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## Full Length Research Article

Advancements in Life Sciences – International Quarterly Journal of Biological Sciences

## ARTICLE INFO

## Open Access



Date Received:

25/06/2019;

Date Revised:

22/08/2019;

Date Published Online:

25/08/2019;

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## How to Cite:

Ashraf M, Bashir MK, Mariam S, Tabassum M, Bilal MQ, Mustafa MI, Rehman S (2019). An assessment of social, economic and managerial factors affecting average production per week in commercial layers at district Toba Tek Singh, Punjab, Pakistan. *Adv. Life Sci.* 6(4): 182-186.

## Keywords:

Social; Economic; Management; Peak production; Layers

## An assessment of social, economic and managerial factors affecting average production per week in commercial layers at district Toba Tek Singh, Punjab, Pakistan

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### Abstract

**Background:** The research was conducted to identify social, economic and management factors that may affect the total egg production in terms of total number of weak for average peak production in layers at district Toba Tek Singh.

**Methods:** Sampling method was based on primary data collected through survey. Twenty-five layer farms were selected randomly with three different types of production systems (viz., open sided litter floor system, Semi controlled cage system and semi controlled litter floor system). Farmers were visited personally and interviewed. The data were analyzed by MINITAB-17 using multiple regression analysis.

**Results:** Result showed that 12% of the respondents are under the age of 25 years, 80% fall between the age of 25-50 years, 8% fall more than the age of 50 and above. Study showed that more than 50% farmers are having qualification above secondary level i.e., 48 % are within the range of higher secondary and graduation, while 4% are specialized in animal production and health (veterinarian). Majority of the farmers had a farm size less than a capacity of 25000 birds, while only 16% farmers had a farm size with a capacity of above 50000 birds. The House type, Birds at first lay, Age at data recording, Age at first egg and Feed cost were significant ( $P \leq 0.01$ ). However, demographic variables were non-significant at all levels of probability. The results showed that the economic and management factors of farmers have significant effect on average peak production of layers kept by them.

**Conclusion:** The importance of the economic and management factors, concluded significant influence made by the social, economic and management factors on poultry egg production.



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## Introduction

Poultry production is the process of keeping birds domestically mainly for the supply of poultry meat and eggs for human consumption. Poultry and its products are an important source of animal protein, essential for good health maintenance worldwide especially in a developing country like Pakistan. Poultry sector contributes 1.4 percent in National gross domestic product of Pakistan and its share in agriculture GDP is 7.5% while it shares about 12.7% contribution in livestock value addition of GDP [1].

Despite the poultry industry has played significant role in national economy, this subsector has to face challenges of insufficient capital, poor quality feed ingredients, diseases and pest, high feed cost, low egg production, poor quality chicks, inadequate access to veterinary services and high cost of ingredients [2]. Many developing countries are facing the problem of food security and hence not getting enough food to support their people for normal, healthy and active living [3].

In Pakistan dietary protein consumption from animal source per capita is 26 g per day [4]. Pakistan produces about 18 billion eggs and 1.4 million tons of poultry meat annually [1] with an average consumption of 5.8 kilograms of meat and 70 eggs per capita per year in comparison to the recommended annual intake of 25-28 kilograms meat and 250-300 eggs annually.

Chicken eggs, apart from supplying protein is also a good source of high and concentrated sources of nutrients to the ever-increasing human population, thereby significantly contributing to human nutrition and economic development [3]. An increase in egg production may play a significant role to compete the conditions like hunger and malnutrition. But like all other businesses, poultry production can also be affected by socio-economic factors particularly in case of small business.

Socio-economic factors are indicators of quality of life that influence the attitudes, behaviors, trends, lifestyles and tastes of individuals. Primary occupation, income and education of farmers are principal parameters used for the assessment of socioeconomic status [5]. Understanding the socioeconomic aspects which may affect poultry business may help in policy making and planning the future and direction of business [6]. Thus it is important to assess the

consequences of socioeconomic indicator on poultry production. The objective of current study was to study the effect of social, economic and management factors that can affect the poultry egg production in district Toba Tek Singh, Pakistan.

