

# Conservation of Haryana cattle through Gaushala - a refreshing experience

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## ABSTRACT

Haryana breed of indigenous cattle is an acknowledged dual-purpose breed reared mainly for production of bullocks to be used for draught purpose and milk production for human consumption. Since extensive mechanization of agricultural operations in the breeding tract of the breed, it has lost its utility, as Murrah buffaloes are preferred for milk production. The breed is now restricted to few pockets and the extensive network of Gaushalas throughout the state of Haryana and adjoining parts of Punjab, Rajasthan and Uttar Pradesh. The gaushala at Jind, Haryana was adopted in 1994 by the Haryana Agricultural University for the improvement and conservation of this precious germplasm. In this study, an evaluation of growth, milk production and reproduction traits has been done to see the impact of improvement programme and its impact on the conservation of the breed. In general there has been a significant improvement in body weight at different ages, i.e. birth, 3-Months and 6 months. Significant improvement in the reproduction traits- age at first calving, service period and inter-calving period was found. Similarly, there was an appreciable improvement in the milk productivity traits like, lactation milk yield, peak yield and lactation length. The study, thus demonstrates that with the introduction of scientific breeding and management, the gaushala network of the state can be exploited as a source of conservation and improvement of Haryana cattle.

**Key words:** dual-purpose, gaushala, conservation, reproduction traits.

## INTRODUCTION

India, being predominantly an agricultural country, has been endowed with vast cattle population. Despite such vast livestock population, the per capita availability of milk in the country is much lower in comparison to that in developed countries. Despite a steady increase in cattle and buffalo population over the years and consequential increased milk production, the corresponding larger multiplication of human population and lower per animal productivity in native breeds have largely neutralized the gain in milk availability. Haryana breed of Indian cattle is acknowledged as one of the best dual-purpose type breeds vastly used for agricultural operations and milk production.

Haryana cows symbolize a precious cattle germplasm of the country and have been taken to almost every region of the country from its breeding tract in Haryana. Due to extensive mechanization of agricultural operations in the breeding tract, the breed, reared mainly for bullock production and milk, is declining in numbers in farmers' herds and is largely found in Gaushalas in the state. The animals are managed under very low input system with limited resources available with the Gaushala, hence, the performance of Haryana cattle has been evaluated under gaushala management. The improvement in performance with respect to body weights at various developmental stages, milk production and reproductive performance of animals within a short period of ten years was comparable with those maintained under more favourable conditions found at organized government farms. The breed thus documents not only its adaptability to varying environmental conditions of the country but also its production potential even under low managerial conditions generally prevalent with Indian farmers. Due to severe declining population trend, there is thus an urgent need to initiate efforts by all concerned for the conservation, preservation and genetic improvement of the breed exploiting more advanced scientific tools.

Genetic improvement of Haryana cattle through selective breeding is thus an important aspect for conservation, preservation and propagation of this valuable germplasm as an element of national heritage and possible future exploitation in the fast shifting global scenario steered by escalating fuel costs. The capacity to produce and reproduce for a longer productive life is a favorite characteristic in dairy cattle. Faster gain in body weights during early life ensures a long productive life ensuing in enhanced overall productivity of dairy animals. Since it takes 3-5 years of productive life for a cow to repay her cost of rearing, longer productive life is categorically profitable and also allows the genetically superior animals to leave more offsprings. High production efficiency in dairy cattle is an economically desirable character, which targets ultimately for genetic up-gradation. In this study the production potential of Haryana cattle has been evaluated under low input conditions prevalent in Gaushala systems.

## MATERIAL AND METHODS

The present investigation was conducted on Haryana cows maintained at Gaushala, Jind of Haryana state with the objective to study the comparative growth, productive and reproductive performance in the years 1994, 1999, 2004 and 2008. The data utilized in the present study pertains to 398 Haryana cows maintained at Gaushala, Jind. Under the managerial conditions operational in the Gaushala. The animals were maintained in open enclosures throughout the year. During severe winter they were moved to half covered sheds. Milking cows, dry cows, young calves and bulls were kept in separate enclosures. Male and female calves were housed separately after the age of six months. The cows were milked twice daily at 3.30 a.m. and 3.30 p.m. No weaning was practiced. The milk yield of a cow was computed from once a week test day yield. In general, group feeding was followed except feeding of advanced stage pregnant cows and breeding bulls kept in individual pens. Antibiotics and feed

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supplements were occasionally given according to the dosage prescribed by the veterinarian. Limited amount of concentrate ration was fed to lactating and pregnant cows. The green fodder cultivated and fed to animals included maize and jowar during the month of June to October and berseem, oats and rape mixture from November to March.

