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Analysis of major causes and rate of mortality at different stages in layer birds of Uttar Pradesh state

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Abstract

The study was conducted to analyse the major causes and rate of mortality in different stages of life cycle of layer birds in Uttar Pradesh state. A total of 30 trainees and 54 non-trainees were selected from same 5 agro-climatic zones of the state. Thus, total sample size was 84 only. Data were collected through structured mailed questionnaire. In the present study, mortality according to season and stages of the birds was measured and expressed in terms of frequency and percentage. Data analysis shows that the mortality occurs at the brooding stage (up to 1 week), were 1.96 per cent and 2.20 per cent for trainee and non-trainee layer farmers, respectively and major causes were stress and heat stroke. Mortality rate at laying stage (20-82 week) were 2.33 and 2.67 per cent for trainees and non-trainees respectively and main causes were egg bound condition, egg peritonitis, oviduct prolapse, fatty liver disease etc. Majority of the trainee (70.00%) and non-trainee layer farmers (53.70%) were reported low (4.5-7.5%) and medium (7.52-10.5%) level of mortality, respectively. It shows that there was low level of mortality in trainees' layer farm compared to non-trainee layer farm. It might be due to their good managerial practice, proper vaccination schedule, maintaining hygiene in farm, providing balanced feed, proper supervision of farm timely treatment of diseased birds.

Keywords: Brooding, growing, layer, trainee, non-trainee, mortality, Uttar Pradesh

1. Introduction

Poultry is one of the highest growing segments in India has around 8 per cent growth rate per annum. The total poultry population in the country is 729.2 million numbers in which about 30 per cent of layers are included (19th Livestock Census). Poultry is one of the most structured sectors in animal husbandry which has worth rupees one lakh crores, progressing with growth rate of 6-8 per cent in layers and 10-12 per cent in broilers per year against the growth of agriculture as a whole which is around 2.5 per cent (Annual Report, DAHD&F, GoI, 2017-18) [1]. Development of high yielding layer (310-340 eggs) varieties together with standardized package of practices on nutrition, housing, management and disease control have contributed to impressive growth rates in egg (4-6% per annum) in India during the last 40 years. At present scenario, the Indian poultry sector has assumed much focus due to the growing demand for poultry products particularly in urban areas because of their high food value. Most of the urban and rural population have been nourishing themselves with eggs and meats. Commercial poultry production system is highly intensive production system that involves greater than 10,000 birds kept under indoor and heavily depends on imported breeds (Dawit *et al.*, 2008) [3]. The poultry sector has the capacity to grow with in a short span but many factors checked the growth. One of the factors is unwanted death of the chickens and laying hens. There is various reason for the mortality in layers i.e., environmental, nutritional, infectious, managerial, predators etc. In these major causes of death in layers are outbreak of diseases (Bharti, 2017) [2] and enteritis (Kumar *et al.*, 2018) [5] due to infection. Mortality rate is higher in laying stage (Shittu *et al.*, 2014) [8] and interestingly it is higher in small and medium farms as compared to large farms (Farooq *et al.*, 2013) [4]. Mortality in poultry farms represents lost income to growers and integrators alike. Even though mortality is an everyday part of poultry production, they should tailor management programs to reduce its overall effect on flock performance (Samarakoon and Samarsinghe, 2012) [7]. Mortality records in a poultry farm are of immense importance to know the prevalence of diseases and for adopting preventive and control measures. Information regarding mortality pattern of poultry and the causes under local condition of Uttar Pradesh is inadequate. This study was initiated to explore the further reason and rate of mortality at the different stages of layer.

2. Research methodology

The study was conducted in purposively selected state Uttar Pradesh as majority of the trainees who got training from CARI (Central Avian Research Institute, Izatnagar) resided in this state. A total of 30 trainees and 54 non-trainees were selected from same 5 agro-climatic zones out of 9 zones of the state. Thus, total sample size was 84 only. Data were collected through structured mailed questionnaire. In the present study, mortality according to stage of the birds was measured and expressed in terms of frequency and percentage. The respondents were categorized in low, medium and high mortality level on the basis of equal class interval between minimum and maximum scores.

3. Result and discussion

3.1 Average mortality at different stages of layer bird

Mortality was calculated on the basis of stages of layer bird. It is clearly indicated by the data presented in table 1 that the average mortality rate at B1 stage of brooding (up to 1 week), B2 stage of brooding (up to 8 weeks) and growing stage (9-20 week) were 1.96, 1.30 and 1.87 per cent, respectively for 6[trainee layer farmers. While, for non-trainee layer farmers, average mortality rate at B1 stage of brooding, B2 stage of brooding and growing were 2.02, 1.78 and 2.74 per cent, respectively. At layer stage (20-82 week) the average mortality rate reported by trainee layer farmers at summer, winter and rainy season were 0.71, 0.65 and 0.95 per cent, respectively. The average mortality rate at summer, winter and rainy season reported by non-trainee layer farmers were 1.10, 0.85 and 0.98 percent, respectively. Total average mortality rate at laying stage reported by trainees and non-trainees were 2.33 and 2.67 per cent, respectively.

