

Summary

Several results from grazing trials with milking cows, carried out between 1992 and 1995 at the CIAT-Quilichao Experiment Station, were analyzed in order to derive methodological principles that could be useful for on-farm pasture evaluation. Data on daily milk production were collected from 15 short-term grazing experiments with 3 x 3 Latin square designs, in which three pure grass pastures (*Andropogon gayanus*, *Panicum maximum*, and *Brachiaria dictyoneura*) and seven associated pastures of the same grasses with the legumes *Centrosema acutifolium* and *C. macrocarpum* were evaluated over time. Seven experiments were conducted during the dry season (water balance <50 mm) and eight in the rainy season (water balance >50 mm). In each experimental period, milk production of Holstein-type cows and Zebu x European crosses was measured for 14 days (morning and evening), of which 7 days corresponded to adjustment and 7 to measurement. Therefore, a total of 268 observations were used to analyze the effects of the sequence of rotation (i.e., grass to grass/legume and grass/legume to grass) and days of adjustment on milk production.

Correlation analysis was performed on milk yield obtained in the morning and evening and with milk production on the first day and last day of grazing during the measuring periods. Cows were milked manually in the mornings and evenings of each experimental period, and then allowed to graze the pastures indicated in the rotational sequence used in the 3 x 3 Latin square design.

The analysis showed a high correlation ($r = 0.86$, $P < 0.0001$) between milk measured in the morning and the evening. Average milk production differed between grazing days ("t" test) regarding pasture and cow type. Average milk yield of crosses grazing either grass or grass/legume pastures varied little over days. In

contrast, with Holstein-type cows, milk yields recorded in grass pastures were higher ($P < 0.05$ and $P < 0.10$) during the first 4 days of grazing than the average across the 7 days of grazing, which was not the case for grass/legume pastures. Differences in milk production due to legumes in the pasture were consistently greater when cows were changed from the grass/legume pasture to the pure grass pasture (average of -2 lt/cow) than when the inverse rotation (average of +0.7 lt/cow).

The effect of adjustment period on milk yield was significant. Without a seven-day adjustment, the effect of legumes on milk production was only 3%, but when adjustment was taken into account, legumes increased milk production by 15%. Therefore the results suggest that when evaluating contrasting pastures, milk production should be measured after at least 7 days of adjustment on the experimental pastures and that cows should be rotated from pastures with better forage attributes (associated grass/legume) to those with less favorable attributes (introduced grass and grass already existing on the farm).

With cows of intermediate production potential (between 5 and 10 lt), milk production should be measured at the beginning, middle, and end of grazing in each pasture, especially when forage quantity and quality are limiting. With cows of lower production potential (between 3 and 5 lt), milk should be measured at the beginning and end of grazing, regardless of the pasture's condition.