

A COMPARISON OF FEEDING REGIMES AND THEIR EFFECTS ON BEEF CATTLE FEEDING ACTIVITY

Lamoglia, Laura^{1*}; López de Armentia, Leire²; Álvarez Rodríguez, Javier¹; Noya, Agustí²; Sanz, Albina²; Serrano Pérez, Beatriz¹; Blanco Penedo, Isabel¹

¹ Department of Animal Science, University of Lleida, Lleida, Spain. ² Centro de Investigación y Tecnología Agroalimentaria (CITA) de Aragón, Instituto Agroalimentario de Aragón – IA2 (CITA-Universidad de Zaragoza), Zaragoza, Spain

*Presenting author: lauralamoglia@gmail.com

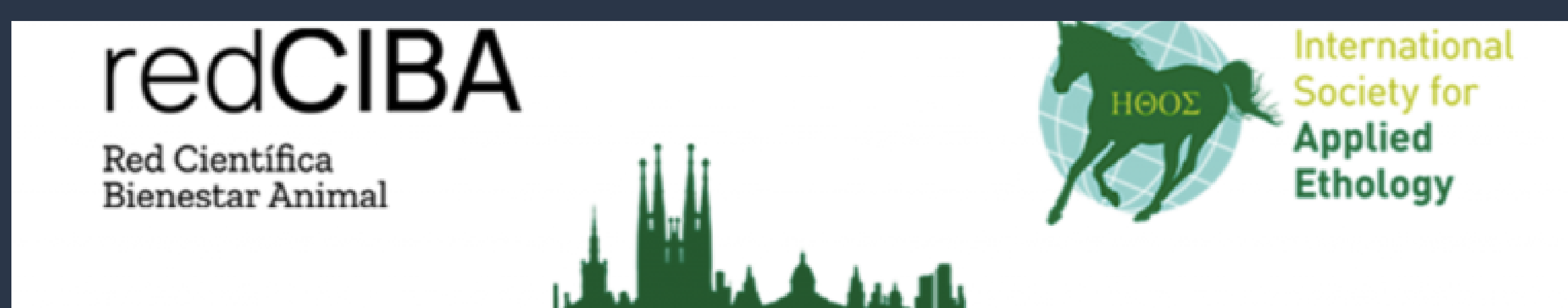
The daily activity budget is a useful tool that offers considerable help with making precise decisions on feeding practical strategies to enhanced cattle welfare. This study evaluated the effects of prepartum nutrition on beef cattle feeding activity during the last trimester of pregnancy. The present study is part of a larger project investigating fetal undernutrition (100% and 60% of energy requirements on maternal diet, 10.5 and 7 kg/day, respectively) and hydroxytyrosol supplementation (0 vs. 178 mg/kg of diet) in a beef production system (FETALNUT; grant no PID2020-113617RR-C22). One-hundred nine beef cows from Parda de Montaña (n=62) and Pirenaica (n=47) breeds at early seventh, the eighth, the nine and late ninth months of gestation were observed for 2 hours starting after 1-hour post-feed ration supply onwards (4 observers purposely trained for FETALNUT). According to the dietary group, both breeds were mixed and housed in loose-house pens during the indoor period. Observations were performed directly in the barn by continuous focal animal sampling. Feeding behavior in this study included the activities of eating, ruminating and standing. Individuals' exact identities and the location at the feed bunk were collected at the observation unit. Non-parametric Wilcoxon tests were used to compare treatment means. The results indicated that cows with restricted feeding spent less time eating and ruminating than the control group, but this difference was more marked in Parda de Montaña breed. There were no significant differences between the control group and the undernourished group regarding the percentage of standing animals. Higher eating rates and shorter feeding times were observed in the undernourished group compared to the control group (+23 g/min and -1.6 h/day, respectively, $P < 0.001$). Antioxidant supplementation resulted in an unmodified eating rate and feeding time. Regarding control date and pregnancy stage effects, differences were observed between the beginning of the ninth month and the rest of the controls, with at least 7% fewer animals eating overall. Regarding the two peripheral positions at the feed bunk, Parda de Montaña breed repeated more than Pirenaica breed (20.0% vs. 6.5%). Similarly, an increase in animals performing rumination at the beginning of the eighth and ninth months of gestation compared to the first control was observed in both breeds. In conclusion, prepartum feeding level affected feeding activity by manipulating the time of each activity and the indirect feeding competition by increasing their feeding rates budgets, which allows for measuring such costs of feeding deprivation. However, further analyses are needed for this study.

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¹ Department of Animal Science, University of Lleida, Av. Alcalde Rovira Roure 191, 25198 Lleida, Spain

² CITA de Aragón, Instituto Agroalimentario de Aragón – IA,C/Montaña 930, 5059 Zaragoza, Spain
lauralamoglia@gmail.com



INTRODUCTION

Undernutrition during pregnancy is frequent in beef cattle and it is known to affect the cow at different levels. The daily activity budget is a useful tool that offers considerable help with making precise decisions on feeding practical strategies to enhance cattle welfare.

MAIN OBJECTIVE

Evaluate the effects of prepartum nutrition and gestation stage on feeding activity through observation of the cows during the last trimester of pregnancy.

MATERIALS & METHODS

- **109 multiparous cows:** 62 **Parda de Montaña (PA)** and 47 **Pirenaica (PI)** divided into **4 breed- mixed pen groups (2 x 2 factorial design):**
 - **Maternal feeding level:** 100 vs. 60% of estimated total requirements
 - **HT supplementation:** 0 or 178 mg HT/kg of unifeed.
- **4 controls:** early 7th, 8th, 9th and late 9th month of gestation.
- **Continuous focal sampling during 2h/day** starting 1h post-feed ration supply.
- **Recorded information:** Cow's activity (standing, eating or ruminating)/breed, individual identities and feed bunk location (central or peripheral)



Trained observer performing focal sampling.

RESULTS

- **Restricted group** spent **less time eating** and **ruminating** than the control group with a difference more marked in PA.
- **Higher eating rate** in the **restricted group** (61 g/min in 100% vs 84 g/min in 60%).
- **Shorter feeding time** in the **restricted group** (3 h in 100% vs 1.4 h in 60%).
- Regarding **pregnancy stage:**
 - At the **beginning** of the **9th** month, at least **7% less cows** were **eating** vs. other controls.
 - At the **beginning** of the **8th** and **9th** months, animals **increased rumination** vs. 1st control.
- Repetition of peripheral location at the feed bunk: **PA repeated** more than PI (20.0% vs. 6.5%).

CONCLUSIONS

Prepartum feeding level and gestation stage seem to **affect feeding activity** with changes in eating and ruminating time, as well as possible **differences** between **cattle breeds**. Further **studies** are needed to determine the **effect of HT supplementation** in feeding activity.

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