

Summary

In an attempt to dynamize national livestock production, the Colombian public and private sectors have joined efforts in research and technology transfer at the level of farm enterprises. Research activities involve the characterization of the principal livestock production systems in 22 micro-regions of the lowland tropics. Information obtained as a result of this characterization is being used to conduct ex-ante evaluations of the technological alternatives generated. Although the micro-region of the Cesar valley, located in northern Colombia, has a marked agricultural vocation, traditional soil uses have been forcibly changed to mostly livestock production because of market price fluctuations and the

prevailing social situation. This study presents the main results of the ex-ante analysis, which used a lineal optimization model into which technical and economic information available for 1997 on the three main crops cultivated in the region (rice, cotton, and sorghum) was fed in addition to forage and animal management parameters of the two main livestock production systems (dual-purpose and fattening). In addition to the evaluation carried out of current production systems, technological alternatives are included to analyze their feasibility of incorporation. The introduction of tree legumes, such as leucaena (*Leucaena leucocephala*), and grass legumes, such as *Clitoria ternatea* in association with angleton grass (*Dichantium aristatum*), in dual-purpose production systems was accordingly evaluated as well as the improvement of calving and calf mortality rates. To make farming systems more competitive compared with dual-purpose systems, ways to reduce production costs and increase productivity were studied. Results indicate that the profitability of dual-purpose cattle systems in the Cesar valley has improved because of the lower demand of labor and the flexibility it offers to produce beef and milk depending on the changes in product prices. The system offers great development potential by incorporating into pastures the association *D. aristatum*-*C. ternatea*, increasing the annual net annual by 194%. Likewise, for each 1% increase in calving, the annual net income would increase US\$978, whereas a reduction of 1% in calf mortality only represents an increase of US\$97 per year. Furthermore, the model demonstrates that production can increase if local dairy farms adopt the twice-a-day milking system, which requires the use of crossbred cows that yield, on average, 2300 kg milk/lactancy and calving rates above 82%. By doing so, the system will become competitive compared with the dual-purpose system.