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# Economic analysis of indigenous, Vanaraja, and crossbred (PB2x Indigenous) chickens under intensive system of rearing

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**Abstract**
A study was conducted on a total 600 numbers of chicks (200 each of Indigenous, Vanaraja and Crossbred) were reared in deep litter under intensive system of management. All the three types of chicken were fed uniform diet of Chick (0-8 weeks), Grower (9-20 weeks) and Layer (above 20 weeks) ration prepared with conventional feedstuffs as per BIS. The total cost of production per bird from day old to 72 weeks of age under intensive system was Rs. 900.91, Rs. 1223.56 and Rs. 1075.30 for Indigenous, Vanaraja and Crossbred (PB2x Indigenous) chickens respectively. The income/return from Indigenous, Vanaraja and Crossbred chickens was Rs.725, Rs.1265 and Rs.1040 per birds, respectively upto 72 weeks of age. The net profit realized per bird under intensive system was Rs. 41.44 for Vanaraja, while a loss of Rs. 35.30 and Rs. 175.91 for Crossbred and Indigenous chicken. From the present study it can be concluded that the performance of Indigenous, Vanaraja and Crossbred (PB2x Indigenous) birds can be improved under intensive system of management but it is not profitable to rear crossbred and indigenous chicken under intensive system.

**Keywords:** Economics, indigenous, Vanaraja, crossbred chicken, intensive rearing

## Introduction
The poultry industry in India represents a major success story in the present era in agricultural production arena. Poultry production has been a household activity in India since time immemorial. However, scientific poultry production in India gained momentum during the last four decades due to concerted efforts of the Government of India through policies, institutions and focused research besides the initiatives taken by the private sector. In India most of the commercial poultry production is concentrated in urban and peri urban areas due their industrial nature of operation. India has 72.22 percent of its population living in rural areas and about 89 percent rural livestock householders' rear poultry as an important supplementary source of cash income [1]. There exists a wide gap of consumption pattern in rural and urban areas. Much of the eggs and meat produced are consumed by the urban or semi urban population while the rural and tribal areas have little access therefore the villages must have to be independent in the poultry production to meet their needs. India ranked 3rd in egg production and 5th in broiler production in the world with the production of 3.4 million ton domestic poultry meat and 66 billion eggs during 2012 [2]. However, despites this rapid growth, the per capita availability of poultry meat and egg is 2.8 kg and 55 numbers as against the requirement of 10.8 kg of poultry meat and 180 eggs/head/annum as per ICMR recommendation [3]. The per capita availability of egg and meat is further lower in Assam which is below one third of all India average i.e. only 16 eggs and 730 g of poultry meat/head/annum [3]. It is estimated that at about 72 lakh eggs per week are coming to Assam from southern states to meet the demand [5].

Besides these, rearing of native fowl is of socioeconomic importance which requires low or no inputs, provides supplementary income and contributes to family nutrition. The people of Assam rearing the indigenous birds since time immemorial. These native birds are highly resistant to disease and thrive on scavenging systems. The meat and eggs from the local birds are tasty and have a characteristic flavour which attracts the people and they are ready to pay higher prices for this products.The sale price of eggs and birds on free range rearing were much higher than the sale price of commercial eggs and broilers [6]. Local chickens may be regarded as "Credit Card" to the rural women that instantly available for sale or barter [7].

The commercial poultry industry leads to the disappearance of less productive local breeds. However, in the recent years native chickens are getting attention in various countries. This is because of unique hardiness of the breeds, their ability to thrive under adverse climatic conditions and the desirable taste and flavor of eggs and meat. Consumer and farmer preference to native chickens due to the better taste and flavor of meat and eggs and higher disease resistance compared to commercial broilers has been reported in various countries [8; 9].

Indigenous birds of coloured plumage are highly preferred by rural and tribal people. The demand for indigenous chicken and their product are high in the North-Eastern part of India. The existing traditional poultry farming with local indigenous fowls is unable to meet the ever increasing demand in the region. Improved variety like Vanaraja which are phenotypic replica of indigenous fowl are now being extensively introduced in the region [10].

Available literature reveals that there is lack of systematic approaches on economics of rearing these birds under intensive system of management. Therefore, the present study has been carried out to find out the economics of raring these birds under intensive systems of rearing.

