
Inicio análisis : 16/06/2010
Fin análisis : 21/06/2010

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVS-06/10

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Recuento de Coliformes totales(Filtración de membrana)	<4 ufc/100 ml	[1]	PEE/2/141
*	Recuento de Coliformes fecales	0 ufc/100 ml		Filtración de membrana
	Recuento de *Escherichia coli*(Filtración de membrana)	0 ufc/100 ml		PEE/2/142
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[2]	PEE/4/80
*	Carbono Orgánico Total en aguas (COT)	3 mg C/ l		UNE-EN 1484
	Fosfatos (Espectrofotometría UV-VIS)	< 0.15 mg/ l		PEE/4/91
	Nitritos (Espectrofotometría UV-VIS)	< 0.03 mg/ l		PEE/4/88
*	Nitrógeno Total	1 mg/ l		Mét. 4500-N Standard Methods

[1]: El microorganismo está presente pero en un nivel inferior a 4 ufc/100 ml.
[2]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

***Observaciones :** LA MUESTRA HA SIDO RECOGIDA POR TÉCNICO DE ANFACO EN EL CANAL DE DESAGUE DONDE SALE AGUA A LA GRANJA

Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente

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E C
ENSAYOS
Nº 96/1.710
Nº 96/1.1148

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 1008582

Nº Muestra: 1007365

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar

VIGO, 07 de Julio de 2010

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

JORGE LAGO ALVARADO

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36.625.309

0916368

E. C
ENSAYOS
N - 96/1148
N - 96/1149

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Informe nº : 917370
Nº Muestra: 0916368
Registro muestra : 01/12/2009
Inicio análisis : 01/12/2009
Finalización análisis : 10/12/2009

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia** : AVE12/09

Determinación/Técnica	Resultado	Com.	Método de ensayo
* Carbono Orgánico Total en aguas (COT)	<2 mg C/ l		UNE-EN 1484
Sólidos en suspensión (Gravimetría)	<25 mg/ l	[1]	PEE/CECOPESCA/80
* Fosfatos (Espectrofotometría UV-VIS)	<0.15 mg/ l		PEE/4/91
Nitritos (Espectrofotometría UV-VIS)	0.05±0.01 mg/ l		PEE/CECOPESCA/68

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:5 mg/l)

***Observaciones** : Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA en el foso de bombas donde entra el agua a la granja.

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiologia se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 18 de Diciembre de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

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0916370

E C
ENSAYOS
Nº 96/LE 710
Nº 96/LE 1140

INFORME DE ENSAYO

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Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Informe nº : 917371
Nº Muestra: 0916370
Registro muestra : 01/12/2009
Inicio análisis : 01/12/2009
Finalización análisis : 10/12/2009

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVS12/09

Determinación/Técnica	Resultado	Com.	Método de ensayo
* Carbono Orgánico Total en aguas (COT)	<2 mg C/ l		UNE-EN 1484
Sólidos en suspensión (Gravimetría)	<25 mg/ l	[1]	PEE/CECOPESCA/80
* Fosfatos (Espectrofotometría UV-VIS)	<0.15 mg/ l		PEE/4/91
Nitritos (Espectrofotometría UV-VIS)	0.05±0.01 mg/ l		PEE/CECOPESCA/88

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:5 mg/l)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA en el canal de desagüe donde sale el agua de la granja.

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 18 de Diciembre de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

ANFACO CECOPESCA

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0908131

INFORME DE ENSAYO

ENSAYOS
Nº 9/LE 710
Nº 9/LE 1130

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Informe nº : 908939

Nº Muestra: 0908131

Registro muestra : 24/06/2009
Inicio análisis : 24/06/2009
Finalización análisis : 29/06/2009

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVE06/09

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Recuento de Coliformes totales(Filtración de membrana)	1 ufc/100 ml	[1]	PEE/CECOPESCA/141
	Recuento de *Escherichia coli*(Filtración de membrana)	<1 ufc/100 ml		PEE/CECOPESCA/142
*	Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[2]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos	< 0,15 mg/ l		UNE EN ISO 6878:2004
	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88

[1]: El organismo está presente pero en un nivel inferior a 4 ufc/100 ml.
[2]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA en el foso de bombas donde entra el agua a la granja.

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36625.309

0908131

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Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 908939

Nº Muestra: 0908131

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 13 de Julio de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

JORGE LAGO ALVARADO

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0908127

ENSAYOS
Nº 96/L 718
Nº 96/I 1118

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Informe nº : 908568

Nº Muestra: 0908127

Registro muestra : 24/06/2009
Inicio análisis : 24/06/2009
Finalización análisis : 29/06/2009

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVS06/09

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Recuento de Coliformes totales(Filtración de membrana)	1 ufc/100 ml	[1]	PEE/CECOPESCA/141
	Recuento de *Escherichia coli*(Filtración de membrana)	<1 ufc/100 ml		PEE/CECOPESCA/142
*	Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[2]	PEE/CECOPESCA/80
*	Fosfatos	< 0,15 mg/ l		UNE EN ISO 6878:2004
	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88

[1]: El organismo está presente pero en un nivel inferior a 4 ufc/100 ml.
[2]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA en el canal de desagüe donde sale el agua de la granja.

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0908127

ENSAYOS
Nº 9/LE 519
Nº 9/LE 1148

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 908568

Nº Muestra: 0908127

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 06 de Julio de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

JORGE LAGO ALVARADO

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0902873

INFORME DE ENSAYO

ENSAYOS

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVE03/09

Informe nº : 903440

Nº Muestra: 0902873

Registro muestra : 11/03/2009
Inicio análisis : 11/03/2009
Finalización análisis : 16/03/2009

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Recuento de Coliformes totales(Filtración de membrana)	< 4 ufc/100 ml	[2]	PEE/CECOPESCA/141
*	Recuento de Coliformes fecales	< 1 ufc/100 ml		Filtración de membrana
	Recuento de *Escherichia coli*(Filtración de membrana)	< 4 ufc/100 ml	[2]	PEE/CECOPESCA/142
*	*Streptococcus* fecales	< 1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos	< 0,15 mg/ l		UNE EN ISO 6878:2004
	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 4mg/l)
[2]: El organismo está presente pero en un nivel inferior a 4 ufc/100 ml.

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA en el foso de bombas donde entra el agua de granja.

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36.625.309

0902873

INFORME DE ENSAYO

E C
ENSAYOS
Nº 9/1.710
Nº 9/1.1149

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 903440

Nº Muestra: 0902873

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 23 de Marzo de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

ANA GARCÍA CABADO

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36625.309

0902869

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Muestra : AGUA DE MAR
Envase : Botella de plástico **Referencia :** AVS03/09

Informe nº : 903437

Nº Muestra: 0902869

Registro muestra : 11/03/2009
Inicio análisis : 11/03/2009
Finalización análisis : 16/03/2009

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Recuento de Coliformes totales(Filtración de membrana)	< 4 ufc/100 ml	[2]	PEE/CECOPESCA/141
*	Recuento de Coliformes fecales	< 4 ufc/100 ml	[2]	Filtración de membrana
	Recuento de *Escherichia coli*(Filtración de membrana)	< 4 ufc/100 ml	[2]	PEE/CECOPESCA/142
*	*Streptococcus* fecales	< 1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos	< 0,15 mg/ l		UNE EN ISO 6878:2004
	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 4mg/l)
[2]: El organismo está presente pero en un nivel inferior a 4 ufc/100 ml.

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA en el canal de salida del agua de la granja.

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0902869

INFORME DE ENSAYO

ENSAYOS Nº 96/1/1139 Nº 96/1/1140

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 903437

Nº Muestra: 0902869

Muestra : AGUA DE MAR

Envase : Botella de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada. Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
* Los ensayos marcados no están incluidos en el alcance de la acreditación.Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

Emitido por : Área de Microbiología y Toxinas, Área de Medio Ambiente y Valorización de Productos del Mar
VIGO, 23 de Marzo de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

ANA GARCÍA CABADO

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0813936

INFORME DE ENSAYO

ENSAYOS
Nº 96/1510
Nº 96/1448

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVE12/08

Informe nº : 900151

Nº Muestra: 0813936

Registro muestra : 18/12/2008
Inicio análisis : 18/12/2008
Finalización análisis : 31/12/2008

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos	< 0,92 mg/ l		Mét.4500-P Standard Methods
*	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88
*	Recuento de *Escherichia coli*(Filtración de membrana)	1 ufc/100 ml		PEE/CECOPESCA/142
*	Recuento de Coliformes fecales	1 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes totales(Filtración de membrana)	8 ufc/100 ml		PEE/CECOPESCA/141
*	*Streptococcus* fecales	< 1 ufc/ml		Recuento en placa

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA.

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0813936

INFORME DE ENSAYO

E C
ENSAYOS
Nº 9/1.710
Nº 9/1110

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 900151

Nº Muestra: 0813936

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada.
Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiologia se encuentra calculada y a disposición del cliente.
(*)Los ensayos marcados no están incluidos en el alcance de la acreditación. Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

VIGO, 05 de Enero de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Área

ANA BELÉN TORRES AYASO

ANA GARCÍA CABADO

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0813928

INFORME DE ENSAYO

ENSAYOS

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : Berta Fernandez
F. Entrega : e-mail

Informe nº : 900143

Nº Muestra: 0813928

Registro muestra : 18/12/2008
Inicio análisis : 18/12/2008
Finalización análisis : 31/12/2008

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVS12/08

	Determinación/Técnica	Resultado	Com.	Método de ensayo
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos	< 0,92 mg/ l		Mét.4500-P Standard Methods
*	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88
*	Recuento de *Escherichia coli*(Filtración de membrana)	2 ufc/100 ml		PEE/CECOPESCA/142
*	Recuento de Coliformes fecales	< 1 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes totales(Filtración de membrana)	17 ufc/100 ml		PEE/CECOPESCA/141
*	*Streptococcus* fecales	< 1 ufc/ml		Recuento en placa

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor: 2mg/l)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida por un técnico de CECOPESCA.

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0813928

INFORME DE ENSAYO

ENSAYOS Nº 9/1.718
Nº 9/1.140

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 900143

Nº Muestra: 0813928

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente salvo indicación contraria. El informe sólo da fe de la muestra analizada.
Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
(*)Los ensayos marcados no están incluidos en el alcance de la acreditación. Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

VIGO, 05 de Enero de 2009

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

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0809194

INFORME DE ENSAYO

E C
ENSAYOS
Nº 96/1230
Nº 96/1446

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : BERTA FERNANDEZ

Informe nº : 809313

Nº Muestra: 0809194

Registro muestra : 16/09/2008
Inicio análisis : 16/09/2008
Finalización análisis : 19/09/2008

Muestra : AGUA DE MAR
Envase : Botella de plástico **Referencia :** AVE09/08

	Determinación/Técnica	Resultado	Com.	Método de ensayo
*	Recuento de Coliformes fecales	5 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes totales(Filtración de membrana)	7 ufc/100 ml		PEE/CECOPESCA/141
*	Recuento de *Escherichia coli*(Filtración de membrana)	5 ufc/100 ml		PEE/CECOPESCA/142
*	*Streptococcus* fecales	< 1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos	< 0,92 mg/ l		Mét.4500-P Standard Methods
*	Nitritos (Espectrofotometría UV-VIS)	0,04± 0,06 mg/ l		PEE/CECOPESCA/88

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:4mg/l)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida en presencia de un técnico de CECOPESCA

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0809192

INFORME DE ENSAYO

ENSAYOS Nº 96/1230 Nº 96/1446

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : BERTA FERNANDEZ

Informe nº : 809126

Nº Muestra: 0809192

Registro muestra : 16/09/2008
Inicio análisis : 16/09/2008
Finalización análisis : 19/09/2008

Muestra : AGUA DE MAR
Envase : Botella de plástico **Referencia :** AVS09/08

	Determinación/Técnica	Resultado	Com.	Método de ensayo
*	Recuento de *Escherichia coli*(Filtración de membrana)	10 ufc/100 ml		PEE/CECOPESCA/142
*	Recuento de Coliformes fecales	18 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes totales(Filtración de membrana)	20 ufc/100 ml		PEE/CECOPESCA/141
*	*Streptococcus* fecales	< 1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Fosfatos	< 0,92 mg/ l		Mét.4500-P Standard Methods
*	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:2mg/l)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente

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0809192

INFORME DE ENSAYO

ENSAYOS Nº 96/1230 Nº 96/1144/0

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 809126

Nº Muestra: 0809192

Muestra : AGUA DE MAR

Envase : Botella de plástico

La muestra fue facilitada por el propio cliente.El análisis sólo da fe de la muestra recibida.Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.

El resultado se comunica sin la corrección de la recuperación.

Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.

(*)Los ensayos marcados no están incluidos en el alcance de la acreditación. Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

VIGO, 25 de Septiembre de 2008

Vº Bº Responsable Técnico

MARIA SANTOS GONZÁLEZ

El Responsable de Area

ANA BELÉN TORRES AYASO

ANA GARCÍA CADADO

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36.625.359

0806121

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : BERTA FERNANADEZ

Informe nº : 806266

Nº Muestra: 0806121

Registro muestra : 18/06/2008
Inicio análisis : 18/06/2008
Finalización análisis : 20/06/2008

Muestra : AGUA DE MAR
Envase : Botella de plástico **Referencia :** AVE06/08

	Determinación/Técnica	Resultado	Com.	Método de ensayo
*	Recuento de *Escherichia coli*(Filtración de membrana)	1 ufc/100 ml		PEE/CECOPESCA/142
*	Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes totales(Filtración de membrana)	1 ufc/100 ml		PEE/CECOPESCA/141
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
*	Investigación de *Salmonella* (Inmunofluorescencia)	Ausencia/25 ml		PEE/CECOPESCA/134
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Nitritos (Espectrofotometría UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88
*	Fosfatos	< 0,92 mg/ l		Mét.4500-P Standard Methods

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:2 mg/L)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente

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Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36625309

0806121

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A.

Informe nº : 806266

Nº Muestra: 0806121

Muestra : AGUA DE MAR

Envase : Botella de plástico

La muestra fue facilitada por el propio cliente.El análisis sólo da fe de la muestra recibida.Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.

El resultado se comunica sin la corrección de la recuperación.

Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.

(*)Los ensayos marcados no están incluidos en el alcance de la acreditación. Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

VIGO, 24 de Junio de 2008

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

JORGE LAGO ALVARADO

DIEGO MÉNDEZ PAZ

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0806122

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : BERTA FERNANADEZ

Informe nº : 806267

Nº Muestra: 0806122

Registro muestra : 18/06/2008
Inicio análisis : 18/06/2008
Finalización análisis : 20/06/2008

Muestra : AGUA DE MAR
Envase : Botella de plástico **Referencia :** AVS06/08

	Determinación/Técnica	Resultado	Com.	Método de ensayo
*	Recuento de *Escherichia coli*(Filtración de membrana)	2 ufc/100 ml		PEE/CECOPESCA/142
*	Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes totales(Filtración de membrana)	4 ufc/100 ml		PEE/CECOPESCA/141
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetria)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	< 2 mg C/ l		UNE-EN 1484
*	Nitritos (Espectrofotometria UV-VIS)	< 0,03 mg/ l		PEE/CECOPESCA/88
*	Fosfatos	< 0,92 mg/ l		Mét 4500-P Standard Methods

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:3 mg/L)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente

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0806122

INFORME DE ENSAYO

Documento firmado electrónicamente

Cliente : STOLT SEA FARM, S.A

Informe nº : 806267

Nº Muestra: 0806122

Muestra : AGUA DE MAR

Envase : Botella de plástico

La muestra fue facilitada por el propio cliente.El análisis sólo da fe de la muestra recibida.Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.

El resultado se comunica sin la corrección de la recuperación.

Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.

(*)Los ensayos marcados no están incluidos en el alcance de la acreditación. Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

VIGO, 24 de Junio de 2008

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

JORGE LAGO ALVARADO

DIEGO MÉNDEZ PAZ

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ANFACO CECOPESCA

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ENAC ENSAYOS Nº 96/LE230

INFORME DE ENSAYO

Documento firmado electrónicamente.

Cliente : STOLT SEA FARM, S.A - PRODEMAR
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : BERTA FERNÁNDEZ

Informe nº : 803263

Nº Muestra: 0802981

Registro muestra : 25/03/2008
Inicio análisis : 25/03/2008
Finalización análisis : 04/04/2008

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVE03/08

	Determinación/Técnica	Resultado	Com.	Método de ensayo
*	Recuento de *Escherichia coli*	<1 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
*	Recuento de Coliformes totales	<1 ufc/100 ml		Filtración de membrana
*	*Streptococcus* fecales	<1 ufc/ml		Recuento en placa
	Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
*	Carbono Orgánico Total en aguas (COT)	2,9 mg C/ l		UNE-EN 1484
*	Nitritos	< 0,03 mg/ l		UNE-EN 26777:1994
*	Fosfatos	< 0,92 mg/ l		Mét.4500-P Standard Methods

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:2 mg/L)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida en presencia de un técnico de CECOPESCA

CENTRO TÉCNICO NACIONAL DE CONSERVACIÓN DE PRODUCTOS DE LA PESCA
C/Colegio Universitario,16. 36310 VIGO Tlf. (34) 986 469 303 - Fax (34) 986 469 269
www.anfaco.es

ANFACO
CECOPESCA

Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36.625.309

ENAC
ENSAYOS
Nº 96/LE230

INFORME DE ENSAYO

Documento firmado electrónicamente.

Cliente : STOLT SEA FARM, S.A - PRODEMAR

Informe nº : 803263

Nº Muestra: 0802981

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente.El análisis sólo da fe de la muestra recibida.Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
(*)Los ensayos marcados no están incluidos en el alcance de la acreditación. Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

VIGO, 08 de Abril de 2008

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

ANFACO DEP TÉCNICO Y DE INVESTIGACIÓN VIGO CECOPESCA

El Responsable de Area

ANA BELEN TORRES AYASO

ANA GARCÍA CABADO

ANFACO CECOPESCA

CENTRO TÉCNICO NACIONAL DE CONSERVACIÓN DE PRODUCTOS DE LA PESCA

C/Colegio Universitario,16. 36310 VIGO Tlf. (34) 986 469 303 - Fax (34) 986 469 269
www.anfaco.es

Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36625.309

ENAC ENSAYOS Nº 96/LE230

INFORME DE ENSAYO

Documento firmado electrónicamente.

Cliente : STOLT SEA FARM, S.A - PRODEMAR
Domicilio : Punta dos Remedios, Lira
Población : 15292 Carnota (A Coruña)
Contacto : BERTA FERNÁNDEZ

Informe nº : 803268

Nº Muestra: 0802986

Registro muestra : 25/03/2008
Inicio análisis : 25/03/2008
Finalización análisis : 04/04/2008

Muestra : AGUA DE MAR
Envase : Bote de plástico **Referencia :** AVS03/08

Determinación/Técnica	Resultado	Com.	Método de ensayo
* Recuento de *Escherichia coli*	<1 ufc/100 ml		Filtración de membrana
* Recuento de Coliformes fecales	<1 ufc/100 ml		Filtración de membrana
* Recuento de Coliformes totales	6 ufc/100 ml		Filtración de membrana
* *Streptococcus* fecales	1 ufc/ml		Recuento en placa
Sólidos en suspensión (Gravimetría)	< 25 mg/ l	[1]	PEE/CECOPESCA/80
* Carbono Orgánico Total en aguas (COT)	4,0 mg C/ l		UNE-EN 1484
* Nitritos	0,04 mg/ l		UNE-EN 26777:1994
* Fosfatos ,	< 0,92 mg/ l		Mét.4500-P Standard Methods

[1]: El valor experimental obtenido no está incluido en el rango cubierto por el Alcance de Acreditación para el ensayo (Valor:2 mg/L)

***Observaciones :** Empresa colaboradora de los Organismos de Cuenca en materia de control de vertidos de agua. Ministerio de Medio Ambiente
La muestra fue recogida en presencia de un técnico de CECOPESCA

CENTRO TÉCNICO NACIONAL DE CONSERVACIÓN DE PRODUCTOS DE LA PESCA
CIColegio Universitario,16. 36310 VIGO Tlf. (34) 986 469 303 - Fax (34) 986 469 269
www.anfaco.es

ANFACO CECOPESCA

Laboratorio de referencia de la Comunidad Autónoma de Galicia para el control de productos transformados de la pesca. CIF: G-36.625.309

ENAC ENSAYOS Nº 96/LE230

INFORME DE ENSAYO

Documento firmado electrónicamente.

Cliente : STOLT SEA FARM, S.A - PRODEMAR

Informe nº : 803268

Nº Muestra: 0802986

Muestra : AGUA DE MAR

Envase : Bote de plástico

La muestra fue facilitada por el propio cliente.El análisis sólo da fe de la muestra recibida.Este informe de ensayo no debe ser parcialmente reproducido sin la autorización por escrito del laboratorio.
El resultado se comunica sin la corrección de la recuperación.
Cuando aplica,la incertidumbre correspondiente a los ensayos acreditados de microbiología se encuentra calculada y a disposición del cliente.
(*)Los ensayos marcados no están incluidos en el alcance de la acreditación. Las opiniones o interpretaciones incluidas en el informe están fuera del alcance de la acreditación de ENAC.

VIGO, 08 de Abril de 2008

Vº Bº Responsable Técnico

ALEJANDRA ULLA CARRERA

El Responsable de Area

ANA BELÉN TORRES AYASO

ANA GARCÍA CABADO

ANFACO CECOPESCA DEP TÉCNICO Y DE INVESTIGACIÓN VIGO

12.12 Greinargerð um smithættu vegna eldisáforma Stolt Sea Farm

Meðfylgjandi greinargerð var tekin saman af Bernharð Laxdal varðandi smithættu vegna eldisáforma Stolt Sea Farm.

Greinargerð um smithættu vegna eldisáforma Stolt Sea Farm (SSF) með Senegalflúru á Íslandi.

Allur innflutningur á lifandi hrognum/fiski hefur í för með sér ákveðna áhættu á að smit berist til landsins. Hvað flutning á lifandi lagardýrum innan Evrópu er unnið samkvæmt tilteknu áhættumati og vinnuferlum því tengdu er lágmarka áhættuna á að ný og jafnvel óþekkt smitefni dreifist frá einum stað til annars.

Lykilatriði í þessu sambandi er að eldisstofninn sem foreldrafiskur hrogna eða seiða sem ætlunin er að flytja til Íslands hafi verið einangraður frá villtum fiski um árabil og nýliðun komi úr eigin eldisstofni eða úr sambærilegum heilbrigðislega skilgreindum eldisstofnum. Þá er uppsöfnuð rannsóknarsaga sjúkdómaeftirlits slíks eldisstofns mikilvæg auk þeirra vinnuferla er snúa að hreinlæti og smitvörnum viðkomandi eldisstöðvar.

Hérlendis er komin nokkurra ára reynsla íslenskra dýralæknayfirvalda hvað varðar mat og afgreiðslu á umsóknum við innflutning á lifandi hrognum/fiski til áframhaldandi eldis hérlendis og í raun engu við það að bæta. Eðlilega munu yfirvöld gera kröfu um einangrun innflutts efniviðar í tiltekinn tíma þar sem vel yrði fylgst með eldisstofninum, vexti hans og viðgangi auk þess sem nauðsynlegar sýnatökur og rannsóknir yrðu framkvæmdar.

