# SUSTAINABLE BREEDING FOR AQUACULTURE: OVERVIEW OF ONGOING RESEARCH AND BUSINESS EFFORTS IN EUROPE

A. – E. Liinamo[1], A. – M. Neeteson[1], H. Komen[2] and M. New[3]

[1]Farm Animal Industrial Platform, Benedendorpsweg 98, NL-6862 WL Oosterbeek, The Netherlands
[2]Wageningen University, Fisheries group, P.O. Box 338, NL-6700 AH Wageningen, The Netherlands
[3]European Aquaculture Society, Wroxton Lodge, 25 Institute Road, Marlow, SL7 1BJ Bucks, United Kingdom

## Introduction

The aim of this paper is to give one possible definition of sustainability in aquaculture. The paper will also present an overview of the ongoing research and business efforts on sustainable breeding objectives and techniques, reproduction methods and biotechnology in European aquaculture species.

## Material and methods

This overview is based on information collected within the SEFABAR (Sustainable European Farm Animal Breeding And Reproduction) thematic research network, which includes scientists and industry representatives from over 40 organisations around Europe. The SEFABAR network aims at finding sustainable, economically sound and accepted breeding scenarios for ruminants, pigs, poultry and farmed aquatic species, and a broad overview of sustainable breeding possibilities for farm animals as a whole. SEFABAR is an EC funded project (project number QLRT-1999-31368), takes three years and started in January 2001.

The aquaculture working party of SEFABAR consists of representatives from most of the countries with important aquaculture industries in Europe, e.g., France, Greece, United Kingdom, Spain, Norway, Belgium and The Netherlands. The definition of sustainable aquaculture was decided on discussions within the working party. In addition, all members have collected from their own countries information on

- ongoing research in aquaculture genetics,
- identification of knowledge gaps,
- priority issues, and
- options for sustainable breeding goals.

## Results and discussion

According to the aquaculture working party, sustainable aquaculture should:

1. minimise environmental impact in terms of pollution, diseases and genetic interaction with wild conspecifics,

2. use sustainable feed ingredient resources,
3. produce fish that are safe and acceptable to consumers in terms of residues, meat quality and (bio)technologies,
4. produce fish at an acceptable price for both consumers and breeders, and
5. maintain animal integrity in terms of normal physiological function.

All members of the working party agreed that the most important issue in aquaculture at the moment is environmental impact in terms of escapes and possible interbreeding of domesticated stocks with wild conspecifics. Pollution from marine cage culture and the impact of disease outbreaks in cultured marine animal stocks on wild populations were seen as other important issues with regard of environment.

A second important issue concerns the use of feed ingredients (fish meal and fish oils) derived from pelagic fisheries. This means feeding fish with other fish, and constitutes a major constraint in the longer term for the development of aquaculture. Sustainable feed ingredients should be of plant origin whenever possible, and candidate fish species for aquaculture should be preferably non-carnivorous.

It was also agreed by all members that, whatever the breeding goals, the animal integrity should not be compromised. Animal integrity is first of all manifested by the ability of animals to breed and reproduce in a natural manner. Any selective breeding program should include breeding goals related to normal reproductive capacity, morphology and behaviour.

Other issues that have been raised in the discussions of the aquaculture working party are

- the need to balance short-term and long-term economic gains and the need to assess also non-market gains,
- social concerns about product quality, food safety and animal welfare,
- consideration of not only intensive systems but also low-cost and alternative systems of aquaculture farming, and
- the need to develop criteria to evaluate the welfare of fish.

Also the priorities for all discussed factors might differ between different species, which should be taken into account when making species-specific breeding programs.

**References**

URL: http://www.sefabar.org