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BEEF MARKETING CIRCUITS IN CHIAPAS, MEXICO AND ITS CONTRIBUTION TO FOOD SECURITY

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Abstract: The growth and development of animals for human consumption are indispensable biological processes related to meat production and food security. We analyze the meat marketing circuits in Chiapas, Mexico, providing quantitative and qualitative information in order to understand and strengthen alliances among actors in the productive chain. Results show the existence of levels of cattle production, and meat marketing, processing, and sales. Support services to actors throughout the productive chain are provided by three cattle raising associations, two municipal slaughterhouses, and a federal inspection slaughterhouse. Four marketing circuits exist which are well-differentiated with respect to number and type of actors; these actors participate in the production-purchase-sale relation, marketed product, and final destination market. The circuit involving the greatest number of live animals is that in which weaned calves are marketed for fattening. In all circuits, the greatest marketing margin is obtained by intermediaries who participate in the marketing level. The principal beneficiaries are regional and national wholesale buyers of the shortest circuit. Producers are organized in local and regional cattle raising associations, while marketing agents do not have any type of organization. A public policy of permanent support is required in order to strengthen alliances among actors, as well as a competitiveness strategy oriented toward differentiating products based on quality. With this, the current productive chain may gradually transit toward a chain of value that promotes food security and sustainability.

Keywords: production-marketing- processing circuits, marketing margin, levels of the productive chain, intermediaries, food security.

INTRODUCTION

The growth and development of animals for human consumption are indispensable biological processes related to meat production, through cell multiplication or hyperplasia, the increase in cell size or hypertrophy (Di Marco et al., 1987), along with the sustainable use and management of natural resources for animal feed and the achievement of food security (Pat-Fernández *et al.*, 2007; Nahed *et al.*, 2013; Aguilar-Jimenez *et al.*, 2019; Valdivieso *et al.*, 2019). The importance of analyzing marketing circuits in productive chains in agri-food is that it allows for identifying limits, potentials, and opportunities in order to guide intervention strategies toward strengthening of alliances among actors involved in production, processing, marketing, and consumption of products.

Productive chains are systems made up of actors who are inter-related through a succession of operations carried out in production, processing, and marketing of a product in a determined environment (ASOCAM, 2005; Balawanth *et al.*, 2025). Productive chains have existed for a long time and may be renovated through new strategies and market relations.

In the 1990´s in Mexico, protectionist barriers began to be reduced and competitiveness became key to producing and marketing products (Villareal and Villareal, 2002). This situation has led many countries to be increasingly interested in learning about comparative advantages of agri-food productive chains.

Competitiveness of productive chains may be attained by: i) obtaining maximum production levels and the greatest profitability regardless of product quality or negative impacts on labor and the environment; or ii) favoring maximum product quality and environmental conservation in order to target alternative niche markets (Nahed *et al.*, 2007; Bischoff and Seuring, 2021; Dagys et al., 2025). As with many nations, in Mexico the first tendency predominates, with the disadvantage that Mexico has the reputation of being an open, not very competitive nation which is globalized in a disadvantageous manner in terms of its economic, social, and technological integration with the rest of the world and in terms of the relation among globalization, corruption, equity, and freedom in the nation (Villareal and Villareal, 2002).

According to Hobbs *et al.* (2000), the difference between a productive chain and a chain of value lies in the fact that in the productive chain, information flow is little or null, the principal focus is cost-price, the strategy consists of obtaining a basic product, supply leads demand, the organizational structure consists of independent actors, and the philosophy of the business´ competitiveness predominates. In the chain of value, information flow is extensive, the principal focus is value-quality, the strategy is to obtain a differentiated product, demand leads supply, the organizational structure consists of independent actors, and the philosophy is oriented toward competitiveness of the chain. According to OGPA (2002), Cristi (2003), Guerra (2004), Lundy *et al.* (2004), Castro-Samano *et al.* (2019), and Dagys *et al* (2025) studies of the chain of value should address the following five levels of analysis: i) structure of the agro-food system, ii) functioning of the agro-food system, iii) relations with the international economy, iv) relations with the national and

regional economy, and v) integration and analysis of competitiveness.