## Methods

The study was focused at district Toba Tek Singh Punjab, Pakistan. Which is considered as a hub of poultry production especially layer production. Sampling method was based on primary data collected through survey. Population of the study was the total number of layer farms in the district Toba Tek Singh. 25 layer farms were selected randomly with three different types of production systems (viz., open sided floor system= 10, Semi controlled cage system= 10 and semi controlled floor system = 5). Pretesting followed by improvement of the questionnaire was done before launching the survey. To collect the more precise data questionnaire was organized and formatted. Farmers were visited personally, and questionnaire was filled by a formal interview. The parameters were organized based on relevance with objective of the study. Social, economic and management factors that may affect the total egg production in terms of total number of weak for average peak production were investigated.

## Statistical Analysis

The obtained data were analyzed using MINITAB-17 software. Multiple regression analysis was used to analyze data for this study.

The multiple regression model is expressed as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + \beta_{13}X_{13} + \beta_{14}X_{14} + \mu$$

Where: -

Y = No of weeks for peak production (Peak production period in weeks)

X<sub>1</sub> = Farmers age (In years)

X<sub>2</sub> = Farmers Occupation (Feed mills & poultry = 1, Agriculture = 2, Others =3)

X<sub>3</sub> = Farmers Education (Secondary =1, Graduation = 2, Above = 3)

X<sub>4</sub> = Farmers Experience (≤10 years =1, ≥20 years = 2, Above = 3)

X<sub>5</sub> = Birds House Type (Open sided litter floor =1, Semi control litter floor system = 2, Semi control cage = 3)

X<sub>6</sub> = Farmers Farm Size (≤20,000 =1, ≤50,000 = 2, above 50,000 = 3)

X<sub>7</sub> = Number of birds at production

X<sub>8</sub> = Chicks Company

X<sub>9</sub> = Type of feed (Palate = 1, Mesh = 2)

X<sub>10</sub> = Consultancy (access to veterinarian =1, No consultancy =2)

$X_{11}$  = Birds age at data records

$X_{12}$  = Flushing source (Sugar = 1, Other = 2)

$X_{13}$  = Birds age at first lay

$X_{14}$  = Feed cost

$\beta_0$  = Constant

$\beta_1 - \beta_{14}$  = regression coefficients

$\mu$  = Error term

$X_1$  to  $X_4$  were social factors while  $X_5$  to  $X_8$  were economic factors and  $X_9$  to  $X_{14}$  were management factors.

### Hypothesis

There is no significance influence made by the social, economic management factors on poultry egg production in district Toba Tek Singh.

### Results

Some major factors indicating the socioeconomic status of farmers at district Toba Tek Singh are described in the table no. 1. Result of the study showed that 12% of the respondents are under the age of 25 years, 80% fall between the ages of 25-50 years, 8% fall above the age of 50. About 84% respondents have experience ranged from 1-10 years, 12 % from 10-20 years and 4 % farmers have more than 20 years' experience of poultry farming. Three different types of housing system were observed during study and results found that 40% farmers have open sided houses with floor bedding production system. 40 % farmers had semi environment-controlled housing system but again with floor bedding. Only 20 % farmers had semi environment-controlled houses with cages indicating the economic status of the formers as environment-controlled houses with automation are much more expensive than open sided manual production system.

Similarly, majority of the farmers had a farm size less than a capacity of 25000 birds, about 52%. 32% farmers had a farm size ranged 25000-50000 birds while only 16% farmers had a farm size with a capacity of above 50000 birds. The results are indicating the level of poultry production at small and medium level.

### Socioeconomic factors influencing poultry egg production

An analysis of different factors that directly or indirectly related to socioeconomic status of farmers are represented in table no. 2 to check either these factors have any significant effect on egg production in terms of total no of weeks for peak production.

The results of the analysis (Table 2) showed that seven out of fourteen variables were significant. The House type ( $X_5$ ), Birds at first lay ( $X_7$ ) Age at data recording ( $X_{11}$ ), Age at first egg ( $X_{13}$ ) and Feed cost ( $X_{14}$ ) were highly significant ( $P \leq 0.01$ ) while other factors were significant at  $P \leq 0.05$  level of probability. The results of the study showed that the economic and management factors of farmers have significant effect on average peak production of layers kept by them.

