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STUDIES ON THE DISTRIBUTION OF ANIMAL STOCKS KEPT AT SELECTED DAIRY HERDS IN EASTERN REGION OF UTTAR PRADESH

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ABSTRACT

The dairies having only cows were have the highest number of cross-bred J x S followed by HF x S, HF and J x H and in the mixed herds only. Similarly amongst the indigenous breed have more numbers of Shiwal cows were kept by the dairies having cattle only and mixed herd. The avergae numbers in the II and III groups were estimated as 32.60 and 7.55 for HF x S, 52.67 and 11.35 for J x S, 3,48 and 1.30 for J x H, 3.26 and 48.56 and 14.22 for Sahiwal, 3.33 and 2.47 for Haryana, and 18.12 and 8.18 for deshi Gangatiri cattle respectively. As stated earlier, being a dairy breed the Sahiwal and the cross of this either HF or Jersye is commonly reared by most of the dairies having buffaloes only i.e. I group and the III groups comprising of both the cattle as well as buffaloes include the average numbers as 41.79 and 21.70 respectively. Thus, in the mixed herd more numbers of cows including both, different cross-breeds and indigenous breeds of cattle were kept while the total number of buffaloes was lesser than the cows, indicating a significant difference between the groups.

Key Words : Distribution, breed-wise adult stocks, dairy herds.

Dairy farming in the country not only plays a vital role in eradicating proverty through generating employment and ameliorating financial instability of the farmers but also contributes significantly in obviating protein malnutrition in the population. It is however realised that in relation to the present per capita income level the price of milk in the country is higher. As such, unless efforts are made to keep the milk available at reasonable price well within the reach of the general messes any attempt to increase its availability will have little impact in solving the problem of protein malnutrition.

Malnutrition is the world's number one problem; it adversely affects mental and physical development, productivity and span of life. However, malnutrition does not arouse the sense of urgency that accompanies on outbreak of contagious diseases susch as small pox. If the nutritional status of the world's hungry masses is to improve food production must be increased at an unprecedented rate. The animal products not only can contribute to the health but these can improve the socio-economic condition of the country people. Foods of animal origin provide high quality protein, vitamin, minerals and other essential dietary elements. Although, the source of animal proteins in the average diet are milk and milk products meat, eggs and fish. The milk and milk products alone contribute to 77 per cent of the total available proteins in the diet. In this context milk is nearly complete food for humans on account of the balanced context of all essential nutrients viz., protein, minerals, fat and lactose. The famous Nutritionist Dr. E.V. Macollum has stated hereunder "The people who have achieved, who have become large, strong, vigorous people, whohave the best trade in world, who have an appreciation of art literature and music, who are progressive in science and in every activity in human, intellect, are the people who have used liberal amount of milk and milk products" (Compell and Marshell, 1975).

Considering all the goodness and beneficial nutritional properties in milk, it has been recommended that for optimum nutrition, an adult human should consume 280 g of milk per day to

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supply a balanced assortment of Amino-acid. Despite large development and massive investment especially from 1971 through the “Operation Flood” programme, the annual milk production has just touched 100 million tonnes as against the aforesaid requirement. To bridge this gap between the demand and supply, steps are needed to exploit our land and livestock resources to the fullest extent through accelerated rate in the country.

MATERIALS AND METHODS

This study was carried out on the dairy, herds situated in Varanasi, Azamgarh, Gorakhpur, Basti and Faizabad division of Eastern region of Uttar Pradesh. From the eastern zone, 3 government, 4 orizational, 15 trustee and 28 private farm located in the 5 divisions as Varanasi, Azamgarh, Gorakhpur, Basti and Faizabad were selected for this study. Thus all 50 diary units engaged in commercial production of milk were selected for this strudy. Thus, all 50 dairy units engaged in commercial production of milk were covered under the programme. Inclusion of longer units, not only increased the range of herds size but also enabled to collect the data from farms managed on modern scientific line, It may be mentioned here that most of the bigger sized farms are managed and financed either by educational institutions or by religious or governmental agencies and their primary activit is not milk production or by religious or governmental agencies and their primari activity is not milk production of commercial purpose. Nevertheless, since they are producing milk on large scale of which the surplus is usually sent for selling, it will not be irrational to treat them as semi-commercial and their management cannot ramain much different from those running on commercial line Rather, it is expected to be more organized and based on latest know-how, than the ones managed and owned by a farmer.

