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## CHAPTER-7

### NUTRITIONAL REQUIREMENTS OF CULTIVABLE FIN FISH AND SHELL FISH

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#### Introduction

Effective and sustainable aquaculture of finfish and shellfish (prawns, lobsters and crabs), depend on the establishment of nutritionally suitable, environmental friendly and economically feasible artificial feeds. Feed is the principal operational input and feed expenses usually range from 30 to 60 % of the operational cost in prawn and finfish culture systems. In view of this, artificial feeds should scientifically formulated, optimally processed, and carefully supplied, considering the precise nutritional needs of the cultivated species and the intensity of culture operations. There are about 40 essential dietary nutrients necessary for fish and prawn.

Therefore, care must be taken to ensure the presence all essential nutrients in the formulated feed for optimal growth. The proteins, lipids/fats and carbohydrates are considered as “macro nutrients”, while vitamins and minerals are “micronutrients” required for the healthy growth in finfish and shellfish.

#### Protein and Amino Acids

Generally, Protein is the major key element as well as the most expensive component in fish and prawn diets. Growth of fish and prawns generally determined by the percentage of protein and its constituent amino acids in the supplemented feed. The diversity in feeding habits revealed by the fish and prawn species in nature is reflected in the variation in their protein and essential amino acid requirements. Significant functions of proteins are (i) source of energy (ii) source of amino acids required for synthesis of diverse kinds of proteins. Thus protein is used for maintenance, the repletion of depleted tissues, and for growth or formation of new additional protein.

Protein is valuable to the animal only when it can be digested and the degradation products like peptides and amino acids absorbed by the animal. If protein in the diet is insufficient, it is withdrawn from the tissues to carry on the vibrant life functions, thereby resulting in rapid reduction in growth. On the other hand, if the diet contains excess protein respectively less will be used to make new protein and the rest will be metabolized to produce energy. The utilization of dietary protein is mostly influenced by its amino acid pattern, level of protein intake, digestible or metabolizable energy content of the diet, level of non-protein nutrients, physiological state of the