The level of education ( $X_3$ ) had a positive coefficient (0.17). Availability of consultancy ( $X_{10}$ ) services also showed the positive coefficient (6.03). The house type ( $X_5$ ) showed the positive coefficient (5.14). The flushing source ( $X_{12}$ ) showed positive coefficient.  $R^2$  value was 0.9118 meaning that 91% of the total variation in the social, economic and management factors influencing poultry egg production was explained by the number of peak production weeks (dependent variable). Variables such as age ( $X_1$ ), Occupation ( $X_2$ ), Education ( $X_3$ ), Farm size ( $X_6$ ), Chick company ( $X_8$ ), and Flushing source ( $X_{12}$ ) through related to poultry egg production were non-significant at all levels of probability.

The results of the study showed that the social factors of farmers have non-significant effect on average peak production of layers kept by them.

### Discussion

Result of the study showed that 12% of the respondents are under the age of 25 years, 80% fall between the ages of 25-50 years, 8% fall above the age of 50. This shows that many the respondents are young and in their productive years. The results of the study are in line with some other studies who found the majority of the farmers in similar age groups [3, 7].

Findings showed that more than 50% farmers are having qualification above secondary level i.e., 48 % are within the range of higher secondary and graduation, while 4% are specialized in animal production and health (veterinarian). Overall results of study are in agreement with [3] and [7] where majority of the farmers had third level of education.

The level of education ( $X_3$ ) had a positive coefficient (0.17). This implies that increasing level of education of the respondent resulted in increased poultry egg production. This could be because education helps the

Variables	Categories	Frequency	Percentage	variance
Age	≤ 25	3	12%	0.207
	25-50	20	80%	
	Above 50	2	8%	
Education	primary & secondary	12	48%	0.527
	Higher secondary & above	12	48%	
	Others	1	4%	
Occupation	Feed mills & poultry	8	32%	0.583
	Agriculture	12	48%	
	Others	5	20%	
House Type	Open sided litter floor system	10	40%	0.250
	Semi control litter floor system	10	40%	
	Semi control cages	5	20%	
Experience	≤10 years	21	84%	0.573
	≥20 years	3	12%	
	Above 20 years	1	4%	
Farm Size	≤ 20,000	13	52%	0.340
	≤50,000	8	32%	
	Above 50,000	4	16%	

Table 1: Socio economic status of farmers

Variables	Coefficients	St. Error	t-value	Significance
Constant	26.8	27.2	0.99	0.348
Farmer Age	0.097	0.104	0.93	0.372
Farmer Occupation	-0.71	3.05	-0.23	0.821
Education	0.17	1.69	0.10	0.921
Experience	-4.71	1.81	-2.61	0.026
House Type	5.41	1.40	3.67	0.004
Farm Size	0.000064	0.000071	0.90	0.387
Birds at 1 <sup>st</sup> lay	0.001933	0.000521	3.71	0.004
Chicks Company	-0.184	0.601	-0.31	0.766
Type of feed	-8.50	3.71	-2.29	0.045
Consultancy	6.03	3.29	1.83	0.097
Age at data record	1.183	0.357	3.32	0.008
Flushing source	3.97	2.75	1.44	0.179
Age at 1 <sup>st</sup> Egg	-4.90	1.16	-4.24	0.002
Feed Cost	0.000001	0.000000	-3.73	0.004
R <sup>2</sup> =0.9118				
R <sup>2</sup> (adj) =0.7833				

Table 2: Multiple regression analysis showing the social, economic and management factors influencing poultry egg production among farmers

farmer to better understand innovations introduced to them regarding poultry production and help in sound and useful economic and managerial decisions. The level of education improves the skills of farmers and their allocative efficiencies to use the innovations and technologies around them. Availability of consultancy( $X_{10}$ ) services also showed the positive coefficient (6.03) this indicates that the respondent consults with veterinarian will result to higher poultry egg production. The farmer is more likely to manage the farm in a better way and make correct decisions. The consultants have better understanding, more efficiency and knowledge about climatic conditions and market

situation and are thus, the respondents having consultations with consultants expected to be efficient and profitable. These farmers are more efficient in setting realistic time and cost target, collect, group and use resources and identify risks. The house type( $X_5$ ) showed the positive coefficient (5.14) this implies the effect of poultry housing system on egg production. The farm size also showed a positive coefficient indicating increase in egg production with an increase of number of laying birds. The flushing source ( $X_{12}$ ) showed positive coefficient this implies that the farmer uses these types of flushing source will lead to increase in poultry egg production. Hence, from the result stated

above and importance of the economic and management factors it can be concluded that significant influence made by the social, economic and management factors on poultry egg production in district Toba Tek Singh.

### Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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