The data collected during the period of inquirywere prapared, tabulated and compiled systematically. Commensurate with the objectives of the study, tabular and functional analysis were performed as the empirical tools in the present study.

Since the nature and duration of manual work vary according to the size and type of bovine, it is necessary to convert different categories of animals into standard animal or Standard Livestock Units (SLU). Stage of lactation was measured in months from the date of calving to the date of taking the observation on milk yield of an animal. That this will facilitate to workout norms for input cost can well be understood. For nthis purpose the method was the same as followed by Pandey and Yadav (1982). In this method, one Standard Livestock Unit has been consiodered equal.

For computation of various statistical parameters and for carrying out analysis of variance of data based on completely randomized block design, methods recommended by the experts were followed for this purpose the computer installed at the Computer Centre. Banaras Hindu University, was used.

RESULTS AND DISCUSSION

Breed-wise number of adult bovines:

The number of buffalo and cattle adult belonging to the different breeds the variations therein due to herd size are summarized in table 2. The number of Gangatiri cow breed were less and noticed in group II, III, IV, V, VI and VIII and the average number were 0.75, 2.33, 2.62, 2.92, 6.00, 8.33, 9.67 and 6.80 respectively. This is perhaps due to the non-recognized dairy breed on one hand and these are found only in the areas situated on the bank of river Ganga. Infact, this is a breed reasonable with the Haryana, a dual purpose cow and that is why, this breed is also known as pseudo-Haryana breed in the locality. Thus, this may also be treated as zebu cattle.

Next indigenous breed is Haryana, which were recorded in group II, III, IV, VI and VII more or less similar to that of Gangatiri cows. The number of cows inthe aforesaid groups averaged 0.25, 1.00, 2.83, 1.50 and 1.67 respectively. Haryana is a dual purpose breed and because of this, this breed was not commonly reared in all the nine groups classified on the basis of herd-size.

The cattle breed which was very common in all the dairy units in the area of study was Sahiwal and their number in the I, II, III, IV, V, VI, VII, VIII and IX groups averaged 2.33, 3.67, 2.66, 8.62, 12.33, 12.75, 11.25, 18.75 and 21.78 respectively

(Table 2). In terms of percentage of the total adults cattle the Sahiwal, Haryana and Gangatiri breeds covers the share of 24.67, 3.42 and 11.63 per cent, respectively.

Besides, these indigenous breeds, the different cross-breeds were also very commonly reared on medium and large-sized units. The first cross-bed which was generally kept by all the categories of dairies was Holstein-Friesian and Sahiwal (HF x S) cross-bed cattle and their number in III, V, VII, VIII and IX groups averaged 3.42, 8.00, 10.00, 19.25, 11.75 and 8.00 (Table 2), respectively.

Among the cross-bed cows Jersy and Sahiwal (J x S) occupied the first place with a shareof 25.17 per cent of the total cows and their average number were 2.33, 3.25, 3.33, 8.38, 13.50, 1.58, 10.75 and 29.40 in I, II, III, IV, V, VI, VII, VIII and IX groups respectively. On second place the cross-bed of HF x S was observed and these were maintained only in III, V, VI, VII, VIII and IX groups and their average number in the corresponding groups were 3.42, 8.00, 10.00, 19.25, 11.75 and 8.00 respectively comprising 23.76 per cent of the total adult cattle. Only in a single group that in III-group 2.42 average number of cows of cross-bred of Holstein-Friesioan and Haryana was observed which covers only 5.71 percent share of total cattle? The cross-bred cows of Jersy with Haryana were least in camparison to the Sahiwal crosses with Hlstein-Friesian and Jersey and this was perhaps fur to the dasiry and dual purpose breed of cattle. Thus, mostly at longer farms over 40 animal heads Sahiwal crosses with two exotic breeds were maintained at large scale by different dairies in the areas of study. Further, as stated earlier dairies with less than 10 animal heads, there were no bulls of breeding. However, at these farms artifical insemination of breeding program was commonly practiced.