Ef horft er til eldis senegalflúrunnar (*Solea senegalensis*) sem og sólflúrunnar (*Solea solea*) m.t.t. sjúkdóma sem eldi þessara eldistegunda virðist standa hvað mesta ógn af þá eru það sjúkdómar af völdum bakteríanna *Tenacibaculum maritimum*, orsakavaldur sjúkdómsins „Black patch necrosis“ (BPN) og *Photobacterium damsela spp. piscicida* sem veldur sjúkdómnum „Pasteurellosis“. Af veirusjúkdómum snýst málið um Nodaveiru sem reyndar er víðtækt vandamál í lagareldi í sjó og því ekki sértækt vandamál í flúru-eldi frekar en fyrrnefndar bakteríutegundir. Þar sem Nodaveira getur smitast frá foreldrafiski í hrogn er um viðsjárverðan sjúkdómsvald að ræða. Ekki virðist sem áðurnefndar flúru-tegundir eigi við sértæk sníkjudýr vandamál að etja umfram það sem þekkt er í öðru fiskeldi t.d. costia, tricodina o.s.frv.

Af þeim upplýsingum sem fyrirliggja auk samtals við yfirmann heilbrigðismála í Senegalflúrueldi SFF virðist sem þeirra áherslur snúa að fyrirbyggja gegn sýkingum af völdum *Tenacibaculum maritimum* og almennum vibríu sýkingum en það gera þeir með sérlöguðu bóluefni og halda þannig vandamálunum í skefjum. Hvorki *Photobacterium damsela spp. piscicida* né Nodaveira hefur verið greind í eldisstöð SFF sem væntanlegur innflutningur

kæmi frá. Einnig er ljóst að mikil áhersla er lögð á velferð fiskjar allan eldisferilinn en með því fæst aukið þrek gegn því lífræna álagi sem eldi óneitanlega hefur í för með sér. Betra heilbrigði eldisstofns dregur úr áhættunni að smit nái fótfestu og verði eigin eldi, öðru lagereldi eða villtu lífríki að fjörtjóni. Varðandi lífríkið þá er vert að geta þess hitastigs munar sem er á eldisvökvanum annars vegar og sjávarhita við Reykjanes hinsvegar.

Vatnsöflun væntanlegrar eldisstöðvar SSF á Reykjanesi mun snúast um smitfrían borholusjó þannig að kjöreldishitastigi (20-22°C) er náð með blöndun. Frárennsli úr eldisstöðinni er hugsuð í svokallaðan bunustokk frárennslis Orkuveitu Suðurnesja (hitastig um 55°C) áður en það rennur til sjávar. Vitanlega er um töluvert vatnsmagn sem fer frá stöðinni þegar fullum afköstum er náð enda um gegnumstreymi eldisvökvans að ræða. Hér er einnig mikilvægt að horfa til lágs heildarmagn svifagna í frárennsli (áætlað <2 mg/l) auk þess sem væntanlegar fiskigildrur hindra að fiskur (dauður eða lifandi) berist út með frárennsli stöðvarinnar. Ég tel því hverfandi líkur á því að smit berist með frárennsli úr eldisstöð út í náttúruna. Vitanlega er lykilatriði að frá upphafi eldisins sé unnið skv áhættugreiningu/áhættumati þar sem vinnuferlar tengdir hreinlæti og smithættu fái notið sín og að smitvarnir stöðvarinnar séu virkar. Sérstaklega þarf að huga að viðurkenndum frágangi og eyðingu dauðs eldisfiskjar frá upphafi rekstrar.

Ljóst er að reynsla SSF í eldi á senegalflúru skiptir höfuðmáli í framgangi eldisins hérlendis. Reynsla þeirra og áherslur í heilbrigðismálum eru sannarlega til fyrirmyndar.

Að framansögðu tel ég að væntanlegt senegalflúrueldi SSF við Reykjanesvirkjun ekki skapi smithættu umfram annað fiskeldi hérlendis, sé öllum kröfum varðandi innflutning eldisstofnsins fylgt í þaula og almennar smitvarnir í hávegum hafðar.

Ölfusi, 23.mars, 2011.

_____

Bernharð Laxdal
dýralæknir/fisksjúkdómafræðingur

Heimildir:

Imsland A.K. et al (2003) A review of the cultural potential of *Solea solea* and *Solea senegalensis.* Reviews in Fish Biology and Fisheries **13**: 379-407

Howell, B. et al (2006) The Cultivation of soles.- Report of a 3rd workshop held at CIFPA EL TORUÑO, CADIZ, SPAIN. Fengið af Netinu: www.easonline.org

Korsnes, K. et al (2005) Nodavirus hos marin fisk og laks. Fiskehelse, 7.årgang Vol 1:10-20

Samtöl við Gísla Jónsson dýralækni fisksjúkdóma & James Hall yfirmann heilbrigðismála hjá SSF á Spáni

Ýmsar upplýsingar úr gögnum SFF vegna umsóknar til íslenskra yfirvalda vegna væntanlegs senegalflúrueldis hérlendis

12.13 Staðfesting Evrópusambandsins á fiskeldi án sjúkdóma

Meðfylgjandi skjöl sýna staðfestingu Evrópusambandisins á sjúkdómafríu eldi á vegum Stolt Sea Farm.

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medio rural

RESOLUCIÓN POR LA QUE SE RENUEVA LA DECLARACIÓN DE COMPARTIMENTOS LIBRES DE SHV Y NHI EN PISCIFACTORÍAS MARINAS

CONSIDERACIONES LEGALES Y TÉCNICAS

1. De acuerdo con la Decisión de la Comisión 2009/177/CE por la que se establecen disposiciones de aplicación de la Directiva 2006/88/CE del Consejo en lo que respecta a la vigilancia, los programas de erradicación y la calificación de "libre de enfermedad" de Estados Miembros, zonas y compartimentos.
2. De acuerdo con el artículo 50 de la propia Directiva 2006/88/CE relativa a los requisitos zoosanitarios de los animales y los productos de la acuicultura, y a la prevención de determinadas enfermedades de los animales acuáticos.
3. De acuerdo con el artículo 47 del Real Decreto 1614/2008 relativo a los requisitos zoosanitarios de los animales y de los productos de la acuicultura, así como a la prevención y el control de determinadas enfermedades de los animales acuáticos.
4. Y estudiadas las condiciones que se vienen manteniendo en los compartimentos que se relacionan, y las pruebas aportadas siguiendo el esquema de los Anexos IV y V de la Decisión 2009/177/CE.

Por todo ello RESUELVO:

Declarar compartimentos libres respecto de SHV y NHI los siguientes establecimientos que a continuación se relacionan:

Código REGA	Titular
ES150160030601	STOLT SEA FARM, S.A. (Cabo Vilán)
ES150200028201	STOLT SEA FARM, S.A. (Lira-Carnota)
ES150200028301	STOLT SEA FARM, S.A. (Quilmas)
ES150520100501	STOLT SEA FARM, S.A. (Merexo)
ES150530031201	MARCULTURA, S.A. (Esteiro)
ES150580027701	ISIDRO DE LA CAL, S.L. (Lorbe)
ES150710097101	SEA SOLE ACUICULTURA
ES150730047201	STOLT SEA FARM, S.A. (Couso-Ribeira)
ES150730058601	STOLT SEA FARM, S.A. (Palmeira)
ES150730061201	CETGA
ES150730062301	NORTH WEST FOOD, S.L.
ES150870127501	LUSO HISPANA DE ACUICULTURA, S.L.
ES159010026201	MARCULTURA, S.A. (Sismundi)
ES270130033501	ALROGAL
ES270130036701	ACUIDOLRO, S.L.
ES270250046501	INSUIÑA, S.L. (Xove)
ES360060053201	AQUACRÍA AROUSA, S.L.
ES360080008501	PISCÍCOLA DEL MORRAZO, S.A.
ES360220014501	INSUIÑA, S.L. (O Grove)
ES360220017201	PUNTA MOREIRA, S.L.
ES360290016201	LOITAMAR S. COOP. GALEGA
ES360360068901	INSUIÑA, S.L. (Oia-Mougás)
ES360450075701	INSUIÑA, S.L. (Chapela-Redondela)
ES360450098601	INSUIÑA, S.L. (Polígono E-Xaulas)
ES369010000101	ALLESA 72

Según el artículo 47.2 del Real Decreto 1614 de 2008, la declaración surtirá efecto a partir de los sesenta días desde la fecha de la reunión del Comité Permanente de la Cadena Alimentaria y de la Sanidad Animal en cuyo orden del día se incluya la notificación de la declaración a título informativo.

Santiago de Compostela, 19 de mayo de 2009

El director general de Producción Agropecuaria

José Álvarez Robledo

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CONSELLERÍA DO MEDIO RURAL

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medio rural

DXPA/SXG/SSA/AMB/emc

Dirección General de Recursos
Agrícolas y Ganaderos
Ministerio de Medio Ambiente,
y Medio Rural y Marino
C/ Alfonso XII, nº 62
28014 Madrid

Asunto: solicitud para la presentación en CPCASA de declaración de mantenimiento del estatuto de autorizados frente a SHV y NHI de los compartimentos de las piscifactorías marinas gallegas.

El pasado 7 de marzo de 2009 se publicó la Decisión de la Comisión 2009/177/CE por la que se establecen disposiciones de aplicación de la Directiva 2006/88/CE del Consejo en lo que respecta a la vigilancia, los programas de erradicación y la calificación de "libre de la enfermedad" de Estados Miembros, zonas y compartimentos. Como se reconoce en el considerando 17 de esta Decisión 2009/177/CE, con la Directiva 2006/88/CE desaparece el concepto de zona litoral; por ello los Estados Miembros deben evaluar nuevamente sus zonas litorales autorizadas como indemnes de conformidad con la Directiva 91/67/CE, y presentar una nueva declaración de conformidad con la Directiva 2006/88/CE.

Galicia comenzó trámites para declararse libre de SHV y NHI ya en diciembre de 1996. A los efectos se cursó ante la UE solicitud de reconocimiento de estatuto de zona autorizada frente a SHV y NHI para nuestras cuencas fluviales y zonal litorales. Después de presentar la correspondiente documentación, y a través de la publicación de la Decisión 1999/513/CE, (sustituida por la Decisión 2002/308/CE, cuya última modificación es la Decisión 2007/345/CE), se declaró Galicia como zona autorizada para las enfermedades mencionadas.

Por tanto, actualmente Galicia tiene las siguientes zonas autorizadas a SHV y NHI:

"Zonas continentales

Cuencas fluviales de Galicia:

- *incluidas las cuencas del Eo, el Sil desde su nacimiento en la provincia de León, el Miño desde su nacimiento hasta la presa de Frieira y el Limia desde su nacimiento hasta la presa Das Conchas,*
- *excluida la cuenca del Támega.*

Zonas litorales

- *Zona costera de Galicia desde la desembocadura del Eo (Isla Pancha) hasta el Cabo Silliero de la Ría de Vigo.*
- *La zona costera desde el Cabo Silliero hasta la Punta Picos (desembocadura del Miño) se considera zona de seguridad.*"

Por todo ello, y en virtud del artículo 47 del Real Decreto 1614/2008 relativo a requisitos zoosanitarios de los animales y productos de la acuicultura, presentamos ante el MMAMRM la presente solicitud de tramitación como zona autorizada.

Asimismo, en aplicación del artículo 50 de la Directiva 2006/88/CE, solicitamos su traslado ante el próximo Comité de la Cadena Alimentaria y de la Sanidad Animal a celebrar en los primeros días de junio, de forma que con la derogación a partir del 1 de agosto de 2009 de la Decisión 2002/308/CE, nuestras piscifactorías marinas no pierdan su estatuto sanitario.

Santiago de Compostela, 19 de mayo de 2009

El director general de Producción Agropecuaria

José Álvarez Rodledo

XUNTA DE GALICIA

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL
DIRECCIÓN XERAL DE PRODUCCIÓN E SANIDADE AGROPECUARIA.
Edificio Administrativo San Caetano - SANTIAGO

Serie 04 Nº: 01289

ACTA DE INSPECCIÓN

Concello Moaña Parroquia Domaio
Lugar Pol. Redondela A - Ría de Vigo En (*) PISCIFACTORIA MARITIMA
LOITAMAR , Nº Rxto./C.E.A. 360290016 2/11PL
ás 10:30 horas do día 16 de Junio de 2004
persóanse D. Miriam Menéndez Prieto e D.
veterinarios dependentes da Consellería de Política Agroalimentaria e Desenvolvemento Rural para comprobar la presencia o ausencia de sintomatología que haga sospechar de procesos patológicos tipo INN o SVH

Previa acrediatación documental da súa identidade requiren ó (**) Biólogo responsable
quen manifestou chamarse D. Antonio Pallares Mendez
con N.I.F.: nº 32398664 J de profesión biólogo
, veciño de NOIA , con
domicilio en Curro nº 37
provincia Coruña para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:
Una vez realizada una inspección visual de las pieles de la piscifactoría y consultado el responsable no se observa sintomatología que haga sospechar de procesos patológicos tipo INN ó SVH

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL
SERVICIO DE GANDERÍA
Pontevedra
COTEXADO, É CONFORME CO ORIXINAL
Data 21 SET. 2004
O XEFE DO NEGOCIADO ADMINISTRATIVO
Asdo.: J. IGNACIO DEL CAMPO GARCÍA

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a que se lle fai entrega dun dos exemplares do Acta.

Rola Consellería, O Comparecente, No seu caso, Testemuñas
(Nome, D.N.I. enderezo)

(*) Explotación da que é titular D. ..., mercado, fábrica, etc.
(**) Titular, responsable, pousidor, empleado, etc. (da explotación, industria, animais, productos. etc.)

Cod. 0004

XUNTA DE GALICIA

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL.

DIRECCIÓN XERAL DE PRODUCCIÓN E SANIDADE AGROPECUARIA.

Edificio Administrativo San Caetano - SANTIAGO

Serie 03 Nº: 40105

ACTA DE INSPECCIÓN

Concello ...NOSIA... Parroquia ...DOUTO...
Lugar ...RÍA DE VIGO. POLGO. REDONDELA... En (*) ...PISCIFACTORIA... MARINA...
...LOITAMAR..., Nº Rxto./C.E.A ...36029.0016?...
ás ...10.30... horas do día ...21... de ...DICIEMBRE... de 200 4...
persóanse D. MARIA DOLORES VARELA ... e D. .....
veterinarios dependentes da Consellería de Política Agroalimentaria e Desenvolvemento Rural, para comprobar a presencia o ausencia de sintomatología que haga sospechar procesos patolóxicos tipo INH o SVH.
.....
.....

Previa acreditación documental da súa identidade requiren ó (**) Responsable
..... quen manifestou chamarse D. Antonio Pallares Maceda
..... con N.I.F: nº 32.398.664-J de profesión .....
....., veciño de ....., con
domicilio en c/ Bama Noia nº s/n
provincia Coruña para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:
Consultado la persona responsable y una vez realizado visita de inspección a las jaulas situadas en la ría de Vigo, no se observan mortalidades ni sintomatología que haga sospechar de procesos patolóxicos del tipo INH o SVH.

En relación con ditos feitos o comparecente manifesta:
.....

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a que se lle fai entrega dun dos exemplares do Acta.

Pola Consellería

O Comparecente,

No seu caso, Testemuñas
(Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..., mercado, fábrica, etc.

(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

XUNTA DE GALICIA

CONSELLERÍA DE AGRICULTURA, GANDERÍA E POLÍTICA AGROALIMENTARIA

DIRECCIÓN XERAL DE PRODUCCIÓN AGROPECUARIA

Edificio Administrativo San Caetano - SANTIAGO

Serie 00 Nº: 091883

ACTA DE INSPECCIÓN

Concello Moaña Parroquia Domaio

Lugar "Domaio" "Loiramar" En (*) Piscifactoría Mariña

, Nº Rxto./C.E.A. 36.029.00.162

ás 11:30 horas do día 5 de Maio de 200 05

persóanse D. Mª Ximena Dorrego Méndez e D. Eusebio Santos Santos

veterinarios dependentes da Consellería de Agricultura, Gandería e Política Agroalimentaria, para Inspección sobre alimentación animal conforme RD 3454/2000

Previa acreditación documental da súa identidade requiren ó (**) Director Técnico quen manifestou chamarse D. Antonio Pallares Méndez co N.I.F. nº 32.398.664 D de profesión Biólogo, veciño de Moia, con domicilio en Camiño 32-33 nº provincia Coruña para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

Os peixes da piscifactoría consumen penso compuesto de casa comercial Trouw España (Skretting). Na etiqueta deste penso figura a lenda: "contiene harina de pescado y no puede destinarse a alimentación para rumiantes".

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O Comparecente, No seu caso, Testemuñas (Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..., mercado, fábrica, etc.

(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS
Delegación Comarcal de Vilagarcía de Arousa

Alto da Rosa, s/n - Carril
36610 Vilagarcía de Arousa (Pontevedra)
Teléfonos 986 503 400 - 986 503 401 - Fax 986 503 721
delegacion.pesca.vilagarcia@xunta.es

MOSTRAXE DE CONTROL. DIRECTIVA 91/67/CEE:

Data: 23 / 05 / 05 Tª da auga: 14,5º

Nome / razón social: LOITAMAR S.L. Nº

Rexistro.....

Titular / representante: D. ANTUANIO PALLARES

Situación: RIA DE VIGO - HORTA Especies que teñen: RODABALLO - P. MEXILLON

Especie mostreada: Rodaballo - P. Mexillón

Data do último mostraxe: / XI / 2004

Nº de inmersións dende entón: 5 - ALROGAL

Nº de balsas / gaiolas con alevins: Nº total de alevins: Densidade media:

Nº de balsas / gaiolas de engorde: Nº total de engorde: Densidade media:

Producción esperada, Ano 2004.....

Engorde e alevins:

		Inmersión	Nº de peixes	Mostreadas	Densidade	Cultivo	Viroloxía	Mucus	Sangue
1. L-16	78 gr	17-XI-04	62.000	3 de 13		6	✓	✓	✓
2. L-14	60 gr	2-02-05	67.000	3 de 14		6	✓	✓	✓
3. L-18	40 gr	15-03-05	55.000	3 de 8		6	✓	✓	✓
4. L-19	25 gr	12-03-05	45.000	3 de 7/8		6	✓	✓	✓
5. L-20	25 gr	25-04-05	50.000	3 de 8		6	✓	✓	✓
6.				de					
7.				de					
8.				de					
9.				de					
Peixes lesionados ou mortes:									
TOTAIS:						30			

Larvas:

Stocks actuais: ..... Cantidade mostreada: ..... de..... dias / horas / gr.

Ovos:

Sin eclosionar.....Stock actual: ..... Cantidade mostreada: .....

Eclosionados: ..... " " : ..... " " : .....

Fluído ovárico:

Nº reproductores actual: ..... Nº mostreado: ..... Fluído ovárico recollido: .....

XUNTA DE GALICIA CONSELLERÍA DE PESCA E ASUNTOS MARÍTIMOS VILAGARCÍA

USC Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD: 101.05

FECHA: 23/05/05 EMPRESA: CONSELLERIA DE PESCA

OPERARIO: JMCL/ASM PROCEDENCIA: ESCOLA DO MORRAZO

Muestreo en situ (PNT-G/PV-02) [X] / Muestra recibida en el laboratorio [ ]

MUESTRA

Código cliente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
05-05 FT	Rodaballo	6	15 g		
02-05 I	"	6	30 g		
02-05 FT	"	6	30 g		
10-04 P	"	6	125 g		
10-04 FT	"	6	125 g		

Tipo de muestra: C (cerebro); H (hígado); R (riñón); B (bazo); PE (Peces enteros); Otros (especificar)

TIPO DE ANÁLISIS SOLICITADO:

[X] Virológico: [ ] [ ] Otros

- [X] Cult cel
- [ ] Clf
- [ ] Me
- [ ] Elts
- [ ] SNT
- [ ] ID
- [ ] IFA
- [ ] RFLPs
- [ ] RT-PCR

[X] Bactereológico:

[ ] Otros:

Representante empresa: C.P.A.H; X.H. ROMARÍS	Representante UIP: JMCL

Formato POC-12.01 Ed. 4

XUNTA DE GALICIA

CONSELLERÍA DE AGRICULTURA, GANDERÍA E POLÍTICA AGROALIMENTARIA

DIRECCIÓN XERAL DE PRODUCCIÓN AGROPECUARIA

Edificio Administrativo San Caetano - SANTIAGO

Serie 00 Nº: 091881

ACTA DE INSPECCIÓN

Concello Noalla Parroquia Donalo

Lugar Donalo En (*) Piscifactoria Marina

"Loitaman" Nº Rxto./C.E.A. 36.029.00162

ás 11:05 horas do día 23 de Maio de 200 5

persóanse D. Mª Eugenia Alonso Mendez e D. Eliseo Sanzos Sanzos

veterinarios dependentes da Consellería de Agricultura, Gandería e Política Agroalimentaria, para

Proceder a toma de mostras para o diagnostico de IPN e SHV (Necrose hematopoética infecciosa e Septicemia hemorrágica vírica).

Previa acreditación documental da súa identidade requiren ó (**) Director Técnico

quen manifestou chamarse D. Antonio Pallares Mendez

co N.I.F. nº 32.358.664-J de profesión Bioloxo

, veciño de Noia, con

domicilio en Curro 37-3 nº

provincia para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

Non se observa mortalidade ou sintomatoloxia que faga sospeita de procesos do tipo IPN ou SHV.

Procedese a toma de mostras consistente nun lote de 30 exemplares de rodaballo en distintas fases de crecemento

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería,

Mª Eugenia Alonso Eliseo Sanzos

O Comparecente,

No seu caso, Testemuñas

(Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..., mercado, fábrica, etc.

(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

XUNTA DE GALICIA

Consellería de Política Agroalimentaria e Desenvolvemento Rural
Dirección Xeral de Producción e Sanidade Agropecuaria - S. X. de Gandería
LABORATORIO DE SANIDADE E PRODUCCIÓN ANIMAL DE GALICIA
Avda. de Madrid nº 77, 27.002 LUGO ldsepa.lu.agri@xunta.es
Teléfono: 982.22.17.50 Fax: 982.22.13.48

INFORME DE RESULTADOS

Viroloxía: NHI-SHV.

Informe nº: 7610-2005 Data de saída: 09/06/05 *Xoves* Data de entrada: 24/05/05 *Martes* **Entrada nº: 6219-2005**

MOSTRAS RECIBIDAS:

Nº e tipo de mostras: **30 Peixe** Especie: **Rodaballo** Motivo da análise: **Programa oficial**

REMITENTES das mostras e DESTINATARIOS dos resultados:

Organismo Oficial
Servicio provincial de Gandería Centro de Apoio de Cabanas - Salcedo 36000 Pontevedra (Pontevedra) Teléfono: 986 860 890 Fax: 986 85 76 24
Piscifactoría CEA: 3602900162
LOITAMAR, S.C.L. Domaio Moaña (Pontevedra)

O Laboratorio non participou na toma de mostras obxecto deste informe. Os seguintes resultados refírense exclusivamente ás mostras recibidas cos datos expresados.

RESULTADOS DE VIROLOXÍA:

• NHI:

(Finalizado o dia: 09/06/05 Xoves)

Detección do virus da Necrose Hematopoyética Viral nun macerado de vísceras, ovos ou fluído ovárico (Segundo Decisión da Comisión 2001/183/CE, de 22/02/01). Illamento nas liñas EPC e BF2, mediante dous pases e identificación por neutralización.

