



Comparative Study on the Performance of Srinidhi, Rainbow Rooster and Local Chicken Reared under Field Condition of Lunglei District, Mizoram

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ABSTRACT

During the period of 2019-2020, comparative performances of Srinidhi (T_1), Rainbow Rooster (T_2) and local chicken (T_3) was studied to see which variety is best suitable for further popularization under backyard system in Mizoram. Local chickens reared under the same system were considered as the control group (T_3). Day old chicks of *Srinidhi and Rainbow rooster* hatched from the demonstration farm of KVK Lunglei were distributed to farmers and the performance parameters such as mortality percentage (up to 6 weeks old), age at first laying (months), body weight at 20 weeks old (kg), annual egg production (numbers) and economic were recorded. From the study, it was observed that the average mortality (up to 6 weeks) in Srinidhi (T_1), Rainbow rooster (T_2) and Desi (T_3) was 13, 12 and 5 per cent, respectively and average age at first egg laid was 89.78 ± 2.07 d (T_1), 177.25 ± 1.04 d (T_2) and 210 ± 2.03 d (T_3). Average body weight at 20 weeks in case of male and female birds was 1.61 ± 0.12 kg and 1.2 ± 0.1 kg (T_1), 2.4 ± 0.15 kg and 1.5 ± 0.11 kg (T_2) and 0.825 ± 1.03 kg and 0.625 ± 1.03 kg (T_3). Average annual egg production per hen was 145.13 ± 1.21 (T_1), 163.03 ± 0.06 (T_2) and 50 ± 0.86 (T_3). In case of economic returns, it was found that Rainbow rooster was the most economic. One unit could generate an income of about approximately Rs 11,600/- to Rs. 21,750 /-. Overall, it may be concluded that Dual purpose breed were more productive than local chicken.

Key Words: Chicken, Local, Performance, Poultry, Rainbow Rooster, Srinidhi.

INTRODUCTION

Backyard poultry farming by supplying high quality protein in the form of meat and eggs, not only improves family nutrition but also adds to the overall agricultural income of household through sale of surplus eggs and meat (Thakur *et al*, 2020). Budharam *et al* (2021) indicated as an inexpensive means for households to generate highly nutritious food commodities at minimal cost. It is an age old practice carried out by poor farmers and tribal population in rural areas. This backyard poultry production consists of keeping indigenous birds with poor production performances. About 66 per cent of the total population of country still lives in rural part, which predominantly constituted by

farmers of poor socioeconomic status *i.e.*, poor, marginal farmers and landless labourer. Backyard poultry farming system profitability can be increased if we adopt an improved indigenous strain of poultry birds (Chatterjee and Rajkumar, 2015). Moreover, the consumers have liking for eggs and meat of indigenous poultry compared to those realized from farm bred chickens or exotic breeds of chicken (Jha and Chakrabarti, 2017). Similarly, backyard poultry manure can be used directly (Pal *et al*, 2020). Acharya and Behera (2019) revealed that the backyard poultry system with improved birds provides a solution to food security to the rural masses thus, paving a way for sustainable livestock production. Sihag *et al* (2021) gave first rank to

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provision of night shelter, adequate and clean water, adoption of improved breeds, vaccination against diseases which were adopted by the beneficiaries in Rajasthan.

Poultry development in Mizoram has taken a new turn in the late eighties with establishment of organised farms in various places (Rahman, 2015). According to the integrated sample survey report (2019-2020), total backyard poultry population in the state is 20,18,495 which contributed 99 percent of the total poultry population (20,34,899). For further increasing the rural poultry production in Mizoram, dual purpose variety of chicken *i.e.*, Srinidhi and Rainbow Rooster which lays brown shelled eggs were introduced to study their performances under rural poultry farming in district Lunglei, Mizoram. Therefore, the present study was undertaken to rule out which breed is better for further popularization under rural backyard system.

MATERIALS AND METHODS

A benchmark survey was conducted in six villages (*viz.* Hnahthial, Tuipui, Rawpui, Rotlang, Lunglei, and Thazawl villages) located at different geographical locations and potential poultry farmers were selected for beneficiary during the study period. A total number of 720 chicks was recorded during the study where farmers were given 40 birds each. The total number of farmers selected during the study was 18. In every village, three (3) different units of farmers were selected where T_1 unit reared 40 birds of Srinidhi, T_2 unit reared 40 birds of Rainbow Rooster and T_3 unit reared 40 birds of Local variety. The farmers were taught about chicks brooding, feeding, health care, other management practices etc before distributing the chicks. Chicks were supplied during the month of March to September and reared by farmers independently. The poultry birds were reared in the backyard under semi-intensive housing system. Restrictedly feeding with concentrated rations and biosecurity measures were followed in the farm. Performance's parameters such as mortality percentage (up to 6 weeks old), age at first laying

(months), body weight at 20 weeks old (kg), annual egg production (numbers) and economic returns were recorded. The information about economic returns from production cum sale of eggs and marketable birds were recorded though personal interview and the data generated were statistically analysed for estimation of descriptive statistics using SAS (ver 9.3) software.

