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Effect of Egg Size on the Hatching Performance of Beltsville Small White Turkey

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A number of factors including nutritional, bird, egg, incubation factors and environmental factors have been shown to influence the hatchability of poultry eggs. (King'ori, 2011). Egg weight is an important parameter that influences hatchability. Egg size affects hatchability. Asuquo and Okon, (1993) recorded low hatchability in small turkey eggs (less in weight) compared to that of medium and large egg. Published literature on the effect of egg size on hatching performance of turkey birds in India is limited. Hence, a study was conducted to determine the effect of egg size on the fertility and hatchability of Beltsville Small White turkey and also to study the optimum egg size for good hatchability. This study would enable good hatchability through optimum egg weight for better profitability.

Materials and Methods

A study was conducted at the Institute of Poultry Production and Management, Tamil Nadu Veterinary and Animal Sciences University, Chennai. One thousand sixty nine hatching eggs were collected from Beltsville Small White turkey breeder flock, aged 40 weeks, incubated in two batches. The hatching eggs were weighed and grouped into six categories based on weight viz., (61 – 65g, 66 – 70g, 71 – 75g, 76 – 80g, 81 – 85g and more than 85g. The eggs were collected, weighted, graded, fumigated and stored at 18°C with 75% relative humidity in physiological zero room. After 7 days of storage, hatching eggs were moved to ambient temperature, kept for one hour and then set for incubation. The setter was maintained at 99.5°F and 87°F in dry and wet bulb reading so as to provide an ideal temperature and relative humidity for first 24 days of incubation. The eggs were turned at hourly interval by an automatic turner. On 25th day of incubation, the eggs were transferred to hatcher, in which 98.5°F in dry bulb and 90°F in wet bulb reading were maintained so as to provide an ideal temperature and relative humidity. Hatching started on day 27 and was completed by the end of the 28th day of incubation. Number of poults hatched was recorded. Unhatched eggs were examined for early and late embryonic mortality. The data were analyzed statistically as per Snedecor and Cochran (1994).

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Results and Discussion

The results of the effect of egg weight on the hatching performance of Beltsville small white turkey in present in Table I. The mean egg weight of Beltsville small white turkey in 75g. Of the total 1069 hatching eggs, 65.76% weighed between 71-80g, 20.67 % were more than 80g and the rest (13.57%) weighed 61-70g.

The mean per cent fertility was 81.64. Statistical analysis revealed that the egg size had no significant ($p>0.05$) influence on fertility. Similar observation made by Alabi *et al.* (2012) in indigenous Venda chicken, Petek *et al.* (2005) in quails and Sahin *et al.* 92009) in breeder hens. However, the mean per cent fertility found in this study was lower than the value (90.95%) reported by Anna Anandh *et al.* (2012) in turkey.

The mean per cent hatchability on total eggs set was 53.68. Egg size had no significant ($p>0.05$) influence on total hatchability. However, the egg weight groups of 71 – 75, 81 – 85 and 76 – 80g, had numerically higher total hatchability (65.04, 62.12 and 59.31%) than other groups. In general, as the egg weight increased from 61 to 75 g, the total hatchability improved from 40.28 to 65.04% and declined from 86g onwards. The overall mean per cent hatchability on total egg set observed in this study was lower than the value (77.38%) reported by

Table I. Effect of egg weight on the hatching performance of Beltsville Small White turkey

Egg weight(g)	No. eggs incubated	Fertility % NS	Dead in germ %*	Dead in shell % NS	Hatchability (%)	
					Total Hatch-ability NS	Fertile Hatch-ability*
61-65	30	77.78	26.54^{d}	21.54	40.28	51.92^{c}
66-70	115	84.81	19.42^{bcd}	17.52	53.96	63.06^{bc}
71-75	348	83.35	6.12^{a}	16.07	65.04	77.81^{a}
76-80	355	85.17	8.30^{ab}	21.98	59.31	69.71^{ab}
81-85	154	87.07	9.32^{abc}	19.82	62.12	70.85^{ab}
>85	67	71.66	23.73^{cd}	17.63	41.34	58.65^{bc}
Overall mean	**1069**	**81.64**	**15.57**	**19.09**	**53.68**	**65.33**

*Means bearing different superscripts in the same column differ significantly
* Significant (P<0.05); NS-Non Significant

Anna anandh *et al.* (*loc cit.*) in turkeys reared under intensive system. Similarly, Mandlekar (1981) also reported that medium sized chicken eggs (45-50 g) had higher hatchability of 88.2% than the larger (51-56 g) sized eggs 84.8%.