Based on this premise, the objective of this study was to analyze the beef marketing circuits of ejidos (collective land holdings) in the municipality of Tecpatan in the humid tropics of the State of Chiapas, Mexico, and its contribution to food security**,** with the interest of provide useful information for decision-making by the different actors (producers, processors, salespeople, organizations, and governmental institutions). It is important to generate consistent data in order to improve access to information of those involved, guide intervention strategies, and contribute to empowering and strengthening alliances among actors of the chain (Lundy, 2003; ASOCAM, 2005; Barua *et al.* 2021; Dagys *et al.*, 2025).

According to INEGI, in 2007 the State of Chiapas had1,406,000 head of cattle, principally destined for fattening and milk production. That year, livestock raising occupied a surface of 427,000ha, principally covered with natural grasses, partially wooded areas, or weeds, with extensive cattle or sheep production systems predominating. While livestock farms show varying levels of technological advancement of productive processes, in general, these livestock systems have high levels of production of live animals. In 2008, they produced just over 196,000 tons of live cattle, and milk production that year surpassed 372 million liters, principally destined to local and national consumption (SIAP, 2008).

Cattle raising in the municipality of Tecpatan, Chiapas has a high level of approximation to the organic production model (Nahed *et al.*, 2009; Nahed *et al.*, 2013; Valdivieso *et al.*, 2019), and currently organic certification is being promoted. Nevertheless, in some regions of Chiapas, cattle production is limited by lack of quality control for milk, cheese, and meat produced. This hinders marketing in the formal market and causes prices to be significantly less than desired by producers (Nahed *et al.*, 2008; Nahed *et al.*, 2013; Nahed-Toral *et al.*, 2018). Statistical information from SIAP (2008) shows that cattle producers of Tecpatan sold 4,765 tons of live cattle – principally calves for fattening and discarded animals - to external buyers. They also sold over 40 million liters of milk to the companies PRADEL and to artisanal and micro-industry cheese makers. Despite the fact that dual purpose cattle production systems of Tecpatan, Chiapas have a high level of approximation to the organic production model, the limits, potentials, and opportunities of the productive chain of cattle agro-food products are unknown.

MATERIALS AND METHODS

This study was carried out in the municipality of Tecpatan, in the northeast mountains of the State of Chiapas, in southeastern Mexico, between 94° 05′ and 91° 23′ west longitude and 17° 16′ north latitude. This lies within the middle watershed of the Grijalva River, and within the Mesoamerican Biological Corridor (Figure 1). According to the Köppen classification, modified by Garcia (1988), climate is warm-humid with abundant summer rains Af (m) w" (i ') g. Total annual precipitation is 1932mm, average altitude is 320masl, predominant vegetation is medium jungle, and topography is rough. The original population belongs to the Zoque ethnic group.