RESULTS AND DISCUSSION

Mortality

There was significant difference in the mortality percent between the varieties (Table 1). This finding was close to the observations of Sarma *et al* (2018). The main factors responsible for mortality were attack by predators such as jungle cats, rodents, wolves etc. followed by stress and diseases. The present observation was also in accordance with Conroy *et al* (2005) who reported that in rural backyard poultry production, predation was the main cause of mortality than diseases. The lowest mortality percent was observed in local chicken which might be due to higher adaptability during brooding. The more adaptivity in local variety poultry over other varieties is also reported by Keambou *et al* (2014), where they study the performance of commercial boilers and *desi* poultry. Mortality is high during monsoon seasons when there is high humidity. Many of the farmers were not aware about the importance of proper storage of feeds, feeding of proper rations with quality feeds. Singh *et al* (2019) also reported that the poultry farmers were not aware about the quality of the feeds available in the market. Feeds imported from outside state were sold to the poultry farmers where farmers have no other choice. Paterson and Lima (2017) reported that the spread of fungal infections is related to several factors such as geographic location, storage conditions, processing of various feeds, and moisture. Among the mentioned factors, moisture is the most important factor, so that reducing the moisture of the feed content to less than 12%, fungal growth and aflatoxin production will be stopped (Saleemi, 2010). Mizoram is having

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a long monsoon seasons, climate is humid-tropical, characterized by short winter, long summer with heavy rainfall (Tiwari, 2006). There are high chances of fungal contaminations due to high humidity. Therefore, farmers should be aware about the proper storage of feeds and feeding quality feeds to avoid fungal infections.

Body Weight

The body weight at 20 weeks of age in male was found to be 1.61 ± 0.12 kg (T_1), 2.4 ± 0.15 kg (T_2) and 0.825 ± 1.03 kg (T_3) and in female, as 1.2 ± 0.1 kg (T_1), 1.5 ± 0.11 kg (T_2) and 0.625 ± 1.03 kg (T_3) (Table 1). There was significant difference between sex as well as between variety. Overall, the male is having higher body weight than female and this in accordance to the reports of Sankhyan and Thakur (2019). In female birds, Rainbow rooster was having higher body weight compared to other variety. In case of male birds, both Srinidhi and Rainbow Rooster were similar and significantly higher than local chicken. Similar type of reports was reported by Islam *et al* (2017) that dual purpose improved variety such as Kuroiler and Rainbow Rooster were having higher body weights than local chicken. Higher body weight was observed where concentrated feeds were given as per the feeding schedule followed by those fed with locally available feeds (Maize, rice bran, tapioca leaves, mustard leaves) mix with kitchen wastes. Body weight was lowest in those group where feeding of kitchen wastes and foraging were practiced. These observations were in accordance with the findings of Sarma *et al* (2018).

Age at first egg

The average age at first egg in T_1 , T_2 and T_3 was found to be 189.78 ± 2.07 d, 177.25 ± 1.04 d and 210 ± 2.03 d, respectively (Table 1). There was significant difference among the variety where the local chicken was found to laid eggs later than others. However, Rainbow rooster lays eggs faster compare to Srinidhi and local chicken. These present observations (T_1 and T_2) were in close proximity to

those observed for Vanaraja (187.45 ± 1.02 days) and Srinidhi (189.78 ± 2.07 days) birds at Boko Block of Kamrup district (Assam) by Sarma *et al* (2018). However, in case of local chicken, a lower age at egg (198.31 ± 2.03 days) was reported by the same authors. Contrary observations in case of local chicken were also reported by Lalhlimpaia *et al* (2021) as 180 days and Haunshi and Doley (2011) as 163.56 ± 1.34 days who also studied Mizo local chicken at Aizawl, Mamit and Kolasib district of Mizoram. The delayed in laying eggs is influenced by age, body weight and day length during growing phase. Since adult body weight was lower in groups where no or little supplementary feeding was practiced, hence age at first egg was delayed.

