

International Journal of Agriculture Extension and Social Development

Volume 9; SP-Issue 6; June 2026; Page No. 24-27

Received: 22-03-2026
Accepted: 28-04-2026

Indexed Journal
Peer Reviewed Journal

Comparing poultry farming practices in Indora region of Kangra district

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DOI: <https://doi.org/10.33545/26180723.2026.v9.i6Sa.3694>

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Abstract

India's one of the fastest growing agriculture industries is poultry farming, which gives a contribution to country's economy, employment and nutrition. The aim of the study was to assess the growth performance, feed efficiency, and productivity of COBB 500 across the different poultry farms in Indora region of Kangra district in Himachal Pradesh, India. A comparative analysis was conducted under different management and environmental conditions. Weekly data was collected for five weeks on body weight, feed intake, mortality, feed conversion ratio (FCR) and average daily gain (ADG). The results showed clear difference among the farms. Farm 3 has highest growth performance with body weight of 2025 gm and average daily gain of 57.52 g/day, but also has highest mortality rate of 3.98%. In contrast, farm 2 had lowest mortality rate (3.44%), indicating good biosecurity and health management. Farm 3 also has highest feed intake which connected with average daily gain and body weight. All farms have equivalent feed efficiency. The study concluded that the farm management techniques like feeding, housing and medical care have a large influence to broiler performance, even genetic potential stays constant. All management strategies are essential to control broiler productivity. The COBB 500 is known for its quick growth and effective use of feed. The study highlighted geographical differences in poultry management techniques which gives information that how differences in management approaches affect the farm's profit, bird health and production. The results suggested better chicken farming methods support rural livelihood and increase regional productivity.

Keywords: COBB500, broiler farming, mortality, feed intake, body weight

Introduction

The fast-growing sector in agriculture in India is poultry farming that has a vital role in providing animal protein through meat and egg. Poultry farming includes layer farming, broiler farming, breeder farming, dual-purpose farming in which broiler farming is very popular due to its rapid growth rate, quick returns and high feed efficiency. Among all the commercial broiler breeds, COBB 500 is widely used because of its growth performance, proper body weight and high feed conversion efficiency. The poultry farming provides employment and income to the rural areas. All farms have different productivity due to variations in management practices, feeding practices, housing practices, diseases control and environmental conditions. These variations affect the mortality, body weight, feed utilization and overall profit. Mortality had impact on productivity and profitability of chicks.

Poultry farming in India contributes to the national GDP. Poultry farming in India raising at a pace of about 8%. India is the world's 3rd largest producer of eggs and the 8th largest producer of the chicken meat. Poultry farming produces 74 billion of eggs and 3.8 million tons of chicken meat annually. The average person consumes roughly 5 kg of chicken meat and 101 eggs annually.

In Himachal Pradesh, poultry farming grew faster with a raising of 36.42% between 2007-2012 and 21.36% between 2012-2019. Poultry farming in Himachal Pradesh is limited

to large-scale commercial farms while backyard farming remains under developed. Only 3.7% of houses in the Himachal Pradesh participate in backyard farming as compare to hill states of north-east where 50% houses practice backyard farming. Also, egg availability in Himachal Pradesh is very low as compare to national, only 12 eggs are consumed by per person annually, which is below that of national

Intensive poultry farming is an industrial method to produce eggs and meats in maximum amount. In this, many birds are kept together under controlled environmental condition. Intensive poultry farming is very large in India with an estimated market size of 20,000 crores. There are many scopes to increase the productivity of eggs and meats. By the using of modern intensive farming techniques, world produce 133.4 million tonnes in 2020 and continued to grow fast annually.

In the Kangra district of Himachal Pradesh, poultry farming has increased rapidly in recent years. By using COBB 500 strain, many farm experiences variations growth performance and mortality. In Indora region of Kangra district, comparative evaluation in farm's management practices, growth performance is limited. The study was performed in Indora region because Indora region has many industrial areas and it helps to increase the economy of nation and state. Indora is nearly located to Punjab that provide easy access for marketing, transportation. Also, its

climate is suitable for agriculture, livestock farming. So, this study was conducted to compare and evaluate the performance of different poultry farms in Indora region.

