71st ICoMST
GIRONA - CATALONIA - SPAIN
3rd-8th August - 2025

MILK PRODUCTION MEASUREMENT IN RUBIA GALLEGA SUCKLER COWS AND ITS EFFECT ON CALF FATTENING

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I. INTRODUCTION

Current agricultural policies focus on promoting pasture- and forage-based livestock systems. In beef cattle, it's crucial for suckler cows to have good maternal traits like milk production, ease of calving, fertility, and longevity. An adequate milk production from pastures reduces the need of concentrates, which make farms more sustainable. The Rubia Gallega (RG), an originally dual-purpose breed from Galicia (NW Spain), has shifted towards a selection based on morphological traits and weight gain. To strengthen extensive production systems and solidify the RG breed's importance, it's necessary to restore its maternal characteristics. The selection of cows with a good milk production should be one of the priority lines in the development of beef herds with suckler cows in pasture- and forage-based production systems, in order to obtain calves with an adequate fat deposition and unique meat attributes. We hypothesize that the variation in milk production of suckler cows, influenced by the month of milking, significantly impacts calf weight gain. Specifically, prolonged suckling and the selection of cows with optimal milk production will result in improved calf conformation. Our goal is to restore the maternal abilities of Rubia Gallega cows, evaluate milk production, and extend the lactation period for calf fattening. We aim to assess the impact of lactation month on calf fattening and milk production, using two methods and selecting the simplest one for management.

II. MATERIALS AND METHODS

Milk production (kg) was measured using two methods in Rubia Gallega cows (8.7 years old, n=15) during their lactation (from 115 to 185 days of calf age). In both methods: weigh-suckle-weigh (W-S-W) vs. mechanical milking (MM), the calves (n=15) were separated from their mothers the day before. In the W-S-W method, the calves were weighed after being separated from their mothers for 18 hours, then reunited with the mothers for 30 minutes to suckle, and then weighed again. For the MM method, the portable milking machine MAYFRA 4200oil Mod.100 R-4 was used to measure the cows´ production after 18 hours without suckling. These measurements were taken between March and June 2023 under grazing conditions. In March and the first half of April, the pasture was supplemented with grass and corn silage.

All calves were weighed two times a week during de lactation period and average daily gain (ADG) was calculated. Statistical data analysis was performed using ANOVA. The study was carried out by personnel who possess the relevant accreditation for conducting animal experimentation procedures as established by Commission Directive EU /566/2015 (BOE 78 of 1 April 2015).

III. RESULTS AND DISCUSSION

In all months, the milk production estimated through the MM method was higher than that estimated with the W-S-W method. However, these differences between methods were not significant and are likely due to the cow's natural behaviour, where she stops the calf from suckling when the udder feels empty. In contrast, the operator controls when to remove the milking machine, which is done when milk extraction is nearly zero, likely resulting in more complete udder emptying. This is consistent with previous studies suggesting that MM is more efficient in complete milk extraction, leading to higher measurements compared to the W-S-W method, where the cow's natural behaviour may result in lower measurements (Zhang et al., 2018).

The results obtained show that the highest milk production was recorded in April and early May (5.93 kg W-S-W and 6.43 kg MM), coinciding with lactation day (LD) intervals between 140 and 170 days. In June and late May, the lowest productions were recorded (5.95 kg MM and 5.38 kg W-S-W) in both methods. Several studies suggest that milk production tends to be higher in the early stages of lactation due to the greater capacity for udder emptying and a higher nutrient demand from the calves (Shrestha et al., 2020), and during early-season grazing due to improved pasture quality and availability, which enhances nutrient intake for suckler cows (Zhang et al. 2018).

The highest ADGs were recorded in April (1.04 ± 0.21 kg/day), while the lowest ADGs were observed in June (0.85 ± 0.29 kg/day). Although no statistically significant differences (P= 0,66) in ADG were found throughout the lactation period, a trend of higher weight gains in April indicates that the period of milking may have an impact on calf growth. The positive correlation observed between the ADGs of the calves and milk production in both methods is consistent with previous studies suggesting that calves receiving a higher amount of milk have a higher average daily gain (Santos et al., 2018).

Table 1 – Milk production (kg) and ADG (kg/day) by lactation day

Lactation days	Milk Production		ADG
	W-S-W	MM	
April (100-140 days)	5.93	6.23	1.04
May (141-170 days)	5.58	6.43	0.94
June (171-210 days)	5.38	5.95	0.85

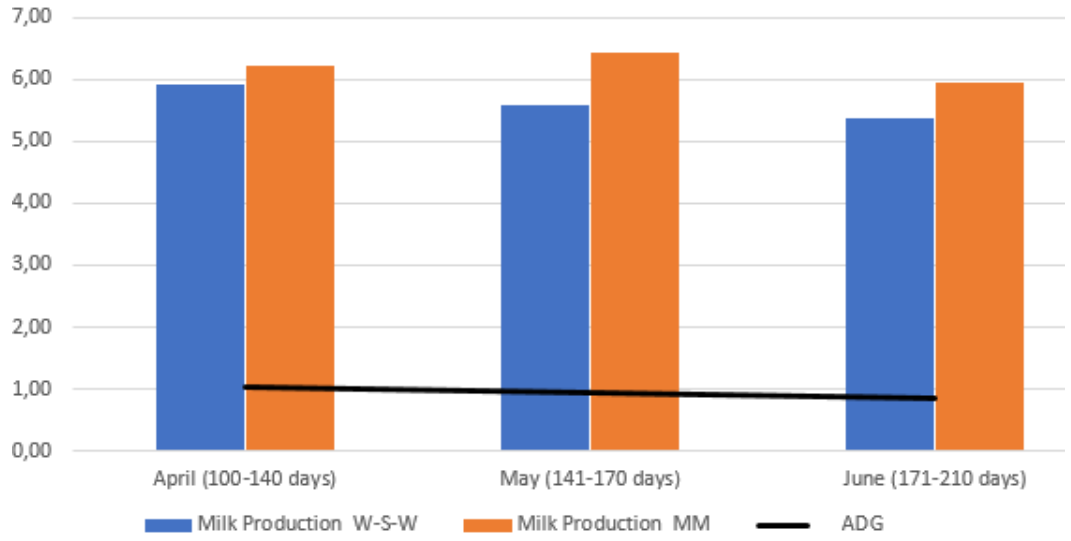


Figure 1. Milk production (kg) and ADG (kg/day) by lactation day

IV. CONCLUSION

The study demonstrated that both the mechanical milking and weigh-suckle-weigh methods can be used effectively to measure milk production in suckler cows. The results also revealed a positive correlation between milk production and calf weight gain, suggesting that greater milk production leads to improved growth outcomes for calves.

ACKNOWLEDGEMENTS

We would like to acknowledge the financial support provided by FEADER funding sources under grant AC2021-09, managed by the Consellería de Medio Rural - Xunta de Galicia.

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