

MARICULTURE COMMITTEE

1977

Norway
(F. Utne)

Disease conditions in aquaculture have been much the same as previous years.

Vibriosis and salmon lice (*Lepeophtheirus salmonis*) are still economically most important. Research on possible measures against both is in progress.

A few farms have had attacks of furunculosis, *Aeromonas salmonicida*, achromogenic strain.

The freshwater station of the Institute of Marine Research at Matredal was closed down in October 1977 due to an outbreak of IPN, virus type Sp. Mortality was very low. (Institute of Marine Research).

Matre Aquaculture Station (Institute of Marine Research) is an experimental hatchery working on juvenile salmonids for improvements in the marine fish farming. Most experiments are supervised by fisheries biologists in Bergen.

In 1977 we continued the salmon release project started in 1976. 3589 tagged fishes were released in Matre River and Matre Fjord. None of the 9000 fingerlings of pink salmon released last year were recaptured as adults. 25,4% of tagged sea trout of the native strain leaving Matre River in the spring were reported as recaptured during summer and fall.

Effect of food particle size (dry pellets) on growth, behaviour and food waste were studied on fingerlings of Atlantic salmon in observation aquarias.

AQUACULTURE STATION - AUSTEVOLL

The first stage of a new research station for marine aquaculture has been built at the island of Huftarøy in Austevoll, south of Bergen on the west coast of Norway. The station will be in full operation from fall 1978. At the present time the staff consists of one scientist and five technicians. It is a field station for the division of marine research and will be extensively used by scientists at the directorate of fisheries.

The station has facilities for laboratory experiments, chemical analysis, preparing of fresh and moist pellet feed for salmonid pen culture and cod storage. For pen culture of fish, the station is equipped with a research raft with 20 units (3 x 3 m pens), 10 large pens, and floating raft of 100 x 1,5 m.

The research work will mainly deal with cultivation of marine species. Of the actual projects can be mentioned: New methods for culture of marine fish larva, long and short storage of live saithe, feeding, growth and metabolism of cod, raft culture of blue mussels, feeding experiments with salmonida and genetical studies of atlantic salmon and rainbow trout.

The aquaculture station is close neighbour to a new governmental school of fisheries. Training and education in the field of aquaculture will be an important part of the future work of the station.

Project: Feeding, growth and metabolism of cod.

The project started in 1977 and will continue for a three years period. It is a part of larger project dealing with feeding, digestion and bioenergetics of cod in the Barents Sea. The work in 1977 included studies on growth and efficiency of cod at various size (10 - 600 gram) in ratio to isocaloric feed of various protein content (30 - 100%), and in relation to ration size (0,8 - 4,5% dry weight food/fish) at 8°C and full salinity. Metabolic rate was calculated on the basis of measurement of

oxygen consumption in specially designed growth - metabolism tanks (J.R. Brett - design), and excretion products were sampled simultaneously.

The experiments showed that cod was well adapted to laboratory conditions after 6 - 8 weeks of acclimatization.

The experiment in 1978 will include studies on feeding and growth in both the laboratory and floating pens scale, using various types of prepared and natural food.

Studies on quantitative genetics on rainbow trout and Atlantic salmon were started in 1971, and have continued since then. Each year 20-25 sib-groups of rainbow trout and 40-50 sib-groups of Atlantic salmon have been reared. During the fresh water stages, the fish are kept at the research station Akvakultur-stasjonen Matre, Matredal, and during the sea water stages at a commercial fish farm (Svanøy Stiftelse, Svanøybukt).

The year classes of the first generation were used to study variation in quantitative traits (especially growth rate and age at first sexual maturity) and to estimate the genetic influence on the variation from full-sib and half-sib correlations. The second generation, which is now growing up, is used to check and confirm the results by parent-offspring correlations and to try to obtain genetic improvement for fish farming by choosing parent fish with the best quantities. Besides the genetic aspects, data are also collected on correlations between growth rate and age at maturity, growth rate of the individual fish at different ages, recovery of spent fish, effect on growth rate of early maturity, etc. The experiments will possibly be interrupted because IPN-virus was detected in the material (Institute of Marine Research).

In spring 1977 an experiment with migrating smolt was performed, where the intention was to find a simple and practical way to separate smolt from fish that were not completely smoltified. Two circular plastic tanks, A and B, were connected with a 16 m long wooden channel. Fresh water was led into tank A and through the wooden channel to tank B. Fishes were put into tank A and after a certain time the smolts had migrated from tank A to tank B, while the fishes that were not completely smoltified were back in tank A. (Institute of Marine Research).

A project related to digestion/nutrition in cod with particular regard to capelin as feed in connection with ecological investigations in the Barents Sea is carried out at Government Vitamin Institute, Directorate of Fisheries. Among the results obtained are 1) to a great extent the caloric content in the faeces is representing fat, probably as Ca-soaps, 2) most of the nitrogen content in the dry matter in the intestine originates from other N-containing compounds than protein (as sum a a), 3) that digestibility in natural environment can be calculated by using Ca, Fe and Zn as internal indicators.

Different vitamins added to a wet feed, well balanced in protein and fat, were tested on rainbow trout at the field station at Matre. These investigations showed that it is important to put a universal vitamin mixture into wet feed consisting of whole fish, fish offal and shrimp waste, as rainbow trout with an initial weight of 30 g gained for 7½ months about 700 g in the positive group while the fish in the negative group grew only the half and had an enormous loss of fishes. (Government Vitamin Institute).

Investigations regarding frequency of feeding for the rainbow trout have been performed in salt water at Matre Aquaculture Station. In different groups the fish was given wet feed 7,6 and 5 days every week and from 2 to 6 times each feeding day. The most favourable result achieved the fish that was given wet feed 3-4 times a day the whole week as this rainbow trout had both the best growth and feed utilization. By feeding the fish 6 times a day the feed utilization was reduced without regard to number of feeding days weekly. (Government Vitamin Institute).

Working with different protein sources and protein utilization in fish.

Growth of Coalfish has been studied using red feed and krill as sole protein sources in the feed. Use of red feed resulted in weight retardation. Experiments with use of krill seems to give optimal growth in Coalfish with 25% protein energy in the diet (Government Vitamin Institute).