Dry fodder consisted of jowar and bajra karbi and wheat bhoosa. Adequate veterinary care was provided round the clock. Entire herd was protected against diseases, like Foot and mouth, Haemorrhagic Septicemia and Black Quarter (BQ). Data collected were subjected to statistical analysis to determine the performance parameters of the cows maintained in the Gaushala.

RESULTS AND DISCUSSION

**Birth weight:** The male calves on an average were heavier by 5.4, 1.8, 2.7 and 3.1 kg than female calves at birth in the years 1994, 1999, 2004 and 2008, respectively (Table 1). The observations substantiate the findings of Dhillon *et al.* (1971), who reported that sex of calves had significant effect on birth weight, in general males being significantly heavier than females. The birth weight increased by 9.05% in females and 15.68% in males during the period 1994 to 2008.

**Body weight at subsequent ages:** Average body weight of female and male Haryana calves from the age of three months upward

displayed variable growth rate depending upon their age of development in both periods. The average body weights of female and male calves at 3 months of age were 38.5±1.45 and 54.2±0.81, 38.8±1.69 and 44.6±0.48, 45.1±0.53 and 56.7±0.60, 46.3±0.72 and 57.1±0.68 kg, respectively in the years 1994, 1999, 2004 and 2008, respectively. There was a substantial gain of 20.26% in females and 29.19% in males in the body weight at 3 months of age during the period of 1994-2008. The corresponding 6 months body weights in the females and males were 55.4±1.08 and 64.0±1.03, 53.4±1.26 and 71.0±1.06, 66.8±0.54 and 74.2±0.66, 68.1±0.98 and 75.5±0.59 kg, respectively in the four years (Table 1). The overall gain in 6-month body weights of female and male calves was 22.92 and 17.07%, respectively during the period of investigation (1994 to 2008). It is thus evident that both male and female calves of the breed exhibited appreciable gains in body weights at different ages during the period of study (1994 to 2008).

**Body measurements:** The corresponding body dimensions i.e. body height, heart girth and body length in the male calves were considerably superior to those in female calves in all the four periods (Table 1). In this study, the higher body dimensions in males may be attributed to the pronounced increase in body length than the other two body dimensions as substantiated by Nigam *et al.* (1975).

Table 1: Body weights (Kg) and dimensions (Cm) of Haryana cattle maintained in Gaushala

