VETERINARY SCIENCE RESEARCH JOURNAL
olume 7 | Issue 2 | Oct., 2016 | 87-91

DOI : 10.15740/HAS/VSRJ/7.2/87-91
Visit us - *www.researchjournal.co.in*
e ISSN-2230-942X

RESEARCH ARTICLE

Effect of different genetic groups (H.F × Local, Jersey × Local and Local × Local) on the lactation length in cattle

RAHUL SHAH[1], RAM PAL SINGH[1] AND KULADIP PRAKASH SHINDE

Members of the Research Forum

Associate Author :
[1]Department of Animal Genetics and Breeding, Sam Higginbottom Institute of Agriculture, Technology and Sciences ALLAHABAD (U.P.) INDIA
Email : rahulshah.shah77@gmail.com; rampal585@gmail.com

AUTHOR FOR CORRESPONDENCE :
KULADIP PRAKASH SHINDE
Division of Livestock Production and Management, Indian Counsil of Agricultural Research-NDRI, KARNAL (HARYANA) INDIA
Email: kuls164@gmail.com

Abstract : A study was conduct to estimate the effect of different genetic groups (H.F × Local, Jersey × Local and Local × Local) on the lactation length in cattle. The productive data pertaining to dairy cows in and around the Allahabad District Karchana Block were collected by providing questionnaires, frequent field visits and personal contact with the farmers over a period of one year (2011-2012). The data thus obtained were classified according to genetic group as Holstein Friesian × Local (G1), Jersey × Local (G2) and Local× Local (G3) cows. The effect of different genetic groupsFriesian×Local(G1), Jersey×Local(G2) and Local× Local (G3) cows on Lactation length was recorded. The mean lactation length was 306.6153 days in G1, 286.9316 days in G2 and 208.409 days in G3.The differences in mean value of lactation length of G1, G2 and G3 inheritance were significant. From the perusal of data on lactation length according to their Genetic groups (G1) H.F x Local, (G2) Jersey x Local, Local x Local (G3) indicated the lactation length in H.F x Local crossbred cattle ranged from 281 to345 days, Jersey x Local crossbred cattle ranged from 206.6 to323 days and Local x Local crossbred cattle ranged from 105.37 to 326.9 days. However the longest mean lactation length (306.6153 days) was observed in cows of G1 followed by 286.9316 days in cows of G2, 208.409 days in cows of G3. Since differences in their lactation length were found significant, it indicated a significant effect of genetic group on lactation length of cows. The differences in lactation length between G1 and G2 as well as G2 and G3 were found at par showing a non – significant influence among them solves while G1 and G3 had a clear significant influence of genetic groups on lactation length of cows, which indicates more milk production from genetic group G1.

Key words : Lactation length, Genetic groups, Holstein friesian, Jersey, Local, Cattle

How to cite this paper : Shah, Rahul, Singh, Ram Pal and Shinde, Kuladip Prakash (2016). Effect of different genetic groups (H.F × Local, Jersey × Local and Local × Local) on the lactation length in cattle. *Vet. Sci. Res. J.*, **7**(2) : 87-91, **DOI : 10.15740/HAS/VSRJ/7.2/87-91**.

Paper History : Received : 03.06.2016; Revised : 21.08.2016; Accepted : 09.09.2016

INTRODUCTION

India is a country of diversified agro climatic conditions. Agriculture and livestock is the main occupation of over

three fourth of the citizens. Among the livestock, cattle play an important role in her agriculture economy. To the marginal farmers and landless it is customary to rear a cow, buffaloes and bullocks or other livestock as a source of extra income. Crop husbandry and animal husbandry are dependent on each other in India, mainly because of small holding of land by majority of the farmers. Unlike the agriculture in western countries, Indian agriculture depends almost entirely on cattle to meet its draught requirement. Bullocks and buffaloes are the main draught animals employed in different agricultural operations. Females of these bovines are the main source of milk and protein of animal origin. The male calves are mostly used for traction purpose. The dairy farming business in tropical and sub-tropical countries is characterized by large number of cattle with low milk yield. There are 220 million cattle about 16.3 per cent of the world's total cattle population and 94 million buffaloes (Livestock population 2002 in India, China and other region, more than half of the world's buffalo population most are non-descript.India currently possesses largest bovine population in the world 190.90 million cattle and 108.7 million buffaloes (BAHS, 2012). Though India stood first in milk production, it contributes only about 10 per cent towards the total world milk production. In India 10 million farmers maintaining a herd of less than 100 million cattle (57 million cows and 39 million buffaloes). The average milk yield of a cow in India is only 1000 kg. in a lactation, which is much less as compared to that of other developed countries. The main cause for low production of Indian cattle is poor management in respect of nutrition, health and improper selection. It is possible to introduce high yielding inheritance of Taurus breeds in Zebu breed and sustain their high level of production by cross breeding in dairy cattle, but it requires availability of adequate nutrition and sophisticated management. The magnitude of impartation will have to be very large and it will not be economically possible to sustain large number of exotic cattle for country. Crossing of indigenous poor yielding cows with high yielding exotic dairy breeds is the quickest way to bring about the transition in genetic makeup of indigenous cows.The crossbreed cows obtained thus has high production potential. The exploitation of genetic superiority of crossbred cows over indigenous cows needs proper attention. India is the world's top milk producer since 1997, with its output

