

EFFECTS OF CHOICE FEEDING ON THE PERFORMANCE OF VILLAGE CHICKEN AFTER THE PEAK OF EGG PRODUCTION

A. H. Ramlah,¹ H. Mohd-Husni and A. H. Sarinah

Department of Animal Sciences, Faculty of Veterinary Medicine
and Animal Sciences, Universiti Pertanian Malaysia
43400 UPM, Serdang, Selangor, Malaysia

Summary

An experiment was carried out with village chicken at the laying stage raised on the semi-intensive system on three feeding treatments with each of 30 birds replicated three times. The three feeding treatments were: layer mash only, layer mash and corn as choices and choices of a high protein concentrate and corn. Feed and protein intake was significantly higher for birds on the layer mash and lower for birds on the choices of a high protein and corn diet. There was no differences in egg production for the birds fed the layer mash either alone or a choice with corn but lower for the birds on the choices of a high protein feed and corn. There was no differences in egg weight and gross efficiency for all treatments. The practice of choice feeding layer mash and corn could be adopted by farmers rearing village chicken under the semi-intensive system due to the lower cost.

(Key Words: Choice Feeding, Egg Production, Energy Intake, Protein Intake, Village Chicken, Semi-intensive System)

Introduction

Chickens have different dietary requirements for maintenance, growth and production. In a flock, any diet which is formulated to meet the requirements of the average chicken will contain excessive levels of energy and protein for chickens below the mean. A possible solution to overcome this problem is to offer an *ad libitum* choice between two diets, one is suitable for maintenance and one for production (Emmans, 1978). This free-choice feeding affects bird performance in terms of decreased feed intake and an increased production efficiency (Cowan et al., 1978; Karunajeewa, 1978; Leeson and Summers, 1979). Most of the studies done on choice feeding had been with commercial breeds and the application of choice feeding had not been carried out with indigenous village chicken. In Malaysia, the indigenous village chicken is a dual-purpose type reared for both meat and eggs, small body size with variable body conformations and physical characteristics and mainly reared on the semi-intensive or free range systems (Ramlah and Shukor, 1987). The

rearing of village chicken can be economically viable if lower costs of feed can be achieved with the same performance. Therefore, the objective of this trial is to study the effects of choice feeding on the performance of village chicken.

Materials and Methods

Animals and management

A total of 270 female village chicken, (40 weeks of age) of the Dark Brown variety as described by Ramlah and Kassim (1992) were randomly distributed to nine enclosures in a semi-intensive system of rearing the village chicken with 30 birds per enclosure. The semi-intensive system is an open grass area fenced in with chain-linked fencing with nylon netting canopy to prevent wild birds from entering the area. The size of each enclosure is 6.30 m × 18.40 m with a wooden shed measuring 2.40 m × 2.40 m as protection from sun and rain. Each bird was provided 3.67 m² floor space in the open area and 0.19 m² in the shed. Feed was provided *ad libitum* in two tubular feeders and water by using a bell-shaped automatic drinker in each of the shed. Five wooden nest boxes measuring 30 cm × 27 cm × 30 cm were provided in each shed. The birds were managed under natural daylight (12 hours).

¹Address reprint requests to Dr. A. H. Ramlah, Department of Animal Sciences, Faculty of Veterinary Medicine and Animal Sciences, Universiti Pertanian Malaysia, 43400 UPM, Serdang, Selangor, Malaysia.

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Feeding regimes

All the birds were fed a layer mash (table 1) from 20 to 39 weeks, and from 40 weeks until 55 weeks they were subjected to three feeding regimes as follows: i) CONTROL - fed the layer mash only (table 1), ii) LAYER and CORN - birds were offered choices of layer mash (table 1) and coarsely ground corn (8.5% CP and 14.0 MJ/kg ME), iii) HIGH PROTEIN and CORN - birds were offered choices of a high protein concentrate (table 1) and coarsely ground corn. Both diets were provided together in separate tubular feeders. The diets were available *ad libitum*. These three feeding regimes were randomly assigned to the 9 groups of birds with 30 birds per group.

TABLE 1. COMPOSITION OF DIETS (%)

	Layer diet	High protein diet
Corn	53.00	—
Soybean meal	22.00	45.00
Rice bran	10.50	—
Fishmeal	6.00	45.00
Salt	0.25	—
Dicalcium phosphate	3.00	—
Limestone	5.00	9.40
D-L methionine	—	0.25
Vit. & Min. premix	0.25	0.35
Calculated composition :		
ME (MJ/kg)	11.38	9.60
Crude protein (%)	18.00	41.40
Lysine (%)	1.10	3.24
Calcium (%)	3.2	7.09

Records

The birds were weighed weekly and the means per group were calculated. The eggs laid by each group were recorded and weighed. Total feed intake of each group were determined weekly. All data was statistically analysed by the analysis of variance using computer software (Statistical Graphics Corporation Inc., 1988). Treatment means were further compared by the protected Least Significance Difference (Snedecor and Cochran, 1981).

Results

The performance of village chicken on the

various feeding regimes from 40 weeks to 55 weeks of age is shown in table 2. There was a significant difference in total feed intake among the three feeding regimes, with the birds offered a high protein concentrate and corn showing the lowest feed intake (68.0 g/b/d) and no significant difference between the birds offered layer mash alone or layer mash and corn (85.7-85.8 g/b/d). There was no significant differences in term of egg production, egg weight, egg mass and the gross efficiency between the three feeding regimes, although the egg production of birds given choices of a high protein concentrate and corn tended to be lower than those of the other two groups.

