



Pikeperch production in RAS

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Excellence Fish bv





Presentation overview

- Excellence Fish bv
- Drivers for pikeperch production
- Recirculating Aquaculture System
- RAS management



Business activities

- Pikeperch reproduction
 - Improve the fish
- Pikeperch ongrowing production in RAS
 - Improve the production methods
- Consultancy and business development
 - Cooperation with (potential) customers



Excellence Fish bv

- Pikeperch in RAS
- Full recirculation
- Usage of deep well water
- Only fed on *Artemia* and dry feed
- Domesticated broodstock
- Certification of disease-free fish



Motivation for pikeperch

- Well known and highly valued species
- Annual consumption increase in Europe
- Decrease of wild catches
- Slow grower for quiet market
- New species for aquaculture
- Difficult to culture
- Very difficult to reproduce
- Possibility for leading market position

Pikeperch production in NL

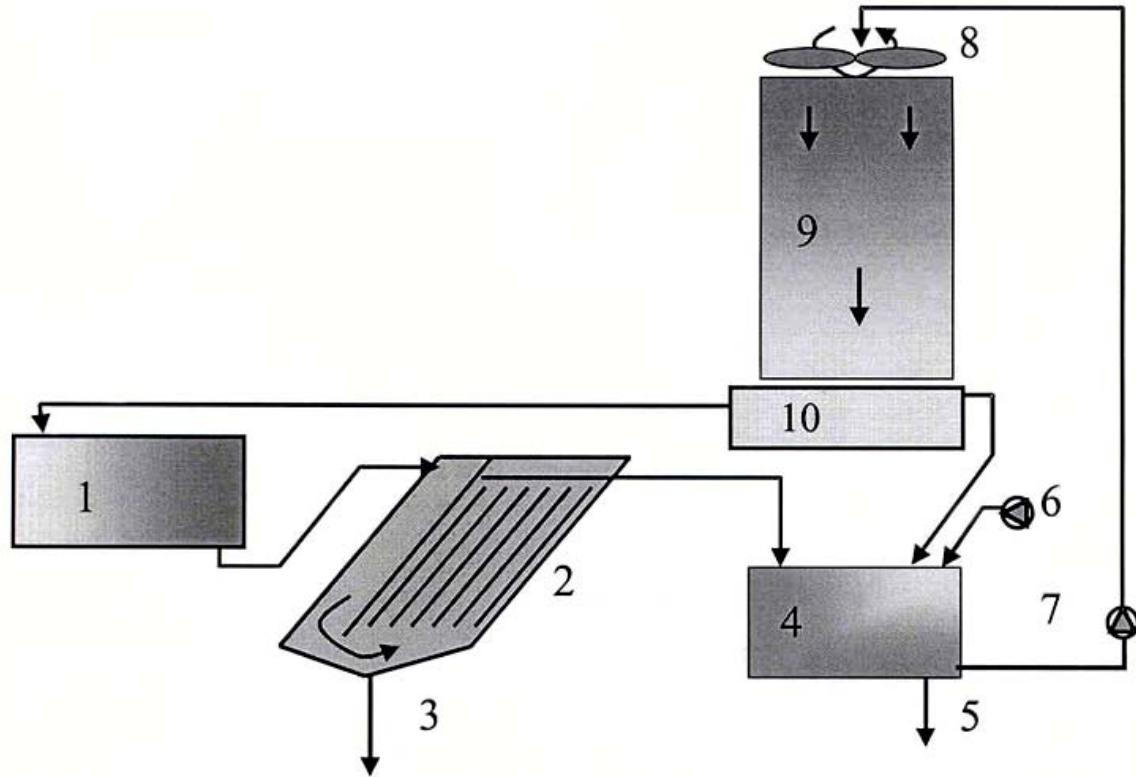


Two ongrowing farms in NL
Total production 100 ton

Recirculation unit

Simplified scheme

1. Fish tank 25 m³
2. Drum filter 40 um
3. Waste discharge
4. Pump tank
5. Discharge
6. Aeration
7. Water pump
8. Spay unit
9. Biofilter 75 m³ (with high surface open structure filter material)
10. Collector tank







Recirculating system

- Circular tanks 25 m³
- Temperature 23° C
- Density 60-80 kg/m³
- Commercial dry feed
- Computerized automatic feeders
- Pure liquid oxygen 100-120% saturation
- Water exchange 8% of culture vol./day
- Emergency power supply



Recirculating system

- Stocking at 20g fingerlings
- Grading at 250 and 600g by hand
- <1 kg FCR of 1
- >1 kg FCR of 1,3
- Productivity largely decreases for larger fish
- No diseases (yet!!)




