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Status of Fish Feed Formulation and Production as per Agro-Ecological Zones (AEZ) of Bangladesh

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Abstract

A study was undertaken to know about the fish feed formulation, production, quality control and to investigate the nutrient contents of fish feeds in Agro-Ecological Zones (AEZ) of Bangladesh. The formulation of feed was done with indigenous ingredients and ingredients imported from different countries. The feed formulation was accomplished through Trial and Error method and Pearson's Square method. The feed production was accomplished through feed milling process which involved several steps. Feed milling was done by grinding, computerized dosing and batching, mixing, pelleting, packaging and finally marketing. The quality control program which involved the verification of quality standards, close monitoring of the quality of ingredients through the period of storage prior to usage and during its processing. The quality control program contained thorough examination of raw materials quality, process control, finished feed quality and raw materials and finished products storage which ensures the quality of final product and essential nutrient level desired in fish diet.

Key words: *Fish Feed, Formulation, Production, AEZ, Bangladesh*

INTRODUCTION

Fish is highly nutritive and rich source of animal proteins. Fish, like other organisms, required food (energy) in order to grow, survive and reproduce. The improvement of fisheries and to achieve maximum yields from resources of fresh water, it is necessary to provide artificial feed, by which fish grows rapidly and attains maximum weight in shortest possible time. Among commonly used feed ingredients, fish meal is considered to be the best ingredients, due to its compatibility with the protein requirement of fish (Alam et al. 1996). The food items (source of energy) in aquatic habitat are in the form of plankton, periphyton, nueston, benthose, nekton and plants are available throughout the year. The success of intensive fish culture depends on the formulation of a fish feed that contains an optimum level of protein and energy necessary for the growth of fish and is also cheap. It is obviously necessary to formulate and manufacture fish feed from locally available feed ingredients. This type of feed prepared from such ingredients should serve as a source of essential amino acid, minerals, vitamins, growth promoting substances and energy. Replacement of fish meal with cheaper ingredients of plant origin in fish feed is necessary because of rising cost and uncertain availability of fish meal (Higgs et al. 1995). Inclusion of feedstuffs with relatively high levels of carbohydrate in formulated fish feed is preferred in view of its protein-sparing action that may make the diet more cost effective (Hidalgo et al. 1993). According to Rumsey (1993), increased use of plant protein supplements in fish feed can reduce the cost of fish meal. The research has focused on utilizing less expensive and readily available resources to replace fish meal, without reducing the nutritional quality of feed (EI-Sayed 1999).

The apparent digestibility of protein, energy and individual amino acids are of prime consideration as the basis for feed formulation in fish, with information gained for different raw materials, such as plant by-products commonly utilized in the feed manufacturing industry. Numerous investigations have been applied to variety of fish species for several decades with digestibility data obtained for most nutrients (Tacon 1994). For commercial culture of fish, the formulation of low-cost balanced diet using locally available agro industry byproducts is needed. Recently fish meal has become the most expensive protein ingredient in aquaculture feeds. Many studies have shown considerable success in partially replacing fishmeal with soybean meal and other soybean products in diet for various fish species (Boonyaratpalin and Tunpibal 1998, Quartararo et al. 1998, Hernadez et al 2007).

Bangladesh has been tentatively divided into 30 agro-ecological zones. These 30 agro-ecological zones have been subdivided into 88 agro-ecological sub-regions (fig.1)

