STUDIES ON THE NUTRITIVE VALUE OF SOME FOOD FACTORIES BY-PRODUCTS

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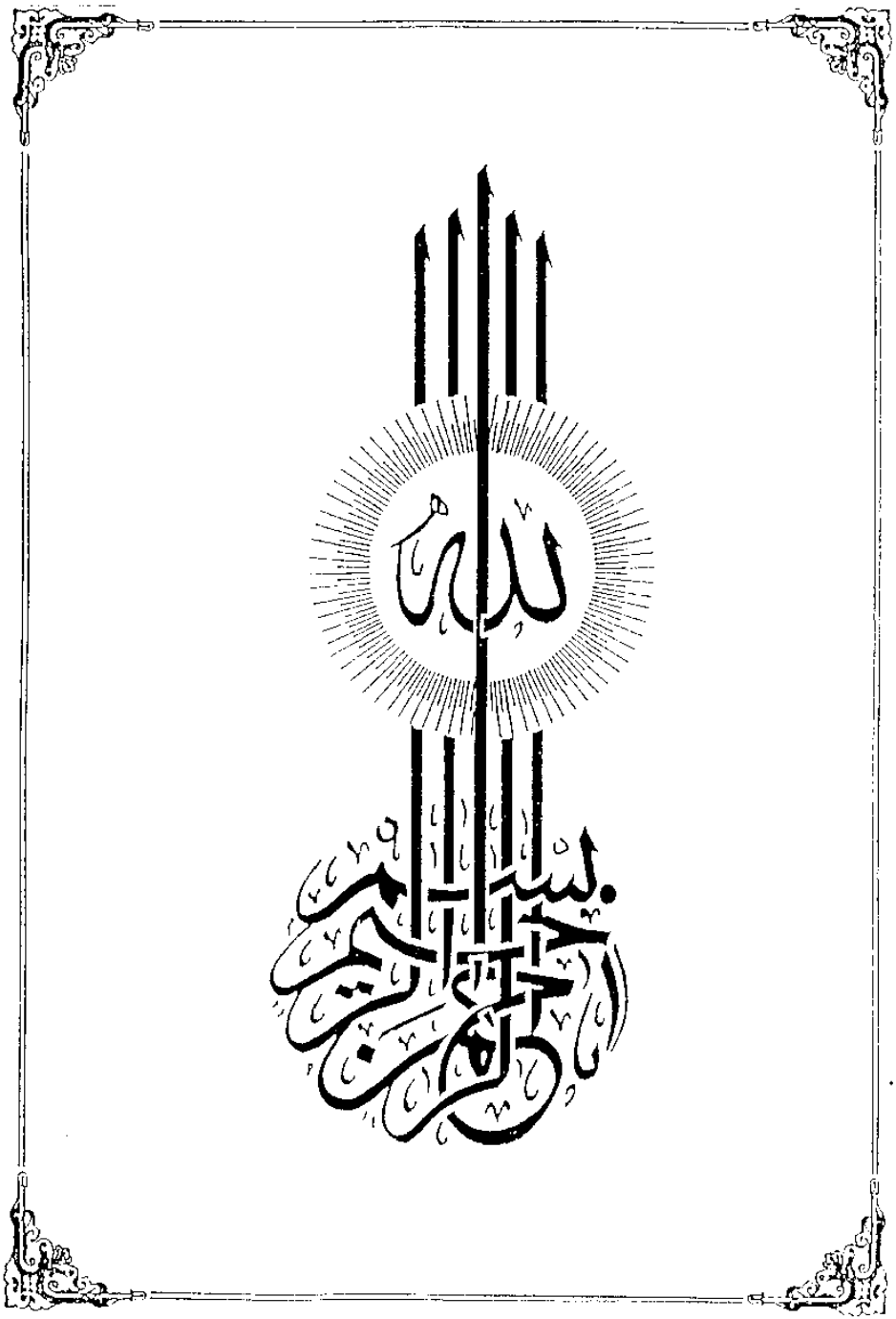

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INTRODUCTION

Rapid expantion of poultry industry in Egypt increase the need for new ingredients to be introduced in the formulation of poultry rations.

At present time the competition on the conventional feeds became very intensive between Man and poultry. Efforts, therefore should be rendered to the incorporation of some food processing wastes in poultry feeds.

