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Exposing the effect: Crossbred calves' water intake in relation to summer management practices

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Abstract
At the Livestock Research Station, COVAH, AAU, Anand, Gujarat, during the summer season (April 1–July 15, 2018), a study was carried out to examine the effects of specific summer management techniques on the performance of crossbred calves in the middle Gujarat agroclimatic conditions. The 18 young (80-100 kg) crossbred calves from the livestock research station were the subjects of the investigation. The ICAR feeding standard (1998) was followed in the care of the test animals. In order to meet the animals' needs for DCP and TDN to meet the dry matter requirement, the chaffed hybrid nippier, Juwar straw, and pelleted concentrate Amul Dane were provided. Ad hoc access to clean water was offered in a plastic tub three times a day. Nine animals each were assigned to Control & treatment groups (T_1: Control, which consisted of housing under an asbestos-roofed shed) or T_2, which consisted of housing under an asbestos-roofed shed where the top surface would be painted white and the animals would receive mist from foggers,) depending on their body weight. The water intake in T_2 (2.76±0.845) and T_1 (4.22±1.079) at 2:30 pm and 11:30 a.m. was significantly (p<0.05) impacted by treatment, time, and T x P.

Keywords: Calves, summer, water

1. Introduction
India is a developing nation made up of villages where over 70% of people still make their living from agriculture and cattle raising. An essential component of the Indian agricultural economy, livestock serves a variety of purposes including supplying food security, a means of subsistence, self-employment opportunities for unemployed women and youth, and assistance to the rural populace. There are 3509.7 million livestock in the globe, and the majority of them are raised using a grazing-based agricultural technique. According to the 2019 Livestock Census. India possesses 535.78 million livestock. India is a subtropical nation with widely-varying climates. Climate is the primary barrier to India's efficient livestock production. The state of Rajasthan experiences exceptionally harsh summer and winter temperatures, ranging from 46-48 °C in the former and 0 °C to 4 °C in the latter. The growth and maturity age of the calves are affected by this unfavourable weather condition (Antil *et al*., 1991) [2]. The buildings should be protected from chilly winds and kept relatively warm during the winter, especially the areas that come into touch with animals, such as the floors and walls. in order to counteract cold stress. To produce more body heat, the animal has to speed up its metabolism. This raises the need for food, especially energy. There are solutions available for housing, nutrition, and management that can help animals experience less climate stress. The different summertime management activities, like air conditioning, showering, water spraying, and lounging (Srivastva *et al*, 1978) [13]. India is a country where cross-breeding is heavily used to increase milk production. Crossbreds, particularly in the age of global warming, require protection from the severe summer months since they are less heat tolerant. It is necessary to explore whether a basic shed with an asbestos roof is more effective than more expensive technologies, such as foggers, in order to better serve Indian farmers who are struggling financially.

2. Materials and Methods
The present experiment was conducted to study on certain summer management practices on performance of crossbred calves in middle Gujarat agro climatic condition during summer season (1st April to 15th July) at Livestock Research Station COVAH, AAU Anand Gujarat. Eighteen young (80-100 kg) crossbred farm-born calves from the Livestock Research Station participated in the study. The ICAR feeding standard (1998) was used to sustain the experimental animals.

Juwar straw, pelleted concentrate Amul Dan, and chaffed hybrid nippier were provided in accordance with the animals' needs for DCP and TDN to meet the dry matter requirement. Three times a day, on-demand access to clean water was offered in a plastic tub. Nine animals per treatment group (T_1: Control; housing under an asbestos roofed shed) and T_2: Treatment (housing under an asbestos roofed shed where the top surface of the roof will be painted white and animals was applied mist through foggers) were used in the experiment. The treatment groups were based on body weight.

2.2 Water intake
Every experimental animal's water consumption was recorded, and three times a day, a plastic tub with clean water was made available to them at will. After deducting leftover water from the water that was offered

