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Different production parameters of layer farms in Uttar Pradesh state

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Abstract
The study aimed to evaluate the different production parameters of layer farms in Uttar Pradesh state. A total of 108 respondents were selected, of which 54 were trainees and 54 were non-trainee layer farmers. Out of these 54 trainees, 30 were adopters and 24 were non-adopters. Data were collected through structured mailed questionnaires and telephonic survey. About 70 per cent of both trainee and non-trainee layer farmers had small farm size (15000-60000). The average layer birds for trainee and non-trainee layer farmers were 49933.33 and 52981.48, respectively. Two-thirds of trainee layer farmers were using both California cages and deep litter mixed system, while in the case of non- trainee the majority (70.37%) of layer farmers were using California cages. The mean sexual maturity age for trainees and non-trainee was 16.73 and 17.74, respectively. The mean egg production per bird in 82 weeks for trainee and non-trainee was 324.60 and 314.61, respectively. The mean egg weight for the trainee was 48.93 gm. and for the non-trainee it was 46.43 gm. The trainee had a longer production cycle for layers than non-trainees.

Keywords: Production parameters, layer farms, 54 trainees, 30 were adopters and 24 were non-adopters

Introduction
Poultry is one of the fastest-growing segments of the agricultural sector in India with around an eight percent growth rate per annum. Livestock and poultry rearing is an imperative factor for improving the nutritional security of rural poor in India (Pathak and Nath, 2013) [7]. The poultry sector in India has undergone a paradigm shift in structure and operation from a mere backyard activity into a major commercial agri-based industry over four decades (Chatterjee and Rajkumar, 2015) [4]. The total poultry population is 851.81 million in 2019 which shows an increase of 16.80 per cent over the previous 19th census (20th Livestock Census, 2019). India has 3rd rank in egg production in the world at present. Development of high-yielding layer (310-340 eggs)) varieties together with a standardized package of practices on nutrition, housing, management and disease control have contributed to spectacular growth rates in eggs (4-6% per annum) in India during the last 40 years. The annual per capita availability also increased to 60 eggs and 2.5 Kg of meat, consistently with an increase in productivity (BAHS, 2020). Poultry gave balanced nutrition to the family as the easy availability and accessibility at home increased their egg consumption (Patil *et al*., 2022) [8] and also rural poultry farming has good potential in India especially in the rural areas to improve the economic condition and overcome protein deficiency (Budharam *et al*., 2021) [3]. The egg prices also follow a seasonal pattern along with sizeable variations in prices across geographies and the average price of an egg in India is increasing 6.5 per cent year on year (Karthikeyan and Nedunchezhian, 2014) [5]. Chicken dominates the poultry production in India with nearly 95% of the total egg production. Most of these indigenous strains exhibit poor production performances. However, nutrition and management are two major factors affecting the number of laying eggs. So, this study was conducted to evaluate the different production parameters for the laying hens.

Research Methodology
The state Uttar Pradesh (UP) was chosen purposively to conduct the study because of the reason having the maximum number of trainees belonging to this state. The respondents (trainee and non-trainee layer farmers) were belonging to five agro-climatic zones of UP. Fifty-four trainees and an equal number of non-trainee layer farmers (54) were selected purposively from the same agro-climatic zone making a total sample size of 108. Out of 54 trainees, 30 had adopted layer farming.

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So, in the case of layer farming-related variables, a comparison of 30 trainee layer farmers was done with 54 non-trainee layer farmers and the total sample size was reduced to 84. A structured questionnaire and telephonic survey were used for data collection. Data analysis was done using suitable statistical tools. About half of the trainee layer farmers had layer birds having early sexual maturity age (15-16 weeks).

Result and Discussion
1. Poultry farm size
The data given in table 1 reveals that the majority (70.00%) of the trainee layer farmers had small farm size (15000-60000), followed by medium (16.67%) and large (13.33%) farm size. Similar findings were also found in case of non-trainee layer

farmers like majority (70.37%) of them had small farm, followed by medium (18.52%) and large (11.11%) farm size. The table further reveals that 13.33 per cent of the small farm size trainee layer farmers also stocked chicks and pullet (10000-30000) along with layer birds. The average layer birds for trainee and non-trainee layer farmers were 49933.33 and 52981.48, respectively. The average pullets for trainee and non-trainee layer farmers were 27833.33 and 19615.38, respectively. The average chicks for trainee and non-trainee layer farmers were 21375.00 and 27068.97, respectively. It shows that trainee layer farmers had more pullets whereas, non- trainee layer farmers had more chicks along with layer birds.

