

Growth Performance of Village Chicken under Different Feeding Systems

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ABSTRACT. *Studies were carried out to investigate the growth performance of village chicken under different feeding and management systems. The performance was compared with those of other chicken reared mainly for meat purpose, namely, broilers, layer-type cockerels, hybrid chicken and crosses (village x hybrid).*

Growth rate was improved and mortality was decreased when village chicken were reared under an intensive system, but the performance was inferior to that of broilers. Crossing village chicken with layer-type hybrid did not improve the growth rate and incidences of cannibalism remained high. The results suggest that the village-chicken in Sri Lanka resemble the egg-type layers, which also possess the selective feeding ability. Under the existing marketing conditions, the scavenging system offers greater economic benefits in producing meat from village chicken.

INTRODUCTION

There are about 1.3 million village hens in Sri Lanka contributing about 15% to the national egg production. The majority of these birds are offered no inputs other than household wastes. Yet their eggs and meat provide a substantial proportion of the protein in the diet of the rural population and also a small cash flow for the family (Gunaratne *et al.*, 1991).

More than 50% of the total feed requirement of the Sri Lankan poultry industry is imported. The same applies to breeding materials and other inputs required for intensive poultry farming. Thus, the commercial poultry sector in Sri Lanka is vulnerable to changes in feed prices and cost of other

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inputs. In contrast, the village chicken production is more sustainable and requires less inputs. It is also integrated into the social system.

Changes are continuously occurring in the rural environment as the standard of living improves and this may demand changes in the husbandry of village chicken. Alternative feeding and management systems are necessary to accommodate these changes.

In the present study, the performance of village chicken during their growing period was measured under different feeding systems. The performance was also compared with those of other types of chicken reared for meat.

MATERIALS AND METHODS

Feeding systems

Scavenging

This is the common feeding system adopted in village chicken production. The birds were provided only night shelter and during the day, they were allowed to scavenge on household refuse and any other food materials available in the surroundings. No purchased feed or any supplementary feed were offered.

Conventional feeding

The three types of birds were kept indoors and different conventional feed mixtures were offered as follows:

Village chicken were offered chick feed and grower feed from day old to 56th day and 56 to 140th day respectively. The broiler type birds and layer type cockerels were offered broiler starter from day old to 28th day and broiler finisher from 28 to 56th day. The other group of layer type cockerels were offered a feed mixture prepared using locally available feed ingredients. The composition was decided based on the findings of a field survey (Rajapakse, *et al.*, 1991). It had 15.5% crude protein, 8.5% crude fibre and 2700 Kcal/kg metabolizable energy. The major proportion of

protein (32.5%) and metabolizable energy (15%) in the mixture were contributed from coconut poonac and coconut oil.

Choice feeding

The birds were kept indoors as above, but instead of a complete mixed feed, different ingredients were offered separately; so that the birds could select and eat as they desired. During the chick and grower period the maize meal, which provided the major part of the energy requirement, was given in one feeder and a mixture supplying protein and all other (nutrients) were offered in another. This mixture was formulated to ensure a balanced nutrient intake when adequate protein is consumed. At point of lay, an additional feeder was introduced to supply the calcium source (shellgrit) separately.

Birds

Village chicken

To represent the scavenging situation, data pertaining to 110 chicks from nine hatches were recorded in two study locations. Galgamuwa and Ibbagamuwa in the North Western Province were the two study locations which represented the dry and intermediate zones respectively. The village chicken used for intensive rearing in pens were produced by collecting eggs from the field and hatching them in an incubator. These eggs were collected from the same area where performance was measured under the scavenging system. No sexing was done during the growing period.

Crossbred chicken

Hybrid males (shaver starcross 579) were introduced to village hens kept in pens and eggs were collected and hatched to obtain crossbred chicks. Male and female birds were together during growing the period.

Hybrid chicken

Commercial hybrid layer (shaver starcross 579) chicks were purchased from a hatchery. This group was reared unsexed during growing the period.

Cockerels : Shaver starcross 579 day-old cockerels were used.

Broiler : Shaver starbro day-old unsexed birds were used.

Measurements

In Pen studies, daily feed consumption and mortality were recorded. Body weights were measured weekly. The laying of the first egg in a group was considered as the point of lay. However, changing from grower feed to layer feed was effected when 5% of the birds in a group had laid eggs.

In the scavenging system, body weight was measured every two weeks and mortality was recorded regularly. Laying of the first egg in a hatch was considered as the point of lay.

The village and hybrid chicken on choice feeding were replicated thrice, while cross bred chicken had no replicates. The group on conventional feeding also had no replicates. The significance of differences in village and hybrid chicken were compared using student "t" test.

RESULTS AND DISCUSSION

The village chicken production system in Sri Lanka is predominantly an egg producing system. The main contribution from village chicken is therefore to nutritional improvement in rural population, through increased egg consumption. However, surplus cockerels and old birds are a good source of meat in rural areas.

At present, broilers are the main source of poultry meat in Sri Lanka. However, layer-type cockerels and village chicken also contribute to a large extent. It is interesting therefore to compare the meat potential of village chicken with those of layer type cockerels and broilers.