Expresión de resultados:positivo/negativo. ENFERMIDADE DE DECLARACIÓN OBRIGATORIA.

Negativo.

• SHV:

(Finalizado o día: 09/06/05 Xoves)

Detección do virus causante da Septicemia Hemorráxica Viral (Segundo Decisión da Comisión 2001/183/CE, de 22/02/01). Illamento nas liñas EPC e BF2, mediante dous pases e identificación por neutralización.

Expresión de resultados:positivo/negativo. ENFERMIDADE DE DECLARACIÓN OBRIGATORIA.

Negativo.

Lugo, 9 de xuño do 2005

A RESPONSABLE DE ÁREA

Asinado: María Carmen Eiras Ferreiro
carmen.eiras.ferreiro@xunta.es

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 23-05-05

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA Ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 15 de Julio del 2005

Fdo: *Dr. Juan L. Barja*
Director de la UIP
Instituto de Acuicultura

V°B° Representante
Consellería de Pesca e AM
Fdo: *Ramón F. Conchas*

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS

INSTITUTO TECNOLOXICO
PARA O CONTROL DO
MEDIO MARIÑO DE GALICIA

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 23-05-05

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Forunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote L-16: Crecimiento abundante en el 10% de los peces en cultivo puro. Aislado *Vibrio* tipo *hollisae*.
Lote L-17: Crecimiento abundante en el 10% de los peces en cultivo puro. Aislado *Vibrio* tipo *hollisae*.
Lote L-18: Crecimiento abundante en el 10% de los peces en cultivo puro. Aislado *Aeromonas salmonicida* subespecie *salmonicida*.
Lote L-19: Ausencia.
Lote L-20: Crecimiento abundante en el 10% de los peces en cultivo puro. Aislado *Aeromonas salmonicida* subespecie *salmonicida*.

En Santiago de Compostela, a 15 de Julio del 2005

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

V°B° Representante
Consellería de Pesca e AM
Fdo: ***Ramón F. Conchas***

Telf.: 986 51 23 20 / 22 - Fax.: 986 51 23 00 - Peirao de Vilaxoán - 36611 Vilagarcía de Arousa

XUNTA DE GALICIA

CONSELLERÍA DE AGRICULTURA, GANDERÍA E POLÍTICA AGROALIMENTARIA

DIRECCIÓN XERAL DE PRODUCCIÓN AGROPECUARIA

Edificio Administrativo San Caetano - SANTIAGO

Serie 00 Nº: 091882

ACTA DE INSPECCIÓN

Concello MEAÑO Parroquia DOMAIO

Lugar DOMAIO En (*) PISCIFACTORIA MAQUIN

"LOITAMIN", Nº Rxto./C.E.A. 36.029.0016.2

ás 11:30 horas do día 23 de MAIO de 200 5

persóanse D. Mª EUGENIA ALONSO e D. CELSO SANTOS SANZ

veterinarios dependentes da Consellería de Agricultura, Gandería e Política Agroalimentaria, para

INSPECCION SOBRE A TENENCIA E USO DE MEDICAMENTOS VETERINARIOS CONFORME R.D. 109/95

Previa acreditación documental da súa identidade requiren ó (**) DIRECTOR TECNICO

quen manifestou chamarse D. ANGEL RALLADES MENDES

co N.I.F. nº 32.368641 de profesión BIOLOGO

, veciño de MOAÑA, con

domicilio en CAMIÑO 37-3º nº

provincia para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

SE COMPRUEBA PRESENCIA DE PIENSO MEDICAMENTOSO

CON RECETA E REFLEJADOS NO LIBRO DE REXISTRO DE TRATAMIENTOS.

POSUEN LIBRO Nº 104221 DILIXENCIADO 16/MAIO/2003

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O Comparecente, No seu caso, Testemuñas.
(Nome, D.N.I., enderezo)

CELSO SANZ

(*) Explotación da que é titular D., matadoiro, fábrica, etc.

(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

XUNTA DE GALICIA

CONSELLERÍA DE AGRICULTURA, GANDERÍA E POLÍTICA AGROALIMENTARIA

DIRECCIÓN XERAL DE PRODUCCIÓN AGROPECUARIA

Edificio Administrativo San Caetano - SANTIAGO

Serie 00 Nº: 091884

ACTA DE INSPECCIÓN

Concello ... Monfero ... Parroquia ... Domaio ...
Lugar ... Domaio, ... En (*) ... Piscifactoría Monfero ...
... s/n Goiriz Alto ..., Nº Rxto./C.E.A. ... 36.029.0001.62 ...
ás ... 11:30 ... horas do día ... 23 ... de ... Maio ... de 200 ... 5 ...
persóanse D. ... Mª Eugenia Nieto ... e D. ... Eugenio Santos ...
veterinarios dependentes da Consellería de Agricultura, Gandería e Política Agroalimentaria, para ... comprobar ...
... Control de movemento pecuario e das inmersións realizadas. ...

Previa acreditación documental da súa identidade requiren ó (**) ... Director Técnico ...
... quen manifestou chamarse D. ... Antonio Pallota Naudi ...
... co N.I.F. nº ... 32.338.664-J ... de profesión ... Biólogo ...
..., veciño de ... Vigo ..., con
domicilio en ... Conxo 137-3º ... nº ...
provincia ... Ourense ... para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:
... Remisa a Requerida a documentación relativa as
últimas inmersións levadas a cabo na piscifactoría, pre-
sentada:
17/3/2005: 43.000 individuos de Peseta maxima
procedente de ALROAL S.A. (Polígono Industrial do
Calvario, S - San Cibrao - Lugo).

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O Comparecente, No seu caso, Testemuñas
(Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..., mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

MOSTRAXE DE CONTROL. DIRECTIVA 91/67/CEE:

Data: 24 / 10 / 2005
Tª da auga: 14ºC

Nome / razón social: LOITANAR S.C.G.Lda Nº Rexistro.....
Titular / representante: D. Antonio Pallarés Méndez NIF: 32.378.664 J
Situación: Donazo Moaña Especies que teñen: Rodaballo

Especie mostreada: Rodaballo

Data do último mostraxe:...../...../.....
Nº de inmersións dende entón:.....
Nº de balsas / gaiolas con alevins:.....Nº total de alevins:.....Densidade media:.....
Nº de balsas / gaiolas de engorde:.....Nº total de engorde:.....Densidade media:.....

Engorde e alevins:

LOTE	Tamaño medio Peixes gr.	Inmersion		Nº peixes		Nº Balsas ou gaiolas		Nº peixesmostreados para:			
		Data	Orixen	Orixinal	Agora	Mostreadas	Densidade	Cultivo	Viroloxía	Mucus	Sangue
1. 21 x2	235g.	17-6-05	Alvogal			1 de —		3	3		
2. 2 G2	260g.	05-05	Alvogal			1 de —		3	3		
3. 1H 2	250g	04-05	Alvogal			1 de —		3	3		
4. U2	260g.	03-05	Alvogal			1 de —		3	3		
5. 22G1	160g.	07-05	Alvogal			1 de —		3	3		
6. 16G1	100g	08-05	Alvogal			1 de —		3	3		
7. 9G1	80g	08-05	Alvogal			1 de —		3	3		
8. 19G1	70g.	09-05	Alvogal			1 de —		3	3		
9. 2H1	70g.	09-05	Alvogal			1 de —		3	3		
~~Peixes lesionados:~~											
" ~~mortos:~~											
10. 4H1	70g	09-05	Alvogal			1 —		3	3		
TOTAIS:								30	30		

Larvas:

Stocks actuais: .....Cantidade mostreada: .....de..... dias / horas / gr.

Ovos:

☐Sin eclosionar.....Stock actual: .....Cantidade mostreada: .....
☐Eclosionados: .... " " : ..... " " : .....

Fluido ovárico:

Nº reproductores actual: .....Nº mostreado: .....Fluido ovárico recollido: .....

O Coordinador
Ramón F. Conchas

FDO/ AREOPAGO

USC Universidade de Santiago de Compostela
Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD: 195.05

FECHA: 24.10.05 **EMPRESA:** Consellería do Pesca

OPERARIO: ASM/JPA **PROCEDENCIA:** ~~INSTITUTO~~ LOIMAR

Muestreo en situ (PNT-G/PV-02) [X] / **Muestra recibida en el laboratorio** [ ]

MUESTRA

Código diente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
21 X2	Rodaballo	3		R. E	
2 G 2	Rodaballo	3		R. E	
1 H 2	Rodaballo	3		P. E	
W 2	Rodaballo	3		P. E	
22 G 1	Rodaballo	3		P. E	
16 G 1	Rodaballo	3		P. E	
9 G 1	Rodaballo	3		P. E	
19 G 1	Rodaballo	3		P. E	
3 H 1	Rodaballo	3			
4 H 1	Rodaballo	3			

Tipo de muestra: **C** (cerebro); **H** (hígado); **R** (riñón); **B** (bazo); **PE** (Peces enteros); **Otros** (especificar)

TIPO DE ANÁLISIS SOLICITADO:

[X] **Virológico:** [ ] [ ] **Otros**

- [X] Cult cel
- [ ] Clf
- [ ] Me
- [ ] Efts
- [ ] SNT
- [ ] ID
- [ ] IFA
- [ ] RFLPs
- [ ] RT-PCR

[X] **Bactereológico:**

[ ] **Otros:**

Representante empresa: Ramón F. Conchas	Representante UIP: ASM
Ramón F. Conchas	

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 24-10-05

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA Ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 23 de Diciembre del 2005

XUNTA DE GALICIA · CONSELLERÍA DE PESCA E ASUNTOS MARÍTIMOS · INSTITUTO TECNOLÓXICO PARA O CONTROL DO MEDIO MARIÑO DE GALICIA · VILAXOÁN

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

V°B° Representante
Consellería de Pesca e AM
Fdo: ***Ramón F. Conchas***

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 24-10-05

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Forunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote 21X2: Ausencia.
Lote 2G2: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Vibrio pelagius* biotipo I.
Lote 1H2: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Vibrio pelagius* biotipo I.
Lote W2: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Aeromonas* sp.
Lote 22G1: Crecimiento abundante en el 100% de los peces en cultivo mixto. Aislado *Vibrio pelagius* biotipo I.
Lote 16G1: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Aeromonas* sp.
Lote 9G1: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Aeromonas* sp.
Lote 19G1: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Aeromonas* sp.
Lote 3H1: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Vibrio pelagius* biotipo I.
Lote 4H1: Crecimiento abundante en el 100% de los peces en cultivo puro. Aislado *Vibrio pelagius* biotipo I.

En Santiago de Compostela, a 23 de Diciembre del 2005

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

V°B° Representante
Consellería de Pesca e AAM
Fdo: ***Ramón F. Conchas***

XUNTA DE GALICIA

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL
DIRECCIÓN XERAL DE PRODUCCIÓN E SANIDADE AGROPECUARIA.
Edificio Administrativo San Caetano - SANTIAGO

Serie 04 Nº: 094559

ACTA DE INSPECCIÓN

Concello MOAÑA Parroquia DOMAIO
Lugar RIA DE VIGO - POLIGONO REDONDELA E En (*) PISCIFACTORIA MARIÑA LOUZAMAR , Nº Rxto./C.E.A. 36.028.0016 2
ás 10:15 horas do día 29 de DECEMBRO de 200 5 .
persóanse D. Mª EUGENIA ALONSO HERNANDEZ e D. MIRIAM HERNANDEZ PORTAS
veterinarios dependentes da Consellería de Política Agroalimentaria e Desenvolvemento Rural

2ª INSPECCIÓN SEMESTRAL A PISCIFACTORIA. CUMPRIMENTASE PROTOCOLO / ENQUISA.

Previa acrediatación documental da súa identidade requiren ó (**) RESPONSABLE quen manifestou chamarse D. ANTONIO PALLARÉS HERNANDEZ con N.I.F.: nº 32398664 - J de profesión BIOLOGO , veciño de VOLA , con domicilio en C/ BARRO nº — provincia CORUÑA para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

UNHA VEZ REALIZADA INSPECCION VISUAL DAS GAIOLAS DA PISCIFACTORIA E CONSULTADO O RESPONSABLE NON SE OBSERVA MORTANDADE NIN SINTOMATOLOXIA QUE FARA SOSPEITAR DE PROCESOS PATOLOXICOS TIPO NECROSE HEMATOPOIETICA INFECCIOSA E SEPTICEMIA HEMORRAXICA VIRAL (NHI e SHV)

PROCEDESE A COMPRIMENTAR PROTOCOLO DE INSPECCION DAS INSTALACIONS PISCICOLAS MARIÑAS.

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a que se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O Comparecente, No seu caso, Testemuñas
(Nome, D.N.I. enderezo)

Mª EUGENIA ALONSO HERNANDEZ. ANTONIO PALLARÉS

(*) Explotación, indicar o titular D. ..., mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos. etc.)

Cod. 0004

XUNTA DE GALICIA

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL
DIRECCIÓN XERAL DE PRODUCCIÓN E SANIDADE AGROPECUARIA.
Edificio Administrativo San Caetano - SANTIAGO

Serie 04 Nº: 094560

ACTA DE INSPECCIÓN

Concello NOAÑA Parroquia DOMAIO
Lugar RIA DE VIGO - POLIGONO RESIDENCIAL LOITAMAR En (*) PISCIFACTORIA MARIÑA
, Nº Rxto./C.E.A. 36 029 00162
ás 10'30 horas do día 29 de DECEMBRO de 200 5
persóanse D. Mª EUGENIA ALONSO MÉNDEZ e D. MIRIAM MENENDEZ PONTAS.
veterinarios dependentes da Consellería de Política Agroalimentaria e Desenvolvemento Rural

INSPECCIÓN A PISCIFACTORIA (MEDICAMENTOS).

Previa acrediatación documental da súa identidade requiren ó (**) RESPONSABLE
quen manifestou chamarse D. ANTONIO PALLARÉS MÉNDEZ
con N.I.F.: nº 32398664-J de profesión BIOLOGO
, veciño de NOIA
domicilio en C/ BANNO , con
provincia CORUÑA para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

ESTAN REXISTRADOS 3 TRATAMENTOS DURANTE ESTE ANO AMPARADOS POLAS CORRESPONDENTES RECEITAS.

NON SE ATOPAN FEITOS QUE. SALIENTAR.

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a que se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O Comparecente, No seu caso, Testemuñas
(Nome, D.N.I. enderezo)

Mª EUGENIA ALONSO MÉNDEZ Mir. Menendez ANTONIO PALLARÉS

(*) Explotación, industria, almacén, etc., mercado, fábrica, etc.
(**) Titular, responsable, pousidor, empleado, etc. (da explotación, industria, animais, productos. etc.)

Cod. 0004

XUNTA DE GALICIA

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL
DIRECCIÓN XERAL DE PRODUCCIÓN E SANIDADE AGROPECUARIA.
Edificio Administrativo San Caetano - SANTIAGO

Serie 04 Nº: 094561

ACTA DE INSPECCIÓN

Concello NOAÑA Parroquia DOMAIO
Lugar RIO DE VIGO - POUGNO REDONDELA En (*) PISCIFACTORIA MARIÑA LONGA - MAR
, Nº Rxto./C.E.A. 36 029 .00162
ás 10:20 horas do día 29 de DECEMBRO de 200 5 .
persóanse D.ª EUGENIA ALONSO MENDEZ e D. MIRIAN MENENDEZ PORTAS
veterinarios dependentes da Consellería de Política Agroalimentaria e Desenvolvemento Rural

INSPECCIÓN A PISCIFACTORIA (ALIMENTACIÓN).

Previa acrediatación documental da súa identidade requiren ó (**) RESPONSABLE
quen manifestou chamarse D. ANTONIO PALARÉS MENDEZ
con N.I.F.: nº 32.398.664-J de profesión BIOLOGO
, veciño de NOIA , con
domicilio en C/ BARRO nº —
provincia CORUÑA para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

UTILIZAN PENSOS DE TROW ESPAÑA E DUNHA EMPRESA FRANCESA BIOMAR.

ATOPANSE CORRECTAMENTE ETIQUETADOS

RECOLLEMOS 2 ETIQUETAS.

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a que se lle fai entrega dun dos exemplares do Acta.

Pola Consellería

O Comparecente

No seu caso, Testemuñas
(Nome, D.N.I. enderezo)

ANTONIO PALARÉS.

(*) Explotación gandeira, matadoiro, fábrica, etc.
(**) Titular, responsable, pousidor, empleado, etc. (da explotación, industria, animais, productos. etc.)

Cod. 0004

XUNTA DE GALICIA

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL
DIRECCIÓN XERAL DE PRODUCCIÓN E SANIDADE AGROPECUARIA.
Edificio Administrativo San Caetano - SANTIAGO

Serie 04 Nº: 094562

ACTA DE INSPECCIÓN

Concello Moaña Parroquia Domaio
Lugar Rúa de Vigo - Polígono Redondela 6 En (*) Piscifactoría Harina Loitamor, Nº Rxto./C.E.A. 36.029.00162
ás 10:40 horas do día 29 de Decembro, de 200 5.
persóanse D. Mª Eugenia Alonso Mondelo e D. Miriam Menéndez Portas.
veterinarios dependentes da Consellería de Política Agroalimentaria e Desenvolvemento Rural

Inspección a piscifactoría (movemento).

Previa acrediatación documental da súa identidade requiren ó (**) Responsable
quen manifestou chamarse D. Antonio Palladó Mendez
con N.I.F.: nº 32398664-J de profesión Biólogo
, veciño de Pola, con
domicilio en C/ Baixo nº s/n
provincia de Coruña para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

Presentan documentación correcta das seguintes inmersións

LV/2005/81	de 50.000	individuos	ó 11/12/2005	Procedentes de Alpchpl
LV/2005/69	de 50.000	"	ó 31/10/2005	" "
LV/2005/61	de 50.000	"	ó 04/10/2005	" "
LV/2005/53	de 50.000	"	ó 02/09/2005	" "
LV/2005/44	de 50.000	"	ó 29/07/2005	" "
LV/2005/38	de 50.000	"	ó 28/06/2005	" "
LV/2005/32	de 50.000	"	ó 31/05/2005	" "
LV/2005/21	de 50.000	"	ó 25/04/2005	" "
LV/2005/16	de 43000	"	ó 17/03/2005	" "
LV/2005/15	de 52.000	"	ó 15/03/2005	" "
LV/2005/07	de 65.000	"	ó 02/02/2005	" "

Non se observan incidencias a salientar.

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a que se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O Comparecente, No seu caso, Testemuñas
(Nome, D.N.I. enderezo)

Mª Eugenia Alonso Mondelo — Antonio Palladó

(*) Explotación, granxa e finca, O ..., mercado, fábrica, etc.
(**) Titular, responsable, pousidor, empleado, etc. (da explotación, industria, animais, productos. etc.)

Cod. 0004

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS
Dirección Xeral de Recursos Mariños

Rúa do Valiño, 63-65 - San Lázaro
15703 Santiago de Compostela
Telélono 981 544 007 - Fax 981 545 025

MOSTRAXE DE CONTROL. DIRECTIVA 91/67/CEE:

Data: 31 / 05 / 06
Tª da auga: .....

Nome / razón social: LOITANAR Nº Rexistro.....
Titular / representante: D. ANTONIO PALLARES
Situación: .....Especies que teñen: RODABALLO
.....

Especie mostreada: RODABALLO

Data do último mostraxe: 24 / 10 / 05
Nº de inmersións dende entón: SETE
Nº de balsas / gaiolas con alevins:.....Nº total de alevins:.....Densidade media:.....
Nº de balsas / gaiolas de engorde:.....Nº total de engorde:.....Densidade media:.....

Engorde e alevins:

LOTE	Tamaño medio Peixes gr.	Inmersion Data	Inmersion Orixen	Nº peixes Orixinal	Nº peixes Agora	Nº Balsas ou Gaiolas Mostreadas		Densidade	Nº peixes mostreados para: Cultivo	Viroloxía	Mucus	Sangue
1. 6A1	3					de			6	6		
2. 28A2	25					de			4	4		
3. 26E2	35					de			4	4		
4. 33B1	50					de			4	4		
5. 15E2	60					de			4	4		
6. 2G1	80					de			4	4		
7. 5B1	100 y					de			4	4		
8.						de						
9.						de						
Peixes lesionados:												
" mortos:												
TOTAIS:									30	30		

Larvas:

Stocks actuais: .....Cantidade mostreada: .....de..... dias / horas / gr.

Ovos:

☐Sin eclosionar:....Stock actual: .....Cantidade mostreada: .....
☐Eclosionados: .... " " : ..... " " : .....

Fluido ovárico:

Nº reproductores actual: .....Nº mostreado: .....Fluido ovárico recollido: .....

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS
Dirección Xeral de Recursos Mariños

Rúa do Valiño, 63-65 - San Lázaro
15703 Santiago de Compostela
Teléfono 981 544 007 - Fax 981 545 025

Entradas na instalación, dende a última inspección:

Data da última inspección: 24/10/05 Nº de inmersións dende entón: 07

Inmersión Nº	N. vulgar N. científico	Data autorización inmersión	Kg total	Nº individuos	Tamaño dos individuos
1ª	RODABALLO	31/10/05	500	50.000	10gr.
2ª	"	1/12/05	"	"	"
3ª	"	10/1/06	"	"	"
4ª	"	3/2/06	"	"	"
5ª	"	21/3/06	"	"	"
6ª	"	27/4/06	"	"	"
	"	26/5/06	"	"	"

Inmersión Nº	PROCEDENCIA			Documento de transporte
	País	Zona	Nome da instalación	
1ª	GALICIA	LUGO	ALROGAL	Si
2ª	"	"	"	"
3ª	"	"	"	"
4ª	"	"	"	"
5ª	"	"	"	"
6ª	"	"	"	"
7ª	"	"	"	"

Observacións: .....

.....

.....

Existencias no momento da inspección:

	Nº individuos	Nº tanques	Densidade aprox.
Alevins (0 - 100 gr)			
Xuvenís (100-600 gr)			
Engorde (600gr-2kg)			
TOTAIS	1.150.000	540	

Observáronse peixes anómalos ou enfermos: ☒Non. ☐Si.....

☐Tomáronse mostras para análise posterior: ~~NON~~

Nº de peixes	Tamaño	Tanques afectados	Mostras tomadas

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS
Dirección Xeral de Recursos Mariños

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15703 Santiago de Compostela
Teléfono 981 544 007 - Fax 981 545 025

ELIMINACION DE SUBPRODUTOS

Numero de baixas: ≥ 90.000 / ano
Destino das mesmas: Mitilicultura (lo lleva Fundicista de la explotación)
Posee sistema de eliminacion de cadaveres: NO
Tiene contratado transporte a planta de eliminacion ou tratamento NO.
Frecuencia de retirada de cadaveres: 3 ó 4 día
Rexistro dos envios: NO.
Documento comercial: NO.

Reciben asistencia técnica:

☐ Non ☑ Si..... ☒ Biólogo.
☐ Veterinario.
☐ Outros: .....

Asistencias externas: .....

En ...MAIO..... a 31 de .....MAIO..... de 2006

Asdo: B.G.I. ..... Asdo: E. ADEO ..... Asdo: ANT. PALLARÉS

Asdo: O titular da instalación ou representante.

XUNTA DE GALICIA CONSELLERÍA DE PESCA E ASUNTOS MARÍTIMOS DIRECCIÓN XERAL DE RECURSOS MARIÑOS

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD: 087.06

FECHA: 31/05/06 **EMPRESA:** CONSELLERÍA PESCA e S.M.