Recently, the use of food processing wastes in poultry feed has been practiced because they provide the birds with cheap sources of both protein and energy. The more use of waste is applied the more conventional ingredients are spared for human consumption.

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In the past, and in some countries until now, these waste products were disposed of in an uneconomical manner such as fuel or organic fertilizers, when they should be used more useful as feeds for poultry. Accordingly, findings achieved in this study to investigate the possibility of using some waste-products to serve whether as energy or plant protein sources in poultry feeding should be of interest since they have direct practical application.

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REVIEW OF LITERATURE

A. PROTEIN SOURCES :

RUBNER (1897) formulated the hypothesis that informed that all proteins were found to be not of the same value in nutrition and that, therefore, there was not protein minimum but as many protein minima as there were proteins. In this respect, research workers have atte. ted to develop methods for determining the relative effectiveness of dietry proteins in meeting the protein and amino acid requirements of animals.

Procedures applied for the determination of nutritive value of proteins were disected into four categories namely :

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nitrogen balance, growth, carcase analysis and microbiological techniques (ANWAR, 1973).

Good agreement was found between growth methods as presented by the gross protein value (G.P.V.) and nitrogen balance methods (CALET, 1967 & BUTTERWORTH, 1962).

Gross protein value was first described by HEIMAN et al (1939) as the relative response in the growth of chicks to the test protein to that caused by casein. The experimental diets were modified first by CARPENTER et al (1955) and second by ANWAR (1967) to be formulated from universal feed stuffs. The values obtained for protein concentrates by this type of evaluation and as calculated by the new method of ANWAR (1960) were then used to present the gross

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in the feeding of chicks.

The cellulose and ash contents are not more than 15 and 4.5%, respectively. The digestability coefficient of the crude protein in tomato seeds was found by MAYMONE and CARUSI (1945) to be 71%.

Quantitative chemical analysis given by EL-ALAILY (1974) showed that tomato seeds contain on dry matter basis : 6.49% ash, 30.27% protein, 19.22% fat, 16.79% fiber, and 27.23% nitrogen-free extract. The same author found its G.P.V. to be 71.52 as determined by the simplified technique of ANWAR (1961). EL-ALAILY (1974) designed a feeding trial to compare tomato seeds with cottonseed meal. The control ration contained 20% cottonseed meal while

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the other experimental ration contained only 10% cottonseed meal plus the required amount of the protein source (tomato seeds) needed for the substitution.

The results obtained for the growth rate of chicks showed that the differences in body weight gain were not significant.

This result suggested that tomato seeds can partially replace cottonseed meal as a source of plant protein in chicks rations (EL-ALAILY, 1974).

B. ENERGY SOURCES :

Energy was found to be required for all physiological processes in the animal such as movement, respiration, circulation, absorption, excretion, reproduction and

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temperature regulation. The nervous system also was included inorder to keep its rhythm (CARD & NESHEIM, 1973).

There are at least four energy values for any given feed stuff. These are : gross, digestable, metabolizable and net energy. The productive energy was explained as the part of the net energy which is used for production (TITUS & FRITZ, 1961).

Gross energy values was found to have little meaning in nutrition since they represent the heat as combusted not as utilized in the animal body (TITUS & FRITZ, 1961).

From the other three values, metabolizable energy was reported by HILL and

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ANDERSON (1958) to be the best for practical use.

Comparing metabolizable energy with productive energy, the metabolizable energy seemed to be better reproducibility obtained in its estimation.

It was found by the same two authors to be ameasure of energy that is available for all purposes including maintenance, growth, fattening and egg production.

Only limited data on directly determined metabolizable energy value are available for poultry (CARPENTER & CLEGG, 1956). However, metabolizable energy values computed from digestability data for many feeding materials have been presented

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by AXELSSON and ERIKSSON (1951) and TITUS (1956). Nevertheless, these data were of limited use due to the methods used for chemical or physical preparations of the fecal and urinary excreta. Estimation of metabolizable energy was then fully practiced by HILL & ANDERSON (1958) using Cr_2O_3 as Marker. Theoretically, (SCHAIBLE, 1970) productive energy values of feed stuff should be the most reliable value because it takes into account all the energy losses caused by the animal. Unfortunately, these values were found by HILL and ANDERSON (1958) to be quite variable because they are influenced by several factors, such as : balance of the ration, plane of nutrition.

Accordingly, metabolizable energy values should provide the most useful measure of

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