"Effect of Body Measurements on First Lactation Milk Yield in Jersey Crosses And Holstein Friesian Crosses"

Rajeev Mishra[1], Ram Pal Singh[2], Sarvjeet Herbert[3]

Department Of Animal Husbandry & Dairying
Sam Higginbottom University Of Agriculture, Technology & Sciences, Allahabad-211007. (U. P).

Abstract: *A study was conducted to predict the influence of body measurements on first lactation milk yield of Jersey crosses and Holstein Friesian crosses. Body weight, body height, heart girth, body length and posterior girth measurements were taken from 50 Jersey crosses and 70 HF crosses. Experimental animals were fed and managed under tail to tail system of housing at dairy farm. From the calculation of data on different parameters it is concluded that body measurements has non-significant effect on body weight, heart girth, body length, body height and posterior girth on first lactation milk yield in Jersey crosses. In Holstein Friesian crosses had significant effect on body weight and posterior girth and non significant effect on heart girth, body length and body height on first lactation milk yield in HF crosses.*
Keywords: *Cattle, body measurements, body weight, Holstein Friesian crosses, Jersey crosses, milk yield.*

I. Introduction

India has emerged as a largest producer of milk in the world. Annual production of milk in India is 114 m. tons (2010). Milk is considered the most satisfactory single food. Minerals like calcium, phosphorus, sodium, potassium and magnesium are present in appreciable quantities. The human body needs more than thirty distinct materials in appreciable quantities. The human body needs more than thirty distinct materials in food. No. single food stuff in nature supplies all but milk supplies nearly all the nutrients. The composition of milk varies with the breed stage of lactation, season of the year and several other factors. The average composition of milk includes water (87.25%), lactose 94.80%), fat (3.80%), casein (2.80%), albumin (0.70%) and salts (0.65%). Also selection of the animals based on the production of more fat & protein is the need of the hour . Since reliable information on the production, pedigree and progeny records of most of the animals particularly in village conditions (where actual animal husbandry practices are going on in the country) are not available. That's why at the time of purchase of animals from open market for selection of animals we depend on its individual superiority based on body conformation, external features, shape and size of udder and teats etc. Farmers in general, select animals on the basis of type, because correct and complete production records are not available except on very few organized dairy farms. Therefore the type of conformation occupies an important part in evaluation of the animal. The significance of this is relatively more in cows and buffaloes because body weight, heart girth and height at withers are the common parameters reported to have some correlation with the milk production **Singh and Prasad (1983).** Such study may furnish some useful information that may help relation with the milk production in predicting the productive ability thereby improving the milking herd.

II. Materials and methods

This study were carried out in the herd maintained in the Department of Animal Husbandry and Dairying, SHUATS, Allahabad, During the period of 2012-2015 of 50 Jersey crosses and 70 HF crosses. Body weight of animals was determined by using a digital weighing scale. The parameters such as body weight, heart girth, body height, body length and posterior girth were measured using and measuring tape when animals were standing as described in The best prediction equations for body weight from other traits (heart girth, body height, body length and posterior girth) as independent variables were determined. The animals were professionally managed and kept under similar management conditions. The animal received adequate ration and greens throughout the year. The data on various factors and parameters were collected, tabulated and subjected to analysis of variance technique (ANOVA) as per **Snedecor and Cochran (1994).**

III. Results And Discussion

The results of this experiment show clearly a positive effect of determine the accuracy of prediction of body measurements in jersey and Holstein Friesian crosses. Body weight, body height, heart girth, body length and posterior girth measurements were obtained from jersey and

Table: 1. Effect of Body measurement on first lactation milk yield in Jersey and Holstein Friesian crosses

