



Evaluation of Meat Type Poultry Chabro in Homesteads of Kerala

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ABSTRACT

This study was conducted to evaluate the performance of Chabro poultry in different systems of rearing in the homesteads of Ernakulam district, Kerala. A feed for safe meat production formulated using CARI Make feed Poultry Version 3.0 software was also evaluated. The chabro poultry was compared with Vanaraja and Gramasree poultry popular in the homesteads of Kerala. The study was conducted in both intensive and semi intensive systems of rearing. Chabro poultry had significantly higher body weight at 7 wk (1.5 kg) and better FCR (2.15) than Vanaraja birds in intensive system of rearing. In semi-intensive system of rearing also, Chabro poultry had significantly higher body weight at 7 wk (1.3 kg) and better FCR (3.05) than the Gramasree birds. Net profit per bird was more in intensive system of rearing making it preferable for farmers. The difference in body weights of Chabro poultry fed commercial poultry feed and formulated feed at 7 wk was found to be non-significant. Chabro poultry was found to be suitable for rearing as a meat type bird in homesteads of Kerala.

Key Words: Body weight, Chabro poultry, Homestead, Intensive, Safe feed, Semi-intensive

INTRODUCTION

Backyard poultry has a significant contribution to the nutritional and livelihood security in rural areas. Traditionally in Indian households, the cocks of indigenous poultry breeds or the spent hens are used for meat purpose. The excess males of improved egg purpose varieties are also used for meat purpose but the growth period is longer and feed conversion efficiency lower as compared to commercial broilers. To fulfill the rising demands of increasing population, commercial broilers are relied upon. Different commercial broiler strains used for meat purpose have unique quality characteristics and are capable to grow faster with good feed conversion ratios. The faster growth rate helped to achieve new milestones of getting birds ready in 35-42d. However, many have apprehension to consume broiler meat as there were many allegations and media propaganda regarding its safety though they all proved otherwise. It was in this context that farmers prefer coloured broilers along with indigenous meat purpose birds.

The Chabro, a meat purpose breed developed by Central poultry development organization, Chandigarh has a multi-coloured plumage and easily adaptable to harsh as well as tropical climate. It is recommended for backyard farming and can also be reared under intensive system. It survives poor husbandry practices without much loss in production (Singh and Pathak, 2019). The production potential of these birds has already been evaluated in intensive rearing method as well as semi-intensive rearing method (Sanka and Mbag, 2014, Patel *et al*, 2018).

Kerala, is known for typical small scale homestead farming systems. The current study was conducted to evaluate Chabro poultry in homesteads in Ernakulam district of Kerala. An attempt was also made to formulate a feed for Chabro birds with intension to drive in the message that the bird genetics and balanced nutritive feed is enough to get maximum growth potential in minimal time.

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MATERIALS AND METHODS

Intensive method of rearing

The performance of Chabro poultry was evaluated in intensive system in comparison with Vanaraja poultry, as Vanaraja is a popular dual purpose breed having plumage resemblance to jungle fowl and commonly reared for meat purpose. In the first trial, 50 day- old Chabro poultry chicks and 50 day old Vanaraja poultry chicks were distributed to each of the five farmers in Vypeen block of Ernakulam district, Kerala (9° 58' N/ 79° 17 E). The study area has humid tropical climate having annual rain fall 2882 mm and relative humidity in the range 74 to 89 per cent. Vanaraja poultry chicks were grouped as T1 and Chabro poultry chicks as T2 and housed in poultry sheds. Uniform feeding, brooding and other management practices were adopted in all the places. Commercial broiler starter (0-3 wk) and finisher ration (4-7 wk) were offered ad libitum to both groups during the rearing period. Vaccination against Ranikhet and Infectious Bursal Disease were also carried out. Leftover feed was weighed and the weekly feed intake noted. Body weights were measured at weekly intervals and data analyzed statistically using unpaired t test with *GraphPad* software.

Semi-intensive method of rearing

In this trial, 50 day- old Chabro chicks and 50 day-old Gramasree male chicks were distributed as a unit to each of the five farmers in Vypeen block of Ernakulam district, Kerala (9° 58' N/ 79° 17 E). The Gramasree poultry chicks were grouped as T1 and Chabro chicks as T2 and housed in poultry sheds. Uniform feeding, brooding and other management practices were adopted in all the places. Commercial broiler starter (0-3 wk) and commercial broiler finisher mixed with wheat, grasses and household food remnants, fish waste (4-7wk) were offered ad libitum. Vaccination against Ranikhet and Infectious Bursal Disease were also carried out. An open space of size 20 m × 10 m was kept outside the shed where the birds were allowed for 1-2 hr/day to feed on wheat, grasses, household food remnants

and fish waste. Leftover feed was weighed and the feed intake noted. Body weights were measured at weekly intervals and the data analyzed statistically by unpaired t test with *GraphPad* software.

