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**Siddharth Ranabijuli**

Scientist (Animal Science),

Krishi Vigyan Kendra,

Bhanjanagar, Ganjam, Odisha,

India

**Nishiswapna Garanayak**

Department of Clinical medicine,

ethics and jurisprudence, College

of Veterinary Sc & AH, OUAT,

Bhubaneswar, Odisha, India

**Santosh Kumar Samantray**

Krishi Vigyan Kendra,

Bhanjanagar, Ganjam, Odisha,

India

**Swagatika Sahu**

Krishi Vigyan Kendra,

Bhanjanagar, Ganjam, Odisha,

India

**Corresponding Author:**

**Siddharth Ranabijuli**

Scientist (Animal Science),

Krishi Vigyan Kendra,

Bhanjanagar, Ganjam, Odisha,

India

## Body weight gain performance of poultry breed Kadaknath in semi-intensive rearing system of Ganjam District, Odisha

**Siddharth Ranabijuli, Nishiswapna Garanayak, Santosh Kumar Samantray and Swagatika Sahu**

### Abstract

Backyard poultry farming is one of the most remunerative ventures for rural farmers. Many improved breeds are thriving in different climatic zone of the country with higher production and economic performances. Black chicken or Kadaknath breed has gained popularity in recent times and the same was assayed in the agro-climatic zone of Ganjam district, Odisha with an objective to study its performance and economic viability. The breed performed better than the compared native indigenous breed birds in terms of body weight gain and economic returns. Overall mortality of the said breed was lower (19%) as compared to the native breed (30%). Similarly the 180 day mean body weight of Kadaknath bird ( $1227.11 \pm 2.416$  g) was higher compared to native birds ( $807.614 \pm 2.033$  g). The Kadaknath birds showed higher degree of growth rate with increasing age fetching higher returns and producing entrepreneurship opportunities.

**Keywords:** Backyard, black meat, body weight, indigenous, Kadaknath

### Introduction

Poultry farming in India is one of the fastest growing industries. Poultry farming has gained its importance both in rural, semi-urban and urban areas as both livelihood and business oriented enterprise [1]. The 20<sup>th</sup> Livestock census figured out of 851.81 million of total poultry population in 2019, 317.07 million (nearly 37%) poultry birds are reared under backyard poultry farming. The backyard poultry has increased by 45.8% over previous census indicating increasing demand for poultry meat as a source family protein and income. The backyard poultry farming contributes 16.7% of total egg production in India as per the animal husbandry statistics, 2018-19. This higher percentage of backyard poultry enlightens the importance of improving the same for better production and livelihood security of rural sector. This can be ascertained from the observation that 30.3 million families of rural poor farmers are directly or indirectly involved in rural poultry for poverty alleviation and food production [2]. The contribution of native birds in the total poultry production has dropped [3]. The contribution of egg production by native birds is 11.5% of the total egg production, while that of improved birds is 5% (Animal husbandry statistics, 2018-19). This accentuates the importance of improved breed incorporation to the backyard system for higher production.

In the state of Odisha backyard poultry constitute a major livelihood component. In Odisha indigenous/native poultry birds are reared in small flocks of about 5-25 numbers by rural households under the traditional scavenging system which provides food and financial security, and has socio cultural and socio-religious significance [4]. Common indigenous or desi chicken breeds reared in Odisha are Hansli, Gujuri, Dumasil, Vezaguda, Dhinki, Phulbani and Kalahandi fowls [5, 6]. Varied poultry breeds developed by different agencies for backyard poultry farming are being tried for their suitability to local agro climatic conditions. Improved poultry breed not only increases the production of the backyard system, also improves the entrepreneur related opportunities for rural youths [7, 2, 8].

Krishi Vigyan Kendras (KVK) of Odisha have propagated many improved breed of backyard poultry in the state alleviating the production and livelihood security of rural mass. Recently one breed Kadaknath has been introduced in the backyard system of Odisha. KVK, Ganjam – 1 also assayed the said breed in the year 2019-20 for its adaptability and profitability in the north eastern ghat zone mostly prevailing in its operational area.

Kadakhnath is an indigenous breed of chabua, Madhypradesh<sup>[9]</sup>. Its performance is comparable with many improved breeds and certainly better than other indigenous breeds. Its adaptability to the hot and humid climate has been reported previously<sup>[9]</sup>.

The study was conducted to ascertain the adaptability of the black meat chicken breed to the specified locality and to access the production parameters along with marketability and economy.

## Materials & Methods

### Area of study

The study was carried out in the village Sindhi nuagan (N 19°39'2" E 84°41'39") of Aska block in Ganjam district of Odisha.