Parameters	Jersey crosses (liter/lactation)		Holstein Friesian crosses (liter/lactation)	
Body weight (kg)	BW1(255-282)	1714.83	BW1(236-292)	1680.85
	BW2(283-309)	1938.13	BW2(293-349)	1396.68
	BW3(310-336)	1943.65	BW3(350-406)	1375.69
Heart girth (inch)	HG1(5.10-5.56)	1950.33	HG1(5.40-6.10)	1563.44
	HG2(5.68-6.25)	1951.39	HG2(6.20-6.70)	1362.83
	HG3(6.26-6.81)	1765.47	HG3(6.80-7.60)	1553.61
Body length (inch)	BL1(5.10-5.44)	2030.16	BL1(5.20-5.60)	1456.81
	BL2(5.45-5.78)	1921.90	BL2(5.70-6.20)	1411.50
	BL3(5.79-6.12)	1715.50	BL3(6.30-6.90)	1579.00
Body height (inch)	BH1(4.10-4.70)	1843.00	BH1(4.10-5.00)	1387.48
	BH2(4.80-5.30)	1937.87	BH2(5.10-5.90)	1458.26
	BH3(5.40-5.90)	1841.72	BH3(6.00-6.99)	1670.60
Posterior girth (inch)	PG1(5.10-5.64)	1872.09	PG1(5.10-6.00)	1359.27
	PG2(5.65-6.18)	1912.47	PG2(6.10-6.80)	1514.56
	PG3(6.19-6.79)	1741.33	PG3(6.90-7.70)	1650.13

