

Comparison of broiler chick performance in single stage incubation and multi stage incubation

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Introduction

Among livestock industries, poultry sector is widely spread throughout Sri Lanka. Chickens raised for meat purpose are broilers. In current broiler market, the competition is high. To face this competition, companies need to have strong production line with the companies. The main input of the broiler industry is day old chicks. The commercial operations depend on the hatcheries for the supplying of day old chicks. Hence, the hatchery should have considerable capacity to produce required amount of chicks to fulfill the demand using artificial incubation. Currently, the commercial markets have Single Stage (SS) and Multi Stage (MS) incubators. According to the specialists in the industry, the SS machines are more effective and efficient than the MS machine. To meet the competition successfully company need to establish an efficient machine type in incubation procedure. Therefore, the primary objective of this research is to compare the performance of broilers incubate in SS and MS incubators and to investigate the effect of SS and MS incubation on chick quality.

Methodology

The hatching eggs were obtained from Cobb 500 female × Cobb 500 male broiler breeders at 54 and 64 week old age. The collected eggs were graded using egg grading machine. The eggs weighing 63 g – 80 g were selected in present study. The setter trays were taken from top, middle and bottom positions from both SS and MS machines. Setter trolleys were set in the Petersime[®] SS setter machine and Petersime[®] MS setter machine. After 18 days, incubated eggs were transferred to the hatcher baskets. At the transferring, the weight was measured and recorded. Weight loss was calculated. The hatcher trolleys were placed in Petersime[®] hatcher machines.

Chick pullout (hatch-out) was obtained at the 21 day of incubation. Live hatched chicks were counted and recorded separately. Thirty newly hatched chicks were selected randomly from the hatcher baskets. The hatch residuals were collected separately, stocks in egg trays and tagged them for break out analysis. Death chicks were recorded separately. Chick weight was measures separately in the replications by using weighing scale and recorded. Chick length was measured using standard chick ruler and recorded in centimetres. Pasgar[®] scoring method was done to analysis chick quality. Breakout analysis was done using hatch residuals. Then chicks were sent through the chick grading and counting machine. Chicks were packed in

paper laid plastic chick boxes as 50 sets and 100 sets.

Chicks were vaccinated with IB, ND and IBD vaccines. Chick boxes were stock in chick room separately as SS and MS. Then chicks were transported to the boiler farm. Chicks were brooded at the closed housed using gas brooder. All chicks were given similar environmental condition, same floor space, feed, and water. Brooding, feeding and watering were automated. Weekly body weight gain, Feed conversion ratio (FCR) and weekly mortality data were collected at the broiler farm level. At the farm level, data were collected from SS - close house and MS - close house.

Results and Discussion

There was no significant difference between initial eggs set for the two machine types. The eggs set for the SS were had 69.73 ± 4.26 g of weight and 69.59 ± 3.93 g of eggs were set for the MS machine. Hence, there was no significant effect of machine type to the results obtained throughout the experiment. Yet, there was a significant relationship between machine type and weight loss. The highest weight loss was shown in eggs set in MS machine. Weight loss in SS machine was 9.1 ± 3.7 and MS was 11.5 ± 3.5 . The results obtained for the weight losses can be between 9 – 11% (Metzer, n.d.). The weight loss from SS and MS machines were lined within 9 – 11%. There was a significant different between two means ($P < 0.05$) of the chick weight. The MS incubated Day old chicks were shown a higher chick weight of 48.4 ± 3.5 g^b than SS incubated chicks (Table 01).

According to a study, the chicks have divided in to three groups and they were 18.0 – 18.3 cm as middle group, higher than 18.3 cm as large group and less than 18 cm as small group (Table 01). A positive correlation between chick length and chick weight was observed at day zero of age (Petek, *et al.*, 2010). The SS incubated chicks have lower FCR with compared to the MS incubated chicks in days 7 and days 14. There was a similar mortality percentage (1.3%) in SS and MS incubated chicks in the first week and no mortality in the second week at the brooding. Table 1 showed there was no significant difference between hatchability and fertility.

Table 01: Effect of incubation type on Weight loss, Day old chick weight, Chick length, Hatchability, Fertility and Average feed conversion ratio

Parameter	Incubation Type	
	Single-stage	Multi-stage
Weight loss (%)	9.10 ± 3.7 ^b	11.50 ± 3.50 ^a
Day Old Chick weight (g)	47.10 ± 3.5 ^b	48.40 ± 3.50 ^a
Chick length (cm)	19.20 ± 0.58 ^a	19.10 ± 0.59 ^a
Hatchability (%)	81.67 ± 2.21 ^a	82.08 ± 2.63 ^a
Fertility (%)	92.50 ± 1.48 ^a	92.00 ± 3.57 ^a
Average Feed conversion ratio	0.92	0.98

Means not labeled with letter a are significantly different from control level mean ($P < 0.05$)

There was a significant different ($P < 0.05$) in broiler weight gain. SS incubated chicks have been obtained higher body weight gain than the MS incubated chicks (Figure 01). It was a 19.23 g of body weight increment compared with the MS incubated chicks.

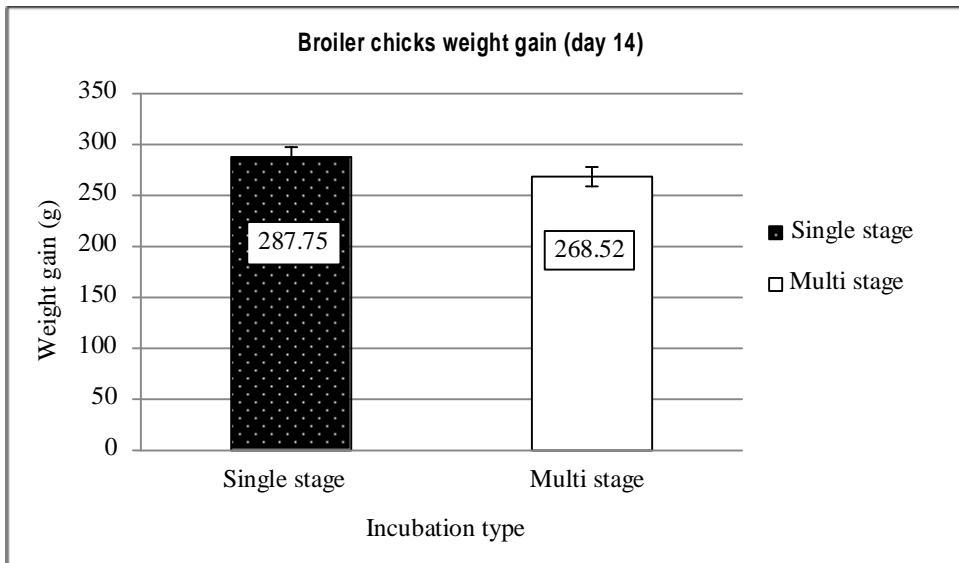


Figure 01: Bar chart of the broiler weight gain versus incubation

Conclusion

Multi stage incubated chicks have higher chick weight and incubation has effect on the broiler performances. Single stage incubated chicks show high quality than multi stage incubated chicks and incubation has effect on quality. Single stage incubated broilers show higher weight gain at the brooding time and incubation has affect to the broiler performances.

Acknowledgement

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References

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