4.10 Development of a Linear-Model based Computer Software for Least Cost Poultry ration formulation

M. K[1]. D. K. Piyaratne[1], N. G. J. Dias[2], M. Attapattu[3]

[1]Computer Unit, Faculty of Agriculture, University of Ruhuna,
[2]Department of Statistics & Computer Science, University of Kelaniya,
[3]Department of Animal Science, Faculty of Agriculture, University of Ruhuna.

ABSTRACT

This study was based on the development of a user friendly, linear-model based computer software system for least cost poultry ration formulation. The software developed in this work used most recent advancements in the field of poultry nutrition and feeding, and developed to suit the local conditions. Sixty locally available feed ingredients were used and thirty nutrients which are most important to poultry growth were considered. Standard linear programming (LP) model for least cost ration formulation was used to analyze and determine the most efficient way of compounding the least cost ration. A mathematical model was constructed, taking into consideration nutrient composition of each of the available ingredient, costs and nutrient requirements of the birds[2]. Since the ideal protein (IP) concept is becoming popular as a mean of increasing the utilization efficiency of dietary proteins by poultry, NRC (National Research Council) and IICP (Ideal Illinois Chick Protein) ideal proteins were also included in broiler rations for calculations. Therefore, although the initial database was based on NRC recommendations users can freely customize ingredient levels and nutrient requirements as and when they required.

Ration balancing can be done with 100% equal requirements up to 10-12 major nutrients based to least cost. The standard nutrient requirement levels can be customized and researchers can do experiments with different requirement levels. Therefore, this software can be a very useful tool for researchers, nutritionists as well as teachers. Amino acid profile selection feature allows researchers to formulate experimental rations with various amino acid levels and protein levels. The software can be run under Microsoft Windows environment and users are able to print and save results as well as initial database information. The software has been successfully installed, tested and evaluated successfully with several research projects.

Key words: Linear programming, optimization, software, least-cost ration, layer ration, broiler ration.

---

[1] Four layer types and one broiler type