Holstein Friesian crosses (50 Jersey crosses and 70 HF crosses). The body weight groups, first lactation milk yield in Jersey crosses and HF crosses ranged from 997 kg – 3354 kg and 733 kg – 2146 kg, respectively. The mean milk yield in first lactation of Jersey crosses for different body weight groups were 1714.83, 1938.13 and 1943.65 kg and in HF crosses were 1680.85, 1396.68 and 1375.69 kg, respectively. The differences in first lactation milk yield in Jersey crosses due to different body weight groups were non-significant and in HF cross significant (Table. 1) respectively. The heart girth groups' first lactation milk yield in Jersey and HF crosses ranged from 997-3554 kg and 723 kg – 2146 kg, respectively. The mean milk yield in first lactation of Jersey crosses for different heart girth groups were 1950.33 kg, 1951.39 kg, 1765.47 kg and in HF crosses were 1563.44, 1362.84 kg, and 1553.70 kg, respectively.
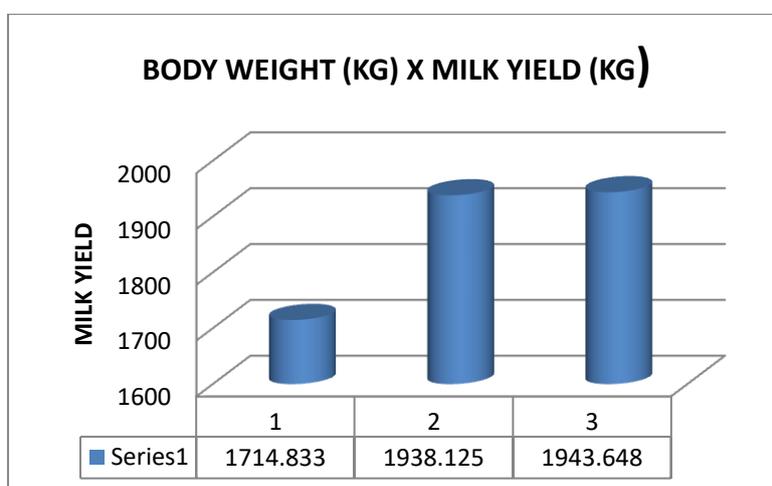
FIG: 1: First lactation milk yield in Jersey crosses due to body weight.,
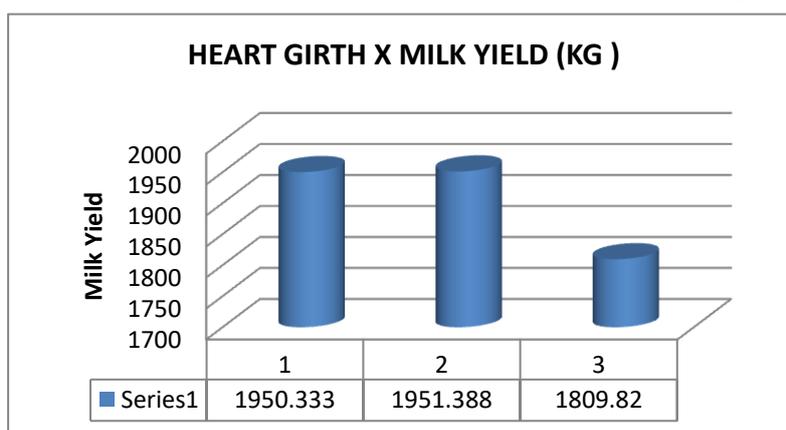
FIG: 2: First lactation milk yield in Jersey crosses due to heart girth.
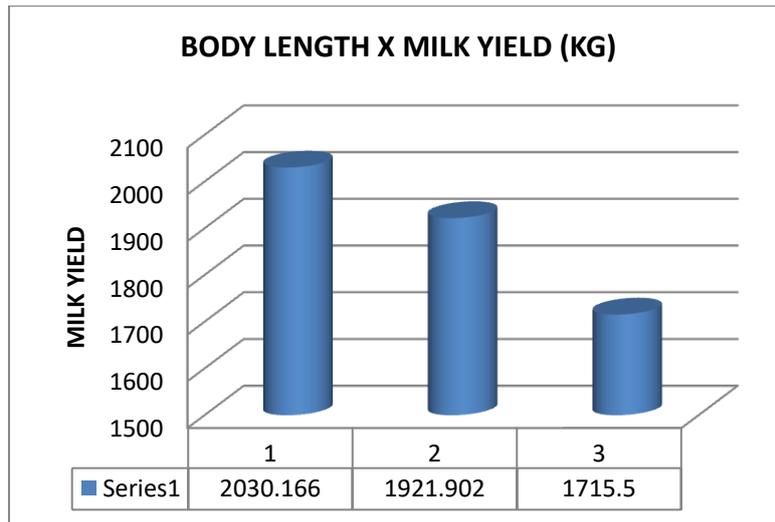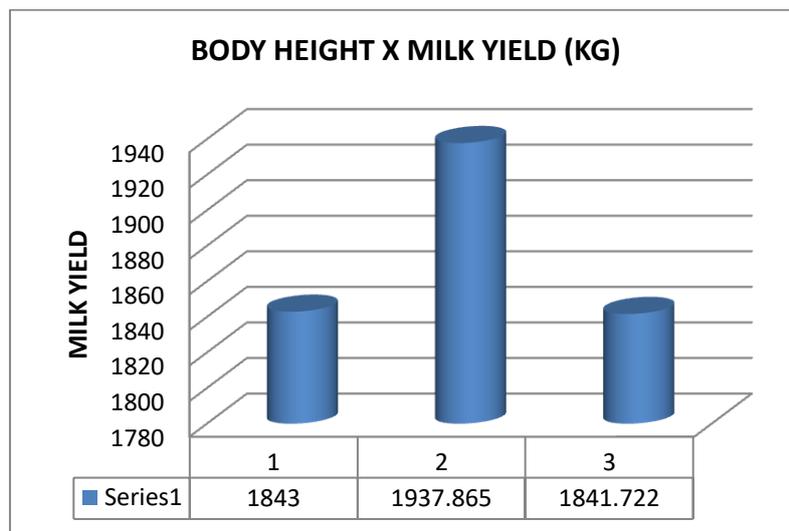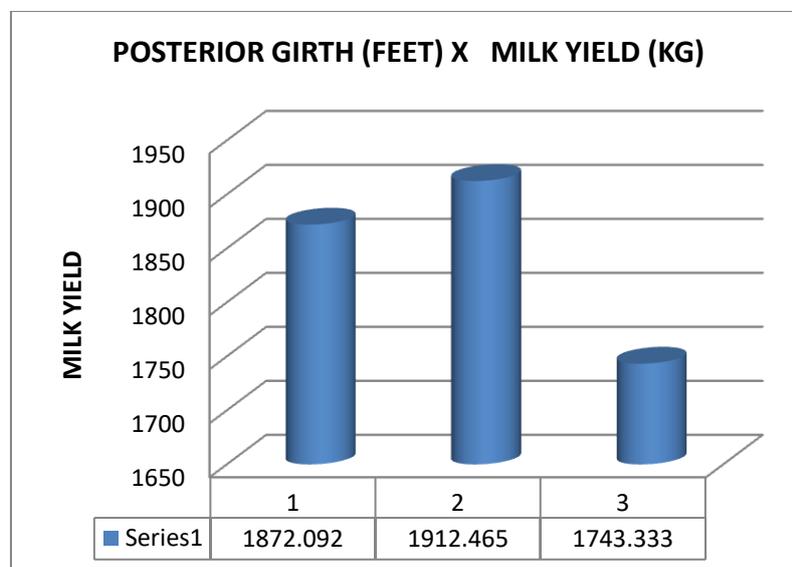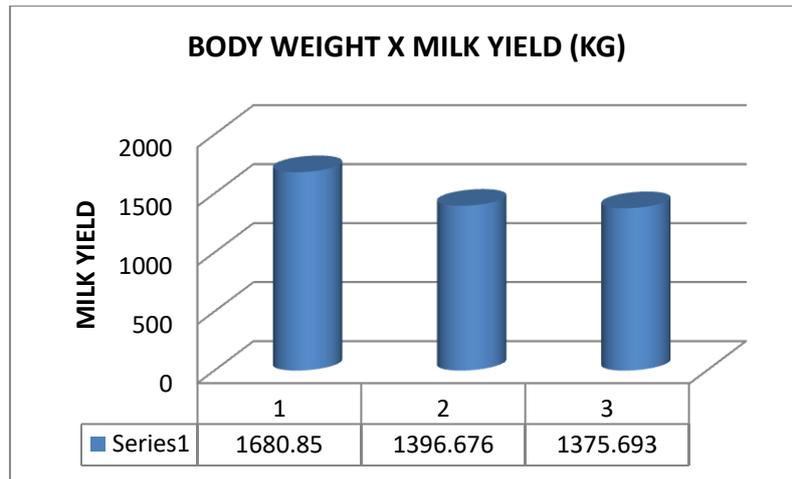
BODY LENGTH X MILK YIELD (KG)