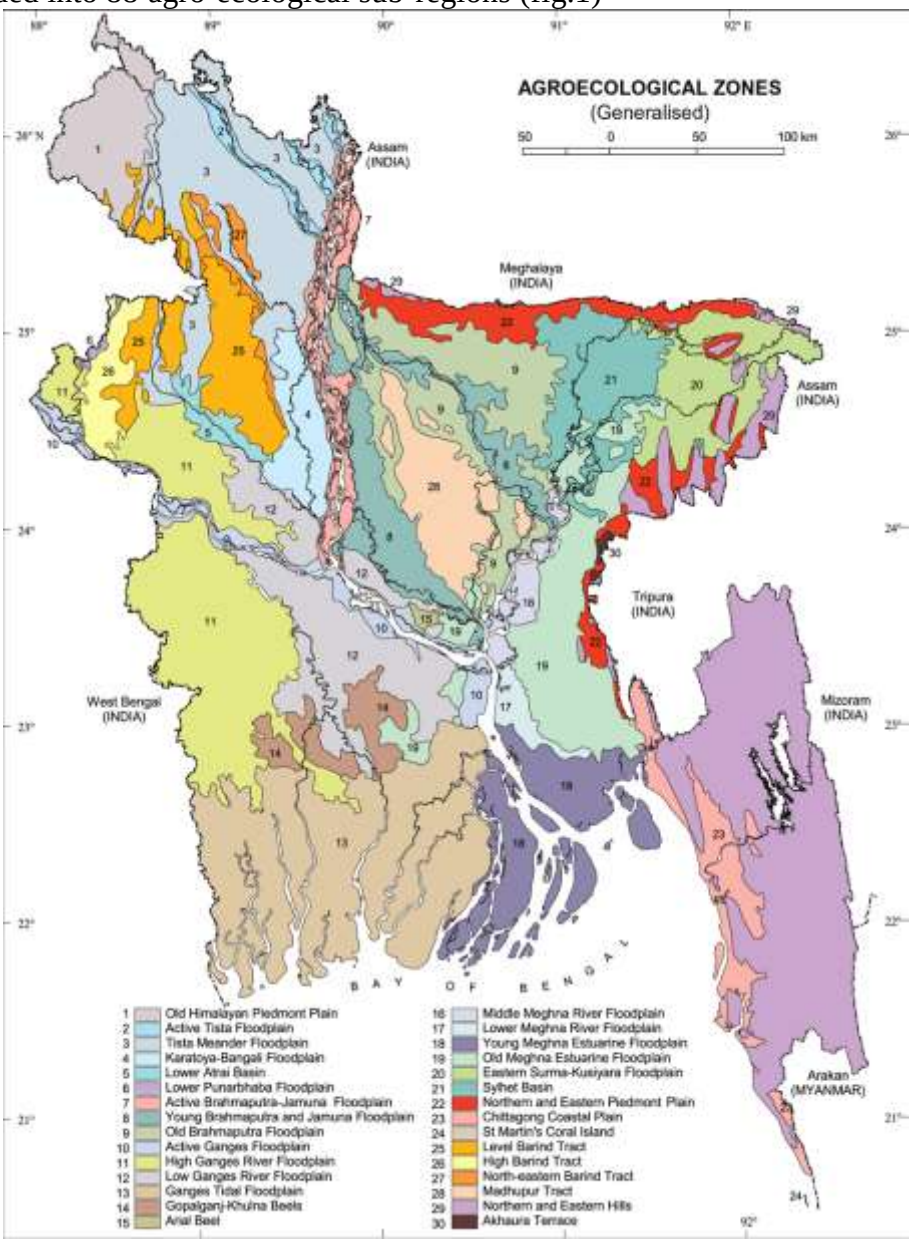


Fig. 1: Agro-ecological zones of Bangladesh

However, lack of appropriate resources and capacity has contributed to low productivity of aquaculture in both countries. One of the key constraints identified is the poor quality and limited availability of supplementary feeds. Where commercial feeds are available, they are often prohibitively expensive. The alternative is for farmers to make their own feeds. However, the limited availability of ingredients, lack of information on fish nutrition and on how to make and deliver feeds often results in poor quality feed and reduced production and profitability.

To maintain high quality of finished feed, good administrative structure of a feed industry committed to produce quality feed is important. As a student of fisheries sciences it is essential to have field level experience on fish feed industry operation. Aqua-internship brings that opportunity to gather practical

experiences about production technique of fish feed, feed ingredients, composition of fish feed, types of fish feed, storage of fish feed and overall maintenance of nutritional quality of fish feeds.

OBJECTIVES

1. To know and learn the maintenance of nutritional qualities of fish feed ingredients and finished goods.

2. To know the formulation of fish feed ingredients with proper nutritive value and amount.

METHODOLOGY

Feed formulation and preparation is the processes of combining feed ingredients to form mixture that will meet the specific goals of production. It is often a compromise between an ideal formula and practical considerations. While formulating the feed one must take into account some considerations such as price, availability of ingredients used anti-nutritional factors and palatability of mixtures (Azevedo 1998). Along with soybean meal other ingredients such as milk powder, corn flour, eggs, cod liver oil, vitamin mixture containing vitamin B complex and E, agar powder, garlic paste, pepper powder and cumin powder are used.

Feed formulation is essentially applied nutrition. A number of terms and expressions are introduced that will be put to practical use as information is presented on the nature and qualities of various feedstuffs and the information presented on the nutrient requirements of fish. Precise understanding of these terms is essential to their correct application. One must recognize that some of these terms have a built-in error that cannot be escaped. This does not eliminate their usefulness in feed formulation. However, one must appreciate the fact that some are useful approximations of the values and not true values.

