

The red and black-red native chickens of Malaysia

(Ayam kampung Malaysia jenis merah dan hitam-merah)

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Key words: native chickens, red and black-red varieties, phenotype, reproduction, growth

Abstrak

Daripada sejumlah 900 ekor ayam kampung Malaysia yang bercampur-campur, dua jenis yang banyak dijumpai telah dipilih terutama berasaskan warna bulu. Ayam kampung ini ialah jenis merah dan hitam-merah. Terdapat banyak persamaan fenotip antara kedua-dua jenis ayam tersebut kecuali warna bulu dan jenis balung. Ayam jenis merah mempunyai bulu kemerah-merahan serta balung jenis tunggal manakala ayam jenis hitam-merah mempunyai bulu dengan campuran warna hitam dan merah. Ayam jenis hitam-merah juga mempunyai balung yang berbentuk ros, 'walnut', 'buttercup' atau kacang. Ciri pembiakan dan prestasi pembersaran kedua-dua jenis ayam kampung ini didapati lebih mundur daripada nilai yang biasa dikaitkan dengan ayam komersial. Perbezaan antara kedua-dua jenis ayam ini dalam setiap parameter yang dikaji kecil dan tidak nyata. Dirumuskan bahawa kedua-dua jenis ayam kampung ini berasal daripada hibrid yang bercampur-campur dan masih belum mencapai status homogen.

Abstract

Two common varieties of native chickens of Malaysia were selected among the varied group of 900 local birds, based mainly on plumage colour. These were the red and black-red varieties. Except for plumage colour and comb type, many phenotypic similarities existed between the two varieties. The red variety had reddish plumage and a single comb while a mixture of black and red was the predominant plumage colours of the black-red variety which also had comb types of either rose, walnut, buttercup or pea. The reproductive traits and growth performance of the two varieties of kampung chickens were inferior to the respective values usually associated with commercial chickens. Between the two varieties, differences in each of the reproductive and growth variables were small and not significant. It is concluded that each variety was basically of mixed hybrids and had yet to achieve homogeneity status.

Introduction

The present stocks of native chickens of Malaysia or the popularly known kampung (village) chickens (*Gallus domesticus*) are the descendents of the red jungle fowl

(*Gallus gallus*). They evolved from random and indiscriminate crossbreedings between the original Malay fowl, the jungle fowl and the exotic commercial breeds. As they are no longer purebreds, their physical attributes

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are so variable that no single description can fit the entire flock.

Kampung chickens are generally small and are poor performers in terms of growth and egg production (Engku Azahan et al. 1980; Engku Azahan 1983; Engku Azahan and Wan Zahari 1983; Jalaludin et al. 1985; Oh 1987; Ramlah and Shukor 1987; Engku Azahan et al. 1990). Body weights of between 1.1 and 1.5 kg over 4 months have been regularly quoted and they produce about 100 eggs/year. Their poor egg producing capacity is mainly due to the prevalent characteristic of broodiness among the females. They are generally considered a dual-purpose bird. For a review of kampung chickens please see Aini (1990).

Although kampung chickens are of mixed hybrids, a few common varieties can be identified among the varied population. The objectives of this study were to identify, select and report on the phenotypic characteristics, productive performance and reproductive traits of the two most common varieties.

Materials and methods

In the first part of the study, 900 day-old kampung chicks of mixed strains were obtained from the north of Peninsular Malaysia. They were kept under intensive management, initially in brooding boxes and later transferred to litter floor pens. At the age of 16 weeks, the two most common varieties were identified and selected. The identification was made based on their phenotypic characteristics, mainly plumage colour. After selection, these birds were transferred to individual laying cages where they were reared until the age of sexual maturity (at 25 weeks) when their body weights were recorded.

In the second part of the study, 100 mature females from each of the two selected varieties were randomly allocated to five replicate groups of 20 birds each. These birds were artificially inseminated weekly with pooled semen collected from the males of the respective varieties. Their

reproductive traits were recorded over a period of 24 laying weeks, from the age of 25 weeks. The eggs were set and hatched in an incubator. Fertility rate was determined by candling the eggs on the 19th day of the incubation period, prior to their transfer to the hatcher.

