

## COMPARISON OF PRODUCTION AND REPRODUCTION PERFORMANCE OF VILLAGE CHICKEN AND NAKED NECK CHICKEN REARED UNDER DIFFERENT MANAGEMENT SYSTEMS

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### INTRODUCTION

Most of the poultry production system in the rural areas of Sri Lanka is characterized by smallholder free range scavenging operations. The system is characterized by small flocks of native type of chicken such as village and naked-neck chicken (Tadelle and Ogle, 2001). However, in Sri Lanka the performance of village chicken and naked-neck chicken is poor and their population also becomes stagnated due to the lack of improvement and breeding programs. To develop strategy for breeding and improvement program, a thorough scientific investigation on their production and reproduction performance under different farming systems is important. To date there is no thorough investigation done under different management systems. In this context, the present study was formulated with the objective of evaluating the production and reproduction performance of selected chicken genotypes under different management systems.

### METHODOLOGY

The study was conducted in different locations in Batticaloa and Ampara districts of Sri Lanka during the period from January, 2010 to May, 2011. A total of 150 poultry farms were selected for this study. Equal numbers of extensive, semi intensive and intensively operated farms were considered in gathering data. From each farming system a total of 75 adult birds of each type were randomly selected to gather information. The production parameters measured were live weight of both cockerel and hen at 9 months age, age at first lay, monthly egg production, egg weight, fertility, hatchability, and productive period and life time. The data were analyzed using Statistical Analysis Software (Version 9.1).

### RESULTS AND DISCUSSION

#### Body weight

According to Table 1 the mean body weight of cockerels and hens of village chicken (2.48±0.56 kg and 2.09±0.17 kg for male and female, respectively) and naked-neck chicken (2.56±0.59 kg and 2.20±0.18 kg for male and female, respectively) was significantly higher ( $P>0.05$ ) under the intensive system, while it was significantly the lowest ( $P<0.05$ ) under the extensive system for both sexes of both populations.

Management system	Mean body weight (kg)			
	Village chicken		Naked-neck chicken	
	Cockerel	Hen	Cockerel	Hen
Extensive system	1.87±0.11 <sup>a</sup>	1.79±0.09 <sup>a</sup>	2.27±0.19 <sup>a</sup>	1.88±0.12 <sup>a</sup>
Semi-intensive system	2.17±0.18 <sup>b</sup>	1.94±0.12 <sup>b</sup>	2.06±0.16 <sup>b</sup>	1.72±0.08 <sup>b</sup>
Intensive system	2.48±0.56 <sup>c</sup>	2.09±0.17 <sup>c</sup>	2.56±0.59 <sup>c</sup>	2.20±0.18 <sup>c</sup>

\*Means with the same letters within the column are not significantly different.

Table 1: Mean body weight of village and naked-neck chicken under different management systems (± Standard Error)

Under the extensive system the birds are actively moving around the farm sheds as they need to search their feed. Therefore, the energy loss is high. In other Asian countries like Bangladesh and India the indigenous hens in the existing scavenging operations had the lowest body weight (1.04

kg for hen and 1.52 kg for cockerel; Ahmed and Hasnath, 1983 and 1.01 kg for hen and 1.38 kg for cockerel; Kalita *et al.* 2009) than the value recorded in the present study under all management systems.

#### Age at first laying

The average age at first laying was significantly longer ( $P>0.05$ ) for village ( $7.13\pm0.34$  months) and naked neck chicken ( $7.90\pm0.37$  months) under the intensive system while it was significantly shorter ( $P<0.05$ ) under the extensive system for both genotypes ( $5.53\pm0.23$  months and  $6.31\pm0.31$  months respectively) (Table 2).

Management system	Average age at first laying (months)	
	Village chicken	Naked-neck chicken
Extensive system	$5.53\pm0.23^a$	$6.31\pm0.31^a$
Semi-intensive system	$6.24\pm0.30^b$	$7.62\pm0.36^b$
Intensive system	$7.13\pm0.34^c$	$7.90\pm0.37^c$

\*Means with the same letters within the column are not significantly different.

Table 2: Average age at first laying in village and naked-neck chicken under different management systems ( $\pm$  Standard Error)

The exposure of birds at grower stage to sunlight stimulates the reproductive activity and starts egg production on time under the extensive system. However, under the intensive system the degree of exposure to sunlight is very low as the houses are not constructed in a proper way to facilitate penetration of sunlight in the study areas.

#### Monthly egg production

According to Table 3 the mean monthly egg production was significantly higher ( $P>0.05$ ) for both genotypes;  $18.90\pm3.01$  eggs and  $20.90\pm3.89$  eggs for village and naked-neck chicken, respectively under the intensive system than the other systems. The higher egg production under intensive system may be attributable to availability of more feed, water and health facilities compared to other systems of management in the study area. However, the egg production of village and naked-neck chicken under the extensive system is higher than that of in other Asian and European countries (lesser than 16 eggs and lesser than 18 eggs for village and naked neck chicken, respectively) under the semi-intensive system (Tadelle *et al.*, 2003).

