

ST. JOSEPH'S COLLEGE FOR WOMEN (A), VISAKHAPATNAM

Four Year – B.Sc. (Hons), Semester – VII

ZOOLOGY

(Skill Enhancement Course -Aquaculture)

FISH NUTRITION AND FEED TECHNOLOGY

Code: Z 7505 (3)

Time:4hrs/week

Max Marks:100

LEARNING OBJECTIVES:

Enable the students to

- To understand the nutritional requirements for different stages of cultivable fish and prawns.
- To Gain knowledge about different forms of feeds and feeding methods of cultivable fish and prawns.
- To Suggest about different ingredients used for feed manufacturing.
- To study about Feed formulation and storage methods
- To analyze different feed additives & non-nutrient ingredients used in feedpreparation.

LEARNING OUTCOMES

By the successful completion of the course the students shall be able to

- Gain knowledge about the nutritional requirements for different stages of cultivable fish and prawns.
- List the different forms of feeds and feeding methods of cultivable fish andprawns.
- Identify different ingredients used for feed manufacturing.
- Select the feed ingredients and their selection and Feed formulation.
- Gain knowledge about different nutritional deficiency diseases in cultivable fish.

SYLLABUS

UNIT-1: NUTRITIONAL REQUIREMENTS OF CULTIVABLE FISH

1.1 Requirements for energy, proteins, carbohydrates, lipids, fiber, micronutrients fordifferent stages of cultivable fish and prawns

1.2 Essential amino acids and fatty acids, protein to energy ratio, nutrient interactions andprotein sparing effect

1.3 Dietary sources of energy, effect of ration on growth, determination of feeding rate,check tray

1.4 Factors affecting energy partitioning and feeding

UNIT-2: FORMS OF FEEDS & FEEDING METHODS

- 2.1 Feed conversion efficiency, feed conversion ratio and protein efficiency ratio
- 2.2 Wet feeds, moist feeds, dry feeds, mashes, pelleted feeds, floating and sinking pellets, advantages of pelletization
- 2.3 Manual feeding, demand feeders, automatic feeders, surface spraying, bag feeding and tray feeding
- 2.4 Frequency of feeding.

UNIT-3: FEED MANUFACTURE & STORAGE

- 3.1 Feed ingredients and their selection, nutrient composition and nutrient availability of feed ingredients
- 3.2 Feed formulation – extrusion processing and steam pelleting, grinding, mixing and drying, palletization, and packing
- 3.3 Water stability of feeds, farm made aqua feeds, micro-coated feeds, micro-encapsulated feeds and micro-bound diets
- 3.4 Microbial, insect and rodent damage of feed, chemical spoilage during storage period and proper storage methods, aflatoxins testing.

UNIT-4: FEED ADDITIVES & NON-NUTRIENT INGREDIENTS

- 4.1 Binders, anti-oxidants, probiotics
- 4.2 Feed attractants and feed stimulants
- 4.3 Enzymes, hormones, growth promoters and pigments
- 4.4 Anti-metabolites and fiber

UNIT-5 NUTRITIONAL DEFICIENCY IN CULTIVABLE FISH

- 5.1 Protein deficiency, vitamin and mineral deficiency symptoms
- 5.2 Nutritional pathology and anti-nutrients
- 5.3 Importance of natural and supplementary feeds, balanced diet

REFERENCE BOOKS

1. Fish Nutrition, Third Edition by John E. Halver and Ronald W. Hardy
2. Fish Feeding in Aquaculture by David G. Allan
3. Aquafeed Formulation by Sergio F. Nates
4. Nutrient Requirements and Feeding of Finfish for Aquaculture by Carl D. Webster and Chhorn Lim
5. Fish Nutrition by Chhorn Lim and Carl D. Webster
6. Fish Feed Technology, Second Edition by C. Venkataramanaiah
7. Fish Nutrition and Feed Technology by A.K. Datta, N. Gupta, and D.K. De
8. Aquafeed Technology by N. Rajendran and N. Gopalakrishnan
9. Aquaculture Nutrition: Gut Health, Probiotics and Prebiotics by S.K. Nayak, J. Mukherjee, and S. Prusty
10. Fish Feed Preparation and Management by K. Santhanam and S. Viswanathan
11. Fish Nutrition and Feed Technology: A Practical Approach by K. Gopakumar and R. Shankar
12. Aquatic Animal Nutrition: Principles and Practices by N. Gupta and D.K. De