Safe feed formulation trial

In order to provide an option of safe feed, balanced broiler starter and finisher feeds were formulated using software ICAR-Central avian research institute (CARI) Make *Feed Poultry Version 3.0*. The formulated feed composition is provided in Table 1. The feed was prepared in a feed mill and distributed to 5 farmers along with 50 day old Chabro chicks in each location in Vypeen block of Ernakulam district, Kerala (9° 58' N/ 79° 17 E). One group of 50 chabro poultry chicks (T1) was kept as control and was fed commercially available broiler poultry feed (Broiler Starter: CP-23 per cent & ME-2800 kcal/kg and Broiler finisher: CP-20 per cent & ME-2900 kcal/kg as per Bureau of Indian Standards specification). The second group of Chabro poultry chicks (T2) was fed CARI Make *Feed Poultry Version 3.0* software formulated feed. Proximate analysis of the feeds was carried out. Commercial broiler starter was fed ad libitum (0-3 wk) and broiler finisher (4-7 wk) in both trials. Vaccination against Ranikhet and Infectious Bursal Disease was also carried out.

A pretested schedule was used to collect data from farmers on their perception on Chabro poultry with reference to cost effectiveness, lower disease incidence, livability and net income.

Consumer's preference

A pretested schedule was used to collect data from meat consumers on their perception on Chabro poultry meat with reference to cost effectiveness, preference, taste and overall acceptability.

Economics

The cost economics was worked out for all trials. The total production cost was calculated as per the livability and feed cost. The net profit was calculated on rate per kg live weight basis.

Table 1. Feed formulated using CARI Make Feed Poultry Version 3.0 software

Ingredient	Broiler starter, per cent	Broiler finisher, per cent
Yellow maize	51.8	56.3
Soyabean meal	20.0	20.0
Sesame meal	12.0	12.0
Fish meal	10.0	5.0
Rice bran oil	3.0	3.0
Shell	1.0	1.0
Di calcium phosphate	1.5	2.0
Salt	0.3	0.3
Minerals, vitamins, liver tonics, etc	0.4	0.4

Farmer's preference

RESULTS AND DISCUSSION

Intensive method of rearing

The weight gain data in intensive method of rearing is provided in Table 2. The average body weight of Chabro poultry (T2) at the end of 7 wk was 1.5 kg which was significantly ($P < 0.05$) higher than that of Vanaraja birds (T1) that weighed 0.95 kg only. The marketable weight for broilers is generally 1.5 to 2 kg and Chabro poultry chicks attained this weight in 7 wk whereas Vanaraja required 10 wk to attain marketable weight of 1.40 kg. This was in line with the findings of Banja *et al* (2017) who found that Chabro poultry attained a body weight of 1.65 kg at 7 wk when reared under intensive system. Khan *et al* (2014) have reported a body weight of 1.11 kg at 7 wk when reared under intensive system

of rearing in winter season. The livability for both the chicks was 97 per cent. Total feed consumed by Chabro poultry during 7 wk period was 3.23 kg whereas Vanaraja consumed 4.5 kg feed in 10 wk to attain a comparable marketable weight. Feed conversion ratio (FCR) in Chabro poultry was 2.15 whereas FCR of Vanaraja poultry was 3.22. Kumar *et al* (2019) reported FCR of colored broilers reared in similar hot and humid conditions in Orissa in the range of 2.04-2.20.

