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Unveiling the impact: Summer management practices on feed intake in crossbred calves

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Abstract
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 2018 to 15th July 2018) at Livestock Research Station, COVAH, Anand Agricultural University, 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 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. Body weight was used to split the experimental animals into two treatment groups, T_1: Control and T_2 Treatment, each with nine animals. The fogger treatment throughout the hot and dry season considerably increased (p<0.05) the daily DMI (kg/d). The treatment group consumed 137 kilograms more on average per day (kg/d) than the control group during the experiment.

Keywords: Calves, feed, summer, crossbred

Introduction
Any combination of environmental factors that raises the effective ambient temperature over the animal's thermoneutral zone might result in heat stress. Effective temperature is influenced by four environmental elements (Buffington *et al*., 1981) [4]. There is a risk of heat stress in crossbred dairy cows when air temperatures rise over their thermoneutral zone, particularly if humidity levels are high. According to Fuquay (1981) [5], nursing cows have a maximum critical temperature of 24 to 27 °C. There are several ways in which hybrids react to heat stress. Lower DMI, less milk produced, and less efficient milk production are linked to increases in air temperature, THI, and rectal temperature over critical limits (West, 2003) [16]. According to Bucklin *et al*. (1991) [3], heat stress causes reductions in feed intake, modifications in metabolic rate, and changes in maintenance requirements—which rise initially but decrease with time. Dairy cow adaptations are survival strategies, not always linked to high output (Berman *et al*., 1985) [2]. The ability to adjust to heat stress is linked to decreased fertility and milk output. Generally speaking, heat stress affects cows more severely when they produce more milk. With the exception of regions with heavy rainfall, this is generally accepted to be the case across India. The hypothalamic thermoregulatory center regulates body temperature; it functions within a limited range based on a number of factors, including humidity, ambient temperature, and heat generation In high ambient temperatures, heat evaporates or absorbed by way of ordinary physical processes such radiation, conduction, convection, and evaporated moisture through sweat or barely noticeable respiration loss. Body heat loss can be increased by three or four times when the shower head and forced air movement are used together. Very tiny water droplets released by atomizers swiftly evaporate and chill the surrounding air. Under pressure, it enhances convective heat losses, which air circulators can accomplish (Shearer *et al*. 1991) [11]. It is also thought to be cost-effective to cool cows using mist systems (Aggarwal and Singh, 2006) [1]. Stressors cause corticosterone to be produced and released more readily (Siegel, 1995) [13].

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, College of Veterinary science and Animal Husbandry, Anand Agricultural University, Anand, Gujarat. The study was conducted on 18 Young (80-100 kg) farm born Crossbred calves of Livestock research station. The experimental animals were maintained on ICAR feeding standard (1998). The chaffed hybrid nippier, Juwar straw and pelleted concentrate Amul Dane was offered as per the requirement of animals for DCP and TDN to fulfill the dry matter requirement. The experimental animals were divided in to two treatment groups based on body weight comprising of nine animals in each treatment *viz*. T_1: Control (Housing under asbestos roofed shed) and T2: (Housing under asbestos roofed shed where top surface of roof will be painted white and animals was applied mist through foggers).

Voluntary feed intake

Every day, the amount of residual feed-Amul Dan, Hybrid Napier, and Jowar straw-was subtracted from the total amount supplied to record the intake of feeds. Every week, feed samples were dried in an oven to determine the dry matter content and crude protein content. The results were then used to calculate the calves' intake of dry matter.

Results and Discussion

Voluntary feed intake

The average dry matter intake (kg/d) ANOVA presented in "Table 1" for control and treatment group was 3.5 ± 0.118 and 3.6 ± 0.115 respectively, average weekly dry matter intake (kg) was 24.40 ± 1.098 and 25.41 ± 1.073 respectively and total. Dry matter intake (kg) in period of experiment was 3294 ± 7.984 and 3431 ± 5.940 respectively. The analysis of variance revealed that the dry matter intake was significantly (p<0.05) higher and 137 kg more consumed in treatment group as compared to control group. The fogger and white painted roof inside shade air temperature and relative humidity was generated a comfortable environment that's leads to alleviated heat stress and biological variations to improved dry matter ingestion. Fuquay, (1981) [5] reported that reduced feed efficiency during summer is probably due to energy expended in ridding the body of the excess heat load by way of increased respiration and other related activities. Feed digestibility has increased with higher temperature but is probably due to depressed intake, which results in slower rate of passage. The results of present study was similarly finding of the feed intake was significantly (p<0.05) lower in hot humid and hot dry environment in bovine. (Igono *et al*., 1987, Smith *et al*., 2006, Shiao *et al*., 2011, Habeeb *et al*., 2014) [8, 14, 12, 6].

Table 1: Feed Intake

Parameter	Control(T_1)	Treatment (T_2)	CD value (5%)	Test
DMI (Kg/d)	3.5^a ± 0.118	3.6^b ±0.115	0.059	*
Weekly DMI(Kg)	24.40^a±1.098	25.41^b±1.073	0.418	*

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

Conclusion

A white painted roof and fogger can reduce the heat stress experienced by crossbred calves and increase feed intake and feed efficiency.

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