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## Studies on seasonal effects on production and fertility of VenCobb 430Y Broiler Breeder of Sinner Block at Nasik District, Maharashtra

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### Abstract

The seasonal effect on production and fertility at broiler breeder farm situated in Sinnar block of Nashik district, Maharashtra was assessed during the year 2020 to 2021 (March 2020 to February 2021). The hen day egg production percentage was higher in winter season (80.50%) in compared to summer (77.63%) the season performed significant role. because in production there is direct contact of climate and bird. Fertile egg percentage in winter season was highest (90.39%) in compared to summer season (88.67%) was performed significant role. production and fertility result shows that winter season is better than summer season because in summer there is high ambient temperature and bird is not able lay egg efficiently.

**Keywords:** VenCobb 430Y, seasonal effect, production, fertility

### 1. Introduction

The Indian poultry sector is characterized by its industrialization, faster growth in consumption and trade than any other major agricultural sectors in the world. Today, India is the third largest egg producer in the world after China and USA and the sixth largest broiler producer after USA, China, European Union, Brazil and Mexico. Based on the poultry industry's development during the last two decades and the need for increased animal protein sources in the hot regions of the world, there is general agreement that these areas are going to witness further expansion in the current decade. Although the need for more eggs and poultry meat is obvious and the availability of these products can go a long way to meet the protein needs of several populations in hot regions, there are several constraints to the future development of the poultry industry (Bhadauria *et al.* 2014) [3].

Dominates the poultry production in India with nearly 95% of the total egg production and the rest is contributed by ducks and others (DADF, 2014). Poultry breeding begins with parent stock, a group of poultry birds used for purpose of systematic breeding. For breeding chickens, a typical breeder intends to receive eggs, meat, and new, young birds for further reproduction. Both male and female broilers are slaughtered for their meat and 80 percent of the broilers are produced by Aviagen, Cobb-Vantress, Hubbard Farms, Hybro. (The Poultry consultancy 2009) [10].

### Impact of Climate on Poultry Production

The challenges posed by climate change fit broadly into one of two categories: loss of productivity or increasing costs. Regarding productivity, housing systems need to be managed to maintain optimal seasonal temperatures and reduce the risk of heat stress, and increased investment will be required in ventilation and cooling. Reproductive capacity may decrease. The Indian poultry sector is characterized by its industrialization, faster growth in consumption and trade than any other major agricultural sectors in the world. Today, India is the third largest egg producer in the world after China and USA and the sixth largest broiler producer after USA, China, European Union, Brazil and Mexico (FAO, 2014). India's contribution to world's egg and chicken meat production is nearly 5.3% and 2.53%, respectively (FAO, 2010a), whereas poultry sector contributes about 1% to national gross domestic product (GDP) and 11% of total livestock GDP in India. The estimated rate of growth in layers is 6-7% per annum and 10-15% for chicken meat. Thus, poultry development in the country has shown steady progress over the years. Along with this, poultry plays an important economic, nutritional and socio-cultural role in the livelihood of poor rural

households in many developing countries, including India. The need for more eggs and poultry meat is obvious and the availability of these products can go a long way to meet the protein needs of several populations in hot regions, there are several constraints to the future development of the poultry industry (Abioja, *et al.*, 2010) [1].

