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EFFECT OF SEASONS ON THE PERFORMANCE OF DIFFERENT VARIETIES OF CHICKS IN MEGHALAYA

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ABSTRACT

Series of experiments were conducted to study the performance of Vanaraja, Gramapriya and Indigenous chicks under deep litter system of rearing from 0-8th weeks of

age in pre-monsoon, monsoon and post-monsoon seasons. The results revealed better performance of chicks in pre-monsoon compared to monsoon and post monsoon seasons in terms of body weight, growth rate and FCR although chick mortality was found to be significantly lower ($p<0.05$) in monsoon season. Irrespective of seasons, Vanaraja performed better followed by Gramapriya and Indigenous chicks in terms of body weight, growth rate and FCR in all the three seasons.

Key words: Seasons, performance, Vanaraja, Gramapriya, Indigenous chicks.

Climatic variables like temperature, humidity and rainfall which vary among the seasons have potential impact on performance of poultry birds. Although birds have the ability to maintain uniform body temperature within certain limits of ambient temperature and humidity, however, below and above these limits have negative impact on productivity of birds. The effects of temperature and humidity are more during early stage of chick, as their thermoregulatory system is not well developed. In general, it reduces the ability of poultry to feed properly whichleads to poor growth and performance. Likewise, high and low rainfall also leads to poor environment affecting their performance. Poor environments make them more susceptible to existing viruses and pathogens (Quarles and Kling, 1974). Present study was carried out to evaluate performance of Vanaraja, Gramapriya and Indigenous chicks in pre-monsoon, monsoon and post-monsoon under deep litter system of rearing.

Series of experiments were carried out to evaluate the performance of Vanaraja, Gramapriya and Indigenous chicks in three different seasons viz. pre-monsoon, monsoon and post-monsoon under standard deep litter system of rearing in the Institutional Poultry Farm, ICAR Research Complex for NEH Region, Meghalaya. A total of 900 day old chicks (DOCs) were allotted for the present experiment, consisting one hundred DOCs of each the varieties in three different seasons. Chicks were brooded for the first 3 weeks and were reared under standard management condition on deep litter system for the rest of the experimental period. They were provided with *ad-libitum* feed and clean drinking water. They were vaccinated against Newcastle disease and IBD according to the standard vaccination schedule. Body weights and feed consumption were recorded weekly and cumulative feed conversion ratio was calculated taking into account the daily mortality. The temperature, humidity and rainfall of the locality were also recorded simultaneously. The data were analyzed as per standard statistical procedures (Snedecor and Cochran, 1994).

Results of weather parameters and performance of Vanaraja, Gramapriya and Indigenous chicks in different seasons are presented in Table 1 and Table 2, respectively. Better body weight, growth rate and feed conversion ratio of chicks were recorded in pre-monsoon than those in monsoon and post-monsoon seasons, although the mortality of chicks was found to be significantly ($p<0.05$) lower in monsoon season.

During pre-monsoon season, the average ambient temperature and relative humidity recorded were 21.62ºC and 67%, respectively. It was well documented that the thermo comfort zone for optimum growth of chicken is 18-21ºC and 50-70% relative humidity. The recorded temperature and humidity in pre-monsoon season were under these ranges which led to better environment for attaining faster body weight and growth rate in pre-monsoon

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season than in monsoon and post-monsoon seasons. The changes in environmental temperature below and above the thermal comfort zone have a negative effect on bird performance[1]. If chicks were reared in a cool rather than in a warm environment, a greater portion of their nutrient intake might be utilized to generate heat, thus adversely affecting body weight gain[2]. Some studies revealed lower feed intake and FCR in birds that were on higher temperature (34^{0}C) compared to those on controlled temperature (21^{0}C) irrespective of breed or strains of the chickens[5].

During early stage, chicks need more heat to maintain body temperature as their thermo control mechanism is not well developed. It was seen from the Table 1 that average ambient temperature was maximum in monsoon season, followed by pre-monsoon and post-monsoon seasons, which might be the reason of lowest mortality in monsoon season. Moreover, during the experimental period, highest chick mortality was recorded at night time due to power cut and was more frequently observed in post-monsoon season and could be another cause of high chick mortality in post-monsoon season. Significantly higher mortality (9.25%) in cold stress treated group compared to control group (1.90%) was observed[3]. High mortality was recorded in cold seasons due to ascites because cold ambient temperature increases the oxygen requirement, cardiac output, and blood flow and may result in increased pulmonary arterial pressure overload on the right ventricle[10].

Irrespective of seasons, the overall better body weight, growth rate and feed conversion ratio were recorded in Vanaraja chicks followed by Gramapriya and Indigenous chicks. However, highest chick mortality was recorded in Gramapriya followed by Vanaraja and Indigenous chicks. The overall better performance recorded for Vanaraja chicks might be due to the better genetic potential for growth rate and adaptability to the varied weather conditions compared to Gramapriya and Indigenous chicks. The lower body weights and growth rates of Indigenous and Gramapriya compared to Vanaraja chicks were on expected lines, since indigenous chickens are known to have lighter body weight and growth rate. On the other hand,Gramapriya is predominantly an egg producing variety and Vanaraja is developed by crossing random bred meat control population as the female line and Red Cornish population as the male line at Project Directorate on Poultry (Directorate on Poultry Research), Hyderabad for backyard rearing[6,8]. Similar trend of results were reported in Indigenous (Miri), Gramapriya and Vanaraja chicks[4].

