COMPARISON OF MILK PRODUCTION OF KANKREJ CATTLE AND MEHSANA BUFFALOES DURING SUMMER STRESS

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Received 13-4-2015 Accepted 12-5-2015

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ABSTRACT

The milk production capacity of Kankrej cattle and Mehsana buffaloes herd at Livestock Research Station was compared from the year 2010 to 2013 to know the influence of season on production of herd and to find out the superior herd of them. The herd average of Kankrej cattle remains significantly higher throughout the year especially in summer season in comparison to Mehsana buffalo.

KEY WORDS: Seasonal influence, Kankrej cattle, Herd average, Mehsana buffalo

INTRODUCTION

Livestock is one of the main sources of growth in agriculture economy of Gujarat. North-Gujarat has ample sources of quality livestock like Kankrej cattle and Mehsana buffaloes. Both these breeds are being maintained at Livestock Research Station (LRS) of Sardarkrushinagar Dantiwada Agricultural University (SDAU), Sardarkrushinagar in the Banaskantha district.

According to bio-climatological variable, the climate of Gujarat falls under semi arid zone coupled with hot and humid condition, which itself poses as harsh abiotic factor for optimum productivity of livestock. The Kankrej cattle maintained at LRS proved to be superior to other native breeds with respect to milk production and disease resistance. The milk yield of this breed has been observed to be increased over the last few years particularly in summer season and hence this report has been made in this aspect.

In the light of above discussion, the present investigation was planned to assess the milk production potential of Kankrej cattle and Mehsana buffaloes in summer stress conditions.

MATERIALS AND METHODS

Total 120 Kankrej cows and 60 Mehsana buffaloes maintained at LRS were selected irrespective of their age or parity for the present study.

The selected animals were divided into two groups depending upon species to evaluate the production parameters. Thus Group-1 was comprised of Kankrej cows and Group-2 was of Mehsana buffaloes. The milk production data were recorded for each of selected animals twice a day at the time of milking from the year 2010 to 2013. The standard feeding and watering practices as per requirement were followed and the animals suffered with mastitis or any other health problems were also given the treatments needed during the period of study.

Subsequently, all the recorded data were alienated into three different seasons considering the milk production data from November to February as production of winter, March to June as of summer and July to October as production of monsoon season. The data were subjected to one way ANOVA

to find out the effect of season on milk production of Group-1 and Group-2. The two sample t-Test was also applied to the data to ensure the difference in milk production between the species to draw a valid conclusion.

RESULTS AND DISCUSSION

The comparative milk production study of Kankrej cow and Mehsana buffalo (Table-1) revealed that average 33.71% of the Mehsana buffalo remains in milk during summer season, in contrast to that 63.89% average Kankrej cows remains in milk during the same period. It indicates nearly 30 per cent more cows remained in milk as compare to Mehsana buffaloes. Perusal of table.1 revealed that per cent Kankrej cows in milk were higher than Mehsana buffaloes during all the four years of study. Wet average of Kankrej cows (8.71 lit.) was higher than Mehsana buffalo (8.23 lit.) during all the four years of study.

Table-1: Wet average and percentage of animals in milk during summer season.

Parameters	2010	2011	2012	2013	Average
Kankrej cow in milk (%)	59.86	69.14	62.65	63.92	63.89
Wet Avg. (Lit.)	8.79	8.04	8.86	9.14	8.71
Mehsana buffalo in milk (%)	28.09	62.89	25.29	18.59	33.71
Wet Avg. (Lit.)	8.13	8.24	8.49	8.16	8.23

Table-2: One-way ANOVA for herd avg. of Kankrej cattle (2010-13)

Source	DF	Adj. SS	Adj. MS	F-Value	P-value
Season	2	38.84	17.9210	36.28	0.00
Error	1458	720.20	0.4940		
Total	1460	756.04			