OPERARIO: JMCL/JOY **PROCEDENCIA:** LOITSAR

Muestreo en situ (PNT-G/PV-02) [X] / **Muestra recibida en el laboratorio** [ ]

MUESTRA

Código cliente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
6A1	Rodaballo	6	89	P.E	
28A2	"	4		"	
26E2	"	4		"	
33B1	"	4		"	
15E2	"	4		"	
2G1	"	4		"	
5B1	"	4	~100 gr	"	

Tipo de muestra: **C** (cerebro); **H** (hígado); **R** (riñón); **B** (bazo); **PE** (Peces enteros); **Otros** (especificar)

TIPO DE ANÁLISIS SOLICITADO:

[X] **Virológico:** [ ] [ ] **Otros**

- [X] Cult cel
- [ ] CIf
- [ ] Me
- [ ] Efts
- [ ] SNT
- [ ] ID
- [ ] IFA
- [ ] RFLPs
- [ ] RT-PCR

[X] **Bactereológico:**

[ ] **Otros:**

Representante empresa:	Representante UIP: JMCL

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 31-05-06

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 20 de Julio del 2006

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

Unidad de Ictiopatología
Instituto de Acuicultura

V°B° Representante
Consellería de Pesca e AM
Fdo: ***Eloy Areoso Casal***

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 31-05-06

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Forunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote 6A1: Ausencia.
Lote 26E2: Ausencia.
Lote 28A2: Ausencia.
Lote 33B1: Ausencia.
Lote 15E2: Crecimiento escaso en el 50% de los peces en cultivo puro. Aislado *Vibrio costicola.*
Lote 2G1: Ausencia.
Lote 5B1: Crecimiento escaso en el 75% de los peces en cultivo puro. Aislado *Vibrio costicola.*

En Santiago de Compostela, a 20 de Julio del 2006

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

XUNTA DE GALICIA · CONSELLERÍA DE PESCA E ASUNTOS MARÍTIMOS · INSTITUTO TECNOLÓXICO PARA O CONTROL DO MEDIO MARIÑO DE GALICIA · VILAXOAN

V°B° Representante
Consellería de Pesca e AM
Fdo: ***Eloy Areoso Casal***

ICS 25

XUNTA DE GALICIA

CONSELLERÍA DE POLÍTICA AGROALIMENTARIA E DESENVOLVEMENTO RURAL
DIRECCIÓN XERAL DE PRODUCCIÓN E SANIDADE AGROPECUARIA.
Edificio Administrativo San Caetano - SANTIAGO

Serie 04 Nº: 094780

ACTA DE INSPECCIÓN

Concello MOAÑA Parroquia DOMAIO
Lugar RÍA VIGO (REDONDELA -POLÍGONO A) En (*) PISCIFACTORÍA LOITAMAR
, Nº Rxto./C.E.A. 36.029.00162
ás 11 horas do día 27 de xuño de 200 6
persóanse D. Eliseo Santos Santos e D.
veterinarios dependentes da Consellería de Política Agroalimentaria e Desenvolvemento Rural

Proceder á inspección semestral en relación coa aparición de procesos de tipo SHV e NHI.

Previa acrediatación documental da súa identidade requiren ó (**) responsable
quen manifestou chamarse D. ANTONIO PALLARES MENDEZ
con N.I.F.: nº 32.398.664-J de profesión BIÓLOGO
, veciño de NOIA , con
domicilio en C/ BARRO nº —
provincia CORUÑA para que facilite o servicio de inspección, poñéndose de manifesto os seguintes feitos:

Non se observa mortalidade nin sintomatoloxía que faga sospeitar de procesos patolóxicos do tipo S.H.V. ou N.H.I..

Procédese a cumprimentar o protocolo de inspección das instalacións piscícolas mariñas.

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a que se lle fai entrega dun dos exemplares do Acta.

Pola Consel... XUNTA DE GALICIA VETERINARIOS DE GANDARIA OFICINA AGRARIA COMARCAL PONTEVEDRA Consellería do Medio Rural

O Comparecente,

No seu caso, Testemuñas
(Nome, D.N.I. enderezo)

(*) Explotación da que é titular D. ..., mercado, fábrica, etc.
(**) Titular, responsable, pousidor, empleado, etc. (de explotación, industria, animais, productos. etc.)

Cod. 0004

MOSTRAXE DE CONTROL. DIRECTIVA 91/67/CEE:

Data: 29 / NOV. 2006
Tª da auga: 13-14ºC

Nome / razón social: ...LOITAMAR.....Nº
Rexistro.....
Titular / representante:
D. .....ANTONIO PALLARÉS.....
Situación: ORDES.....Especies que teñen: ROBALO

Especie mostreada: .....ROBALO.....

Nº de inmersións dende o último mostraxe.....MAIO 2006.....6 inmersions.....
Nº de balsas / gaiolas con alevins:.....Nº total de alevins:.....Densidade media:.....
Nº de balsas / gaiolas de engorde:..... .Nº total de engorde:.....Densidade media:.....

Engorde e alevins:

LOTE	Tamaño medio Peixes gr.	Inmersion Data	Inmersion Orixen	Nº peixes Orixinal	Nº peixes Agora	Nº Balsas ou Gaiolas Mostreadas		Nº peixes mostreados para: Cultivo	Viroloxia	Mucus	Sangue
				aprox.			Densidade				
1. 32	10			50.000		de		5	5		
2. 33						de		5	5		
3. 34						de		5	5		
4. 35						de		5	5		
5. 36						de		5	5		
6. 37	60					de		5	5		
7.				374.000	345.00	de					
8.						de					
9.						de					
Peixes lesionados:											
" mortos:											
TOTAIS:								30	30		

Larvas:

Stocks actuais: .....Cantidade mostreada: .....de..... dias / horas / gr.

Ovos:

☐Sin eclosionar.....Stock actual: .....Cantidade mostreada: .....
☐Eclosionados: .... " " : ..... " " : .....

Fluido ovárico:

Nº reproductores actual: .....Nº mostreado: .....Fluido ovárico recollido: .....

Entradas na instalación, dende a última inspección:

Nº de inmersións dende a última mostraxe: 016

Inmersión Nº	N. vulgar N. científico	Data autorización inmersión	Kg total	Nº individuos	Tamaño dos individuos
1ª	LUBARIO	26/5			
2ª		27/6			
3ª		27/7			
4ª		4/9			
5ª		28/9			
6ª		31/10			

Inmersión Nº	PROCEDENCIA			Documento de transporte
	País	Zona	Nome da instalación	
1ª			ALRIGAL	S/
2ª			"	"
3ª			"	"
4ª			"	"
5ª			"	"
6ª			"	"

Observacións: .....
.....
.....

Existencias no momento da inspección:

	Nº individuos	Nº tanques	Densidade aprox.
Alevins (0 - 100 gr)	374.000		
Xuvenís (100-600 gr)			
Engorde (600gr-2kg)			
TOTAIS	1.063.000	500	

Observáronse peixes anómalos ou enfermos: ☒Non. ☐Si.....

Nº de peixes afectados	Tamaño	Tanques afectados	Mostras tomadas

☐Tomáronse mostras para análise posterior:

Eliminación subprodutos:

¿Tivo mortalidades anómalas? Non. (7-9% → 20-30%)

Posee sistema de almacenamiento de cadáveres: Contenedor. Tipo: plastico. ¿Están etiquetados os colectores? Si ¿E correcto o etiquetado? Si
¿Tiene contratado transporte a planta de eliminación ou tratamento?: TOYSAL

Nº de mortos (kg)	Nº rexistro do envio	Data de saida	Destino	Planta de eliminación

Reciben asistencia técnica:

☐ Non ☒Si ☒Biólogo.
☐ Veterinario.
☐ Outros: ...

Asistencias externas: ...

En Lomaio a 29 de novembro de 2006

Asdo: [signature] Asdo: A. Landín Asdo: O titular da instalación ou representante.

XUNTA DE GALICIA - CONSELLERÍA DE PESCA E ASUNTOS MARÍTIMOS - DIRECCIÓN XERAL DE RECURSOS MARIÑOS

USC Universidade de Santiago de Compostela
Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD

FECHA: 29/11/06 **EMPRESA:** Cons Pesca

OPERARIO: **PROCEDENCIA:** Loitamar

Muestreo en situ (PNT-G/PV-02) [X] / **Muestra recibida en el laboratorio** [ ]

MUESTRA

Código cliente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
Lote 32	Rodaballo	5	~~10-60~~ 70	PE	
33	"	5	10-60	PE	
34	"	5	10-60	PE	
35	"	5	10-60	PE	
36	"	5	10-60	PE	
37	"	5	10-60	PE	

Tipo de muestra: **C** (cerebro); **H** (hígado); **R** (riñón); **B** (bazo); **PE** (Peces enteros); **Otros** (especificar)

TIPO DE ANÁLISIS SOLICITADO:

[X] **Virológico:** [ ] [ ] **Otros**

[X] Cult cel [ ] ID
[ ] Clf [ ] IFA
[ ] Me [ ] RFLPs
[ ] Efts [ ] RT-PCR
[ ] SNT

[X] **Bactereológico:**

[ ] **Otros:**

Representante empresa:	Representante UIP:
Eva Fdez	

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 29-11-06

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 29 de Diciembre del 2006

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

V°B° Representante
Consellería de Pesca e AM
Fdo: ***Eloy Areoso Casal***

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 29-11-06

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Forunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote 32: Ausencia.
Lote 33: Crecimiento escaso en el 40% de los peces en cultivo mixto. Aislados *Vibrio alginolyticus* y *Vibrio marinus.*
Lote 34: Crecimiento moderado en el 60% de los peces en cultivo mixto. Aislados *Acinetobacter-Moraxella* sp.
Lote 35: Crecimiento moderado en el 100% de los peces en cultivo mixto. Aislados *Acinetobacter-Moraxella* sp *y Vibrio alginolyticus.*
Lote 36: Ausencia.
Lote 37: Ausencia.

En Santiago de Compostela, a 29 de Diciembre del 2006

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

V°B° Representante
Consellería de Pesca e AM
Fdo: ***Eloy Areoso Casal***

XUNTA DE GALICIA
CONSELLERÍA DO MEDIO RURAL
Dirección Xeral de Produción,
Industrias e Calidade Agroalimentaria

ICS25

Serie 04 N.º 150306

ACTA DE INSPECCIÓN

Concello MOAÑA Parroquia DOMAIO
Lugar RÍA VIGO (REDONDELA -POLÍGONO E) En (*) PISCIFACTORÍA LOITAMAR
, N.º Rxto./ C.E.A. 36.029.00162
ás 10:45 horas do día 13 de decembro de 200 6
persóanse D. Eliseo Santos Santos e D.
veterinarios dependentes da Consellería do Medio Rural

Proceder á inspección semestral en relación coa aparición de procesos de tipo SHV e NHI.

Previa acreditación documental da súa identidade requiren ó (**) encargado
quen manifestou chamarse D. Antonio Manuel Alvarez
Graña con N.I.F.: n.º 52.490222-J de profesión
veciño de Cangas do morrazo
con domicilio en n.º
provincia Pontevedra para que facilite o servizo de inspección, poñéndose de manifesto os seguintes feitos:

Non se observa mortalidade nin sintomatoloxía que faga sospeitar de procesos patolóxicos do tipo S.H.V. ou N.H.I..

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O comparecente, No seu caso, testemuñas
(Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..... mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

XUNTA DE GALICIA
CONSELLERÍA DO MEDIO RURAL
Dirección Xeral de Produción,
Industrias e Calidade Agroalimentaria

Serie 04 N.º 150822

ACTA DE INSPECCIÓN

Concello MOAÑA Parroquia DOMAIO
Lugar Ría de Vigo - Polígono Redondela En (*) Piscifactoría mariña "LOITAMAR
S. Coop Galega , N.º Rxto./ C.E.A. 360290016 2
ás 10:25 horas do día 12 de MARZO de 2007
persóanse D. Miriam Menéndez Rúa e D.
veterinarios dependentes da Consellería do Medio Rural inspección en relación
coa aparición de procesos del tipo SHV e NHI.

Previa acreditación documental da súa identidade requiren ó (**) Responsable técnico
quen manifestou chamarse D. Antonio Pallares
Mendez con N.I.F.: n.º 32398664J de profesión biólogo
veciño de NOIA
con domicilio en Curro n.º 37
provincia Coruña para que facilite o servizo de inspección, poñéndose de manifesto os seguintes feitos:
Unha vez realizada inspección visual das xaulas
da piscifactoría e consultado o responsable non
se observa mortalidade entre os animais ou
sintomatoloxía que faga sospeitar de procesos
patolóxicos tipo ne crose hematopoiética infe-
ciosa (NHI) nin septicemia hemorráxica
viral (SHV).

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O comparecente, No seu caso, testemuñas
(Nome, D.N.I., enderezo)

Miriam Menéndez Rúa

(*) Explotación da que é titular D..... mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

XUNTA DE GALICIA

Consellería do Medio Rural
D.X. de Produción, Industrias e Calidade Agroalimentaria - S.X. de Gandaría
LABORATORIO DE SANIDADE E PRODUCIÓN ANIMAL DE GALICIA
Avda. de Madrid nº 77, 27.002 LUGO ldsepa.lu.agri@xunta.es
Teléfono: 982.22.17.50 Fax: 982.22.13.48

INFORME DE RESULTADOS

Viroloxía: NHI-SHV.

Informe nº: 11305-2007 Data de saída: 16/04/07 *Luns* Data de entrada: 13/03/07 *Martes* **Entrada nº: 7804-2007**

MOSTRAS RECIBIDAS:

Nº e tipo de mostras: **30 Peixe** Especie: **Rodaballo** Motivo da análise: **Programa oficial**

REMITENTES das mostras e DESTINATARIOS dos resultados:

Organismo Oficial
Servicio provincial de Gandería de Lugo Rolda da Muralla 70 Edificio Administrativo. 27001 Lugo (Lugo) Teléfono: 982 294 534 Fax: 982294452
Piscifactoría CEA: 3602900162
LOITAMAR, S.C.L. Domaio Moaña (Pontevedra)

O Laboratorio non participou na toma de mostras obxecto deste informe. Os seguintes resultados refírense exclusivamente ás mostras recibidas cos datos expresados.

RESULTADOS DE VIROLOXÍA:

(Finalizado o día: 29/03/2007 Xoves)

• NHI:

Detección do virus da Necrose Hematopoyética Viral nun macerado de vísceras, ovos ou fluído ovárico (Segundo Decisión da Comisión 2001/183/CE, de 22/02/01). Illamento nas liñas EPC e BF2, mediante dous pases e identificación por neutralización.

Expresión de resultados:positivo/negativo. ENFERMIDADE DE DECLARACIÓN OBRIGATORIA.

Negativo.

(Finalizado o día: 29/03/2007 Xoves)

• SHV:

Detección do virus causante da Septicemia Hemorráxica Viral (Segundo Decisión da Comisión 2001/183/CE, de 22/02/01). Illamento nas liñas EPC e BF2, mediante dous pases e identificación por neutralización.

Expresión de resultados:positivo/negativo. ENFERMIDADE DE DECLARACIÓN OBRIGATORIA.

Negativo.

Lugo, 16 de abril do 2007
A RESPONSABLE DE ÁREA

Asinado: María Carmen Eiras Ferreiro
carmen.eiras.ferreiro@xunta.es

Tfno. 981-823411

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS

MOSTRAXE DE CONTROL. DIRECTIVA 91/67/CEE:

Data: 12/03/07
Tª da auga: 13ºC

Nome / razón social: LOITADAR Nº Rexistro.....
Titular / representante: D. ANTONIO PALLARES
Situación: BOIRO Especies que teñen: RODABALLO

Especie mostreada: RODABALLO

Nº de inmersións dende o último mostrase: unha.
Nº de balsas / gaiolas con alevins:.....Nº total de alevins:.....Densidade media:.....
Nº de balsas / gaiolas de engorde:..... .Nº total de engorde:.....Densidade media:.....

Engorde e alevins:

LOTE	Tamaño medio Peixes gr.	Inmersion Data	Inmersion Orixen	Nº peixes Orixinal	Nº peixes Agora	Nº Balsas ou Gaiolas Mostreadas	Nº Balsas ou Gaiolas Densidade	Nº peixes mostreados para: Cultivo	Viroloxía	Mucus	Sangue
1 5B2	55					de		5	5		
2 2M	80					de		6	6		
3 8E2	100					de		6	6		
4 12H2	200					de		6	6		
5 29B1	300					de		6	6		
6.						de					
7.						de					
8.						de					
9.						de					
Peixes lesionados:											
" mortos: NON											
TOTAIS:								29	29		

Larvas:

Stocks actuais: .....Cantidade mostreada: .....de..... dias / horas / gr.

Ovos:

☐ Sin eclosionar.....Stock actual: .....Cantidade mostreada: .....
☐ Eclosionados: .... " " : ..... " " : .....

Fluido ovárico:

Nº reproductores actual: .....Nº mostreado: .....Fluido ovárico recollido: .....

XUNTA DE GALICIA
CONSELLERÍA DE PESCA E ASUNTOS MARÍTIMOS
A CORUÑA

MARÍA JOSÉ MONTERO FIGUEIRAS A DOMINGO

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD

FECHA: 12/03/07 **EMPRESA:** CONSELLERÍA PESCA

OPERARIO: JMCL **PROCEDENCIA:** LOTAMAR

Muestreo en situ (PNT-G/PV-02) [X] / **Muestra recibida en el laboratorio** [ ]

MUESTRA

Código cliente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
5B2	Rodaballo	5	55 g	P.E.	
20A1		6	80 g	"	
8E2		6	100 g	"	
12H2		6	200 g	"	
29B1		6	300 gr	"	

Tipo de muestra: **C** (cerebro); **H** (hígado); **R** (riñón); **B** (bazo); **PE** (Peces enteros); **Otros** (especificar)

TIPO DE ANÁLISIS SOLICITADO:

[X] **Virológico:**

- [X] Cult cel
- [ ] Clf
- [ ] Me
- [ ] Efts
- [ ] SNT
- [ ] ID
- [ ] IFA
- [ ] RFLPs
- [ ] RT-PCR

[X] **Bactereológico:**

[ ] **Otros:**

[ ] **Otros**

Representante empresa:	Representante UIP: JMCL
EVA AREOSO	

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS

Intecmar
INSTITUTO TECNOLOXICO
PARA O CONTROL DO
MEDIO MARIÑO DE GALICIA

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 12-03-07

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 15 de julio de 2007

Fdo: *Dr. Juan L. Barja*
Director de la UIP
Instituto de Acuicultura

Fdo: David Iglesias Estepa
Xefe da unidade de Patoloxía do Intecmar

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS

Intecmar
INSTITUTO TECNOLOXICO
PARA O CONTROL DO
MEDIO MARIÑO DE GALICIA

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 12-03-07

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Forunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote 5B2: Ausencia.
Lote 20A1: Crecimiento moderado en el 100% de los peces en cultivo puro. Aislados *Photobacterium damselae* subespecie *damselae*.
Lote 8E2: Crecimiento moderado en el 100% de los peces en cultivo mixto.
Lote 12H2: Crecimiento escaso en el 50% de los peces en cultivo mixto. Aislado *Vibrio* sp.
Lote 29B1: Crecimiento escaso en el 100% de los peces en cultivo mixto. Aislado *Vibrio* tipo *scophtalmi*.

En Santiago de Compostela, a 15 de julio de 2007

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

Fdo: David Iglesias Estepa
Xefe da unidade de Patoloxía do
Intecmar

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS
Delegación Territorial de A Coruña

Ramón y Cajal, 1
15006 A CORUÑA
Tel. 981 18 20 00

MOSTRAXE DE CONTROL. DIRECTIVA 91/67/CEE:

Data: 14/NOV/07
Tª da auga: 13'5ºC

Nome / razón social: LOITAMAR S COOP Nº Rexistro
Titular / representante: D. ANTONIO PALLARES
Situación: RANDE-GAIOLAS Especies que teñen: RODABALLO

Especie mostreada: RODABALLO.

Nº de inmersións dende o último mostrase
Nº de balsas / gaiolas con alevins: Nº total de alevins: Densidade media:
Nº de balsas / gaiolas de engorde: Nº total de engorde: Densidade media:

Engorde e alevins:

LOT E	Tamaño medio Peixes gr.	Inmersion Data	Inmersion Orixen	Nº peixes Orixinal	Nº peixes Agora	Nº Balsas ou Gaiolas Mostreadas	Nº Balsas ou Gaiolas Densidade	Nº peixes mostreados para: Cultivo	Viroloxía	Mucus	Sangue
1. 2E2	750			ALRIAL		1 de 1		7	7		
2. 3B1	125			ALRIAL		1 de 1		8	8		
3. 1E2	165			MEREXO		1 de 1		5	5		
4. 2E2	150			MEREXO	150.000	1 de 1		5	5		
5. 3E1	25			MEREXO		1 de 1		5	5		
6.						de					
7.						de					
8.						de					
9.						de					
Peixes lesionados: NON.											
" mortos: NON.											
TOTAIS:								30	30		

Larvas:

Stocks actuais: Cantidade mostreada: de dias / horas / gr.

Ovos:

☐ Sin eclosionar Stock actual: Cantidade mostreada:
☐ Eclosionados: " " : " " :

Fluido ovárico:

Nº reproductores actual: Nº mostreado: Fluido ovárico recollido:

L. Arcos

Mª José Alonso

A. Pallares

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD

FECHA: 14/11/07 **EMPRESA:** CONSELLERÍA DE PESCA

OPERARIO: RCI **PROCEDENCIA:** LOITAMAR

Muestreo en situ (PNT-G/PV-02) [X] / **Muestra recibida en el laboratorio** [ ]

MUESTRA

Código cliente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
2E2	RODABALLO	7	250 g	PE	LOTE 1
2481	"	8	125 g	PE	LOTE 2
14E2	"	5	165 g	PE	LOTE 3
20E2	"	5	150 g.	PE	LOTE 4
3F1	"	5	25 g.	PE	LOTE 5

Tipo de muestra: **C** (cerebro); **H** (hígado); **R** (riñón); **B** (bazo); **PE** (Peces enteros); **Otros** (especificar)

TIPO DE ANÁLISIS SOLICITADO:

[X] **Virológico:** [ ] [ ] **Otros**

- [ ] Cult cel
- [ ] Clf
- [ ] Me
- [ ] Efts
- [ ] SNT
- [ ] ID
- [ ] IFA
- [ ] RFLPs
- [ ] RT-PCR

[X] **Bactereológico:**

[ ] **Otros:**

Representante empresa:	Representante UIP:
E. AREOSO	

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS

Intecmar
INSTITUTO TECNOLOXICO
PARA O CONTROL DO
MEDIO MARIÑO DE GALICIA

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 14-11-07

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 28 de diciembre de 2007

UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Unidad de Ictiopatología
Instituto de Acuicultura

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

Fdo: David Iglesias Estepa
Xefe da unidade de Patoloxía do Intecmar

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 14-11-07

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Forunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote 2E2: Crecimiento moderado en el 28% de los peces en cultivo puro. Aislado *Vibrio pelagius* biotipo I.
Lote 24BI: Ausencia.
Lote 14E2: Crecimiento escaso en el 20% de los peces en cultivo puro. Aislado *Vibrio pelagius* biotipo I.
Lote 20E2: Crecimiento escaso en el 40% de los peces en cultivo puro. Aislado *Vibrio* sp.
Lote 3F1: Crecimiento moderado en el 20% de los peces en cultivo puro. Aislado *Vibrio* sp.

