4. The use of linear programming to evaluate the impact of credit for investments in small goat farms

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The PRONAF is a government program that subsidies the credit for investment to small farmers and improve the social development in Brazil. This research was carried out to evaluate the effect of increasing the values of credit for investment used for the PRONAF farmers in semi-arid areas, and their impact in the income and labor in the production system. Was used the economic data of dairy and meat goat systems of PRONAF farmers in "Rio Grande do Norte", Brazil. The limit of the model was the credit for investment, maximum number of animals in the system and the labor time. The current values of credit for investment (R$ 6,000.00) were increased by of 25%, 50% e 100% and analyzed its impact in the farm income when considering milk and meat production. The maximum number of animals in the system was estimated by multiplying the carry capacity (1.5 heads/ha/year) plus the average pasture areas of PRONAF farms (35 ha). The maximum labor time, available for farm work, was 12 hours/day. This mathematical model was solved using linear programming with LINDO® software. If the credit for investment was expanded in 25 and 50%, the income of the system increased, respectively, to 22 and 41%. It happened because the values of credit allowed also an augment in the number of dairy goats in the system. However, this income could not permit a use and pay for more than 5 hours/day in goat system activities. By raising the credit for investment up to 100% it would increase the income of the system around 81%. It happened because the number of dairy goats went up to 83% and the dairy production was having better results than meat production. The system with more dairy goats produces enough income to pay the farmer labor (7 hours/day) and the other five hours could develop another activity. Therefore, the results of the model indicated that an increase in the credit for investment in small goat farms in semi-arid areas in Brazil would biased towards the dairy goat production enhancing the income of families and employment opportunities.