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Lok Prakash Verma
M.V.Sc. Scholar, Department of Veterinary and Animal Husbandry Extension, GBPUAT, Pantnagar, Uttarakhand, India

Neetu Sonkar
MVSc. Scholar, Livestock Production and Management Department, College of Veterinary Science & A. H., Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora, Durg, Chhattisgarh, India

Chandraprakash Verma
M.Sc. Scholar, Department of Agronomy, Indra Gandhi Krishin Vishwavidyalaya, Raipur, Chhattisgarh, India

Corresponding Author:
Neetu Sonkar
MVSc. Scholar, Livestock Production and Management Department, College of Veterinary Science & A. H., Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora, Durg, Chhattisgarh, India

Kadaknath chicken farming: Empowering Indian rural economy: A review

Lok Prakash Verma, Neetu Sonkar and Chandraprakash Verma

Abstract
Indigenous/native breeds of chickens are playing an important role in rural economy in most of the developing countries. They play a major role for the rural poor and marginalized section of the society with respect to their subsidiary income and also provide them with nutritious chicken egg and meat for their own consumption. Kadaknath is an important indigenous poultry breed. It has huge meat demand due to its unique black meat. It has more disease resistance and high meat and egg price with 14 week finisher poultry breed. Price of Kadaknath meat is 2-3 times more than normal native poultry breed due to that same number of Kadaknath gives many fold profit than same number of other chicken breed with minimum land and feed requirement in free range condition with cost benefits ratio 15.67. That is very beneficial and helpful to strengthen rural people and help them to reduce dependency solely on crop farming and diversifying their source of income. This review concludes by presenting importance of Kadaknath to empowering rural economy.

Keywords: Indigenous breed, black meat, high price, rural economy

Introduction
India has 70% rural population (Population census 2011) [11]. Out of this 25.7% of total rural people come under below poverty line and poverty gap ratio in rural area is 5.05% (Poverty estimation 2011-12) [11]. Poverty has reduced considerably, from 35% in 1994 to 22% in 2012 (Narayan & Murgai 2016) [16]. Most of Indian rural population depends in agriculture for their economic security. Chand *et al.* (2011) [4] report that if agriculture were to be the sole source of livelihood, a majority of such households would have remained trapped in poverty. Diversification of agriculture activities, such as livestock, fisheries, poultry and beekeeping that are more remunerative, generate a stream of income and provide a cushion against climatic shocks, and are claimed to be an important pathway to reduce poverty. Rural poultry farming using native breeds is being practiced in many developing and underdeveloped countries throughout the world [4-20]. Importance of native birds for rural economy is immense in different countries [2-14]. Kadaknath breed, also known as Kalamashi is very famous for its black-colored meat. It is being reared by tribal communities in its breeding tract of the Jhabua and Dhar districts in the western region of the state of Madhya Pradesh. Although the meat of this breed has an unattractive appearance, it has a delicious flavor (Panda and Mahapatra, 1989) [17]. The meat of the Kadaknath breed contains high percentage (25.47%) of protein and is believed to have aphrodisiac properties (Mohan *et al.*, 2008) [15]. Unemployed youth and women can also earn an income through kadaknath farming. Kadaknath are well known for their tropical adaptability and disease resistance. The present review is to document the importance of Kadaknath chicken for rural economy.

Indigenous breed kadaknath
Kadaknath chicken meat is famous for its taste and claimed aphrodisiac and medicinal properties. The blood, meat and body of the birds are black, and compared with other poultry, Kadaknath meat is high in protein and also contains 18 kinds of essential amino acids and Vitamins B-1, B-2, B-6, B-12, C and E [5]; Haunshi *et al.* [13] reported that Kadaknath breed reached sexual maturity at an early age, and it had higher 40-wk egg production ($P < 0.001$). Parmar *et al.* [18] reviwed egg quality of kadaknath such as strong, medium and brittle shelled eggs were found to be 67.06%, 30.74% and 2.21% respectively, dark brown shell colour was most frequently (67.87%) observed in eggs of Kadaknath birds followed by light brown colour (32.12 %), the mean shell thickness ranged from 0.29 to 0.32 mm with an average of 0.31 mm, the average mean egg weight was found to be 41.99 g with a range of 40.87 g to 42.86 g, the

overall mean shape index was found to be 73.95, the overall average mean albumen index was found to be 7.03,the overall mean haugh unit was found to be 73.77, the overall mean yolk index was observed to be 37.07, the overall mean yolk weight was found to be 14.77 g, the overall mean albumen weight was found to be 20.74 g. This shows the egg traits of Kadaknath, which gives reason to farmer to adapt Kadaknath farming.

Kadaknath has good growth performance. Ekka *et al.* [8] reported that, body weights of males and females were 1249.33 ±42.73 and 936.33 ±10.17g, respectively. Males were significantly (P<0.05) heavier than females. Non significant differences (P<0.05) were recorded between sex for percentage weight of bled, dressed, eviscerated, giblet, back + neck and gizzard. However, leg % and wing% were significantly higher (P<0.05) in males than females, while liver %, heart % and abdominal fat % were significantly higher (P<0.05) in females than males. The dressing percentage in the two sexes was found to be 67.57 ±1.41 and 67.38 ±0.46, respectively. The percentage loss in body weight due to blood, feather, evisceration and aggregate loss were 3.57 ±0.33, 18.04 ±0.66, 10.91 ±0.57 and 32.52 ±0.80, respectively and showed no significant (P>0.05) difference between the two sexes. The percentage mean values of moisture, dry matter, crude protein did not differ significantly (P>0.01) whereas total ash % and ether extract % were 3.74 ±0.28 and 5.55 ±0.28, respectively which showed significant difference (P<0.01) in breast and leg muscle of males and females.

