In El Salvador, most dairy farms rely on sorghum or maize silage as basal diet. These forages are low in protein, so that cattle are commonly supplemented with expensive human-edible protein feeds such as imported soybean. Hence, in this study two legumes, jackbean (*Cannavalia* *ensiformis*) silage and cowpea (*Vigna* *unguiculata*) hay, were studied as alternative protein sources for dairy cows to reduce farmers’ dependency on imported protein sources.

Eight crossbred cows (451±50.7 kg body weight; 9.4±2.60 kg milk/d; 125±50.6 days in milk) were used in a replicated 4×4 latin-square design with four periods (14 days adaptation + 7 days sampling). Four sorghum silage-based diets differing in their main protein source were tested: soybean meal (Control), jackbean silage, cowpea hay, or urea. A concentrate mixture was supplemented to create four iso-proteic (125 g crude protein/kg dry matter) and iso-energetic (11.8 MJ metabolizable energy/kg dry matter) diets with a constant forage:concentrate ratio of 70:30. Feed intake, apparent total tract nutrients digestibility, milk yield and composition, and cost-benefit ratio were studied.

Table 1. Effects of dietary protein sources on nutrition and performance parameters of crossbred dairy cattle in El Salvador.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Control | Jackbean | Cowpea | Urea | P-value |
| DM intake (kg/d) | 13.6b | 14.8a | 14.6ab | 13.8b | 0.02 |
| DM digestibility coefficient | 0.56 | 0.55 | 0.54 | 0.53 | 0.68 |
| Nitrogen digestibility coefficient | 0.58 | 0.57 | 0.52 | 0.53 | 0.13 |
| Energy-corrected milk (kg/d) | 8.9 | 9.2 | 8.6 | 8.8 | 0.9 |
| Energy-corrected milk yield (kg/kg human-edible protein) | 9.6c | 14.6ab | 15.6a | 12.3bc | <0.01 |
| Cost-benefit ratio | 1.40 | 1.58 | 1.47 | 1.58 | 0.69 |

DM, dry matter.

Feeding legumes increased DM intake without affecting energy-corrected milk yield and apparent nutrients digestibility (Table 1). Legumes did not change fat, protein, or lactose contents of milk (P>0.10). Although not statistically different, cost-benefit ratio was 0.18 US$ higher with the jackbean diet compared with Control, which might still be an incentive for farmers. Furthermore, milk yield relative to human-edible protein intake (i.e. cereals and soybean) was higher when legumes were fed compared with Control, but not compared with the diet containing urea, suggesting that these alternative protein sources may also reduce competition in resource use for feed or food production.