## Material and Methods

The present study was conducted in the experimental poultry shed under the project AICRP on Poultry breeding, Department of Poultry Science, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India. A total of 600 numbers chicks (200 each of Indigenous, Vanaraja and Crossbred) were procured and brooded in battery brooder for a period two weeks with optimum brooding temperature and then in the third week the birds were distributed in the respective pens for rearing in deep litter under intensive system using paddy husk as bedding material and optimum ventilation was provided. All the types of chicken were fed uniform diet of Chick (0-8 weeks), Grower (9-20 weeks) and Layer (above 20 weeks) ration prepared with conventional feedstuffs as per BIS [9] containing CP (%) and ME (Kcal/kg) 20 and 2648; 18 and 2367 and16.53 and 2456, respectively throughout the rearing period up to 72 weeks of age. All the three types of birds were reared under similar condition following standard managemental procedures. The birds were offered measured quantity of feed twice daily with sufficient plain drinking water. All the birds were vaccinated and medicated following standard schedule. The birds were provided 23hours of light and one hour darkness during chick period then restricted the light for 10 hours during growing period and during laying period again increased to 16 hours for optimum egg production. To calculate the economics of production, the cost of construction of shed, equipments, chicks, feeds, medicines, labour, electricity, litter material and other miscellaneous costs, and return from all sources on per bird basis were taken into consideration at University approved rates. The data were analysed statistically as per Snedecor and Cochran [12].

## Results and Discussion

The total cost of production (Rs./bird) and the net profit per bird of Indigenous, Vanaraja and Crossbred chicken under intensive system are presented in Table 1. The total cost of production per bird from day old to 72 weeks of age under intensive system was Rs. 900.91, Rs. 1223.56 and Rs. 1075.30 for Indigenous, Vanaraja and Crossbred chicken respectively. The total incomes for Indigenous, Vanaraja and Crossbred chicken (PB2x Indigenous) under intensive system were Rs. 725.00, Rs.1265.00 and Rs.1040.00 respectively. The net profit per bird under intensive system of rearing was Rs. 41.44 for Vanaraja, while a loss of Rs. 35.30 for Crossbred and Rs. 175.91 for Indigenous chicken. The cost of production, total income and net profit was found to be higher in Vanaraja followed by Crossbred and Indigenous chicken under intensive system. The feed consumption was more in Vanaraja and Crossbred birds compared to Indigenous birds of Assam as their body size was heavier than indigenous birds, therefore more feed is required for body maintenance as well as for production leading to more cost of production. The total income and net profit was better in Vanaraja and Crossbred birds might be due to better performance of Vanaraja and Crossbred birds in terms of annual egg production and higher body weight which has fetched the higher profit than Indigenous chicken. Doley [13] conducted a study on indigenous bird reared under intensive and semi intensive system of management and reported loss in indigenous birds which is in good agreement with the findings of the present study. Kumerasan *et al.* [14] observed that the productivity of Vanaraja birds improved considerably under intensive system and rearing Vanaraja bird under this system was also found to be economical. Zuyie *et al.* [15] reported that the total cost incurred to produce per kilogram of body weight of Vanaraja bird was Rs. 46.49 and the gross receipt was Rs. 62.47 per bird reared under deep litter systems of management in Nagaland. The net profit per kilogram of body weight was Rs. 16.06. Similar results were also observed by Gonmei [16] who recorded a net profit of Rs. 350.12 per bird for Vanaraja and while a loss of Rs.11.16 per bird for Indigenous chicken under intensive system of management. Bharambe and Garud [15] reported that the net returns (Rs.) of rearing improved crossbreds and pure bred chicken as 18.79, 88.05, 12.78, 56.15, 52.23, 104.52 and 61.48 respectively for Giriraja × Dahlem Red, Dahlem Red × White Leghorn, Giriraja × Asselkala, Dahlem Red × Giriraja, Asselkala × Giriraja, Dahlem Red pure and Vanaraja pure birds under intensive system of rearing. The corresponding benefit cost ratios were 1.07, 1.36, 1.05, 1.23, 1.22, 1.45 and 1.26 respectively. Kalita *et al.* [18] while conducted a study on Vanaraja, Dahlem Red, PB2 x indigenous and Indigenous birds under intensive system of management, recorded a net profit per bird which was higher in Vanaraja (Rs. 235.55) followed by Dahlem Red (Rs. 197.97) and lowest in PB2 x indigenous (Rs. 66.88), whereas there was a loss of Rs.15.65 for indigenous birds in Assam which was due to lower production performance of indigenous birds. Pathak [19] recorded the cost of production per bird was Rs. 934.40 for the different indigenous chicken and Rs.1027.10 for PB2 × Indigenous chicken. It was recorded that the income for PB2 × indigenous chicken was more than indigenous chicken and also recorded profit for PB2 × indigenous chicken and loss for indigenous chicken. It was concluded that PB2 × Indigenous chicken could be reared economically in deep litter system of management. However, in contrary to the findings of the present study, the profit margin of Mizo-local chicken for meat production under intensive system of rearing was Rs. 70.12 per bird which was found to be profitable [20] which might be due to the economics being calculated up to 18 weeks of age resulting in lower cost of production. The chickens might also have had better growth rate, resulting in increased body weight gain in the early hours of life.