RAS Advantages

- Reduced water requirement and discharge water
- Year-round production
- High production per water volume
- Improved feed conversion
- Reduced reproduction
- More control of environment and animal
- Higher market price



RAS Disadvantages

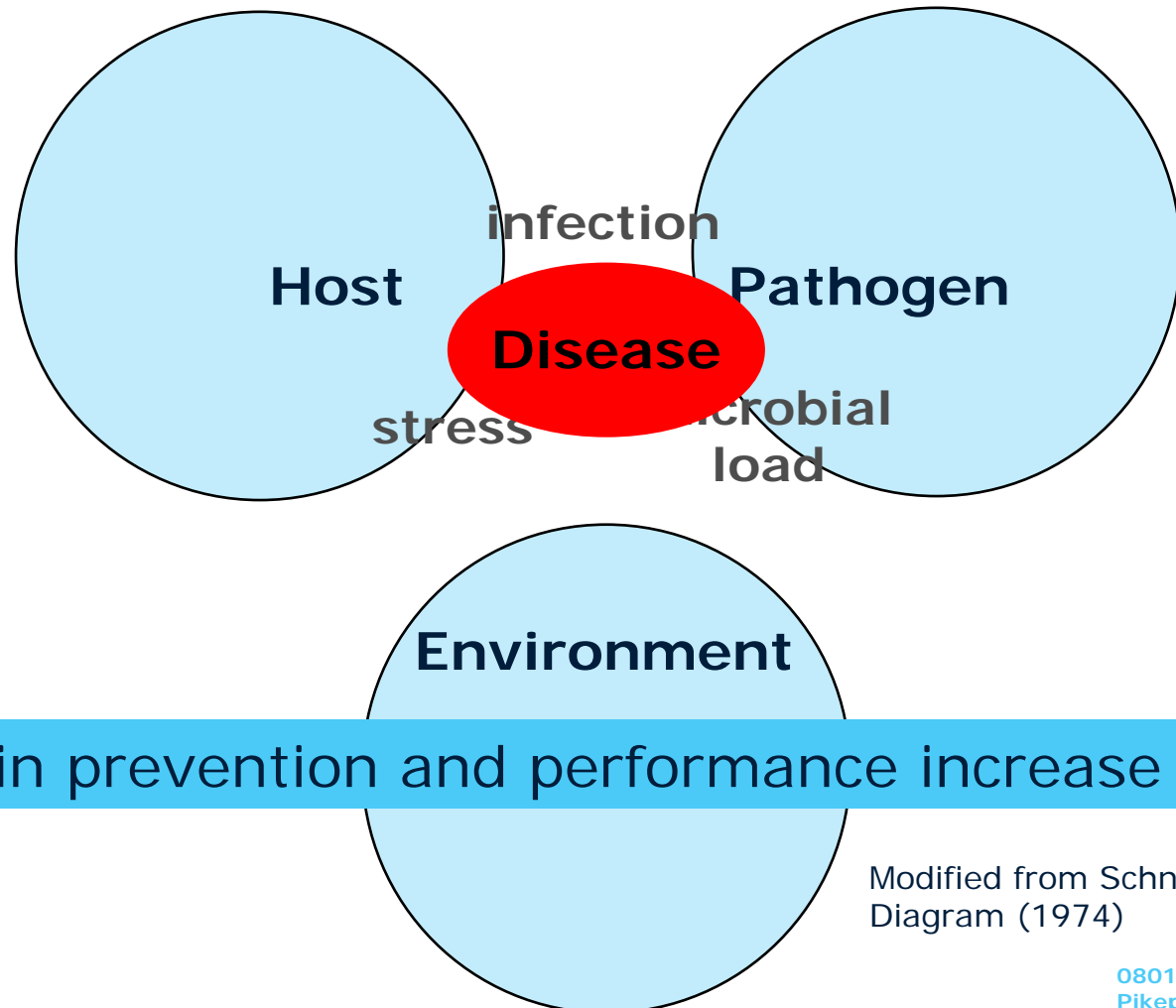
- High and long-term initial capital investment
- Possible lack of successes for investors
- Complexity
- Inefficiencies in filtration
- Unknown chronic sub-lethal effects of ammonia and CO₂ or other stressors
- Sub-optimal feed
- More stress sensitive



