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Sward allowance at early lactation of primiparous dairy cows : I-Milk yield and composition

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Key words : grazing, sward allowance, early lactation, primiparous dairy cows

Introduction Grazing the whole year round represents the dominant feeding system in Uruguayan dairies. The inter-relationship between pasture and the grazing ruminant is a dynamic, two-way process. The quantitative, qualitative and structural aspects of the different plant species present in the pastures influence the plant material ingested by the animal, which in turn modifies the plants remaining and their subsequent production and fate (Chilibroste et al., 2005). Farm surveys carried out at dairy farms in Uruguay have shown that individual milk production levels are under the breed milk production potential, specially in first lactation dairy cows (Chilibroste et al., 2004). This experiment was carried out to understand the impact of daily sward allowance on milk production and composition of early lactation first calving dairy cows grazing temperate pastures.

Materials and methods The experiment was carried out at the EEMAC Research Station, Agronomy Faculty, Uruguay (30° S). Primiparous dairy cows (n=44, BW=595±41 kg, age at calving=2.96±0.11 years and BC=3.7±0.3) were blocked by BW, age and BC, and randomly assigned from calving up to 60 days in milk to one of the following treatments (n=11 each): Control with a 100% TMR diet (*ad libitum*) and the grazing treatments, high (HA, 30 kg DM cow day⁻¹), medium (MA, 15 kg DM cow day⁻¹) and low sward allowance (LA, 5 kg DM cow day⁻¹). The grazing treatments were supplemented with TMR to cover their maintenance requirements. All the cows were individually supplemented at 18:00 h with a mixture of corn silage (10 kg) compound feed (4.8 kg) and grass hay (0.4 kg) on a fresh weight basis. Cows were milked at 5:00 and 16:00 h and grazed between 8:00 and 15:00 h on a 7-days rotation schedule for each individual treatment a pasture of Tall fescue (*Festuca arundinacea*), Birdsfoot trefoil (*Lotus corniculatus*) and White clover (*Trifolium repens*). Sward mass before and after grazing was estimated with a rising plate meter (ASHGROVE) using the double sampling technique (Haydock and Shaw, 1975). Individual milk production was recorded daily while milk samples were taken during 4 milking each week and one representative weekly milk sample was analysed for protein, fat and lactose with a milko-scan (Foss Electric®, 133b). Milk yield and composition were analysed as repeated measurements in time using Proc MIXED of SAS v. 8.

Results and discussion Mean sward availability during the experiment was 2750±275 kg DM. Sward utilization was 47, 61 and 73% of the allowed sward mass for HA, MA and LA, respectively. The average daily production differed (p<0.01) among groups, being highest in the Control group (26.1±0.37 L), HA group (24.1±0.33 L), followed by MA (22.9±0.42 L) and LA (18.9±0.42 L). Both milk protein and fat content decreased with days in milk. Milk protein content (g/kg) was significantly higher for the control group (3.31±0.049) but did not differ among grazing treatments, while protein yield (kg.cow day⁻¹) was significantly higher for HA (0.74±0.019) and MA (0.69±0.024) than LA (0.56±0.023). The opposite trend was observed for fat content, control group had less fat percentage, and no difference were found among grazing groups. As expected, fat yield (kg.cow day) was significantly lower for LA group (0.89±0.04) than for HA (1.06±0.03) and MA groups (1.01±0.04), (p<0.01).

Conclusions Sward allowance positively affected milk-yield of early lactation primiparous dairy cows although not enough to attain the production level of a 100% TMR feeding system (Control group). Milk response to sward allowance was 0.51 L per extra kg DM when the daily allowance moved from LA to MA. Differences in milk components concentrations like fat and protein were less evident among grazing treatments although fat and protein milk yield were depressed in the LA treatment. Cows in the control group (100% TMR) were able to combine higher levels of milk production and protein content than the grazing treatments irrespective of sward allowance.

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