A WASHINGTON SEA GRANT REPORT

WSG-WO 74-1

WORKSHOP ON SALMONID AQUACULTURE

A SUMMARY REPORT

SEPTEMBER 21, 1973
UNIVERSITY OF WASHINGTON

CHAIRMAN: *Ernest Brannon*
EDITORS: *Terry Nosho, Roy Nakatani*
Ernest Brannon, and Ernest Salo

Cosponsored by Washington Sea Grant Marine Advisory Program
and College of Fisheries, University of Washington

in cooperation with

National Marine Fisheries Service
Washington Department of Fisheries
Salmon Aquaculture Groups of Washington

Published by Division of Marine Resources
University of Washington • Seattle 98195

VARIATIONS IN GROWTH RATE AND FEED CONVERSION IN PEN-REARED STOCKS OF PACIFIC SALMON

*Conrad Mahnken**

Abstract: Growth rates are presented for stocks of coho, chinook, chum, and pink salmon raised in floating enclosures in Clam Bay, Puget Sound. Interspecific comparison of growth and the implication for saltwater pen culture are discussed. The low efficiency of feed utilization in a slow-growing segment of a 0-age coho stock may be due to fish size and timing of saltwater entry.

Discussion Summary

1. Two important considerations for the economic success of fish farming are a thorough understanding of growth rate and conversion of feed.

2. A successful operation often depends on four important factors that control feeding efficiency: diets, environment, genetics, and disease.

3. For salmon reared in saltwater, growth rates and feed conversions are likely to be different from those in freshwater hatcheries where fish are subject to a different set of environmental conditions as well as being smaller. Unfortunately, the relative importance of genetic, environmental, and dietary growth factors are poorly understood for saltwater.

4. Environmental considerations are particularly important in the saltwater pen-rearing of 0-age coho salmon. In this case the grower must accelerate his eggs, fry, and fingerlings through to smoltification in freshwater by their first summer in order to take advantage of higher summer temperatures in saltwater where grow-out pens are located. If the grower is unable to transfer by early summer, or if saltwater growth schedules are not met, then the grower may be unable to meet the targeted harvest schedule. Since fish grow little from December to April, overwintering can be an expensive situation for the grower.

5. Variations in growth rate and feed conversion within stocks and between species of Pacific salmon reared in floating enclosures at Manchester may be due to a variety of reasons. Reduced growth rates may be caused by disease, stress, osmoregulation, or by a genetic segment of the population that is normally a slow grower. Stress may not necessarily manifest itself in mortality but may cause drastic reductions in growth and an increase in feed conversion in pen-reared salmon. A reduction in growth is accompanied by worsening feed conversions. Once stressed, coho salmon may never recover their full growth potential.

6. Pink and chum salmon and their hybrids, because of sustained rapid growth to a larger size than coho or chinook salmon, may be more efficient converters of feed at larger sizes. But, their use as aquaculture animals is limited by their susceptibility to disease.

*National Marine Fisheries Service, Manchester Aquaculture Station.