

AquaSearch ova ApS

AquaSearch ova ApS is a subsidiary of AquaGen A/S, Norway who again is owned by EW group, the world largest animal breeding company.

- **Brood stock farms:**

- 7 national brood stock farms
- Additional 1 national partner farm
- 1 joint venture farm in Slovenia
- 2 joint venture farms in South Africa

- At two of our national locations we are currently building new concrete raceways with water recirculation. These will also be roofed completely. That way we can control the light and move the spawning seasons to the Danish summer months (June – October). That way our general capacity is growing and particularly our capacity during June – October is considerably larger. By those actions we will be able to supply Danish produced trout eggs during all 12 months of the year.

Health status of brood stock farms:

- All AquaSearch farm approved free from IPN and BKD in addition to a list of exotic diseases
- Denmark officially free from VHS since November 2013
- IHN never reported in Denmark
- EHN never reported in Denmark
- EUS never reported in Denmark
- ISA never reported in Denmark
- VHS – last occurrence in Denmark 2003

- **Breeding:**

Family breeding with pedigree assignment and mass selection for the most coming breeding traits have been performed for several generations. Breeding traits include but are not limited to:

- Growth rate Feed conversion rate
- Age of maturation
- Phenotypic exterior
- General stress resistance and survival
- Saltwater adaptation

10 distinct breeding lines are currently maintained, and in cooperation with AquaGen, AquaSearch has recently initiated the process of implementing genetic markers (QTL's) for specific traits e.g. including specific disease resistance.

Furthermore, genomic selection are being implemented in AquaSearch breeding plans, in cooperation with Aarhus University, supported by a grant from the Green Development and Demonstration Program (GUDP) under the Ministry of Environment and Food of Denmark. The project started in 2017 and will run for 4 – 5 years. During this period, reference populations will be established in relevant production environments and statistical prediction models will be developed. Based on DNA analyses these prediction model will be used to select the fish in the breeding environment with the best production traits. The effectiveness of the method is compared with traditional breeding methods to evaluate the potential of genomic selection in Danish fish breeding. AquaSearch is currently establishing collaborations with customers with the relevant production environments to ensure a more customized product.