Secondly the higher selling price of eggs and live birds in their location and the season might have facilitated increased price of the products might be the probable reason for increased profit margin. Arulnathan *et al.* [21] reported that the net return per bird under intensive systems was Rs. 41.33 when standard management practices, family lablours and minimum inputs were followed. Thanaseelan and Arulnathan [22] also calculated a net return of Rs.25 per bird in desi chicken farming under intensive systems of management.

**Table 1:** Costs of production (Rs.) per bird of indigenous, vanaraja, and crossbred chicken under intensive system of rearing up to 72 weeks of age

| Items | Indigenous | Vanaraja | Crossbred |
|---|---|---|---|
| A. Non recurring Expenditure | | | |
| 1. Land | Existing | Existing | Existing |
| 2. Construction of poultry shed | 450 | 470 | 460 |
| 3. Equipments | 30 | 30 | 30 |
| B. Total Non-recurring Expenditure | 480 | 500 | 490 |
| C. Recurring Expenditure | | | |
| 1. Cost of Day Old Chick | 12 | 22 | 18 |
| 2. Cost of feed @ Rs.19.00/kg (41.39 kg/bird for Indigenous, 57.74 kg/bird for Vanaraja, 50.20kg/bird for Crossbred | 786.41 | 1097.06 | 953.80 |
| 3. Cost of medicines and vaccines | 27 | 27 | 27 |
| 4. Cost of labour, electricity, litter etc. | 16 | 16 | 16 |
| 5. Miscellaneous expenditure | 10 | 10 | 10 |
| D. Total Recurring Expenditure | 851.41 | 1172.06 | 1024.80 |
| E. Income | | | |
| 1. Sale of Indigenous eggs @Rs. 6/ egg (90 eggs per bird),Vanaraja eggs Rs. 6/egg ( 140 eggs per bird) and Crossbred eggs @ Rs.6/ eggs ( 115 eggs per bird) | 540 | 870 | 690 |
| 2. Sale of live birds (Indigenous birds @ Rs.100/kg, Av. 1.5 kg/bird, Vanaraja birds @ Rs.90/kg, Av. 4.0 kg/bird, Crossbred birds @ Rs. 90/kg, Av. 3.5 kg/bird | 150 | 360 | 315 |
| 3. Sale of litter @ Rs.25/qtl | 25 | 25 | 25 |
| 4. Sale of gunny bags @ Rs. 10/bag | 10 | 10 | 10 |
| F. Total income | 725 | 1265 | 1040 |
| G. Depreciation | | | |
| 1. Poultry sheds @ 10 % per year | 45 | 47 | 46 |
| 2. Equipments @ 15% per year | 4.5 | 4.5 | 4.5 |
| H. Total depreciation | 49.50 | 51.5 | 50.5 |
| I. Total cost of production (D+H) | 900.91 | 1223.56 | 1075.30 |
| J. Net profit/ loss (F-I)(+/-) | - 175.91 | 41.44 | - 35.30 |

## Conclusion

From the present findings it can be concluded that the rearing of Indigenous, Vanaraja and crossbred chicken was not economically viable under intensive system of rearing. The Vanaraja could be reared successfully under backyard system of rearing for increasing egg and meat production. However, crossbred chicken can also be reared profitably under backyard system of rearing for increasing egg and meat production than Indigenous chicken under backyard system of rearing.

