



Evaluation of Performance of Rajasri Birds Under Different Management Situations

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ABSTRACT

A study was conducted to evaluate the performance of Rajasri bird reared under different systems. The control (T_1) group was reared under intensive system and were fed *ad lib*, while second (T_2) and third (T_3) groups were maintained under semi-intensive system receiving 20 and 40 percent of *ad lib*. feeding, respectively. The remaining two treatment groups were reared under scavenging, one group at farm (T_4) and the other at farmer's backyard (T_5), respectively. Significantly higher ($P<0.05$) body weight was noticed in control group as compared to other groups at 40 and 60 weeks of age. The mean hen day production was better with control group and least with 20% and 40% *ad lib*. groups. Physical verification revealed that crop contents at 20 and 60 weeks respectively comprised of grains (35.88 and 52.02%), green forages (15.06 and 15.39%), kitchen waste (24.26 and 6.33%), animal food (1.44 and 3.84%) and other items (23.36 and 22.41%). Dry matter (DM) content of the crop contents was 36.34 and 36.04% at 20 and 60 weeks of age, respectively. Content of nutrients (on DM basis) such as crude protein (CP), ether extract (EE), total ash, crude fibre (CF) and nitrogen free extract (NFE) at 20 and 60 weeks of age were 9.68 and 10.59; 6.53 and 3.57; 31.18 and 23.80; 18.05 and 28.67; and 34.58 and 33.38%, respectively. It can be concluded that significantly higher hen day egg production could be attained in Rajasri birds reared under intensive system offering *ad lib*. feeding compared to other systems of rearing.

Key words: Crop contents, Chemical composition, Rajasri, Scavenging system

INTRODUCTION

Modern poultry production is rapidly progressing towards vertical integration. The scale of operations of poultry farms has gone up. The number of small and marginal poultry farms both in urban and rural areas is reducing and availability of country chicken is gradually coming down. After commercialization of poultry production, the trend and availability of eggs and chicken meat was completely reversed. As a result, about 75% of total poultry produce is available for 25% of country's population residing in urban/semi urban areas (Prasad, 2004). These two vital aspects have provided an excellent base for production of backyard poultry suitable for backyard rearing. Rajasri, a prolific egg laying chicken variety has been developed by PV Narsimha Rao Telangana Veterinary University, Rajendranagar, Hyderabad to boost the backyard poultry production. Rajasri birds were capable of producing 140-150 eggs per year under scavenging system (Srinivas *et al.*, 2017). It is better to know the type of feed available in the field for making necessary

suggestions in supplementing deficient nutrient, if any. Hence, the present study was undertaken to evaluate the physical and chemical composition of crop contents of Rajasri birds reared under scavenging and other systems of management.

MATERIALS AND METHODS

Five hundred day-old chicks were reared up to 6 weeks of age in the nursery. At 7th week of age 400 growers were randomly distributed into 5 treatments groups each having 4 replicates and each replicates comprising of 20 females each (Table 1). The control (T_1) group was reared under intensive system and were fed *ad lib*, while second (T_2) and third (T_3) groups were maintained under semi-intensive system receiving 20 and 40 percent of *ad lib*. feeding, respectively. The remaining two treatment groups were reared under scavenging, one group at farm (T_4) and the other at farmer's backyard (T_5), respectively. Body weight was recorded at 40 and 60 weeks of age. Egg production was recorded from 20 to 60 weeks of age, divided in to 10 laying periods of 28 days each. Birds were

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Table 1: Experimental design

Treatment	System of rearing	Feeding pattern
T ₁	Intensive deep litter	<i>Ad lib.</i> Feeding, control
T ₂	Semi-intensive deep litter	20% of <i>ad lib.</i> + lucerne meal (500 g)
T ₃	Semi-intensive deep litter	40% of <i>ad lib.</i> + lucerne meal (500 g)
T ₄	Extensive (on the farm)	Scavenging
T ₅	Extensive (Backyard)	Scavenging

sacrificed in two lots, first time at the age of 20 weeks and the second at the age of 60 weeks and sampling was done as per the procedure outlined by Rashid *et al.* (2004). A total of 40 birds were slaughtered at each sampling time, 8 birds from each treatment and 2 birds from each replicate. Birds were slaughtered at farmer's households in the evening after their return from scavenging. Necropsy of each bird was conducted; crop contents were collected and were subjected for physical examination. The gizzards were also opened and the contents were collected.

