



DEPARTMENT OF AQUACULTURE

2002 Strategic Plan 2006



INSTITUTE OF MARINE RESEARCH

The activities of the Department of Aquaculture will be carried out in harmony with the general strategy and objectives of the Institute of Marine Research. The Department will actively encourage and collaborate with national and international centres in the performance of research and monitoring activities in the field of aquaculture.

1. General Objectives

The Institute of Marine Research will be Norway's leading research institute in future-oriented aquaculture research, and will be an international leader in prioritised fields of research.

The Institute will act as the authorities' principal advisor as well as supplying the premises on which the continued sustainable development of a growing and profitable Norwegian aquaculture sector will be based.

We will make our expertise available to developing countries.

2. Challenges

Our coasts and oceans have an enormous potential for the further development of the Norwegian aquaculture industry. We will experience a growing interest in the cultivation of marine species such as cod, halibut, haddock and shellfish, while salmon and trout production will continue to grow. Our task is to generate relevant knowledge, so that this potential can be exploited in large-scale, versatile aquaculture production. At the same time, we must ensure that future growth takes place within a framework of sustainability without excessive environmental impact or conflicts with other industrial and leisure interests.

The Department of Aquaculture will perform research in three areas:

- Basic research
- Research for public-sector management
- Industrially oriented research

Whether carried out on behalf of the authorities or for the industry, research demands a solid foundation of basic knowledge. To a great extent, we still lack the basic knowledge of all of our cultivated species that we need to solve the problems facing us. For this reason, strengthening the Department's basic research has high priority.

Our relationship with the Ministry of Fisheries means that we pay particularly close attention to research requested by the authorities. At the same time, however, the Department of Aquaculture will continue to set the pace in industrially oriented research.

The Department of Aquaculture will actively seek out research opportunities with other national and international institutions, and we will suggest to other institutions that they make active use of our facilities and experimental material. We wish to develop cooperation with the Directorate of Fisheries' Institute of Nutrition, the Norwegian Institute of Fisheries and Aquaculture, the National Veterinary Institute and the Universities of Bergen and Tromsø into binding alliances. We will also establish formal processes of cooperation with state-of-the-art institutions in other countries, when these have expertise that complements our own competence.

In order to achieve these goals we need excellent, modern facilities in order to perform controlled large- and small-scale biological studies. Modern laboratories are also needed for chemical, molecular biological and physiological analyses. During the period covered by this Strategic Plan, the expansion and modernisation of our two research stations at Matre and Austevoll will have the highest priority on the infrastructure side. It is vital to have stations of a high international standard with the potential to inspect and monitor the environment in which our experimental animals are cultivated. We also need to maintain extremely high standards of hygiene in order to be in a position to accept new live material without the risk of spreading diseases to other parts of our stations or their immediate environments. It is also important to have good laboratories connected directly to our research facilities for fish and crustaceans. In the course of the period covered by this Strategy Plan, the operations of our marine mesocosmos Parisvatnet will be re-oriented towards breeding studies of gadoids experimental ecology (incl. recruitment studies) and the semi-intensive production of marine fry.

3. Background

The Department of Aquaculture's budget for 2001 is about NOK 95 million. The Department employs 39 researchers, 14 research fellows, 47 technicians and eight administrative members of staff. In 2001, the Department will produce a total of about 107 person-years of work in 2001. The Department enjoys a wide range of biological competence with top-level expertise in virology, biochemistry, parasitology, bacteriology, molecular biology, pharmacology, immunology and vaccination, behavioural and sensory biology, endocrinology, reproductive physiology, developmental biology, ecophysiology



(environmental requirements and adaptations), ecology, genetics, the biology of growth, the biological basis of product quality and feed uptake and digestion.

If the Department is to be in a position to meet its objectives, its budget and manpower will have to be increased. There will be a particular need for researchers with first-class expertise, a group for which demand is steadily growing. The remoteness of the stations in Matre and Austevoll means that providing them with the high-level expertise that they need within their core areas will be specially challenging. To do this extra measures that will make these stations into attractive work-places are required while we actively seek to recruit new personnel and upgrade existing competence.

The Department of Aquaculture will concentrate its activities on the following four general fields of research:

1. *Environmental effects of aquaculture*
2. *Health and welfare of cultivated organisms*
3. *Safe aquaculture products and good food*
4. *The continued development of marine aquaculture and ocean ranching.*

4. Fields of research

4.1 *Environmental effects of aquaculture*

We will develop knowledge that will ensure that both industry and the authorities possess the scientific basis for the responsible and sustainable development of a Norwegian aquaculture industry. An essential precondition for such an industry is that aquaculture production should take place in such a way that its environmental consequences remain within acceptable limits. High-priority areas of research include routes of transfer of infections and effects on wild fish populations, the effects of escapes of farmed fish, genetic effects of cultivated organisms on wild populations, chemicals, medicines and ecological effects, and the location of fish farms.

4.2 *Health and welfare of cultivated organisms*

We will generate knowledge aimed at ensuring the health and welfare of the organisms that we cultivate. It is an overarching aim that cultivated organisms should not suffer or be exposed to unnecessary stress. The health of such organisms must be maintained by preventive care, effective and accurate diagnosis and finally, the efficient treatment of disease. Prioritised areas of research include infectious diseases, environmental requirements and welfare, deformities caused by the production process, and pain, stress and suffering.

4.3 *Safe aquaculture products and good food*

Norwegian aquaculture products must be good, safe food. This means that we need to produce knowledge that will enable the aquaculture industry to tailor its products to the wishes of its customers and supply the authorities with the competence and scientific advice required for good management. The Institute of Marine Research will focus on biological processes. Priority areas of research include organic environmental toxins in the food chain, new raw marine feed ingredients for aquaculture, genetically modified organisms, consumer acceptance and quality. The first of these fields will be studied in close collaboration with the Department of Marine Environment's advanced measurement laboratory.

4.4 *Further development of marine aquaculture and ocean ranching.*

We will utilise basic and applied research to generate knowledge capable of being used as a basis for the sustainable and profitable aquaculture production of marine species such as cod, haddock, halibut, scallops and mussels. We will focus in particular on problems that produce environmental risks, but will also pay attention to identifying solutions for production bottlenecks. Priority research tasks include domestication, quality of broodstock and gametes, early life stages (survival and growth), feeds, feed quality and feeding strategies, behavioural and sensory development, aquaculture technology and environmental requirements.

5. Other areas of activity

Researcher training and scientific education are vital for recruitment to our own ranks and because the aquaculture industry's need for competence will continue to grow. The Department of Aquaculture will play an active role in training researchers by employing Ph.D. students on our research projects, and will support professional training programmes by offering apprenticeships and work-experience positions in our research stations.

We intend to establish a company to take over our semi-intensive production of fish fry in our marine mesocosmos Parisvatnet. In due course, this company will be able to take over the Institute's large scale production of other cultivated fish species.



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