Egg production

Average annual egg production per hen was 145.13 ± 1.21 (T_1), 163.03 ± 0.06 (T_2) and 50 ± 0.86 (T_3) (Table 1). The present observation was in line with Sankhyan and Thakur Thakur (2019) for *Himsamridhi* variety which produced 140 eggs and for Vanaraja birds (131 eggs) (Sankhyan and Thakur, 2016) in Himachal Pradesh. In local chicken, the present egg production was however higher than the reports of Haunshi and Doley (2011) where they reported 31.96 ± 1.81 numbers. A closed findings with the present data was reported by Lalhlimpaia *et al* (2021) while studying local chickens in Mamit and Aizawl district, Mizoram. Season of chick distribution should be noted since egg production performance of birds could be influenced by the season. Patra *et al* (2017) reported that better egg production performance could be obtained from Vanaraja birds, raised in summer and those initiated laying in winter. In compliance to this observation, the present study also recorded those chicks raised during summer (April-May) initiated laying in early winter (September- October) laid more eggs. However, chicks raised during winter (December-January) initiated laying in summer (March-April) laid less eggs. Egg production was less where chicks were on foraging. Prakash *et al* (2020) also reported that gross energy and protein

Table 2. Economics.

Treatment	Variety	Annual Egg production				% Increase	Economics of demonstration (Rs/unit)			
		Demo			Check if any		Gross Cost	Gross Return	Net Return	BCR
		H	L	A						
T ₁	Srinidhi	155	130	145	50	190	14,500	29,000	11,600	2
T ₂	Rainbow rooster	168	157	163	50	226	14,500	36,250	21,750	2.5
T ₃	Local Chicken	45	55	50	-	-	5800	8700	2900	1.5

intake in foraging chicken was critically low, which limit their production performance. Problems faced in foraging chicken were cannibalism, soft egg shell and eggs picking etc which might be due to imbalanced, inadequate protein, less mineral nutrition, stressors like overcrowding, improper laying nests, weather etc.

Economic

The economic returns from backyard poultry unit of 40 birds assuming at least 25 hens completed laying and 10 cocks reached marketable age was presented in Table 2. Cost of chicks for both Srinidhi and Rainbow rooster was Rs.50/- and for local chicken (check) Rs.40/-. Cost of feeding for male and female has been assumed to be Rs.200/- and Rs.500/-, respectively. However, cost of housing and labour has been considered nil. The rate of expenditure and income was different in case of local chicken. The market price of eggs for all the variety was assumed to be Rs.10-15/egg and adult cock is sold for Rs.500-700/-. Similarly, sale price of hen at the end of laying cycle has been considered as Rs. 500-600/- for both Srinidhi and Rainbow rooster, and for local chicken it was Rs.350/-. Thus, a unit of Srinidhi and Rainbow Rooster was giving a net profit of Rs.11,600 - 21,750/-, respectively, which was Rs.8,000-18,000/- more than keeping local variety. The finding was in line with Chaturvedani *et al* (2015) and Thakur *et al* (2020) who also reported higher net profit in dual purpose and lower in local

chicken while studying dual purpose poultry and local poultry birds in Himachal Pradesh. Aparna *et al* (2021) noticed that there was significant increase in consumption of eggs and meat among beneficiary families. Besides the sale of eggs and meat, the farmers were also generating income by continuing the enterprise by reproducing the chicks by using local hens for brooding.

CONCLUSION

It may be concluded that dual purpose poultry performs better than local variety. Among the three varieties evaluated, Rainbow rooster variety survived better under the climatic conditions of Lunglei and also gave the best economic return. Owing to its higher egg production under rural poultry production, farmers may be advised to rear dual purpose breed for better returns. In addition to that, parent stocks of Rainbow Rooster are easily available at Inbro Poultry Farm, Tanhril which was managed by the Department of Animal Husbandry and Veterinary, Govt. of Mizoram. Therefore, Rainbow rooster variety could be further popularised in different villages within the state.

ACKNOWLEDGEMENT

The authors are thankful to the Director of Agriculture (Govt. of Mizoram) for approving the programme. Inbro Poultry Farm, Tanhril and C.V.Sc & AH, Selesih for their technical support and advices. This article is especially dedicated to

