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**G Srinivasan**

M.V.Sc. Department of Animal Husbandry Economics, Faculty Basic Sciences, Madras Veterinary College, Tamil Nadu Veterinary and animal Sciences University Chennai, Tamil Nadu, India

**M Prabu**

Department of Animal Husbandry Economics, Faculty Basic Sciences, Madras Veterinary College, Tamil Nadu Veterinary and animal Sciences University Chennai, Tamil Nadu, India

**KN Selvakumar**

Department of Animal Husbandry Economics, Faculty Basic Sciences, Madras Veterinary College, Tamil Nadu Veterinary and animal Sciences University Chennai, Tamil Nadu, India

**R Narendra Babu**

Department of Animal Husbandry Economics, Faculty Basic Sciences, Madras Veterinary College, Tamil Nadu Veterinary and animal Sciences University Chennai, Tamil Nadu, India

**A Serma Saravana Pandian**

Department of Animal Husbandry Economics, Faculty Basic Sciences, Madras Veterinary College, Tamil Nadu Veterinary and animal Sciences University Chennai, Tamil Nadu, India

**Corresponding Author:****A Serma Saravana Pandian**

Department of Animal Husbandry Economics, Faculty Basic Sciences, Madras Veterinary College, Tamil Nadu Veterinary and animal Sciences University Chennai, Tamil Nadu, India

## Broiler poultry rearing in northern districts of Tamil Nadu: The economic dimensions

**G Srinivasan, M Prabu, KN Selvakumar, R Narendra Babu and A Serma Saravana Pandian**

**Abstract**

The purpose of this study was to demonstrate the factors influencing profitability of broiler farming in Vellore, Tirupattur, Ranipet, Dharmapuri and Krishnagiri districts of Tamil Nadu using the profit function regression model for contract and non-contract broiler farmers. Data were collected from 90 broiler rearing contract and non contract farmers. The factors considered in the model were Multiple linear regression function to study the factors influencing Profit per kilogram of broiler meat were age, gender, educational status of farmers, experience, regular disinfection, period of rest between batches, quantity of feed consumed, mortality rate, access to credit, and status of contract farming. Among the 11 independent variables used in the analysis, the variables age of the farmers, experience of the farmers, flock size, mortality rate, access to credit and status of contract farming were found to influence the profitability of broiler farming at 1 per cent level ( $P < 0.01$ ). Among these significant variables age, experience, flock size, access to credit and status of contract farming found to have positive influence over profitability of broiler farming in the study area. The variable mortality rate had negative impact on the profitability of broiler farms.

**Keywords:** Broiler farming, factors, influencing, poultry

**Introduction**

Expansion in the middle class in India is helping to boost the demand for more plentiful and less costly proteins and consequently chicken meat. Major poultry companies have vertically integrated operations which comprise approximately 60-70 percent of the total chicken production. Major companies/ integrators own hatcheries, feed mills and primary processing facilities and often provide credit, extension services, and veterinary medicine to the contractual farmers. Integrators contract with multiple smaller farmers who rear the chicks to slaughter weight. Broiler production is mainly concentrated in the states of Tamil Nadu, Andhra Pradesh, Maharashtra, Uttar Pradesh, and Telangana.

Indian Broiler Industry experiences the rapid growth driven by increase in per capita consumption. The impressive growth in the poultry sector in general and broiler industry in particular is the result of technological breakthroughs in breeding, feeding and health, and sizeable investments from the private sector. Most of the poultry farms are simple open sheds while only a few large poultry integrators have controlled-environment housing with automatic feeding and drinking systems. High capital costs and unreliable power supplies restrict large scale adoption of the controlled environment poultry barn model in India NAPEP<sup>[1]</sup>. Village or backyard production can make a useful contribution to dietary protein intake and incomes of resource poor households Acamovic *et al.*,<sup>[2]</sup>. Poultry farming has tremendous potential for expansion and employment generation Sharma and Chatterjee<sup>[3]</sup>. Tirupattur, Ranipet, Vellore, Krishnagiri and Dharmapuri districts of Tamil Nadu were selected as study area for this research. These areas were dominated by contract farmers and only 4 per cent of total farms belonged to non-contract farmers.

