Research Article

EFFECT OF DIFFERENT SHELTER MANAGEMENTAL PRACTICES ON FEED AND WATER INTAKE OF CALVES

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Abstract: Fifteen crossbred calves were divided into 3 groups of 5 animals each on the basis of their similar body weight and age. Each group was allotted to three housing system *viz.* (T_1 loose house; T_2 loose house + bedding + curtains and T_3 conventional barn) during winter. Average maximum temperature was significantly (P<0.05) higher in T_1 (2°C) and minimum temperature was higher (P<0.05) in T_3 (2°C) as compared to other two groups in micro-climate. Crossbred calves reared under closed barn (5.51) consumed more (P<0.05) DM (kg) than reared in modified (5.45) and loose house (5.22). Mean DMI/100 kg body weight was higher (P<0.05) in T_3 calves as compared to other group calves. Average daily VWI and VWI/kg DM consumed were higher (P<0.05) in T_3 group calves as compared to T_1 and T_2 group calves.

Keywords: Feed intake, water intake, calves

Introduction

Livestock is an important sub-sector of Indian agricultural economy which plays a multi-purpose role in providing livelihood support to the rural population. The young calves are future herd replacement stock and need a special attention including climate protection, therefore; growth of calves determines the future production as well as reproduction efficiency in cattle. Hence optimum growth must be ensured through proper housing, feeding and health management as per their genetic potential. The aim of good management of calves during their early life is to attain optimum growth and better feed conversion efficiency and thereby to reach early maturity. This may reduce the age of first calving, which is an important trait of significance, leading to improvement of life time production performance of the animals [1]. India is a sub-tropical country where climate varies in most of its part. The main constraint in the efficient livestock production in India is climate. The climatic conditions in Rajasthan state are extremely hard both in summer and winter where ambient temperature varies from 46-48°C in summer and 0°C to 4°C in winter. This adverse climatic condition effects the growth and age of maturity of the calves [2]. During winter, the structures especially those parts coming in contact with animal, like floors and walls, should not get too cold and provide protection from cold winds.

Materials and Methods

Fifteen crossbred (Tharparkar / Sahiwal x HF) calves (10-30 months) were taken from the dairy farm of SKN College of Agriculture, Jobner from 05-12-2014 to 05-03-2015 and divided into 3 groups of 5 animals each on the basis of their body weight and age. Each group was allotted randomly to the following housing conditions/treatments:

T₁ - Loose house (control): House having covered area with asbestos cement sheet roofing, brick paved floor and open area surrounded by 1.5 metre high from three sides.

T₂ - Loose house + Bedding + Curtains: Bedding of left over wheat bhusa was changed at weekly intervals and loose house as detailed above in T1 was used as modification.

Curtains were provided to calves at night hours for protection from cold stress.

T₃ Conventional Barn (closed): In conventional barn is completely closed structure as roofed and walls are also complete with windows and ventilators located at suitable places to get more ventilation and lighting. Animals were tied at neck by iron - chains.

Crossbred calves were offered wheat straw (*Triticum aestivum*) ad lib. as dry fodder. The concentrate as pelleted feed (Sarus Gold) / readymade feed was formulated which contained 20.53% CP, 2.25% EE and 14.69% CF. The animals were fed in the morning as per NRC recommendations for dairy cattle. Maximum, minimum, dry and wet bulb temperatures were recorded at 8.30 am and 3.00 pm daily. The relative Humidity was calculated from dry and wet bulb reading using hygrometric table. The Humidity Index (THI) was calculated [3].

THI   =   0.72 (dry bulb temp. ◦C + wet bulb temp. ◦C) + 40.6

The experiment was conducted in a completely randomized design (CRD) and data was statistically analyzed by standard statistical methods [4,5].

Result and Discussion

The average daily dry matter intake (DMI) of calves in different treatments [Table-1]. The average daily dry matter intake in T_1, T_2 and T_3 groups claves were 5.22+0.094, 5.45+0.136 and 5.51+0.203 kg respectively. The DMI through roughage were 2.90+0.054, 3.13+0.136 and 3.19+0.203 in T_1, T_2 and T_3 kg respectively. The average Total DMI on 100 kg body weight basis were 2.816+0.085, 2.817+0.083 and 2.862+0.088 kg in T_1, T_2 and T_3, respectively. The average daily voluntary water intake was 14.42+0.89, 16.68+0.91 and 19.41+0.79 litre in T_1, T_2 and T_3, respectively [Table-1]. Voluntary water intake was lower (P<0.05) in T_1 as compared to other treatments. The lower water intake in T_1 group may be as described to lower feed intake due to exposure of animal to cold. The evening voluntary water intake was higher as compared to morning in all groups. Similar finding was reported [6-9].

Table-1 Average daily dry matter intake (kg) of crossbred calves

Parameters	T_1	T_2	T_3
Concentrate	2.32±0.000	2.32±0.000	2.32±0.000
Wheat straw	2.90c±0.054	3.13b±0.136	3.19a±0.203
Total DMI	5.22c±0.094	5.45b±0.136	5.51a±0.203
DMI Kg /100 kg BW	2.816c±0.085	2.817b±0.083	2.862a±0.088

Means having different superscript differ significantly (P<0.05)

Table-2 Average daily voluntary water intake (Lit.) of crossbred calves

Parameters	T_1	T_2	T_3
Morning	6.58 c ±0.53	8.21 b ±0.42	8.92 a ±0.62
Evening	7.85 c ±0.45	8.48 b ±0.63	10.49 a ±0.49
Voluntary water intake / day	14.67 c ±0.89	16.68 b ±0.91	19.41 a ±0.79
Voluntary water intake / kg DMI	2.75 c ±0.081	3.06 b ±0.112	3.51 a ±0.215

Means having different superscript differ significantly (P<0.05)

Conclusion

It can be concluded that the DM intake per 100kg body weight were affected significantly (P<0.05) in T_3, T_2 and T_1 treatments. Mean DM intake was higher (P<0.05) in closed barn calves followed by T_2 than T_1 calves. However, there was significant difference in DMI of T_2 as compared to T_1 calves. Average daily VWI and VWI/kg DM consumed were lower (P<0.05) in T_1 group calves as compared to T_2 and T_3 group calves.

Application of research: The findings of the study was helpful to know the effect of different shelter managemental practices on feed and water intake of calves.

Research category: Shelter management practices

Abbreviation:
DMI: Dry Matter Intake
VWI: Voluntary Water Intake

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Research project name and number: M.Sc. Thesis

Author contributions: All author equally contributed

Author statement: All author read, reviewed, agree and approved the final manuscript.

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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