

## Profitability and Meat Yield Traits of Different Fast Growing Broiler Strains in Winter

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**Abstract:** A total of 100 ISA-Vedette, 100 Arbor Acres and 1000 Hybro fast growing broiler chicks were divided in to 5 replications having 20 chicks in each, reared up to 42 days of age to select the suitable broiler strain of better profitability and meat yield traits. A total of 30 representative male and female broiler from each breed slaughtered at 42 days of age to investigate the dressing yield. ISA-Vedette was the highest in respect of body weight (1552.25 m/b) and feed intake (3105 m/b) followed by Hybro (1401.60 and 2764 m/b) and Arbor Acres (1372.48 and 2749 m/b) respectively. Production cost and profitability of ISA-Vedette, Hybro and Arbor Acres were 44.23 and 25.77, 50.01 and 20.00 and 50.41 and 19.49 Tk/kg live bird respectively. The strains were significantly for body weight, blood weight and giblet weight. Despite there was no significant difference among the strains, ISA-Vedette was the superior for dressing yield to the other strains. That ISA-Vedette is the most suitable strain in tropical environment in comparison with the other strains (Hybro and Arbor Acres).

**Key words:** Broiler strains, profitability, meat yield traits, tropical environment

### Introduction

Bangladesh is a developing country, where different types of broiler strains are available. These strains are not similar in productivity and adaptability at any climatic condition. Some investigator reported that the better body weight gain, feed efficiency, profitability and meat yield were found in winter to the summer season (Baghel and Pradhan, 1989; Islam, 2000). Bohren *et al.*, 1982 reported that fast growing broilers were suffered at high environmental temperature. Growth performance as well as profitability of broilers is decreased with the increase of temperature (Harris and Nelson, 1975; Howlader and Rose, 1987). The detrimental effect of temperature was increased with the increase of body weight (May *et al.*, 1998). An investigation showed that the crossbred hybrid from Nigerian local (LL) with Arbor Acres (AA) were better performer than the pure AA under Nigerian hot humid climate (Binwagu and Nwosu, 1994). A report from Haque (1993) showed the lower production performance of fast growing broiler (Shaver troiticbro, Ross, Hybro, ISA-Vedette, Arbor Acres, Cobb and Hubbard) at 8 weeks of age in Bangladesh. Several studies indicated that environmental temperature affected on carcass composition and meat yield traits. The female chicken contained more fat, breast meat and skin weight than the male chicken at higher temperature (Howlader and Rose, 1989; Tawfik *et al.*, 1989; Bray, 1983). Breast meat increased with the increase of age and size of the birds reported by Perreault and Leeson (1987). A few works has been done involving some broiler strains but not all broiler strains available in Bangladesh. So the present study was aimed to compare the performance of different fast growing broiler strains in selecting the best performed strain during winter season.

### Materials and Methods

The experiment was carried out at Bangladesh Agricultural University poultry farm, Mymensingh for the period of December 1998 to January 1999. The fast growing three broiler strain; Arbor Acres, ISA-Vedette and Hybro were divided in to five replications in each strain. Twenty chicks were placed in each treatment. The birds were fed ad libitum diet, containing 22.24% crude protein (CP) and 1907.80 Kcal metabolizable energy (ME) perKg as starter diet and 19032% CP and 3010.00 K cal. ME/kg as finisher diet (3-6 weeks). The birds were kept on littered floor

with a stocking density of 900 cm<sup>2</sup>/b. The birds were exposed to continuous lighting of 23 hours and 30 minutes in a day during the experimental period. The birds were vaccinated against Newcastle and Infectious bursal disease (Gumboro) as per schedule.

Body weight and feed intake were recorded weekly and mortality was recorded daily. Production cost (Tk/kg live bird) was calculated involving chick cost, feed cost, mortality, labour cost, vaccine and medicine cost, litter cost and electric bulb cost etc. Profitability was calculated on the sale and production cost of per kg live bird. The representative birds in each replication had been selected and kept in fasting for 12 hours. Therefore the birds were slaughtered and recorded the following meat yield traits of individual male and female:

Blood weight, feather weight, shank weight, head weight, giblet weight (liver, heart and gizzard), dressing yield.

Meat yields traits were calculated as percentage. Temperature and relative humidity (RH%) were 79.12°F and 90.77% respectively during experimental period.