Only 24.73 percent of the total adult bovines were buffaloes and only Murrah breed was maintained. All groups of dairies were having buffaloes and the highest number of the adult she-buffaloes mantained by IX group of dairies comprising of 26.72 average numbers in the dairy unit in the group.

Breed-wise adult stock on the basis of ownership:

The indigenous Sahiwal cows has maintained by all the categories of dairies and their number were estimated as 32.00, 15.76, 1960 and 26.80 in I, II, III and IV groups respectively. Though the number of Haryana breed of cattle was less but it was maintained by I, III and IV groups and their corresponding number were 4.70, 1.65 and 2.35. In I, II, III and IV groups 10.40, 7.00, 12.60 and 9.44 number of Gangatiri/desi cows has also been kept.

Nevertheless, the Governmental dairy groups were kept the highest number of cross-breed (j x S) cattle 39.00 followed by the Private i.e. 23.94 only. Cross-breeds (J X S) were maintained by Organizational (18.38) and Trustee (14.72 farms). The maximum number (22.80) of HF x S was kept by the organizational farms followed by Government (15.66), Private (13.65) and Trustee farms (8.33). Some groups have maintained the cross-bred of Jersy x Haryana, HF x H cows and their corresponding number were 2.00, 1.67 and 3.50; 2.42 and 43.00 in I, III and IV groups, respectively.

In the I, III and IV groups owned by Governmental, Trustee and Private the cross-breeds of Jersey and haryana were kept and their number were only 2.00, 1.67 and 3.50 respectively. Cross-breed of Holstein-Friesian and Haryana was kept by private farms and the number was only 2.42, which is less. The reasons have already stated earlier, as the Sahiwal breed is a dairy purpose breed where as the Haryana and Gangatiri is a dual purpose type, therefore, the cross of Sahiwal with the two exotic breeds namely Holstein-Friesian and Jersy were preferred and Haryana by most of the owner-groups. A significant variation in the groups for S x HF and Sahiwal cattle was estimated (Table 3).

Breed-wise adult stocks on the basis of location of the dairies:

The number of J x S cross-bred cattle occupied the first place with having the number of 42.60, 22.05 and 31.38 in I, II and III groups followed by the HF x S cross-bred with their number estimated as 15.17, 18.88 and 26.40 in the corresponding three groups. The number of III x H cross-bred cattle was only 3.40 and 1.44 in I and II

groups only respectively I and II groups only respectively. However, 3.64, 2.53 and 1.00 cows of JxH cross-bred was noticed in the I, II and III respectively. In indigenuous categories the Sahiwal occupied the first place followed by Gangatiri/desi or zebu cattle and Haryana. The number of Sahiwal cows in I, II and III groupd avergaed 45.38, 28.42 and 20.37 that of Haryana were 3.72 and 2.08 in I and II group respectively. However, the number of desi or Gangatiri breed of cows was found 18.46, 12.87 and 8.12 in the I, II and III groups respectively (Table 4). Only Sahiwal breed shows a significant difference between the groups.