	1	2	3
■ Series1	2030.166	1921.902	1715.5

FIG: 3: First lactation milk yield in Jersey crosses due to body length.

BODY HEIGHT X MILK YIELD (KG)

	1	2	3
■ Series1	1843	1937.865	1841.722

FIG: 4: First lactation milk yield in Jersey crosses due to body height.

POSTERIOR GIRTH (FEET) X   MILK YIELD (KG)

	1	2	3
■ Series1	1872.092	1912.465	1743.333

FIG: 5: First lactation milk yield in Jersey crosses in due to Posterior girth.

BODY WEIGHT X MILK YIELD (KG)

	1	2	3
■ Series1	1680.85	1396.676	1375.693

Fig: 6 : First lactation milk yield in HF crosses due to body weight.

HEART GIRTH X MILK YIELD (KG)

	1	2	3
■ Series1	1563.435	1362.837	1553.696
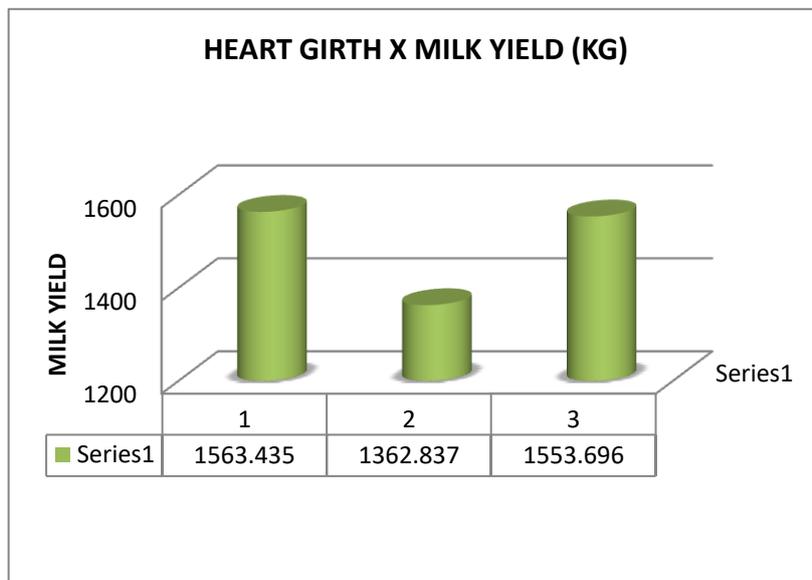
Fig: 7: First lactation milk yield in HF crosses due to heart girth..

