

Vanashree: A promising improved purebred native chicken for free-range or backyard farming

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Improvement of production performance of native chickens is essential for increasing the productivity of backyard or free-range systems of poultry. Vanashree, an improved indigenous chicken was evolved from Aseel-Peela (PD-4) breed through selective breeding for improvement of body weight and egg production. They have a majestic look with attractive yellow coloured plumage, yellow shanks and red pea combs. Vanashree hens produce eggs with brown to light brown coloured shells. The appearance of eggs is similar to those of any other native chickens. Hens show broodiness behaviour under field conditions. The average fertility and hatchability (Fertile eggs set) observed over the last 11 generations was 81 and 79%, respectively. The dressing percentage observed in male and females was 68.6% at 20 weeks of age and the abdominal fat percentage was 0.39%. This bird has the lean meat, and flavour and texture of native chickens. Vanashree birds are attractive, hardy and aggressive in nature. They are suitable as a dual-purpose bird for meat and egg production under free-range, backyard and semi-intensive systems of production.

Keywords: Backyard, Free-range, Improved performance, Native chicken

NATIVE chickens (NC) are reared mostly in free-range and backyard systems of production with no proper housing/shelter as these are low input and low output systems. NC production is gaining importance in recent years due to higher demand for their meat and eggs. Which can be attributed to the desirable flavour and perceived health benefits. Native chickens have attractive plumage; they are hardy and known for their ability to adapt sub-optimal rearing conditions and harsh environment. They also have a broodiness character for self-propagation and males are known for their aggressive behaviour. Their meat and eggs possess a desirable taste and flavour. Rearing of NC generates subsidiary income by utilizing minimum inputs and human attention. Furthermore, they cater to the needs of consumers who are willing to pay higher prices for coloured birds and light brown

shelled eggs. However, the growth and egg production potential of native chickens is low. Any attempts to improve the productivity of native chickens will benefit the farmers immensely. Therefore, the need of the hour is to improve the production potential of NC so that the productivity of backyard/free-range systems of rearing can be increased in rural and tribal areas. Furthermore, it helps in meeting the increasing demand for meat and eggs of native chickens across the country. Vanashree, an improved purebred native chicken was evolved by selecting the Aseel-Peela (PD-4) birds for higher growth and egg production for the last eleven generations at ICAR-Directorate of Poultry Research, Hyderabad to address this issue. These birds can serve as dual purpose (both meat and eggs) improved native chickens for backyard and free-range systems of production. Evaluation of the

performance of this germplasm over the generations revealed impressive production performance.

Origin

Vanashree was evolved from the Aseel-Peela (PD-4) breed is a purebred native chicken. Fertile eggs of Aseel-Peela were obtained from the Anand Agricultural University, Anand (2006). Initially, random mating using pooled semen was practiced for three generations. Subsequently, selective breeding for improvement of body weight during the growing period and higher egg production up to 40 weeks of age was practised for 11 generations. This way the improvement in both growth (meat) and production (eggs) traits was achieved while maintaining the original native breed characteristics.

Morphological features

As Vanashree birds are evolved

from the Aseel-Peela breed, their physical appearance is exactly those of Aseel-Peela birds. They have a majestic look with attractive yellow coloured plumage, pea comb, yellow shank and red coloured combs, wattles and ear lobes, and white skin. Vanashree hens are characterized by the uniform yellow plumage. In males, golden yellow feathers in neck and back regions, and black and white coloured sickle and wing feathers are seen. They have long and slender face with thick neck, short and stout beak. Rudimentary wattles are seen in males and their eyes are brown, well set and compact.

Growth performance

Birds of Vanashree can reach market weight at about 12 to 14 weeks of age under intensive systems and around 18 to 20 weeks of age under backyard or free-range systems. The average body weight recorded on pooled sex at 12, 16 and 20 weeks was 1020, 1427 and 1624 g, respectively. Average shank length at 12 weeks of age was 102.3 mm on pooled sex. The average body weight of male and female birds at 40 weeks of age was 3034 and 2072 g, respectively recorded over five generations. The average shank length of male birds at 20 and 40 weeks of age was 130.6 and 133.3 mm, and for female birds at a the corresponding age was 106.2 and 106.8 mm, respectively. The body weight of male and female birds at 52 and 72 weeks of age was 3161 and 3318 g, respectively, and for female birds at a matching age was 2230 and 2364 g, respectively.