The terms that one needs to understand to formulate practical fish diets are: crude protein level; energy level, either expressed as metabolizable energy (ME) or as digestible energy (DE); specific amino acid levels; crude fibre level; and ash level. Since most complete practical fish diets are supplemented with a vitamin premix at levels in excess of the dietary requirement, this category of nutrients will be ignored temporarily. The potential problems occur when one fails to recognize that all of the above mentioned terms, except ME and DE, represent the quantity or level of a nutrient in the feed as determined by chemical tests on a specific sample of a feedstuff. These chemical tests generally correlate well enough with biological methods of feed evaluation (growth studies, tissue, levels) to be very useful to feed formulators, but they are still chemical tests that are subject to experimental error during nutrient level determination. For example, the proximate composition of fish meals changes during the spawning season. Generally, the lipid levels increase before spawning and decrease after spawning. This will alter the percent of protein, ash, and carbohydrates in fish meal as the seasons change. Similarly, many plant feedstuffs vary in proximate composition with their stage of maturity at harvest, location grown, and other environmental conditions, such as the weather. Tabled values represent an average value that is usually close enough to the actual value to allow accurate feed formulation. However, one must be aware that assumptions are being made in order to recognize the potential sources of error that may exist.

Metabolizable, energy and digestible energy values are obtained biologically and, thus, should accurately represent the true energy value of feedstuffs to fish. However, ME values may be obtained in different ways (faeces collection methods) and thus may be subject to experimental error. It has recently been reported that the digestibility of feed by rainbow trout was lower at 7°C than at 11°C or 15°C. At 11°C and 15°C body size (18.6 g, 207.1 g or 585.7 g) did not affect feed digestibility. The digestibility of carbohydrate and energy was slightly reduced by meal size in rainbow trout fed at 1.6 percent body weight. Protein and lipid digestibility was not reduced by meal size. Obvious differences exist between fish species in nutrient digestibility, especially in the carbohydrate fraction of feed. Herbivorous and, to a lesser extent, omnivorous fish have longer digestive tracts than do carnivorous fish and are able to obtain more digestible energy from carbohydrates. An awareness of these facts will prevent misuse of ME and DE values.

Each feedstuff in any diet formulation should be present for a specific reason; i.e., it is a good energy source, it is rich in a limiting amino acid, etc. In addition, each feedstuff in a particular diet formulation should be the least costly ingredient available for its particular function in the diet. This leads to another

assumption in feed formulation; that is, any nutrient in a particular feedstuff, such as an amino acid, is just as valuable as the same nutrient in any other feedstuff. This allows feed formulators to interchange one feedstuff with another as cost and availability change. Thus, it is assumed that there is no "ideal formulation", but rather an almost infinite number of possible feed formulations that met the nutritional needs of the fish equally well. While this assumption may not be entirely valid and some nutritional judgment must be employed in any feed formulation, it does seem to be valid in most cases. As with the previously mentioned assumption, an awareness of the potential pitfalls involved is necessary for the fish feed formulation so that allowances can be made in diet formulation and problems can be anticipated and avoided.

Experimental Sites and Study Period

A number of visit on fish feed market were carried out in Ramgati, Kamalnagar upazilla and Lakshmipur city in Lakshmipur district in southern Bangladesh during the period from March, 2011 to July, 2011 considering the presence of large number of fish farms in those areas. During the study period, fish feed ingredients were collected and then transported to the Fish Nutrition Laboratory, Department of Aquaculture, Bangladesh Agricultural University, Mymensingh.

Collection and Storage of Samples

Three fish feed markets named Alexander bazar in Ramgati upazilla, Hazirhat bazar in Kamalnagar upazilla and Lakshmipur city of Lakshmipur district were selected for samples collection. Samples of available feed ingredients such fish meal, rice bran, wheat bran, maize, pulse, oil seed cakes, broken rice (khud), beson, wheat flour etc were collected and packed in polyethylene bags to prevent initial spoilage and brought to the Fish Nutrition Laboratory, Department of Aquaculture, Bangladesh Agricultural University, Mymensingh as well as stored in a refrigerator for subsequent analysis.

RESULTS AND DISCUSSION

The overall water quality parameters of ponds in different months are presented in Table 6. The values of water quality parameters in different months were: temperature 24.66±0.45 to 31.33 ±0.740C, dissolved oxygen (DO) 5.32±0.98 to 7.95±0.52 mg/l, alkalinity 160.0±11.20 to 182.50±12.30 mg/l and salinity 8.30±1.22 ppt to 8.60±0.50 ppt.

Table 1: Mean value (±SD) of water quality parameters in different months

Month	Water temperature (0C)	pH	Dissolve oxygen (mg/L)	Total Alkalinity (mg/L)	Salinity (ppt)
February	24.66±0.45	7.55±0.58	5.64±0.86	160.0±11.20	8.30±1.22
March	25.57±0.12	7.43±0.31	7.95±0.52	182.50±12.30	8.65±1.10
April	28.40±0.69	7.59±0.56	7.05±0.43	176.20±15.30	8.50±1.38
May	30.60±0.57	7.94±0.51	5.38±1.12	179.30±9.86	8.70±0.32
June	31.33±0.74	7.63±0.21	5.32±0.98	176.78±10.98	8.60±0.50

Water temperature influences the physico-chemical and biological factors of a water body. The ranges of mean value of water temperature in different months in the present study were 24.66-31.330C. These values are more or less similar to that reported by Paul (1998), Rahman (1999), Kohinoor (2000) and Kohinoor et al (2004). The pH in all ponds water was alkaline throughout the experimental period. Different authors have reported a wide variation in pH from 6.7 to 8.3 (Hossain et al. 1997), 7.18 to 7.24 (Kohinoor et al. 1998), and 7.37 to 8.65 (Kohinoor et al. 2004) in fertilized fish ponds and found the ranges productive. The ranges and mean values of pH in the present study were alkaline indicating the productive nature of the fertilized ponds.