Table A : Estimates of production and per capita availability of milk in 1950-51 to 2010-2011 – all India

Year (March to February)	Milk production (million tonnes)	Human population (Million nos.)	Per capita availability (g/day)
1950-51	17.0	359	130
1955-56	19.0	393	130
1960-61	20.0	434	126
1973-74	23.2	580	110
1980-81	31.6	679	128
1999-2000	78.3	1001	214
2000-01	80.6	1019	217
2001-02	84.4	1040	222
2002-03	86.2	1056	224
2003-04	88.1	1072	225
2004-05	92.5	1089	233
2005-06	97.1	1106	241
2006-07#	102.6	1122	251
2007-08	107.9	1138	260
2008-09	112.2	1154	266
2009-10	116.4	1170	273
2010-11	121.8	1186	281
2011-12*	127.3		

Anticipated achievements:

Note – Population projected as on 1st October of a calendar year by Office of the Registrar General of India is used as mid-year population for calculating per capita availability.

Estimates of 2006-2007 to 2009-2010 have been revised

Source: State / UT Animal Husbandry Department (Govt. of India)

Table B : Share of milk production by cows 2010-11 **(000 tonnes)**

Sr. No.	States/Uts	CB	ND	Total
1.	Tamil Nadu	5247	774	6021
2.	Utter Pradesh	1634	3709	5342
3.	Rajasthan	913	4120	5032
4.	Maharashtra	3068	1230	4297
5.	West Bengal	1922	2187	4109
6.	Gujarat	1593	1978	3572
7.	Bihar	1382	2180	3561
8.	Karnataka	2183	1292	3475
9.	Madhya Pradesh	482	2670	3152
10.	Andhra Pradesh	1974	1128	3102
	All India	29555	25348	54903

CB / Crossbred, ND / Non – descript
Source: State / UT Animal Husbandry Department (Govt. of India)

of 76 million tonnes, but the per capita availability even then is quite low at 180 g. Per day per person. Various survey indicate that the actual average milk intake per person per day is hardly 20 g. in parts of the eastern region, as against as high of 400 g. In Punjab region. These levels reflect the vast scope for rise in milk demand in the future. Milk production starts with the initiation of reproduction cycle in cows. The estimates reported by various workers differ even within genetic groups; the factors like season of calving, lactation length and lactation order, butter fat yield also affecting the milk production.The milk yield depends on persistency as well as lactation period for. Shorter lactation length causes poor milk lactation yield while longer lactation will correspondingly enhance milk production. There are conflicting views on whether lactation length is heritable or not, whereas some investigators opined that variation in this trait is mainly due to managerial differences, while some showed that it was heritable. In most of the indigenous cattle lactations are short and determined by many factors, heredity being the main one. Since the genetic variability in Indian breeds of cattle is more, there is sufficient scope for selection of the animals for this trait. It is one among the economic traits which influences the persistency in the total milk production (Table A and B).

RESEARCH METHODOLOGY

Productive data pertaining to dairy cows in and around the Allahabad District Karchana Block were collected by providing questionnaires, frequent field visits and personal contact with the farmers over a period of one year (2011-2012). The data thus obtained were classified according to genetic group as Holstein Friesian×Local (G1), Jersey×Local(G2), and Local× Local (G3) cows.The effect of different genetic groups Friesian×Local(G1), Jersey×Local(G2) and Local× Local (G3) cows on Lactation length was recorded.

Genetic groups:

The data thus obtained were classified according to genetic group:

Sr. No.	Genetic group	Abbreviation
1.	Holstein × Local	G_1
2.	Jersey × Local	G_2
3.	Local breeds	G_3

Statistical analysis :

The data were subjected to statistical analysis using analysis of variance (ANOVA) technique (one way classification) as per method of Snedecar and Cochran (1967).

The structure of analysis of variance (ANOVA) was as follows:

Source of variation	d.f.	S.S	M.S.S.	F value		Result
				F. Cal	Table at 5%	
Genetic groups	n-1	SSG	VT	VT/VE	-	S/NS
Error	N-n	SSE	Ve		-	
Total	N-1					