Production performance

Average age at sexual maturity (age at first eggs of all hens) recorded during the previous five generations was 167.7 days. The average age at 50% production was 165.7 days (162 to 173 days) and age at peak production was 192.2 days (185.5 to 201 days). The average peak egg production percentage was 76.9 (75 to 79.5%). The average number of eggs produced up to 40 weeks recorded during the last five generations was 72.9 eggs. Average survivors', hen housed and hen day egg production up to 40 weeks was 79.97, 78.6 and 79.5 eggs, respectively during the latest generation. On an average (averaged over five generations) they produced about 173.4 eggs up to 72 weeks of age. In one generation, Vanashree birds produced 195 eggs up to 72 weeks of age under an intensive system.

Egg weight

Average egg weights recorded during the previous five generations at 28, 32, 36 and 40 weeks of age were 43.7, 46.0, 47.9 and 49.0 g respectively. Egg weight at 72 weeks of age was 51.2 g.

Comparison of performance

The performance of Vanashree with respect to growth and production traits was compared with other crossbred varieties developed using some percentage of native germplasm (Table 1). Vanashree being a purebred native chicken has 100% native chicken blood. The growth performance of Vanashree is higher than all other crosses involving native chicken. Its growth

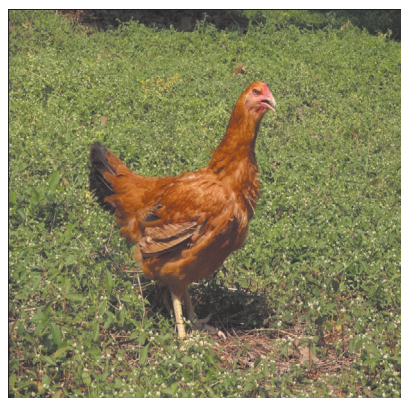
and egg production performance is higher than the Rajasri variety. Egg production up to 72 weeks of age is comparable to that of Himsamridhi. In fact in one generation, Vanashree hens produced 195 eggs up to 72 weeks of age and if we consider this performance, the egg production performance is at par with CARI Nirbhik and HITCARI varieties. The average egg weight of Vanashree taken over five generations is comparable to Rajasri breed, but it is lesser than other crossbred varieties.

Performance index

The performance of different varieties was compared by calculating the performance index (PI) for each variety by giving equal weights (0.5) to body weight at 20 weeks of age (pooled over sex) and egg production up to 72 weeks of age (0.5). $PI = [(Average\ body\ weight\ at\ 20\ weeks \times 0.5) + (Egg\ production\ up\ to\ 72\ weeks \times 0.5)] / 100$. It is observed that the PI (9.8) of Vanashree was highest among all the varieties except Pratapdhan (10.8). Higher PI of Pratapdhan is on the expected line as it is a BNR cross originating from the broiler, native and RIR breeds. This indicates that despite being a purebred germplasm the production potential of Vanashree birds exceeds those of other crossbred varieties having some percentage of native blood.

Egg quality traits

Vanashree hens produce eggs having brown to light brown coloured shells. The average shape index, haugh unit, albumen index and yolk index were 76.7,



A pair of adult Vanashree birds



Vanashree male birds in deep litter system

Table 1. Growth and production performance of various backyard poultry germplasm

Variety/ Germplasm	Purebred / crossbred	Purpose	Body weight at 20 weeks (g)		EP72 weeks (Nos.)	EW40 weeks (g)	Performance index
			Male	Female			
Vanashree*	Purebred Native (100%)	Dual purpose	2040	1538	173	49	9.8
Rajasri	Crossbred Native (25%)	Dual purpose	1750	1309	152	50	8.4
CARI Nirbheek	Crossbred Native (50%)	Dual purpose	1847	1350	198	54	9.0
CARI Shyama	Crossbred Native (50%)	Dual purpose	1460	1120	210	53	7.5
UPCARI	Crossbred Native (50%)	Egg type	1688	1285	220	60	8.5
HITCARI	Crossbred Native (50%)	Egg type	1756	1320	200	61	8.7
Himsamridhi	Crossbred Native (25%)	Dual purpose	1825	1475	170	53	9.1
Pratapdhan	Crossbred Native (25%)	Dual purpose	2309	1734	161	53	10.9
Jharsim	Crossbred Native (25%)	Dual purpose	1791	1554	167	53	9.2
Kamrupa	Crossbred Native (25%)	Dual purpose	1750	1310	145	55	8.4
Narmadanidhi	Crossbred Native (25%)	Dual purpose	1721	1661	179	49	9.4

EP72 weeks: Egg production up to 72 weeks, EW40 weeks: Egg weight at 40 weeks. *Average figures of five generations data.