Opportunities and challenges

- Increasing fingerling production
- Year-round production
- Development genetic pool of broodstock
- Investment in domestication and genetic selection
- Specialisation - Market leader in quantity and **quality** fingerling production
- Initiator of supply chain management
- Fish health and welfare
- Answer to consumer demand

Host-pathogen-environment interaction



Invest in prevention and performance increase

Modified from Schnieszko's
Diagram (1974)



**Optimum
performance
requires a
multidisciplinary
approach**

Host-pathogen-environment interaction

Health increase and stress reduction

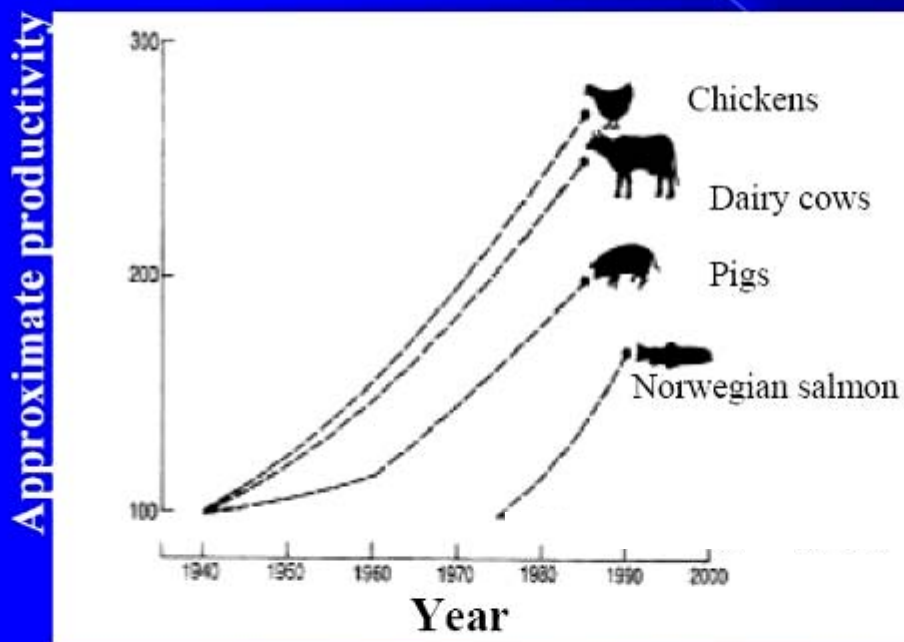
- domesticated broodstock
- stocking of quality fingerlings
- daily monitoring and record keeping
- screening of diseases
- quality feed
- good feeding management
- feed supplements



Checking broodstock in the spawning tanks

Gains through domestication

genetic diversity is the raw resource



From Eknath et al. 1991, p.11 in
(used with permission)



Genetic improvement by domestication and strain selection



Nutrition

Broodstock – Larvae – Ongrowing

- Fatty acids; DHA/EPA
- Arachidonic acid
- Nucleotides
- Vitamins (C and E)
- Trace elements
- Nutraceuticals/Immune stimulants



Monitoring and record keeping for weight increase
to calculate FCR and adjust feeding rate

Host-pathogen-environment interaction

Reduce introduction of pathogens

- domesticated broodstock
- optimum hygiene
- correct disinfection
- regular monitoring and correct diagnosis
- no use of chemicals

Host-pathogen-environment interaction

Environmental and microbial and control

- clean water supply
- keep optimum water quality parameters
- filter system
- water circulation in tank
- control waste and fouling



1,5 kg pikeperch being packed for the market

Consumer trends towards healthy eating and increased nutritional awareness

RAS

- Healthy product
- Functional food
- *n*-3 fatty acids and trace minerals
- Traceability
- Animal welfare
- Environmental-friendly
- Sustainable





**Thank you
for your attention!**