The progenies obtained from each of the varieties were evaluated for their productive performance in litter floor pens, over a period of 16 weeks. In this final part of the study, 240 mixed-sex birds in six equal replicate groups from each of the two varieties were used. A floor space of 0.18 m² was allocated to each bird. The variables recorded were body weight, feed intake, feed conversion efficiency and mortality rate.

Throughout the study period, feeds (*Table 1*) were provided *ad libitum*.

All results were analysed by analysis of variance to determine the significance of mean differences between varieties.

Results and discussion

Phenotypic characteristics

The population of native or kampung chickens in this study came in various shades of plumage colour. However, the general plumage description of these birds was inclined towards blackish, reddish or brownish colours. Plumage distributions were mainly normal. Exceptions were frizzle and silkie feather types. From the varied population, two common varieties could be identified, based on their phenotypic characteristics. These were the black-red and red varieties (*Table 2*).

The black-red variety of kampung chickens is generally regarded by the indigenous Malays as the closest to the original native chickens while the red variety was preferred by the Chinese community who considers them as the local chicken.

There were some phenotypic and productive features common to both varieties of kampung chicken. Each of them had a broad head with a short strong beak

Table 1. Experimental feeds for native chickens of Malaysia

	Starter 0–6 weeks	Grower 7–18 weeks	Breeder over 18 weeks	
			Female birds	Male birds
Corn (%)	44.8	64.7	50.6	48.3
Soybean meal (%)	27.7	26.5	24.8	22.7
Rice bran (%)	17.6	2.1	11.2	24.6
Fish meal (%)	6.0	3.0	–	–
Dicalcium phosphate (%)	0.4	1.6	1.5	1.1
Limestone powder (%)	1.3	1.0	9.6	2.2
Lysine (%)	–	–	0.3	0.2
DL-methionine (%)	0.23	0.15	0.4	0.3
Trimix (%)	0.1	0.1	0.15	0.15
Salt (%)	0.3	0.3	0.3	0.3
Palm oil (%)	1.6	0.6	–	–
Crude protein (%)	21.0	19.0	17.0	17.0
Metabolisable energy (kcal/kg)	2 900	3 000	2 650	2 750
Ca (%)	1.0	1.0	4.0	1.2
P (%)	0.4	0.48	0.4	0.4
Lysine (%)	1.3	1.07	1.19	1.10
Methionine + cystine (%)	0.93	0.8	0.94	0.84

Table 2. Phenotypic description of the black-red and red varieties of native chickens of Malaysia

Characteristic	Black-red variety	Red variety
Plumage	Majority black and red or brown colours	Reddish colour
Male	Glossy black tail feathers; hackle, saddle, back and wing bow rich red in colour; remaining plumage black or green and black	Red plumage over the entire body except the glossy black tail feathers
Female	A mixture of brown-red and black plumage	Mainly brown, yellowish or reddish-brown plumage
Comb	Rose, walnut, buttercup or pea type	Single and large
Wattle	Double, red and ranged from small to large	Double, red and large
Ear-lobes	Red or a mixture of red and white	Red or a mixture of red and white; large
Neck	Long and upright	Relatively short
Legs	Relatively long	Relatively short
Shanks	Black, whitish or yellowish; free of feathers	Yellow or whitish yellow; free of feathers

which curved slightly downwards. The eyes were deep-set and the face smooth. The males had a spur on each leg but this was absent in females. The weights of mature males and females were around 2.0 kg and 1.5 kg respectively. Females were broody.

Although there existed other varieties of kampung chickens such as the naked-neck, the frizzle, the silkie and the barred-feather varieties among others, their occurrences among the varied group under study were limited to just a few birds. As such, they were not selected for identification and description.

Reproductive traits

Over 24 laying weeks, egg production and egg weight of the kampung chickens were inferior to the respective values usually reported for commercial layers (Engku Azahan and Noraziah 1989; Ramlah and Jalaludin 1989; Engku Azahan et al. 1993). While commercial layers had been highly selected for egg laying characteristics, the kampung chickens could be described as unselected mongrels (Engku Azahan et al. 1980).

