Indian Vet. J., May 2013, 90 (5) : 42 - 44

Effect of Mating Ratio on the Hatching Performance of Guinea Fowl

K. Premavalli[1], R.Rajendran, M.Babu and A.V. Omprakash

Institute of Poultry Production and Management, TANUVAS, Nandanam, Chennai – 600035.

(Received : 26-07-2012; Accepted : 22-09-2012)

Fertility and hatchability are important factors in guinea fowl production and are influenced by both genetic and environmental causes. (Stromberg, 1975). Guinea fowls are wild, essentially territorial, monogamous and seasonal in their reproductive habits. A number of other factors including age of the egg, storage condition, age of flock, system of husbandary and rearing technology, mating ratio, incubation, relative humidity and eggs turning angle have been shown to influence the hatchability of poultry eggs.

A major item of expense in producing hatching eggs is keeping male birds. Mating ratio is also an important factor affecting fertility. Too many males or fewer males lead to reduced fertility. Therefore it is recommended to have optimum mating ratio for the production of good quality fertilized eggs and optimum hatchability. Information on mating ratio on the hatching performance of guineafowl is rather scanty. The present study was undertaken to find out the optimum mating ratio by seeing the effect of various mating ratios on fertility and hatchability of pearl guineafowl.

Materials and Methods

This experiment was conducted at the Institute of Poultry production and management, Tamil Nadu Veterinary and Animal Sciences University, Madhavaram, Chennai. The Experimental pearl guineafowl flocks were randomly allotted to different mating ratios (male: female) viz., 1:1, 1:2, 1:3, 1:4 and 1:5 under deep litter system of management. The hatchings eggs were collected from 31 to 35 weeks old birds and five consecutive settings was made during May- June, the summer season in Tamil Nadu. The eggs were collected every morning, graded, fumigated and stored at 18°C with 75-80% relative humidity. After 7 days storage, they were brought into room temperature by keeping them for one hour and then sent for incubation after proper cleaning, disinfection and fumigation. The temperature of 99.5°F in dry bulb and relative humidity of 87°F in wet bulb were set to incubate the eggs for 24 days during which they were turned at hourly interval by automatic turner. Thereafter, these eggs were transferred to the hatcher where temperature of 98.5°F in dry bulb and relative humidity of 90°F in wet bulb were maintained. Hatching started on the day 26th and was completed by the end of the 27th day. At the end of hatching process, number of infertile eggs, number hatched and embryonic mortalities (early and late) were recorded. The data generated were analyzed statistically by following standard procedures.

Results and Discussion

The mean per cent fertility was 63.62 and it was 21.31, 67.12, 72.73, 81.05, and 75.89 for the birds with the mating ratio of 1:1, 1:2, 1:3, 1:4 and 1:5, respectively. Statistical analysis revealed that the mating ratio had significant ($P<0.01$) influence on the fertility. Fertility increased in a linear fashion as the number of females per

[1]*Corresponding author* : Email : drpremavalli@gmail.com

male increased. Higher fertility rates were observed in flocks where male to female ratio was 1:4(81.05%) and 1:5(75.89%). Ayorinde *et al.* (1989) reported that in guinea fowls reared on the deep litter system with a mating ratio of one male to four or five females, fertility of 34 to 74 percent was obtained and mean per cent fertility over three breeding seasons in local guinea fowls reared on the deep litter were 42.4, 54.0 and 59.3 for the first, second and third seasons, respectively. The mean per cent fertility value (75.89%) obtained in this study when followed at 1:5 mating ratio was higher than the value (49.97%) reported by Nwagu *et al*. (1997).

Mean per cent hatchability on total eggs set was 49.45 and it was 13.11, 47.95, 50.00, 73.68 and 62.50 for the birds with the mating ratio of 1:1, 1:2, 1:3, 1:4 and 1:5 respectively, and variations were highly significant (P<0.01). The birds with mating ratio of 1:4 and 1:5 had significantly (P<0.01) higher total hatchability (73.68, 62.50%) which was higher than the 32.97% reported by Nwagu *et al*. (*loc. cit*) who maintained a mating ratio of 1:5 in the experimental guinea fowl flock.

Mean per cent hatchability on fertile eggs was 75.00 and it was 61.54, 71.43, 68.75, 90.91 and 82.35 for the birds with the mating of 1:1, 1:2, 1:3, 1:4 and 1:5 respectively, and variations were significant (P<0.05). Mating ratio had a statistical significance (P<0.05) on hatchability on fertile eggs. The birds with mating ratio of 1:4 and 1:5 had significantly higher (P<0.05) fertile hatchability (90.91, 82.35%).