Table 1: Distribution of trainee and non-trainee layer farmers according to average mortality at different stages

Stages	Average mortality (%)		
	Trainees (n=30)	Non-Trainees (n=54)	Pooled (n=84)
Brooding (B1-up to 1 week)	1.96	2.02	1.99
Brooding (B2- up to 8 weeks)	1.30	1.78	1.54
Growing (9-20 weeks)	1.87	2.74	2.30
Laying (20-82 weeks)			
Summer season	0.71	1.10	0.90
Winter season	0.65	0.85	0.75
Rainy season	0.95	0.98	0.96
Total	2.33	2.67	2.5
Total mortality	6.30	9.17	7.73

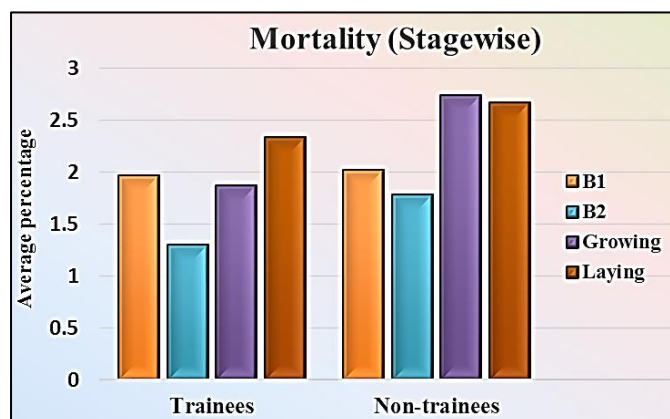


Fig 1: Graph representing mortality of layer bird at different stages of life cycle.

3.2. Total mortality

The table 2 shows the total mortality in all the stages and data reveals that majority (70.00%) of the trainee layer farmers reported low (4.5-7.5%), followed by medium (23.33%) and high (6.67%) level of mortality. While, in case of non-trainee, majority (53.70%) of the layer farmers reported medium (7.521-10.5%), followed by high (25.93%) and low (20.37%) level of mortality. Overall, 42.85 per cent layer farmers reported medium (7.51-10.5%), followed by low (38.10%) and high (19.05%) level of mortality. It shows that there was low level of mortality in trainees' layer farms compared to non-trainee layer farm. It might be due to their good managerial practice, proper vaccination schedule, maintaining hygiene in farm, providing balanced feed, proper supervision of farm timely treatment of diseased birds.

Table 2: Distribution of trainee and non-trainee layer farmers according to total mortality of birds

Total mortality	Trainee (n=30)	Non-trainee (n=54)	Pooled (n=84)
Low (4.5-7.5%)	21 (70.00)	11 (20.37)	32 (38.10)
Medium (7.51-10.5%)	7 (23.33)	29 (53.70)	36 (42.85)
High (10.51-13.5%)	2 (6.67)	14 (25.93)	16 (19.05)

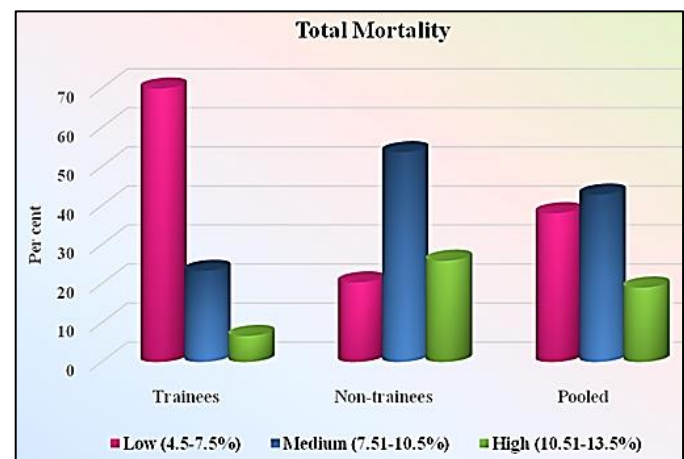


Fig 2: Graph representing distribution of trainee and non-trainee layer farmers according to total mortality

