



**villa**

**Cod farming in Nordic countries**

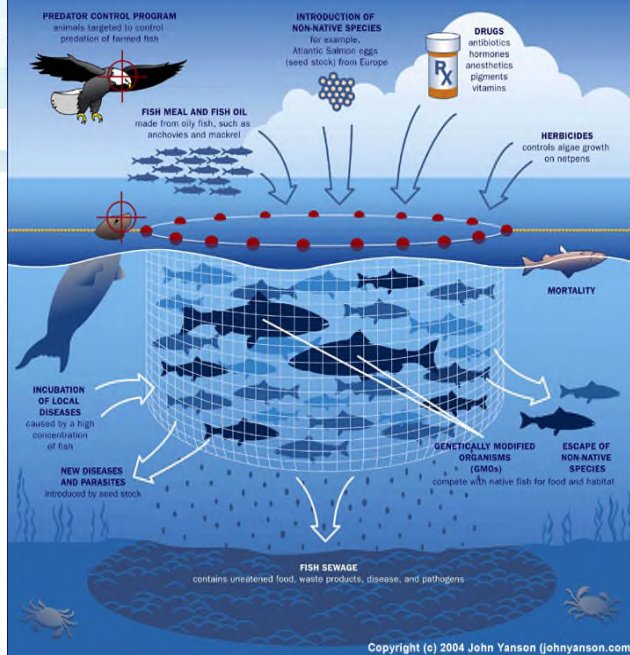
**Reykjavik - 2008**

**Eco-labelling, status and challenges**

Per Gunnar Kvenseth – Villa Organic

2

Environmental Risks of Marine Aquaculture



How aquaculture are presented by some people that do not "love" the industry.

Great focus on the negative sides!

We must develop very good routines and systems to reduce this conflicts.

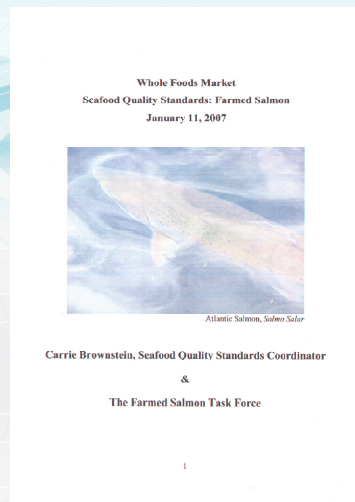
Ecolabelling may be one solution?

Copyright (c) 2004 John Yanson (johnyanson.com)

Several organic standards for aquaculture exists today  
 Ongoing work to produce  
**ONE European standard**  
**Council Regulation (EC) No 834/2007**

Several meetings in Brussels during 2007 – 2008

Planned to be implemented by  
**01012009**



SOIL - UK  
 USA

In addition we have "Best Practice"  
= Whole Foods Markets Standard - US

BEST PRACTICE/WFM standard

- Max 20 kg/m<sup>3</sup>
- The feed is not certified
- No use of Slice
- No use of antibiotics
- Only for salmon

Conclusion; very much like the European organic standards



The Villa-Story !  
Founded on cleanerfish

- In the early 90s Bjorn-Vegard Løvik and Johan Andreassen started fishing cleanerfish (wrasse)
- This was the only known sustainable way of treating the parasite **sealice** on farmed salmon – than as now !
- At that time the sealice was a huge issue that costed salmon farmers 100s MNOK a year





## Lead to salmon, trout & cod

- Company developed to the sole biggest "player" in cleanerfish
- Aquired R&D licence in year 2000
- Started cod farming from by-catch of cleanerfish in 1999
- Consolidated into Villa Organic in 2004 after a buyout of a salmon company



When Villa started developing organic codfarming in 2005 – there were no rules for that. So we arranged meetings in 2005 and 2006 to develop rules !



Workshop

## – organic aquafarming

Rica Seilet Hotel, Molde, Norway

13. – 15. July 2006



Norsk Sjømatcenter



Oelbio



Møre og Romsdal fylke



VESTNES KOMMUNE  
Skjutter opp en næringslivet i Kvamsvåg

Norges forskningsråd



MACROGARD®  
HEALTHY AND SAFE





## What Villa have to do to fulfill the Eco labelling (Debio – Naturland etc.)

- Conversion period
- Parallell production
- Nets
- Fish density
- Feed – ingredients, storing, separation
- Health and fish welfare
- Use of medicine
- Actions agains escape
- Water quality, temperature etc.
- The use of "artificial" light
- Predators
- Fallowing
- Transportation, harvesting

11

## All production units and inputs must be marked organic

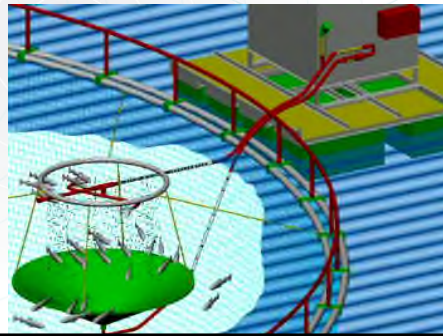
- Must be clearely tagged and separated from the conventional production
- To avoid mixing



