Nutritional Diseases

The continued expansion and improvements efficiency of aqua-cultural production requires continued improvements in nutritional formulation and feed technology. However, to be effective feed developments must consider on the one hand the nutritional requirements of the cultured species, in terms of their energy, protein, lipid, vitamin and mineral requirements and on the other hand the range of available feed ingredients, their cost, digestibility and the nature and regularity of their supplies. Formulation of well-balanced diets and their adequate feeding are two of the most important requirements for successful aquaculture.

The primary cause of many diseases may be defective nutrition. It can be traced back to the lack of nutrition, but more often to the imbalance of certain nutritive components. The disease signs are mostly perceptible only some time after administering the feed, if the individual components drop below the critical value of the body reserves.

1-Protein deficiency: The growth and the maintenance of health of fish depend on the content and quality of protein in the feed. This dependence becomes more significant when fish are subject to more unfavorable environmental conditions. The harmful effects of high stock densities, pollutants in the water oxygen deficiency, stress situations due to baths for protection against or control of diseases and soon, can be well tolerated by fish when fed on diets containing the requisite quantity and quality of protein. Also protein is importance for the growth of fish and ensures the formation and activity of essential enzymes and hormones.

The most common signs of protein and/or amino acid deficiency in fish are:

1. Reduction of growth rate.

2. Mortality.

3. Scoliosis and Lordosis.

4. Anemia (Reduction of RBCs 750000/m3).

2-Lipids deficiency:

Pathological conditions occur in fish from excess dietary fats, deficiency of fatty acids and the toxic effect of unsaturated dietary fats.

1. Reduced growth of the fish.

2. Skin de-pigmentation.

3. Fins erosion.

4. Rapid swimming is followed by immobility and loss of reflex.

5. Fish may float or sink to the bottom and then recover or die.

6. Ascetics.

3-Vitamins deficiency:

Symptoms of vitamin deficiency constitute some of the most common disease originating from nutrition. The problems associated with vitamin deficiencies.

Vitamin Symptoms of deficiency

Ascorbic acid Skeletal deformities poor wound healing.

Thiamine Poor growth and nervous symptoms.

Riboflavin

Cataract and corneal opacity.

Pigmentation abnormalities.

Poor growth.

Fin erosion.

Pantothenic acid

Clubbing of gills filaments loss of appetite, poor growth, exudates on gills.

Folic acid

Poor growth, lethargy, dark coloration, anemia.

Pyridoxine

Nervous disorders, anemia loss of appetite, rapid and gasping breathing.

Vitamin A

Blindness, poor growth.

Vitamin E

Muscular dystrophy anemia, poor growth.

Vitamin K

Reduced blood clotting time.

4-Starvation:

Starvation can occur due to number of reasons other than obvious under feeding:

1. Incorrect assessment of the weight of receiving the food.

2. Presentation of a feed of inappropriate physical characteristics, usually when size of individual particle is too large for size of fish or sinks too quickly through the water.

Signs of starvation are easy to spot and include loss of condition, loss of weight and failure to reproduce. These may be an increase in cannibalism, ranging from fin nipping to attempts to swallow whole fish particularly very young ones.

Diagnosis of nutritional deficiency:

Presumptive diagnosis of nutritional deficiency is based on clinical signs and combined with evidence of an inadequate diet. Definitive diagnosis requires identification of a specific nutritional deficiency in diet.

Treatment and control:

Treatment of disease due to nutritional imbalance depends on:

1. Provision of fish with right kind of food with sufficient quantity according to diagnosis of the types of deficiency of nutritive components.

2. Mathematical formulation of a complete ration must be followed by ration preparation, analysis and actual feeding of fish to be assured that all nutrients are available.

3. Physical preparation of the ration must also be considered to allow for presentation of the nutritionally balanced diet to the fish in such a way that it can be ingested and digested. Taste or palatability of the ration for each fish species must be considered. Fish have a highly sensitive sense of taste, so the ration must pass the palatability test. When presented to the fishes in order for it to be completely and continuously ingested.

4. The ration must be fed to the fish at prescribed time intervals because of a more or less limited stomach capacity.

5. The amount of ration fed to confined fish daily to maintain nutritional depends on fish species, fish size, ration quality, water temperature and type of ration.