3.3 Mortality reason

Mortality reasons were analysed and ranked on the basis of different stages of layer bird. The data presented in table 3 clearly indicates that dehydration & heat stroke (86.67%), stress due to transportation (83.33%), and temperature instability in winter (80.00%) were the most important reasons of mortality reported by trainee layer farmers in brooding stage with rank 1st, 2nd and 3rd, respectively. Other reasons of chicks' mortality in brooding stage were yolk disorders like yolk retention and yolk sac infection (70.00%), followed by vaccination stress (66.67%), parasitic infestation & diseases like Brooder pneumonia, Marek's disease, fowl pox etc. (63.33%), underweight chicks supplied (60.00%), improper handling of chicks during shifting, vaccination, debeaking & treatment (56.67%), improper debeaking (46.67%) and overcrowding (36.67%) etc. While, in case of non-trainees, stress due to transportation (96.30%), dehydration & heat stroke (92.59%) and temperature instability (90.74%) were the most common reasons of mortality reported in brooding stage with ranks 1st, 2nd and 3rd, respectively. Other reasons of chicks' mortality in brooding stage were

yolk disorders (87.04%), followed by improper handling of chicks during shifting, vaccination, debeaking and treatment (74.07%), vaccination stress (72.22%), underweight chicks supplied (68.51%), parasitic infestation & diseases (66.67%), improper debeaking (51.85%) and overcrowding (38.89%) etc. Reason of mortality in growing stage included weather stress (80.00%), followed by parasitic infestation & diseases (73.33%), vaccination stress (66.67%) and cannibalism (36.67%) reported by trainee layer farmers with ranks 1st, 2nd, 3rd and 4th, respectively. While, in case of non- trainees, the most important reasons of mortality were parasitic infestation & diseases (92.59%), followed by weather stress (87.03%), vaccination stress (72.22%) and cannibalism (81.85%) with ranks 1st, 2nd, 3rd and 4th, respectively.

The data presented in table also indicated the reasons of mortality in laying stage. The laying disorders *viz* egg bound condition, egg peritonitis, oviduct prolapse, fatty liver disease

etc. (73.33%), followed by parasitic infestation & diseases (66.67%), weather stress (56.67%) and cannibalism (36.67%) were the most important reasons of mortality reported by trainee layer farmers with rank 1st, 2nd, 3rd and 4th, respectively. While, in case of non-trainees, the most important reasons of mortality were parasitic infestation & diseases (90.74%), followed by laying disorders (85.18%), cannibalism (81.85%) and weather stress (64.81%) with rank 1st, 2nd, 3rd and 4th, respectively. In this study both trainee and non- trainee layer farmers reported temperature instability, diseases and cannibalism as major causes of chicken mortality, this is in agreement with the finding of (Moges *et al.*, 2010) [6] in North West of Ahmara Region. In other studies, conducted by (Tadesse *et al.*, 2014) [9] in Ethiopia cited diseases and feed shortage as major causes of mortality in chicken.

Table 3: Distribution of trainee and non-trainee layer farmers according to reasons of mortality

Reasons	Trainees (n=30)	Rank Non-trainees (n=54)	Rank Pooled (n= 84)	Rank
A. Brooding stage				
Underweight chicks supplied	18 (60.00)	VII	37 (69.)	VII
Stress due to transportation	25 (83.33)	II	52 (96.)	I
Overcrowding	11 (36.67)	X	21 (39.)	X
Temperature Stability in winter	24 (80.00)	III	49 (91.)	III
Vaccination stress	20 (66.67)	V	39 (72.)	VI
Improper debeaking	14 (46.67)	IX	28 (52.)	IX
Parasitic infestation & diseases	19 (63.33)	VI	36 (67.)	VIII
Heat stroke and dehydration	26 (86.67)	I	50 (92.59)	II
Yolk disorder DI	21 (70.00)	IV	47 (87.03)	IV
Improper handling of chicks during shifting, vaccination debeaking and treatment	17 (56.67)	VIII	40 (74.07)	V
B. Growing stage				
Parasitic infestation & disease condition	22 (73.33)	II	50 (92.59)	I
Weather stress	24 (80.00)	I	47 (87.03)	II
Cannibalism	11 (36.67)	IV	28 (51.85)	IV
Vaccination stress	20 (66.67)	III	39 (72.22)	III
C. Laying stage				
Lying disorder)	22 (73.33)	I	46 (85.18)	II
Parasitic infestation & diseases	20 (66.67)	II	49 (90.74)	I
Weather stress	11 (36.67)	IV	35 (64.81)	IV
Cannibalism)	17 (56.67)	III	42 (77.78)	III

Conclusion and recommendation

A study was undertaken to assess the causes and rate of mortality of the layer birds at different stages of life cycle. The major causes of mortality in brooder birds were stress and heat stroke, in the growers, were weather stress and parasitic infestation while in adult main cause of death was various diseases. Mostly, mortality happened at the brooding stage and in the rainy season. Trainee reported lower mortality compared to non- trainees which shows the utility of training programs as they were following the recommended management practices. Thus, the poultry improvement program in the area should focus on minimizing and ultimately avoiding these challenges.

- 1) The creation of awareness and training of farmers as to the importance of proper housing and good management should be carried out.
- 2) Since traditional medicine was widely used by farmers, studies are needed to determine the efficacy and the exact medical value for specific poultry disease.
- 3) More detailed studies should be carried out to investigate the disease problems prevailing in the study area that would help develop a sustainable strategy of disease prevention and control.

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