3. Results and Discussion
The average daily water intake of crossbred calves their analysis of variance presented in Table 1 The mean daily water intake was 19.26±0.569 16.33±0.555 17.80±0.476 Kg in T_1, T_2 and Pooled value, respectively The analysis of variance revealed that the voluntary water intake was significantly (p<0.05) higher in control group than treatment group. Higher water intake in hot humid period may be due to increase in ambient temperature and body weight of calves in treatments group was lower water intake as compared to control group this may be because of less thermal stress in this treatment shade as compared to control shade (Cowan *et al*. (1978) [5] reported that voluntary water intake was found to be positively correlated to maximum air temperature and hours of sunshine in a day. Similar results were obtained in the present study. The results of the present study are also in close agreement with the findings of Ranjhan and Daniel (1972) [9], Singh (1982) [10], Bempong *et al*. (1985) [3] and Singh *et al*. (2014) [11] who also reported significant (p<0.05) effect of cooling modification in summer seasons on the voluntary water intake of bovine. The average water intake at 11:30 AM was 9.02±0.92, 8.06±0.78 and 8.54±0.60, at 2:30 PM was 4.22±1.079, 2.76±0.845 and 3.49±0.687 and at 5:30 PM was 6.02±0.497, 5.51±0.597 and 5.77±0.384 in T_1, T_2 and pooled, respectively The analysis of variance revealed that the water intake at 11:30 AM, 2:30 PM was significantly (p<0.05) lower in treatment, periodical and T x P but at 5:30 PM significance (p<0.05) difference found in periodically and T X P interaction found not significance difference. The water intake was significantly (p<0.05) higher during ambient temperature was 36.6 ˚C in control group and 35.01 ˚C in treatment group they was significantly higher and their water intake was higher mainly because heat loss through evaporation process in control group so they water consumption more and in treatment group under fogger system they easy to evaporation with cooling process and they loos of water less as compared to control group. The result also showed that the water intake was more at 11:30 AM (morning) as compared to 2:30 PM and 5:30 PM. Because of heat loss more after morning to afternoon hour that leads to more consumption of water at morning time. The water intake was more in morning as compared to afternoon in summer seasons and also water intake was significantly (p<0.05) higher in high sun exposure, without cooling condition during summer season and the water intake was more consumption due to more dry matter intake and at time of morning the ambient temperature low as compared to afternoon period so at that time dry matter consumption was more and water intake indirectly more in hot humid season. (Bhardwaj *et al*., (1992) [4], Singh (1996) [12], Nessim (2004) [8] and Habeeb *et al*., (2014) [6].

Table 1: Shows the daily water intake

Parameter	Duration	Control (T_1)	Treatment (T_2)	CD value (5%)	Test
Water Intake (Kg)	Mean Daily (Kg/d)	19.26^{a}±0.569	16.33^{b}±0.555	1.159	*
	11:30 AM (Morning)	9.2^{a}±0.921	8.06^{b}±0.780	0.725	*
	2:30 PM (afternoon)	4.22^{a}±1.079	2.76^{b}±0.845	0.403	*
	5:30 PM (Evening)	6.02^{a}±0.497	5.51^{b}±0.597	-	NS

a, b Means within a row with different superscripts differ * (p<0.05)

4. Conclusion
Crossbred calves' heat stress can be reduced with a fogger and a white painted roof. The comfort zone in the control group receives increased water intake because of heat stress and significant evaporation

5. References

1. Anonymous. 20th Livestock all India report. Ministry of Agriculture Department of Animal Husbandry, Dairying and Fisheries Krishi Bhawan, New Delhi; c2019.
2. Antil IS, Yadav RS, Yadav BL. Influences of special summer management practices on growth and feed consumption of growing buffalo calves. Indian J Ani Prod Mgmt. 1991;7:102-104.
3. Bempong IA, Gupta LR, Georgrie GC. Voluntary feed and water intake of Holstein Friesian x Haryana milch cow under shelter and water sprinkling condition in summer. Indian J Animal Prod Mgmt. 1985;(2):53-58.
4. Bhardwaj A, Sethi RK, Chopra SC. Influences of environmental stress on voluntary intake in locating Murrah buffaloes. Indian Dairyman. 1992;44(10):489-492.
5. Cowan RT, Shacket D, Davison JM. Water intake, milk yield and grazing behaviour of Friesian cow with restricted access to water in tropical upland environment. Aust J Exp Agric Anim Hub. 1978;18:190.
6. Habeeb AAM, Gad AE. Improving live and dry body weight gain of bovine baladi calves during hot summer season of Egypt using genetic crossing process. 4th International Conference on Radiation Sciences and Applications, Taba, Egypt. 2014;1:15.
7. ICAR. Nutrient Requirements of Domestic Animals. Indian Council Agricultural Research, New Delhi, India; c1998, 11.
8. Nessim MG. Heat-induced biological changes as heat tolerance indices related to growth performance in buffaloes. PhD Thesis, Faculty of agriculture, Ain Shams University, Cairo, Egypt; c2004.
9. Ranjhan SK, Daniel SJ. Effect of varying roughage to concentrate ratio on the growth rate of Holstein (*Bos*

taurus), Holstein x Hariana and Hariana (*Bos indicus*) calves in tropical zone. Indian J Anim Sci. 1972;42:662.
10. Singh MP. Effect of different housing conditions during summer and winter season on feed utilization and water intake by growing female buffalo calves. PhD Thesis. Haryana Agricultural University, Hisar, India; c1982.
11. Singh SV, Hooda OK, Narwade B, Upadhyay RC. Effect of cooling system on feed and water intake, body weight gain and physiological responses of Murrah buffaloes during summer conditions. Indian J Dairy Sci. 2014;67(5):427-431.
12. Singh Y. Studies of certain summer management practices on performance of growing buffalo calves. MVSc Thesis, CCS Haryana Agricultural University, Hisar, India; c1996.
13. Srivastava RK, Dhingra DP, Gangwar PC, Soni PL, Mehta SN, Bahga CS. Effect of spray cooling and wallowing on milk yield and reproductive performance of buffaloes. J Agri Engi. 1978;15:189-196.