The crop contents were separated into 5 categories namely grains (whole paddy, rice, broken rice, maize and seeds of grasses), green forages (different grasses, plant materials, herbs *etc.*), kitchen waste (cooked rice, cooked pulses, vegetable trimmings, vegetable leaves), animal protein sources (insects, ants, earth worms, snails and flies) and others (feathers, hairs and unidentified items). Each group was weighed quantitatively to the nearest gram and the percentage contributed was calculated. The crop contents were subsequently dried in hot air oven at 26.6 °C, individually ground and analysed for their proximate composition according to AOAC (1990) procedures. The

generated data were analysed by Statistical Package for the Social Sciences (SPSS for windows, V10; SPSS Inc., Chicago, IL, USA). Significance was determined at $P < 0.05$.

RESULTS AND DISCUSSION

At 40 and 60 weeks of age the body weight of the birds of control group was significantly ($P < 0.05$) higher than all the treatment groups (Table 2). Lowest ($P < 0.05$) body weight was recorded in semi intensive deep litter and in scavenging at farmers backyard treatments. Ali (2002) recorded least growth rate in scavenging than intensive or semi-intensive systems of management. This may be attributed to the extent of feed available, which could be utilized for deposition of protein and or fat in the body, besides meeting the requirements of egg production. The best mean hen day egg production (Table 3) was recorded in birds of *ad lib.* group (54.07%) compared to other groups because the birds were fed *ad lib.* with layer mash. Ali (2002) had shown that egg production was significantly higher in *ad lib.* fed birds as compared to those reared under scavenging system supplemented with 30 and 60 g of feed or reared on scavenging alone. Liveability was

Table 2. Body weight (g) at 40 and 60 weeks of age and liveability (21-60 weeks) of Rajasri birds reared under different systems of management

Group	Body weight (g)		Livability (%)
	40 wks	60 wks	21-60 wks
T ₁	1796 ^a	1907 ^a	90.20
T ₂	1442 ^{bc}	1522 ^b	90.79
T ₃	1543 ^b	1613 ^b	91.25
T ₄	1382 ^c	1541 ^b	87.06
T ₅	1455 ^{bc}	1564 ^b	82.97
SEM	36.26	35.51	1.363
P value	0.001	0.001	0.278

^{a,b,c}Means bearing different superscripts in a column differ significantly ($P < 0.05$)

Table 3. Hen day egg production (%) of Rajasri birds from 20 to 60 weeks of age

Group	Laying period (28 days each)										Treatment mean
	1	2	3	4	5	6	7	8	9	10	
T ₁	35.60 ^a	68.14 ^a	58.76 ^a	50.95 ^a	58.04 ^a	58.75 ^a	64.11 ^a	50.48 ^b	44.35 ^a	51.49 ^a	54.07 ^a
T ₂	0.00	2.79 ^c	27.90 ^c	32.88 ^c	21.13 ^b	28.44 ^d	32.08 ^d	22.89 ^c	22.26 ^c	18.92 ^e	20.93 ^e
T ₃	0.00	3.46 ^c	36.05 ^b	37.85 ^b	35.34 ^c	36.26 ^c	41.69 ^{bc}	29.03 ^d	27.52 ^c	24.11 ^d	27.13 ^d
T ₄	0.00	22.54 ^b	32.76 ^b	29.39 ^{dc}	37.18 ^c	37.45 ^c	38.95 ^c	47.80 ^c	37.68 ^b	40.94 ^c	32.47 ^c
T ₅	0.25 ^b	27.45 ^b	37.00 ^b	28.49 ^d	40.45 ^d	40.66 ^b	43.43 ^b	54.09 ^a	41.20 ^{ab}	45.22 ^b	35.83 ^b
SEM	3.263	5.563	2.516	1.960	2.740	2.339	2.525	2.872	2.070	2.911	2.603
P value	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

^{a,b,c,d} Means bearing different superscripts in a column differ significantly (P<0.05)

recorded low in backyard system of rearing as compared to other systems of management which may be attributed to predators and accidents apart from normal cause of death. Similarly, Czech *et al.* (2004) and Pennycott (2004) reported highest mortality in case of backyard reared birds.

