Comparative Heat Tolerance in ersey × Kankrej (F_2) and Holstein Friesian × Kankrej (F_2) Heifers

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The important exotic donor breeds, most suited varying agro-climatic conditions in India, are the rsey, the Holstein Friesian and the Brown Swiss r crossbreeding in cattle. Crossing of Kankrej th Jersey and Holstein Friesian has been done at vestock Research Station of Gujarat Agricultural niversity, Anand Campus, to evolve suitable breed oss strain for Gujarat. Comparative heat tolerance Jersey × Kankrej (F_1) and Holstein Friesian × ankrej (F_1) heifers was studied by Das (1982). Vith an interest to know comparative heat olerance of Jersey × Kankrej F_2 (JKF_2) and Holstein riesian × Kankrej F_2 (HKF_2) heifers, an experiment as carried out in summer of 1985.

Two groups each of 4 heifers of JK F_2 and two roups each of 4 heifers of HK F_2, were continuously kept exposed to sun during the summer. One group of 4 heifers from each breed group was splashed water on their body for one hour between 1:00 to 2:00 p.m. daily. Observations on respiration rate, rectal temperature and pulse rate were recorded at 7:30 a.m. and 2:30 p.m. on ten selected hottest days in the months of April and May. The ambient temperature was more than 40°C, during afternoon, on these selected days.

The heat tolerance indices of the crossbred heifers were worked out by using the methods described by Benezra (1954), Mullick (1961) and Thomas *et al.* (1973). In estimating the heat tolerance indices of the heifers, the average values of the physiological responses recorded during the morning were used as normal values, and those recorded during the afternoon were taken as deviated values, due to heat stress. The average values of heat tolerance indices calculated by different methods are presented in Table 1.

The analysis of variance and F test indicated that the (control) unsplashed JK F_2 had better ($P < 0.05$) heat tolerance than the unsplashed (control) HKF_2 heifers, under all the three methods of heat tolerance calculations.

TABLE 1

Average values of heat tolerance indices for JK F_2 and HK F_2 heifers.

reed roup	*Treatment*	*Method*		
		Mullick's	*Benezra's*	*Thomas' (Dairy Search Index)*
K F_2	Unsplashed	74.75 a,b ±1.9738	3.9825 a ±0.1547	1.56 b ±0.0242
K F_2	Splashed	80.75 a ±0.8539	3.1425 a ±0.1347	1.36 a ±0.0382
ba K F_2 re	Unsplashed	59.50 c ±1.7078	5.0975 b ±0.6069	1.78 c ±0.1106
HK F_2	Splashed	71.25 b ±3.3510	3.1125 a ±0.2871	1.3 a ±0.054
	C. V. %	6.05	18.31	8.72

ortal: ies within a column with different supercript differ significantly ($P < 0.05$).

The splashing treatment seems to improve the eat tolerance of both the crosses. It, however, lead o significant ($P < 0.05$) improvement in the heat olerance of only the HK F_2 heifers as indicated by ll the three methods. Only with the Thomas' ethod, the JK F_2 heifers showed a significant ($P <$ .05) improvement in the heat tolerance. Thus, for educing the summer heat stress, the splashing reatment was found to be more advantageous in he Holstein crosses than in the Jersey crosses.

The results are in agreement with Srivastava d Sindhu (1979), Das (1982) and Patel (1984), ho reported better heat tolerance in the Jersey osses than in the Holstein crosses.

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