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Perspectives on Productive Continuity: Dual Purpose Cattle in the South of the State of Mexico, 2022

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SUMMARY

In Mexico, double-purpose cattle farming is the most widespread productive activity in rural areas and is carried out in all agroecological regions of the country. In the southern region of the State of Mexico, this type of livestock has been developed more by natural conditions than by induction and technology transfer. In the municipality of Tejupilco, State of Mexico, there are 2,237 dual-purpose cattle producers, which contribute 30% of the meat production in the Rural Development District of Tejupilco. The objective of the research was to diagnose the perspectives of productive continuity in three communities of the Tejupilco municipality for the year 2022, a semi-structured survey was applied under three thematic axes: 1) Socioeconomic aspects; 2) Importance and impact of the increase in the price of inputs and animal sale price (economic viability of the production unit); 3) Perspectives on productive continuity. Dual-purpose cattle producers are widespread due to little or no schooling received, the labor used is family, with eventual employability; Animal feeding has changed radically, based mainly on grazing and exclusive supplementation in the critical season due to the increase in the cost of inputs generated by the purchase of commercial feed, so the current trend of producers is to reduce the number of heads of their herd associated with the animal carrying capacity of their pastures, the use of waste and agricultural derivatives for animal feed in order to lower production costs, since, if the upward trend in costs continues and the sale price of the animal does not increase, the perspectives of productive continuity would lead to a voluntary-compulsory pause of production and/or possible disappearance of the productive activity.

Keywords: Dual Purpose Cattle; Productive Continuity; Animal Feeding

Introduction

In 2022, Mexico hosted a population of 126.7 million inhabitants, of which 8.9 million generate and transform agricultural and fishing goods, as an economic alternative for the generation of resources, 761 thousand people feed and care for their cattle herd; 6 million people prepare and harvest the land, and 130 thousand people capture and raise fish, while 5.3 million inhabitants work in agricultural activities; 819 thousand in the breeding and exploitation of livestock species and 139 thousand in fishing and aquaculture. In the agricultural and fishing activity, 45% of the workers are subordinate and paid; while 37.1% are self-employed, 12.6% are unpaid workers and 5.3% are employers (INEGI, 2022) [1]. A quarter of the country's total population lives in rural areas, where the main economic activities in order of importance are: agriculture with 70.1%: livestock 22.9%, forestry 4.2% and fishing 2.8%; however, these activities only generate 5.4% of the country's economy, that is; that agricultural activity generates $5.4 of every $100 generated (INEGI, 2019) [2].

Cattle farming is the second most widespread economic activity in rural areas, after agriculture, basing its importance on the generation

of jobs for rural areas. In Mexico, 81% of agricultural production systems are small units, with great heterogeneity in herd size, socioeconomic condition, destination of production, technological management, among others (Leos-Rodríguez, et al. [3,4]). In Tejupilco, State of Mexico, there are 288,925 heads of beef cattle managed by 2,237 livestock production units (UPP), which contribute 30% of the production of the Tejupilco district and 14.9% at the state level (PGN, 2020). These systems face challenges associated with environmental deterioration, dependence on external inputs (forage, balanced feed), limited diffusion of technology, disease incidence, deficient organizational and marketing systems, low profitability, migration, insecurity, and inefficient public policies (Cavalloti [5]).

With the objective of diagnosing the perspectives of productive continuity in three communities of the Tejupilco municipality (Almoloya de las Granadas, Tenería and Rio Grande) in the year 2022, a semi-structured survey was applied under three thematic axes:

1) Socioeconomic aspects;

2) Importance and impact of the increase in the price of inputs and animal sales price;

3) Perspectives on productive continuity, in the context that agricultural activity currently demands productive reorientation, towards sustainable forms of production, which optimize the use of resources and guarantee the economic viability of agricultural production systems in the study area.

Development of the Topic

Location of the Study Area: The study was carried out in three communities in the municipality of Tejupilco located in the southwest of the State of Mexico (18° 45' 30" and 19° 04' 32" north latitude and 99° 59' 07" and 100° 36' 45" west longitude). 94% of the territory is used for agricultural activities (COMPLADEM, 2012). The agricultural area is 20,245 ha, pasture cultivation occupies 53% (INEGI, 2019) [2]. Cattle are produced under double purpose systems, extensive cow-rearing and intensive fattening in pens (Figure 1).