En Santiago de Compostela, a 28 de diciembre de 2007

Fdo: *Dr. Juan La Barja*
Director de la UIP
Instituto de Acuicultura

Fdo: David Iglesias Estepa
Xefe da unidade de Patoloxía do
Intecmar

XUNTA DE GALICIA
CONSELLERÍA DO MEDIO RURAL
Dirección Xeral de Produción,
Industrias e Calidade Agroalimentaria

Serie 04 N.º 255880

ACTA DE INSPECCIÓN

Concello MOAÑA Parroquia DOMAIO
Lugar RIA DE VIGO En (*) PISCIFACTORIA MOAÑA
LOITAMAR , N.º Rxto./ C.E.A. 360290016 2
ás 12:25 horas do día 14 de DEZEMBRO de 2007
persóanse D. Miriam Menéndez Portas e D.
veterinarios dependentes da Consellería do Medio Rural proceder á inspección en relación coa aparición de procesos de tipo SHV e NHI e cubrir o protocolo de inspección das instalacións piscícolas mariñas

Previa acreditación documental da súa identidade requiren ó (**) Director Técnico
quen manifestou chamarse D. Antonio Pallares Méndez
con N.I.F.: n.º 32398664J de profesión biólogo
veciño de NOIA
con domicilio en Curro n.º 37
provincia Pontevedra para que facilite o servizo de inspección, poñéndose de manifesto os seguintes feitos:
Unha vez realizada a inspección visual dos
Xaulas da piscifactoría e consultado o responsable
non se observa mortalidade entre os animais
ou sintomatoloxía que faga sospeitar de
procesos patolóxicos tipo Necrose Hematopoética
Infecciosa (NHI) nin septicemia hemorráxica
viral (SHV)
Procédese a cumprimentar o protocolo de
inspección de instalacións piscícolas mariñas

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O comparecente, No seu caso, testemuñas
(Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..... mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

XUNTA DE GALICIA
CONSELLERÍA DO MEDIO RURAL

medio rural

DOCUMENTO DE DECLARACIÓN CENSUAL ANUAL DE EXPLOTACIÓN DE ACUICULTURA

D. ANTONIO PALLARES YENES

con DNI 32398664-J e enderezo a efectos de notificacións en REPÚBLICA DE CUBA, 4 - 1º IZQ.,

concello CANGAS, provincia de PONTEVEDRA,

titular/representante da explotación de acuicultura inscrita no Rexistro Oficial de Explotacións Gandeiras co código 360290016 2

DECLARA:

Que, segundo o recollido no artigo 4.3 do Real Decreto 479/2004, do 26 de marzo, polo que se establece e regula o Rexistro xeral de explotacións gandeiras, a explotación de acuicultura referenciada arriba, da que o titular/representante, presentou o seguinte censo/produción durante o ano 2007

ESPECIE ANIMAL	Ovos (unidades)	Alevíns (unidades)	Adultos para engorde (unidades e Tm anuais)		Reprodutores (unidades e Tm anuais)
☐ Troita					
☐ Salmón					
☒ Rodaballo			400 471	117,561	
☐ Lubina					
☐ Abadexo					
( ) Ollomol					
( ) Outras:					

En DONAIO, a 18 de DIC. de 2007

Asdo.: ANTONIO PALLARES

SR/SRA. DELEGADO/A PROVINCIAL DA CONSELLERIA DO MEDIO RURAL DE

→ A LA ATENCIÓN DE MIRIAM YENES

CONSELLERÍA DE AGRICULTURA, GANDERÍA E POLÍTICA AGROALIMENTARIA
DIRECCIÓN XERAL DE PRODUCCIÓNS AGROPECUARIAS
SUBDIRECCIÓN XERAL DE SANIDADE E PRODUCCIÓN ANIMAL
SERVICIO DE SANIDADE ANIMAL

INSPECCIÓN DAS INSTALACIÓNS PISCÍCOLAS MARIÑAS

Correspondencia coa Acta Nº 04/255880. Data 14/12/2007

I.- DATOS DA EMPRESA.

I.1.- Datos Comerciais

Nome ou Razón Social LOITAMAR S. COOP. GALEGA
Nome Comercial LOITAMAR
C.I.F. F3639 2223
Enderezo RIA DE VIGO/POLIGONO REDONDELA - DOMAIO **Concello** MOAÑA
Provincia PONTEVEDRA
Nº Rexistro 3602900162 **Teléfono** 619768385
Fax _____ **E-mail** _____

Carácter da piscifactoría: ☐ Pública ☒ Privada

Outras instalacións da Empresa ou Grupo:

.....
.....
.....
.....

I.2.- Datos do Titular ou Representante: DIRECTOR TECNICO

Nome ANTONIO PALLARES MENDEZ **N.I.F.** 32398664J
Enderezo CURRO 37 - NOIA **Concello** NOIA
Provincia CORUÑA **Cargo** DIRECTOR TECNICO

XUNTA DE GALICIA
CONSELLERÍA DO MEDIO RURAL
Dirección Xeral de Produción,
Industrias e Calidade Agroalimentaria

Serie 04 N.º 255963

ACTA DE INSPECCIÓN

Concello MOAÑA
Parroquia DOMAIO
Lugar RIA DE VIGO
En (*) PISCIFACTORIA MARIÑA
LOITAMAR
, N.º Rxto./ C.E.A. 360290016 2
ás 11:20 horas do día 28
de ABRIL de 200 8
persóanse D. Miriam Menéndez Rivas
e D.
veterinarios dependentes da Consellería do Medio Rural para proceder á inspección en relación coa aparición de procesos de tipo SHV e NHI

Previa acreditación documental da súa identidade requiren ó (**) Director técnico
quen manifestou chamarse D. Antonio Pallares Méndez
con N.I.F.: n.º 32398664J de profesión biólogo
veciño de NOIA
con domicilio en Curro n.º 37
provincia Coruña para que facilite o servizo de inspección, poñéndose de manifesto os seguintes feitos:
Unha vez feita inspección visual das xaulas de piscifactoría e consultado o responsable non se observa mortalidade entre os peixes ou sintomatoloxía que faga sospeitar de procesos patolóxicos tipo necrose hematopoiética infecciosa (NHI) nin septicemia hemorráxica viral (SHV)

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O comparecente, No seu caso, testemuñas
(Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..... mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD

FECHA: 12/05/08 **EMPRESA:** Conselleria de Pesca

OPERARIO: ASM / NFR **PROCEDENCIA:** Loitamar

Muestreo en situ (PNT-G/PV-02) [X] / **Muestra recibida en el laboratorio** [ ]

MUESTRA

Código cliente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
Lote 1	Rodaballo	5	±250gr	P. E	
Lote 2	"	5	±250gr		
Lote 3	"	10	±250gr		
Lote 4	"	10	25gr		

Tipo de muestra: **C** (cerebro); **H** (hígado); **R** (riñón); **B** (bazo); **PE** (Peces enteros); **Otros** (especificar)

TIPO DE ANÁLISIS SOLICITADO:

[X] **Virológico:**

- [X] Cult cel
- [ ] Clf
- [ ] Me
- [ ] Efts
- [ ] SNT
- [ ] ID
- [ ] IFA
- [ ] RFLPs
- [ ] RT-PCR

[X] **Bactereológico:**

[ ] **Otros:**

[ ] **Otros**

Representante empresa: Eloy Areoso	Representante UIP: ASM

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 12-05-08

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 15 de julio de 2008

Fdo: *Dr. Juan L. Barja*
Director de la UIP
Instituto de Acuicultura

Fdo: David Iglesias Estepa
Xefe da unidade de Patoloxía do Intecmar

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 12-05-08

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Furunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote 1: Ausencia.
Lote 2: Ausencia.
Lote 3: Crecimiento en el 10% de los peces en cultivo mixto. Aislado *Vibrio pelagius* biotipo II y *Pseudomonas* sp.
Lote 4: Crecimiento en el 10% de los peces en cultivo mixto. Aislado *Vibrio pacinii* y *Vibrio pelagius* biotipo I.

En Santiago de Compostela, a 15 de julio de 2008

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

Fdo: David Iglesias Estepa
Xefe da unidade de Patoloxía do
Intecmar

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Instituto de Acuicultura

SOLICITUD DE ANÁLISIS RECOGIDA DE MUESTRAS

Unidad de ICTIOPATOLOGÍA - Sección de:

NÚMERO DE SOLICITUD

FECHA: 4.11.08 **EMPRESA:** Consellería de Pesca

OPERARIO: ASJ **PROCEDENCIA:** Lourizán

Muestreo en situ (PNT-G/PV-02) ☐ / **Muestra recibida en el laboratorio** ☐

MUESTRA

Código cliente / Nº de Lote:	ESPECIE	Nº:	PESO MEDIO:	TIPO DE MUESTRA	Observaciones
06.08FT	Rodaballo	30	150/p	P.E	

Tipo de muestra: **C** (cerebro); **H** (hígado); **R** (riñón); **B** (bazo); **PE** (Peces enteros); **Otros** (especificar)

TIPO DE ANÁLISIS SOLICITADO:

☒ **Virológico:** ☐ ☐ **Otros**

- ☒ Cult cel
- ☐ Clf
- ☐ Me
- ☐ Efts
- ☐ SNT
- ☐ ID
- ☐ IFA
- ☐ RFLPs
- ☒ RT-PCR

☒ **Bactereológico:**

☐ **Otros:**

Representante empresa: Eloy Moreno	Representante UIP: ASJ

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 04-11-08

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista I (ISA ó AIS)

Ausencia

2.- Enfermedades de la Lista II(IHN ó NHI y VHS ó SHV)

Ausencia.

En Santiago de Compostela, a 22 de diciembre de 2008

UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Unidad de Ictiopatología
Instituto de Acuicultura

Fdo: ***Dr. Juan L. Barja***
Director de la UIP
Instituto de Acuicultura

XUNTA DE GALICIA
DELEGACION TERRITORIAL

Fdo: **Eloy Arcos Casal**
Técnico da Consellería de Pesca
e Asuntos Marítimos

XUNTA DE GALICIA
CONSELLERÍA DE PESCA
E ASUNTOS MARÍTIMOS

intecmar
INSTITUTO TECNOLOXICO
PARA O CONTROL DO
MEDIO MARIÑO DE GALICIA

RESULTADOS ANALÍTICOS

Especie: Rodaballo (*Psetta maxima*)
Empresa: Loitamar
Planta de cultivo: *Pol. Redondela A* (Domaio)
Fecha del muestreo: 04-11-08

De acuerdo con las Directivas Europeas 91/67 (modificada por las Directivas 93/54, 95/22, 97/79 y 98/45) y 93/53 (modificada por las Directivas 2000/27 y 2001/288), y la Decisión 2001/183, y sus correspondientes transposiciones a la Legislación Española, Reales Decretos R.D 1882/94 (modificado por R.D. 2581/96, R.D. 1255/1999 y R.D. 1597/2004) y 1488/94 (modificado por R.D.138/97 y R.D. 3481/2000), y la Orden del 19 de Septiembre de 2001, se realizaron los análisis para determinar la presencia de los agentes/enfermedades de las Listas I y II.

1.- Enfermedades de la Lista III (IPN ó NPI, *Renibacteriosis, Yersiniosis, Forunculosis y Girodactilosis).*

Ausencia.

2.- Otras enfermedades/agentes no incluidos en las listas, que en este momento no tienen relevancia legal pero que se detectaron durante el muestreo.

Lote 06.08FT: Crecimiento abundante en el 16% de los peces en cultivo mixto. Aislados *Vibrio scophthalmi* y *Aeromonas* sp.

En Santiago de Compostela, a 22 de diciembre de 2008

UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
Unidad de Ictiopatología
Instituto de Acuicultura

Fdo: *Dr. Julio L. Barja*
Director de la UIP
Instituto de Acuicultura

XUNTA DE GALICIA
DELEGACIÓN TERRITORIAL

Fdo: **Eloy Arcos Casal**
Técnico da Consellería de Pesca
e Asuntos Marítimos

XUNTA DE GALICIA
CONSELLERÍA DO MEDIO RURAL
Dirección Xeral de Produción, Industrias e Calidade Agroalimentaria

Serie 04 N.º 206869

ACTA DE INSPECCIÓN

Concello MOAÑA Parroquia MOAÑO - DOMAIO
Lugar Polígono Redondela A En (*) Piscifactoría MOITAMAR
, N.º Rxto./ C.E.A. 360290016 2
ás 12:15 horas do día 24 de Noviembre de 200 8
persóanse D. Miriam Menéndez Riba e D.
veterinarios dependentes da Consellería do Medio Rural procedeu á inspección en relación coa aparición de procesos tipo SHV e NHI

Previa acreditación documental da súa identidade requiren ó (**) Técnico responsable quen manifestou chamarse D. Antonio Pallares Menéndez con N.I.F: n.º 32398664J de profesión biólogo veciño de NOIA con domicilio en CURRU n.º 37 provincia Pontevedra para que facilite o servizo de inspección, poñéndose de manifesto os seguintes feitos:
Unha vez realizada inspección visual das xaulas - balsas da piscifactoría e consultado o responsable de non se observar mortalidade entre os animais ou sintomatoloxía que faga sospeitar de procesos patoloxicos tipo nefrose hematopoiética infecciosa (NHI) ou septicemia hemorráxica viral (SHV).
Procédese a cumprimentar o protocolo de inspección de instalacións piscícolas mariñas.

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase o presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O comparecente, No seu caso, testemuñas (Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..... mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

30024

XUNTA DE GALICIA
CONSELLERÍA DO MEDIO RURAL
Dirección Xeral de Produción, Industrias e Calidade Agroalimentaria

Serie 04 N.º 210593

ACTA DE INSPECCIÓN

Concello Moaña Parroquia Domaio
Lugar Polígono Redondela - Ría de Vigo. En (*) Loitamar S. Coop. Galega
, N.º Rxto./ C.E.A. 36029 0016201
ás 12'40 horas do día 4 de marzo de 2009.
persóanse D. Óscar Baz Blanco e D. José Fabelo Gallego
veterinarios dependentes da Consellería do Medio Rural para proceder á toma de mostras para a determinación de SHV e NHI

Previa acreditación documental da súa identidade requiren ó (**) Responsable
quen manifestou chamarse D. José Antonio Torres Chapela.
con N.I.F.: n.º 35277786 H. de profesión Acuicultor.
veciño de Bueu
con domicilio en n.º
provincia Pontevedra. para que facilite o servizo de inspección, poñéndose de manifesto os seguintes feitos:
Non se observan mortalidade nin histopatoloxía que faga sospeitar de procesos patolóxicos do tipo SHV/NHI. Procédese á toma de mostras de tecidos correspondentes a 30 exemplares da especie rodaballo procedente do único lote existente na planta.

En relación con ditos feitos o comparecente manifesta:

En proba do actuado levántase a presente Acta por triplicado exemplar, asinando os veterinarios actuantes e o comparecente a quen se lle fai entrega dun dos exemplares do Acta.

Pola Consellería, O comparecente, No seu caso, testemuñas
(Nome, D.N.I., enderezo)

(*) Explotación da que é titular D..... mercado, fábrica, etc.
(**) Titular, responsable, posuidor, empleado, etc. (da explotación, industria, animais, productos, etc.)

Cod. 0004

12.14 Staðfesting vegna tilskipunar 2008/392 Evrópusambandsins á fiskeldi án sjúkdóma

EXPLOTACIONES DE ACUICULTURA DE PECES DE GALICIA

Anexo I de la Decisión 2008/392/CE, de 30 de abril de 2008, de la Comisión.
Información de conformidad con el artículo 59 de la Directiva 2006/88/CE.

INFORMACIÓN			EXPLOTACIÓN
1. Empresa de producción acuícola	1.1.1. Nombre de la :	Empresa de producción acuícola	STOLT SEA FARM SA
		Explotación	MEREXO-MUXIA
	1.1.2.	Dirección o ubicación de la explotación:	MEREXO-OZON-MUXIA
2. Número de registro (de cada explotación)	2.1.		ES150520100501
3. Posición geográfica y sistema de coordenadas (de cada explotación)	3.1.	Longitud / X	485174
		Latitud / Y	4772238
		Sistema de coordenadas	UTM/ED50/29
4. Especies mantenidas (1) (de cada explotación y en relación con su sensibilidad a determinadas enfermedades) **Marcar con una "X" la casilla correspondiente para cada una de las enfermedades**	4.1.1. Septicemia hemorrágica vírica	NO, hay especies sensibles o portadoras	
		SI, hay especies sensibles	X
		SI, hay especies portadoras	
	4.1.2. Necrosis hematopoyética infecciosa	NO, hay especies sensibles o portadoras	X
		SI, hay especies sensibles	
		SI, hay especies portadoras	
	4.1.3. Virus herpes koi	NO, hay especies sensibles o portadoras	X
		SI, hay especies sensibles	
		SI, hay especies portadoras	
	4.1.4. Anemia infecciosa del salmón	NO, hay especies sensibles o portadoras	X
		SI, hay especies sensibles	
		SI, hay especies portadoras	
5. Situación sanitaria reconocida (2) (de cada explotación) **Marcar con una "X" la casilla correspondiente a la situación sanitaria para cada una de las enfermedades**	5.1.1.Septicemia hemorrágica vírica	5.1.1.1. Declarada libre de la enfermedad	X
		5.1.1.2. Sometida a programa de vigilancia	
		5.1.1.3. Sin infección conocida	
		5.1.1.4. Otros	
	5.1.2.Necrosis hematopoyética infecciosa	5.1.2.1. Declarada libre de la enfermedad	X
		5.1.2.2. Sometida a programa de vigilancia	
		5.1.2.3. Sin infección conocida	
		5.1.2.4. Otros	
	5.1.3.Virus herpes koi	5.1.3.1. Declarada libre de la enfermedad	
		5.1.3.2. Sometida a programa de vigilancia	
		5.1.3.3. Sin infección conocida	X
		5.1.3.4. Otros	
	5.1.4.Anemia infecciosa del salmón	5.1.4.1. Declarada libre de la enfermedad	X
		5.1.4.2. Sometida a programa de vigilancia	
		5.1.4.3. Sin infección conocida	
		5.1.4.4. Otros	
	5.1.5.Necrosis pancreática infecciosa (3)	5.1.5.1. Declarada libre de la enfermedad	
		5.1.5.2. Sometida a programa de vigilancia	
		5.1.5.3. Sin infección conocida	X
		5.1.5.4. Otros	
	5.1.6.Gyrodactylus salaris (3)	5.1.6.1. Declarada libre de la enfermedad	
		5.1.6.2. Sometida a programa de vigilancia	
		5.1.6.3. Sin infección conocida	X
		5.1.6.4. Otros	
	5.1.7.Necrosis pancreática infecciosa (3)	5.1.7.1. Declarada libre de la enfermedad	
		5.1.7.2. Sometida a programa de vigilancia	
		5.1.7.3. Sin infección conocida	X
		5.1.7.4. Otros	
	5.1.8.Otras enfermedades (4)	5.1.8.1. Declarada libre de la enfermedad	
		5.1.8.2. Sometida a programa de vigilancia	
		5.1.8.3. Sin infección conocida	
		5.1.8.4. Otros	
6. Tipo de explotación (de cada explotación) (5) **Marcar con una "X" la/s casilla/s correspondientes**	6.1.1. Jaulas/cercados/corrales de agua salada		
	6.1.2. Estanques de agua salada		X
	6.1.3. Tanques/canales de agua salada		
	6.1.4. Sistema cerrado de agua salada (recirculación)		
	6.1.5. Jaulas/cercados/corrales de agua dulce		
	6.1.6. Estanques de agua dulce		
	6.1.7. Tanques/canales de agua dulce		
	6.1.8. Sistema cerrado de agua dulce (recirculación)		
	6.1.9. Instalación de investigación		
	6.1.10. Instalación de cuarentena		
	6.1.11. Otros		
7.Producción (de cada explotación) (5) **Marcar con una "X" la/s casilla/s correspondientes**	7.1.1. Incubadora		X
	7.1.2. Vivero		
	7.1.3. Población reproductora		
	7.1.4. Engorde para consumo humano		X
	7.1.5. Pesquerías "de suelta y captura"		
	7.1.6. Otros		

(1)Las especies sensibles y portadoras están enumeradas en el anexo IV de la Directiva 2006/88/CE.
(2)Utilice la casilla "otros" si la explotación está sometida a un programa de erradicación o a medidas de control con arreglo a las secciones 3,4,5 o 6 del capítulo V de la Directiva 2006/88/CE.
(3)Solo aplicable a los Estados miembros, las zonas o los compartimentos enumerados en los anexos I o II de la Decisión 2004/453/CE de la Comisión (DO L 156 de 30.4.2004, p.5) en relación con esta enfermedad.
(4)Solo aplicable a los Estados miembros, las zonas o los compartimentos en los que se hayan autorizado medidas con arreglo al artículo 43 de la Directiva 2006/88/CE.
(5)Pueden marcarse dos o más casillas.

12.15 Fræðigrein “The Question of the Existence of Specific Marine Bacteria”

Meðfylgjandi fræðigrein fjallar um sjúkdóma tengda fiskeldinu.

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The Question of the Existence of Specific Marine Bacteria[1]

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INTRODUCTION

Much information has accumulated over the past 60 years on the nutrition and metabolism of bacteria from nonmarine sources. In contrast, little comparable information is available regarding bacteria from the sea. This may be due, at least in part, to the fact that there has been considerable doubt as to whether or not there actually are specific marine bacteria. Representatives of most of the well-defined bacterial genera found growing on land and in freshwater have been isolated from seawater and marine muds. If no differences exist between bacteria in the sea and their counterparts on land except superficial ones readily lost by training, there would be little purpose in studying the nutrition and metabolism of the same genera of bacteria in more than one habitat. In fact, it has been stated that the central problem of marine microbiology is the question of the existence of specific marine bacteria, and, until this problem is settled, work on marine bacteria, apart from studies on gross transformations of matter, would have very little point (76).

Most of the experiments undertaken in attempting to settle the question have dealt with the temperature range and halophilic nature of bacteria from the sea. Marine bacteria were found to be generally more psychrophilic in character than terrestrial species and to prefer seawater or 3% NaCl to freshwater in the medium for growth. Evidence was presented, however, to indicate that these physiological properties were unstable. Baars (2), for instance, reported success in interconverting, by training procedures, three varieties of sulfate-reducing bacteria which, on the basis of temperature range, salt range, and habitat, had been regarded as separate species. ZoBell and Rittenberg (92) found that chitinoclastic bacteria from the sea, after prolonged laboratory cultivation or acclimatization procedures, developed the ability to grow in freshwater media. This change was accompanied by a widening of the temperature range for growth.

Reports on the stability of the halophilic character of marine bacteria have been particularly

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confusing. Korinek (36) stated that after cultivation for 1 year on laboratory media original differences in salinity requirements between freshwater and marine bacteria were not eliminated. Stanier (76) reported failure to train marine agar-digesting bacteria to grow at appreciably lowered seawater or salt concentrations. Littlewood and Postgate (40), studying strains of *Desulfovibrio desulfuricans* of both freshwater and saltwater origin, found a complete gradation of behavior towards NaCl within the genus *Desulfovibrio*, ranging from very salt-sensitive to salt-requiring types. The strain requiring NaCl could not be adapted to grow in media lacking added NaCl. ZoBell and Michener (86), however, observed that 9 of 12 cultures requiring seawater in the medium on initial isolation grew in the same medium prepared with freshwater after the cultures had been held 5 months without transfer. Paradoxically, attempts to train the original cultures to grow at lower seawater concentrations met with only limited success. ZoBell reported subsequently that 56 of 60 species of marine bacteria had developed a capacity to grow in freshwater media (89). Observations such as these led ZoBell and Upham (88) to define marine bacteria as being bacteria from the sea which on initial isolation required seawater in the medium for growth.