**Statistical analysis:** Data was analyzed using computer package program. The following statistical model was used for data analysis:

$$Y_{ij} = \mu + S_i + e_{ij}$$

Where,  $Y_{ij}$  is the observation in  $j^{\text{th}}$  population

$\mu$  is the overall mean

$S_i$  is the fixed effect of  $i^{\text{th}}$  strain ( $i = 1, 2, 3$ )

$e_{ij}$  is the random error, assumed to be distributed (0,  $\sigma^2$ )

### Results and Discussion

Male was heavier than that of female broiler. It had been found that ISA-Vedette gain the highest body weight followed by Hybro and Arbor Acres ( $P < 0.05$ ). Blood weight of male or female and their mean value were differed significantly ( $P < 0.05$ ) among the strains, where Hybro had the highest blood weight, intermediate on ISA-Vedette and the lowest on Arbor Acres (Table 2). Feather and shank weight within male and female, and their average value among the strains did not differ significantly ( $P > 0.05$ ). However, these were found highest on Hybro, intermediate on Arbor Acres and the lowest on ISA-Vedette. Giblet weight was found to be highest on Arbor Acres followed

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Table 1: Production cost and profitability of Arbor Acres (AA), ISA-Vedette (IV) and Hybro broiler strain at 42 days of age

Parameters	Broiler strain			Significance level
	Arbor Acres	ISA-Vedette	Hybro	
Live weight (g/bird)	1372.48	1552.25	1401.60	*
Feed intake (g/bird)	2749.00	3105.00	2764.00	*
Mortality (%)	3.00	5.00	6.00	NS
Production cost (Tk/kg live bird)	50.41	44.23	50.01	NS
Sale (Tk/Kg live ird)	70.00	70.00	70.00	NS
Profitability (Tk/Kg live bird)	19.59	25.77	20.00	NS

\* =NSSignificant (P < 0.05), NS: Non significant (P > 0.05)

Table 2: Meat yield traits of different fast growing broiler strains

Parameters	Sex	Broiler strains			Level of significance
		Arbor Acres	ISA-Vedette	Hybro	
Live weight (g/bird)	male	1330.00 ± 30.62	1548.00 ± 30.62	1440.00 ± 30.62	*
	female	1260.00 ± 30.55	1494.00 ± 30.55	1415.00 ± 30.55	*
	mean	1295.00 ± 21.75	1521.00 ± 21.75	1427.00 ± 21.75	*
Blood weight (%)	male	5.48 ± 0.15	5.60 ± 0.15	6.3 ± 0.15	*
	female	5.46 ± 0.15	5.60 ± 0.15	6.56 ± 0.15	*
	mean	5.47 ± 0.10	5.60 ± 0.10	6.35 ± 0.10	NS
Feather weight (%)	male	5.65 ± 0.17	3.90 ± 0.17	4.85 ± 0.17	NS
	female	4.52 ± 0.14	4.26 ± 0.14	4.71 ± 0.14	NS
	mean	4.58 ± 0.14	4.42 ± 0.14	4.78 ± 0.14	NS
Shank weight (%)	male	4.35 ± 0.09	4.24 ± 0.09	4.54 ± 0.09	NS
	female	4.34 ± 0.07	4.21 ± 0.07	4.23 ± 0.07	NS
	mean	4.34 ± 0.06	4.20 ± 0.06	4.38 ± 0.06	*
Giblet weight (%)	male	4.72 ± 0.13	4.40 ± 0.13	3.92 ± 0.13	*
	female	4.59 ± 0.13	4.26 ± 0.13	3.74 ± 0.13	*
	mean	4.66 ± 0.10	4.43 ± 0.01	3.83 ± 0.10	NS
Head weight (%)	male	1.36 ± 0.06	1.23 ± 0.06	1.16 ± 0.06	NS
	female	1.26 ± 0.06	1.10 ± 0.06	1.14 ± 0.06	NS
	mean	1.31 ± 0.04	1.16 ± 0.04	1.15 ± 0.04	NS
Dressing (%)	male	72.70 ± 0.30	73.83 ± 0.30	72.61 ± 0.30	NS
	female	72.17 ± 0.23	73.43 ± 0.23	72.45 ± 0.23	NS
	mean	72.50 ± 0.18	73.63 ± 0.18	72.53 ± 0.18	NS

