International Journal of Chemical Studies

R Burhagohain
College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

D Sapcota
College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

K Boruah
Lakhimpur College of Veterinary Science, Assam Agricultural University, North Lakhimpur, Joyhing, India

G Bordoloi
Lakhimpur College of Veterinary Science, Assam Agricultural University, North Lakhimpur, Joyhing, India

S Khargharia
Lakhimpur College of Veterinary Science, Assam Agricultural University, North Lakhimpur, Joyhing, India

Hatchability of broiler chicken eggs on total egg set

R Burhagohain, D Sapcota, K Boruah, G Bordoloi and S Khargharia

Abstract
An investigation was aimed at to evaluate the hatchability of broiler chicken eggs and its variation among the hatcheries. The study was carried out in different hatcheries located in Guwahati city throughout the whole year, 2011. Total seventeen numbers of established hatcheries were included for the study and the required information and data were collected from the hatchery owners using a set of structured interview schedule specially prepared for the study. The highest hatchability rate on Total Egg Set (TES) was found in Dynamic hatcheries (81.53%) and lowest hatchability was found in Shivam hatcheries (75.91%). From the overall observation it could be concluded that the mean hatchability in the hatcheries was 78.49%. The Analysis of variance for hatchability (%) of broiler chicken eggs on TES basis has shown highly significant difference between the hatcheries ($P<0.01$) in hatchability (%) on TES.
However, further studies in this aspect with large numbers of hatcheries need to be carried out to conclusively authenticate the result.

Keywords: Hatchability, hatcheries, total egg set, broiler chicken

Introduction
Livestock and poultry plays a pivotal role in the rural economy of Assam from the ancient time. They contribute as a source of milk, meat, egg, manure, draught and transportation for the rural farmers. The state having a quite large livestock and poultry population in the country and it is the leading and prominent state among the North East region, comprising highest number of livestock and poultry. In Assam, the total poultry has increased by 71% and the total poultry is 46.7 million during 2019 [1]. The total meat production of the state from livestock sources is not sufficient to fulfill the required amount of animal protein as major part contributed from pig (Pork). In this regards poultry is the only facilitator and easy source of animal protein to combat the shortage of meat.

Assam is a state where people of different caste and creed reside. Most of the people of this region are in tribal community and they prefer meat in their daily dishes. Poultry meat particularly broiler chicken meat is well accepted by all the people in all forums, occasions, festivals and performing some religious rituals of this region. Broiler rearing is gradually increasing among the rural as well as urban farmers in commercial level as Broiler chicken demand is increasing at a rapid pace in the state. Different private poultry companies and NGO has emerged in this sector to introduce their product like chick, feed, poultry medicine etc. But these are in a nascent stage and they are unable to supply of day old chick in sufficient and required quantity in the state. Hence, to meet the demand of broiler chicken there is need of increase number and quality [2] day old chicks with optimum growth. Hatchability has been found to be the most important factor influencing the number and quality of chicks.

Materials and Method
The present study was carried out in hatcheries located in Guwahati city of Kamrup district (Assam). A total 17 numbers of established hatcheries were included for the purpose of this study for the whole year of 2011. A standard pre-tested questionnaire was prepared with the help of experts containing all the information to be collected. The required information and data were collected from the hatchery owners through a standard interview schedule and the data collected were quantified, computed, tabulated suitably and statistically analyzed as per the method by SAS Enterprise guide (2008) [3]

Corresponding Author:
K Boruah
Lakhimpur College of Veterinary Science, Assam Agricultural University, North Lakhimpur, Joyhing, India

Results and Discussion

The hatchability of Broiler chicken eggs was calculated on total egg set (TES) basis for the eggs set in different hatcheries in and around Guwahati city of Assam and presented in the Tables 1.1.

Table 1.1: Mean ± SE for hatchability rate on TES

S. No.	Name of hatcheries	Mean ± SE
1.	Arambagh hatcheries	79.08 [abc]±0.85
2.	Amrit hatcheries	77.53[cdef] ±1.08
3.	Alpine hatcheries	80.41[ag] ±1.09
4.	Classic group of hatcheries	78.20[bce] ±0.97
5.	Dynamic hatcheries	81.53[g] ±0.93
6.	D.R farms	78.01[bcef]±0.90
7.	Guwahati Enterprise	78.65[abce]±1.20
8.	Lotus chicks Pvt. Ltd.	78.05[bcef]±0.92

9.	Luit hatcheries	78.51[abce]±0.91
10.	Loknath hatcheries	80.26[ag] ±0.86
11.	MMNJ hatcheries	78.91[abc] ±0.95
12.	Poly poultry hatcheries	76.78[def] ±1.03
13.	Release hatcheries	76.15[df] ±1.25
14.	Shivam hatcheries	75.91[d] ±1.54
15.	Sundaram hatcheries	78.69[abce]±1.02
16.	Unique hatcheries	78.10[cbe] ±1.01
17.	UD hatcheries	79.58[ab] ±0.76

Means with at least one common superscript does not differ significantly ($P<0.01$) from each other.

The statistical analysis of variance for the hatchability rate has been presented in the Tables 1.2.