BODY LENGTH X MILK YIELD (KG)

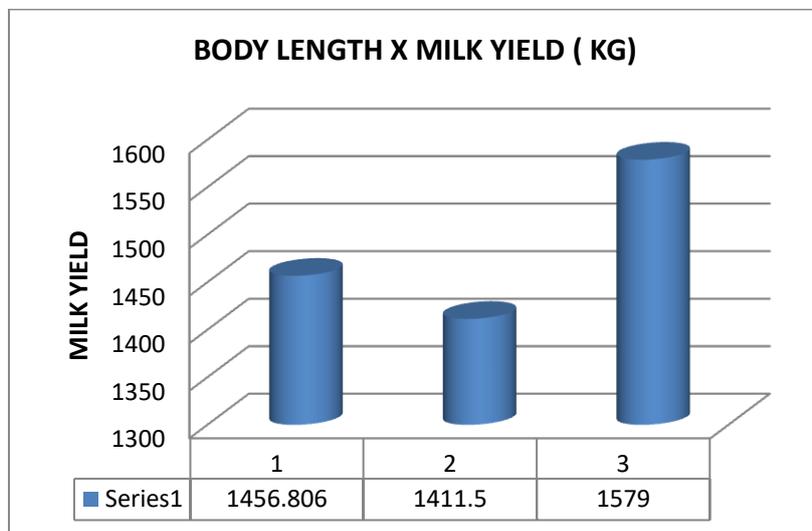|	1	2	3
■ Series1	1456.806	1411.5	1579

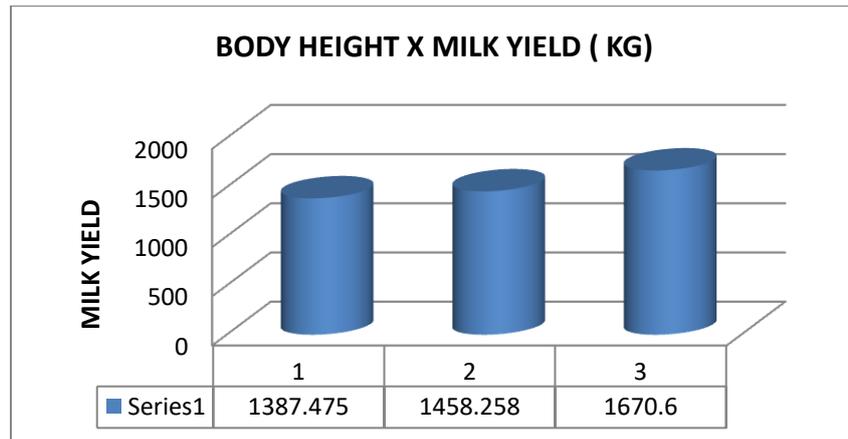**Fig: 8:** First lactation milk yield in HF crosses due to body length..

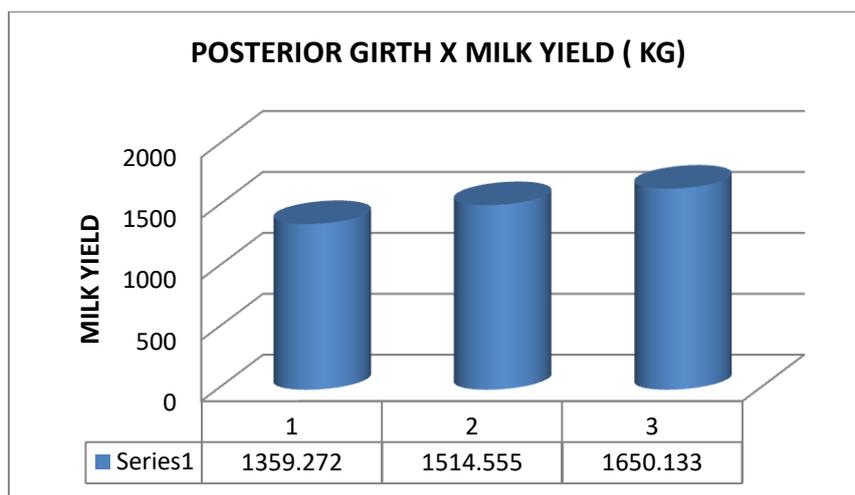**FIG: 9:** :First lactation milk yield in HF crosses due to body height.

