

EGG PRODUCTION PERFORMANCE OF TWO INDIGENOUS TYPES OF DUCKS OF KERALA*

J.D. Mahanta**, A. Ramakrishnan and A. Jalaludeen
Centre for Advanced Studies in Poultry Science
College of Veterinary and Animal Sciences
Mannuthy, Kerala. 680 651

Documents on scientific study of indigenous ducks available in India are scanty (Ramakrishnan, 1982). In Kerala, investigations on production performance of indigenous ducks have been carried out on certain aspects (George, 1977., Andrews, 1978., Ramakrishnan *et al.*, 1982 and Eswaran, 1983). However, these studies were not based on clearly identified phenotypic groups. Subsequent surveys (Ravindran, 1983) have given indication that duck farmers of Kerala have identified two distinct groups of indigenous ducks known as *Chara* and *Chemballi* based on their plumage colour. For genetic improvement and to develop viable breeding strategies production potential of these two types of indigenous ducks were evaluated.

Materials and methods

Five hundred sexed day-old female ducklings each from *Chara* and *Chemballi* types were brought from M/s. Susan Roy, Hatchery of Chennithala, Kerala. They were reared under deep litter system till eight weeks of age and thereafter under semi-intensive system with wallowing facility. Feed and water were provided *ad lib.* throughout the

experimental period. At 18 weeks of age, 300 females from each type were divided into three groups of 100 birds each, wing badged and were provided with individual nest to facilitate recording of individual performance.

Duck-day number and per cent and the duck-housed number and per cent for each type were calculated, to arrive at eight, 28 day laying period wise and weekly per cent duck-day and duck-housed egg production.

The data were statistically analysed as per the method described by Snedecor and Cochran (1980).

Results and discussion

Period-wise egg production

The average egg number per duck and per cent duck-day egg production of *Chara* and *Chemballi* for eight, 28-day laying periods from 129 days of age is presented in Table 1. The data indicated that *Chara* and *Chemballi* ducks during a production period of 224 days laid 116.09 and 124.95 eggs per duck upto 352 days of age. The corresponding overall per cent duck-day production was 44.49 in *Chara* and 48.68 in *Chemballi*. Statistically

* Part of Ph.D. thesis submitted by the first author to the Kerala Agricultural University.

** Present address: Assistant Professor, Dept. of Poultry Science, Lakhimpur College of Veterinary Science, Azad P.O., North Lakhimpur. 787 001. Assam.

Table 1 Egg number per duck and per cent duck-day egg production of *Chara* and *Chemballi* at eight, 28-day laying periods

Laying periods	Chara		Chemballi	
	Per duck	% Duck-day Mean \pm S.E.	Per duck	% Duck-day Mean \pm S.E.
1	2.01	5.70 \pm 1.17 ^a	2.16	6.86 \pm 1.25 ^a
2	13.07	39.93 \pm 1.01 ^a	12.84	40.83 \pm 1.07 ^a
3	16.50	52.83 \pm 1.59 ^a	17.28	56.38 \pm 1.82 ^a
4	17.86	54.51 \pm 0.93 ^a	17.83	57.42 \pm 1.16 ^a
5	21.16	62.33 \pm 0.83 ^b	22.29	67.11 \pm 0.97 ^a
6	18.07	54.76 \pm 1.14 ^b	20.29	64.59 \pm 1.28 ^a
7	14.97	42.68 \pm 1.12 ^b	17.42	48.53 \pm 1.48 ^a
8	12.45	42.75 \pm 1.73 ^b	14.54	47.71 \pm 2.08 ^a
Cumulative	116.09	-	124.95	-
Overall	-	44.49 \pm 1.18 ^b	-	48.68 \pm 1.29 ^a

Note: Figures with different superscripts in a line differ significantly ($P < 0.01$)

Chemballi laid significantly ($P < 0.01$) more number of eggs than *Chara*. There was gradual increase in egg production from first to 5th period and thereafter a decline in production was evident in both *Chara* and *Chemballi*. The highest egg production was found during 5th laying period in both *Chara* (62.33%) and *Chemballi* (67.11%). During five, six and seven laying periods *Chemballi* duck had significantly higher ($P < 0.01$) egg production than that of *Chara*.

The duck-day egg production of *Chara* and *Chemballi* during 8 periods were comparatively higher than those reported by Ramakrishnan *et al.* (1982), Andrews *et al.* (1984), Eswaran *et al.* (1985), Sivaselvam and Prabhakaran (1986), Gajendran *et al.* (1990) and Baruah *et al.* (1991) and lower than those observed in native duck by Hetzel (1981), Tai *et al.* (1989) and Velez *et al.* (1996).