It is possible to estimate factors affecting profit with profit function models. A linear profit function model has frequently been used to determine and quantify factors affecting broiler production and milk production to determine long term strategies for breeding programmes. Similar kind of a research has been done by Farooq *et al.*<sup>[4]</sup> to determine factors affecting cost of production and net profit per broiler in the another study by Yavuz and Cengiz<sup>[5]</sup>, to estimate the profitability of broiler farming considering factors responsible for profit per live weight and on quantitative analysis on factors affecting profitability of small scale broiler

production in Sri Lanka. Bandara and Dassanayake [6]. The results of these researches were encouraging as they were similar to the practical situations to a great extent. The aim of the study is to assess the factors associated with the profitability of broiler poultry farming.

### Materials and methods

The study was designed and conducted during January 2020. The required primary data were collected through a well-structured and pre-tested interview schedule. Simple random sampling technique was adopted to select the respondents from each district. 60 contract farms were selected from Dharmapuri, Krishnagiri and integrated Vellore district (Now Tirupattur, Ranipet and Vellore) and 30 non contract farms were selected from Krishnagiri and Dharmapuri districts. The collected data included socio-economic characteristics of both contract and non contract farmers like age, Gender, educational status, and experience in broiler farming were collected. The details of farm management practices such as regular disinfection, period of rest between two batches, quantity of feed consumed, mortality rate were also collected. Data regarding Access to credit and status of contract farming in the study area were collected. Income details in terms of growing charge per bird of Broiler during 2019 in contract farming and income in terms of live birds sold as well per kilogram meat produced were collected. Collected data were analyzed using IBM Statistical Package for Social Sciences

(SPSS) version 20.0. Analysis carried out include descriptive statistics and Multiple linear regression analysis to find out the relationship between profit per Kilogram of meat produced in broiler farming and factors like age, gender, educational status of farmers, experience, regular disinfection, period of rest between batches, quantity of feed consumed, mortality rate, access to credit, and status of contract farming.

### Multiple linear Regressions

Multiple linear regression function of the following form was fitted separately to study the factors influencing Profit per kilogram of meat produced by the farmers.

$$Y_j = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \mu$$

### Where

- $Y_j$  = Net profit per Kilogram of meat produced by broiler (in Rupees)  
(j = 1-contract farms, j = 2-non contract farms)
- $\alpha$  = Constant term
- $\beta_i$  = Regression coefficients
- $X_i$  = Demographic and Farm related variables
- $\mu$  = Random disturbance term; ( $\mu_i \sim 0, \sigma_i^2$ )

**Table 1:** The explanatory variables ( $x_i$ ) used in this analysis include

$X_i$	Variables
$\alpha$	(Constant)
$X_1$	Age of farmer (1= young, 2= Adult, 3=old)
$X_2$	Gender of the farmer (0=Male,1=Female)
$X_3$	Experience of the farmer (in years)
$X_4$	Education of the farmer (1=illiterate, 2=primary,3=secondary and 4=collegiate)
$X_5$	Regular disinfection (1=Yes, 0=No)
$X_6$	Period of rest between two batches (in number of days)
$X_7$	Flock size (in numbers)
$X_8$	Quantity of feed consumed (in kilograms)
$X_9$	Mortality rate
$X_{10}$	Access to credit (1=Yes, 0=No)
$X_{11}$	Contract farming (Contract=1,Non contract=0)

### Results and Discussion

To analyze the demographic and farm related personal factors influencing the profitability in broiler meat, a multiple linear regression analysis was carried out and the results are presented in table 2. On perusal of results of the table it could be observed that the value of adjusted  $R^2$  is 0.827 indicating

that the regression model has a good fit, which is 82.7 per cent of the variation in the dependent variable was explained by the independent variable chosen for the study. The ANOVA also showed that the model was statistically significant ( $P < 0.01$ ) with a F value of 39.601.