The ranges of mean value of dissolved oxygen concentrations were found from 5.32±0.98 to 7.95±0.52 mg/L which is similar to findings reported by several researchers (Ali et al. 1982; Martyshew, 1983; Rahman, 2000; Kohinoor, 2000 and Kohinoor et al. 2004). Total alkalinity more than 100 mg/L should be present in high productive water bodies (Alikunhi, 1957). Paul (1998), Kohinoor (2000), Grag and Bhatnagar (2000) and Kohinoor et al (2004) found the average total alkalinity values above 100 mg/L in their experiments. The total alkalinity values found in the present study were within the suitable range.

As Bangladesh is mainly agro based country, a large variety of agricultural crops wastages and byproducts are being used as fish feed. Although most are available throughout the year and all over the country, some are much localized. In this study the locally used fish feed ingredients were found to be fish meal, broken rice, maize, mustard oil cake, pulse, rice bran, snail shell meal, soybean oil cake, wheat bran, wheat flour. Among them only commonly used ingredients e.g. fish meal, mustard oil, rice bran, wheat meal and wheat flour were used for proximate composition analysis.

The analyzed ash contents of the samples of the fish feed ingredients collected three areas were in the range of 14.79 to 18.84% in rice bran, 2.52 to 8.26% in wheat bran, 6.99 to 9.08 % in mustard oil cake, 2.5 to 3.64% in wheat flour and 15.16 to 34.14 % in fish meal respectively.

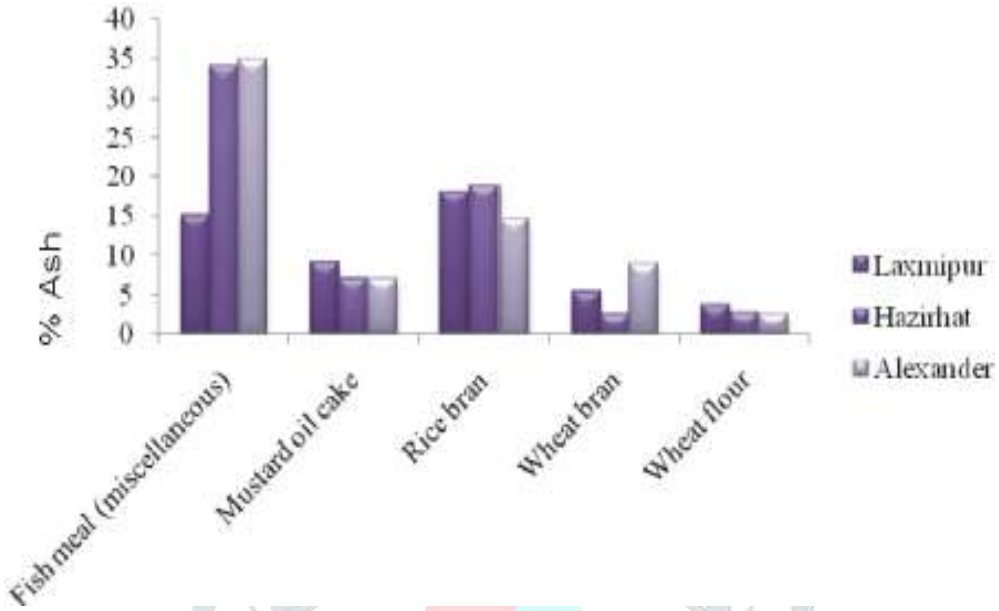


Fig. 2: Comparison of ash percentage of the ingredients in three regions

Protein is the major growth promoting factor in feed. The protein requirement of fish are influenced by various factors such as fish size, water temperature, feeding rate, availability, quality of natural foods and overall digestible energy content of diet. The analyzed crude protein contents of mustard oil cake, wheat bran, wheat flour, fish meal varied between 35.17-37.25%, 14.15-17.73%, 14.84-15.40% and 51.32-65.34% respectively. The highest crude protein content (65.34%) was found in miscellaneous type fish meal of Lakshmipur city.

