Tropentag, September 20-22, 2023, hybrid conference

"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Intensive grazing system making possible a profitable and sustainable livestock production in the dry tropic of Mexico

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Abstract

Oaxaca state in Mexico faces important challenges in terms of development. It is the third poorest state with 67 % of the population below the poverty line. One reason for that is the extreme climatic condition with very low annual precipitation (less than 700 mm) and high temperatures. It is normal for the region to stay more than 200 days without rain. Despite this challenging scenario, Oaxaca state has 2.8 millions of potential hectares for cattle grazing. Currently, it has more than 1.6 million animals. More than 70 % of livestock is extensive and composed of small production units, with precarious level of technology. The main limitation factors for development of livestock in the region are low reproductive performance, lack of infrastructure and low production of grains and forage to feed the animals. An experiment with 20 animals has been conducted since 2019 in Oaxaca State at Papalotla Group research centre to explore the cattle production potential in an intensive grazing system. The experiment covers an area of 10 hectares, divided into 40 paddocks, with a grazing period of 1 day per paddock. The grass species used in this experiment are two *Brachiaria* hybrids developed by CIAT (International Center for Tropical Agriculture) in a public-private partnership with Papalotla Group. Camello is a highly drought tolerant forage sowed in the paddocks, while Cobra that produces high amount of forage under irrigation and fertilisation, was offered to the animals during dry seasons in a cut-and-carry system mixed with *Cratylia argentea*, a shrubby perennial tropical legume. Both hybrids have up to 18 % of protein crude and around 70 % of dry mattrer digestibility. The results so far show an average daily weight gain of 0.802 kg ha^{-1} (2019–2022). Animals kept gaining weight even during dry season when normally the local producers lost around 10 % of their animals. Even though the investment to implement the system is relatively high, with the right technology, using highly adapted improved pastures and intensive grazing methods, it is possible to have a profitable business in the region. Once installed, the economic analysis showed a positive balance with an annual income around US$20k (10 ha) and a net profit around 25 %, depending on costs and sales price.

Keywords: *Brachiaria* hybrid, grazing system

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