Table 1: Carcass traits of kadaknath overall (Ekka *et al.*, 2018) [8]

Live wt.(gm)	1092.83 ± 72.69
Dressed wt (%)	67.47 ± 0.67
Bled wt (%)	96.43 ± 0.33
Eviscerated wt (%)	65.76 ± 0.75
Giblet wt (%)	4.07 ± 0.17
Leg wt (%)	19.29 ± 1.02
Breast (%)	16.88 ± 0.61
Back + Neck wt (%)	12.64 ± 0.34
Wing (%)	5.94 ± 0.21
Gizzard (%)	2.12 ± 0.11
Liver (%)	1.52 ± 0.06
Heart (%)	0.43 ± 0.02
Abdominal fat(%)	0.35 ± 0.03
Blood loss (%)	3.57 ± 0.33
Feather loss (%)	18.04 ± 0.66
Eviscerated loss (%)	10.91 ± 0.5
Total loss (%)	32.52 ± 0.80

Importance of kadaknath to empowering rural economy

Indian agriculture census 2011, [11] shows that 68% farmers of India are marginal, small and semi medium with less than 4 acre land and 70% of farmers are depends on agriculture but small agriculture land do not able to fulfill their economic requirements (F.A.O., 2017-18) [8] Here native breed of poultry comes as hope of light for marginal and small farmers and helps to fight poverty in India. The family poultry (chicken) husbandry support program was profitable for the beneficiary and contributed to the welfare of participants. Yang and Jiang [20]; Das *et al.* [7] reported that rural poultry production particularly chickens (followed by ducks production) play significant role in the socioeconomic development of Bangladesh. Almost 90% of all rural families keep a small number of native chickens and ducks under traditional free range semi-scavenging systems. They reported that poultry are generally maintained by rural women and children that generate cash revenue and that supply adequate eggs and meat to their personal family's diet. Chickens generally scavenge around the homestead areas during day time, where they eat kitchen waste, left over cereal like rice, wheat, pulses, green grass, insects, and other available feed stuff. Village poultry makes a substantial contribution to household food security throughout the developing world. It helps to diversify income, provides high quality food and fertilizer, and acts as form of household savings and insurance [1]. A study in the Niger delta showed that family poultry husbandry contributes 35% of the income of household's women and it is estimated at about 25% and 50% of Nigerian minimum wage and per capita income, respectively [3].

Kadaknath is one very valuable native poultry breed with good growth rate, egg quality, carcass quality and huge demand in market with remarkable high meat and egg price than other native and boiler breed of chicken. Kadaknath birds are well adapted to harsh environment of free range and they produce eggs and meat at least possible cost. Many say they have successfully paid off outstanding debts and have also been able to buy their own agricultural equipments. Kadaknath required 1.5 sqft space per bird and easily rear in free range, backyard and semi intensive system.

Kadaknath has promising feature such as body weight after 6 month is 1.5 kg/bird, price 500-700 Rs/Kg, Survival percentage 95-99%, High protein percent >25%, Less fat percent 0.73-1.05%, Less cholesterol percent 184.75mg/100gm. [20]. Parmar *et al.* [19] reported that the average weekly feed consumption per bird was 27.56 g during first week, 69.25g during 4th week, 133.63g during 8th week, 290.50g during 12th week, 366.87g during 16th week and 458.68g during 20th week. The feed efficiency (feed consumed /gain in body weight) during different weeks ranged from 2.04 to 7.61. No definite trend was observed for feed efficiency; however it can be observed that feed efficiency increased with increase in age of the birds. The overall feed efficiency was observed as 4.26 + 0.40. [12]

Sahu *et al.* [19] was conducted experiment in the farm of Krishi Vigyan Kendra, Dantewada in the year of 2016-17 and "Kadaknath Poultry Farming Project" was implemented by District Administration Dantewada (DMF) and reported a economic analysis of rearing 50 kadaknath chicks rearing profit by collecting data from 10 villages. [Table 2]

Table 2: Economic Analysis of Kadaknath Farming:[19]

Particular Expenses	**Cost**
Cost of Chicks for 50 chicks	2500=00 (Rs. 50/ bird)
Cost of equipments (Feeder, drinker etc.)	200=00
Cost of medicine and vaccines	0
Housing cost	0
Lobour cost	0
Marketing cost	0
Miscellaneous cost (electricity, etc.)	0
Total	2700
Benefits	
Sale of birds of 1.5kg weight	45000
Net benefits	42300
Cost benefits ratio	15.67

Its show the profit of 42300 Rs. in free range condition with cost benefits ratio 15.67 that is very huge and helpful to strengthen rural people and help them to reduce dependency solely on crop farming and diversifying their source of income.

Conclusion

The importance of Kadaknath birds to empowering Indian rural economy. Its helps diversification of Indian farming system and has vital role in the rural households as a source of high quality animal protein and emergency cash income and play a significant role in the socio -cultural life of the rural community. One of the most important positive characters of Kadaknath chicken is their hardiness, which is ability to tolerate the harsh environmental condition and poor husbandry practices without much loss in production. Kadaknath chickens are also a reservoir of genomes and major genes for improvement of high yielding exotic germplasm for tropical adaptability and disease resistance. The study on Kadaknath production cost reveals that cost of one-day-old chick is main expenses and others are cost of medication and labor cost even feed is not main cost for rural Kadaknath production that gives remarkable advantage in Kanadukathan production .The prices in wholesale market, as well as in the retail market, over the years, have increased at a significant rate. The review concluded with presenting economic profit in Kadaknath farming with less input and empowering Indian rural economy.

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