Semi-intensive method of rearing

The weight gain data in Semi intensive method of rearing is provided in Table 3. Chabro poultry (T2) attained an average body weight of 1.3 kg in 7 weeks which was significantly higher ($P < 0.05$)

Table 2. Weight gain in Intensive method of rearing

Age in weeks	Average body weight, g	
	Chabro	Vanaraja
Day old	41.0 $\pm$ 0.57	33.6 $\pm$ 0.51
1	105.2 $\pm$ 3.68	67.4 $\pm$ 2.54
2	257.4 $\pm$ 10.1	126.4 $\pm$ 7.63
3	420.6 $\pm$ 17.8	287.2 $\pm$ 9.14
4	655.8 $\pm$ 19.0	478.6 $\pm$ 15.84
5	959.0 $\pm$ 33.8	660.4 $\pm$ 13.84
6	1343 $\pm$ 58.8	861.4 $\pm$ 32.0
7	1506 $\pm$ 40.4	950 $\pm$ 24.11

Table 3: Weight gain in Semi intensive method of rearing

Age in weeks	Average body weight, g	
	Chabro	Gramasree
Day old	39.6 ± 0.33	34.3 ± 0.33
1	73.6 ± 2.02	68.3 ± 2.00
2	166.7 ± 6.35	111.3 ± 1.45
3	459.0 ± 35.8	284.0 ± 15.63
4	718.3 ± 74.8	460.3 ± 30.8
5	997.6 ± 45.3	530 ± 47.2
6	1134.6 ± 51.8	637 ± 59.9
7	1302 ± 93.3	849.3 ± 54.1

than that of Gramasree chicks (T1) that attained body weight of 0.85 kg only during the same period. The weight gain of Chabro poultry was slightly less as compared to that in intensive system. Similar results were obtained in an earlier study conducted by Banja *et al* (2017) who also found slightly lower body weight in Chabro poultry reared in backyard conditions. They got a body weight of 1.5 kg in 8 wk as compared to 1.65 kg in intensive method of rearing. The average livability was 97 per cent in both the groups. Total feed consumed by Chabro poultry (T2) was 3.9 kg whereas the total feed consumption of Gramasree poultry (T1) was 4.9 kg for a period of 10-11 wk required to attain similar body weight as in T2. The FCR in Chabro poultry

was 3.05 whereas it was 3.96 for Gramasree poultry. Yadav *et al* (2018) also found an FCR in the range 2.75 to 3.0 in trials conducted by incorporating Shatavari root meal in diets of coloured broilers reared in semi intensive conditions with additional feeding of food remnants and vegetable wastes. The FCR value found in semi intensive rearing (3.05) was higher as compared to that found in intensive method of rearing (2.15).

Safe feed formulation trial

The weight gain of Chabro chicks in feed formulation trials is provided in Table 4. The Chabro chicks fed with CARI Make feed Poultry version 3.0 software formulated broiler feed (T2)

Table 4. Weight gain in feed formulation trials

Age in Weeks	Average body weight, g	
	Birds fed with commercial feed	Birds fed with CARI software formulated feed
Day old	40.8 ± 0.16	41 ± 0.16
1	101.6 ± 0.88	101.6 ± 2.19
2	250.6 ± 3.48	253 ± 5.46
3	448.6 ± 15.6	478.6 ± 8.11
4	653.6 ± 7.31	700.6 ± 31.7
5	911 ± 24.22	984 ± 41.89
6	1291 ± 31.2	1275 ± 36.44
7	1540 ± 59.95	1519 ± 64.3

Table 5. Proximate analysis of formulated and commercial feeds.

Parameter	CP*	EE*	CF*	NFE*	Ash*	AIA*	Energy
As fed							
Commercial starter	21.32	5.15	0.68	60.73	5.46	0.67	
Commercial finisher	20.88	6.07	0.42	56.62	5.89	0.70	
Formulated starter	23.89	7.31	1.94	47.92	9.05	1.69	
Formulated finisher	21.06	7.42	1.34	52.50	7.92	1.27	
On Dry matter basis							
Commercial starter	22.841	5.73	0.73	64.863	5.85	0.67	2930
Commercial finisher	23.228	6.74	0.47	63.014	6.55	0.70	3005
Formulated starter	26.512	8.11	2.15	53.190	10.04	1.69	2850
Formulated finisher	23.341	8.22	1.48	58.176	8.78	1.27	2990

* CP - Crude Protein, EE - Ether Extract or crude fat, CF - Crude Fiber, NFE - Nitrogen Free Extract or Soluble carbohydrates and AIA - Acid Insoluble Ash (sand and silica)

reached average body weight of 1.52 kg whereas those fed commercial broiler feed (T1) reached average body weight of 1.54 kg in 7 wk. The slight difference in the body weights was found to be non-significant ($P < 0.05$). The average livability was 98 per cent in both the trials. Total feed consumed by commercial broiler feed fed group (T1) was 3.36 kg/bird whereas in the formulated feed fed group (T2), the total feed consumption was 3.35 kg. The FCR in T1 and T2 groups were respectively 2.18 and 2.2.

