



## Laying Performance of Kadaknath Chicken under Deep Litter System

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### ABSTRACT

To study the production performance of Kadaknath, birds were reared under deep litter system upto 14 months. The production traits including egg weight, monthly egg production, cumulative egg production per bird, eggmass, HHEP% and HDEP% were analysed under the study. The first egg was observed in flock at age of 153 days and age of sexual maturity was 156 days. Fifty percent and eighty percent egg production was achieved at age of 171 and 210 days respectively. The cumulative egg production per bird during the period was 143.24. The average egg weight during the study was 42.90 gram, minimum average egg weight was 36.15±0.19 gm at 6 month age while maximum egg weight was 47.22±0.20 gm at 14 month age. The egg weight was improved upto 11.07 gram during the study period. The monthly egg production was maximum at age of seven months after that egg production declined. The eggmass produced at 14 month age was 6763.79 gram. The HHEP% and HDEP% was measured for egg persistency they are maximum during eighth (68.16%) and seventh (68.57%) month respectively.

### HIGHLIGHTS

- Cumulative egg production per bird was 143.24 upto 14 month of age.
- Monthly egg production was in range of 9.01 - 21.09 (eggs/bird).

**Keywords:** Production performance, Kadaknath, Deep litter system

Indian poultry sector has attained very fast growth in last decades, as a result India holds third position in egg production and fifth position in broiler production in world. The total poultry population of India is 851.81 million which is 16.8% higher than previous census. Out of total poultry population major contributor is commercial poultry while backyard poultry population of India is 317.07 million BAHS. (2019); Dalal *et al.* (2022). Indigenous poultry breeds have immense role in improving nutritional as well as economic status in rural areas. These breeds are reared in backyard hence their genetic potential is unexplored and exploited Bhagora *et al.* (2022). Out of 20 registered chicken breeds of India Kadaknath is a famous breed which is popular for disease resistance, climate resistant and ability to protect themselves from predators. The tribal people use Kadaknath meat, blood and eggs for treatment of various diseases. Kadaknath

is a native breed of Dhar and Jhabua district of Madhya Pradesh but it is also found in Chhattisgarh, Rajasthan and Gujrat. The synonym of Kadaknath is Kalamansi because of its black colour. The meat of Kadaknath is rich source of protein, antioxidant (Carnosine) and have aphrodisiac properties Sharma *et al.* (2022); NBAGR. CARI-Shyama; a strain developed by Central Avian Research Institute (CARI), Izatnagar is a cross of Kadaknath and CARI Red and suitable for rearing in tribal areas as it has similar properties of Kadaknath. This indigenous breed has many unique properties but neglected due to poor production and reproduction potential. In recent years demand of Kadaknath has been increased due to unique properties

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of Kadaknath and adoption of healthy diet after pandemic Dalal *et al.* (2022). To meet the high demand, this breed is being raised under intensive and semi intensive systems across the nation, especially in the peri urban and sub urban areas. Despite such unique features of meat and egg, business opportunities this breed is minimally explored Haunshi and Prince, (2021). The current experiment was conducted with aim to assess the production performance of Kadaknath breed reared under deep litter system in Jammu (sub-tropical) region.

## MATERIALS AND METHODS

### Procurement and management condition of experimental birds

Day old Kadaknath female chicks were procured from hatchery, and reared at Experimental poultry shed, Division of LPM, F.V.Sc&AH, R.S.Pura, SKUAST-Jammu (32.6049° N, 74.7315° E). All birds were kept under same conditions (deep litter management system) during brooding, growing and laying phase. The commercial chick starter feed was provided upto 8 weeks and commercial grower ration was provided from 9 to 21 weeks in *ad lib.* amount. At age of 22 weeks 120 pullets were started feeding with commercial layer ration (0.1 kg/bird). The light duration of 16 hours (daylength included) was provided to layers.

### Egg production traits

The eggs were collected four times(7:00 A.M, 11:A.M, 3:00 P.M and 6:00 P.M.) a day and weighted just after collection by electronic weighing balance(nearest to 0.1 gram). The daily egg weight and number of egg laid were recorded and average monthly egg weight and egg number was recorded. Age of first egg in flock, Age of sexual maturity (5% eggs in flock), fifty percent and eighty percent egg production in flock was recorded. Egg production traits were analysed in term of month wise total egg production (Total number of eggs produced in month), monthly egg production per bird (Total number of eggs produced during the month divided by average number of birds during the month), cumulative egg production per bird (Monthly egg output per bird was added up to determine the cumulative egg production per

bird). Persistency of producing eggs was measured using hen housed egg production (HHEP%) and hen day egg production (HDEP%) from 6 month of age to 14 month of age. Eggmass, Hen Day egg production (HDEP%) and Hen Housed egg production (HHEP%) were calculated from following formulae:

$$\text{Monthly Egg mass (gm)} = \% \text{HDEP} \times \text{Average egg weight (gm)}$$

$$\text{HDEP\%} = \frac{\text{Total number of egg produced on particular day}}{\text{Number of hens on that day}} \times 100$$

$$\text{HHEP\%} = \frac{\text{Total number of egg produced in given period}}{\text{Number of hens in flock at beginning of period}} \times 100$$

The number of layers and days of month were variable so daily HDEP% was calculated and monthly average HDEP% was determined.