12

## Environment / Waterquality

- Must have good watercurrent and waterexchange !
- The environment shall not be loaded by faeces, feed leftovers etc.
- Must have **yearly** environmental tests = MOM B
- Fallowing – at least 4 months
- Use equipment that secure NO spill feed



## Feed

- Only organic approved feed are allowed (Big discussion EU / USA – what is real organic feed)
- **What is organic feed ?**
  - Contains organic produced ingredients and/or feed from wild aquatic stocks
  - Aquatic stocks = fish not used for human consumption + cuttings
  - **The aquatic stocks must be managed in a sustainable way (ICES, FAO, MSC, etc.)**
  - And or organic fishmeal produced from cuttings from sustainable managed stocks (NVG-sild)
  - Additives as; vitamin, minerales, antiooxidanter, color must come from natural sources (Phaffia, Vitalox, etc.)
  - Must contain at least 30 % organic certified vegetabilia ingredients (Debio – not SOIL)

## Health and welfare

- The production unit – more than 15 m deep
- The production unit must **continuous be under observation**
  - to discover stress and change of behaviour – and do actions to create normal behaviour
- Often observations; from surface, with camera and with divers !



## Medicine

- Redrawal time if use of medicine is allways **twice the redraval** time in ordinary production
- In case of use of a medicine with redraval time in one unit – **ALL units within a distance of 250 m will have the same redraval time.**

## Actions against escaping fish !

- **Fullfill NS 9415 (Nytek - Newtechnology)**
- Always use the best avilable technology
- Inspections of the nest must be done at least monthly (divers or camera)
- Debio can force the producer to take special actions to prevent escapees and for the identification of potential escaped fish
  
- **Inspection and documentation !**



## Environmental parametres

- **Daily measurements;**
  - Temp – Sal - Ox
  - (in the middel of the net - 3 m deep)
  
- The watertemperature in an organic farm shall not be higher than this set temp. For more than obe week
  - **20 C** salmon and cod
  - **22 C** rainbowtrout
- **The oxygenleven shall never be lower than 7 mg/l**
- If there is a real risk for breaking these set levels action must be taken, ex. Pumping up deeper water, input of oxygen etc.

## **Fish density**

- **Highly focused at organic production**
- **Not higher density for cod than 15 kg/ m<sup>3</sup>**
- **Not more than 10 kg/ m<sup>3</sup> on average in the grow out period**

## **Predators**




- Topnet on the pens for all fish smaller than 0,5 kg, or when needed
- Shooting with guns are not allowed



## Fish transportation



- All fish handling and transportation must be run at a minimum stress to the fish
- Max density at wellboat transportation
  - Closed – 30 kg/m<sup>3</sup>
  - Open – 50 kg/m<sup>3</sup>

21



## The use of chemicals

- At organic productions NO use of "bad" chemicals – ex. NO copper in netpaint
- Cleaning by mechanical device (cleaning disk, divers, robots etc.) or netchanging !
- This solution have also been adopted by conventional farms
- But the total use of copper for netpainting in Norway is still 10 times more than the target (about 200 tons yearly)



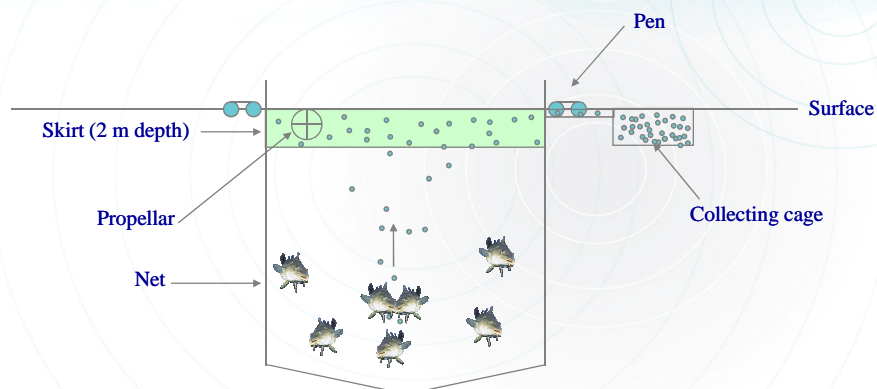
## Challenges – Preventing maturation – spawning – effect on wild stocks ?

- The use of additional – "artificial" light – to "prevent" maturation/spawning
  - "Difficult" in the organic world
  - Max 16 hours – EU – exception until 2015
  - Accepted by Debio – Not by Soil
- Some cod will always spawn
- Try to collect all the fertilized eggs
- In use for decades in the breeding tanks on land and in spawning pens
- Alternative; combination of light and collection of spawned eggs ?