Gumulka, and Rozenboim, (2013) [6] reported that to use experienced (2 years or older) ganders with one year old geese is impractical in large scale production because the geese are kept for 4-5 years in production. In order to have experienced ganders for one year old geese a new breeding flock needs to be raised every year (or every second year) and these different age groups need to be managed on the same breeding farm. This is costly and requires a lot of housing. Okonkwo and Ahaotu, (2019) [2] studied that ambient temperature is high, chickens tend to have higher energy needs than when in thermo-neutral environments. Major losses result from a less efficient conversion of feed to meat; this also affects poultry health and productivity. As the feed consumption of the chickens decreases from 108.3g/bird/day at 31.6 °C to 68.9g/bird/day at 37.9 °C, the egg production will be reduced by 6.4% Ahaotu *et al.*,(2019) [2] reported that internal body temperature of domesticated gallinaceous birds (chickens) at 106°F to 108°F is measurably higher than that of mammalian livestock and humans (97°F to 102°F) According to Okonkwo and Ahaotu., (2019) [2] reported that the egg quality seasonal fluctuations limits the productivity of laying hens, as reflected by egg production and egg quality, as the bird diverts feed metabolic energy to maintain its body temperature constant, resulting in lower egg production, and particularly in lower egg quality. Pragma *et al.*, (2014) [8] reported that birds can only tolerate lowly temperature ranges to sustain the peak of their production for human consumption. The environmental conditions affecting the performance of chicken include temperature, relative humidity and light at a given time stated that as the ambient temperature increased to 34 °C, the mortality due to heat will be higher in broilers by 8.4%. Sohail *et al.*, (2012) [9] studied that growth and Production Efficiency Seasonal fluctuations depress growth rate and production as a result of a down-turn in voluntary feed intake in birds. Jassim *et al.* (1996) [7] reported that Infertility and embryonic mortality are economically important for the commercial broiler industry because they are components of hatchability. Embryonic mortality in chickens is not uniformly distributed over the course of incubation; two phases of embryonic mortality are characteristic of chicken development. The objective of this paper was to develop a mathematical model to assess infertility and to characterize the distribution over time of embryonic mortality in chickens. Chowdhury *et al.* (2004) [5] stated in a report that an extreme weather condition was one of the factors responsible for infertile eggs. Though the temperature was decreasing from April till August, the fertility did not significantly improve until September through December. The highest hatchability of total eggs set in layer-breeder hens recorded in December was not different from other months except February and March. In both Jos and Ibadan, the highest mean temperature was recorded in February and March, which fall within the hot-dry season.

**Material and Methods**

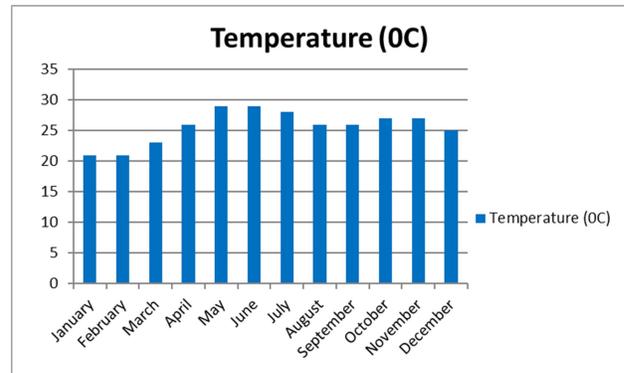
**Selection and description of site**

The study was conducted in “Om poultry farm” at village Vedzire, Sinnar Block of Nasik District, Maharashtra. The

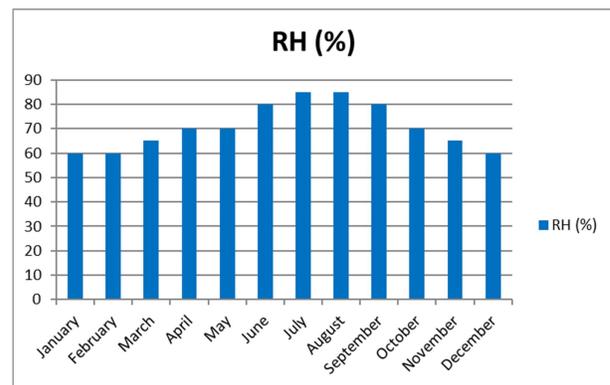
farm is located away from villages and industries area to get the optimum result and benefits in hatchery. Nasik is the place knows for poultry in country after paladam of Tamil Nadu and the climatic condition is always in comfort zone. Its the success to get optimum production to Nasik farmer. ( fig no 1 and fig No 2 showed the temperature and relative humidity of sinnar block, Nashik District, Maharashtra.