Reports of the growth of marine bacteria in media prepared without seawater or NaCl were all based on observations made with complex laboratory media such as nutrient broth, fish broth, or Trypticase. This type of medium could be expected to be contaminated with inorganic ions, a factor which might conceivably have a bearing on the conflicting reports on the stability and specificity of the salt requirements of marine bacteria. The importance of inorganic contaminants for the growth of marine bacteria was first clearly demonstrated by Richter (70) in 1928, but his observations were generally ignored. By using low concentrations of peptone and taking very special precautions to avoid the introduction of inorganic contaminants, he was able to show that a marine luminous bacterium had a specific requirement for Na^+ for growth and luminescence.

Recently, studies of pure cultures of marine bacteria growing in chemically defined media have been conducted for the purpose of critically evaluating the role of the various components of the media in the growth and metabolism of the cells. From the observations made, as well as from investigations with washed-cell suspensions, cell-free extracts, and particulate components of the organisms, new insight has been gained into the relation of marine bacterial cells to their environment. These studies and the bearing of the findings on the question of the existence of specific marine bacteria are the subject of the present review.

ORGANIC REQUIREMENTS

The highest plate counts on seawater and marine materials are obtained when the plating medium contains a complex carbon and nitrogen source such as peptone. Those bacteria of marine origin which grow on such a medium prepared with seawater but not on the same medium prepared with freshwater on initial isolation have been defined as marine bacteria and their characteristics, unless otherwise indicated, are the subject of the present review. The bacteria isolated from such media are heterotrophic, 95% are gram-negative rod forms, and most are motile (89). The first attempts to replace the complex carbon and nitrogen source with chemically defined components in media for the growth of these organisms were made with marine luminous bacteria. Mudrak (58) showed that 10 strains of luminous bacteria isolated from various marine fish grew and luminesced well in nutrient solutions in which peptone was replaced by asparagine or aspartic acid. Bukatsch (12) found that several amino acids, such as glutamic acid, serine, alanine, and leucine, could replace peptone in a medium containing glycerol for the growth of some marine luminous bacteria isolated from herring. Ostroff and Henry (60) studied the capacity of 15 aerobic bacteria of marine origin to utilize various classes of nitrogen-containing compounds as sources of carbon and nitrogen in a simple medium containing 3% NaCl. The different bacteria grew luxuriantly on amino acids which, as a class of compounds, were the best sole source of nitrogen and carbon. Alanine, aspartic acid, and glutamic acid, tested separately, permitted growth of the largest numbers of different organisms. Doudoroff (22) found that four species of *Photobacterium* were able to develop in inorganic media with simple organic compounds as sole carbon source and NH_4Cl as a nitrogen source. In contrast, most strains of *P. phosphoreum* did not develop readily in the basal medium with a single carbon source but required the further addition of methionine. MacLeod et al. (43) investigated the organic nutritional requirements of 33 bacteria of marine origin; 19 were found to have relatively simple nutritional requirements, in that any one of several organic compounds could act as a source of carbon and energy with an inorganic ammonium salt present as a source of nitrogen. More organisms could use succinate as sole carbon source than could utilize glucose. The one carbon and energy source ac-

ceptable to all the organisms tested was a complex mixture of 18 amino acids. Seven of the organisms grew only in the presence of the amino acids. For the latter bacteria, the complex mixture could be replaced by glutamic acid, preferably in combination with alanine and aspartic acid. Burkholder and Bornside (13) showed that a number of marine isolates from the coast of Georgia, which were able to decompose marsh grass, did not possess specific requirements for single amino acids but grew better on multiple mixtures. Among the combinations of pure amino acids studied, a mixture of alanine, aspartic acid, and glutamic acid was reported to yield very good growth.

MacLeod et al. (43) found that several marine bacteria required the addition of vitamins to the medium for growth. Requirements for biotin, for biotin and thiamine, and for biotin, thiamine, and niacin were demonstrated in the case of three organisms. Surface-active agents stimulated the growth of two others. One organism, a *Flavobacterium*, required six amino acids, biotin, thiamine, a combination of three nucleosides, and a surface-active agent in the medium to promote appreciable growth in the absence of yeast extract (47).

Burkholder (14) reported on the general growth requirements of 1,748 aerobic heterotrophic bacteria isolated from marine muds. He was able to grow 75% of these on media of known chemical composition. Biotin and thiamine were the vitamins most frequently required for growth. Cobalamin and nicotinic acid stood next, and pantothenate and riboflavine requirements occurred infrequently.

Studies so far indicate that the marine bacteria which grow on complex media possess a wide range of organic nutritional requirements, from the relatively simple to the very complex. The plankton in seawater and its residues in marine mud could be expected to serve as a source of the nutrients required by these organisms. Although these bacteria appear to have a characteristic preference for amino acids as a carbon, nitrogen, and energy source, there is nothing that could be considered unique about their organic nutritional requirements.

INORGANIC REQUIREMENTS

The need for seawater or NaCl in the medium for growth has long been considered to reflect a requirement of marine bacteria for a medium in which salts maintained a suitable osmotic pressure. This conclusion stemmed from observations that marine luminous bacteria lysed when suspended in seawater too greatly diluted with distilled water (31, 32, 33). The first indication that there might be a specific function for the ions of seawater in the growth of marine bacteria was provided by Richter (70), who showed that a marine luminous bacterium had a specific requirement for Na^+. This report was confirmed, and the observation was extended to 10 additional strains of marine luminous bacteria by Mudrak (58), who used a chemically defined medium for the growth of his organisms. Bukatsch (12), using a defined medium, showed that luminous bacteria of marine origin also required K^+. Dianova and Voroshilova (21), employing a fish broth medium, found that Na^+ salts were required for the growth of a number of marine isolates and could not be replaced by equimolar concentrations of K^+ salts. MacLeod and Onofrey (44) found that six marine isolates grew relatively poorly when either natural or artificial seawater was the diluent in a chemically defined medium unless a supplement of an iron salt was added. In addition, both the rate and extent of growth were increased when half-strength, rather than full-strength, seawater was used. When both natural and artificial seawater were supplemented with iron and tested at half strength, there was no significant difference in the capacity of the two diluents to promote the growth of the organisms. When the need for the various ions in artificial seawater was examined, all of the organisms tested could be shown to require Na^+, K^+, Mg^{++}, $PO_4^{=}$ and SO_4^{-} for growth. Several of the organisms also required Ca^{++} and some Cl^-.

Requirement for Na^+

Specificity of the requirement. Since the possession of a requirement for Na^+ for growth distinguishes marine bacteria from most nonmarine species, the characteristics of the Na^+ requirement are of special interest.

When the quantitative requirements of three marine bacteria for Na^+ were determined, MacLeod and Onofrey (46) found that the maximal rate and extent of growth was achieved with 0.2 to 0.3 M Na^+, which is about one-half of the Na^+ concentration in seawater. Below this level, the rate and extent of growth were roughly proportional to the amount of Na^+ added. After a sufficiently long incubation period, growth occurred at almost one-tenth of the optimal concentration of Na^+, but never in the absence of the ion. Li^+, Rb^+, and Cs^+ showed no capacity to replace Na^+ for the growth of the organisms. K^+ exhibited a very slight sparing action at suboptimal concentrations of Na^+, an effect which disappeared on longer incubation. Sucrose had about the same limited capacity to spare the Na^+ requirement. These findings indicated that the requirement for Na^+ of the organisms examined was highly specific and that Na salts had little

if any osmotic function. Two of the organisms examined in this study have been recognized more recently to be pseudomonads, and the third was a *Cytophaga* species (52).

Payne (61) studied the Na^+ requirement of a glucuronate-oxidizing marine pseudomonad and also concluded that the effects of salts could not be explained by their osmotic action. Pratt and Austin (66), on the other hand, found that a number of salts and sucrose could greatly reduce but not eliminate the requirement of a marine *Vibrio* for Na^+. They concluded, in the case of this organism and three others examined, that a considerable proportion of the salt requirement was needed to satisfy the osmotic demands of the organisms. In an extension of these studies, Pratt (67) reported that, with seawater samples plated on a Trypticase medium containing a low concentration of added NaCl, increases in counts were obtained when the medium was supplemented with either KCl or sucrose. The counts were not so high as those obtained when the medium was made equiosmolar with respect to NaCl. He concluded that approximately half the bacteria in the samples would grow in media in which a substantial replacement of NaCl by sucrose or KCl had been made. It would thus appear that different marine bacteria differ in the extent to which nonspecific solutes can replace Na^+ for growth. In all cases examined in detail, however, it has been shown that bacteria of marine origin requiring seawater in the medium for growth have an irreplaceable minimal requirement for Na^+. Tyler et al. (80) studied 96 isolates of marine bacteria from Atlantic coastal waters off Florida and found all to require Na^+.

Most marine bacteria which have been examined have Na^+ requirements which are readily detectable, because the amounts needed for optimal growth are 0.2 to 0.3 M. Such organisms require the addition of Na salts or seawater even to the complex laboratory media commonly used for their isolation, though such media are usually contaminated with appreciable amounts of Na^+. Two organisms of marine origin were isolated, however, which grew optimally in complex media prepared with freshwater. Such organisms would not have been classified as marine bacteria according to earlier criteria (88). When grown on chemically defined media, however, their requirements for Na^+ became apparent (43). Quantitative estimations of their requirements revealed that one needed 0.02 M Na^+ and the other 0.005 M Na^+ for optimal growth (MacLeod and Onofrey, *unpublished data*). By comparison, the nutrient broth-yeast extract isolation medium prepared with distilled water contained 0.03 M Na^+, an amount clearly sufficient to permit optimal growth of both organisms.

Stability of the requirement. It was of interest to determine whether the requirement of marine bacteria for Na^+ is as readily lost as the requirement for seawater had been reported to be. By plating heavy suspensions of marine bacteria on Trypticase medium prepared without added Na^+, Pratt and Waddell (63) obtained a few colonies which they concluded were mutants of marine bacteria no longer requiring Na^+ for growth. MacLeod and Onofrey (53) trained a marine pseudomonad to grow on Trypticase medium prepared without added Na^+ salts by streaking cultures serially onto the surface of plates of the medium containing progressively lower concentrations of Na^+. A flame photometric analysis of the Trypticase medium without added salts revealed a concentration of 0.028 M Na^+ present as a contaminant. When the adapted culture was tested in a chemically defined medium containing less than 6.5×10^{-5} M Na^+, the organism was found still to require Na^+ for growth. The adapted culture grew only a little more quickly and at a slightly lower Na^+ concentration in the chemically defined medium than the parent culture. All attempts to train the organism to grow in the chemically defined medium in the absence of added Na^+ failed. This organism, which had been trained to grow in a complex medium without added Na^+ salts had apparently developed a capacity to grow well at the concentrations of Na^+ present as a contaminant in the complex medium, so long as other components of the complex medium were present. The possible significance of this finding in relation to the reported ability of some marine bacterial cultures to lose their requirement for seawater remains to be established.

When a marine pseudomonad was exposed to ultraviolet irradiation, a limited number of what appeared to be mutants were obtained which grew in the chemically defined medium in the absence of added Na^+ (53). The extent and rate of growth of the mutants was still enhanced by added Na^+, but this response could be eliminated by training. The difficulty experienced in getting any appreciable number of mutants lacking a Na^+ requirement by irradiation of a Na^+-dependent culture is a further indication of the stability of the Na^+ requirement of these organisms.

Uniqueness of the requirement. The evidence which has accumulated suggests that bacteria from the sea which require seawater in the medium for growth on isolation possess a stable, highly specific, and in most cases readily detectable requirement for Na^+ for growth. To

what extent is this a characteristic unique for marine bacteria? Halophilic bacteria, including representatives of the extreme halophiles, have been isolated from freshwater sources and soil. Both extreme and moderate halophiles have been reported to have specific requirements for Na^+ [*see* Larsen (39) for a review]. Among nonhalophilic species, two strains of *Rhodopseudomonas spheroides* and one strain of *R. palustris* were found to require Na^+ when grown in a chemically defined medium (75). The original source of these isolates was unknown. A strain of *Bacteroides succinogenes*, a cellulolytic organism isolated from the rumen of a steer, also has been shown to require Na^+ for growth (10). Goldman and co-workers made the interesting observation that a number of strains of lactic acid bacteria isolated from meat-curing brines developed a requirement for NaCl at elevated temperatures (28). Tests indicated that neither the Na^+ nor the Cl^- could be replaced by other ions. These are the only well-documented cases so far reported of bacteria from nonmarine sources requiring Na^+ specifically for growth. Sakazaki et al. (71), however, reported that they have confirmed an observation made by Nakagawa (cited as a personal communication) that various halophilic organisms can be found in the feces of guinea pigs, rats, and monkeys. These organisms required 3% salt for growth. Although a requirement for Na^+ has not been established in this case, it is evident that a specific need for Na^+ is not a characteristic unique for bacteria of marine origin and may well prove to be more widespread than was previously imagined.

Among those organisms needing Na^+ for growth, there is a wide range in quantitative requirements. In the case of extreme halophiles, growth ceased when the Na^+ concentration fell below 1.5 M, even in the presence of large amounts of K^+ or Mg^{++}, and for maximal growth under these circumstances 2.5 M Na^+ was required (5). The moderate halophile *Vibrio costicolus* had a nonspecific requirement for about 0.4 M salt in the medium but a specific requirement for only 0.017 M Na^+ (18). The strains of *Rhodopseudomonas* studied by Sistrom (75) required a maximum of 0.002 M Na^+ for growth. The marine bacteria so far examined have been found to have optimal requirements for Na^+ ranging from 0.005 to 0.2 M, depending on the species.

Function of Na^+. Washed-cell suspensions of two marine pseudomonads were shown to require Na^+ as well as K^+ for the oxidation of exogenous substrates (79, 48, 62). In the case of these organisms, neither related ions nor sucrose showed any significant capacity to reduce the requirement for Na^+ for oxidation. In this respect, the responses to the ions for substrate oxidation were similar to those for growth. When one of the organisms was examined in more detail, the amounts of Na^+ required for oxidation were found to vary, depending on the substrate being oxidized (48). To obtain maximal rate of oxidation of acetate, butyrate, propionate, or an oxidizable sugar, 0.05 M Na^+ was required; for malate, citrate, and succinate, 0.15 to 0.20 M Na^+ was necessary. All the enzymes of the tricarboxylic cycle were found to be present in cell-free extracts of the organism. When each of the enzymes was tested for its response to inorganic ions, the acetate-activating enzyme and malic dehydrogenase were found to require K^+, aconitase and isocitric dehydrogenase required media of appropriate ionic strength (0.3 to 0.4 μ) for optimal activity, and the remainder functioned better in the absence of added salts than in their presence. None of the enzymes, however, could be shown to require Na^+ specifically (48, 49).

Washed cells of a marine *Vibrio* species were found to require both Na^+ and K^+ for the production of indole from tryptophan (64). In the case of this organism, however, the presence of sucrose in the suspending medium reduced the Na^+ requirement for indole production from 0.3 to 0.05 M. A similar sparing action of sucrose on the Na^+ requirement has been observed with this organism during growth (66). Cell-free extracts of the *Vibrio* required K^+ and pyridoxal phosphate for indole production. Added NaCl was not required, and concentrations of NaCl giving optimal activity with intact cells partially inhibited the activity of cell-free extracts.

Payne noted that induction and activity of enzymes for catabolizing glucuronate in the marine isolate *Pseudomonas natriegens* were specifically affected by the presence of Na^+ and K^+. The role of K^+ appeared to be restricted to influencing the activity and not the induction of enzymes. The requirement for Na^+, however, seemed to be coupled to the induction of a mechanism for the uptake of glucuronate (61, 62). In subsequent experiments, the induction of resting cells of the same organisms and other marine isolates to the oxidation of L-arabinose, mannitol, and lactose was found to be dependent on the presence of Na^+ (69).

A role for Na^+ in the induction of penetration mechanisms or in the formation of adaptive enzymes would fail to account for the requirement for Na^+ observed when compounds were oxidized by pathways employing constitutive permeases and enzymes. Under these circumstances, since whole cells required Na^+ for the metabolism of

substrates whereas intracellular enzymes appeared not to require the ion, it seemed likely that Na^+ might be involved in the transport of substrates into the cell. To test this possibility, it was necessary to dissociate the uptake of substrates from their subsequent metabolism. This was accomplished by using nonmetabolizable analogues of metabolizable substrates. Drapeau and MacLeod (23) found that, when washed cells of a marine pseudomonad were incubated with C^{14}-α-aminoisobutyric acid, this analogue of the naturally occurring amino acids accumulated inside the cells but could not be metabolized. The uptake required the presence of Na^+ in the suspending medium. Since uptake took place without a lag period from an incubation mixture containing chloramphenicol, the possibility that the accumulation was due to the preliminary induction of a penetration mechanism was rendered very unlikely. K^+, Rb^+, NH_4^+, Li^+, and sucrose could not substitute for Na^+ in the transport process. Sulfate and chloride salts providing the same level of Na^+ were equally effective. The uptake process was an active one, because the substrate was concentrated in the cells to a level some 3,000 times that in the medium. The uptake was stimulated by the presence of an oxidizable substrate (in these experiments, galactose). Since galactose required less Na^+ for its maximal rate of oxidation than was needed for the optimal rate of uptake of the amino acid analogue, there was clearly a role for Na^+ in the uptake process which was separate from any other possible role of Na^+ in oxidative metabolism. Because D-fucose, a nonmetabolizable analogue of galactose, also required Na^+ for uptake, it seemed likely that the requirement for Na^+ for galactose oxidation also represented a requirement for transport. The uptake of α-aminoisobutyric acid by cells of the marine luminous bacterium *Achromobacter* (*Photobacterium*) *fischeri* has also been shown to be a Na^+-dependent process (Drapeau and MacLeod, *unpublished data*). These results support the conclusion that the primary function of Na^+ in marine bacteria may be to permit the transport of substrates into the cell. Previously observed differences in the quantitative requirements for Na^+ for the oxidation of various substrates by cells of a marine bacterium (48) can now be accounted for if one assumes a number of different permeases in the cell membrane with quantitatively different requirements for Na^+ for activation. Whether or not there are Na^+-dependent transport mechanisms in Na^+-requiring bacteria of nonmarine origin has yet to be determined.

Response to Halides

Of six marine bacteria examined, three were found to have an absolute requirement for halide ions for growth, and three reached maximal growth more quickly if halide was present in the medium (45). Chloride and bromide could be used interchangeably on a mole for mole basis in these experiments. Iodide was toxic. The amounts of halide required and the effects of the anion on rate and extent of growth corresponded closely to the response to Na^+, suggesting that the function of the two ions might be closely related in the metabolism of those organisms requiring both ions.

Some moderate and extreme halophiles have specific requirements for chloride for growth, whereas others do not [*see* Larsen (39) for a review]. In all cases but one so far reported, halide requirements for growth among bacteria have been detected only in bacteria which also need Na^+ specifically, though organisms requiring Na^+ do not always need halide. The exception is a strain of *D. desulfuricans* which failed to grow without the addition of NaCl to the medium. The Na^+ but not the Cl^- could be replaced by other ions (40).

Requirement for Mg^{++}

When grown in a chemically defined medium, marine bacteria have been found to require 4 to 8 mM Mg^{++} for maximal rate and extent of growth (45). This requirement is high compared with that of most terrestrial species examined. A level of 0.02 mM Mg^{++} was established as the requirement of a strain of *Escherichia coli* (85) and 0.08 mM was needed by *Bacillus subtilis* (26). Wiebe and Liston (83), noting the high Mg^{++} requirement of classical marine bacterial types, suggested that this might be a useful criterion of the marine origin of a bacterium. In the case of the marine bacteria examined by MacLeod and Onofrey (45), however, a marked interaction between Mg^{++} and Ca^{++} was noted. For one organism, the presence of 2.5 mM Ca^{++} in the medium reduced the requirement for Mg^{++} from 8 mM to 0.04 mM but did not eliminate the need for the ion. Higher levels of Ca^{++}, on the other hand, increased the requirement for Mg^{++}. For other organisms, both Mg^{++} and Ca^{++} were required for growth and, in these, the quantitative requirements for one of the ions was much affected by the level of the other in the medium. Both Mg^{++} and Ca^{++}, therefore, appear to play an important role in the nutrition of marine bacteria, and the requirements for these two ions taken together are somewhat higher than those of most terrestrial species. The requirements of marine bacteria for divalent ions are low, however, compared with the levels required by the extreme halophiles. For the latter organisms, 100 to 500 mM concentrations of Mg^{++} are necessary for optimal growth and for the maintenance of

normal morphology in media containing all the other ions necessary for growth at their optimal concentrations (5).

Salt Tolerance

It is commonly assumed that marine bacteria, since they live in the sea, must be salt-tolerant organisms. Seawater, however, contains only 0.45 M Na^+, 0.05 M Mg^{++}, 0.01 M K^+, and 0.01 M Ca^{++}, plus traces of other ions. The Na^+ level, expressed as NaCl, is about 2.6%. Three marine bacteria investigated by MacLeod and Onofrey (46) were inhibited by the presence of 0.8 M Na (4.7% NaCl) in the medium. Of 15 marine bacteria examined by Tyler et al. (80), all grew at 0.8 M (4.7%) NaCl, 9 grew at 1.4 M (8.2%) NaCl, and none grew at 2.6 M (15.2%) NaCl. In contrast, many terrestrial species, among them organisms not classed as halophiles, can tolerate much higher concentrations of salt than the marine bacteria studied. Larsen (39) stated that, among bacteria commonly found to be agents of food spoilage, aerobic sporeformers grow at 15 to 20% NaCl and many micrococci tolerate 25% NaCl. Gram-negative rods of terrestrial origin are generally completely inhibited by NaCl concentrations between 5 and 10%, and thus have a sensitivity to salt similar to that of the marine bacteria examined.

Lytic Susceptibility

Characteristics of the lytic phenomenon. Harvey (31) observed in 1915 that marine luminous bacteria failed to luminesce when the seawater in which they were suspended was too greatly diluted with distilled water. He ascribed the effect to cytolysis through lowered osmotic pressure, because light production was maintained when seawater was replaced by a 1 M sucrose solution. Hill (32) concluded that luminous bacteria are cytolyzed by water, hypotonic nonpenetrating solutions, and penetrating solutions of all concentrations. A penetrating solution in Hill's study was one which failed to prevent lysis of cells suspended in it. In a study of 96 isolates of marine bacteria (all nonluminous gram-negative rod forms), Tyler et al. (80) observed that in the majority of cases suspensions of cells of the organisms were susceptible to a loss of optical density in distilled water. MacLeod and Matula (52) found that five marine bacteria differed considerably in lytic susceptibility. Two lysed immediately and completely when suspended in less than 0.15 M NaCl, but suspensions of the other three still contained many whole cells at 0.025 M NaCl.