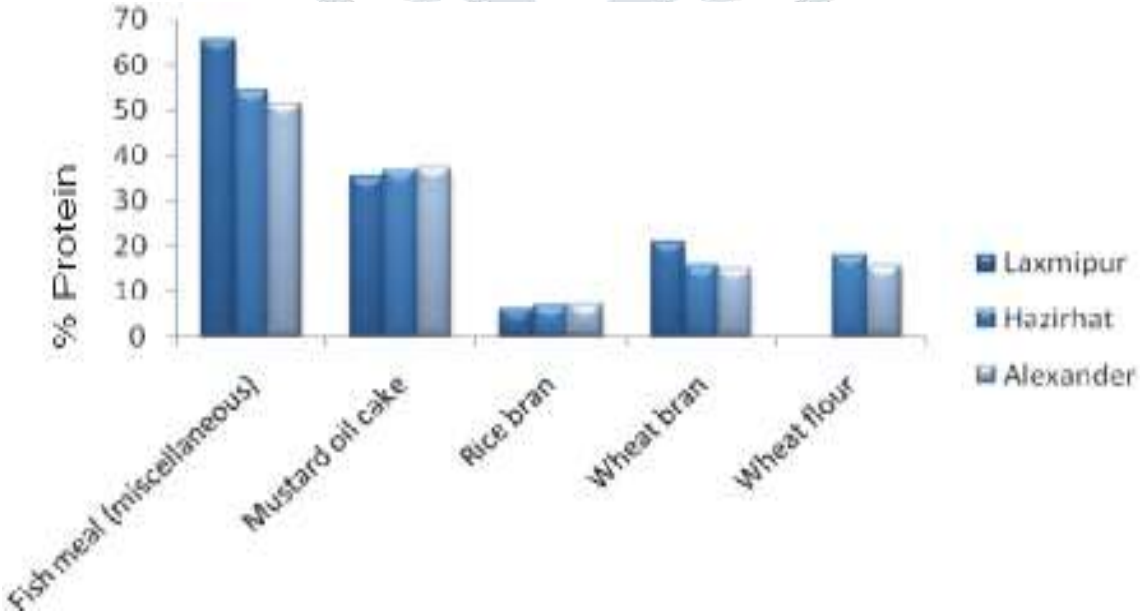


Fig. 3: Comparison of protein percentage of the ingredients in three regions.

The analyzed crude lipid contents of different fish feeds ingredients varied considerably among the three study areas. The mean range of crude lipid was recorded as 10.73 to 15.52% in mustard oil cake, 4.09 to 9.71% in wheat bran, 2.94 to 4.57 % in wheat flour and 3.69 to 12.50% in fish meal.

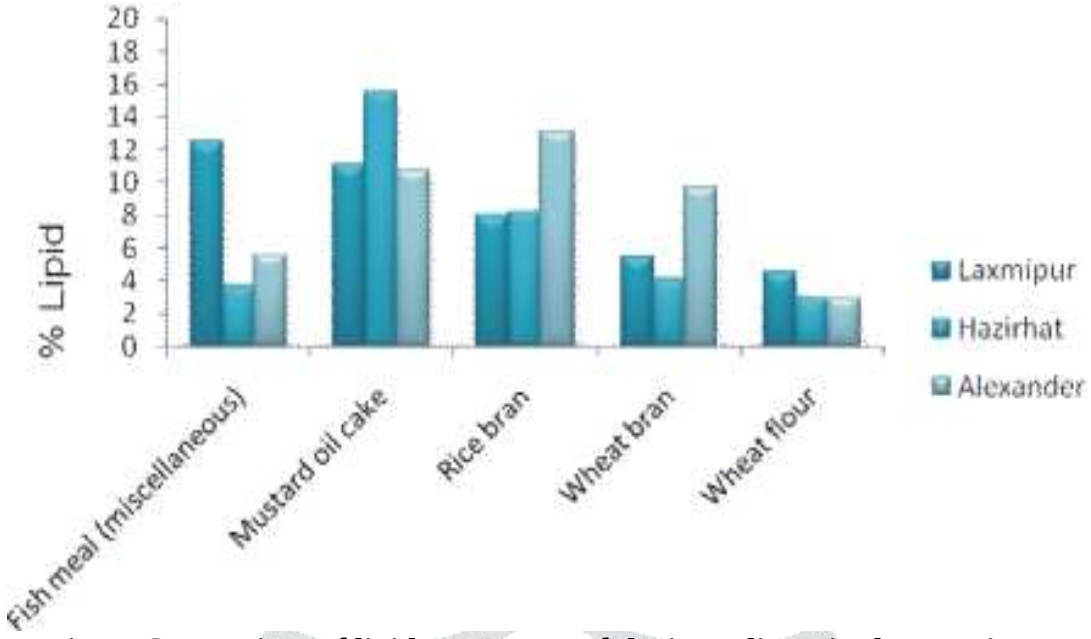


Fig. 4: Comparison of lipid percentage of the ingredients in three regions

During the present study the protein percentage of the mustard oil cake was estimated at 35.17-37.25% which is more or less coincides with the findings of Fisheries Research Institute. A nationwide survey was conducted by the Fisheries Research Institute to identify potential fish feed ingredients based on their availability, price and primary nutritional value. Eighty- three different types of ingredients, both of plant and animal origin were studied. They reported that the mustard oil cake contained about 33.30% protein.

