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Pasture management reshaping dairy cows grazing behavior and performance

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Key words : grazing management , grazing behavior , pasture-based dairy , pasture management

Introduction Pasture-based animal production has assumed in the last decade an outstanding importance all around the world (Mannetje et al . 2007) . This fact is mostly related to economic advantages , animal welfare , and ecological issues (Murphy et al . 1996) . The viability of small family farms , through pasture-based ecological dairying , has been highlighted as a way to revitalize rural communities and avoid urban social problems in South America (Rizzoli et al . 2007) . Management methods determine synchronized grazing behavior responses (Taweel et al . 2006) . Dairy cows can be expected to anticipate being moved to a fresh paddock after milking and synchronize their behavior to this prediction . This results in reduction of grazing time and intake , especially around reward time (Arriaga-Jordan and Holmes 1986) . This experiment tested the effect of paddock management in reshaping behavioral patterns of cows to improve use of the pasture resource .

Material and methods A herd of lactating , rotationally grazed , Holstein cows was the subject of this grazing trial at a commercial dairy farm near Hinesburg , Vermont USA . The host farmer participated in the University of Vermont Pasture Management Outreach Program . Two control groups of cows were under typical half-day paddock management . Two treatment groups were moved to paddocks with distinct internal design . Half-day paddocks were fenced into two areas : main (85% of area) and remainder (15% of area) . The main area was made available to cows when they arrived in a paddock . The remaining area of fresh forage was integrated to the main area during the waiting period few hours before milking (12 PM /AFTERNOON and 10 PM /EVENING) . Evaluations of behavioral budgets were done by analyzing 24-hour periods , main periods (AM /PM AND PM /AM) and sub-periods (MORNING ,AFTERNOON ,EVENING and DAWN) . Daily milk yield (kg day⁻¹) was assessed during a week in each monthly experimental period .

Pasture daily dry matter requirement provided per animal was about 2.5% of bodyweight . Cows grazed each paddock when a target pre-grazing mass reached 2700 kg DM/ha . During the experiments , an average of 32 days of plant regrowth was required to reach target pre-grazing mass . Cows were supplemented individually after every milking . Supplements were intended to complement pasture forage nutritional value in meeting cows' requirements for lactation , growth , and maintenance . Behavioral and production differences between treatment and control were tested using ANOVA . The magnitude of the difference was evaluated through Tukey-Kramer HSD .

Results and conclusion Total grazing time during 24-hour periods was 72 min (P < 0.01) longer for alternative treatment cows than control cows . Total grazing time was 498.5 min (SD=46.8) for the alternative treatment , compared to 426.5 min (SD=48.5 P < 0.01) for the control . Grazing times differed only during the sub-periods when extra pasture area was released to alternative treatment animals (AFTERNOON and EVENING) . Treatment cows produced 1.1 kg d⁻¹ more milk (P < 0.01) than controls during July trial and 0.9 kg d⁻¹ more milk (P < 0.01) than controls during August trial . A simple management practice such as this can greatly reshape cow grazing behavior , improve overall productivity , and may affect farm profitability .

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