The mean per cent duck-housed egg production of *Chara* and *Chemballi* at eight, 28 day laying periods from the date of first egg indicated an overall duck-housed production of 41.78% in *Chara* and 42.91% in *Chemballi* (Table 2). Statistically *Chemballi* had significantly higher ($P < 0.05$) duck-housed egg production. The present duck-housed egg production of *Chara* and *Chemballi* during eight periods were in accordance with the observations of Eswaran *et al.* (1984), while these values were higher than those reported by Ramakrishnan *et al.* (1982).

Weekly egg production

The mean weekly per cent duck-day and duck-housed egg production of *Chara* and *Chemballi* upto 52 weeks of age (Table 3) revealed that the egg production of both types fluctuated from week to week. Ramakrishnan *et al.* (1982) also observed similar trends.

Table 2 Per cent duck-housed egg production of *Chara* and *Chemballi* at eight, 28- day laying periods

Laying periods	Chara	Chemballi
	Mean \pm S.E.	Mean \pm S.E.
1	5.70 \pm 1.17 ^a	8.86 \pm 1.25 ^a
2	39.65 \pm 0.98 ^a	40.38 \pm 1.02 ^a
3	50.94 \pm 1.50 ^a	53.88 \pm 1.72 ^a
4	51.04 \pm 0.83 ^b	53.69 \pm 0.96 ^a
5	58.24 \pm 0.76 ^a	57.32 \pm 1.14 ^a
6	50.35 \pm 1.06 ^a	52.69 \pm 1.06 ^a
7	39.19 \pm 1.03 ^a	39.35 \pm 1.21 ^a
8	39.17 \pm 1.59 ^a	39.08 \pm 1.86 ^a
Overall	41.78 \pm 1.09 ^b	42.91 \pm 1.12 ^a

Note: Figures with different superscripts in a line differ significantly ($P < 0.05$ and $P < 0.01$)

Throughout the production period upto 52 weeks of age, there were two peaks in egg production in both *Chara* and *Chemballi* types. The first peak was recorded in both types on 30 weeks of age in the month of June-July and the second peak was found in *Chara* on 37th week in the month of August and in *Chemballi* during 35th week of age in the month of August itself. The present finding was in agreement with the earlier report of Ramakrishnan *et al.* (1982), who also observed two peaks in egg production. The maximum weekly production was as high as 69.77 per cent duck-day in *Chemballi* and these records were in par with the highest production (70%) reported by Ramakrishnan *et al.* (1982). The peak production was only for a very short duration and Ramakrishnan *et al.* (1982) attributed these peaks to possible differences in the release of leutinising hormone.

The frequency distribution of egg number per duck upto 50 weeks of age recorded for *Chara* and *Chemballi* (Table 4)

indicated that 33% of *Chara* and 27% of *Chemballi* laid eggs less than 100 number. In a similar study, Eswaran (1983) found maximum number of Kerala desi that laid towards the minimum range i.e., less than 50 eggs.

The frequency distribution table further indicated wide variation in egg production in both the flocks of duck. Hence, for improvement of egg production of the flocks to the optimum range of 150 and above, performance traits of the ducks may be recorded in an organised manner so as to apply appropriate selection and mating system taking cognisance of the genetic parameters to make refinement in this primary trait.

Summary

A study was conducted to evaluate the egg production performance of two distinct indigenous types of ducks namely *Chara* and *Chemballi* of Kerala. Five hundred sexed day-old female ducklings from each type were

Table 3 Weekly per cent duck-day and duck-housed egg production of *Chara* and *Chemballi* upto 52 weeks of age (Mean \pm SE)

