

# Summary

A grazing trial was conducted at CIAT's Quilichao experiment station, Colombia (3° 6' N, 76° 31' W; 1700 mm; 990 m.a.s.l.; 24 °C), to evaluate milk production potential of *B. decumbens* CIAT 606 alone and complemented with *C. macrocarpum* CIAT 5713 and *C. acutifolium* CIAT 5568 as protein banks. The study had three phases that lasted 42 days, with three measuring periods of 14 days each. Each period consisted of 7 days for adjustment on 0.5 ha and 7 days for measurements on 0.5 ha. In phases 1 and 2, cows were allowed to graze the protein bank for 1 hour in the morning and 1 hour in the afternoon. In phase 3, the access to the protein bank was 2 hours in the morning and 2 hours in the afternoon. In phases 1 and 3, crossbred cows (zebu x European) with medium milk production potential were used (1 cow/ha), while in phase 2 Holstein and crossbred cows were used (2 cows/ha). Cows were milked by hand twice a day and milk samples were collected from each cow on days 1, 4, and 7 of occupancy in the measuring paddocks in each period. Milk samples were analyzed for protein, urea, and fat and nonfat solids. Milk yield was corrected for 4% fat. Observations on grazing frequency in the protein bank were made during the three phases of the study.

Grass on offer was measured in each period of the three phases and crude protein (CP) and in vitro dry matter digestibility (IVDMD) were determined for the grass and legume.

In phases 1 and 3, grass availability was greater in *B. decumbens* alone as compared with the *C. acutifolium* protein bank. The availability of *C. macrocarpum* was greater than that of *C. acutifolium* in the three measuring phases.

Crude protein content in *B. decumbens* was similar for the treatments in phases 1 and 2. In phase 3, the CP of the grass alone was less than in the grass complemented with the banks. The CP content of *C. macrocarpum* was high and tended to be greater than the CP of *C. acutifolium* in the three phases. The IVDMD of the green dry matter of *B. decumbens* did not vary among treatments in the three measuring phases. The IVDMD of *C. macrocarpum* was higher than that of *C. acutifolium* in phases 2 and 3.

Milk production corrected for fat did not vary significantly between the grass alone and protein bank treatments during the three measuring phases. Nevertheless, in phase 1, during a dry period, there was a tendency for crossbred cows with 1 month of lactation to produce more milk in the grass complemented with protein banks as compared with the grass alone. Fat, nonfat solids, and protein levels in milk did not vary significantly due to treatments. However, milk urea levels were higher in cows that grazed *B. decumbens* complemented with the legume protein banks.

Grazing frequency of the protein banks was 100% when the cows were allowed 1 hour of access after each milking. However, when access to the banks was for 2 hours after each milking, the grazing frequency of the legume in the protein dropped to 56%.

High urea levels in the milk of cows with access to protein banks suggested that energy may have limited utilization of rumen ammonia for efficient bacterial protein synthesis.