Table 2: Proximate composition of fish feed ingredients

Name of ingredients	Alexander Bazar				Luxmipur				Hazirhat Bazar			
	Dry matter	Ash	Crude protein	Crude lipid	Dry matter	Ash	Crude protein	Crude lipid	Dry matter	Ash	Crude protein	Crude lipid
Fish meal (miscellaneous)	89.55	34.97	51.32	5.58	90.52	15.16	65.42	12.50	86.21	34.14	54.34	3.69
Mustard oil cake	91.53	6.99	37.25	10.73	89.97	9.08	35.17	11.07	89.13	7.00	36.46	15.52
Rice bran	90.85	14.79	6.97	13.07	90.13	18.17	6.09	7.99	89.15	18.84	6.62	8.22
Wheat bran	90.08	8.96	14.84	9.71	88.03	5.31	20.71	5.44	87.96	2.51	15.40	4.09
Wheat flour	89.83	2.50	15.70	2.95	89.26	3.64	14.15	4.57	90.04	2.70	17.73	2.94

The protein percentage of the wheat bran and wheat flour were estimated at 14.84-15.40% and 14.15-17.73% respectively those are more or less similar with the findings of Fisheries Research Institute. The findings were also similar to the investigation of Bashu [16]. In the present study the protein percentage of the fish meal was estimated at 42.57-65.34%. According to FRI, A 1, A 2 and B grade fish meal had more or less 59.61, 50.81 and 44.74% protein respectively. Kim and Easter conducted a study on chemical composition of various fish and fishmeal as feed ingredients and found Chai Bo fish contained 55.0% crude protein, some mixed small whole fish contained 51.9% at protein and fishmeal contained 56.8% crude protein in dry weight basis.

During the present study the mean range of crude lipid percentage were recorded as 10.73 to 15.52% in mustard oil cake, 4.09 to 9.71% in wheat bran, 2.94 to 4.57 % in wheat flour and 3.69 to 12.50% in fish meal respectively. De Silva and Hasan et al. reported that mustard oil cake with 2-15% and fish meal with 5-20% lipid contents respectively have a potential to be incorporated into aqua feed. The results of ash and lipid percentage were also close to the findings of Zaher.

This study showed that fish meal found in three markets has variation. Protein content of fish meal that found in Hazirhat and Alexander has no significant variations but have significant variations that found in Luxmipur city. Fish meal (miscellaneous) that found in Hazirhat and Alexander contain about 51.32-54.34% protein while fish meal (miscellaneous) that found in Luxmipur city contain about 65.34% protein. There are some ingredients those are available and can replace the fish meal without changing the protein level

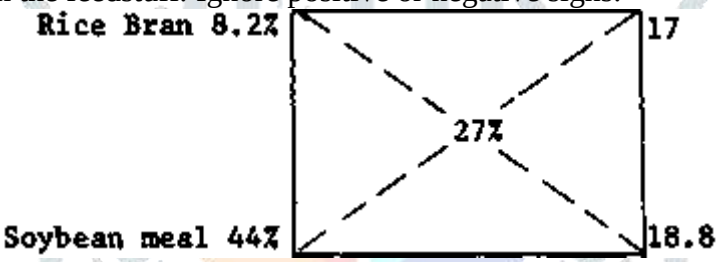
and cost of feeds become low. One way of reducing protein sources. Soybean is one of the important available protein rich ingredients, which can be used to partial replacement of fishmeal.

For improved practices besides management, supplementary feed is essential. In respect of fish producer of Bangladesh, good quality and low cost fish feed is the most important demand of farmer to reduce production cost. Farmers are at a turning point in their fish feeding strategies due to the high price of this feed. However, lack of knowledge and information make them uncertain about the application of other feeds. For formulation of such fish feed information about price, availability, nutritive value and seasonal variation on quality and availability are essential. The present study attempted to collect this information.