### Breed and flock size

Kadakhnath breed was reared in the backyard of the farmer with a flock size of 100. Kadakhnath chicks (day old) were procured from Central Poultry Development Organisation (CPDO-ER), Bhubaneswar. The chicks were transported to the place of study.

### Brooding

After providing glucose water the chicks were grown by recommended artificial brooding method (Management guide for rural poultry, CPDO, Bangalore). Metal low cost brooding materials used for the purpose and electric bulbs (2 Watts/chick) used as a heat source<sup>[10]</sup>. Recommended dose of vaccines and supplements were given (Table 1)

**Table 1:** Adapted vaccination schedule

Age	Name of vaccine	Dose	Route
5th day	Newcastle Disease (Lasota)	One drop	Intra-ocular/ Intra-Nasal
14th day	Infectious Bursal Disease	One drop	Intra-ocular/ Intra-Nasal
21st day	Pox	0.20 ml	IM/SC injection
28th day	Newcastle Disease	One drop	Intra-ocular/ Intra-Nasal

### Housing

Separate housing system was adapted by the farmer for rearing and sheltering of the birds. Space requirement for the birds, feeding and drinker requirement at different age was provided as per recommendations<sup>[10]</sup> (Table -2).

**Table 2:** Space provided to the birds

Age (Weeks)	Floor space (ft <sup>2</sup> )	Feeding space (cm)	Watering space (cm)
0-4	0.5	2.5	1.5
4-8	1.0	5.0	2.0
8-12	2.0	6.5	2.5

### Litter management

Deep litter system of housing was adapted with litter thickness up to 5-10 cm with frequent stirring to avoid caking and excess ammonia production<sup>[10]</sup>.

### Feeding management

During brooding the chicks were provided with commercial broiler feed as per broiler feeding schedule. After 28 days the chicks were reared in semi-intensive system of rearing with restricted supply of feed. Major feed requirement of the body was obtained from scavenging as in case of backyard poultry<sup>[12]</sup>.

## Collection of Data

The body weight gain, mortality were collected at regular interval. One flock of indigenous bird was kept as control in the similar rearing condition to compare the performance of Kadakhnath breed.

## Results and Discussion

The mortality rate of the both breed of birds is depicted in table 3.

**Table 3:** Mortality % of birds

Age (Days)	Mortality %	
	Kadakhnath	Indigenous
7	5	9
14	8	14
21	10	18
28	11	21
42	12	22
56	14	23
70	15	25
90	17	27
180	19	30

From the table it was evident that the mortality rate is higher in case of indigenous birds. The mortality rate is higher in indigenous breed during the brooding period. Mortality is one of the key factors in poultry economics as it affects the final biological mass and thereby economics of the flock. Less mortality in Kadakhnath compare to the indigenous birds ensured more profit.

Similarly the body weight gain of both the breeds is presented in the table 4.

**Table 4:** Mean Body weight (g) at different ages (n= number of birds alive after mortality)

Age (Days)	Mean body wt (g)				t- value (significant at p < 0.05)
	Kadakhnath		Indigenous		
	Mean±SE	n	Mean±SE	n	
7	36.831±0.216	95	29.615±0.432	91	15.11662 (p < .00001)
14	52.614±0.359	92	42.337±0.606	86	14.85036 (p < .00001)
21	74.655±0.291	90	63.322±0.375	82	23.4154 (p < .00001)
28	116.191±0.659	89	83.164±0.535	79	38.28237 (p < .00001)
42	351.477±0.715	88	117.628±0.529	78	257.33062 (p < .00001)
56	504.872±0.441	86	252.26±0.598	77	344.42591 (p < .00001)
90	959.964±0.638	83	546.808±0.617	73	462.25302 (p < .00001)
180	1227.11±2.416	81	807.614±2.033	70	130.50546 (p < .00001)

From the above table it could be postulated that the body weight gain in case of Kadakhnath birds were much faster than indigenous birds under similar management system. Similar findings were also reported with mean body weight of 868±5.54 g at 20<sup>th</sup> week age of the birds<sup>[9]</sup>. Body weight gain up to 1.5kg at six month age was also reported in Dantewada district of Chhattisgarh<sup>[14]</sup>.

Body weight of 1003.20±5.97 g at 6 to 20 weeks age was also reported in the native breeding tract of the breed (Chabua, Madhya pradesh)<sup>[15]</sup>.

This notion can be further ascertained from the Graph 1&2.