Materials and Methods

Study Design and Location

Indora region is located at a latitude of 32.134°N and a longitude of 75.689°E with sub-tropical to humid sub-tropical climate. The region is very hot with dry summers and mild winters with heavy rain in monsoon months. This study was conducted to compare the different poultry farms of Indora region of district Kangra. Three poultry farms were selected having the broiler breed specifically COBB 500.

Sampling

The study employed purposive sampling to select these poultry farms where knowledge across housing system, chick management, feeding, health and breeding was considered.

Pre-arrival preparation

Before arrival of the chicks, the house was prepared with clean concrete floor, proper ventilation, sunlight and brooding temperature (90° F). Shed was fumigated before chick placement.

Housing System

Deep litter was used with layers of sawdust or straw and replaced regularly to maintain hygiene.

Chicken management

Pre-starter (week 1): 90° F temperature, clean housing, nutrient rich feed, supplements (vitamins, immunity boosters).

Starter (weeks 2-3): 85° F, high protein feed, proper space, water and ventilation.

Finisher (week 4-5): 70-75° F temperature, energy rich feed for maximum weight gain.

Feeding

Commercial pre-starter, starter and finisher of brand Manhas and Paras was feed used. Feed intake increased weekly across farms (approx. 150-1344 g/bird/week).

Data Collection and Analysis

Weekly records of body weight, feed intake and mortality were maintained.

Feed intake (per birds) = feed offered- feed leftover/ number of birds.

ADG= (final weight- initial weight)/ days.

FCR= feed intake/ weight gain.

Correlation and descriptive analysis were applied to evaluate the data.

Results and Discussion

This study evaluated the growth performance, feed efficiency, mortality of COBB 500 broiler breed in different

poultry farms under different management conditions in the Indora region of Kangra district. There were considerable differences among the farms in their mortality, feed intake, body weight, feed conversion ratio (FCR), average daily gain (ADG). These variations may be due to different management practices, feeding habitat, nutrition, environmental conditions.

Mortality

Over the course of five weeks, farm 3 showed highest loss whereas farm 1 and 2 had modest mortality. The mortality decreased weekly due to better management and adaptation. Also farm 3 has highest death rate followed by the farm 1 and farm 2 shown in table 1.

Soni *et al.* (2021) ^[14] also reported that the survival of chicks depends upon chick quality, temperature and early brooding management. The overall mortality rate was within acceptable commercial bounds but still shows room for improvement. Similar findings were made by Diwang (2021) ^[3], which revealed that mortality had impact on productivity and profitability of chicks.

Feed intake and Body Weight

From week 1 to week 5, the feed consumption increased in all farms, which is related with broiler's typical growth pattern. Farm 3 showed higher feed intake in all the weeks particularly in week 4 while farm 2 had highest intake in week 5. Comparatively farm 2 and farm 3 consumed more than farm 1 shown in table 2.

This confirmed the findings of Mramba and Mapunda (2024) ^[11] who found that given enough nutrients and effective management the broiler breed COBB 500 grow quickly and increase survival rate.

Body weight increased with age in all three farms. Farm 3 had the highest body weight during entire study period followed by farm 2 and farm 1 due to better nutrients and feed consumption shown in table 2.

Similar findings were noted by Mramba and Mapunda (2024) ^[11], who stated that sufficient feed, nutrients and effective management practices increased the body weight and survival of chicks.

Feed Conversion Ration and Average Daily Gain

Both the FCR and ADG increased with increase in age of chicks. Farm 2 had a better feed efficiency in the start and farm 3 had a fast growth. In the middle weeks, all farms had almost same performance. In the last week, farm 1 showed better feed efficiency with high weight gain shown in table 3. The differences in the values between three farms may be due to management practices, environmental conditions and feeding habit.