Age in Weeks	Chara		Chemballi	
	% Duck-day	% Duck-housed	% Duck-day	% Duck-housed
19	0.53 \pm 0.08	0.53 \pm 0.08	0.46 \pm 0.08	0.46 \pm 0.08
20	1.33 \pm 0.34	1.33 \pm 0.34	1.95 \pm 0.51	1.95 \pm 0.51
21	5.19 \pm 1.04	5.19 \pm 1.04	6.19 \pm 0.63	6.19 \pm 0.63
22	10.00 \pm 1.69	10.00 \pm 1.69	12.33 \pm 0.99	12.33 \pm 0.99
23	28.81 \pm 1.04	28.81 \pm 1.04	32.14 \pm 1.01	32.14 \pm 1.04
24	38.19 \pm 0.62	38.16 \pm 0.61	38.39 \pm 1.27	38.28 \pm 1.27
25	42.12 \pm 1.35	41.76 \pm 1.35	45.04 \pm 1.05	44.53 \pm 1.04
26	43.93 \pm 0.94	43.33 \pm 0.93	40.43 \pm 1.49	39.67 \pm 1.49
27	48.91 \pm 1.89	48.00 \pm 1.82	52.44 \pm 2.60	50.52 \pm 2.45
28	43.34 \pm 1.69	42.43 \pm 1.65	49.08 \pm 2.01	46.99 \pm 1.94
29	51.57 \pm 3.09	50.14 \pm 2.98	52.23 \pm 2.72	49.81 \pm 2.59
30	61.69 \pm 1.06	59.57 \pm 1.00	69.23 \pm 1.58	66.00 \pm 1.51
31	56.33 \pm 1.22	52.76 \pm 1.23	54.19 \pm 1.53	51.67 \pm 1.45
32	55.77 \pm 0.64	52.71 \pm 0.58	55.60 \pm 1.14	52.99 \pm 1.07
33	49.20 \pm 1.43	46.84 \pm 1.64	53.49 \pm 1.07	49.86 \pm 0.87
34	56.11 \pm 2.21	51.95 \pm 1.99	63.74 \pm 1.91	58.48 \pm 1.64
35	62.45 \pm 1.44	57.67 \pm 1.33	69.77 \pm 0.87	62.72 \pm 0.79
36	64.17 \pm 1.95	59.19 \pm 1.77	68.50 \pm 1.12	59.67 \pm 1.74
37	65.11 \pm 1.21	59.91 \pm 1.12	62.87 \pm 1.28	51.76 \pm 1.05
38	61.13 \pm 1.69	56.24 \pm 1.56	67.69 \pm 2.79	57.24 \pm 2.69
39	59.26 \pm 1.62	54.38 \pm 1.57	67.69 \pm 1.82	55.48 \pm 1.50
40	58.44 \pm 0.82	53.76 \pm 0.76	68.86 \pm 1.56	56.24 \pm 1.27
41	50.16 \pm 1.66	46.14 \pm 1.53	61.39 \pm 2.25	50.05 \pm 1.80
42	56.57 \pm 0.79	52.05 \pm 0.73	64.87 \pm 1.38	52.76 \pm 1.12
43	40.53 \pm 1.32	37.29 \pm 1.22	47.42 \pm 1.73	38.57 \pm 1.41
44	49.84 \pm 1.14	45.86 \pm 1.05	57.03 \pm 1.71	46.33 \pm 1.39
45	44.62 \pm 1.29	40.90 \pm 1.19	51.09 \pm 2.82	41.30 \pm 2.34
46	36.21 \pm 1.17	33.19 \pm 1.08	40.09 \pm 0.64	32.48 \pm 0.52
47	39.01 \pm 0.98	35.76 \pm 0.89	41.45 \pm 1.26	33.57 \pm 1.02
48	39.84 \pm 0.97	36.52 \pm 0.89	46.85 \pm 1.97	37.95 \pm 1.59
49	51.84 \pm 1.64	47.52 \pm 1.51	59.73 \pm 1.32	50.11 \pm 2.46
50	45.88 \pm 2.25	42.00 \pm 2.08	49.15 \pm 2.68	39.81 \pm 2.17
51	8.29 \pm 3.68	7.57 \pm 3.36	8.82 \pm 4.07	7.14 \pm 3.29
52	0.73 \pm 0.08	0.67 \pm 0.07	0.53 \pm 0.08	0.43 \pm 0.06
Overall	41.91 \pm 3.02	39.71 \pm 3.20	45.90 \pm 3.71	40.46 \pm 3.22

Table 4 Frequency distribution of egg number per duck for *Chara* and *Chemballi* upto 50 weeks of age

Sl.No	Number of eggs (Range)	Chara		Chemballi	
		Number	(%)	Number	(%)
1	Less than 100	99	33.0	81	27.0
2	100-109	36	12.0	27	9.0
3	110-119	51	17.0	36	12.0
4	120-129	48	16.0	51	17.0
5	130-139	33	11.0	42	14.0
6	140-149	27	9.00	27	9.0
7	150-159	6	2.0	24	8.0
8	160 and above	-	-	12	4.0
	Total	300	100.0	300	100.0

reared under semi-intensive system adhering to scientific managerial practices. Egg production was recorded by providing individual laying nest. The average egg number per duck upto 50 weeks of age was 116.09 in *Chara* and 124.95 in *Chemballi*. The corresponding mean per cent duck-day production in *Chara* and *Chemballi* was 44.49 and 48.68 respectively. The mean duck-housed egg production to 50 weeks of age in *Chara* and *Chemballi* was 41.78 and 42.91 respectively. The mean weekly per cent egg production of both types of ducks upto 52 weeks of age widely fluctuated from week to week and during the production period there were two peaks in egg production. From the individual production records it was seen that there were no definite clutch size or pauses. Egg production upto 50 weeks of age was significantly superior in *Chemballi* ducks in comparison to *Chara* ducks.

Acknowledgement

The authors thank the Indian Council of Agricultural Research for providing fund to carry out the experiment.

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