**Table 1: Season**

Seasons	Month
Winter	Sept, Oct, Nov, Dec, Jan, Feb
Summer	March, April, May, June, July, Aug



**Fig 1: Temperature Sinner Block of Nasik District, Maharashtra**



**Fig 2: Relative humidity Sinner Block of Nasik District, Maharashtra**

**Breeder management practices**

Management practices is very important to rearing of breeders birds to get optimum production and result. Management practices was fowllwed Cobb Breeder manual guide and Cobb hatchery management guide by Om poultry farm. Management practices during reserch period followedhousing system management, brooding, growing, laying management, peak production management, feeding management, biosecurity management,water management, heat stress management, etc.All management practices was followed by Om poultry farm as per the Cobb breeder management guide and hatchery manual. Other than all the management practices were followed as per the Cobb SOP (Standerd operating process) of vencobb.

**Table 2:** Distribution of Month as Replication

T.R.	Months	T.R.	Months
Winter R <sub>1</sub>	Sept	summer R <sub>1</sub>	March
Winter R <sub>2</sub>	Oct	summer R <sub>2</sub>	April
Winter R <sub>3</sub>	Nov	summer R <sub>3</sub>	May
Winter R <sub>4</sub>	Dec	summer R <sub>4</sub>	June
Winter R <sub>5</sub>	January	summer R <sub>5</sub>	July
Winter R <sub>6</sub>	Feb	summer R <sub>6</sub>	Aug

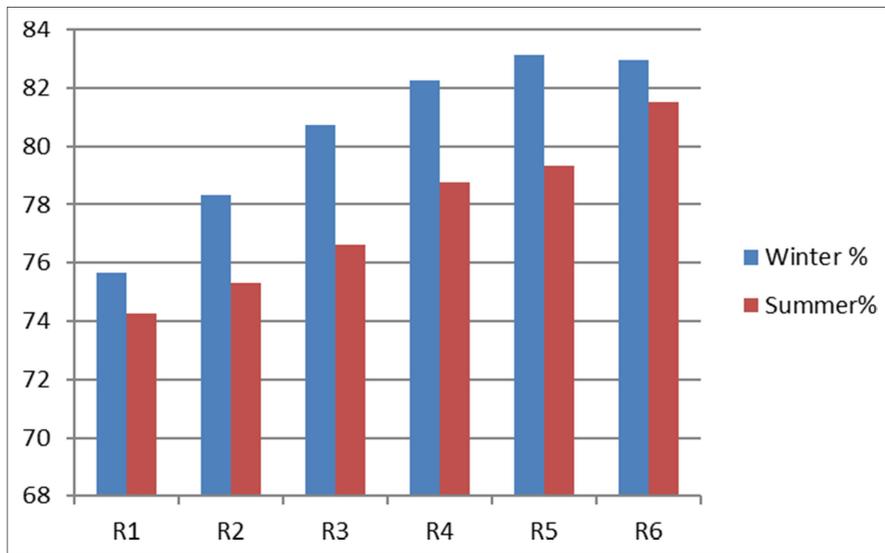
**Seasonal effect on Hen day egg production percentage (HDEP) of Vencobb 430Y Broiler Breeder**

Seasonal effect on Hen day egg production of Vencobb 430Y Broiler Breeder it is showed in Table No.3. In general hen day egg production percentage of VenCobb 430Y Broiler Breeder in winter season 83.11 to 75.64 percent. Hen day egg production percentage in winter season is highest (80.50%) than summer season (77.63%). Hen day egg production

percentage was highest in month of WR5 (January) 83.11% and hen day egg production percentage was highest in month of SR6 (August) 89.87%. Hen day egg production percentage of VenCobb430Y Broiler Breeder in summer season 81.53 to 74.24 percent. Hen day egg production percentage was lowest in month of WR1 (September) 75.64% and fertile egg percentage was lowest in month of SR1(June) 74.24%. From the CRD table it is evident that the CD at 5% due to season significant 1.343 which showed that there is significant difference between the season. The CD at 5% due to Replication significant 2.326 which showed that there is significant difference between the replication.