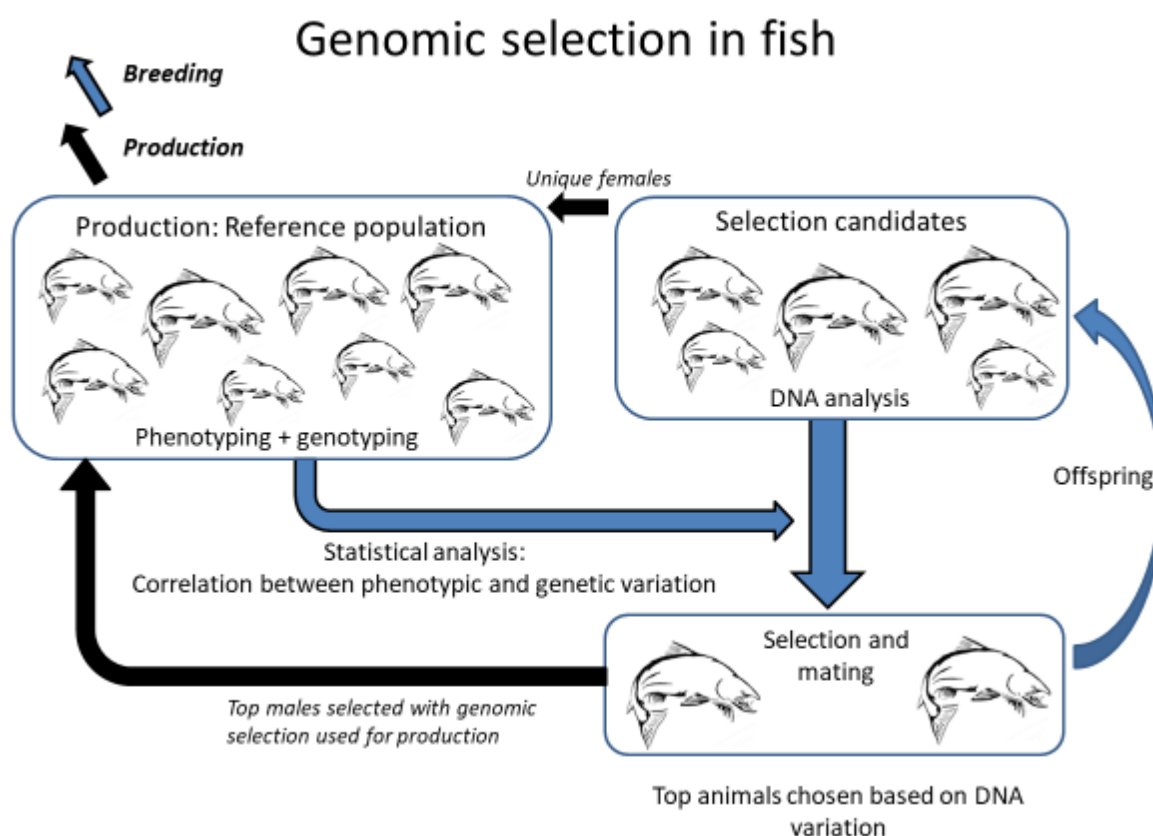
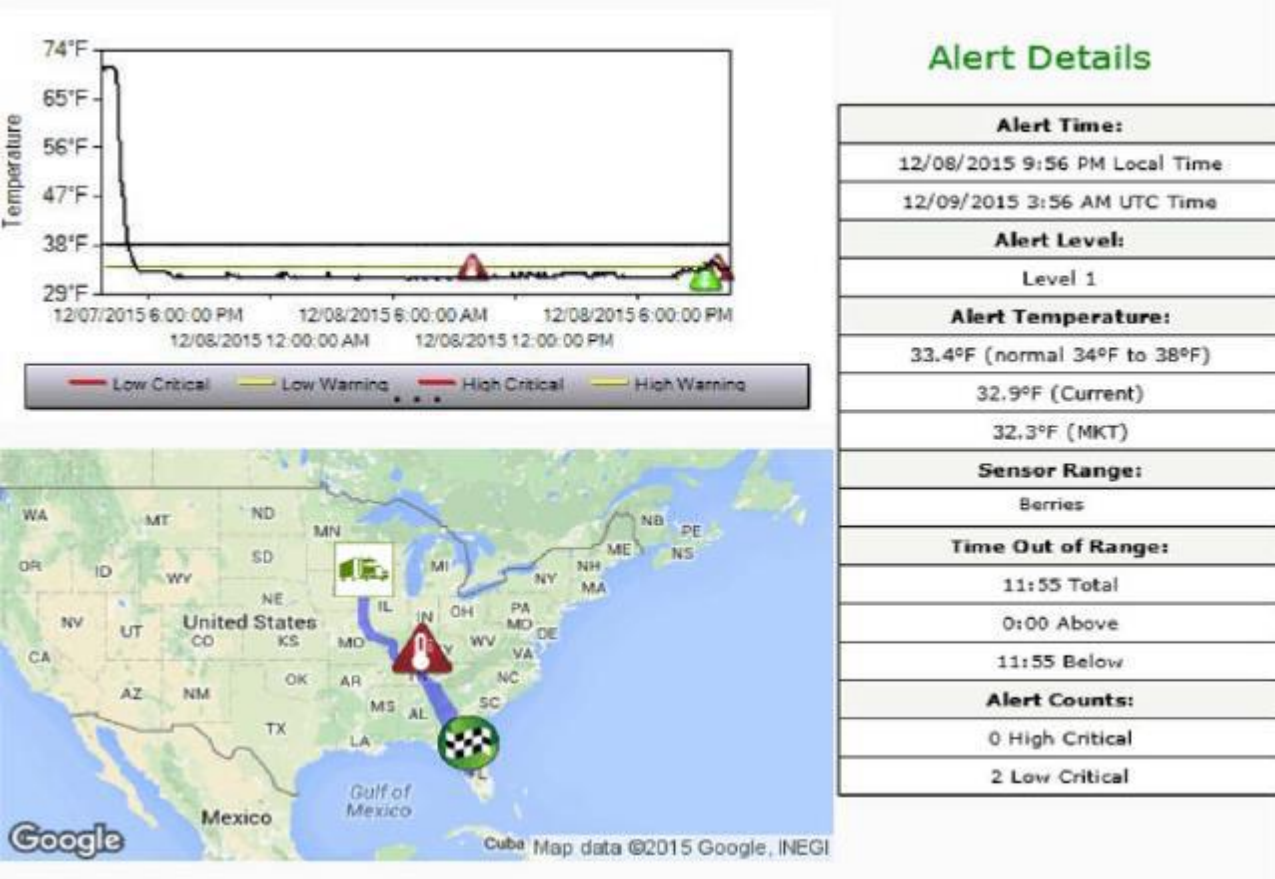