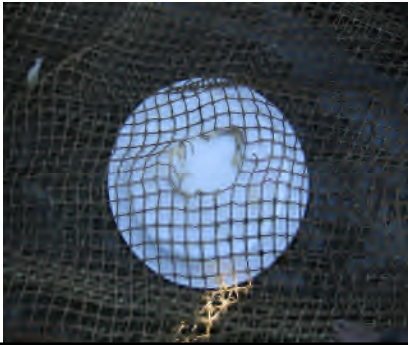
## Collecting fertilized eggs

- Fertilized eggs will float up to the surface
- A propellar brings the eggs out of the net into a collecting cage and are removed and destroyed



## **villa** Challenges – nets

- Nets of nylon and polyethylen
- No standard antifoulant permitted
- The nets are therefore rapidly fouled and must be cleaned or changed very often
- We power-wash by divers, approx. twice as often as painted nets
- **Net inspection at least once a month by divers, and always inspection after put to sea, before cod is added**



**villa**

### Summary of EC work according One Common Standard for Organic Production and labelling of Aquaculture Product/Production

- Working document version 25.06.2008
- Lots of comments have been sent to Brussels by the deadline – 13.th. Of August
- Both from Governmental and private organizations

### Origin of organic animals

- Preference to fry/fingerlings from organic brood stocks, organic hatcheries and nurseries
- Not available in sufficient numbers ?
- The whole or at least 2/3 of lifecycle under organic management
- Species for organic aquaculture must be bred with minimum interference with wild stocks
- Collecting of wild aquatic young stocks (fish) for organic production is not permitted

27

### Conversion and simultaneous production of organic and non-organic livestock

- Organic aquaculture unit must be run according to organic principles in its entirety.
- **With the following exceptions;**
- Hatcheries can rear both organic and non organic larvae/juveniles – with a clear separation
- By five years from 010109 – where not all production units on one aquaculture site are organic – the non organic production must be a different species than the organic one (polyculture)

28

### General husbandry rules

- Sufficient space
- Sufficient oxygen level
- Natural temperature and light of their species
- Density according to species and to concerned environment
- Minimize the risk and impact of escaping livestock
- Stocking density – comfort and well being of the animal
- Antifoulant are not permitted
- Indoor production systems may be used for the hatchery stage

29

### Management of animals

- Artificial light shall only permitted in hatcheries, and used to influence reproduction and to improve survival and welfare of young stock
- **Special restrictions !**
- **The use of artificial light shall be limited to prolonging natural light up to a maximum day length of 16 hours (adapted directly from chicken ?)**
- **Abrupt changes in light intensity shall be avoided by the use of dimable lights or background lighting**
- The use of liquid oxygen is prohibited
- Slaughter techniques shall render fish immediately unconscious and insensible to pain – must persist until death
- **Exceptions;**
- **To enable the development of organic cod farming the limit of 16 hours of light daily shall not apply to on-growing of this species until 2015 !**

30

### Feeds – general rules - priorities

- Animal health
- Product quality
- Low environmental impact
- All ingredients of agricultural origin shall be organic
- Fish meal and fish-oil shall originate from sustainable fisheries

31

### Feeds – specific rules

- Fishmeal and oil shall be made from trimmings of fish already caught for human consumption in sustainable fisheries
- Preference to LT fish meal
- **Max content of phosphorous 1,2% of the dry matter of the feed**
- **Max content of nitrogen 9% of the dry matter of the feed**
- **Natural sources of carotenoid pigments (Phaffia rhodozyma yeast) for pigmentation og salmonid fish is allowed**
- Only natural antioxidants based on tocopheroles (garlic acid, ascorbic acid etc.) – shall be permitted to preserve the feed

32



# Challenges



**villa**

## Challenges

- **Increased production cost** (feed, fish density, no antifouling, mechanical cleaning, predator control, diving inspections etc.) + 20 – 30%
- Market willing to pay the extra cost ?? – especially in todays situation ??
- **Encourage feed companies** to produce organic feed (small volume – difficult logistic - high price)
- **Not enough volume to support or build a year round market** (well known from the start of cod farming !)

34

## Challenges 2

- High price market = fresh
  - Fresh = high transportation cost = BIG CO<sub>2</sub> footprint
  - Some organic consumers will NOT take airborne organic fish
- The use of "artificial lights" more than 16 hours
- Low fish density in production and transportation
- Buildup of organic broodstock and organic fryproduction
- **"Resistance" from conventional production - "The establishment"**
  - Meeting in Brussels 10. and 11. Sept 2008 – International Aquaculture Conference. Discussion about organic aquaculture, FEAP (Federation of European Aquaculture Producers; "Organic Aquaculture is not important. This is only a philosophy today – a nisch"

35

