

Risk Coping Strategies Adopted by Poultry Layer Farmers to Income Risk and their Determinants

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INTRODUCTION

Poultry is the fastest-growing livestock subsector in Sri Lanka. For the year 2019, poultry contributed to 0.38 GDP, which is 64% of the total contribution of Sri Lankan livestock. However, poultry farmers face various risks such as diseases, production, and market disruptions. One of the main risks faced by poultry farmers is seasonality in the demand for poultry meat and eggs that is high during the festival seasons such as April (Sinhalese and Tamil New Year period) and December (Christmas and year-end vacations), and low during January, May, June, September-November, causing market fluctuations of price and quantities (Wickramarachchi *et al.*, 2017). In addition to the seasonality in demand, recent events such as the Easter attack and the Covid-19 pandemic, government regulations on prices, and import restrictions influencing the input supply (eg. maize, soybean meal, and layer breeding stocks) have also influenced poultry farmers' income. The ultimate impact of many of these risks is the reduction of farmer income and attractiveness of the industry.

Farmers cope with risks in different ways; the most common risk management strategies adopted by farmer includes both ex-ante strategies such as biosecurity measures against the spread of poultry diseases, income diversification, and altering production strategy that reduces the likelihood of the risk, and ex-post strategies or risk coping strategies that are taken once the livelihood is threatened to reduce the loss. The most common risk copying strategies include drawing down on other savings, insurance, and asset liquidation and seeking cooperative assistance (Akinola, 2014; Baruwa and Adesuyi, 2018). Selling of productive assets, poultry birds are also used as a coping strategy in some instances (Akinola, 2014; Obike *et al.*, 2017). Risk

coping strategies adopted by poultry farmers depend on the risk perception of the farmer, awareness of insurance policy, past risk experience (Akinola, 2014), land size, size of the business, legal form of the farm, access to extension education, demographic characteristics of the farmers such as education, years of experience (Adeyonu *et al.*, 2021) and age of the farmer (Saqib *et al.*, 2016; Adeyonu *et al.*, 2021). A study conducted in West Nigeria indicates that years of experience and the value of poultry birds influence the choice of risk management practices. More specifically, as the value of the business increases, and experience in poultry farming increases the likelihood to adopt disease prevention strategy and financial strategy increases (Adeyonu *et al.*, 2021). The poultry sector, despite being considered as the fast-growing livestock sector in Sri Lanka has drawn less attention in this literature. Against this background, this study explores the risk coping strategies adopted by Sri Lankan layer farmers and the determinants of the adoption of the selected risk coping strategies.

METHODOLOGY

To investigate the risk copying strategies adopted by poultry farmers, a primary survey was conducted among farmers who have registered with the All-Island Poultry Association. Data were collected using a pre-tested questionnaire through a telephone survey. Though the study planned to interview all the members, the response rate was only 33% and hence the sample size was 50.

Once the risk coping strategies were identified through the primary survey, determinants of the most widely used adoption measure 'selling half or the whole batch of birds' which was recognized as the most unfavorable coping strategy, were assessed through a probit analysis.

The probit regression model is used to model dichotomous or binary outcome variables. Average marginal effects were estimated to understand the change of probability on adopting the selected strategy when there is a unit change in an independent variable, while the other independent variables are held constant. The dependent variable was the decision to adopt the selected coping strategy and the independent variables are farmer and farm characteristics.

$$Y_i = \alpha + \beta_i x_i + \varepsilon_i \quad (1)$$

where,

$Y_i = 1$ if the i^{th} farmer adopts the selected risk coping strategy and 0 otherwise.

β_i : The vector of parameters

x_i : Vector of factors affecting the choice and

ε_i : error term

FINDINGS

Sample profile

The majority (86%) of the layer farmers were small and medium-scale farmers¹. Around 48% of farmers engage in the layer industry part-time, while for the rest, it is the primary income source. Most of the farmers (66%) used only hired labour for poultry farming. Furthermore, 44 percent of farmers were educated up to Ordinary Level, whilst 28 percent had only primary education. The majority (58%) used manufactured feed for feeding the birds. The average production level was 149,450 eggs per month.