The mean per cent hatchability of fertile eggs was 65.33. Egg size had a significant influence (P<0.05) on hatchability on fertile eggs set. Eggs weighed between 71 – 75g had significantly higher (P<0.05) fertile hatchability (77.81%) than other groups. As the egg weight increased from 61 to 75 g, the fertile hatchability improved from 51.92 to 77.81% and declined from 86g onwards. Medium size eggs showed higher fertile hatchability in this study and in agreement with the findings of Karacanta *et al.*, (1977) who reported that hatchability of turkey eggs was maximized with eggs weighing between 70-85.5g. This is also in agreement with the findings of Kalita (1994) and Abiola *et al.* (2008) who found that the medium sized eggs had higher hatchability in broiler chicken. However, the mean per cent hatchability on fertile eggs observed in this study was lower than the values (81.00%) reported by Anna Anandh *et al.* (*loc cit.*) in turkeys. Gonzalez *et al.* (1999) explained that medium-sized eggs could be expected to have enhanced ability to lose weight and breathe during incubation because of more pores in the shell surface area. The effect of egg size on hatchability could be due to a reduction in the surface area to volume ratio with increasing egg size making the gas heat exchange more difficult.

Significant differences (P<0.050 were observed in per cent dead in germ and the mean value was 15.57%. Significantly (P<0.05) low dead in germ (6.12 %) was recorded in egg size of 71-75g group followed by egg size groups of 76-80g (8.30%) and 81 – 85g (9.32%). This was lower than the value (17.44 %) reported by Anna Anandh *et al.* (*loc cit.*) in turkeys. Non-significant differences (P>0.05) were observed in dead in shell among different egg size groups. The mean per cent dead in shell was 19.09. Numerically low dead in shell (16.07%) was recorded in egg size of 71-75g group. This was lower than the value (17.44 %) reported by Anna Anandh *et al.* (*loc cit.*).

Summary

This study on effect of egg size on the hatching performance of Beltsville Small White turkey showed that the egg size had significant (P<0.05) effect on the hatching performance of Beltsville Small White turkey. Eggs weighing 71 – 75g had significantly (P<0.05) higher fertile hatchability (77.81%), numerically high total hatchability (65.04%) and significantly (P<0.05) low dead in germs (6.12%) and dead in shell (16.07%). It is concluded that medium sized Beltsville Small White turkey eggs weighing 71 to 85 g are optimum for obtaining good hatchability.

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Influence of Broiler Starter and Finisher Rations on the Growth Performance of Guinea Fowl Keets

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Nutritional requirements of Guinea fowl are not yet standardized in India. Broiler feeds are commonly used to feed guineafowls in rural areas of Tamilnadu. Documentation of production performance of Guineafowl fed with commercial broiler starter and finisher rations under hot and humid climatic condition of Tamilnadu is rather scanty. Hence, the present study was designed to find out the influence of broiler starter and finisher rations on the growth performance of guinea fowl keets which will be very useful for the farmers to procure and/or produce optimum feed for their guinea fowl birds to tap maximum growth potential.

Materials and Methods

A eight weeks biological experiment was conducted to find out the influence of broiler starter and finisher rations on the growth performance of Nandanam Guinea fowl 1 (a strain developed by Tamilnadu Veterinary and Animal Sciences University, Chennai, India). A total of eight keet at day old age were individually weighed and wing banded and randomly distributed into four treatments with two replicates each. Each replicate had ten number of keets. The treatment groups consisted of T1- Guinea fowl pre-brooder mash (ME-2875 kcal/kg & CP-24% for 0-4 wks) + Guinea fowl brooder mash (ME-3000 kcal/kg & CP-20% for 5-8wks), T2 - Broiler starter mash (ME-2900 kcal/kg & CP-22% for 0-8 wks), T3 - Broiler finisher mash (ME- 3000 kcal/kg & CP-20% for 0-8 wks) and T4- Broiler starter mash (ME-2900 kcal/kg & CP-22% for 0-4 wks) + Broiler finisher mash (ME-3000 kcal/kg & CP-20% for 5-8wks). Birds were reared in cages and standard managemental condition was followed throughout the experiment. The body weight, feed intake and livability were recorded biweekly from 0 day to 8th weeks of age. The

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