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## References

1. Khandait VN, Gawande SH, Lohakare AC, Dhenge SA. Research Journal of Agricultural Sciences. 2011; 2(1):110.
2. Patil NP. Economics of Broiler Poultry Production in South Konkan region. M.Sc Thesis. Dept. of Agril. Economics, College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli- 415 712, Dist. - Ratnagiri, (M.S.), 2015.
3. Anonymous. www.icra.in/Files/ticker/SH-2013-1-ICRA-Poultry.pdf. 2013.
4. Anonymous. Economic Survey of Assam, Govt. of Assam. 2011, 12. http://shodhganga.inflibnet.ac.in/bitstream/10603/92882/10/10_chapter%202.pdf
5. Selvam S. An economic analysis of free range poultry rearing by rural women. Indian Journal of Poultry Science. 2004; 39(1):75-77.
6. Hossen MJ. Effect of management intervention on the productivity and profitability of indigenous chickens under rural condition in Bangladesh. Livestock Research for Rural Development, 2010; 22: Article # 192. http://www.lrrd.org/lrrd22/10/hoss22192.htm
7. Wattanachant S, Benjakul S, Ledward DA. Compositions, color and texture of Thai indigenous and broiler chicken muscles. Poultry Science. 2004; 83:123-128.
8. Cheng FY, Huang CW, Wan TC, Liu YT, Lin LC, Chyr CYL. Effect of free-range farming on carcass and meat qualities of black-feathered Taiwan native chicken, Asian-Australian Journal of Animal Science. 2008; 21:1201-1206.
9. Singh M, Singh U, Gurung BS. Evaluation of egg weight and its various measurement attributes in indigenous Aseel breed of chicken. International Journal Poultry Science. 2000; 35:312-314.
10. BIS. Bureau of Indian Standard of poultry feed. Manik Bhawan, Bahadur Shah Zafer Marg, New Delhi, 1992.
11. Snedecor GW, Cochran WG. Statistical methods, 6th

edn., Oxford &IBH Publishing Co., Calcutta, 2004.
12. Doley S, Ph D Thesis. Submitted to Assam Agricultural University, Khanapara, Guwahati, 2004.
13. Kumerasan A, Pathak KA, Bujarbaruah KM, Das A. Research Bulletin No.48, ICAR Research Complex for NEH Region, Barapani, Meghalay, 2006.
14. Zuyie R, Sharma VB, Bujarbaruah KM, Vidyarthi VK. Performance of Vanaraja birds under extensive system of rearing at different altitudes in Nagaland. Indian Journal of Poulry Science. 2009; 44(3):411-413.
15. Gonmei G, Barua N, Kalita N, Borpuzari RN. Productive Performance of Indigenous and Vanaraja chicken under Deep litter system of rearing. International Journal of Veterinary Sciences and Animal Husbandry. 2016; 1(1):06-07
16. Bharambe VY, Garud PK. Comparative performance of some improved poultry crossbreds under Konkan region of India. Journal of Hill Farming, 2012. 25 (1): 48-52.
17. Kalita N, Sheikh IU, Pathak N, Ahmed M. Economy of rearing indigenous, Vanaraja, Dahlem Red and PB2 x Indigenous birds under intensive system of management, In Compendium 2: XXX IPSACON, National Symposium on poultry production: Feed, Food and Environmental safety, 22-23 November, CARI, Izatnagar, Bareilly, India, 2013, 207.
18. Pathak SS. Performance of Indigenous chicken and its cross with PB-2 male line in deep litter system of management. M.V.Sc. Thesis, Assam Agricultural University, Guwahati-22, Assam, 2013p.
19. Haunshi S, Doley S, Performance of native chicken of Mizoram under intensive system of rearing. Indian Veterinary Journal. 2011, 88(3):45-47.
20. Arulnathan N, Thanaseelan V, Selvakkuma R. Country Chicken (*Gallus domesticus*) farming – A promising enterprises in rural areas of Tamilnadu. In: Proceedings of XXIX IPSACON on Commercial and rural poultry production: Novel concepts and strategies to meet growing demand and changing consumer needs, 5-7 Dec, Hyderabad, 2012; 186p.
21. Thanaseelan V, Arulnathan N. Strategies to augment profit in intensive Desi chicken farming, In: Proceedings of XXIX IPSACON on Commercial and rural poultry production: Novel concepts and strategies to meet growing demand and changing consumer needs, 5-7 Dec. Hyderabad, 2012; 193.