Attributes	Age	Sex	Trait Value During		% gain over 1994	2003	% gain over 1994	2008	% gain over 1994
			1994	1998					
Body weight	Birth	F	22.2±0.63 (36)	22.3±0.64 (161)	0.45	24.1±0.43 (350)	8.56	24.2±0.84 (450)	9.01
		M	23.6±0.43 (28)	24.1±1.23 (181)	2.12	26.8±0.31 (373)	13.56	27.3±0.60 (484)	15.68
	3-Month	F	38.5±1.45 (26)	38.8±1.69 (140)	0.78	45.1±0.53 (312)	17.14	46.3±0.72 (407)	20.26
		M	44.2±0.81 (19)	44.6±0.48 (138)	0.90	56.7±0.60 (326)	28.41	57.1±0.68 (418)	29.19
	6-Month	F	55.4±1.08 (11)	53.4±1.26 (126)	-3.6	66.8±0.54 (305)	20.58	68.1±0.98 (399)	22.92
		M	64.0±1.03 (8)	71.0±1.06 (132)	10.94	74.2±0.66 (320)	15.31	75.5±0.59 (407)	17.07
Body Height	Birth	F	63.0±0.76 (31)	68.0±0.78 (161)	7.94	68.0±0.39 (350)	7.94	67.0±0.34 (450)	6.35
		M	66.0±0.63 (28)	83.0±1.32 (181)	25.75	76.0±0.47 (373)	15.15	77.0±0.41 (484)	16.67
	3-Month	F	71.0±1.38 (26)	73.0±1.59 (140)	2.82	78.0±0.49 (312)	9.86	82.0±0.42 (407)	15.71
		M	87.0±0.61 (19)	96.0±0.84 (138)	10.34	91.0±0.50 (326)	4.60	92.0±0.48 (418)	5.75
	6-Month	F	78.0±1.01 (11)	89.0±1.40 (126)	14.10	92.0±0.72 (305)	17.95	93.0±0.69 (399)	19.23
		M	93.0±0.97 (8)	98.0±1.03 (132)	5.38	99.0±0.63 (320)	6.45	99.0±0.57 (407)	6.45
Heart Girth	Birth	F	67.0±0.83 (31)	66.0±0.69 (161)	-1.49	71.0±0.38 (350)	5.97	70.0±0.32 (450)	4.48
		M	70.0±0.79 (28)	74.0±1.08 (181)	5.71	75.0±0.51 (373)	7.14	75.0±0.43 (484)	7.14
	3-Month	F	77.0±1.89 (26)	71.0±1.34 (140)	-7.79	85.0±0.51 (312)	10.39	84.0±0.46 (407)	9.09
		M	81.0±0.93 (19)	97.0±0.69 (138)	19.75	90.0±0.45 (326)	11.11	90.0±0.41 (418)	11.11
	6-Month	F	92.0±0.79 (11)	86.0±1.43 (126)	6.52	99.0±0.76 (305)	7.61	100.0±0.66 (399)	8.70
		M	96.0±1.03 (8)	103.0±1.23 (132)	7.29	102.0±0.52 (320)	6.25	103.0±0.44 (407)	7.29
Body Length	Birth	F	60.0±0.76 (31)	62.4±0.62 (161)	4.00	66.0±0.40 (350)	10.00	65.0±0.34 (450)	8.33
		M	63.0±0.61 (28)	71.5±1.18 (181)	13.49	70.0±0.37 (373)	11.11	70.0±0.39 (484)	11.11
	3-Month	F	68.0±1.30 (26)	69.0±1.32 (140)	1.47	74.0±0.61 (312)	8.82	75.0±0.53 (407)	10.29
		M	76.0±0.93 (19)	87.0±0.58 (138)	14.47	82.0±0.64 (326)	7.89	84.0±0.58 (418)	10.53
	6-Month	F	81.0±0.91 (11)	79.0±1.23 (126)	-2.47	90.0±0.81 (305)	11.11	89.0±0.69 (399)	9.88
		M	84.0±1.01 (8)	93.0±1.31 (132)	10.71	94.0±0.57 (320)	11.90	96.0±0.51 (407)	14.29

Productive and reproductive traits: The estimates of productive and reproductive parameters of Haryana cows are presented in Table 2. The mean age at first calving (AFC) in the study was 1728±192, 1624±102, 1565±106.7 and 1546±107.2 days in the years 1994, 1999, 2004 and 2008, respectively, indicating a significant reduction of AFC by 182 days (9.16% improvement) from 1994 to 2008. However, Saha *et al.* (2000) and Singh (2002) reported slightly lower age at first calving as 1328.62 and 1435.48 days, respectively in Haryana cattle reared in organized farms. The results of the study revealed that Haryana breed take more time to calve for the first time under Gaushala managerial conditions possibly due to the poor nutritional status of the animals fed on low quality crop residues based ration and also reproductive diseases when animals are brought to the gaushala and after that there is a trivial improvement.

The average calving period (CP) was 482.0±52.1, 445.0±49.5, 441.0±47.2 and 422.0±23.0 days in the year 1994, 1999, 2004 and 2008, respectively (Table 2). There was reduction of 60 days (8.51% improvement) in calving period from 1994 to 2008. However, the CP was still on the higher side and necessitates improved management for it's dropping to about a year for profitable and efficient productivity. The mean service period in the study was 197.0±27.0, 191.0±21.7, 182.0±0.41 and 169.0±0.72 days in the year 1994, 1999, 2004 and 2008, respectively, reflecting a decrease by 28 days (7.61% improvement) from 1994 to 2008. The SP, however, was quite higher than reported by the Singh (2002) in Haryana cattle. Higher

service period may be chiefly attributed to the poor health and nutritional status of the animals due to the feeding of low quality roughages. Consequently animals take more time to recover the depletion of nutrients that took place in the previous lactation.