Breed-wise adult stocks on the basis of type of bovine kept:

The dairies having only cows were having the highest number of cross bred of J x S followed by HF x S, HF x H and J x H and in the mixed herds only. Similarly amongst the indigenous breed have more numbers of Sahiwal cows were kept by the dairies having cattle only and mixed herd. The average numbers in the II and III groupd were estimated as 32.60 and 7.55 for HF x S, 52.67 and 11.35 for J x S, 3.48 and 1.30 for J x H, 3.26 and 48.56 and 14.22 for Sahiwal, 3.33 and 2.47 for Haryana, and 18.12 and 8.18 for desi Gangatiri cattle respectively. As stated earlier, being a dairy breed the Sahiwal and the cross of this with either HF or Jersey is commonly reared by most of the dairies having either cattle only or a mixed herd of both cattle as well as buffaloes (Table 1). The dairies having buffaloes only i.e. I group and the III groups comprising of both the cattle as well as buffaloes include the average numbers as 41.79 and 21.70 respectively. Thus, in the mixed herd more numbers of cows including both, different cross-breeds and indigenous breeds of cattle were kept while the total number of buffaloes was lesser than the cows, indicating a significant difference between the groups (Table 1).

Breed-wise adult stocks on the basis of size of land holdings:

In the I, II, III and IV groups the Sahiwal of cattle averaged 15.58, 19.82, 26.00 and 32.76 respectively (Table 5) indicating a significant rise in number of cattle heads due to increase in farm area. In comparison to Sahiwal breed lesser number of Haryana and Gangatiri/desi cows were observed in the four groups, their means were 1.35, 2.65, nil and 4.70 for Haryana and 7.44, 9.20, 10.35 and 12.45 for desi/Gangatiri cows in I, II, III, IV groups respectively indicating no significant difference between the groups. The landless group has no Cross bred J x H and HF x H cows. The I, II, III and IV groups were having the cross-bred cows of Jersey and Sahiwal (J x S) in more number as 14.78, 18.94, 23.00 and 29.32 respectively. The cross-bred of HF x S cows occupied the second place and their means were 8.65, 13.33, 15.66 and 22.80 in I, II, III and IV groups and the corresponding averages for J x H were zero, 1.67, 2.00 and 3.50. Zero, 1.86, 2.48 and 2.92 cows of HF x H cross were kept by I, II, III and IV group respectively (Table 5). Clearly, the average number of dairy breed of cattle was significant greater with land holding beyond 2 hectares, than at units with smaller land holding. Similarly, the number of bulls also increased significantly with increase in land area beyond 5 hectares.

Nevertheless, the number of buffaloes in the herd in the I, II, III and IV groups worked out to 18.67, 19.80, 21.85 and 65.04 respectively (Table 5). Clearly, it indicates that as the land area increases beyond 2 hectares, there is a strong tendency to keep less number of buffaloes, but in the IV group of the dairies having over 5 hectares of land area show the tendency to have more number of buffaloes. However, the difference between the groups was observed not significant at 5% and 1% level of significance.

In the buffalo part of the herd only Murrah buffaloes was maintained and their averages were estimated as zero, 16.38, 34.86, 31.20, 42.70, 39.75, 53.55, 56.00, 44.65, 62.90 and 67.36 in I, II, III, IV, V, VI, VII, VIII, IX, X and XI groups respectively with an overall average of 44.94. These findings are similar and full confirmity to the findings of Singh and Pandey (2010), Shah and Singh (1995), Krishan (1997), Patel (1993), Rao and Pal (2204) and Meena *et al.* (2010).

Table 1. Variation in ther herd statistics of adult stock in relation to type of bovine species at selected dairy herds.

Group No.	Group Description	Avg No. of Units	Murrah buffaloes	Cross breds (HFxS)	Cross breds (JxS)	Cross breds (JxH)	Cross breds (HFxH)	Sahiwal	Haryana	Deshi Gangatiri	Total no. of animal heads	Total no. of SLU
1	2	3	4	5	6	7	8	9	10	11	12	13
I	Buffalo	15	41.79	-	-	-	-	-	-	-	41.79	41.79
II	Cow	25	-	32.60	52.67	3.48	3.26	48.56	3.33	18.12	162.02	129.62
III	Both	10	21.70	7.55	11.35	1.30	1.58	14.22	2.47	8.18	68.35	59.02
	Average		31.75	20.15	32.01	2.39	2.42	31.39	2.90	13.15	90.72	76.81
	F Value (Calculated		12.30**	1.97	1.62	1.78	0.31	2.46	1.03	0.72	11.84	1.49

N.B.: *** Indicates significant at 5% (P> 0.05), 1% (P?0.01) level respectively.