Coping strategies adopted by farmers

The major coping strategy (48%) was selling layer birds (working capital) to finance farm and household needs during challenging times. The second highly recorded strategy (40%) was using bank-deposited money to finance the farm and household needs. Only 2 percent of the farmers have taken a loan, whilst only 10 percent of the farmers switched to a low-cost diet to reduce the cost of production. Out of all these strategies, selling layer birds for culling was the most undesirable strategy that threaten the sustainability of the small-scale layer industry in Sri Lanka. The 7.4% reduction in the total egg production in 2020 compared to 2019 (DAPH, 2020) can be mainly attributed to this unsustainable practice of early culling of commercial layers.

¹ If the production of the farm is less than 5000 eggs per month, they were considered as small and medium scale farmers.

Using the bank-deposited money can be recognized as a comparatively healthy response to risk-adapted by 40 percent of the interviewed farmers. The strategy of changing the feed into a low-cost ration during low-income times was easily adapted by farmers with nutritional knowledge and experience in feed formulation and mixing. A low-cost ration may presumably decrease the egg production but help layer farmers to survive with enough eggs to meet the lower demand without selling their birds due to the high cost of production.

Determinants of choice to sell layer birds

Since the most widely adopted coping strategy is selling layer birds, the dependent variable of the probit regression model was selling half or a whole batch of birds. Independent variables were production per month in thousands, diversification of income (dummy variable, the value is equal to 1 if the farmer has diversified his/her income, otherwise the value is equal to zero) and age of the business in years and education of the farmer (dummy variable, the value equal to 1 if the farmers have A/L and zero otherwise).

The results of the probit regression and its marginal effects are shown in Table 1. The results indicate that three significant factors including the production level of the farm, income diversification, and age of the business affected the probability of adoption of coping strategy, "selling layer birds". When the scale of operation of the farm increased by one unit, the probability of selling layer birds decreased by 0.001 percent. The effect of diversification on the decision to sell layer birds is comparatively high. Having an alternative income reduces the likelihood of selling layer birds by helping the farmer to overcome periods of low income. Since income diversification is an ex-ante strategy, this suggests that farmers who act proactively are less likely to take unhealthy coping strategies.

Table 1: Estimation result of the binary probit model on farmer’s decision to sell poultry birds

Variables	Coefficient	Marginal effect
Production per month (‘000)	-0041**	-00001**
Education level	-0.339	-0.111
Diversification of income	-0.864**	-0.283**

Age of the Business	-0.045	-0.015*
R ²		0.1237

***, ** and * indicates Significance at 1%, 5% and 10% level.

Overall, it is obvious that farmers that operate small-scale layer operations, farmers without an additional income source and farmers who have relatively young businesses tend to adopt the most undesirable coping strategy of selling their working capital, most commonly for culling. Even though the self-mixing layer farmers may attempt to go for the low-cost ration, it can be speculated raw-materials shortage and higher prices due to import bans and implications of the pandemic may have limited the option.

CONCLUSIONS

The study investigated the risk coping strategies adopted by poultry layer farmers and the determinants of the most common coping strategy. The results indicated that 48% of the farmers sell their principal working capital (layer bird) as a coping strategy to income decline. The unsustainable strategy to sell the layer birds was influenced by the level of production on the farm, the age of the business, and income diversification. Adopting sound risk management strategies by poultry farmers is imperative for the poultry sector's sustainability, and hence the study recommends that small-scale poultry farmers must adopt healthy risk coping strategies to sustain the industry. Furthermore, providing credit facilities, education, and training on entrepreneurship programs to equip farmers with the necessary skills for adopting healthy responses to risk is recommended.

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