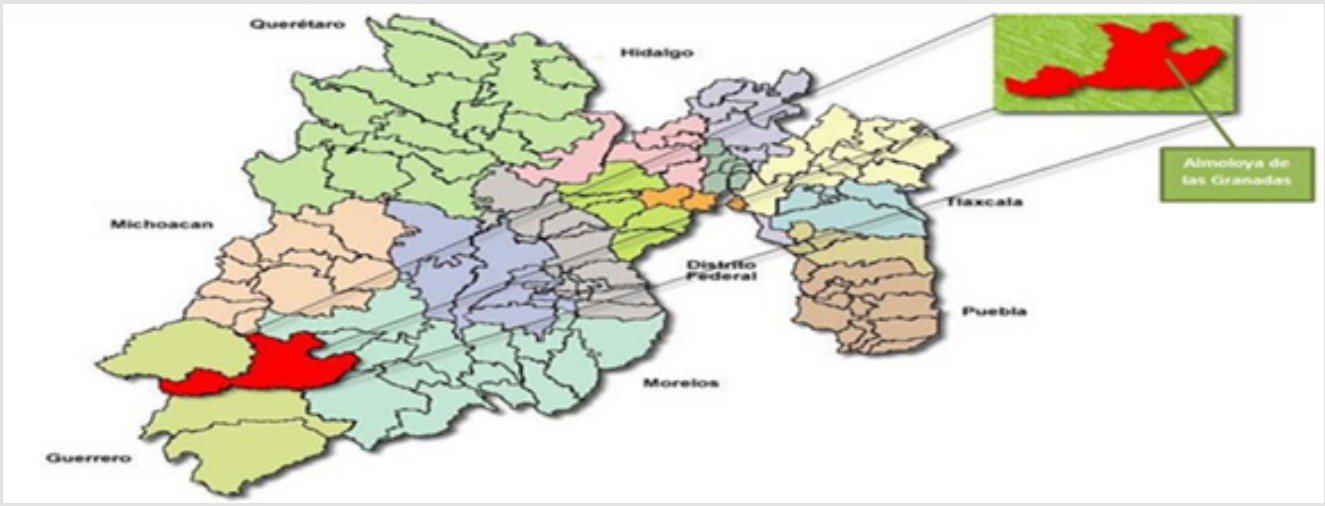

Figure 1: Location of the study area.

Information Collection

It was decided to use semi-structured surveys, applied through direct interviews with dual-purpose cattle producers in the communities of Almoloya de las Granadas, Rio Grande and Tenería, all belonging to the municipality of Tejupilco, collecting annual information on the production process. and incorporating variables under three thematic axes:

1) Socioeconomic aspects;

2) Importance and impact of the increase in the price of inputs and animal sales price;

3) Perspectives on productive continuity.

The survey is a methodology applied in various fields of research and widely used for the study of farms and agricultural systems (Rodríguez, et al. [6]). It is one that allows answers to problems in descriptive terms such as the relationship of variables, after the systematic collection of information according to a previously established design that ensures the rigor of the information obtained (EUMED, 2008) [7]. The surveys were applied using non-probabilistic sampling, called intentional sampling or trial sampling, intentional sampling, similar to the snowball. It is a sampling technique in which the person in charge of conducting the research is based on his own judgment to choose the members who will be part of the study. It is applied when the statistical sample to be formed is selected in the environment close to the researcher, without specific requirements,

but trying to meet at least 10% of the total population. The information from the surveys was processed in an Excel sheet, by number of respondents and for each variable included in order of importance, in such a way that it allows the objectives to be achieved.

Determination of Production Costs

With reference to Rebollar [8-11], at the private level, costs are classified as fixed and variable. The former do not depend on the volume of production, they must be assumed, even if there is no production, they remain both in the short and long term and represent the (negative) profit in the absence of production. The second ones represent the real disbursements linked to the payment for the purchase of variable inputs, they occur when there is production, they depend on the quantity produced and they change when the volume produced changes. Within the fixed costs, emphasis was placed on the useful life of the fixed or immobilized asset, its purchase price, years of utility, divided by one year and multiplied by the amount of product generated. Variable expenses were simply multiplied by the price of the input by the quantity used. All this was done for each producer surveyed, then the total cost for each producer, its average variable cost, average fixed cost and total average cost was obtained. Subsequently, an average cost was obtained by considering the total number of producers surveyed.

Therefore, the total cost, per activity (TC) = CV + CF = PxX + CF; where Px was the price of the variable input used in the process and X the amount of variable input used. The total income (IT) per sale was obtained by multiplying the amount of final product that was generated by the current average in the local market. Thus, IT = PyY, where Py was the price per ton of product obtained and Y, the amount of product obtained for sale. In addition, the gain of the process was calculated as the arithmetic difference between the IT minus the CT; that is to say: Gain (G) = IT – CT = PyY– PxX. Therefore, if G is greater than zero, it is evidence of profitability of the process, otherwise, there will be an economic loss in production.

Results

Socioeconomic Characteristics

Based on the results obtained, it is stated that in the study area, the production systems are relatively small-scale, since they do not exceed 30 head of cattle per producer, with the average being 18.1 ± 10.83 head; the age of the producers was located at 59.5 ± 14.7 with more than 40 years dedicated to the activity; Regarding the education that the producers present, this is relatively low since it goes from no education to basic education in minimal cases; Regarding family integration, the results indicated between six and nine members per family, of which in the study period just under 50% still depend on agricultural activity (Table 1). In the year of study, animal feeding was based on grazing with established and natural pastures in 75%, that is, keeping the cattle only in their pastures supplying mineral supplementation, while 25%, which belongs to the critical months (March, April and May), 100% of the producers provide supplementary feeding based on concentrate, ground corn with stubble and mineral supplementation (Table 2).