Table 2: Variation in the breed-wise herd statistics of adult stock in relation to the herd size at selected dairy herds.

Group No.	Group Description (Animal Heads)	Avg No. of Units	Sahiwal	Haryana	Desi Gangatiri	Cross breds (HFxS)	Cross breds (JxS)	Cross breds (JxH)	Cross breds (HFxH)	Murrah buffaloes	Total no. of animal heads	Total no. of SLU
1	2	3	4	5	6	7	8	9	10	11	12	13
I	Upto 10	03	2.33	-	-	-	2.33	-	-	4.67	9.33	8.40
II	10-20	10	3.67	0.25	0.75	-	3.25	2.00	-	8.33	18.50	16.27
III	20-30	13	2.66	1.00	2.33	3.42	3.33	1.67	2.42	9.92	26.75	23.38
IV	30-40	08	8.62	2.62	-	6.38	3.50	-	12.17	38.12	32.93	
V	40-50	05	12.33	-	2.92	8.00	13.50	-	-	8.50	45.25	39.50
VI	50-60	05	12.75	1.50	6.00	10.00	12.58	-	-	13.50	56.33	47.76
VII	60-70	03	11.25	1.67	8.33	19.25	10.75	-	-	18.33	69.33	59.33
VIII	70-80	02	18.75	-	9.67	11.75	12.50	-	-	23.25	75.92	65.39
IX	>80	01	21.78	-	6.80	8.00	29.40	-	-	26.72	92.70	79.50
	Average		10.46	1.45	4.93	10.07	10.67	2.39	2.42	13.93	48.05	41.38
	F Value (Calculative)		2.18*	0.16	0.34**	1.39*	1.21*	0.51	0.29	2.37*	8.17	7.39

N.B.: *,** Indicates significant at 5% (P> 0.05), 1% (P?0.01) level respectively.

Table 3: Variation in the bred wise herd statistics of adult stock in relation to type of Ownership at selected dairy herds.

Group No.	Group Description	Avg No. of Units	Murrah buffaloes	Cross breds (HFxS)	Cross breds (JxS)	Cross breds (JxH)	Cross breds (HFxH)	Sahiwal	Haryana	Deshi Gangatiri	Total no. of animal heads	Total no. of SLU
1	2	3	4	5	6	7	8	9	10	11	12	13
I	Governmental	03	65.67	15.66	39.00	2.00	-	32.00	4.70	10.40	169.43	148.68
II	Organisational	04	21.04	22.80	18.38	-	-	15.76	-	7.00	79.98	68.19
III	Trustee	15	19.85	8.33	14.72	1.67	q-	19.60	1.65	12.60	78.42	66.71
IV	Private	28	18.80	13.65	23.94	3.50	2.42	26.80	2.35	9.44	100.90	84.48
Average			31.34	15.11	24.01	2.39	2.42	23.54	2.90	9.86	107.18	92.02
F Value (Calculated)			7.65**	4.58*	1.97	0.43	3.69**	1.10	0.27	3.49**	8.25**	

N.B.: *** Indicates significant at 5% (P> 0.05), 1% (P>0.01) level respectively.

Table 4: Variation in the bred wise herd statistics of adult stock in relation to Location of dairy units at selected dairy herds.

Group No.	Group Description	Avg No. of Units	Murrah buffaloes	Cross breds (HFxS)	Cross breds (JxS)	Cross breds (JxH)	Cross breds (HFxH)	Sahiwal	Haryana	Deshi Gangatiri	Total no. of animal heads	Total no. of SLU
1	2	3	4	5	6	7	8	9	10	11	12	13
I	Rural	08	53.68	15.17	42.60	3.64	3.40	45.38	3.72	18.46	186.05	159.58
II	Semi-Urban	11	45.76	18.88	22.05	2.53	1.44	28.42	2.08	12.87	134.03	116.38
III	Inside Ciry	31	25.93	26.40	31.38	1.00	-	20.37	-	8.12	113.20	95.75
Average			41.79	20.15	32.01	2.39	2.42	31.39	2.90	13.15	144.43	123.90
F Value (Calculated)			1.02	2.47	2.79	1.38	0.32	4.13*	0.26	1.05	2.83*	2.37

N.B.: *** Indicates significant at 5% (P> 0.05), 1% (P>0.01) level respectively.