Table-3: Fisher Pair wise Comparisons of herd avg. for Kankrej cattle (2010-13)

Season	N	Mean	St. Dev	95% CI
Monsoon	492	5.7491[a]	0.6600	5.3028, 5.4284
Summer	487	5.5479[b]	0.7760	5.4854, 5.6103
Winter	482	5.3656[c]	0.6664	5.6869, 5.8112

Pooled St. Dev= 0.702824

It is known that the herd average is better indicative of herd performance in contrast to wet average therefore we did one way ANOVA of herd average versus season and found that the effect of season on the production of Kankrej cattle (Table-2) is significant (P<0.01). Further the pair wise mean comparison of herd average in different season exposed that the herd average of Kankrej cattle (Table-3) remained significantly (P<0.01) higher in monsoon season (5.75) followed by summer season (5.55) as compared to winter season (5.37). Ganaie et al., (2013) reported that heat stress has negative impact on production and reproduction of dairy animals but the findings of present study are in contrast to their findings, whereas the findings of Lateef et al., (2014) and Broucek et al., (2009) were in support to the present report.

Similar studies in Mehsana buffaloes group revealed that the effect of season on the production of Mehsana buffalo (Table-4) was also significant (P<0.01) and pair wise mean comparison of herd average (Table-5) in different season exposed that the herd average remained significant higher (P<0.01) in winter season (5.08) only as compared to summer and monsoon season.. Pawar et

al., (2012) in their study on effect of year, season and parity on milk production traits reported significant effect of heat stress on milk production and milk composition of Murrah buffaloes, they reported that daily milk yield decreases from 4.46 to 3.65 kg, heat stress reduced milk yield by 18.2 per cent.

Table-4: One-way ANOVA for herd avg. of Mehsana buffalo (2010-2013)

Source	DF	Adj. SS	Adj. MS	F-Value	P-value
Season	2	463.9	231.9270	272.2	0.00
Error	1458	1242.3	0.8520		
Total	1460	1706.1			

Table-5: Fisher Pair wise Comparisons of herd avg. for Mehsana buffalo (2010-13)

Season	N	Mean	St. Dev	95% CI
Winter	482	5.0821[a]	0.7806	4.9996, 5.1645
Summer	487	3.8964[b]	0.8672	3.8144, 3.9785
Monsoon	492	3.8714[b]	1.0903	3.7898, 3.9531
Pooled St. Dev= 0.923061				

Note: Means bearing different superscript in a column differ significantly (P<0.01)

Further between group comparison during summer season (Table-6) revealed that the herd average of Kankrej cow (5.55) remains significantly higher (P<0.01) than that of Mehsana buffalo (3.90). Similar observations were also found in Monsoon season (Table-7). However, the performance of both remains at par during winter season (Table-8). Lateef et al., (2014) in their hematological

Table-6: Two sample t-Test assuming equal variance for summer season

Between group comparision	Kankrej cattle	Mehsana buffalo
Mean	5.55	3.9
Variance	0.6	0.75
Observation	487	
t-stat	31.32	

Table-7: Two sample t-Test assuming equal variance for monsoon season

Between group comparision	Kankrej cattle	Mehsana buffalo
Mean	5.75	3.87
Variance	0.44	1.19
Observation	492	
t-stat	32.59	

Table-8: Two sample t-Test assuming equal variance for winter season

Between group comparision	Kankrej cattle	Mehsana buffalo
Mean	5.37	5.08
Variance	0.44	0.61
Observation	482	
t-stat	6.09	

studies of Kankrej cattle reported that the seasonal change in climate had no significant effect on the ratios of neutrophils, lymphocytes, eosinophils and basophils suggesting and proving that the Kankrej cows have ability to sustain higher temperature during summer season and thereby to maintain their milk production. Further, Jegoda et al., (2014) in their study found that milk production of Mehsana buffalo in summer season goes down due to less ability to sustain the same which is in accordance to present findings.

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