Table 1: Socio-economic characteristics of dual-purpose cattle production in the south of the State of Mexico.

Concept	Value
Age (years)	59.5 ± 14.7
Family integration (children)	5.6 ± 3.0
Number of people dependent on the farm	3.5 ± 1.3
Time in activity (years)	41.6 ± 22.9
Animals by producer	18.1± 10.83
Schooling (years)	6.5± 3.5

Source: Own elaboration with field data.

Table 2: Feeding costs of dual-purpose cattle in the South of the State of Mexico.

Input	Cost ($/Head)
Concentrated feed	614.3 ± 508.2
Ground corn with stubble	402.3 ± 437.3
Mineral stone	1 031.4 ± 78.7

Source: Own elaboration with field data.

Table 3: Summary of the production costs of dual-purpose cattle in the south of the state of Mexico.

Concept	$/Head	%
Average Variable Cost	1 016.7 ± 905.51	45.6
Feeding	614.3 ± 508.2	27.5
Vaccines and dewormers	402.3 ± 437.3	18.1
Average Fixed Cost	1 214.0 ± 593.91	54.4
Labor (permanent)	301.2± 192.3	13.5
Infrastructure	9 12.8 ± 439.67	40.9
Total average cost	2 230.7	100

Source: Own elaboration with field data.

Respecto a los costos totales de producción promedio en la zona de estudio, los variables medios, representaron 45.6% del costo total, que en términos monetarios fue $1 016.7, derivado del costo de alimentación (27.5%) y vacunas y desparasitantes (18.1%), mientras que el consto fijo medio osciló en $1 214.0, representando el 54.4% de los costos totales, siendo el costo de infraestructura el más representativo con el 40.9% y el 13.5% restante referente a los costos por mano de obra permanente; esto es $912.8 y 4301.2 respectivamente. Con base a lo anterior el costo total de producción

por cabeza de ganado fue de $2 230.7 (Cuadro 3).Respecto al ingreso total, los productores argumentaron que, para el periodo de estudio, únicamente realizaban la venta de becerros destetados a un peso promedio de 220 kg y un precio promedio por kg de $42, entonces de haberse vendido el animal, el ingreso total se estimó en $9 240. Así, la ganancia por cabeza de ganado fue de $7 009.3 (Cuadro 3). (Table 3) Regarding the productive continuity, based on the information collected, the producers expressed great concern about the productive continuity, currently, there is an upward trend in the price of inputs and a decrease in the sale price of cattle, for which They are only limited to producing according to the forage availability of their pastures and single sale of weaned calves as a strategy to maintain their productive genetic potential.

Conclusion

The production of double purpose bovine cattle in the area and time of study, proved to be economically viable, in terms of costs and income per head; This is directly related to the low production index, since the perspectives of productive continuity are summarized in: producing exclusively according to the nutritional capacity of the area destined for cattle, in other words, not producing more than the carrying capacity of the paddocks, in order to reduce the cost of production per feed. Currently, agricultural producers in the study region pay a high price for the establishment and maintenance of their facilities, without these being used for their primary objective, due to the decrease in production.

References

1. (2022) INEGI National Institute of Statistics, Geography and Informatics.
2. (2019) INEGI National Institute of Statistics, Geography and Informatics.
3. Leos RJA, Serrano PA, Salas GJM, Ramírez MPP, Sagarnaga VM (2008) Characterization of farmers and livestock production units beneficiaries of the program to stimulate livestock productivity (PROGAN) in Mexico, DF. Agric Soc 2(5): 213-230.
4. Hernandez MP, Estrada FJG, Aviles NF, Yong AG, Lopez GF, et al. (2013) Typification of peasant systems in the South of the State of Mexico. Mexico. University and Science 29(1): 19-31.
5. Cavalloti VBA (2014) Beef and milk cattle. Problems and alternatives. Mexico. The Everyday 188(5): 95-101.
6. Rodríguez OA, Berbel VJ, Ruiz AP (1998) Methodology for the analysis of farmers' decision-making. MAP, INIA. Madrid Spain 101: 157.
7. (2008) EUMED Knowledge management as a competitive advantage for travel and tourism agencies. Research methodology.
8. Stone MR, Hernandez DG, Albarrán PB, Rebollar RS, García MA (2011) Typology of cattle farms in the Municipality of Tejupilco, state of Mexico. In: livestock in the face of the exhaustion of the dominant paradigms. Beatrice A, Cavallotti V, Ramirez VB, Martinez CFE, Álvarez MCF, Cesín VA 2: 205-218.
9. Rebollar RS (2011) Methods to estimate production costs and profitability. Experiences and case studies. (1st Edn.)., Spanish Academic Editorial pp. 103.
10. (2012) COPLADEM (Planning Committee for the Development of the State of Mexico) Region X. Tejupilco. Regional Program 2012-2017. Government of the State of Mexico, p. 272.
11. (2015) National Livestock Register (PGN) State bovine inventory of the national livestock register.

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