The other reproductive traits observed (Table 3) emphasised the general inferiority of kampung chickens to commercial birds. Between the two kampung chicken varieties, differences in all the reproductive traits studied were small, varying between 0.2% and 6.2% only, and were not significant ($p > 0.05$).

The relatively poor reproductive performance of kampung chickens has been reported by many workers (Engku Azahan et al. 1980; Engku Azahan 1983; Jalaludin et al. 1985; Ramlah and Shukor 1987). Engku Azahan (1983) attributed the low egg production capacity of the kampung chickens partly to the occurrence of broodiness which might have been responsible for 15% reduction in egg production.

Results from this study indicated that the current stocks of kampung chickens have improved slightly over their predecessors with respect to egg production (Engku Azahan 1983; Jalaludin et al. 1985; Ramlah and Shukor 1987). Similar improvements have been observed by Yeong and Noraziah (1991). This could have been due to genetic improvements made over the last decade through unplanned crossbreedings with commercial birds or to the improved nutrition given, among others. However, taking into consideration the results in total, there is no reason to believe that kampung chickens have improved much over the years. This was probably due to the fact that no systematic breeding and selection work has been carried out to improve these birds. On the contrary, the usual practice by the villagers of slaughtering the biggest birds first for a meal or feast might have led to the culling off of the best birds early, leaving behind only the 'second class' birds to reproduce, resulting in progenies of relatively low quality.

Table 3. Reproductive traits of two varieties of Malaysian native chickens

Reproductive trait	Red variety	Black-red variety
Egg production (%)	46.9 ± 3.76	45.7 ± 4.43
Egg weight (g)	41.8 ± 0.58	41.7 ± 2.02
Fertility (%)	77.1 ± 6.25	71.9 ± 6.93
Hatchability (%)		
From total eggs set	58.1 ± 6.15	58.0 ± 11.46
From fertile eggs	75.1 ± 6.01	79.0 ± 8.28
Chick weight (g)	27.3 ± 1.09	29.0 ± 0.72

For each variable, differences between varieties were not significant ($p > 0.05$)
Results are means ± standard errors of the means

Table 4. Growth performance of the offsprings of two varieties of Malaysian native chickens over 16 weeks

	Red variety	Black-red variety
Body weight, 1-day (g)	28.80 ± 1.03	27.90 ± 0.88
Body weight, 16-week (kg)	1.22 ± 0.059	1.29 ± 0.042
Feed intake, 16-week (kg)	5.65 ± 0.360	6.88 ± 1.871
Feed conversion, 16-week	4.75 ± 0.120	5.44 ± 1.365
Mortality (%)	12.10 ± 6.96	12.20 ± 3.17

For each variable, differences between varieties were not significant ($p > 0.05$)
Results are means ± standard errors of the means

Productive performance

At the age of 16 weeks, which is the usual market age for intensively-reared kampung chickens, the two varieties of native chickens achieved a sex average body weight of 1.26 kg (Table 4). This figure was comparable with the weights obtained from earlier reports by Engku Azahan et al. (1990), and Yeong and Noraziah (1991) for mixed groups of unselected kampung chickens reared under similar conditions. At this age, the growth performance of kampung chickens was apparently inferior to that of commercial broiler chickens reared to their respective marketable age of 7–8 weeks (Lim et al. 1985; Yeong et al. 1989; Yeong and Azizah 1992).

The two kampung chicken varieties appeared to adapt well to the intensive system of rearing as evidenced by their relatively low mortality rates which did not differ significantly between varieties ($p > 0.05$). Kampung chickens are known to be hardy birds and are believed by some to be highly resistant to diseases. However, Raghavan (1991) contended that disease, especially Newcastle disease, is the main constraint to native chicken development, especially for those raised under the traditional extensive system with no proper vaccination programmes. Whether or not the observed low mortality was related to their adaptability to the local environmental conditions and/or to the presumed high disease resistance of these birds remains to be investigated and determined.

In all the reproductive and growth traits studied, differences between varieties were not statistically significant. The absence of significant differences between varieties could probably be due to the fact that each of the varieties identified in this study has yet to achieve homogeneity status. Although certain phenotypic differences enabled the recognition of two different varieties, each of them was basically of mixed hybrids. Further breeding and selection work needs to be carried out to achieve full homogeneity.

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