Table 1: Distribution of trainee and non-trainee layer farmers according to poultry farm size

Farm size	Layer (15000-130000)		Pullet (10000-30000)		Chick (10000-30000)	
	Trainees (n=30)	Non-trainees (n=54)	Trainees (n=30)	Non-trainees (n=54)	Trainees (n=30)	Non-trainees (n=54)
Small (15000-60000)	21(70.00)	38 (70.37)	4 (13.33)	0 (0.00)	4 (13.33)	12 (22.22)
Medium (60001-105000)	5 (16.67)	10 (18.52)	2 (6.67)	7 (12.96)	4 (13.33)	10 (18.52)
Large (105001-150000)	4 (13.33)	6 (11.11)	0 (0.00)	6 (11.11)	0 (0.00)	6 (11.11)
Mean	49933.33	44981.48	27833.33	19615.38	21375.00	27068.97

Figures in the parenthesis indicate percentage.

2. Poultry housing system
The data given in table 2 reveals that the majority (66.67%) of trainee layer farmers were using both California cages and deep litter mixed system and rest (33.33%) were using only California cage system of poultry housing. While, in the case of non- trainee the majority (70.37%) of layer farmers were using California cages, followed by battery cages (16.66%), both battery cages and deep litter combination (7.41%) and both California cages and deep litter (5.56%) system of poultry housing. It can be inferred from results that trainee

layer farmers were using the California ages & deep litter system combination, while non-trainees layer farmers adopted the California cage system. It might be due to its cheaper cost. In the combination of cages and deep litter system, the deep litter system was used for brooding of chicks while cages were for laying period of layer birds. Maduka *et al.* (2016) [6] also reported somewhat similar findings, majority (86.3%) of the farmers were using deep litter system, followed by battery cage system (12.5%).

Table 2: Distribution of trainee and non-trainee layer farmers according to poultry housing system

Poultry housing system	Trainees (n=30)	Non-trainees (n=54)	Pooled (n=84)
California cages	10 (33.33)	38 (70.37)	48 (57.15)
Battery cages	0 (0.00)	9 (16.66)	9 (10.71)
Deep litter system	0 (0.00)	0 (0.00)	0 (0.00)
California cages + deep litter mixed system	20 (66.67)	3 (5.56)	23 (27.38)
Battery cages + deep litter mixed system	0 (0.00)	4 (7.41)	4 (4.76)

Figures in the parenthesis indicate percentage.

3. Production Parameter
Data presented in Table 3 reveals that 53.33 per cent of trainee layer farmers had layer birds having early sexual maturity age (15-16 weeks), followed by middle (17-18 weeks, 26.67%) and late (19-20 weeks, 20.00%) sexual maturity. While, 44.44 per cent of non-trainee layer farmers had middle sexual maturity age (17-18 weeks) layer birds, followed by late (25.92%) and early (29.63%). Altogether, 38.09 per cent of layer farmers had early (15-16 weeks) & middle sexual maturity age (17-18 weeks), followed by late (23.82%) sexual maturity. The mean sexual maturity age for trainee, non-trainee and pooled was 16.73, 17.74 and 17.38, respectively. The independent sample t-test analysis reveals a significant difference between trainee and non-trainee layer farmers with respect to the sexual maturity age of layer birds at a 5 per cent level of significance. The trainee layer farmer's mean sexual maturity age was lower than non-trainee layer farmers which may be due to better management particularly feeding practices adopted by trainee layer farmers.
The table further reveals that the same proportion of trainee

layer farmers (36.67%) had low (290- 310) & high (331-350) egg production, and the remaining (26.67%) had medium egg production per bird in 82 weeks. While in the case of the non-trainee highest percentage of layer farmers (46.30%) had low (290-310) egg production, followed by medium (37.04%) and high (16.67%) egg production per bird per cycle. Altogether, a maximum (42.86%) of layer farmers had low (290-310) egg production, followed by medium (33.33%) and high (23.81%) egg production per bird in 82 weeks. The mean egg production per bird in 82 weeks for trainee, non-trainee and overall was 324.60, 314.61 and 318.18, respectively. The independent sample t-test analysis reveals a highly significant difference between trainee and non-trainee layer farmers concerning egg production per bird in 82 weeks. The trainee layer farmer's mean egg production per bird was high than non-trainee layer farmers. The low egg production among non-trainees may be because of low potential strain and feeding management practices.
In the case of egg weight, 36.67 per cent of trainee layer farmers had high (>51 gm) egg weight followed by medium

(48-51gm, 33.33%) and low (up to 47 gm, 30.00%) egg weight. While 44.44 per cent of non-trainee layer farmers had medium (48-51 gm) egg weight, followed by low (37.04%) and high (18.52%) egg weight. The pooled data reveals that 40.48 per cent of layer farmers had medium (48-51 gm) egg weight, followed by low (34.52%) and high (25.00%) egg weight. The mean egg weight for trainee, non-trainee and pooled was 48.93 gm, 46.43 gm and 47.61 gm, respectively. The independent sample t-test analysis reveals a non-significant difference between trainee and non-trainee layer farmers concerning egg weight.

