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Effect of Supplementation of Shell Grit on Performance of Desi Birds under Backyard System of Rearing

Muthusamy N.*
Krishi Vigyan Kendra, TANUVAS,
Veterinary College and Research Institute Campus, Namakkal (Tamil Nadu), India.

(Corresponding author: Muthusamy N.)*
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ABSTRACT: The additional supplementation of shell grit as calcium source improves the egg shell quality. The objective of the experiment was to study the effect of supplementation of shell grit on egg production, hatchability and economics of desi bird in backyard system rearing. The Front Line Demonstration (FLDs) was conducted at Naraikinaru and Mangalapuram Village in Namagiripettai block of Namakkal District in Tamilnadu. In this village 10 backyard desi bird farmers were selected, each farms grouped into two (T_1: Farmers practice (FP) was not supplemented shell grit and T2 supplemented with shell grit @ 5-7 g/bird/day with the size of 2 mm in the evening), each group consist of 3 desi birds reared under backyard. The average egg production per bird per cycle was significantly (P<0.05) higher in shell grit supplemented group compared to control. The supplementation of calcium from shell grit significantly (P<0.05) decreased cracked egg percentage results in hatchability was significantly (P<0.01) increased under natural brooding compared to control. BCR was higher in shell grit supplemented group compared to control.

Keywords: Shell grit, Calcium, Hatchability, Egg shell, Backyard.

INTRODUCTION

In India, growth in the livestock sector contribute to poverty reduction, because of the peoples lived in rural areas depends on livestock for their daily livelihoods. The demand for the animal protein source is increasing rapidly in developing countries. Rearing of local poultry breeds in backyard is an important source of livelihood for the rural people. Backyard poultry production system is a low input business and is characterized by indigenous night shelter system, scavenging system, natural hatching of chicks, poor productivity of birds, with little supplementary feeding, local marketing and less health care practice. Small holdings containing 2-3 hens per unit to be more efficient producer of eggs compared to those with 5 or more hens per unit. The interest of the poultry farmers having backyard poultry is not production of eggs as returns are very low from sale of eggs. They hatch all their eggs and sale them as birds because of broodiness habit of these breeds.

The percentage of hatchable egg was low in country chicken due to inferior quality of egg shells specifically in second and third laying cycle. A significant inverse relationship between shell thickness and the percentage of cracked eggs was identified (Roberts, 2004). Dietary Ca is one of the primary factors affecting egg shell quality and shell strength (William *et al.,* 2006**).**

The particle size of Ca sources and dietary factors influence calcium availability to the laying hens. As eggshell is usually formed during the night, when hens do not eat feed, the advantage of the use of larger particles of shell grit is its slower passage through the gastrointestinal tract. This makes Ca available for eggshell formation, with consequent lower mobilization of bone Ca by the laying hens (Harms, 1982).

The egg contains 2.2 g of calcium and 95 % of calcium in the form of calcium carbonate in the eggshell (Pelicia *et al.,* 2009). During the laying phase of desi bird in backyard system of rearing, calcium supplied as calcium carbonate in the form of calcite, limestone, oyster shell and marine shells to improve egg shell quality (Rajkumar *et al.,* 2021).

Hence, the objective of the experiment was to study the effect of supplementation of shell grit on egg production, hatchability and economics of desi birds under backyard system of rearing.

MATERIALS AND METHODS

The study was conducted at Naraikinaru and Mangalapuram Village in Namagiripettai block of Namakkal District in Tamilnadu. In Naraikinaru and Mangalapuram village, 10 backyard desi bird farmers were selected for this study. Each farms grouped into two, Each group consist of 3 desi birds. The two treatment groups were T_1: Farmers practice (FP) was not supplemented shell grit and T2 supplemented with shell grit @ 5-7 g/bird/day with the size of 2 mm in the evening. All the birds reared under backyard with the same feeding schedule. The desi bird egg was collected daily.

RESULTS AND DISCUSSION

Effect of shell grit on desi bird laying hen performance was shown in Table 1. The average egg production per bird per cycle was significantly (P<0.05) higher in shell grit supplemented group compared to control. Similarly, the layer fed with high calcium diet significantly improved production performance (William *et al.,* 2006). The high egg production per cycle due to longer retention time of shell grit in the gizzard increases the digestibility of feed (Nam *et al.,* 1998). However, in this study additional supplementation of shell grit not influenced egg weight. In contrast to results of the present study, Saki *et al.* (2019) reported that the supplementation of shell grit significantly decreased egg weight

The supplementation of calcium from shell grit significantly (P<0.05) decreased cracked egg percentage results in hatchability was significantly (P<0.01) increased under natural brooding compared to control. Dietary supplementation shell grit increased the shell thickness (Olgun *et al*., 2015). Similarly, additional supplementation of calcium from shell grit, stone grit and marblr chips improved the egg shell quality in desi birds under backyard system of rearing (Rajkumar *et al*., 2021). The poor egg shell quality with cracked egg decrease the hatchability and high embryonic mortality (Barnett *et al.,* 2004).

The economics of supplementation of shell grit in desi bird layer was presented in table 2. The highest income per unit (Rs 868) was recorded in shell grit supplemented group compared to control (Rs. 616). The BCR was higher in shell grit supplemented group compared to control.

Table 1: Effect of supplementation of shell grit on egg production and hatchability in desi chicken.

Treatment	Average Egg production/bird/clutch (Nos)	Egg weight (g)	Cracked eggs (%)	Hatchability (Natural brooding) %
T1	11.6[a]	37.2	12.35[b]	75.59[a]
T2	14.6[b]	38.2	4.30[a]	84.98[b]
P Value	0.003	0.29	0.03	0.001

Table 2: Economics of effect of supplementation of shell grit on desi chicken.

Treatment	Income (Rs./unit)	Cost of production (Rs./unit)	Profit (Rs./unit)	BCR
T1	616	232	232	1.64
T2	868	292	292	1.97

CONCLUSIONS

The present study revealed that, additional supplementation of shell grit increased the egg production, hatchability and improved the livelihood of the backyard poultry farmers. In future, effect of supplementation of shell grit on survivability of chicks upto one month may be studied.

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Conflict of Interest. None.

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