Table 5: Variation in the bred wise herd statistics of adult stock in relation to size of land holding at selected dairy herd.

Group No.	Group Description	Avg No. of Units	Murrah buffaloes	Cross breds (HFxS)	Cross breds (JxS)	Cross breds (JxH)	Cross breds (HFxH)	Sahiwal	Haryana	Deshi Gangatiri	Total no. of animal heads	Total no. of SLU
1	2	3	4	5	6	7	8	9	10	11	12	13
I	Landless	12	18.67	8.65	14.78	-	-	15.58	1.35	7.44	66.47	56.91
II	Upto 2 ha	16	19.80	13.33	18.94	1.67	1.86	19.82	2.65	9.20	87.22	73.74
III	ha 2-5	10	21.85	15.66	23.00	2.00	2.48	26.00	-	10.35	101.34	85.44
IV	> 5 ha	12	65.04	22.80	29.32	3.50	2.92	32.76	4.70	12.45	173.49	151.80
	Average		31.34	15.11	24.01	2.39	2.42	23.54	2.90	9.86	107.13	91.97
	F Value (Calculated)		1.59	2.27**	1.93	0.31	0.32	4.87**	1.46	1.18	6.53**	9.46**

N.B.: *** Indicates significant at 5% (P> 0.05), 1% (P>0.01) level respectively.

Table 6: Variation in the breed-wise herd statistics of adult stock in relation to the quantity of daily Milk production at selected dairy herds.

Group No.	Group Description (Liters)	Avg No. of Units	Sahiwal	Haryana	Desi Gangatiri	Cross breds (HFxS)	Cross breds (JxS)	Cross breds (JxH)	Cross breds (HFxH)	Murrah buffaloes	Total no. of animal heads	Total no. of SLU
1	2	3	4	5	6	7	8	9	10	11	12	13
I	Upto 25	01	4.55	-	-	8.33	9.21	-	-	-	22.09	17.67
II	25-50	05	18.82	-	-	2.44	5.39	-	-	16.38	43.03	37.70
III	50-75	03	3.63	1.36	7.42	3.25	12.92	-	-	34.86	63.44	57.72
IV	75-100	05	17.41	-	16.48	2.58	10.65	11.86	-	31.20	90.18	78.38
V	100-125	08	13.26	11.63	22.38	9.76	16.14	-	-	42.70	115.87	101.24
VI	125-150	02	16.98	21.44	26.67	13.34	11.34	12.14	-	39.75	141.66	121.28
VII	150-175	06	18.34	-	19.74	22.70	19.21	11.54	12.42	53.55	175.50	136.71
VIII	175-200	04	24.46	10.94	18.25	16.35	17.76	25.78	27.34	56.00	196.88	168.70
IX	200-225	02	29.42	31.72	36.20	12.87	14.35	32.68	16.98	44.65	218.87	184.03
X	225-250	06	27.56	21.18	25.82	21.65	42.24	14.33	18.32	62.90	234.00	199.78
XI	>250	08	29.73	22.33	31.78	27.12	26.82	34.69	22.46	67.36	262.29	223.30
	Average		18.56	17.23	22.75	12.76	16.91	20.43	19.50	44.94	142.16	120.59
	F Value (Calculated)		1.39	1.17	1.73	1.65	2.31**	2.25*	1.99*	6.31	3.97**	2.89*

N.B.: *,** Indicates significant at 5% (P> 0.05), 1% (P>0.01) level respectively.

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