

5. Effect of feeding strategies and exposition to weather conditions on milk production and efficiency of feed conversion into milk solids

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A 2 years whole lactation study was carried out in EEMAC, Paysandú-Uruguay, to evaluate the effect of two feeding strategies (grazing plus TMR and full TMR) and two levels of exposure to environmental conditions (access or not to a compost barn during supplementation). An incomplete factorial design was carried on involving three treatments: confined cows fed TMR ad-libitum in a compost barn (**CB-TMR**); one-session grazing cows supplemented with TMR in a compost barn (**CB-GRAZING**); and one-session grazing cows supplemented with TMR in an open lot (**OL-GRAZING**). It were evaluated two calving seasons (Autumn and Spring; 16 Holstein cows/treatment/calving season) each year. Cows were milked twice a day and the milk production was recorded automatically. Milk fat and protein concentration were analyzed once a week from 0 to 90 DIM, once every two weeks from 91 to 180 DIM, and once a month after 181 DIM. The TMR intake were determined by pen (4 cows/pen) once a week as the difference between offered and refused feed in each pen. Herbage DMI was determined as the amount of pasture necessary to supply the difference between net energy requirements and that provided by the TMR diets. Individual 305-days milk yield was obtained by fitting the exponential function of Wilmink (1987). Response variables were analyzed with PROC GLIMMIX of SAS and mean values were declared different when Tukey test <0.05. The milk production per cow was greater ($P<.0001$) on CB-TMR cows ($10782\pm 251L$) than on CB-GRAZING ($8467\pm 217L$) and OL-GRAZING ($8265\pm 212L$) cows. The milk production tended to be higher in Autumn than Spring calving cows ($9514\pm 215L$ vs $9069\pm 207L$; $P=0.070$). The productivity for OL-GRAZING cows was around 1000L per cow lower in Spring (8077 ± 275) than in Autumn (9173 ± 279) calving season. The efficiency of conversion of feed into milk was higher on confined than in grazing cows ($1.54\pm 0.026L$ vs $1.40\pm 0.025L$ of milk per kg of DMI; $P=0.0005$). The DMI necessary to produce milk solids (fat+protein) was lower on confined (9.42 ± 0.183 ; kg/kg) than grazing cows (10.30 ± 0.144 ; kg/kg; $P=0.0008$). However, the concentrate required per litre of milk was greater in confined than in grazing cows ($395g$ vs $278g/L$; $P<.0001$). The confined cows had a greater milk production per lactation and were more efficient to convert feed into milk, despite they required a bigger input of concentrate per kg of milk produced. The milk production was affected by calving season when the exposition to weather conditions during supplementation was higher.

