

TILAPIA NUTRITION UNDER FRESHWATER CONDITIONS

Emmanuel M. Cruz  
Central Luzon State University

## TILAPIA NUTRITION UNDER FRESHWATER CONDITIONS

Emmanuel M. Cruz

Research on the nutrition of Tilapia in the Philippines, is still in the conception stage compared to poultry, swine and cattle nutrition. Most of the exploratory nutrition experiments were conducted at the Freshwater Aquaculture Center under aquarium, hapa and pond conditions and at the College of Inland Fisheries under cage condition. Both stations are located at Central Luzon State University in Muñoz, Nueva Ecija.

Experiments on the nutrition of Tilapia in freshwater involve the testing of rations using various ingredients in different proportions normally utilized in the manufacture of animal feed. Two approaches in feeding Tilapia have been carried out at CLSU. First is the feeding of materials that will supplement what is already available in the pond with the idea that certain elements or compounds essential to the proper nutrition of the fish are produced by the pond or environment where the fish is reared. This approach is often used for feeding tilapia at low to moderate density and in fertilized ponds.

The second approach which is complete feeding is applicable in the case of ponds stocked at high densities and in all types of intensive culture units, i.e., cage culture, race way culture, and pen culture. A complete ration adequate in its nutrient content is offered since the fish becomes entirely dependent on the quantity and quality of nutrients added in the diet and the natural feeds may not be present in quantities and proportions to balance a nutritionally incomplete ration.

Preliminary studies on the determination of the protein requirements of Tilapia sp. revealed the following results:

| Species  | Levels of protein (%) | Reference |
|--|-----------------------|-----------|
| <u>Tilapia mossambica</u> fingerlings                              | 30-38                 | (5)       |
| <u>Tilapia mossambica</u> fry                                      | 38-45                 | (2)       |
| <u>Tilapia mossambica</u> (all-male)                               | 25                    | (4)       |
| <u>Tilapia nilotica</u>  | 20-30                 | (9)       |
| <u>Tilapia Hybrid</u> (Male Nile x tilapia<br>Female Java tilapia) | 30                    | (3)       |

Screening of feedstuffs as feed supplement and as part of a complete ration had also been undertaken. The following ingredients have been tested as feed supplement for Tilapia nilotica.

|                     |     |
|---------------------|-----|
| Rice bran           | (1) |
| Copra meal          | (1) |
| Ipil-ipil leaf meal | (8) |
| Mulberry leaf meal  | (8) |
| Kangkong leaf meal  | (8) |
| Hydrilla meal       | (8) |

Similarly, the following with promising results were tested as part of a complete diet for Tilapia nilotica.

|                     |        |
|---------------------|--------|
| Ipil-ipil leaf meal | (6)    |
| Rice bran           | (6,10) |
| Copra meal          | (6,10) |
| African snail meal  | (7)    |
| Horse meat meal     | (7)    |
| Tilapia meal        | (7)    |
| Soybean meal        | (6)    |
| Mulberry leaf meal  | (6)    |
| Cracked rice        | (6)    |
| Sorghum             | (6)    |
| Fish meal           | (6,10) |

The following research studies should be conducted to be able to scientifically formulate a nutritionally adequate ration for tilapia.

- a. Protein-energy ratio.
- b. Levels of fats and essential fatty acids required by tilapia.
- c. Essential vitamins needed.
- d. Essential minerals needed.
- e. Utilization of non-conventional feedstuffs.
- f. Formulation of effective feed at the least cost.

## Literature Cited

1. Cruz, E.M., 1979. Polyculture of Nile tilapia, common carp snakehead with supplemental feeding. Submitted to the CLSU, Sci. Journal.
2. \_\_\_\_\_ and I.L. Laudencia, 1976. Protein requirements of Tilapia mossambica fry. Tech. Rept. No. 9 of the Inland Fisheries Project.
3. \_\_\_\_\_ and \_\_\_\_\_. 1977. Preliminary Study on the protein requirements of tilapia hybrids. Technical Report No. 11 of the Inland Fisheries Project, (77) pp. 49-52.
4. \_\_\_\_\_ and \_\_\_\_\_. 1977. Preliminary study on the protein requirements of all-male Java tilapia stocked at different densities in hapas. Tech. Rept. No. 12 of the Freshwater Aquaculture Center.
5. \_\_\_\_\_ and \_\_\_\_\_. 1977. Protein requirements of Tilapia mossambica fingerlings. Kalikasan, Phil. J. Biol. 7(2):159-169.
6. \_\_\_\_\_ and \_\_\_\_\_. 1978. Studies on the substitution of fish meal with African snail, horse meat and tilapia meal in the rations of Nile tilapia. Tech. Rept. No. 13 of the Freshwater Aquaculture Center.
7. \_\_\_\_\_ and \_\_\_\_\_. 1978. Screening of feedstuffs as ingredients in the rations of Nile tilapia. Kalikasan, Phil. J. Biol. 7(2):159-164.
8. \_\_\_\_\_ and \_\_\_\_\_. 1978. Screening of materials as feed supplement in a polyculture system. V. Supplemental feeding of leaf meals with rice bran. Tech. Rept. No. 13 of the Freshwater Aquaculture Center.
9. \_\_\_\_\_ and \_\_\_\_\_. 1979. Preliminary study on the protein requirements of Nile tilapia fingerlings. Submitted to the Fisheries Research Journal.
10. Guerrero, R.D. 1978. Studies on the feeding of Tilapia nilotica in floating cages. IFS Supported Project.