**Table 2:** Results of regression analysis

$X_i$	Variables	Standardized Coefficients $\beta_i$	t-statistic
$X_1$	Age of farmer (1= young, 2= Adult, 3=old)	0.479**	4.770
$X_2$	Gender of the farmer (0=Male,1=Female)	0.047 <sup>NS</sup>	0.583
$X_3$	Experience of the farmer (in years)	0.317**	2.980
$X_4$	Education of the farmer (1=illiterate, 2=primary, 3=secondary and 4=collegiate)	0.060 <sup>NS</sup>	1.204
$X_5$	Regular disinfection (1=Yes, 0=No)	0.106 <sup>NS</sup>	0.572
$X_6$	Period of rest between two batches (in number of days)	0.190 <sup>NS</sup>	1.261
$X_7$	Flock size (in numbers)	0.232**	4.308
$X_8$	Quantity of feed consumed (in kilograms)	0.054 <sup>NS</sup>	-0.551
$X_9$	Mortality rate	-0.553**	-4.275
$X_{10}$	Access to credit (1=Yes, 0=No)	0.526**	3.317
$X_{11}$	Contract farming (Contract=1,Non contract=0)	0.223**	2.840
Dependant Variable = profit per Kg of meat produced in broiler farming			
N = 90			

F-Value = 39.601**
R <sup>2</sup> = 0.848
Adjusted R <sup>2</sup> = 0.827
NS= > 0.05 ** - P < 0.01

Among the 11 independent variables used in the regression analysis, the variables age of the farmer, experience of the farmer, flock size, mortality rate, access to credit and status of contract farming were found to influence the profitability of broiler farming at 1 per cent level ( $P < 0.01$ ). Among these significant variables age, experience, flock size, access to credit and status of contract farming found to have positive influence over profitability of broiler farming in the study area. Majority of contract farms were owned by adult and old aged farmers. This might be due to the fact that, increase in the age of the broiler poultry farmers, they decide to minimize risk. In contract farming, input purchase and selling of the birds can be done easily whereas; in non contract farming there is a risk of management, marketing and selling of birds. With increase in age, the risk bearing capacity of the farmer decreases.

Experience is measured by the number of years a farmer spends on the poultry farming business. Higher experience in farming business may favor farming activity than other poultry business. A similar study was conducted by Zeberga [7] on analysis of poultry market chain. As for as flock size is concerned, it indicates that the small sized non contract farms are not economically viable for run and so the farmers holding small flocks were quitting their business because of low returns. Farm size increases corresponding to their age and experience Islam *et al.* [8] concluded that the farm size increases with increase in experience of the farmer. It is assumed that easy access to credit would improve the financial capacity of poultry household to invest more on improved management skilled work force, infrastructure and technology to increase poultry productivity. A similar study was conducted by Thadesse [9] on market chain analysis of fruits. While, the variable mortality rate had a negative influence over profitability. Increase percentage of mortality will significantly decrease the profitability. According to Eminie [10], age of the producer, number of family members involve in the production, the budget for producing terms, good management, heating system, weight of the chicks in the broiler and the transportation distance have been found statistically significantly affect mortality. The study stated the broilers need a certain budget provides for their expenditures such as heating, lightening and work-labour. In the research area, it has been observed that the more the budget increase, the less the death rates become.

## Conclusion

Although the study is limited with respect to the number of respondents, it provides an insight and direction of further studies on performance of broiler farming based on the profit function model. The performance of broiler farming depends on several factors. Age of the farmer, experience of the farmer, flock size, access to credit and status of contract farming were found to have positive influence the profitability and of broiler farming in the study area. The variable mortality rate had negative impact on the profitability and performance. Overall a mortality rate of less than 5 per cent will improve the profitability. The status of contract farming is highly profitable in comparison with non contact farming in the study area.

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