Pratt and Riley (65) and MacLeod and Matula (52) noted differences in the capacities of different salts to prevent lysis of marine bacteria. For a number of different isolates NaCl and LiCl were found to be more effective than KCl or NH_4Cl in preventing lysis. The same salts had the same relative capacity to prevent lysis in the case of the moderate halophile *Vibrio costicolus* (19) and the extreme halophile *Halobacterium cutirubrum* (1), suggesting that the mechanism of lysis may be basically the same in all of the organisms examined.

Divalent cations were found to be much more effective than monovalent cations in preventing lysis of marine bacteria (51). The order of effectiveness of the divalent cations appeared to be similar to that of their capacity to form chelate complexes. The Mg^{++} and Ca^{++} concentrations in seawater would have been sufficient to prevent the lysis of all but one of the marine bacteria examined, without the assistance of Na^+ salts.

The nature of the anion was found to be important in preventing lysis of marine bacteria, particularly on long incubation of suspensions of the cells (52). For four of five organisms examined, sulfate salts stabilized the cell suspensions better than did chlorides. For the fifth organism, the reverse was true.

As little as 5×10^{-4} M spermine was found to suppress lysis of the marine luminous bacterium *Achromobacter fischeri* (41).

Mechanism of lysis. The wide variation in the concentration of the different solutes required to prevent lysis made it seem extremely unlikely that all the solutes exerted their effects through osmotic action. Proof that NaCl does not prevent lysis in this way in the case of one marine pseudomonad was obtained by measuring the intracellular Na^+ and Cl^- concentrations at various levels of extracellular NaCl (78). At all levels of Na^+ in the medium, the intracellular and extracellular Na^+ concentrations within the limits of experimental error were the same. Intracellular and extracellular Cl^- concentrations were the same at the one level of Cl^- examined. Since, so far as NaCl was concerned, no gradient was maintained between the inside and outside of the cell, NaCl could not prevent lysis of the cells through osmotic action.

Brown (6, 7) prepared cell walls of a marine pseudomonad by mechanical disintegration of the cells followed by washing with distilled water. Suspensions of the cell walls, when incubated in a dilute phosphate buffer (0.05 M), showed a decrease in absorbancy with time. This decrease was prevented by increasing the buffer concentration, by heating the cell walls, or by the addition of spermine. When cell walls were incubated under conditions permitting a decrease in absorbancy of their suspensions, a dialyzable fraction and a nondialyzable fraction were released. An acid hydrolysate of the nondialyzable fraction was shown to contain hexosamine, muramic acid,

and the normal amino acids of protein hydrolysates. Both diaminopimelic acid and glucose, constituents of the cell-wall residue, were absent from the nondialyzable fraction. The dialyzable fraction contained a number of peptides. The latter observation suggested to Brown that the breakdown of the crude cell wall is caused by a lytic enzyme in the cell wall, and not merely by spontaneous disintegration under appropriate physicochemical conditions. Comparison of the effect of cations on the cell-wall autolytic system and on tryptic digestion of the cell envelope suggested to Brown (8) that the simplest and most probable explanation of the effects of ionic strength and particularly di- and multivalent cations was that they operate through their influence on the conformation of membrane proteins. Proteolytic autolysis was considered to be a direct consequence of such changes.

Buckmire and MacLeod (11) did not favor this hypothesis, because the lysis of whole cells is such a rapid process that it seemed unlikely that it could be due to the action of an enzyme. Cell envelopes of a marine pseudomonad were prepared by mechanical disintegration of the cells in 0.5 M NaCl, a concentration of salt able to prevent lysis. The envelopes were washed free from cytoplasmic material with 0.5 M NaCl. This was a departure from the procedure of Brown, who washed his cell envelopes in distilled water. It was felt that this might well lead to the loss of components important in the maintenance of cell-envelope structure. When a suspension of the cell envelopes in 0.5 M NaCl was added to distilled water, a soluble nondialyzable material was found to be present in the supernatant solution. Both the nondialyzable fraction and the cell-envelope residue after acid hydrolysis contained glucosamine, muramic acid, 15 amino acids (including diaminopimelic acid), and four unidentified ninhydrin-positive compounds. It appeared from visual inspection of the paper chromatograms that not only were the same compounds present in both fractions but that they were present in the same relative proportions. When cell envelopes suspended in 0.5 M NaCl were heated at 100 C for 15 min, they still released the nondialyzable hexosamine-containing fraction on suspension in distilled water. When the suspension of walls in 0.5 M NaCl was autoclaved at 121 C for 10 min, a considerable release of hexosamine-containing material occurred. This could be largely prevented, however, by raising the NaCl concentration to 5 M. The effect of heat and salt concentration on the release of the hexosamine-containing fraction is exactly analogous to the effects of heat and salts on the denaturation of a polyanion, and is explainable in terms of polyelectrolyte theory (37).

The finding that a fraction is released from the cell envelopes into distilled water, which has apparently the same composition as the residual cell envelope, suggested that the cell envelope is made up of a series of units. The effect of heat and salt concentration could best be explained if one assumes that the units are held together by cross-linkages between polyanions on adjacent units. The units would be able to come close enough together to form a continuous wall only if the negative charges on the polyanions were screened by the cations of a salt. The effects of salts in maintaining the integrity of the envelopes could thus be explained satisfactorily on the basis of polyelectrolyte theory. Conditions which prevent denaturation of a polyelectrolyte maintain the structure of the envelope. This did not eliminate the possibility that an enzyme was involved, because enzymes are polyelectrolytes. An explanation of lysis based on spontaneous disintegration of the envelopes under appropriate physicochemical conditions, however, was more compatible with the observations than an explanation involving enzymes.

It would thus appear that the cell envelopes of the marine bacteria examined are maintained intact by salts in somewhat the same way as the envelopes of the more extreme halophiles. Abram and Gibbons (1) suggested that the cell walls of halobacteria are held together by hydrogen bonds, Coulomb forces, or "salt" linkages, and that in the presence of NaCl the electrostatic forces are screened so that the bonds hold the organism in a rod shape. Brown (9) concluded that the effects of salt concentration, bivalent cations, and *p*H on the disaggregation of cell envelopes of *H. halobium* are all consistent with a mechanism which operates principally through exposure on the membrane of a net negative charge.

In the case of organisms which lyse in distilled water, then, there is direct evidence through studies with isolated cell envelopes that inorganic ions are directly involved in holding the cell wall together. Evidence has been obtained which suggests that a somewhat similar situation may prevail in some terrestrial species. Repaske (68) reported that a number of gram-negative bacteria could be induced to lyse in the presence of lysozyme if the incubation mixture contained the metal-binding agent ethylenediaminetetraacetic acid (EDTA). Carson and Eagon (17) found that EDTA alone was capable of lysing a suspension of *P. aeruginosa*, producing large cell-wall fragments which could then be further digested by lysozyme. It is tempting to speculate that these fragments are units of the cell envelope which, in the intact cells, are held together by metal ion bridges. Thus, there may be more in

common in the structures of the cell envelopes of marine and terrestrial pseudomonad species than was suspected previously.

Singularity of lytic susceptibility. Among gram-negative bacteria, there is a spectrum of susceptibility to lysis ranging from organisms which require high salt concentration to prevent disruption of the cells to those which maintain their integrity in distilled water. The bacteria which are most susceptible to lysis are the extreme halophiles, the halobacteria, which lyse below 2.0 M NaCl (1). Next come the moderate halophiles, of which *V. costicolus* is an example. This organism lyses at NaCl concentrations ranging from 0.25 to 1.0 M, depending upon the salt concentration of the growth medium (19). At the lower end of the spectrum come the marine bacteria. Some species lyse when the NaCl concentration drops below 0.15 to 0.2 M. In the case of others, only part of the population lyses in distilled water (52). Organisms of terrestrial origin are ordinarily considered not to be susceptible to lysis. However, two nonmarine species, *Pasteurella tularensis* and *Neisseria perflava* are markedly affected by a lowered solute concentration, as indicated by leakage of cell material, decay of respiratory ability, and decline of viability on brief exposure to distilled water (41, 42). Furthermore, the capacity of solutes such as Mg^{++} to maintain the respiratory activity of cells of *Azotobacter* (29), an organism otherwise stable in water suspension, may represent a further ramification of a basically similar phenomenon. It is evident, therefore, that a clear-cut distinction between marine and nonmarine species of bacteria cannot be made on the basis of lytic susceptibility alone.

METABOLIC PATHWAYS IN MARINE BACTERIA

Very little information is available regarding the intermediary metabolism of marine bacteria. All the enzymes of the tricarboxylic acid cycle have been found to be present in cell-free extracts of a marine pseudomonad (48, 49). Enzymes of the glyoxylate by-pass were also detected (50). Isocitrate lyase was demonstrated in extracts of *Agarbacterium alginicum* (84). Enzymes of both the glycolytic pathway and the hexose monophosphate pathway were demonstrated to be present in extracts of glucose-grown cells of the marine pseudomonad, *P. natriegens* (24). Data from radiorespirometric experiments indicated that approximately 92% of the glucose was catabolized via the glycolytic pathway and 8% by the hexose monophosphate pathway. The factor controlling the choice of pathways in this organism has been shown to be the availability of nicotinamide adenine dinucleotide phosphate (NADP) (25). The bacterium requires NADP for the operation of the hexose monophosphate pathway but lacks pyridine nucleotide transhydrogenase and reduced NADP ($NADPH_2$) oxidase, enzymes required for the reoxidation of $NADPH_2$. That this is not a phenomenon associated exclusively with marine bacteria is evident from the fact that the hexose monophosphate pathway in bacteria from other habitats as well as in mammalian tissues is rate-limited by the supply of NADP (25).

Ochynski and Postgate (59) compared the properties of freshwater and saltwater (though not necessarily marine) strains of *Desulfovibrio desulfuricans* and found that growth in a saline environment led to the production of a mucopolymannoside not chemically related to the cell wall. An increase in the content and change in the kind of "free amino acid material" within the cell was also noted. Adaptation of a freshwater strain to a saline environment led to the acquisition of these characters and a morphological change. For an adaptive change in the reverse direction, only the last character was studied and it was not lost.

OTHER FACTORS

Relation to Temperature

Most marine bacteria examined can be described as being facultatively psychrophilic because, according to Bedford (4) and others, the majority grow at 0 C, have a temperature optimum of 20 to 25 C, and do not grow above 30 C. ZoBell and Conn (87) reported that heating samples of seawater and marine mud to 30 C for 10 min killed about 25% of the bacteria, and only 20% survived 40 C for 10 min. Psychrophilic microorganisms are, of course, very widely distributed in nature, having been isolated in appreciable numbers from air, water, soil, plants, animals, and a great variety of foods (77).

Though psychrophily is not a characteristic unique for bacteria of marine origin, its physiological basis in marine bacteria is of considerable interest. Burton and Morita (15) found that 55 to 60% of the malic dehydrogenase activity of cell-free extracts of a marine facultative psychrophile (optimal temperature for growth, 24 C; maximal, 30 C) was lost by exposure of the extract to 30 C for 15 min. The rate of denaturation of the enzyme was much greater at 35 and 40 C. Heat stability of the enzyme was found to be greater in whole cells than in cell-free extracts (56). Heating the cells or treatment with a lysing agent apparently destroyed some regulatory factor for malic dehydrogenase activity. The data indicated that this regulatory factor was cell permeability. Additional support for the conclusion that at least two factors, heat lability of

vital enzymes and membrane permeability, are involved in governing the maximal temperatures at which these organisms can grow arose from studies with an obligate psychrophile *Vibrio marinus* (optimal temperature for growth, 15 C; maximum, 20 C). Morita and Robison (57) found that temperatures from 20 to 30 C were sufficient to inactivate the metabolic systems involved in oxygen uptake, either endogenously or in the presence of glucose, in this organism. These temperatures also caused leakage of 260- to 280-mμ absorbing material. The amount of leakage was greater with increased exposure as well as increased temperature.

Evidence is accumulating that enzymes and enzyme-forming systems in other psychrophilic microorganisms are abnormally sensitive to heat (3, 30, 81).

Since more than 80% of the marine environment is perpetually colder than 5 C, factors permitting growth of marine bacteria at the lower end of their temperature range are also of concern. Of particular interest in this connection was the observation of Morita and Burton (56) that in whole cells of a marine facultative psychrophile there was a 50% decrease in malic dehydrogenase activity with each 10 C decrease in temperature down to 13.8 C. A further temperature drop to 5 C reduced the enzyme activity only 15%. Since malic dehydrogenase activity in cell-free extracts was reduced 64% over the same temperature range, the authors concluded that whole cells have some mechanism for permitting enzymes to function at low temperatures at rates which are higher than one would expect from their response to temperature in a cell-free system.

Relation to Pressure

Since the average depth of the world's oceans is more than 2 miles, and hydrostatic pressure increases roughly 1 atm for each 10 m of depth, much of the sea floor is subjected to pressures exceeding 300 atm. At the deepest points in the ocean, hydrostatic pressures approaching 1,100 atm prevail. Thousands to millions of bacteria are known to be present per gram of marine sediments (89). One might expect, therefore, that organisms able to survive and grow at the bottom of the sea would be more tolerant of pressure than terrestrial species. ZoBell and Johnson (90) compared the effects of pressure on representative species of terrestrial and marine bacteria. None of the terrestrial bacteria multiplied perceptibly at a pressure of 600 atm, and growth of most was slowed by 300 atm. Marine species from near the surface of the sea resembled the terrestrial bacteria in their sensitivity to pressure, whereas those isolated from depths, where the pressure approximated 500 atmospheres, grew readily at a pressure of 600 atm. Mixed microflora from muds of the same depth appeared to grow faster under pressure. Organisms whose growth was favored by pressure were referred to as barophiles. ZoBell and Morita (91) found bacterial populations ranging from 10^3 to 10^6 per gram of wet mud in samples taken from depths of 7,000 to 10,000 m. Counts made at a pressure of 1,000 atm (the approximate pressure prevailing at these depths) were in most cases appreciably higher than those conducted at 1 atm. The authors reported that a good many tests made on bacteria which grew at a pressure of 1,000 atm demonstrated their inability to grow in similar media incubated at 1 atm. Similarly, among the many cultures tested, none which grew at 1 atm did so when incubated at 1,000 atm.

Kriss and co-workers (38) isolated 146 strains of bacteria from deep-sea bottom deposits and from garden soil which had been subjected to high hydrostatic pressure. The organisms could be divided into two groups, those which remained viable but were unable to reproduce at 450 atm of pressure and those which were able to grow at this pressure. Only one strain was found which developed better at 450 atm of pressure than at atmospheric pressure. In general, strains growing well at 450 atm grew even better at 1 atm. These workers reported the isolation from the upper layers of the soil of cultures able to grow and reproduce at 1,500 atm of pressure.

The mechanism of action of pressure on biological systems has been extensively studied by Johnson and co-workers (34). The effects of pressure have been explained in terms of the molecular volume change accompanying a limiting reaction. The influence of pressure not only may be modified but even reversed in direction by a change in temperature. Below the normal optimal temperature, an increase in pressure may produce inhibition by opposing the molecular volume increase accompanying the limiting reaction. At temperatures above the optimum, the critical enzyme undergoes a reversible denaturation that proceeds with an even larger volume increase than the limiting reaction. At these temperatures, the net effect of pressure is to increase the rate of the reaction by reversing the denaturation of the enzyme to a greater extent than opposing the catalytic reaction. In keeping with this hypothesis, ZoBell and Johnson (90) observed that lower temperatures markedly accentuated the growth-retarding and disinfecting effects of pressure on bacterial cultures. At higher temperatures, pressure in some cases acted in the direction of opposing the unfavorable effects on growth and

viability caused by high temperature. As a further example of the effect, Morita and Haight (55) observed malic dehydrogenase activity at 101 C under hydrostatic pressure.

There are enormous technical problems associated with obtaining quantitative information on the relation of the various types of marine bacteria in deep-sea bottom deposits to pressure. It takes 8 to 18 hr to bring samples to the surface from a depth of 10,000 m (91), and no way has yet been devised to maintain samples during collection and subsequent manipulation at the pressures and temperatures prevailing in the depths. If there are bacteria at the bottom of the sea which depend upon the particular temperature-pressure combination found there to maintain the conformation of vital polyelectrolytes, many of these bacteria could well be rendered nonviable by the decrease in pressure and increase in temperature associated with bringing samples to the surface.

Taxonomic Position

It is of interest to know whether bacteria in the sea differ in a sufficient number of characteristics from bacteria in other habitats to warrant their being placed in a separate taxonomic group. Miyamoto and co-workers (54), for instance, proposed that the gram-negative polarly flagellated rod forms found widely distributed in the ocean be grouped in a new genus *Oceanomonas*. The distinctive character of this genus would be the degree of halophilism usually exhibited by marine bacteria. Sakazaki et al. (71) could not accept this proposal, since the genus would include a group of enteropathogenic marine bacteria which they concluded were vibrios. Shewan and co-workers (74) have worked out a determinative scheme for gram-negative bacteria from the marine environment which groups these organisms into the genera *Pseudomonas*, *Xanthomonas*, *Aeromonas*, *Vibrio*, *Achromobacter*, *Alcaligenes*, *Flavobacterium*, *Cytophaga* and a peritrichously flagellated group referred to as "Paracolons." Colwell and Gochnauer (20) examined 60 bacterial cultures of marine origin for approximately 100 characteristics, including Na^+ and Mg^{++} requirement, amino acid growth response, and the standard bacteriological characters. The data were coded and analyzed by electronic computer by use of the Adansonian method. Also, these data were compared by computer with other data similarly obtained for 131 named strains of the Eubacteriales and Pseudomonadales. Results of the analyses showed four groupings within the marine strains, three *Pseudomonas* and one *Vibrio* cluster. No single characteristic was exclusive to any one of the groups which were based on overall similarity. This data suggested that separate genera should not be formed to describe marine species, and is the type of result one might expect to obtain if there is a close evolutionary relationship between marine and terrestrial species. Since life is believed to have originated in the sea, it is not unlikely that the common ancestor of both marine and terrestrial bacteria was a marine bacterium. Although much remains to be done to elucidate the differences between marine and terrestrial species at the molecular level, enough information is available to suggest that a quite limited number of successive mutations could convert a marine species to a form which would not be dependent on the sea for its survival.

Capacity to Survive in Seawater

It is evident that there are bacteria in the sea which depend upon the kinds and amounts of inorganic ions in seawater for their survival. Just what proportion of the bacteria in the sea have this dependence is not yet clear. That it is probably a high proportion, at least of those bacteria able to grow on laboratory media, was made evident very early in the study of marine microbiology by the large increases in counts obtained when marine materials were plated on seawater rather than freshwater media. It is also evident that there are bacteria having some of the special characteristics of marine bacteria in other environments. Such characteristics as Na^+ dependence and lytic susceptibility will not alone stamp bacteria as being uniquely marine. Nevertheless, bacteria dependent on the inorganic composition of seawater for their survival appear to predominate in the sea, even though the possession of these inorganic requirements confers no obvious competitive advantage on the organisms.

It has long been known that seawater possesses marked bactericidal activity for a variety of terrestrial organisms. This is not a simple matter of intolerance to the concentrations of salts that are present in the sea, because seawater can be rendered nontoxic for some organisms by autoclaving and for others by adding small amounts of appropriate organic materials. Because of its relation to sewage disposal, most of the investigations have dealt with the effects of seawater on *E. coli* (16). The loss of viability which occurs when cells of this organism are suspended in either natural or artificial seawater can be prevented by adding small amounts either of cysteine or of other amino acids having the capacity to form chelate complexes with metal ions (73). Jones (35) observed that the long lag phase which occurred when *E. coli* was grown in media prepared with seawater or 2.5% NaCl could be overcome by the addition of small amounts of com-

pounds which had in common the capacity to act as chelating agents. It has been concluded by the various workers that the bactericidal action of seawater for *E. coli* is due to its content of toxic heavy metals in trace amounts. Saz et al. (72) report the presence in seawater of a non-dialyzable, heat-labile compound having rapid bactericidal activity against both penicillin-sensitive and -resistant strains of *Staphylococcus aureus*. Under the conditions of the experiments, the substance exhibited no activity against *E. coli*.

The key, then, to the distinction between marine and terrestrial bacterial species may well be the mechanism or mechanisms which confer on bacteria the capacity to survive and grow in the sea. The fact that ability to survive in the sea is linked to the possession of particular inorganic requirements is probably not fortuitous, but a direct relationship between these characteristics, if it exists, remains to be elucidated. We are forced to conclude that there are bacteria which are uniquely marine because they are able to survive and grow in the sea, and we have yet to find out why.

Relation of Organisms Isolated to Indigenous Flora

It has been known for many years [see Waksman et al. (82)] that the numbers of bacteria in seawater or marine mud able to grow on laboratory media are as many as 1,000 times smaller than the numbers observed by direct microscopic examination. This has been emphasized recently by Kriss and co-workers (38), who reported that plating on standard laboratory media detected not more than 0.1 to 1% of the total numbers of microorganisms which can be observed microscopically in seawater or mud samples. That at least some of these forms must be viable was indicated by the fact that unusual morphological types never isolated from laboratory media were capable of forming microcolonies on glass slides submerged in seawater. Furthermore, deep-sea investigations in the Black Sea, Pacific, Atlantic, and Arctic oceans showed that some of the microbial forms revealed by direct microscopic examination were widely distributed. It would thus appear that present knowledge of the properties of marine bacteria has been gained from studies on representatives of the less than 1% of bacteria in the sea able to grow under ordinary laboratory conditions. To what extent their characteristics are common also to the types of organisms yet uncultured remains to be determined. This, of course, is a problem not confined to the marine environment. Only a small percentage of the bacteria observed by microscopy in soil and fresh water ever grow on laboratory media [see Gibson (27) for a review]. We are therefore faced with the very real possibility that, in the case of many natural environments, the organisms isolated and studied may not in fact be true representatives of the indigenous population.

SUMMARY

The marine bacteria which grow on media giving the highest plate counts on seawater and marine materials are largely gram-negative rod forms most of which are motile. The majority are facultatively psychrophilic and some, particularly those from deep-sea bottom deposits, can grow at high hydrostatic pressures. Many have a preference for amino acids as sources of carbon, nitrogen, and energy, and some require vitamins and other growth factors. Metabolic pathways in these organisms appear to be similar to those in other species.

Marine bacteria have special requirements for inorganic ions, partly to supply the needs of the organisms for growth and metabolism, partly to maintain the integrity of the cells. They have a highly specific need for Na^+ for growth, which has been shown in two species to reflect the presence of a Na^+-dependent mechanism for transporting substrates into the cells. Some of the bacteria fail to grow in the absence of halide ions, and this requirement can be satisfied either by chloride or bromide. Their need for Mg^{++} or for a combination of Mg^{++} and Ca^{++} exceeds that of most terrestrial species. For some marine bacteria, the effect of salts in maintaining the integrity of the cells has been shown to be due entirely to the capacity of the salts to interact directly with the cell envelopes. For other species of marine origin salts may also have an osmotic function.

Although the marine bacteria examined have a number of characteristics in common, the only one which clearly distinguishes them from bacteria in other habitats is a capacity to survive and grow in the sea. In this respect, then, marine bacteria are unique. Taxonomic studies show that the marine bacteria which have so far been studied fit well into genera which have already been defined. It should be remembered, however, that less than 1% of the bacteria observed in seawater and marine mud by microscopy grow under laboratory conditions. It is therefore quite possible that the organisms so far examined are not representative of the indigenous flora.