Table 1.2: Anova for hatchability rate on TES showing effect of hatcheries and seasons

Source of variation	DF	Sum of squares	Mean sum of squares	F value
Season	3	1329.40	443.13	78.42**
Hatchery	16	413.43	25.84	4.57**
Season × Hatchery	48	288.52	6.01	1.06[NS]
Error	136	768.53	5.65	
Total	203	2799.88		

**: Highly Significant ($P<0.01$).[NS]: Non –significant.

The average hatchability on TES in different hatcheries was found to be 78.49% and the mean hatchability on TES ranges between 75.91% to 81.53%. The highest rate of hatchability rate on TES basis was found higher in Dynamic hatcheries (81.53%) and it may be probably due to the good environment provided from obtaining the eggs to the hatching viz. proper transportation, uniform and congenial atmosphere during pre-incubation storage and good hygienic measures adopted in the hatcheries. The findings of present study are in agreement with [4] who observed that when broiler breeder eggs (TES) were subjected to 14 days pre- incubation storage of 6 hour significantly improved the hatchability. A slightly higher rate of hatchability rate was observed by [5] who noted that candling did not alter average hatchability, when calculations were based on total number of eggs set (84.53% vs. 84.07% respectively for candled and controlled eggs), And also a slightly higher result of 88.30±0.30 was obtained by [6] who observed in a laboratory experiment that when eggs were stored with broad end up and hatchability of eggs without turning and preheating.
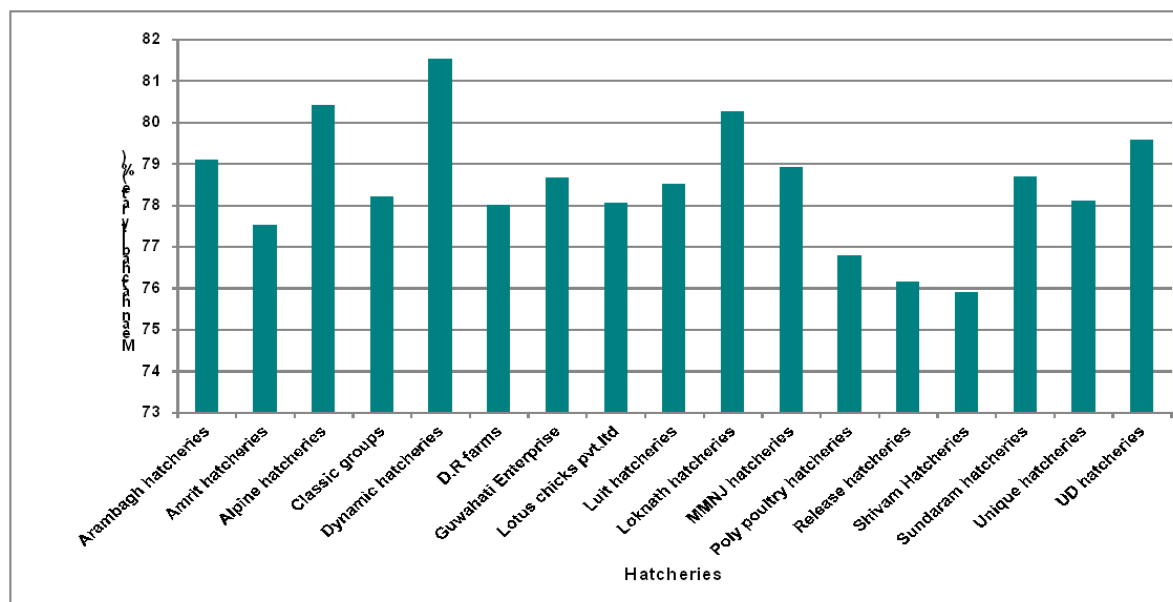

Fig. 1: Graphical representation of hatchability on total egg set shown by different hatcheries

The lowest hatchability rate on TES was found in Shivam hatcheries (75.91%) and this may be due to high environmental temperature, improper storage and longer duration of transport of hatching eggs. The result is in agreement with [7] who observed that the overall mean interval specific hatchability in their study was 75.90%.

Conclusion

The conclusions could be drawn from the present study that the hatchability found in the study was within the standard and there was variation in hatchability of broiler chicken eggs among the hatcheries. Moreover, seasonal variation was also found to be highly significant in hatching the broiler chicken

eggs. More study in this aspect is advocated, so that hatchability rate indifferent hatcheries could be improved in near future.

Reference
1. 20th livestock Census. Department of Animal Husbandry, Dairying and Fisheries. Government of India, 2019.
2. Potter MA, Bassett SM. Effects of transportation-induced jarring on ratite embryo development and hatching success. Conservation advisory Science Notes No. 341. 2001 Department of Conservation, Wellington.
3. SAS. Enterprise Guide, version 4.2. 2008. SAS Institute Inc., Cary, NC, USA.
4. Fasenko GM, Robinson FE, Whelan AI, Kremeniuk KM, Walker JA. Prestorage incubation of long-term stored broiler breeder eggs: 1. Effects on hatchability. Poult. Sci. 2001; 80(10):1406-1411.
5. Reis MH, Soares MC. The effect of candling on the hatchability Of eggs from broiler breeder hens. J. Appl. poult. Res. 1993; 2:142-146.
6. Mahmud A, Pasha TN. Effect of storage, preheating and turning during holding period on the hatchability of broiler breeder eggs. Pakistan J. 2008; 28(3):153-154.
7. Heier BT, Jarp J. An epidemiological study of the hatchability in broiler breeder flocks. Poult Sci. 2001; 80(10):1132-1138.