The energy and protein intakes of the birds from the various sources of feed are shown in table 3. The feed intake of the choice-fed birds mainly come from corn than the complete layer and high protein concentrate. In terms of protein intakes, about equal proportion was derived from corn and the layer mash and about 60.4% derived from corn as compared to only 39.6% from the high protein concentrate in the case of birds offered these two sources of feed, whereas for the ME intakes, corn contributes the highest energy to the birds (66.1% and 91.5%) in both cases.

Discussion

Feed intake

The total feed intake of village chicken fed the layer mash either singly or as a choice with corn is about equal but higher than the birds offered a choice of a high protein concentrate and corn (table 2). The reduction in the total feed intake of choice-fed birds of a high protein and corn is 20.7% and this is in agreement with Farrell et al. (1981) which is 20.3% but slightly higher than that reported by Karunajeewa, (1978) whereby the reduction was 11% on a choice of wheat and barley. The proportion of intakes of the high protein concentrate (11.9%) and corn (88.1%) agrees with that of Cowan et al. (1978) but lower than those reported by Farrell et al. (1981) and Karunajeewa (1978).

Village chicken under the semi-intensive system had a preference for corn when given a choice as reflected in the intake of corn of 61.4% with choice of layer mash and 88.1% with a choice of high protein concentrate.

CHOICE FEEDING IN VILLAGE CHICKEN

TABLE 2. PRODUCTION REPOSSES OF VILLAGE CHICKEN FED ON THREE FEEDING REGIMES (MEAN±S.E FOR 15 WEEKS PRODUCTION)

Performance parameters	Layer only	Layer & corn	High protein & corn
Egg prod (%)	23.3 ± 0.80 ^a	24.5 ± 2.39 ^a	20.7 ± 0.65 ^a
Feed intake (g/b/d)	85.7 ± 1.30 ^a	85.8 ± 2.58 ^a	68.0 ± 1.41 ^b
Egg wt (g)	45.0 ± 0.41 ^a	44.9 ± 0.43 ^a	44.3 ± 0.77 ^a
Egg mass (g/b)	10.7 ± 1.17 ^a	11.0 ± 1.05 ^a	9.2 ± 0.32 ^a
Gross efficiency (kg feed/kg egg)	8.00 ± 0.69 ^a	7.80 ± 0.67 ^a	7.41 ± 0.43 ^a
Mortality (%)	19.8 ± 0.60 ^a	10.1 ± 0.08 ^b	11.7 ± 0.19 ^b

^{ab} Values in a row with different superscripts are significantly different (p < 0.05)

TABLE 3. FEED INTAKES OF VILLAGE CHICKEN GIVEN CHOICES OF FEEDS (MEANS±S.E)

Performance parameters	Layer only	Layer & corn	High protein & corn
Feed intake (g/b/d)			
Total	85.7 ± 1.30 ^a	85.8 ± 2.58 ^a	68.1 ± 1.41 ^b
Layer/High Prot. (% of intake)	—	33.15 ± 0.76 ^a (38.6%)	8.1 ± 0.84 ^b (11.9%)
Corn (% of intake)	—	52.60 ± 1.82 ^a (61.4%)	60.01 ± 1.62 ^b (88.1%)
Protein intake (g/b/d)			
Total	15.4 ± 0.23 ^a	10.4 ± 0.29 ^b	8.45 ± 0.43 ^c
Layer/High Prot. (% of intake)	—	5.97 ± 0.14 ^a (57.0%)	3.35 ± 0.38 ^b (39.6%)
Corn (% of intake)	—	4.47 ± 0.16 ^a (43.0%)	5.10 ± 0.31 ^b (60.4%)
Me intake (kJ/b/d)			
Total	975 ± 14.6 ^a	1,113 ± 15.5 ^b	918 ± 16.3 ^a
Layer/High Prot. (% of intake)	—	377 ± 8.8 ^a (33.9%)	78 ± 8.4 ^b (8.5%)
Corn (% of intake)	—	736 ± 6.1 ^a (66.1%)	840 ± 8.8 ^b (91.5%)

^{abc} Values in a row with different superscripts are significantly different (p < 0.05)

Egg production

There was no significant difference in term of egg production between birds fed on layer mash only and those offered layer mash and corn (table 2) and this is consistent with the findings of Karunajeewa (1978). On the other hand, the birds fed a choice of a high protein concentrate and corn showed the lowest egg production and this is not consistent with the finding of Farrell et al. (1981). The low egg production for this group could be attributed to the low intakes of both

protein and energy, which are 8.45 g/b/d and 91 8 kJ/b/d respectively (table 3). The overall egg production of the village chicken in this study was low (table 2) and this is consistent with those of Engku Azahan and Noraziah (1992); Ramlah and Kassim (1992) and Yeong (1992).

The cost of daily feed per bird is highest in birds fed layer mash only (RM 0.067 or US 0.025) as compared to layer mash and corn (RM 0.057 or US 0.021) and high protein and corn (RM 0.045 or US 0.017). Since there was no sig-

nificant differences in term of performance between the birds fed layer mash only or layer mash and corn as choices, it would be beneficial to feed village chicken at the laying stage a choice of a completely balanced layer mash with grain particularly corn due to the lower cost of feeding corn and layer mash as compared to layer mash alone.

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