THE NUTRITIVE VALUE OF LOCAL FISH MEALS FOR CHICKS

BY

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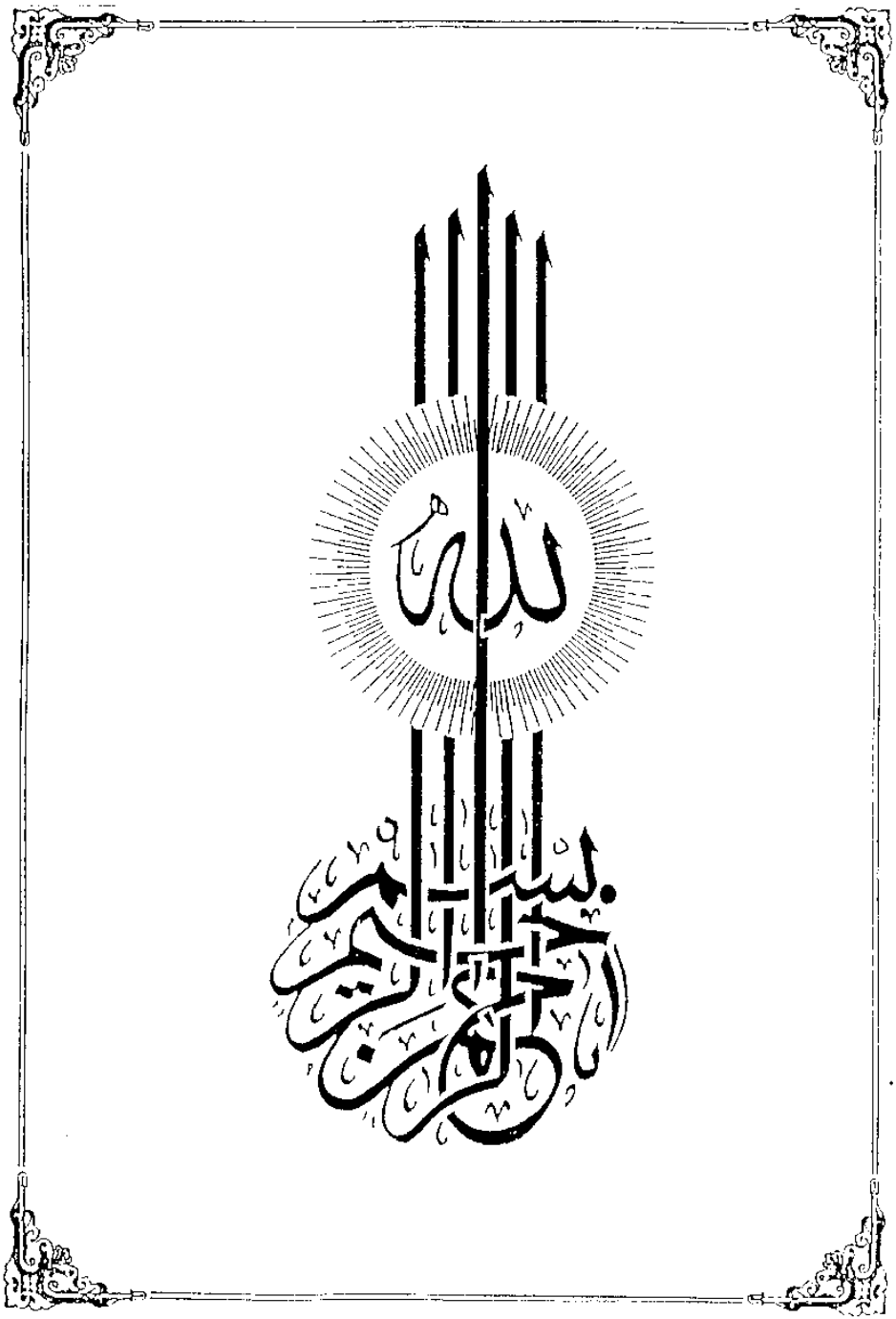

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INTRODUCTION

In Egypt Poultry industry has become one of the most important branches of agriculture, and its future will depend largely on how economically Poultry meat and egg are produced. Studies were carried out by many investigators to evaluate some ingredients used in Poultry rations. The information is still lacking about the methods of production and the chemical composition of these ingredients. Also the quality of protein supplements is affected by many factors such as sources and the method of processing.

Poultry needs a relatively high amount of protein in their diets to stand their requirements. Since protein is relatively the most important and expensive part of the diet, therefore protein supplements should be chosen with great care.

Animal protein is usually utilized more efficiently by chickens than that of plant sources, moreover, it has higher biological value. The animal protein sources used for feeding poultry were almost exclusively imported until recently many companies in Egypt started to produce these ingredients. Fish meal which may contribute a small share in formulating Poultry rations is still rather expensive of item cost.

Therefore attention has been focused to evaluate some of fish meal sources produced locally.

Some studies have been carried out to evaluate fish meal produced by Edfina Factory. However it does appear any information in the literature about evaluation of fish meal produced by Misr - Aswan Factory.

The present study was therefore designed in an attempt to evaluate some sources of local fish meal which are used in feeding broiler chicks.

REVIEW OF LITERATURE

- Chemical composition of fish meal :-

Chemical analysis of fish meal samples was determined in various parts of the world. Awide range of variation among samples was observed due mainly to differences in source of raw materials.

Some authers listed out in tables the analysis of fish meal processed from different fish species.

Bolton and Blair, (I974), Scott, Nesheim and young (I976), Allen (I980) and N. R. C. (I984).

Fish meal prepared from croaker fish contained 63.I % crude protein, IO.9 crude fat, 20,2 % ash , 6.5 % Ca and 3 % P (Day and Hill I959).