Irrespective of types of chicks, the overall better performance in terms of body weight, growth rate and FCR were recorded in pre-monsoon season although maximum chick mortality took place during post-monsoon season followed by pre-monsoon and monsoon seasons. Irrespective of seasons, the overall performance of Vanaraja chick was better followed by Gramapriya and Indigenous in terms of growth rate and FCR. Therefore, the result indicated overall better performance of Vanaraja chicks in pre-monsoon season compared to monsoon and post monsoon seasons in Meghalaya.

Table 1.Temperature, humidity and rainfall in different seasons during the experimental period.

Seasons	Temperature (°C)			Humidity (%)			Rainfall (mm)
	Min.	Max.	Avg.	Min.	Max.	Avg.	
Pre-monsoon (Mar.-May)	15.23 ± 1.67	28.00 ± 0.67	21.62 ± 2.99	57.00 ± 5.76	77.20 ± 0.19	67.08 ± 5.22	138.00 ± 78.55
Monsoon (June-Aug.)	19.84 ± 0.26	28.70 ± 0.26	24.27 ± 1.99	73.90 ± 0.39	88.40 ± 0.47	81.15 ± 3.25	336.00 ± 54.41
Post-monsoon (Sept.-Nov.)	14.67 ± 2.59	26.00 ± 1.01	20.34 ±2.83	66.20 ± 6.88	85.40 ± 2.31	75.80 ± 5.38	210.00 ± 94.33

Table 2. Performance of chicks in different seasons.

Varieties	Traits	Pre-monsoon (March-May)	Monsoon (Jun-Aug)	Post monsoon (Sept.-Nov.)	Overall
Day old body weight (g)	Vanaraja	38.57^{a} ±0.78	34.77^{b} ±0.74	35.07^{b} ±0.74	36.03^{A}±0.47
	Gramapriya	37.03^{a} ±0.81	41.60^{b} ±0.54	42.16^{b} ±0.53	40.06^{B}±0.43
	Indigenous	31.00^{a} ±0.57	30.67^{a} ±0.39	31.03^{a} ±0.39	30.78^{C}±0.26
	Overall	35.53^{a} ±0.54	35.67^{a} ±0.58	36.08^{a} ±0.59	
Body weight at 8th week (g)	Vanaraja	709.33^{a} ±6.75	673.67^{a} ±23.85	600.67^{b} ±23.82	663.78^{A}±11.65
	Gramapriya	592.33^{a}±10.07	435.33^{b}±15.69	431.33^{b}±15.67	44.00^{B}±12.93
	Indigenous	501.67^{a}±7.69	412.00^{b}±12.27	399.33^{b}±12.25	384.44^{C}±9.76
	Overall	601.11^{a}±9.96	507.00^{b}±16.42	477.11^{b}±12.55	
Growth rate (g/b/d)	Vanaraja	10.67^{a}±0.10	10.12^{a}±0.36	8.89^{b}±0.26	9.89^{A}±0.17
	Gramapriya	8.84^{a}±0.16	6.25^{b}±0.28	6.18^{b}±0.32	7.09^{B}±0.19
	Indigenous	7.47^{a}±0.15	6.06^{b}±0.22	5.95^{b}±0.24	6.49^{C}±0.14
	Overall	8.99^{a}±0.16	7.48^{b}±0.26	7.01^{b}±0.21	
FCR	Vanaraja	3.07^{a}±0.12	3.35^{ab}±0.18	3.53^{b}±0.14	3.32^{A}±0.09
	Gramapriya	3.25^{a}±0.13	3.77^{a}±0.29	3.82^{a}±0.31	3.61^{A}±0.15
	Indigenous	4.04^{a}±0.09	4.17^{ab}±0.18	4.45^{b}±.014	4.22^{B}±0.08
	Overall	3.45^{a}±0.18	3.76^{ab}±0.24	3.93^{b}±.024	
Mortality (%)	Vanaraja	9.76^{a}±1.23	3.98^{b}±1.17	10.30^{ac}±1.79	8.02^{A}±0.99
	Gramapriya	10.44^{a}±1.83	2.15^{b}±0.46	11.25^{ac}±1.01	7.95^{A}±1.09
	Indigenous	9.65^{a}±1.67	2.78^{b}±0.56	10.06^{ac}±1.77	7.50^{A}±1.05
	Overall	9.95^{a}±0.89	2.97^{b}±0.46	10.54^{ac}±0.87	

Means with different superscript with small letter in a row and capital letters in column differ significantly ($p<0.05$)

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