Balancing Crude Protein Level

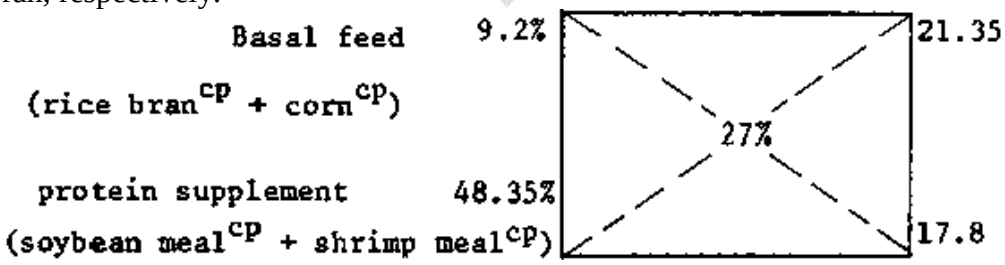
In most animal diets, protein is the most expensive portion and is usually the first nutrient that is computed in diet formulation. The energy level of the diet is then adjusted to the desired level by addition of high energy supplements) which are less expensive than protein supplements. The square method is an easy way to determine the proper dietary proportions of high and low protein feedstuffs to add to a feed to meet the dietary requirement of the animal to be fed.

For example, suppose rice bran and soybean meals were available as feedstuffs to prepare a diet for carp that was 25 percent crude protein. A square is constructed and the two feedstuffs are put on the two left corners along with the protein content of each. The desired protein level of the feed is placed in the middle of the square. Next, the protein level of the feed is subtracted from that of the feedstuffs, placing the answer in the opposite corner from the feedstuff. Ignore positive or negative signs.



To make the 27 percent crude protein carp feed; we must mix 17/35.8 of rice bran with 18.8/35.8 soybean meal.
Rice Bran 17/35.8 = 47.5%
Soybean meal 18.8/35.8 = 52.5%.

So to make 100 kg of this feed we must mix 47.5 kg of rich bran with 52.5 kg of soybean meal.
If more than two feedstuffs are used in a feed, they may be grouped into basal feeds (CP < 20 percent) and protein supplements (CP > 20 percent), averaged within each group, and plugged into the square method. For example, suppose shrimp meal and corn were also available for the carp feed mentioned above. The crude protein levels of the shrimp meal (52.7 percent) and of corn (10.2 percent) are averaged with soybean meal and rice bran, respectively.

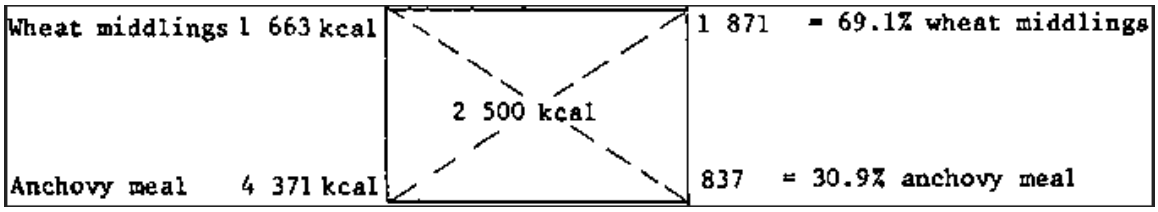


Basal feed = 21.35/39.15 = 54.53%
Protein supplement = 17.8/39.15 = 45.47%

Thus, to make 100 kg of this feed one would mix the following:

Rice bran	27.265 kg
Corn	27.265 kg
Soybean meal	22.735 kg
Shrimp meal	22.735 kg

The square method is helpful to novice feed formulators because it can get them started in diet formulation without the need to resort to trial and error. The square method can also be used to calculate the proportion of feeds tuffs to mix together to achieve a desired dietary energy level as well as a crude protein level. If one wanted to make a feed containing 2 500 kcal ME/kg using wheat middling (1663 kcal ME/kg) and anchovy fish meal (4 371 kcal, ME/kg) a square (fig.9) could be constructed as follows:



The square method cannot be used to simultaneously solve for both crude protein level and ME level.

Steps in Feed Formulation

The first step in diet formulation is balancing the crude protein and energy levels. This can be accomplished by trial and error, by the square method for either crude protein level or energy level and then adjusting, or by solving simultaneous equations. At first, it is helpful to use at least three feeds tuffs during the initial balancing of protein and energy levels: one high in protein and high in ME, one low or intermediate in protein and high in ME, and one low or intermediate in both protein and ME. Once practice makes one more proficient at diet formulation any number of feedstuffs can be used. One must remember to reserve room in the formulation for any feed additive, such as a vitamin or mineral pre-mix.

The second step in diet formulation is to check the levels of indispensable amino acids in the formulation to be sure the dietary levels meet the requirements of the animal to be fed. The requirements of fish for indispensable amino acids is expressed as the dietary level (as a percent of the diet) or as a percent of the dietary protein level. To convert an amino acid level from the percent of diet to percent of protein, divide the dietary level of each amino acid by the dietary protein level. It might be of interest to calculate the dietary levels of all of the indispensable amino acids, but it is not practical to do it all of the time. If the levels of arginine, lysine, methionine, and tryptophan meet the dietary requirements of the fish to be fed, the levels of the other six indispensable amino acids will most likely be above required levels. When using unconventional protein supplements, the levels of all ten indispensable amino acids should be checked.