## STATISTICAL ANALYSIS

The mean and standard error was calculated using SPSS computer software.

## RESULTS AND DISCUSSION

The number of egg, egg weight, monthly egg production and cumulative egg production at different age is described in Table 1. The first egg in flock was observed on age of 153 day and age of sexual maturity was 156 day, while age at first egg was in range of 162-200 days (Mohan *et al.*, 2008, Jha *et al.*, 2013), 155-192.5 days Haunshi *et al.* (2015). The fifty percent egg production of flock was achieved on age of 171 day and eighty percent egg production of flock was achieved on age of 210 day, higher age of sexual maturity (168 days) was observed by Dinesh *et al.*(2024) in an experiment conducted at Plampur, H.P, India. Lower age of sexual maturity in layers is desirable as it results in long laying period and higher number of egg production. The average egg weight was 36.15±0.19 gm at six month and 47.22±0.20 gm at fourteen month of age. The egg weight of Kadaknath was 36.02±0.33 gm at 28 week age and 44.06±0.34 gm at 56 week of age Haunshi *et al.* (2012). The cumulative egg production upto fourteen months was 143.24 per bird while range of 90-105 eggs during first laying cycle was described by Mohan *et al.* (2008) and GI Journal. The estimated annual range of egg production in Kadaknath was 120-140 Haunshi and

**Table 1:** Measurement of egg production traits of Kadaknath

Sl. No.	Age of birds in month	Total egg production in month	Avg. Egg Weight (gram) (WT±SE)	No. of Laying birds (Avg)	Monthly egg production per bird	Cumulative egg production per bird	Monthly eggmass (gram)
01	6 (Feb.)	1081	36.15±0.19	120	9.01	9.01	1416.72
02	7 (March)	2489	40.40±0.10	118	21.09	30.1	2770.23
03	8 (April)	2413	41.98±0.09	118	20.45	50.55	2862.20
04	9 (May)	1913	42.31±0.12	118	16.21	66.76	2212.40
05	10 (June)	1872	42.98±0.13	118	15.86	82.62	2272.35
06	11 (July)	1991	44.63±0.14	117	17.01	99.63	2447.96
07	12 (Aug.)	1833	45.14±0.11	115	15.94	115.57	2326.06
08	13 (Sept.)	1665	45.34±0.47	113	14.73	130.3	2226.20
09	14 (Oct.)	1437	47.22±0.20	111	12.94	143.24	1985.13

Prince. (2021). The improvement in egg weight from 6 months to 14 months was 11.07 gram while Haunshi *et al.* (2012) reported lesser egg weight gain from 28 to 56 week age (8.04 gram). The age of sexual maturity in Kadaknath chicken was 166 days with annual egg production of 123.55 Ekka *et al.* (2021). The egg production of Kadaknath G1-generation upto 64 and 72 week age was 149.2±1.67 and 177±2.97 respectively Shanmugam *et al.* (2022).

The measures of egg persistency (Hen day egg production and Hen housed egg production) along with egg mass are presented in Table 2. The eggmass produced at age of six month was 1416.72 and maximum eggmass was produced at 8 months of age (2862.20). The eggmass reported by Haunshi *et al.* (2012) was 274.83, 932.21, 1796.43 and 2592 gram at 28, 32, 36 and 40 week age respectively.

**Table 2:** Egg production persistency by %HHEP and %HDEP

Sl. No.	Age of birds in month	%Hen housed egg production	% Hen day egg production
01	6 (Feb.)	32.17	39.19
02	7 (March)	68.04	68.57
03	8 (April)	68.16	68.18
04	9 (May)	52.29	52.29
05	10 (June)	52.88	52.87
06	11 (July)	54.89	54.85
07	12 (Aug.)	51.41	51.53
08	13 (Sept.)	49.11	49.10
09	14 (Oct.)	41.76	42.04

The HDEP% was 39.19 during sixth month and maximum during seventh month (68.57) after that HDEP% decreased

continuously upto 14 month. Lower HDEP% was observed by Haunshi *et al.* (2012), who reported HDEP% as 3, 20.91, 38.34, and 48.10 at 24, 28, 32, and 36 week of age. Similar findings were found in HHEP%, it started from 32.17 at sixth month and maximum during eighth month (68.16), after that it declined continuously upto 14 month age while Haunshi *et al.* (2012) reported lower HHEP% i.e. 3, 20.91, 38.34 and 47.97 at 24, 28, 32 and 36 week of age and similar HDEP% and HHEP% 52.54, 52.22 respectively at 40 week and 53.35, 53.89 at 44 week of age. Higher HHEP% and HDEP% was observed in current study when compared to Dinesh *et al.* (2024) who reported HHEP% and HDEP% as 45 and 48.41 at 40 weeks of age in Kadaknath chicken. Dinesh *et al.* (2024) reported HHEP% and HDEP% as 66.31 and 78.56 respectively at 52 week age which is higher than the observed results of current study. The variation of data among different studies may be due to different environmental and managerial conditions.

## CONCLUSION

The breed Kadaknath is native to Dhar and Jhabua district of Madhya Pradesh (temperate zone) while study conducted in Jammu (sub-tropical region). Despite of change in climatic region and topography, production performance of Kadaknath found similar to available previous data. However limited research data is available for Kadaknath in various regions despite of that it can be said that Kadaknath breed can be reared in Jammu region to serve by its benefits.

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