

Course Code: 547V08

Duration: 30 Hrs

FISH FEED MANUFACTURING

Course Objectives:

- To understand the basic principle of fish nutrition
- To identify the conventional and unconventional feed ingredient
- To understand the nutritional requirement of fishes
- To prepare the feed formulation
- To understand the feed manufacturing process

UNIT-1 Fish Nutrition: Protein nutrition, Lipid nutrition, Carbohydrate nutrition, Vitamin nutrition, Mineral nutrition - Functions and their classification, Utilization by fish, Evaluation criteria, Deficiency symptoms; Live feed for Larval and Broodstock nutrition.

UNIT-2 Feed Ingredients: Feed production trend; conventional feed ingredients; unconventional feed ingredients; single cell proteins, leaf protein concentrates, gluten meal and additives ; Anti nutritional factors- methods of detection and detoxification process.

UNIT-3 Nutritional Requirements: Body composition of finfish and shellfish; Methods of qualitative and quantitative requirements of nutrients for finfish and shellfish; Growth evaluation- FCR, SGR, Absolute and Relative growth; Factors affecting nutritional requirements.

UNIT-4 Feed Formulation: General principles; Pearson's methods, and computerized least coast feed formulation method for aqua feed formulation; Types of feeds- dry feeds- non-dry feeds.

UNIT-5 Feed Manufacturing process: Grinding, Homogenization, conditioning, pelleting, Cooling or Drying, crumbling, coating / top dressing. Feed storage- water stability of feed, feed spoilage; Quality control and evaluation, shipping.

References:

Halver, J. E. and Hardy, R. W. (2002). Fish Nutrition. Academic Press, London.

Lovell, R. T. (1998). Nutrition and Feeding of Fishes. Kluwer Academic Publishers.

Halver, J. E. and Tiews, K. T. (1979). Finfish Nutrition and Fishfeed Technology Vol. I and II Heenemann, Berlin.

FAO training manual related to feed analysis.

Course outcomes:

After completion of the course, students will be able to

- discuss the nutritional composition of feed ingredients and limiting nutrients that cause diseases
- select the ingredients for feed preparation according to nutritional needs for fishes
- identify the nutritional requirements of finfish and shellfish
- prepare the nutritional balance feed for fishes using different feed formulation methods
- discuss the feed manufacturing process