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12.16 Fræðigrein “Studies on the thermal senistivity of the marine bacteria”

Meðfylgjandi fræðigrein fjallar um sjúkdóma tengdu fiskeldinu.

STUDIES ON THE THERMAL SENSITIVITY OF MARINE BACTERIA[1]

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There are numerous reports (Benecke, 1933, Waksman, 1934, ZoBell, 1938) on the occurrence and importance of bacteria in the sea in different parts of the world but, unfortunately, the methods of investigation used by various workers have been so widely divergent that neither the qualitative nor the quantitative results are comparable. One of the greatest variables is the temperature to which the bacteria have been subjected, although Forster (1892), Drew (1910), Berkeley (1919), and others have emphasized the extreme thermal sensitivity of marine bacteria. In fact, due to a lack of appropriate refrigeration of water baths, incubators, and other facilities while working on a boat at sea, marine bacteria have been subjected to wide ranges of temperature. This paper is concerned with the effect that this may have upon the life processes and death of the bacteria.

Only those bacteria found in the sea which will grow in nutrient sea water media but not in corresponding freshwater media, or those which have been isolated from a marine environment at places remote from possibilities of terrigenous contamination, are regarded as marine species. This distinction is made to exclude bacteria of obviously terrestrial origin with which bays, estuaries and coastal waters are contaminated. While there may be an interchange of bacteria between the land and the sea (Burke,

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1934) with certain bacteria common to both environments, the majority of those occurring under truly oceanic conditions are believed to be distinctive marine species (ZoBell and Feltham 1933).

EXPERIMENTAL METHODS

Samples of sea water for analysis were obtained by means of the bacteriological sampler described by ZoBell and Feltham (1934) and bottom deposits were obtained with a Trask coring tube (Hough, 1939). Radially central portions of the mud core were dissected out aseptically for bacteriological purposes. Most of the samples were analyzed shortly after collection although sometimes the urgency of other activities, rough weather or other adverse field conditions necessitated storage of the samples. Since earlier studies have revealed that the total number of bacteria in sea water (ZoBell and Anderson, 1936) as well as in mud samples (ZoBell, 1938) increases rapidly with storage, a change which is accompanied by a decrease in the number of different species discernible, the stored samples were held in the refrigerator at near 0°C. At this temperature the changes in the bacterial population are minimized, though not entirely prevented. There is no evidence that any species are killed or overgrown even after several days storage at 0°C., but many heat-sensitive species are destroyed by a few minutes exposure to temperatures exceeding 25°C. and the fastidious ones are soon crowded out when samples are stored at temperatures higher than 5°C. Prescott and Winslow (1931) have discussed the effect of storage upon water bacteria with particular reference to temperature.

Sterile sea water was used for dilution blanks. The nutrient media contained 0.2 per cent each of Bacto-peptone, proteose-peptone and beef extract and 0.002 per cent iron citrate in sea water using either 1.2 per cent agar or 10 per cent gelatin as solidifying agents. The reaction was adjusted to pH 7.6 with N/10 NaOH after autoclave sterilization. Unless otherwise stated, 10 ml. of medium was used to pour the plates and the plates were incubated for two weeks at 22°C. The colonies were counted with a Stewart colony counter using a 3.5× engraver's lens.

POURING TEMPERATURE OF THE MEDIUM

Not infrequently nutrient agar is poured into inoculated plates before it has cooled to 42°C., below which temperature it begins to congeal. (Similar concentrations of agar congeal at a somewhat higher temperature in sea water than in freshwater.) In order to ascertain to what extent the temperature of melted agar influences plate counts, samples of sea water were plated with agar at temperatures ranging from 42° to 60°C. The medium was cooled to exactly the stated temperature in a water bath and then poured into 10 cm. Pyrex Petri dishes previously inoculated with 1.0 ml. of raw sea water.

TABLE 1

Relative number of colonies developing from sea water or marine mud when plated with nutrient agar at different temperatures, the plate counts being expressed as percentages of the average plate count on media poured at 42°C.

INOCULA	NUMBER OF SAMPLES	POURING TEMPERATURE OF AGAR				
		42°C.	45°C.	50°C.	55°C.	60°C.
		per cent	*per cent*	*per cent*	*per cent*	*per cent*
Sea water.....	14	**100**	95.8	89.4	34.2	17.5
Marine mud.....	9	**100**	93.4	82.1	26.9	11.4

More bacteria developed on the medium which was poured at 42°C. than on that poured at higher temperatures. Moreover, the agreement between duplicates was better when the agar was poured at the lower temperatures. The results obtained with 14 different samples of sea water and 9 of marine bottom deposits which were plated in duplicate with nutrient agar at different temperatures are summarized in table 1. The average plate counts are expressed as ratios on a basis of the 42°C. count being 100.

The data reveal that about 95 per cent as many bacteria form colonies when the agar is plated at 45°C. as when it is plated at 42°C. and successively smaller percentages at higher temperatures. However, the experiment fails to show what percentage of the bacteria may be rendered incapable of multiplication by pouring the agar at 42°C., a temperature which is considerably

in excess of that of their environment. Since agar begins to congeal at 42°C., gelatin was used to prepare a solid medium which could be plated at lower temperatures. Gelatin is not entirely satisfactory as a solidifying agent because it is liquified by the actively proteolytic bacteria which are abundant in the sea. Therefore, gelatin plates must be counted before the slower-growing bacteria have had time to develop into macroscopically visible colonies.

The nutrient gelatin was poured at temperatures ranging from 30° to 50°C. The plates were incubated at 12°C. for a week. The relative numbers of bacteria which developed on the medium poured at each temperature are shown in table 2 which gives the

TABLE 2

Relative number of colonies developing from sea water or marine mud when plated with nutrient gelatin poured at different temperatures, the plate counts being expressed as percentages of the average plate count on media poured at 30°C.

INOCULA	NUMBER OF SAMPLES	POURING TEMPERATURE OF GELATIN				
		30°C.	35°C.	40°C.	45°C.	50°C.
		per cent	*per cent*	*per cent*	*per cent*	*per cent*
Sea water.....	12	100	98.6	96.5	87.5	76.2
Marine mud.....	16	100	97.9	91.3	83.4	67.8

average of duplicate analyses on 12 samples of sea water and 16 of marine mud.

Approximately as many bacteria developed on the gelatin medium poured at 35°C. as on that poured at 30°C. and almost as many developed on the medium poured at 40°C. However, significantly fewer bacteria developed on the medium poured at higher temperatures. It is evident from these observations that while marine bacteria are extremely sensitive to heat, they are not sufficiently so to invalidate the use of nutrient agar poured at 40° to 42°C. for estimating the abundance of bacteria in marine materials since, at their best, plate counts detect only a small percentage of the bacterial population. It is obvious, though, that the medium should be cooled at least to 42°C. before pouring to insure comparable and maximum counts because even

at this temperature certain heat-sensitive species are inactivated. If, due to the exigencies of field conditions, media are poured at temperatures exceeding 50°C., more than half of the bacteria may fail to develop. Drew (1910) reports that the bacteria from tropical waters around the Bahamas are very sensitive to temperatures as high as 40°C. and exposure at 45°C. causes the death of a large proportion of them.

In the foregoing experiments the plates themselves were at room temperature (21° to 22°C.) at the time the media were introduced. It was found that when the plates were cooled on ice prior to the introduction of the medium, plating temperatures in excess of 42°C. were less injurious. This is what might be expected because the introduced medium is cooled faster, thus subjecting the bacteria therein to the higher temperature for a shorter period of time. As revealed by the results summarized in table 3, little or no practical advantage is gained by cooling the plates on ice when the medium itself is cooled to 42°C. before pouring but the beneficial effect of the use of ice is quite pronounced when the medium is poured at higher temperatures. The use of ice to hasten the cooling of the media might save a few heat-sensitive species from destruction but for practical purposes this procedure does not increase the plate count enough to offset the disadvantages of the extra work involved and the undesirable effects of the medium congealing in the cold plate before it has been evenly distributed (Green, 1936).

Other factors which influence the effect of the pouring temperature of the medium are the type of plate, the heat-conductivity of the table upon which the plate rests and the size of the inoculum. The media are cooled faster by thick-walled Pyrex Petri dishes of high heat-holding capacity than by thin-walled ones, assuming that the dishes themselves are at a low temperature when the medium is introduced. Similarly, the media are cooled faster when the plates are resting on a foundation of concrete, metal or soapstone than on one of wood. Such factors influence the magnitude of plate counts and the agreement between duplicates.

Prescription bottles are quite widely used as a substitute for

Petri dishes for field studies. One milliliter of the appropriately diluted sample is introduced directly into 15 ml. of melted nutrient agar in the bottles cooled to 40° to 42°C. The inoculated bottles are then placed on their sides until the agar has solidified. In the initial experiments less than half as many colonies developed in prescription bottles inoculated by this procedure as when a similar medium was used in Petri dishes, probably because

TABLE 3

Relative number of colonies developing from sea water plated with nutrient agar poured at different temperatures into plates at different temperatures, the plate counts being expressed as percentages of the average plate count on media poured at 42°C. into dishes having a temperature of 21–22°C.

TEMPERATURE OF PLATE	POURING TEMPERATURE OF AGAR				
	42°C.	45°C.	50°C.	55°C.	60°C.
°C.	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
Near 0	108	103	95	68	51
21–22	100	97	86	41	16
30	79	72	61	36	14

TABLE 4

Relative number of colonies which developed from samples of sea water or mud after being held at the stated temperature for 10 minutes, the plate counts being expressed as percentages of the plate count of material held for ten minutes at 20°C.

INOCULA	NUMBER OF SAMPLES	EXPOSURE TEMPERATURE						
		20°C.	30°C.	40°C.	50°C.	60°C.	80°C.	100°C.
		per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
Sea water	10	100	81.3	21.9	6.8	3.0	0.2	+
Marine mud	10	100	68.5	18.3	10.3	5.2	0.7	+

the prescription bottles cool so slowly. By immersing them to the neck for thirty seconds in ice water immediately after inoculating, almost as many colonies developed in prescription bottles as in Petri dishes.

Marine bacteria are not unique in their susceptibility to the pouring temperature of nutrient agar because the senior author found that the bacteria indigenous to Lake Mendota (a freshwater lake in Wisconsin) are similarly heat-sensitive. Using the pre-

scription bottle technique, two to five times as many bacteria developed when the bottles were quickly cooled after inoculation by immersion in cold water as when they were merely permitted to cool on the table top, although in both cases the medium was cooled to 40° to 42°C. before inoculation.

The use of pre-solidified agar as advocated by Anderson and Stuart (1935) obviates the necessity of exposing the bacteria to the temperature of melted agar. While, statistically, the counts obtained by this procedure compare favorably with plate counts obtained by the conventional technique, there is a greater divergence of duplicates and many time-consuming precautions must be exercised to prepare satisfactory plates.

THERMAL DEATH POINT

The temperature tolerance of marine bacteria was determined using thermal death point technique. For this purpose 2.0 ml. portions of recently collected sea water or appropriately diluted mud samples were placed in 6 ml. serological tubes. The use of the small thin-walled tubes reduced to a minimum the time required to change the temperature of the contents. Pairs were immersed in water baths ranging in temperature from 20° to 100°C. After exactly ten minutes the tubes were transferred to ice water and 1.0 ml. of the heated suspension was spread uniformly over the surface of pre-solidified nutrient agar in Petri dishes. The plates were incubated at 12°C. for two weeks. Table 4 shows the average number of colonies which developed from samples of sea water and marine mud treated in this manner.

There is no evidence to suggest that any of the bacteria are injured by ten minutes exposure to a temperature of 20°C. regardless of the temperature of the environment from which they were obtained. However, about one-fourth of the bacteria were rendered incapable of multiplication in ten minutes at 30°C. and only one-fifth of them survived after being held for this period of time at 40°C. Direct microscopic observations of the material showed that the heat treatment had not merely caused the bacteria to clump together or to adhere to the walls of the sero-

logical tubes which would have reduced the plate counts. Moreover, as will be discussed below, the respiration of the bacteria was impaired by the heat treatment.

In general, the bacteria from bottom deposits were found to be somewhat more heat-sensitive than those occurring in sea water. A few heat-tolerant spore-forming bacteria were found in nearly all of the samples, there being more of these in mud than in water. Most of the bacteria which survived temperatures higher than 40°C. proved to be spore formers. Not many of the spore formers survived at 80°C. and too few survived boiling for ten minutes to warrant the numerical expression of an average from the available data.

TABLE 5

Number of pure cultures which multiplied after being held at the stated temperature for 10 minutes

DESCRIPTION OF CULTURES	EXPOSURE TEMPERATURE						
	20°C.	30°C.	40°C.	50°C.	60°C.	80°C.	100°C.
"C_1" from water	25	24	9	3	0	0	0
"C_1" from mud	25	21	11	5	1	1	0
Stock cultures	78	78	36	14	8	6	2

The temperature tolerance of several pure cultures of marine bacteria was tested by noting their ability to reproduce after being heated. Nutrient sea-water broth was inoculated and distributed in serological tubes. Pairs of these were held in water baths at different temperatures for ten minutes and then cooled immediately in ice water, after which the bacteria were tested for viability. Table 5 shows the number of cultures which multiplied following this treatment.

The cultures designated "C_1", are colonies differing superficially from each other, fished directly from pre-solidified nutrient agar which had been inoculated with freshly collected samples of sea water or marine mud and incubated at 12°C. At no time were these organisms subjected to temperatures higher than 12°C. until they were tested for their temperature tolerance. The "stock" cultures, all differing either morphologically, culturally

or physiologically from each other, have been isolated over a period of years from sea water or other marine materials. They have been sub-cultured many times and maintained on sea-water agar slants in the refrigerator at 0° to 4°C.

Only five cultures out of the 128 tested failed to grow after being held at 30°C. for ten minutes but many of them multiplied less rapidly, indicating that while all of the individuals comprising any one culture had not been killed, many of the individuals were injured. This was confirmed later by plate counts on the cultures and observations on the respiration of heat-treated cultures. It is noteworthy that over half of the pure cultures were killed in 10 minutes at 40°C. Similarly Bedford

TABLE 6

Oxygen consumed by suspensions of marine bacteria in two hours at 20°C. after being heated to the stated temperature for ten minutes and the number of viable bacteria in the heated suspensions

	EXPOSURE TEMPERATURE			
	20°C.	30°C.	40°C.	50°C.
Oxygen uptake (mm.³)	0.92	0.54	0.19	0.04
Bacteria per ml. × 100,000	267	184	51	9

(1933) found that 37°C. was lethal for 40 of the 71 cultures of marine bacteria with which he was working.

According to Bronfenbrenner *et al.* (1939) the respiration of bacteria is a better criterion of their viability than their ability to reproduce in a given medium. Studies on the oxygen uptake of suspensions of marine bacteria demonstrated that many were rendered incapable of respiration by 10 minutes exposure at 30°C. The tests were made by pipetting 2.0 ml. of a heavy suspension of a 24-hour old enrichment culture of mixed marine microflora into Barcroft respirometer flasks. Duplicates of each were held in water baths at 20°, 30°, 40° and 50°C. for ten minutes, after which they were cooled immediately to 20°C. After placing 0.2 ml. of 10 per cent KOH solution in the inset the respirometer flasks were fitted to the manometers and the oxygen uptake of each suspension was noted after two hours at 20°C.

Appropriate dilutions of each suspension were plated on nutrient agar to determine the number of viable cells. The results are summarized in table 6.

It will be observed that the decrease in the number of viable bacteria as indicated by plate counts is proportional to the decrease in the oxygen uptake of the heat-treated bacteria. Similar observations were made on four different heat-sensitive pure cultures which failed to multiply after being held at 40°C. for ten minutes. The loss of the ability of heated cultures to consume oxygen indicates that the respiratory enzymes of the bacteria have been inactivated. According to Edwards and Rettger (1937) the maximum temperature tolerance of bacteria is related to the minimum temperature at which their respiratory enzymes are destroyed.

OPTIMUM TEMPERATURE OF INCUBATION

In spite of the fact that Standard Methods of Water Analysis (1933) is concerned primarily with the bacteria which are of sanitary significance and which may differ markedly from the autochthonous microflora of natural waters, many bacteriologists have taken literally the instructions to count agar plates at either 20° or 37°C. when analyzing ocean, lake or river water. Most frequently the plates have been incubated at some intermediate temperature, namely, 25° or 30°C. We have studied the effect of the temperature of incubation upon plate counts by inoculating Petri dishes in groups of 14 each with 1.0 ml. of sea water or marine mud. Duplicate plates from each sample were incubated at 4°, 12°, 18°, 22°, 25°, 30° and 37°C. After different periods of incubation the colonies were counted. Table 7 shows the average results obtained with ten samples of sea water and four of marine mud. The colony counts were calculated as percentages of the maximum colony count, assuming the latter to be the colony count on plates incubated at 18°C. for 18 days. As a matter of fact the maximum number of colonies appeared on only half of the plates incubated at 18°C. for 18 days. The maximum counts of four samples occurred on plates incubated at 12°C. and the maximum counts of the other three samples were on plates

incubated at 22°C. Results with water and mud samples were almost the same.

For the first few days of incubation the most colonies were found on plates incubated at 25° or 30°C., but after seven to ten days the most colonies were found on plates incubated at 12° to 22°C. The bacteria which multiply at the higher temperatures do so more rapidly and hence appear earlier as colonies than those incubated at lower temperatures. As a rule the colonies found on the plates incubated at the higher temperatures are larger than those growing at lower temperatures and give the former

TABLE 7

Relative number of colonies appearing on nutrient agar incubated for different periods of time at different temperatures, the plate counts being expressed as percentages of the average plate count after 18 days at 18°C.

INCUBATION TIME	INCUBATION TEMPERATURE						
	4°C.	12°C.	18°C.	22°C.	25°C.	30°C.	37°C.
days	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
2	0	18	30	36	41	44	8
4	0	28	41	60	65	61	12
7	4	46	67	82	78	69	12
10	9	67	91	96	84	71	13
14	17	90	98	97	85	70	
18	26	97	100	95	82	63	
21	33	98	96	87	74	53	

plates the superficial appearance of having more colonies. The decrease in the counts after two weeks on plates incubated at 25°C. or higher is due to the merging of colonies and the liquefaction of the agar by certain bacteria, thereby obliterating the surrounding colonies. Very few colonies developed on the plates incubated at 37°C.

The results confirm previous experiments on the thermal sensitivity of marine bacteria and show that, in general, media inoculated with sea water or marine sediments should not be incubated at temperatures exceeding 22°C. The greatest number of different species can be detected on plates incubated at 12°C. or lower, presumably because fewer heat-sensitive species are

inactivated and apparently all of them can grow, though slowly, at 4° to 12°C. Moreover, the lower temperatures seem to favor pigment production (Hess, 1933a) and as pointed out by ZoBell and Feltham (1934) most marine bacteria are chromogenic under favorable conditions. However, due to the slowness with which colonies form at relatively low temperatures, the maximum number of visible colonies will be found on plates incubated at 18° to 22°C. for a week or two. Except for special purposes it is not feasible to incubate plates for several weeks before counting.

DISCUSSION

Since the temperature of the ocean is monotonously constant with over 80 per cent of the water and bottom perpetually colder than 5°C., it is not surprising to find that marine bacteria are extremely thermo-sensitive. It so happens that the critical point for the majority of them is near the temperature at which nutrient agar begins to congeal. While too few bacteria are killed when the medium is properly cooled to invalidate the use of plating procedures for estimating bacterial populations, it should be emphasized that prolonged exposure at 40° to 42°C., or instantaneous exposure at temperatures a few degrees higher, is lethal for a large percentage of the bacteria from the sea and perhaps from lakes also.

Anomalously the optimum temperature for the multiplication of marine bacteria in the laboratory is several degrees higher than the environment inhabited by them. Though coming from an environment which is for the most part considerably colder than 12°C., the optimum temperature for maximum plate counts of bacteria from the sea is between 12° and 22°C. The pure cultures which have been studied have temperature optima ranging from 18° to 37°C., the range for the majority being 18° to 25°C. This has been found to be true of cultures which were isolated from plates incubated at 12°C. and which had not been subjected to higher temperatures until the tests were made. Working with 71 species of bacteria from the northern Pacific Ocean, most of which were concerned with the spoilage of fish at refrigeration temperatures, Bedford (1933) found that none of them had

optima lower than 20°C. Too many intrinsic as well as extrinsic factors are involved which influence the temperature tolerance of bacteria to speculate at this time why certain bacteria have temperature optima which are several degrees higher than the environment inhabited by them.

Bacteria which are transferred directly from their native habitat to artificial media are subjected to many abrupt environmental changes besides temperature but the inimical effect of the adverse condition will probably be proportional to the temperature in accordance with the R.G.T. or van't Hoff rule. However, if the bacteria survive the shock of transplantation and start to multiply, the resulting cultures are more tolerant of laboratory conditions in general, including temperature extremes which may be because, as expounded by Sherman and Cameron (1934), physiologically old cells withstand adverse conditions better than young ones. Consequently the temperature tolerance seems to increase and the most tolerant individuals will soon predominate in the culture as the less tolerant ones fail to multiply or perish, or as stated by Reimann (1937), "an environment unfavorable to one of two mutants will cause the elimination of one and permit the growth of the other." It may be for this reason that Kluyver and Baars (1932) maintain that the longer a culture has been in the laboratory the less adaptive ability it possesses. Incidentally, like the experience of Casman and Rettger (1933) with members of the "*subtilis* group," our attempts to acclimate marine bacteria to temperatures higher than the maximum of 3- or 4-week old sub-cultures have been unsuccessful.

There is no evidence to indicate that temperatures as low as 0° to −5°C. injure marine bacteria although according to Hess (1933b), they slowly die at −16°C. Most of them multiply and are otherwise physiologically active until the water essential to chemical reactions is removed by solidification due to freezing. ZoBell (1934) reports that 76 out of 88 different species of marine bacteria multiplied slowly at 0° to −4°C. Bedford (1933) found that all of his 71 species except three grew at 0°C. and 23 of them grew at −5°C. Neither Bedford nor the senior author have

found true psychrophiles, or cultures which grow best at relatively low temperatures, but Hess (1933b) gives 5°C., as the optimum temperature for the multiplication of the marine bacteria which he has studied. Berry and Magoon (1934) who have been working with microorganisms which grow at sub-zero temperatures question the existence of a true cold-loving or psychrophilic flora.

SUMMARY

Many of the bacteria occurring in sea water and marine sediments are sensitive to the plating temperature of nutrient agar, there being significantly fewer which formed colonies on agar plated at 45°C. or above than on that plated at 42°C. There were only 81 to 83 per cent as many colonies which developed on nutrient gelatin plated at 45°C. as on that plated at 30°C.

Heating samples of sea water and mud to 30°C. for ten minutes killed around 25 per cent of the bacteria, and only 20 per cent of the bacteria survived 40°C. for ten minutes.

A diminution of the oxygen uptake of suspensions of heat-treated bacteria indicated that the respiratory enzymes of some forms are inactivated by temperatures as low as 30°C.

Nutrient agar inoculated with sea water or marine sediments yields maximum colony counts when incubated at 18° to 22°C. for a week or two. Very few colonies develop on plates incubated at 30° to 37°C.

Most of the bacteria isolated from the sea grow best at temperatures which are considerably higher than the marine environment inhabited by them. Although nearly all marine bacteria multiply slowly at near zero temperatures, true psychrophiles have not been found.

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