In the case of the production cycle, 43.33 per cent of trainee layer farmers had long (78-83 weeks) the production cycle, followed by standard (30.00%) and very long (26.67%) production cycles. While in the case of non-trainees majority (51.85%) of layer farmers had standard (72-77 weeks) production cycles followed by long (37.04%) and very long (11.11%) production cycles. Altogether, 44.05 per cent of layer farmers had standard, followed by long (39.28%) and very long (16.67%) production cycles. The mean production cycle for trainee, non-trainee and pooled was 80.63, 77.33 and 79.45 weeks, respectively. The independent sample t-test analysis reveals a highly significant difference between trainee and non-trainee layer farmers concerning the production cycle. Trainee layer farmers had a longer production cycle than non-trainee layer farmers.

Table 3: Distribution of trainee and non-trainee layer farmers according to production parameters

Production parameters		Trainees (n=30)	Non-trainees (n=54)	Pooled (n=84)
Sexual maturity age (in weeks)	Early (15-16)	16 (53.33)	16 (29.63)	32 (38.09)
	Middle (17-18)	8 (26.67)	24 (44.44)	32 (38.09)
	late (19-20)	6 (20.00)	14(25.92)	20 (23.82)
	Mean ±SE	16.73±0.31	17.74±0.29	17.38±0.22
	t-test -2.21*			
Egg production per bird/cycle (82 weeks)	Low (290-310)	11 (36.67)	25 (46.30)	36 (42.86)
	Medium (311-330)	8 (26.67)	20 (37.04)	28 (33.33)
	High (331-350)	11 (36.67)	9 (16.67)	20 (23.81)
	Mean ±SE	324.60±3.59	314.61±2.39	318.18±2.06
	t-test -2.38**			
Egg weight (in grams)	Low (up to 47)	9 (30.00)	20 (37.04)	29 (34.52)
	Medium (48-51)	10 (33.33)	24 (44.44)	34 (40.48)
	High (>51)	11 (36.67)	10 (18.52)	21 (25.00)
	Mean ±SE	48.93±0.41	46.43±0.29	47.61±0.24
	t-test -1.00^{NS}			
Production cycle (in weeks)	Standard (72-77)	9 (30.00)	28 (51.85)	37 (44.05)
	Long (78-83)	13 (43.33)	20 (37.04)	33 (39.28)
	Very long (84-89)	8 (26.67)	6 (11.11)	14 (16.67)
	Mean ±SE	80.63±0.62	77.33±0.76	79.45±0.51
	t-test-3.23**			

Figures in the parenthesis indicate percentage.
** Significant at 1% level of significance

Conclusion
This study appears to be the first one on the production parameters of layer farms in Uttar Pradesh state. Significant differences were found among trainee and non-trainee layer farms. The sexual maturity age was lower for the trainee layer farmers. Egg production per cycle was higher in a layer of trainee layer farmers. The average egg weight was heavier and the production cycle was longer for trainees than non-trainees. The t-test analysis revealed that there was a highly significant difference among trainee and non-trainee layer farmers at 1 per cent of the level of significance for sexual maturity age, egg production and production cycle. Study results indicate that trainee layer framers had more net returns than non-trainee layer farmers. It is concluded from the above facts and profitability that the study area was enough potential to grow in the poultry sector and motivate the farmers to participate in the training programmes.

References
1. Annual Report. Department of Animal Husbandry, Dairying and Fisheries, GOI. 2019-20.
2. Basic Animal Husbandry Statistics. Government of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying & Fisheries, New Delhi, India, 2020.
3. Budharam Kumar L, Muwal H. A study on the economics of poultry farmers and suggestions of poultry management practices in Dungarpur district of Rajasthan. The Pharma Innovation Journal. 2021;SP-10(10):489-492.
4. Chatterjee RN, Rajkumar U. An Overview of Poultry Production in India. Indian J. Anim. Hlth. 2015;54(2):89-108.
5. Karthikeyan R, Nedunchezhian VR. An analysis of price trends and its behavioural patterns of the Indian poultry market concerning egg. African journal of agriculture research. 2014;9:8-13.
6. Maduka CV, Igbokwe IO, Atsanda NN. Appraisal of chicken production with associated biosecurity practices in commercial poultry farms located in Jos, Nigeria. *Scientifica* (*cario*), 2016. DOI: 10.1155/2016/1914692.
7. Pathak PK, Nath BG. Rural Poultry Farming with Improved Breed of Backyard Chicken Journal of World's Poultry Research. 2013;3(1):24-27.
8. Patil P, Jadhav S, Shubha S. Empowerment of rural women in backyard poultry farming with improved breeds. The Pharma Innovation Journal. 2022; SP-11(3):662-663.