From the above two graphs almost linear relationship (straight line) was obtained between advancing age and body weight gain in both the breeds. However, in case of Kadakhnath the slope of the line obtained was  $y = 7.606x - 0.975$  with coefficient of determination ( $R^2$ ) being 0.915 as an indication of significant relationship. Similarly the indigenous breed graph showed a linear relationship of  $y = 4.884x - 24.55$ ,  $R^2 =$

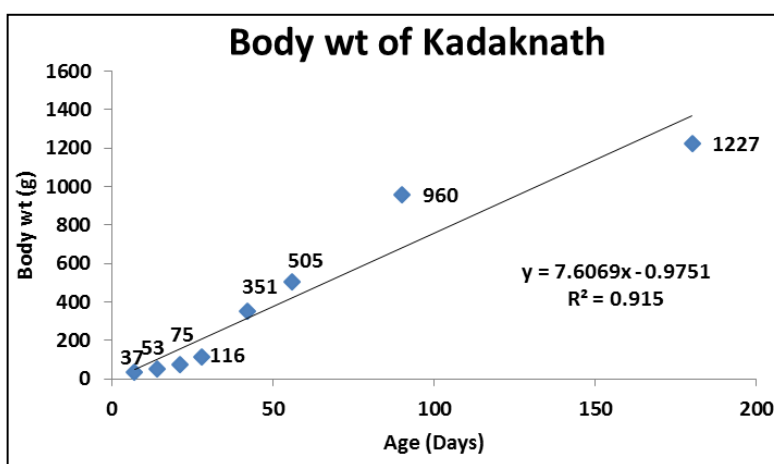
0.956. Although both the breed showed increase in body weight with advancing age, Kadaknath showed higher rate of body weight gain than indigenous breed evident from higher value of m in the linear equation. Similar observations on body weight of Kadaknath were also observed by different researchers [12, 13, 14, 15].

**Cost Analysis/ Economics**

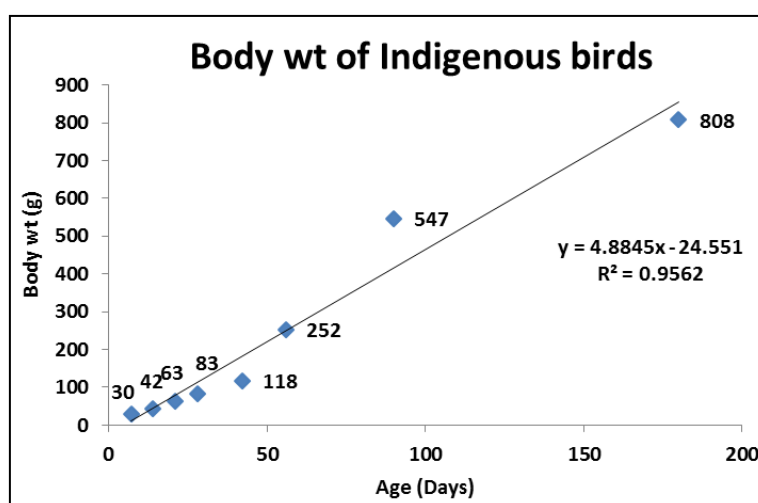
The cost economics of both breeds is given in the table 5. The Kadaknath rearing was more profitable and viable than indigenous bird farming as evident from the higher BC ratio 4.16. The positive impacts of Kadaknath breed on farm family are also advocated by Sahu *et al.* (2019) [14]. The authors further also showed better adaptability of the breed in rural areas.

**Table 5:** Economics of farming for both the breeds (100 birds)

Breed: Kadaknath				Breed: Indigenous			
Gross cost (Rs)	Gross return (Rs)	Net Return (Rs)	Benefit-cost ratio (B:C)	Gross cost (Rs)	Gross return (Rs)	Net Return (Rs)	Benefit-cost ratio (B:C)
chick@30×100no = 3000 feed 100kg@30/kg = 3000 Vaccine & medicine@10/bird×100 = 1000 Total =7000	Mean body wt. = 1.2kg@ 300/kg×81 birds = 29160	22160	4.16	chick@30×100no = 3000 feed 100kg@30/kg = 3000 Vaccine & medicine@10/bird×100 = 1000 Total =7000	Mean body wt = 0.8kg @ 300/kg ×70 birds = 16800	9800	2.4



**Graph 1:** Body weight of Kdaknath birds (X- axis: Age, Y-axis: Body wt)



**Graph 2:** Body weight of Indigenous birds (X- axis: Age, Y-axis: Body wt)

**Conclusion**

Kadaknath breed can be a viable livelihood option in the region with scope for entrepreneur activity. The adaptability of the breed is at par with the native indigenous breeds and production performances are higher. With the increase in demand for black meat the breed can be propagated in large scale among the rural house hold. The breed can cater the protein need of the farm family and also ensures entrepreneur

development for rural youths.

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