**Table 3:** Seasonal effect on Hen day egg production percentage (HDEP) of Vencobb 430Y Broiler Breeder

Month (R)	Winter	Summer	
R1	75.64	74.24	
R2	78.33	75.29	
R3	80.74	76.63	
R4	82.24	78.74	
R5	83.11	79.33	
R6	82.94	81.53	
Mean	80.50	77.63	
Max. range	83.11	81.53	
Min. range	75.64	74.24	
	Result	S. Ed. (±)	C.D. at 5%
Due to Repli	S	0.842	2.326
Due to season	S	0.486	1.343



**Fig 3:** Seasonal effect on Hen day egg production percentage of Vencobb 430Y Broiler Breeder

**1.1 Seasonal effect on fertile egg % of Vencobb 430Y Broiler Breeder**

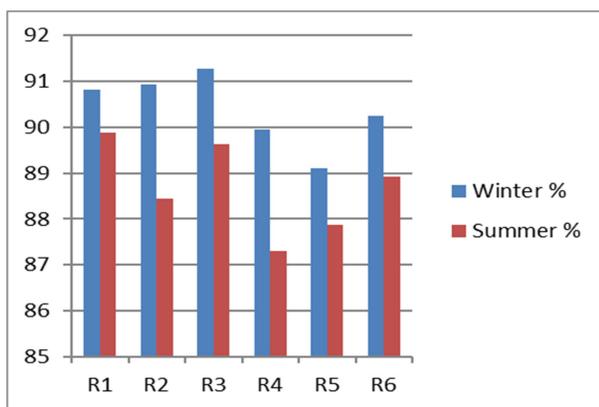
Seasonal effect on Fertile egg of Vencobb 430Y Broiler Breeder it is showed in table no.4 In general fertile egg percentage of VenCobb 430Y Broiler Breeder in winter season 91.27 to 89.11 percent. Fertile egg percentage in winter season is highest (90.39%) than summer season (88.67%). Fertile egg percentage was highest in month of WR3 (November) 91.27% and fertile egg percentage was highest in month of SR1 (March) 89.87%. Fertile egg percentage of VenCobb430Y Broiler Breeder in summer season 89.87 to 87.29 percent.

**Table 4:** Seasonal effect on fertile egg percentage of Vencobb 430Y Broiler Breeder

Month	Winter	Summer	
R1	90.81	89.87	
R2	90.94	88.45	
R3	91.27	89.63	
R4	89.94	87.29	
R5	89.11	87.87	
R6	90.25	88.92	
Mean	90.39	88.67	
Max. range	91.27	89.87	
Min. range	89.11	87.29	
	Result	S. Ed. (±)	C.D. at 5%
Due to Repli	S	0.495	1.369
Due to season	S	0.286	0.791

Month	Winter	Summer	
R1	90.81	89.87	
R2	90.94	88.45	
R3	91.27	89.63	
R4	89.94	87.29	
R5	89.11	87.87	
R6	90.25	88.92	
Mean	90.39	88.67	
Max. range	91.27	89.87	
Min. range	89.11	87.29	
	Result	S. Ed. ( $\pm$ )	C.D. at 5%
Due to Repli	S	0.495	1.369
Due to season	S	0.286	0.791

**Table 4:** Seasonal effect on fertile egg percentage of Vencobb 430Y BroilerBreeder



**Fig 4:** Seasonal effect on fertile egg percentage of Vencobb 430Y BroilerBreeder

## Conclusion

The present study was summarized by the seasonal effect on production in winter season is highest egg production than summer season, because in production there is direct contact of climate and bird. The seasonal effect on fertile egg in winter season is highest fertile egg than summer season.

In case of production and fertility result shows that winter season is better than summer season because in summer there is high ambient temperature and bird is not able lay egg efficiently.

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