If the diet formulation is low in any amino acid, a feedstuff that contains high levels of that amino acid must be added to the diet at the expense of another ingredient. Once the amino acid requirements are met, the dietary protein and energy levels must be rechecked to, see if any substitution of ingredients has imbalanced the formulation.

A diet mixing sheet should be constructed to standardize diet formulation. A sample sheet is shown in Table 1. The amino acids listed are for illustration purposes only and may be changed to suit different circumstances. In practical feed formulation, pellet quality and acceptability must be considered in addition to nutrient levels and cost. These considerations will vary from species to species and with the type of pellet being made, and are dealt with in other sections of this manual.

Best-Buy Techniques

The price of the feedstuffs used in diet formulations must be considered to formulate a cost-efficient diet. Feedstuffs can be compared with one another on the basis cost per unit of protein, energy, or amino acid. For example, suppose one has wheat middlings and wheat millrun available for a fish diet, which feedstuff would be the least expensive source of energy?

Wheat millrun costs US $ 0.0858/kg, and contains about 1200 kcal ME/kg.

$$\text{Cost/kcal} = \frac{.08758}{1200} = \text{US \$ } 0.0000715/\text{kcal.}$$

Wheat middlings cost US $ 01883/kg and contain 1663 kcal ME/kg.

$$\text{Cost/kcal} = \frac{0.1883}{1663} = \text{US \$ } 0.0001132/\text{kcal.}$$

Thus, the wheat millrun which has a lower ME value for fish is the better buy because it costs less per kcal. To compare oat groats and wheat middlings on a cost per unit ME basis one would do the following:

Wheat middlings = US$ 0.0001132/kcal, and
Oat groats cost US $ 0.2652/kg, and contain about 2450 kcal ME/kg.

$$\text{Cost / kcal} = \frac{0.2652}{2450} = \text{US \$ } 0.001082 / \text{kcal.}$$

Oats groats, although costing more than wheat middlings, constitute a better buy on an energy basis.
The cost of protein is often the greatest part of the cost of a fish diet. Therefore, substantial savings can be made by using best-buy techniques to determinate least expensive protein supplement. To compare anchovy meal and herring meal, the following calculations are made:
Anchovy meal costs US $ 0.5357/kg, and contains 70.9 percent protein.

$$\text{Cost per kg protein} = \frac{0.5357}{0.709} = \text{US \$ } 0.7556 / \text{kg protein.}$$

Herring meal costs US $ 0.4709/kg, and contains 76.7 percent protein.

$$\text{Cost per kg protein} = \frac{0.4709}{0.767} = \text{US \$ } 0.61395 / \text{kg protein}$$

On the basis of cost per unit protein, herring meal is less expensive as a dietary ingredient than is anchovy meal. To compare feedstuffs on the basis of cost per unit of an amino acid, one can calculate the best buy in the same way as before.

For example, sesame oil cake which has twice as much methionine content as does groundnut cake on a per unit protein basis would be a more attractive buy at comparable prices. These kinds of comparisons are only valid if the nutrient in one feedstuff is as valuable or available to the animal as the same nutrient in another feed. Such comparisons should be made whenever prices change.

CONCLUSION

Aquaculture practices in Bangladesh are gaining more and more grounds in many countries in the continent especially among the rural populace. Furthermore, rooms exist for increasing aquaculture production through better farm management, genetics, tested techniques and innovations. But meeting the ever increasing demand for fish in Bangladesh through aquaculture will have to come from the use of locally produced fish feed that will increase aquaculture production and make it attractive to all and sundry especially, the majority of poor people living on the Bangladesh. Locally produced feed using locally available ingredients will reduce the cost of production and hence, cheaper fish to meet the protein needs of the populace. Besides, the government should subsidize the cost of locally fabricated machines to make it affordable to fish farmers. Also there is the need to further train fish farmers on how to formulate and produce nutritionally balanced high quality fish feed. There is the need for quality control policy by the government to regulate fish feed manufacturing in Bangladesh.

Bangladesh is a great country for fishing locations and has 36998 lakes, rivers, streams, reservoirs, waterfalls, sandbars, and other fishing destinations to select from, all having potential for you catching your trophy fish. Our maps directory categorizes the Bangladesh maps by feature type lakes, streams, islands, harbors and more. You will find all the fishing data and information to fish or explore the outdoors in Lakes, Rivers or from an Island, or to find the trail to get to the lake or river, all from the largest database of fishing and outdoor maps and information. To see the full list of Bangladesh locations under a feature click on the feature type. Myfishmaps.com also provides fishing contests, fishing buddy groups, fishing destinations and the ability to track your fish or catches to the exact GPS location.

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