N= Total number of observation, N-1 total degrees of freedom, N= Total number of genetic groups, n-1 = Degree of freedom for genetic groups, SS = Sum of squares, SSG = Sum of squares due to genetic groups, SSE = Sum of squares due to error, MSS = Mean sum of squares, VT = SST/n-1 VE = SSE/N-n, S = Significant, NS= Non- significant, C.D= Critical difference,

$$C.D. = \sqrt{VE\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}$$

RESULTS AND DISCUSSION

Lactation length of different genetic groups G1, G2 and G3 are expressed in Table 1 and the ANOVA for the same is given in Table 2. The highest to lowest Lactation length 345 to 281days, 323 to 206.6 days and 326.9 to 105.37 days was observed in G1, G2 and G3 genetic groups, respectively, average service period, lactation length and milk yield in f1 crosses of brown Swiss as 102 days, 338 days, and 3018 kg respectively reported by (*Chopra et al.*, 1973). The mean lactation length was 306.6153 days in G1, 286.9316 days in G2 and 208.409 days in G3. Overall lactation length and calving interval in Holstein x Sahiwal crosses averaged at 287.02 ± 3.01 and 390.36 ± 7.28 days, respectively (Nehra *et al.*, 1987) where as Reddy *et al.* (1987) reported that the difference in lactation length between rainy and winter season were significant but not milk yield in Holstein Friesian x Ongole cows.The differences in mean value of lactation length of G1, G2, and G3 inheritance were significant (Table 2). From the perusal of data on lactation length according to their Genetic groups (G1) H.F x Local, (G2) Jersey x Local, Local x Local (G3) furnished in Table 1 indicated the lactation length in H.F x Local crossbred cattle ranged from 281 to345 days, Jersey

Table 1 : Genetic group wise lactation length

Sr. No.	G1	G2	G3
1.	301	206.6	142
2.	305	244.33	201.7
3.	281	311.69	297.5
4.	286	227.51	234
5.	296	315	200.2
6.	322	288	201
7.	316	309	219.42
8.	282	280.05	326.9
9.	310	309	156
10.	307	323	105.37
11.	312	312	
12.	320	317	
13.	345		
Mean	306.6153	286.9316	208.409

Table 2 : ANOVA for the data for genetic group wise lactation length contain in Table 1

Source of variation	d.f	S.S	M.S.S	F. value		Result	CD
				F-Cal	5% Tab		
Between the sample	2	29671563.364	14835781.682				
Within the sample	32	4703877.127	146996.160	100.923	3.295	S	349.26
Total	34						

	G1	G2	G3
Mean	306.6153	286.9316	208.409

x Local crossbred cattle ranged from 206.6 to323 days and Local x Local crossbred cattle ranged from 105.37 to 326.9 days. However the longest mean lactation length (306.6153days) was observed in cows of G1 followed by 286.9316 days in cows of G2, 208.409 days in cows of G3. Since differences in their lactation length were found significant, it indicated a significant effect of genetic group on lactation length of cows.Dhumal *et al.* (1989) made a study on 161 J x R.S. crossbred cows and reported mean lactation yield as 1934 kg and lactation length as 815 days and non-significant correlation was observed between lactation yield and length with dry period while Singh and Dave (1989) reported that calving interval averaged at 455.92 ± 47.45 kg, lactation length 321.1 ± 9.47 day and dry period 145.18 ± 12.34 day in 71 Holstein x Tharparker cows also Taneja and Rai (1989) reported mean lactation length as 312 days form 2069 records of Holstein Friesian x Sahiwal crossbred's cows. The differences in lactation length between G1 and G2 as well as G2 and G3 were found at par showing a non – significant influence among them solves while G1 and G3 had a clear significant influence of genetic groups on lactation length of cows, which indicates more milk production from genetic group G1.

Conclusion :

Among genetic groups only Holstein Frisian × Local crosses had over all high performance with regard to lactation length hence Holstein Frisian inheritance can be used to obtain higher milk yield withlonger lactation length.

LITERATURE CITED

Chopra, R.C., Bhatnagfar, D.S. and Gurunai, M. (1973). Influence of service period on lactation length and lactation yield in Sahiwal, Red sindhi and Brown Swiss crossbreds. *Indian J. Dairy Sci.,* **43**(8): 384.

Dhumal, M.V., Sakhare, P.G. and Deshpande, K.S. (1989). Factor effecting lactation milk yield and lactation length in red kandhari and crossbred cows. *Indian J. Dairy Sci.,* **42**(1) : 102-104.

Nehra, S.C., Ram, S. and Chaudhary, A.L. (1987). Factor affecting calving interval and lactation length in Friesian X Sahiwal crosses. *Internat. J. Tropical Agric.,* **5**(3-4): 240-246.

Reddy, U.K., Sharma, G.P. and Murthy, A.S.R. (1987). Studies on the effect of season of calving on milk yield and lactation length of lactation Ongole crossbred cows. *Indian Vet. J.,***64** (7) : 587-590.

Singh, M.P. and Dave, S.K. (1989). Performance of tarparkar x holstein crossbreds in Central India.*Indian J. Animal Production & Mgmt.,* **5** (1) : 1-4.

Snedecor, G.W. and Conhran, W.G. (1994). *Statistical method*. 8th Ed., The lowa State University press, AMES, LOWA.

Taneja, K.R. and Rai, A.V. (1989). Relative importance of various of factor affecting milk production traits in Holstein Friesian x Sahiwal crossbreds. *Indian J. Dairy Sci.,***42**(1): 87-89.

WEBLIOGRAPHY:

BAHS (Basic Animal Husbandry Statistics) (2012). Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India. April, 2012. *http://www.dahd.nic.in.*