Management system	Average egg production (number)	
	Village chicken	Naked-neck chicken
Extensive system	$15.86\pm1.21^a$	$16.31\pm1.99^a$
Semi-intensive system	$17.59\pm2.78^b$	$19.62\pm3.62^b$
Intensive system	$18.90\pm3.01^c$	$20.90\pm3.89^c$

\*Means with the same letters within the column are not significantly different.

Table 3: Average monthly egg production in village and naked-neck chicken under different management systems ( $\pm$  Standard Error)

#### Egg weight

Management system	Average egg weight (g)	
	Village chicken	Naked-neck chicken
Extensive system	$42.20\pm0.88^a$	$46.45\pm1.89^a$
Semi-intensive system	$47.50\pm2.01^b$	$49.62\pm2.56^b$
Intensive system	$47.33\pm2.00^b$	$49.21\pm2.43^b$

\*Means with the same letters within the column are not significantly different

Table 4: Average egg weight of village and naked-neck chicken under different management systems ( $\pm$  Standard Error)

The average egg weight was significantly higher ( $P>0.05$ ) in the semi-intensive and intensive systems for both village and naked-neck populations while it was significantly the lowest ( $P<0.05$ ) under the extensive system in both population.

### Hatchability

Management system	Average hatchability (%)	
	Village chicken	Naked-neck chicken
Extensive system	81.50±3.34 <sup>a</sup>	90.31±6.88 <sup>a</sup>
Semi-intensive system	86.84±5.01 <sup>b</sup>	91.62±7.01 <sup>a</sup>
Intensive system	82.50±3.99 <sup>c</sup>	90.90±6.99 <sup>a</sup>

\*Means with the same letters within the column are not significantly different

Table 5: Average hatchability of eggs in village and naked-neck chicken under different management systems ( $\pm$  Standard Error)

Hatchability was significantly differed ( $P>0.05$ ) among different management systems for village chicken while it was not significantly differed ( $P<0.05$ ) for naked neck chicken in all systems (Table 5). The hatchability of eggs for village chicken was significantly higher under the semi-intensive system because the availability of diverse nutritious feed is higher than other systems and the birds are partially allowed for scavenging and supplemented with commercial feed and additives when housed in a day. Similar to fertility the hatchability percent more than 75 is acceptable to the point of fertility in all poultry production systems.

### Productive period

The productive period was significantly higher ( $P>0.05$ ) under the semi intensive system (22.80±0.56 months and 22.62±0.50 months for village and naked neck chicken respectively) compared to the other management systems for both genotypes (Table 7). However, it was significantly lowest in these two populations under the intensive system (17.60±0.41 months and 19.90±0.39 months for village and naked neck chicken, respectively). The limited movement under the intensive system can cause excess fat deposition on body which may shorten the productive period (Kalita, 2009).

Management system	Average productive period (months)	
	Village chicken	Naked-neck chicken
Extensive system	19.10±0.36 <sup>a</sup>	20.31±0.49 <sup>a</sup>
Semi intensive system	22.80±0.56 <sup>b</sup>	22.62±0.50 <sup>b</sup>
Intensive system	17.60±0.41 <sup>c</sup>	19.90±0.39 <sup>a</sup>

\*Means with the same letters within the column are not significantly different

Table 6: Average productive period of village and naked-neck chicken under different management systems ( $\pm$  Standard Error)

### Life time

The life time was significantly longer ( $P>0.05$ ) under the extensive system for both village (2.48±0.03 years) and naked-neck chicken (2.31±0.02 years) while it was significantly lowest ( $P<0.05$ ) in the intensive system (1.67±0.01 years and 1.75±0.01 years for village and naked neck chicken, respectively). This is because of the faster rate of disease spreading when birds are in the confinement.

Management system	Average life time (years)	
	Village chicken	Naked-neck chicken
Extensive system	2.48±0.03 <sup>a</sup>	2.31±0.02 <sup>a</sup>
Semi-intensive system	2.17±0.02 <sup>b</sup>	1.90±0.02 <sup>b</sup>
Intensive system	1.67±0.01 <sup>c</sup>	1.75±0.01 <sup>c</sup>

\*Means with the same letters within the column are not significantly different

Table 7: Average life time of village and naked-neck chicken under different management systems (± Standard Error)

## CONCLUSION

The village chicken and naked-neck chicken populations are performing well under the extensive and semi intensive system with respect to some production parameters (egg weight, hatchability, productive period and life time). Therefore, performance of village and naked neck chicken could be further improved under semi intensive and extensive system of management with improved management practices and breeding programs.

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