The chemical composition of three types of venezuelan tuna fish meal processed from whole tuna fish was compared with the meal processed from fish tails and waste products of fish. The former contained 65.7 % protein while the latter had only 50 - 60 % protein. (Felix and Harina, I96I).

In Egypt some research workers compared the locally processed fish meal with the imported fish meal. The proximate analysis of a sample of local fish meal was given by Abou- Raya et al (I97I) as follows : crude protein 56 %, ether extract 8.59 %, crude fiber

I.75 %, N. F. E. I.4 % and ash 24.I8 %. The same sample contained 6.57 % Ca and 3.I4 % P.

Ismail (I977) showed that imported white fish meal contained high percent of protein being 7I.4 % compared with 5I.9 for local fish meal.

Attia (I987) showed that the local fish meal produced by Organic Fertilizer Compony had very low percentage of protein being 2I.68 compared with 67.64% protein in imported fish meal from Denmark. The same local fish meal contained very high percentage of crude fiber being I3.07 %.

2 - Nutritive value of fish meal :-

Fish meal may be considerd as the best source of high quality animal protein for poultry.

Grau and Williams (I955) evaluated fish meal when fed as sole source of protein for chicks at 20 % level in the diet. More than one hundred samples of fish meals were evaluated. Wide variation in protein quality was found and 48 % of the samples were good amino acids source while 52 % were fair or poor.

Macintyre (I957) evaluated 40 different samples of commercial fish meal. Basal mixture with I2 % protein was used and fish meal in equal quantites

was made up to supply 6% crude protein. The results showed that fish meal had crude protein content ranging from 5I.6 to 69.2% . There was no correlation between protein percentage and the growth obtained. Variation in growth rate of the chicks was attributed to differences in quality of fish meal protein.)

March et al (I957) compared the nutritive value of commercial and laboratory rendered fish meal when given as sole source of protein at I8% level and as supplements to practical chick ration. There was no difference in growth rates and feed efficiency was better with meals of the lower fat content.

Rand et al (I958) recognized that within the general class of commercial fish meals, there was a great variation in nutritive value both in respect to their protein and potency in unidentified growth factor.

Yanez (I966) compared Net protein utilization of fish meal prepared from different species. The results obtained in descending order were as followes: Cod fish 68.7 : Anchovy 64.7 : Jibia 42.8 and cacholate 34.55.

Woodham (I967) evaluated the protein quality of white fish meal which contained 65% crude protein.

The fish meal provided I2.5 % protein in broiler diet which had I8.5 % protein. The author found that total protein efficiency T. P. E. of the fish meal was 2.48.

Anderson et al (I968) investigated the most limiting amino acids in commercial fish meals prepared from Herring fish, Anchovy fish, Tuna fish., and Hake fish. They found that the essential amino acids were different for each of the four meals. Lysine and methionine oppeared to be the most important factors which showed difference in the value of fish meal. However herring meal tended to produce higher growth rate and feed efficiency than the other fish meals.

Miller and Kifer (I970) evaluated protein quality of fish meal fed as sole source of protein at I2 and I5 % level by adding 3 % from herring meal to I2 % peruvain fish meal. The growth response was increased about 20 % at I5 % percent level.

Cuppett and Soares (I972) determined the metabolizable energy and protein digestibility of ten samples of menhaden fish meals. The results indicated that protein digestability of fish meal was 58.4 % and metabolizable energy was 3370 Kcal / Kg.

Biological evaluation was carried out by ISMAIL (I977) . Net protein utilization obtained was higher for imported fish meal compared with the locally processed meal.

EL-DEEK et al (I982) found that when the imported and Egyptian local fish meal were fed to brailer chicks for four weeks, total protein efficiency obtained was 2.7 and 2.32 respectively. There were significant differences between the treatments in body weight and feed conversion in favour of imported fish meal.

Afifi et al (I984) evaluated some animal protein sources fed to poultry in Egypt by using net protein utilization method. Imported fish meal (67.64 % Cp) showed the highest N.P.U. being (43.2), While the lowest N.P.U. value was 22.57 for local fish meal.

WU, and Kellms (I984) studied the effect of feeding four types of fish meal to broiler chicks. The results showed no significant differences among the treatments in body weight and feed conversion. However the mean of dressed broiler weight was influanced by the type of fish meal.

3 - Factors affecting the nutritive value of fish meal:

The most important factors which affect the quality of fish meal are source of raw material , processing condition and storage.

a - Effect of raw material :-

Raw material may be one of the most important factors affecting the quailty of fish meal. There are fish meal sources made from whole fish and others processed from fish wastes which have inferior quality. Fish species and age of fish affect too the quality of fish meal.

Record and Bethke (I933) reported differences in the values of fish meals produced from different species. This was due partly to differences in the biological value of their proteins.

Baelum (I962) stated that the type of raw material greatly influence the value of the product as feed for poultry.

WESSELS (I976) studied differences between fish meal processed from whole fish and from wastes. Neither chemical composition nor biological value was related to the waste content of fish meal. However, there were differences

between the meals attributable to difference in fat content, but not to use of fish waste.

b - Effect of processing conditions :-

Much heat in the processing of fish meal may damage the protein and cause some of the essential amino acids especially lysine and methionine to be un available to the chickens (EWING, I95I).

Bissett and Tarr (I954) showed that drying or heating low temperature dried herring meals at I49°F for 30 to 60 minutes did not adversely affect the nutritive value of the meal. However heating the meal at I49°F for I80 min impaired the availability of all the essential amino acids.

Miller (I956) measured the nutritive value of some commercial fish meals. He found that fish meal heated strongly during manufacture gave the lowest value. On the other hand the highest value was obtained for the sample which was subjected to drying temperature not exceeding 50°C .

Carpenter et al (I957) found that commercial fish meals gave results about I0% lower