

Summary

A simulation model was developed to evaluate the biological response of different management alternatives on the milk and meat production of dual-purpose cows in tropical systems throughout one year or during one complete lactation. The following parameters were considered: producing cows (cows plus calves); *Brachiaria* pastures, alone and associated with forage legumes; and genotypes of crossbred dairy cows between local races, Holstein, Zebu, and Brown Swiss. The Microsoft Visual Basic® version 6.0 programming language was used, and an interface is included that allow the user to enter the information required by three modules (pastures, animals, and economic). In general, the model allows the daily simulation of the behavior of each animal or group of animals under different production management alternatives, and then performs an economic evaluation for the year. The modified Wood equation was used to estimate the daily milk production potential, where $\text{potdia} = A * (\text{dialact}(i))^B * e^{-C * \text{dialact}(i)} * e^{-g * \text{diages}(i)}$, where, 'potdia' is the daily milk production potential (kg); 'A', the average milk production of the herd, (kg/day); 'dialact (i)', the days of lactation of the animal of category i; 'diages (i)', the days of gestation of the animal of category i; and 'B', 'C', and 'g' are the parameters of the lactation curves.

The energy value of liveweight gain of calves was calculated based on the following relations: fat = $1.788 * e^{-6.118} * \text{pesovacria}^{0.788}$; protein = $0.8893 * e^{-1.1598} * \text{pesovacria}^{-0.1107}$; and energy value = (fat * 9,527) + (protein * 5,505). It was found that this model can be used with a limited number of entry parameters to support research activities and the transfer of technology in dual-purpose production systems in the tropical conditions of the piedmont of Colombia's Eastern Plains.