FIG: 10 :First lactation milk yield in HF crosses due to Posterior girth.

The differences in first lactation milk yield in Jersey crosses due to different heart girth groups were non-significant (Table. 1) and in HF crosses (Table. 1) respectively. The body length groups first lactation milk yield in Jersey and HF crosses ranged from 997-3354 kg and 723 kg – 2146 kg, respectively. The mean milk yield in first lactation of Jersey crosses for different body length groups were 2030.17 kg, 1921.90 kg, 1715.50 kg and in HF crosses were 1456.81 kg, 1411.50 kg, and 1579.00 kg , respectively. The difference in first lactation milk yield in Jersey crosses due to different body length group was non-significant (Table. 1) and in HF crosses (Table 1) respectively. Similar results are also in agreement with **Miller** and **McGilliard (1959)** and **Shulimov, (1972).** The body height first group's lactation milk yield in Jersey crosses and HF crosses ranged from 997-3354 kg and 723-2146 kg, respectively. The mean milk yield in first lactation of Jersey crosses for different body height groups were 1843.00 kg, 1937.87 kg, 1841-72 kg and in HF crosses were 1387.48 kg, 1458.26 kg, and 1670.60 kg, respectively. The different in first lactation milk yield in Jersey crosses due to different body height groups were non-significant (Table. 1) and in HF crosses (Table. 1) respectively. Similar results are also in agreement with **Kleiber** and **Mead (1941)** and **Alphan (1971)** The posterior girth group's first lactation milk yield in Jersey crosses and HF crosses ranged from 997-3354 kg and 723 kg-2146 kg, respectively. The mean milk yield in first lactation of Jersey crosses for different posterior girth groups were 1872.09 kg, 1912.47 kg, 1741.33 kg and in HF crosses were 1359.27 kg, 1514.56 kg, and 1650.13 kg, respectively. The differences in first lactation milk yield in Jersey crosses due to different posterior girth groups were non-significant (Table. 1) and in HF cross significant (Table. 1) respectively. Similar results are also in agreement with **Wood (1980)** and **Yanar *et.al*, (2000).**

IV.   Conclusion

It is concluded that the body measurement has non-significant effect on first lactation milk yield of body weight, heart girth, body length, body height and posterior girth on first lactation milk yield in jersey. In Holstein Friesian crosses had significant effect of body weight and posterior girth and non-significant effect of

---

heart girth, body length and body height on first lactation milk yield. Therefore, these factors can be taken into consideration while selecting animals for better production or for breeding improvement.

References

[1]. Alphan, O. (1971). Relationship of some early growth traits to first lactation milk yield in Karacabey Brown cattle. Animal Breeding Abs. 39(1), 52.
[2]. Kleiber, M. and Mead, S.W. (1941). Body size and milk production. J. Dairy Sci., 24(2).
[3]. Miller, R.H. and MacGlliard, L.D. (1959). Relations betwwen weight at calving and milk production during the first lactation. J. Dairy Sci., 41,747.
[4]. Snedecor, G.W. and Cochran W.G. (1994) Statistical method 8th edition the Iowa State University. Press Amer Iowa USA.
[5]. Shulimov, A.G. (1972). Relationship between body weight and milk production in simmental cows . Animal Breeding Abs.,40(1), 43.
[6]. Singh, S.P. and Prasad, J. (1983). To study the correlation of certain body measurements, age at first calving and body weight at different age with total milk yield   and butter fat production in murrah buffaloes and Red Sindhi cows, Dairy Sci. Abstr. 45(7) No. 4458. The Livestock Advisor 8(2), 47-49.
[7]. Wood, P.D.P. (1980). "A note on the lactation curve of some high yielding British Friesian cows". Anim.Prod.130:299-302.
[8]. Yanar, M. Aydin, R. and Ugur, F. (2000). Relationship of body measurements with milk production traits in Brown Swiss cattle, Indian J. Dairy Sci. 53.(6), 444-447.