Non significant differences were observed in per cent total embryonic mortality on fertile egg and the mean value was 25.00 and 38.46 28.57, 31.25, 9.09 and 17.65 for the birds with the mating ratio of 1:1, 1:2, 1:3, 1:4 and 1:5, respectively. Lower per cent total embryonic mortality % dead in germ (2.60, 8.24) and dead in shell (6.49, 9.41) were recorded at 1:4 and 1:5 mating ratios respectively. However, Nwagu *et al*. (*loc. cit*) observed that 14.02% dead in germ and 12.72% dead embryo in shell in pearl guinea fowl flocks where male to female ratio was maintained at 1:5.

Summary

The study showed that the mating ratio had significant effect on hatching performance of pearl guinea fowl. The birds with mating ratio of 1:4 and 1:5 had significantly (P<0.01) higher fertility (81.05, 75.89%), total hatchability (73.68, 62.50%) and fertile hatchability (90.91, 82.35%). Hence it is concluded that mating ratio of 1:4 and 1:5 may be optimum for guineafowl birds reared under intensive system of

Table. Effect of mating ratio on the hatching performance of guineafowl

Mating Ratio	No. eggs Incubated	Fertility %**	Total Embryonic mortality^{NS}	Dead in germ %*	Dead in shell %^{NS}	Hatchability (%) Total Hatchability**	Hatchability (%) Fertile Hatchability*
1:1	122	21.31^{e}	38.46	23.08^{c}	15.38	13.11^{e}	61.54^{c}
1:2	73	67.12^{abcd}	28.57	18.37^{abc}	10.20	47.95^{abcd}	71.43^{bc}
1:3	66	72.73^{abc}	31.25	16.67^{abc}	14.58	50.00^{abc}	68.75^{bc}
1:4	95	81.05^{a}	0.09	2.60^{a}	6.49	73.68^{a}	90.91^{a}
1:5	112	75.89^{ab}	17.65	8.24^{ab}	9.41	62.50	82.35^{ab}
Overall mean	468	63.62	25.00	13.79	11.22	49.45	75.00

**Means bearing different superscripts in columns differ significantly (P<0.01)

management as they had good fertility, hatchability and low embryonic mortality.

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Indian Vet. J., May 2013, 90 (5) : 44 - 45

Effect of Yeast Supplementation on Growth Performance and Carcass Characteristics in Weaned Piglets

Sachin Kumar[1], A.K. Verma and O.P. Malav

Division of Animal Nutrition, Indian Veterinary Research Institute, Izatnagar, Bareilly 243122, Uttar Pradesh

(Received : 14-07-2012; Accepted : 25-09-2012)

Weaning is a stressful practice for young piglets involving nutritional, environmental, social and microbial stresses (Lalles *et al*., 2008). These stresses cause many adverse effects viz. reduced feed intake, impaired intestinal morphology and function, a high incidence of diarrhea (Pluske *et al.,* 1997). Antibiotics have traditionally been widely used in nursery pigs to solve post-weaning problems. However, ban of antibiotics in feed by the European Union and growing public demand for safe and qualitative meat over the use of antibiotics as feed additives has encouraged recent commercial interest in probiotics to ameliorate the weaning stress and to enhance the growth performance and carcass attributes of pigs. Hence the present study was conducted to assess the effect of feeding live *Saccharomyces cerevisiae* (yeast) on growth performance and carcass characteristics in crossbred (Landrace × Desi) weaned piglets.

Materials and Methods

12 crossbred piglets of 4-6 weeks age were randomly selected on their body weights and assigned to two different groups (T1 and T2), each containing 6 animals. T1 fed with basal diet alone served as control while T2 was fed basal diet supplemented with live *S. cerevisiae*. Basal diet was formulated as per NRC (1998). Crushed maize was fermented with *S. cerevisiae* (2-3x10^6 cfu/g feed) and fed @ 200g (on fresh basis) /piglet/day in group T2. The study was continued for 150 days. At the end of the experiment all the piglets were slaughtered. Carcass characteristics and biochemical properties of the *longissimus dorsi* muscles were also studied.

The *S. cerevisiae* (yeast) culture was maintained by repeated sub culturing on agar slants. The ingredients of yeast extract peptone

[1]*Corresponding author* : Email : arensachin@gmail.com