Average lactation milk yield (Table 2) of Haryana cows maintained under low input conditions of Gaushala was estimated as 833±11.30, 914±1.15, 1025±1.00 and 1214±1.01 kg in year 1994, 1999, 2004 and 2008, respectively. There was a striking gain of 381 Kg of milk (23.05% gain) in lactation milk yield from 1994 to 2008. However, the findings of Ashraf *et al.* (2000), Thakur and Singh (2000) and Singh (2002) showed that the cattle of this breed can produce more milk (up to 1870 kg) than obtained in the study. The low milk productivity in the study may be due to the low nutritional status of the animals, which is even unable to fulfill the maintenance requirement and what to talk about the production under the Gaushala managerial systems. The lactation length averaged as 211±1.09, 220±0.51, 251±0.46 and 255±0.47 days in the year 1994, 1999, 2004 and 2008, respectively, which is in close approximation of the reports of Kumar (1995) and Singh and Nivsarkar (1998) for cows maintained at organized farms. Average dry period was 184±1.76, 178±0.42, 174.60±0.36 and 161±0.38 days in all periods, similar to those estimated by Singh (2002). The dry period is very high for any economic dairy animal and calls for steps to reduce it significantly for increasing the economic utility of the breed. However, there was a substantial improvement in lactation length, peak yield and dry period (Table 2) during the period of investigation (1994 to 2008).

Table 2: Productive performance of Haryana cows maintained in gaushala

Trait	Mean ± S.E.		% Gain over 1994	% Gain over 1994		% Gain over 1994	
	1994	1999		2004	2008		
Lactation Milk Yield (kg)	833.0±11.3 (35)	914.0±1.15 (81)	9.72	1025.0±1.00 (176)	23.05	1214±1.01 (246)	45.74
Lactation Length (Days)	211.0±1.09 (35)	220.0±0.51 (81)	4.27	251.0±0.46 (176)	18.96	255±0.47 (246)	20.85
Dry Period (days)	184.0±1.76 (35)	178.0±0.42 (81)	-3.26	174.0±0.36 (176)	-5.43	161±0.38 (246)	-12.5
Peak Yield (kg)	5.1±0.70 (35)	5.6±0.8 (81)	10.0	6.0±0.06 (176)	17.65	6.7±0.6 (246)	31.37
Age at First Calving (days)	1728±192 (8)	1624±102 (11)	-6.02	1565± 106.7 (85)	-9.16	1546±107.2 (115)	-25.00
Service Period (days)	197±27.0 (9)	191±21.7 (81)	-3.05	182±0.41 (135)	-7.61	169±0.72 (139)	-14.21
Calving Period (days)	482±52.1 (7)	445±49.5 (74)	-7.68	441.0±47.2 (98)	-8.51	422±23.0 (172)	-12.45

*Gaushala as potential improvement and conservation centers:* Perusal of the production performance of Haryana cows under inadequate managerial system existing in Gaushalas is as good as with the performance of the breed under more favourable conditions operative at organized farms. The results from the present study reveal that there had been satisfactory improvement in different traits since the animals came to the gaushala before the year 1994 as compared with subsequent years, viz. 1999, 2004 and 2008. This signifies the potential and suitability of the breed for enhanced productivity under low input system commonly prevailing with our Indian farmers. The breed is vastly distributed in almost every part of the country again testifying its adaptability under a wide-ranging environmental conditions existing in the country. The breed thus necessitates immediate attention of farming communities, breed associations, NGOs and Governmental policies for initiating steps for its conservation, preservation and improvement exploiting advanced scientific knowledge. India being a signatory to the global biodiversity convention is obliged to conserve all of its biodiversity. Efforts thus must be directed towards intensification and scientific intervention in terms of selection, breeding policy and managerial practices etc. in Gaushalas for operative improvement and conservation of this valuable germplasm.

#### SUMMARY

The production performance of Haryana cows under inadequate managerial system existing in Gaushalas is comparable with the performance of the breed under more favourable conditions operative at organized farms. A substantial improvement in the growth, milk production and reproduction traits could be obtained during the period of 1994 to 2008 due to better management and scientific breeding practices adopted in the Gaushala. This signifies the potential and suitability of the breed for better productivity under low input system generally prevalent with our Indian farmers. The breed is vastly distributed in almost every part of the country again testifying its adaptability under a wide-ranging environmental conditions existing in the country. Thus, breed necessitates immediate attention of farming communities, breed associations, NGOs and Governmental

policies for initiating steps for its conservation, preservation and improvement exploiting advanced scientific knowledge because this breed has the advantage over the buffalo to produce milk and draft bullocks even under the low input system.

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