NS: P > 0.05, \*: P < 0.05, \*\*: P < 0.01

by ISA-Vedette and Hybro broiler (P < 0.05). The significant difference was not found among the strains for head weight and dressing yield. However, ISA-Vedette produced the highest percentage of dressing yield, Hybro and Arbor Acres produced dressing yield by 72.53 and 72.50% respectively. ISA-Vedette showed significantly higher body weight at 6<sup>th</sup> week of age compared to the Hybro and Arbor Acres strain, which was closely related with the findings of Azad (1996). This was also supported by Zullitch *et al.* (1989). ISA-Vedette consumed more feed in comparison with Hybro and Arbor Acres, which was consistent with Hornia-Kova (1985). He mentioned that heavier broiler strains consumed more feed. Despite there was significant difference among the strains for mortality, Hybro strain had the highest mortality (%), followed by ISA-Vedette and Arbor Acres, which was in agreement with the findings of Branvie *et al.* (1985) who found 6.52 and 5.68% mortality on Hybro and LohMann respectively. Despite there was no significant difference among broiler strains for production cost and profitability, ISA-Vedette showed the highest profitability due to its lower production cost in comparison with Hybro and Arbor Acres strains, this finding was in agreement with Islam (2000). Though the higher body weight and the blood weight were found on ISA-Vedette, feather, shank and head weight were almost similar among the strains, which was consistent with Akhter, (1996) who found the non-significant difference between the ISA-Vedette and ISA-i757 broiler strains. This finding is also supported by Azad (1996) who found the non significant difference among Starbro, Hybro and ISA-

Vedette but Arbor Acres showed significantly higher giblet weight than the ISA-Vedette or Hybro strains.

Despite non-significant difference was found for dressing yield among the strains, ISA-Vedette was the best for dressing yield, this was advocated with Rahman (1990) who found the non-significant difference for dressing yield among the different broiler strains.

## References

- Akhter, N., 1996. Comparative performance of ISA-i757 and ISA-Vedette broilers. M. Sc. Thesis, Department of Poultry Science, Bangladesh Agricultural University, Mymensingh, Bangladesh
- Azad, M. M. H., 1996. Performance of Starbro, Hybro and ISA-Vedette broiler strains under identical management. M.Sc. Thesis, Department of Poultry Science, Bangladesh Agricultural University, Mymensingh, Bangladesh.
- Baghel, R. P. S. and K. Pradhan, 1989. Performance of broilers influenced by the phase of growth and seasons. Indian Vet. J., 66: 1176-1178.
- Binwagu and C. C. Nwosu, 1994. Growth performance of F1 crosses between Arbor Acres broiler and local chicken of Nigeria. Indian J. Poult. Sci., 64: 651-653.
- Bohren, B. B., J. C. Rogler and J. R. Carson, 1982. Survival under heat stress of lines selected for fast and slow growth at two temperatures, 61: 1804-1808
- Branvie, A., D. Ciric, N. Sujica, J. Popovick and M. Nedeljkov, 1985. Comparative investigation of Hybro and Lohmann chickens in broiler production. Peradartvo (Yugoslavia), 20: 9-11.

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- Bray, T.S., 1983. Broilers-Why is temperature important? Gleadthorpe experimental Husbandry Farm Poultry Booklet No. 10, pp: 10-21 (Ministry of Agriculture, Fisheries and Food, London.
- Harris, G.C.J. and G.S. Nelson, 1995. Influence of high relative humidity on performance of strains of commercial broilers. Arkansas Farm Res., 24: 6-7.
- Horniakova, E., 1988. Evaluation of growth and feed consumption in various types of broiler chicks. Poult. Abs., 14 : 3.
- Howlider, M. A. R. and S. P. Rose, 1987. Temperature and the growth of broilers. World Poult. Sci. J., 43: 228-237.
- Howlider, M. A. R. and S. P. Rose, 1987. Rearing temperature and meat yield of broilers. British Poult. Sci., 30: 61-67.
- Huque, Q. M. E., 1993. Current status of poultry production and marketing system in Bangladesh. Bangladesh Agricultural Research Council. USAID/CHECCHI and company consulting, INC.
- Islam, M. A., 2000. Effect of local and exotic strains of chicken at hot-humid climate. Ph.D. Thesis, Institute of Animal Science, Faculty of Agriculture and Horticulture, Humboldt University of Berlin, Germany.
- May, J. D., B. D. Lott and J. D. Simmons, 1998. The effect of environmental temperature and body weight on growth rate and consumption gain of male broiler. Poult. Sci., 77: 499-501
- Perreault, N. A. and S. Lesson, 1987. Demand for breast yield to increase. Poult. Misset, 3: 29-8-31
- Rahman, M. M., 1990. A comparative study on the performance of different hybrids of broiler chicken. M.Sc. Thesis, Department of Poultry Science, Faculty of Animal Husbandry, Bangladesh Agricultural University, Mymensingh.
- Tawfik, E. S., A. M. A. Osman, M. Ristic, W. Hebel and F. W. Klein, 1989. Einfluss der stall-temperature and Mastleistung, Schlachtkörperwert und Fleischbeschaffenheit von Broilern unterschiedlichen Alters und Geschlechts. 2. Mitteilung Schlachtkörperwert. Arch. Geflügelkd, 53: 235-244.
- Zullitch, W., A. Wurznier and F. Lettner, 1989. A comparison of four broiler hybrids. Poult. Abs., 15: 306.