A SURVEY OF COMMERCIAL SMALL-SCALE POULTRY PRODUCTION SYSTEMS AND NUTRIENT CHARACTERISATION OF LOCAL FEED INGREDIENTS IN LAOS

A Thesis Presented in Partial Fulfilment of the Requirements for the Degree of Master of AgriScience at Massey University

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ABSTRACT

This thesis comprises of two separate studies. A survey of small-scale chicken production (layer and broiler) in Laos is presented in Part 1 and the characterisation of local feed ingredients is presented in Part 2.

Part 1 examined aspects of demographic details, breeds and sources, management systems, labour, diseases, production parameters, marketing and farmer attitude in small-scale chicken farms. For the survey of layer farms, a total of 35 farmers from Xaythany and Naxaithong districts were interviewed. All producers were over 30 years of age. Almost 75% of interviewees were males, showing that males play a significant role in the leadership in the families. The average hen day production was found to be 0.65 and an average of 1.81 kg feed was required to produce a dozen eggs. It was observed that this feed conversion efficiency level was similar to those reported in some tropical countries, but poorer than the recommendation by breeding companies for modern layers (1.58 kg feed/dozen eggs). Hens were culled after 18 months of production (around 2 years of age). During this period, a hen produced an average of 242 eggs, which was lower than the 300 or more eggs expected for modern layers under optimum conditions. Number factors are responsible for the poor layer performance under small farm conditions in Laos, with poor management being the main cause. This problem can be solved by the involvement of government and better veterinary and extension services. The average mortality was 11%; diarrhoea and bird flu were the main causes associated with the deaths. Vaccines and drugs were regularly used by all farms.

For the broiler survey, 7 broiler farms in Naxaithong district were surveyed. All farms operated under contract with a large company (Charoen Pokphand Laos Company). The annual broiler output per farm ranged from 15,000 to 24,000 birds. The number of production cycles per year and the type of breed provided are decided by the company. Three breeds are raised, namely Ross 308, Brown Nick and 3-line crossbreeds. The average market age was 8.6 weeks at an average body weight at 1.5 kg. The FCR (feed conversion ratio) was 2.1 kg feed/kg gain. Although all farms received good quality feed and regular monitoring from the CP Company, the feed efficiency was higher compared to breeding company standards (1.6 kg feed/kg gain).

The average mortality was 1.4%. Ross 308 was found to be more susceptible to the hot environment than the other two breeds. Deaths in Ross 308 were related largely to the faster growth rate.

The study reported in Part 2 aimed at characterising the nutrient contents of locally available poultry feedstuffs so that dependence on imported commercial feeds can be reduced. Fifteen local feedstuffs (rice bran, broken rice, cassava leaf meal, cassava root meal, coconut meal, fish meal, green banana meal, groundnut, leucaena leaf meal, maize, sesame seed, snail meal, soybean, sweet potato tuber meal and taro meal) were collected. Each sample was analysed for proximate composition, minerals and amino acids. Of the tested ingredients, fishmeal had the highest crude protein content (54.4 g/100 g), while sweet potato tuber meal had the lowest crude protein content (3.5 g/100 g). The highest crude fat value (65.0 g/100 g) determined for full-fat copra, followed by sesame and groundnut seeds (54.8 and 54.4 g/100 g, respectively). Roce bran had the highest fibre content (14.7 g/100 g) and snail meal the highest ash content (71.3 g/100 g). Snail meal had the highest calcium content (30.0 g/100 g) followed by fish meal (4.50 g/100 g). Snail meal was also rich in t iron, copper, manganese and zinc. Fish meal had high contents of amino acids. Whereas cassavas root meal had the lowest.

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LIST OF ABBREVIATIONS

%	Percentage
AOAC	Association of Analytical Communities
AME	The apparent metabolisable energy
AHD	The Animal Health Division
^{0}C	The degree Celcius
CP	Charoen Pokphand
CSM	Cottonseed meal
DM	Dry matter
FAO	Food and Agriculture Organization
FCR	Feed conversion ratio
g	gram
GDP	Gross Domestic Product
H5N1	Hemagglutinin Type 5 and Neuraminidase Type 1
kg	kilogram
MAF	Ministry of Agriculture and Forestry
ME	Metabolisable energy
MJ	mega joules
N/A	Not applicable
NFE	Nitrogen-free extract
NGOs	Non-Government Organisations
NRC	National Research Council

SD	Standard deviation
US$	The United States dollar