Figure 1 AquaSearch ova ApS - genomic selection in our breeding work

• **Transport security:**

AquaSearch is establishing a procedure to implement a temperature logger into all deliveries to China. This way we will be able to monitor and follow the delivery all the way to the end-user and during the hatching period. By this we will have even better traceability on our deliveries during transport end the first critical days prior to hatching of the eggs.



3 Improved traceability and temperature measurements during transports

Figure

• Danish Aquaculture Health Surveillance System

Unique principles and unmatched biosecurity

1. Surveillance expertise

The Competent Authority for animal health is the Danish Veterinary and Food Administration (DVFA) of the Ministry of Food, Agriculture and Fisheries. Within the DVFA, the Animal Health Division is responsible for animal health, animal health surveillance, veterinary epidemiology, veterinary preparedness, health management, etc.

2. Surveillance program and activities

The aquatic animal health surveillance in Denmark is based on the obligation to notify suspicion of animal diseases, the obligation to notify increased mortality, routine inspections and laboratory examinations of surveillance samples and finally: Historical freedom of disease of the entire location.

2.1 The obligation to notify suspicion of animal diseases

The Danish list 1 & 2 of notifiable diseases includes the following fish diseases: EHN, EUS, SVC, VHS, IHN, ISA, KHV, BKD and IPN. According to the Animal Health Act, any farmer and veterinarian is obliged to call an official veterinary officer right away if he suspects a notifiable disease.

2.2 The obligation to notify increased mortality

According to § 6 of Executive Order No. 968 of 18 July 2013, a person responsible for aquatic organisms shall, if an increased mortality in aquatic organisms is registered, immediately call a veterinarian or notify it to DVFA.

2.3 Routine inspections

During the regular routine inspections conducted as part of the official surveillance, all farm facilities (cages, tanks and ponds) are checked for dead, weak fish and fish showing abnormal behaviour. Where possible the newly dead fish, weak fish and fish with abnormal behaviour examined for clinical signs or necropsy signs of a contagious fish disease.

2.4 Laboratory examinations of surveillance samples

Brood stock farms are inspected min. twice a year and samples are taken regarding each inspection.

Targeted surveillance is carried out at brood stock farms that are registered free of IPN and BKD.

2.5 Historical freedom from disease

Licensed disease-free brood stock farms can only be approved as such, if the location has been historically free from specific disease since the initial stocking of the site.

No fish, eggs, semen or other biological material can enter the brood stock farm after it has been approved specific disease free.

3. Surveillance design

Brood stock farms are inspected twice a year, and samples are taken regarding each inspection.

Brood stock farms are always located as first aquaculture operation in a watercourse and either use borehole water or spring water as water supply or other water source protected from the disease risk from wild fish.

All laboratory tests are conducted at the National Veterinary Institute (DTU-Vet), which are both the European Union Reference Laboratory for Fish Diseases (www.eurl-fish.eu) and the OIE Reference Laboratory for VHS.

- AquaSearch ova ApS certifications

- Global GAP, reg. no.: 4056186367501
- Freedom Food, reg. no.: 4287.0001FT
- ASC certified brood stock farms