According to Gadzama (2024) ^[4], feed utilization can be affected by better management parameters such as ventilation, housing, litter quality and stock density. The results of ADG were related to the findings of Soni *et al.* (2021) ^[14], which revealed that proper feeding programs (pre-starter, starter and finisher) and environmental conditions influenced the growth rate of the chicks.

Correlation analysis

Mortality showed negative relationship with all growth features that suggesting healthy birds with better productivity and feed efficiency. While there is positive

relationship between feed intake, body weight, ADG and FCR that indicates better feeding habit contributed to higher body weight and fast growth shown in table 4.

Marmelstein *et al.* (2024) ^[10] showed similar relationship among the production parameters that highlighted the importance of feed efficiency and growth factors in determining the farm productivity.

Quantitative analysis of production parameters of broiler farms

Descriptive statistics were used to analyse the performance

of the COBB 500 in three different poultry farms. Farm 3 had the highest body weight and feed intake which show better growth. Farm 2 showed lowest FCR which indicating better feed efficiency. Farm 1 recorded the lowest mortality shown in table 5. These variations may be because of management practices, environmental conditions and biosecurity measures.

Mramba and Mapunda (2024) ^[11] showed similar findings which stated that proper feed, farming practices helped to increase productivity, body weight and survival.

Table 1: Comparison of Weekly Mortality and Mortality Rate

	Week 1	Week 2	Week 3	Week 4	Week 5	Mortal Chicks	Total Chicks	Mortality Rate
Farm 1	91	60	39	74	61	325	9152	3.55%
Farm 2	124	76	41	41	56	338	9815	3.44%
Farm3	153	55	38	55	76	377	9460	3.98%

Table 2: Comparison of Weekly Feed Intake & Body Weight

	FARM 1		FARM 2		FARM 3	
	Feed Intake	Body Weight	Feed Intake	Body Weight	Feed Intake	Body Weight
Week 1	162	160	154	150	207	200
Week 2	365	450	328	450	353	475
Week 3	508	800	599	800	584	890
Week 4	826	1300	779	1400	1344	1500
Week 5	954	1900	1078	1925	985	2025

Table 3: Comparison of Weekly FCR and ADG

	Farm 1		Farm 2		Farm 3	
	FCR	ADG	FCR	ADG	FCR	ADG
Week 1	0.89	21.43	0.85	20	0.94	27.1
Week 2	1.16	41.4	1.11	42.8	1.16	39.2
Week 3	1.27	50	1.26	50	1.27	59.2
Week 4	1.4	71.4	1.4	85.7	1.4	87.1
Week 5	1.47	85.7	1.52	75	1.52	75

Table 4: Correlation Analysis

	Mortality	Feed Intake	Body Weight	FCR	ADG
Mortality	1				
Feed Intake	-0.48502	1			
Body Weight	-0.45241	0.924792	1		
FCR	-0.6486	0.902415	0.947609	1	
ADG	-0.57648	0.937268	0.929058	0.940844	1

Table 5: Quantitative Analysis of Production Parameters of Broiler Farms

	Farm 1	Farm 2	Farm 3
Mortality	65±17.1	67.6±30.9	75.4±40.6
Feed Intake	563±289.17	587.6±326.39	694.6±417.78
Body Weight	922±619.3	945±642.7	1018±667.3
FCR	1.24±0.23	1.23±0.27	1.26±0.22
ADG	53.99±25.31	54.7±26.18	57.52±24.72

Conclusion

This study concluded that there is variation exist in all farms in terms of mortality, feed intake, body weight, FCR and ADG of COBB 500 broilers. Farm 3 showed higher growth performance and body weight while farm 2 has low mortality and better feed efficiency. The findings suggested that proper diet with nutrition, brooding, diseases control and environmental conditions greatly influenced the

productivity and survivability of the chicks. The study highlighted that adopting scientific practices helps to increase profitability in Kangra district.

Acknowledgement

The authors express sincere gratitude to farm owners and workers of the Indora region for their cooperation and for providing necessary data during the study.

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