Source: Viroji Rao *et al.* (2012), ICAR-CARI (https://cari.icar.gov.in/varieties_deve.php), Brochures of respective varieties, Annual Report (2019-20) AICRP on Poultry Breeding

79.4, 0.08 and 0.41, respectively as observed over three generations. Vanashree hens produce eggs with comparatively larger yolks (34.7% yolk and 0.62 yolk to albumen ratio) and better shell thickness (0.34 mm). Overall, the appearance of eggs is similar to those of any other native chicken with better egg weight.

Liveability

Liveability of Vanashree chicks and adult birds during the last several generations under an intensive system of rearing was recorded (Table 2). Average liveability figures reveal that Vanashree birds have impressive liveability trait particularly during the 21 to 40 weeks of age. Similarly, better liveability was observed during juvenile (0 to 8 weeks) and growing stage (9 to 20 weeks) on pooled sex under an intensive system. Better liveability of birds translates in to higher egg and meat production and hence it is a desirable trait.

Self propagation

Vanashree hens show broodiness behaviour under field conditions.

This will help the hens to hatch the chicks naturally on their own. Farmers can use the fertile eggs of Vanashree birds to produce the subsequent generation at their field as it is a purebred population.

Aggressiveness

Male birds of Vanashree are very aggressive in nature, which could be helpful in field conditions to ward off small predators. Male birds can protect themselves, young chicks and hens from small predators.

Fertility and hatchability

Average fertility of 81% and hatchability of 79% and 65%, respectively on fertile and total egg set basis was observed over the last several generations.

Dressing percentage

The average dressing percentage observed in male and females was 68.6% at 20 weeks of age. The abdominal fat percentage was 0.39%. The giblet (heart, liver and gizzard) was 3.92%. This bird has

Table 2. Liveability of Vanashree birds during last 10 generations

Generation	0-8 weeks	9-20 weeks	0-20 weeks	21-40 weeks	
				Male	Female
S-1	96.9	97.5	94.5	-	97.2
S-2	97.4	95.7	93.2	97.7	99.5
S-4	92.5	91.9	85.0	91.9	91.0
S-5	95.9	94.4	90.6	94.6	96.2
S-6	94.4	81.0	77.2	95.6	93.5
S-7	95.8	97.7	93.6	99.1	95.0
S-8	89.4	95.2	85.1	94.4	97.6
S-9	95.3	98.0	93.5	92.2	92.9
S-10	84.3	98.0	82.6	100.0	95.6
Average	93.5	94.4	88.4	95.7	95.4



Flock of adult birds of Vanashree in the free-range system

the lean meat, flavour and texture of native chickens.

Field performance

The performance of improved Aseel-Peela (PD-4) under a low input free-range system of farming was studied in a village in Telangana state. Birds were reared under the free-range system with little inputs. During the lean period, birds were offered left over kitchen waste and they survived mostly on scavenging in the village. During crop harvesting season, birds were provided with paddy, jowar, broken grains, etc. Average body weight and shank length recorded at 20 weeks of age were 1100 g and 107 mm, respectively on pooled sex. At 29 weeks of the age, the average body weight of male and female birds was

1798 and 1448 g, respectively. Hens started producing eggs at 199 days of age. Average body weight and shank length at 34 weeks of age were 1722 g and 102 mm, respectively in female birds. The body weight and shank length of male birds at 34 weeks were 2037 g and 122 mm, respectively. The average body weight of cocks and hens at 40 weeks of age was 2334 and 1809 g, respectively. Average egg weight recorded at 34 and 40 weeks of age was 41.8 and 45.2 g respectively. No incidence of disease was observed. The performance of Vanashree was encouraging under a low input free-range system.

SUMMARY

Vanashree, evolved from Aseel-Peela, through selective

breeding has better growth and egg production potential compared to other native chickens and crossbred native chicken varieties. These birds can be used for meat and egg production under free-range, backyard and semi-intensive systems of production. Vanashree birds are attractive, hardy and very aggressive in nature. Since they are purebred native birds, their meat and eggs command a better price, and this way higher returns can be realized for meat and eggs of Vanashree birds. Furthermore, farmers can produce the subsequent fresh batches of chicks of Vanashree at their level (field) using broody hens.

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