Data pertaining to green forages and other component of crop contents as recorded at 20 and 60 weeks of age are presented in Table 4. Whereas, higher grain content (52.02 %) was noticed during 60 weeks, it was lower at 20 weeks of age. Kitchen waste was higher (24.25%) at 20 weeks and lower (6.33%) at 60 weeks of age. The animal protein sources were less (1.44 %) during 20 weeks than 60 weeks (3.84%) of age indicating change in appetite according to increasing demand for protein during its growth phase.

The data indicated (Table 5) that DM values of crop and gizzard contents varied largely both during 20 and 60 weeks of age for all the treatment groups. DM content was highest in control T₁, T₂ and T₃ groups. In the scavenging group (T₄ and T₅), DM content ranged between 35-36 % indicating the moisture content of

64-65%. High moisture content might be due to more greens, herbage and kitchen waste in diets of scavenging group. In earlier works, the DM of crop contents was shown as 34.4% by Gunaratne *et al.* (1993) and 42.9% by Mwalusanya *et al.* (2002). The CP value of crop contents was highest in control group both at 20 and 60 weeks of age (17.83 vs. 17.79%), as these birds were fed *ad lib.* Lower CP values as observed in 20% and 40% *ad lib.* groups might be due to restriction of mash feeding. The highest CF was observed in scavenging groups, attributable to higher forage and kitchen waste contents in their diets, followed by 20% and 40% *ad lib.* groups and least in control group. Based on the other nutrients intake, there was variation in NFE intake. Present findings were found to be varying marginally from the findings of Ukli (1992), who observed 8.18, 1.61, 9.44, 9.18 and 57.9% CP, EE, CF, total ash and NFE, respectively. Prawirokusumo (1988) recorded 11.3, 8.13 and 9.74% CP, EE and CF, respectively. Similarly, Gunaratne *et al.* (1993) reported 9.4, 9.2, 5.4 and 16%, CP, EE, CF and total ash, respectively in the crop contents of scavenging hens.

Table 4. Physical composition of crop contents at 20 and 60 weeks of age in scavenging Rajasri bird

Scavenging group	Total crop contents (g)		Different components of crop contents (%)									
			Grain		Green		Kitchen waste		Animal proteins		Others	
Age (Weeks)	20	60	20	60	20	60	20	60	20	60	20	60
R ₁	16.75	19.09	72.16	44.30	12.31	16.85	1.39	6.49	0.73	4.29	13.41	28.07
R ₂	19.42	21.35	33.51	30.98	25.72	29.37	16.66	4.50	2.28	4.24	21.83	30.92
R ₃	16.64	26.56	29.65	66.60	9.62	2.89	6.80	8.39	0.33	6.08	53.60	16.03
R ₄	22.06	28.29	8.20	66.21	12.60	12.45	72.17	5.92	2.41	0.76	4.62	14.65
Mean	18.72	23.82	35.88	52.02	15.06	15.39	24.26	6.33	1.44	3.84	23.36	22.41

Table 5. Nutrient composition (%DM) of crop contents during 20 and 60 weeks age of Rajasri birds

Group	Dry matter		Crude protein		Ether extract		Total ash		Crude fiber		Nitrogen free extract	
Age (Weeks)	20	60	20	60	20	60	20	60	20	60	20	60
T ₁	41.97	42.77	17.83	17.79	1.23	1.76	16.71	19.59	9.64	8.07	59.61	57.81
T ₂	41.00	40.68	7.66	10.33	1.32	0.43	24.09	25.49	13.32	30.63	53.62	33.13
T ₃	40.87	39.67	8.27	11.61	2.70	0.82	26.77	17.48	13.91	32.97	48.36	37.13
T ₄	35.72	35.68	8.89	10.88	2.50	0.34	28.93	22.24	17.68	30.17	42.02	36.38
T ₅	36.34	36.04	9.68	10.59	6.53	3.57	31.18	23.80	18.05	28.67	34.58	33.38

Similar results were also reported by Rashid *et al.* (2005), Momoh *et al.* (2010) and Goromela *et al.* (2007).

CONCLUSIONS

From this study it can be concluded that significantly higher body weight and hen day egg production were observed in Rajasri birds reared under intensive system offering *ad lib.* feeding compared to others. The birds reared under scavenging were getting low level of protein than required. The full potential of the Rajasri birds can be exploited by supplementing the diet with locally available protein rich sources.

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