IV. TERMINATION REPORTS

A. EFFECT OF NUTRITION ON BODY COMPOSITION AND SUBSEQUENT STORAGE QUALITY OF FARM-RAISED CHANNEL CATFISH

Termination Report
For the Period
May 2, 1989 to December 31, 1992

FUNDING LEVEL:

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<th>Year</th>
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PARTICIPANTS:

University of Georgia
Food Science & Technology

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PROJECT OBJECTIVES:

1. Determine effects of diet composition and feeding strategies (energy, protein and type and amount of lipid) on yield, dressing percentage, body fat, subsequent frozen storage quality and profitability of catfish grown to 0.5-1.0 kg (1-2 lb) sizes under conditions that reflect management practices used by most of the catfish industry.

2. Determine effects of finisher diets or alternative feeding rates and schedules on yield, dressing percentage, body fat, subsequent frozen storage quality and profitability of catfish grown to 0.5-1.0 kg (1-2 lb) sizes under conditions that reflect management practices used by most of the catfish industry.

3. Determine effects of diet supplements on chemistry and sensory qualities of fat in fish flesh and stability of fish during subsequent frozen storage.

4. Develop procedures for disseminating these findings to appropriate clientele groups.
ANTICIPATED BENEFITS:

The research conducted in this project showed that varying protein and/or energy in practical catfish feeds can influence fat in the fish, but this does not significantly affect frozen keeping quality of the processed fish. The research also showed effects of various protein levels in catfish feeds on pond production under various feeding strategies which fish farmers can use to make economic decisions on feeds. The study showed that fish size has much more effect on body fat content than diet, and large fish have a great amount of fat on the outside of the muscle which if removed during skinning will reduce autoxidation of the frozen flesh. Increasing dietary vitamin E will reduce autoxidation of the fish muscle in low temperature storage.

PROGRESS:

OBJECTIVE 1

Reducing protein in practical feeds to 24 to 26% (and thereby increasing energy/protein ratio) did not cause a reduction in growth but caused a slight increase in body fat, but this change in fat did not affect frozen keeping quality.

OBJECTIVE 2

Raising or lowering the protein content of finishing feeds (fed the last 4 weeks of grow-out period) did not affect growth or body composition of the fish.

OBJECTIVE 3

Vitamin E fed at four times the dietary requirement protected the lipids in catfish muscle from autoxidation during abused (high temperature) frozen storage conditions. Adding various commercial antioxidants, lysine and carnitine, to the diet did not affect autoxidation of muscle lipids during storage.

OBJECTIVE 4

An extension fact sheet, "Channel Catfish Production--Impacts of Diet Composition and Feeding Practices" (SRAC #187) has been prepared which describes major findings of this project in practical language. Many publications in technical and trade journals have been prepared and are listed at the end of this report (pages 9-12).

IMPACTS:

Results from this project have indicated to the catfish industry that protein, or protein/energy ratio, in catfish feeds can be decreased without reducing fish production and with no effect on frozen storage quality of the processed fish. This has allowed the protein percentage to be reduced in commercial feed from 32 to 28% which lowers the cost approximately $10 per ton. In 1992, many farmers changed to the lower protein feed. One large feed mill reported that 30% of the feed manufactured in 1992 was 28% protein as compared to less than 10% the previous year.

The study demonstrated to processors that large catfish have a thick layer of fat on the surface of the muscle and that removing this will enhance frozen storage quality. Processors have adjusted skinning machines to remove this layer of fat from the fish.

This funding has initiated research in various areas of catfish nutrition and processing at several institutions which has been continued with other funding. An example is the University of Georgia, Food Science Department, which was not previously involved in catfish research but has 16 publications on processing (listed below) from this project and is continuing research in this area.

PUBLICATIONS:


Bai, S. C. and D. M. Gatlin, III. 1993. Effects of L-lysine supplementation of diets with
different protein levels and sources on channel catfish, *Ictalurus punctatus* (Rafinesque). Aquaculture Fish Mgmt. In press.

Bai, S. C. and D. M. Gatlin, III. 1992. Dietary rutin has limited synergistic effects on vitamin C nutrition of fingerling channel catfish (*Ictalurus punctatus*). Fish Physiology and Biochemistry 10:183-188.


Annual Meeting Institute of Food Technologists.
June 20-24, New Orleans, La.


Huang, Y. W. and M. Zheng. 1991. Chemical, microbiological and sensory qualities of vacuum skin packaged channel catfish stored at 4°C. Abstract. Annual Meeting of Institute of Food Technologists. June 1-5, Dallas, Texas.


Liu, Q. Interaction of supplemental carnitine and lysine on growth, tissue lipid and protein content of fingerling channel catfish. M.S. Thesis. University of Georgia.


**B. HARVESTING, LOADING AND GRADING SYSTEMS FOR CULTURED FRESHWATER FINFISHES AND CRUSTACEANS**

Termination Report
For the Period
May 2, 1989 to April 30, 1993

**FUNDING LEVEL:**

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**PARTICIPANTS:**

Louisiana State University (Lead Institution) -
Robert P. Romaine, T. B. Lawson,
J. L. Avery

Auburn University - J. W. Jensen, John M.
Grizzle, L. L. Lovshin, R. K. Goodman

Clemson University - John A. Collier,
Thomas E. Schwedler