Tables 1, 2 and 3 show the growth rate of village chicken with those of other meat type chicken namely, cockerels, hybrid and crossbred chicken,

reared under different feeding systems. The growth rate of village chicken fed on commercial feed was very much lower compared to broilers, but similar to layer-type cockerels fed on the same feed. When cockerels were given a low quality feed prepared from locally available raw materials, their growth rate further reduced to a level comparable to village chicken under the scavenging system. The data suggest therefore, that the village chicken in Sri Lanka is typically an egg-type bird and their genetic potential for meat production is poor. Higher feed conversion ratio in village chicken also lend support to this conclusion.

Similar growth rates of village chicken under the scavenging system and the feed resource base available for scavenging was deficient or inadequate. Gunaratne *et al.*, (1991) and Gunaratne (1992) had identified protein, calcium and phosphorus deficiencies under the scavenging system.

Age at point of lay and mortality during the growing period were reduced when village chicken were reared in pens and fed with a complete feed (conventional or choice). The causes of higher mortality in the scavenging system has been discussed elsewhere (Gunaratne *et al.*, 1991. Kingston, 1980), but in pen studies it was mainly due to cannibalism. Village and crossbred birds showed a greater tendency for cannibalism when compared to hybrid birds. Debeaking was carried out just before point of lay, however, this did not reduce the incidence to minimum level.

An improvement in growth rate was expected when village chickens were upgraded with hybrid males. However, the improvement was marginal. This may be due to the fact that the male bird used for crossing was of layer-type. The growth performance may have been different, if broiler type males were used.

The domestic fowl of today is believed to be a descendent of the jungle fowl. In a wild state, they possess an inherent ability for selective feeding, and this character could be expected to be present at least in unimproved domestic chicken. The purpose of choice feeding was to test this ability. According to Table 4, intake ratios were similar in all three types of birds, averaging around 70% maize to 30% concentrate mixture. The amount of maize and the proportion of ingredients in the concentrate mixture were calculated on the basis of the nutrient requirements recommended for hybrid chicken (NRC 1984, Feeding standards for Australian livestock, 1987) and it was expected that the birds would consume between 69 to 70% maize and 30 to 31% mixture. All three types consumed close to the above values.

Table 1. The growth rate, point of lay and mortality in village chickens under three different feeding systems.

Feeding system	Growth rate ^a (g/day)	Weight at point of lay (g)	Age at point of lay (weeks)	Mortality ^a (%)
Scavenging (n=110)**	9.14 ± 2.63	1227 ± 170.3	28.1 ± 2.67	40.0
Conventional feeding (n=29)**	12.87	1600	19.0	7.7
Choice Feeding (n=66)**	11.79 ± 1.48	1510 ± 64.6	20.5 ± 1.45	8.0

* Up to 17 weeks ** Number of birds

Table 2. Comparison of growth rate and feed conversion ratio of village chicken with broiler and layer-type cockerels.

Type of bird	Growth rate (g/day) ^a	Feed conversion ratio
Village chicken	14.0	4.5
Cockerels ^b	13.60**	3.10
	9.75***	4.24
Broiler	32.20****	2.32

^a Shaver Star cross 579

** At 56 days-fed with commercial broiler feed.

*** At 70 days-fed with a feed mixture prepared from locally available raw materials.

**** At 42 days-fed with a commercial broiler feed.

Table 3. Comparison of performance of village chickens with hybrid and crossbred chicken on choice fed feeding.

Measurement	Village chicken	Hybrid chicken	Crossbred chicken*
Number of birds	66	75	29
Growth rate (g/day)	14.0 \pm 1.7	15.0 \pm 0.5	15.3
Weight at point of lay (g)	1510 \pm 64.6	1529 \pm 72.6	1496
Age at point of lay (days)	143 \pm 10 ^a	130 \pm 4 ^b	138
Feed intake ** (g/day)	59.0 \pm 8.3	60.3 \pm 2.1	55.0
Feed conversion ratio	4.50 \pm 0.15 ^a	4.09 \pm 0.13 ^b	3.60
Mortality (%)	8.00 ^a	2.67 ^b	10.34

* Shaver Star cross 579 male x Village chicken.

** Up to 17 weeks.

a,b, Values bearing different superscripts in a row are significantly different, ($P < 0.05$).

The data also suggest similarities in energy and other nutrient requirements among village, cross bred and hybrid chickens.

The success of any chicken meat production system will finally depend on the cost and benefits involved. There is no premium price offered to village chicken meat if they are fed and managed under intensive conditions, although a marginally higher price is paid in rural areas for birds reared under the scavenging system. In some countries, the price of village chicken are much higher than broiler (Aini, 1990). If higher prices are not paid in relation to the price of broiler meat, rearing village chicken or layer-type cockerels for meat production under intensive system is not economical (Rajapakse *et al.*, 1991). The same applies to crossbred chicken as well.

Table 4. Consumption of maize and concentrate mixture by village, crossbred and hybrid chickens.

Type of bird	Intake (g/bird) *		Intake ratio (%)	
	Maize	Mixture	Maize	Mixture
Village chicken	5088 ±312	1913 ±115	72.67	27.33
Crossbred chicken	4434	1895	70.06	29.94
Hybrid chicken	4883 ±124	1984 ±77	71.11	28.90
Expected Intake			69 to 70	30 to 31

* Up to 17 weeks.

Under these circumstances, the scavenging system would be the most economical system to produce meat from village chicken.

CONCLUSION

The results of this study suggested that the village chicken in Sri Lanka resembles egg-type layer which posses the selective feeding ability. Under the existing commercial poultry production and marketing conditions the scavenging system offers greater economic benefits in poultry meat production.

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