The proximate analysis of both formulated and the commercial poultry feeds are provided in Table 5. Both the feeds had Crude protein in the range of 22-26 per cent and energy in the range 2850-3000 kcal/kg (as per BIS standards). Such formulated feed trials in broilers have been carried out earlier by few researchers to satisfy the organic meat concept or lean meat production. Omenka and Anyasor, 2010 formulated vegetable based diets for poultry to study the weight gain and meat quality parameters. They found non-significant difference in the organ weights but significant changes in the meat quality and body weight from that of conventional feeds available in the market. In the present study, the difference in feed consumed as well as body weights obtained were found to be

non-significant and very less implying that the formulated feed can be used to promote organic or safe to eat poultry production.

Economics

The cost economics in different systems of Chabro poultry rearing is provided in Table 6. The Benefit-Cost (B:C) ratio in intensive system was higher than that of Vanaraja poultry rearing. The Chabro poultry required comparatively less time to reach the minimum marketable weight and the body weight comparing to Vanaraja poultry. The cost of production in semi-intensive system was lower than intensive system. The receipt was higher in Chabro poultry due to significantly higher body weight gain. Chabro poultry gave net profit of Rs. 81.25 per bird in intensive system and Rs.57 per bird in semi intensive system. The net profit for coloured broiler obtained by medium farmers reported in an earlier study by Ramalingia *et al* (2017) was Rs.71/ bird.

Farmer's preference

The data on farmer's preference is presented in Table 7. Farmer's perceived that Chabro poultry provide them higher income. Higher income from Chabro poultry was on account of higher demand for slow growing or coloured birds in rural areas. The

Table 6. Cost economics

Sr No.		Cost per bird, Rs	
Intensive system			
		Chabro	Vanaraja
	Capital and operational cost	143.75	181.40
	Gross revenue	225.00	209.25
	Net profit (b-a)	81.25	27.85
	BC ratio	1.56	1.15
Semi intensive system			
		Chabro	Gramasree
	Total capital and operational cost	127.63	93.30
	Gross revenue	184.69	120.73
	Net profit (b-a)	57.00	27.43
	BC ratio	1.45	1.29
Safe feed formulation trial			
		Commercial feed fed Chabro	Formulated feed fed Chabro
	Capital and operational cost	146.24	155.37
	Gross revenue	231	228
	Net profit (b-a)	84.76	72.6
	BC ratio	1.6	1.5

yield of Chabro poultry was acceptable to farmers at 86.66 per cent. The disease incidence reported by the farmers was also very less. Ramalingia *et al* (2017) reported that coloured broilers were found to be more acceptable by the small farmers as compared to medium or large scale farmers as the benefit obtained reduced due to involvement of middlemen. Hence, Chabro poultry was found to be acceptable to small scale farmers promoting safe meat in local areas.

Consumer's preference

The data on consumer's preference is presented in Table 8. Consumers testified that the taste and overall acceptability was higher as compared to broilers. They also opined that Chabro had tender meat as compared to the desi native breeds or spent hens. Earlier, Devatkal *et al.* (2019) also found that consumer preference was higher for meat and meat products from slow growing broilers. The consumers concerned on safety of meat preferred

Table 7. Farmer's perception on Chabro poultry. (N= 15)

Sr. No	Perception	Frequency	Percent
1	Cost effectiveness	13	86.66
2	Lower disease incidence	14	93.33
3	Yield	13	86.66
4	Net income	15	100.00

Table 8. Consumer's perception on Chabro poultry.

N= 20

Sr. No	Perception	Frequency	Percent
1	Cost effectiveness	18	90.00
2	Preference over broilers	20	100.00
3	Taste and overall acceptability	19	95.00

to purchase colored birds like Chabro from local small scale farmers so as to get to know on rearing practices as well.

CONCLUSION

Chabro poultry reared in homesteads is found to be suitable for meat purpose. They had better weight gain in short duration when compared to improved backyard poultry breeds like Vanaraja and Gramasree. Net profit per bird was found to be more in intensive system of rearing making it preferred method of rearing among farmers. The meat of this bird seemed to be safe to consumers as they have similar appearance to desi birds due to the coloured plumage. The feed formulated using CARI Make feed Poultry version 3.0 software is recommended for entrepreneurs who promote safe-to-eat meat production.

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