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REFERENCES

- Acharya Sumita and Behera Monalisa (2019). Backyard poultry rearing: an effective tool for enhancement of livelihood of farm family. *J Krishi Vigyan* 7 (2) : 32-35
- Anonymous, 20th Livestock Census 2019, All India report. <http://dadf.gov.in/sites/default/files/20th%20Livestock%20census-2019%20All%20India%20Report.pdf>
- Aparna Regula, Kumar Yugandhar M and Vinoo R (2021). Rajasri Birds - A Source of Better Livelihood for Rural Farmers in Guntur District. *J Krishi Vigyan* 9 (2) : 89-93.
- Budharam, Choudhary J L and Kumar Lekhu (2021). Practices adopted for backyard poultry rearing in Dungarpur district of Rajasthan. *J Krishi Vigyan* 10 (1): 204-207.
- Chaturvedani A K, Khalid NL, Khyalia N K and Pratap J (2015). Empowering tribal women through backyard poultry in Bastar district of Chhattisgarh. *J Krishi Vigyan* 3 (special issue): 19-22.
- Chatterjee R N, and Rajkumar U (2015). An overview of poultry production in India. *Indian J Anim Health* 54 (2): 89-108.
- Haunshi S and Daley S (2011). Performance of Native Chickens of Mizoram under Intensive System of Rearing. *Indian Vet J* 88 (3): 45 – 47.
- Islam R, Deka C K, Rahman M, Deka B C, Hussain M and Paul A (2017). Comparative performances of Kuroiler, Rainbow Rooster and Indigenous birds under backyard system of rearing in Dhubri district of Assam. *J Rural and Agri Res* 17(1): 40-43.
- Keambou T C, Hako Touko BA, Mboumba S, Mezui Mezui T, Toukala J P, Boukila B and Manjeli Y (2014). Resistance of Local Chicken and Commercial Broiler Breeds to Chronic Heat Stress in Tropical Environment: 2- Effects on Blood and Physiological Parameters. *Int J Appl Poult Res* 3 (2): 28-32.
- Lalhlimpua C, Singh N S, Mayengbam P, Goswami R and Tolenkomba T C (2021). Production Performance of 'Zo ar' a Local Chicken of Mizoram in its Home Tract. *Int J Lives Res* 11 (4): 100-104.
- Pal S, Prakash B, Kumar A and Singh Y (2020). Resource utilization for better livelihood of the rural population. *Int J Curr Microbiol App Sci* 9(5): 2361-2371.
- Paterson R R and Lima N (2017). Thermophilic fungi to dominate aflatoxigenic/mycotoxigenic fungi on food under global warming. *Int J Envir Res Pub H* 14 (2):199.
- Patra M K, Hajra D K, Das R K, Sarkar P and Deka B C (2017). Effect of season on growth and reproduction performance of improved backyard poultry in North Eastern Hill Region. *Indian J Anim Res* B (3192): 1-6.
- Prakash B, Verma S K, Rama Rao S V, Raju M V L N, Paul S S, Kannan A, Mishra S, Singh V and Sankhyan V (2020). Feeding status of free-range scavenging chickens in different agro-climatic regions of India. *British Poul Sci* 61(1):26-32.
- Rahman S (2015). Management of Broiler Farms in Aizawl District of Mizoram, India. *Lives Res Rural Dev* 27 (4): 61.
- Saleemi M K, Khan M Z, Khan A, Javed I (2010). Mycoflora of poultry feeds and mycotoxins producing potential of *Aspergillus* species. *Pakistan J Bot* 42 (1):427-434.
- Sankhyan V and Thakur Y P (2016). Comparative performance of Vanaraja and indigenous chicken under intensive system in sub temperate climatic condition of north western Himalayan state of Himachal Pradesh. *Int J Sci Environ and Technol* 5(2) : 449 – 453.
- Sankhyan V and Thakur Y P (2019). Development and evaluation of location specific chicken variety for improving rural poultry farming in western Himalayan state of Himachal Pradesh, India: Proceedings of the World Congress on Genetics Applied to Livestock Production, 87.
- Sarma M, Islam R, Borah M K, Sharma P, Mahanta J D, Kalita N and Bhattacharyya B N (2018). Comparative performance of Vanaraja, Srinidhi and Desi chicken under traditional system among tribal community of Assam. *Indian J Anim Res* 52 (10):1518-1520.
- Sihag Priyanka, Sharma K C, Sharma Ram Avtar and Yadav Seema (2021). Housing practices ranked at top in backyard poultry farming by the beneficiaries in Rajasthan. *J Krishi Vigyan* 9 (2): 76-81.
- Singh Tejbeer, Sharma M and Singh Gurinder (2019). Performance of different commercial layer feeds on egg production in hens during summer. *J Krishi Vigyan* 7 (2): 184-189.
- Thakur R, Sankhyan V, Kumar R and Mankotia B S (2020). Demonstration on Himsamridhi Variety of Chicken under Rural Poultry Production in District Kangra, Himachal Pradesh. *J Krishi Vigyan* 9 (1): 351-354.
- Tiwari R C (2006). Analytical study on variation of climatic parameters at Aizawl, Mizoram (India). *Bulletin of Arunachal Forest Research* 22 (1&2): 33-39.

Received on 30/5/2021

Accepted on 10/1/2022