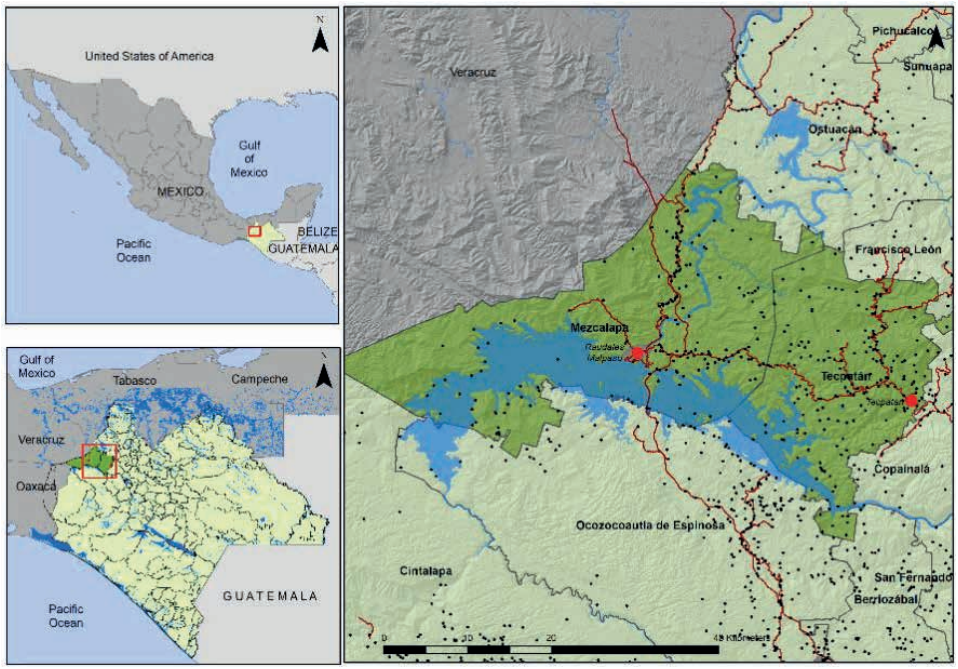


Figure 1. Location of the study area, corresponding to the municipality of Tecpatan, Chiapas, Mexico, in green.

Analysis of beef marketing circuits was carried out during an agricultural cycle, based on methodologies explained by Lundy (2003), ASOCAM (2005), Angulo (2007), and Nahed *et al.* (2008). The following levels were identified: i) production (producers and volumes of production); ii) marketing (buyers or local retailers, and regional or national wholesalers); iii) processing and sale to the final consumer (local and regional butchers, as well as supermarkets; and iv) strategic support services (cattle raising associations, municipal slaughterhouses, federal inspection slaughterhouse, and transport and storage of live animals and carcasses). We also characterized beef marketing circuits, producer income, marketing margins per level, and organizations involved in the productive chain.

Marketing margins were calculated as the difference between buyers´ purchase and sale prices of a unit of product (Caldentey, 1979; Garcia *et al.*, 1990).

Information was obtained in the following manners: i) by consulting archives of three cattle raising associations in the municipality of Tecpatan, Chiapas (Local Cattle Raising Association of the Grijalva of the communities Luis Espinosa and Emiliano Zapata; Local Cattle Raising Association of the community Malpaso; and Local Cattle Raising Association of the community Tecpatan), from which quantitative and qualitative information was obtained regarding weight and destination of animals sold, purpose (slaughter, fattening), inspection process, obligatory permits, and loading animal for transport; ii) through direct observation on the cattle farms; and iii) by applying two questionnaires; the first to 75 producers (100% of all active producers of the rural production societies Grijalva = 35, Pomar-

roza = 22, and Malpaso = 18) in order to ascertain basic economic aspects of production (17 items); the second was a consisted of all retail buyers and butchers who decided to provide information) with the goal of obtaining information on the marketing process (12 items). Furthermore, other actors involved in the meat productive chain were interviewed, including truck drivers, staff of the cattle raising associations, veterinarians in charge of hygienic-sanitary animal inspection, wholesale buyers, and inspectors in municipal slaughterhouses. These informants provided valuable data regarding prices and destination of animals sold.

Analysis of information was carried out using tables and graphs of descriptive statistics (average, standard error, and range). We also elaborated a conceptual model (Aracil, 1999) of the beef productive chain (schematic diagram of the relationships established among the elements of a system). Information was systematized in a data base and examined with the SPSS (Statistical Package for Social Sciences) statistical program, version 20.0 (SPSS, 2021).

RESULTS

Figure 2 shows the levels of the beef productive chain and the four marketing circuits identified in the municipality of Tecpatan, Chiapas.

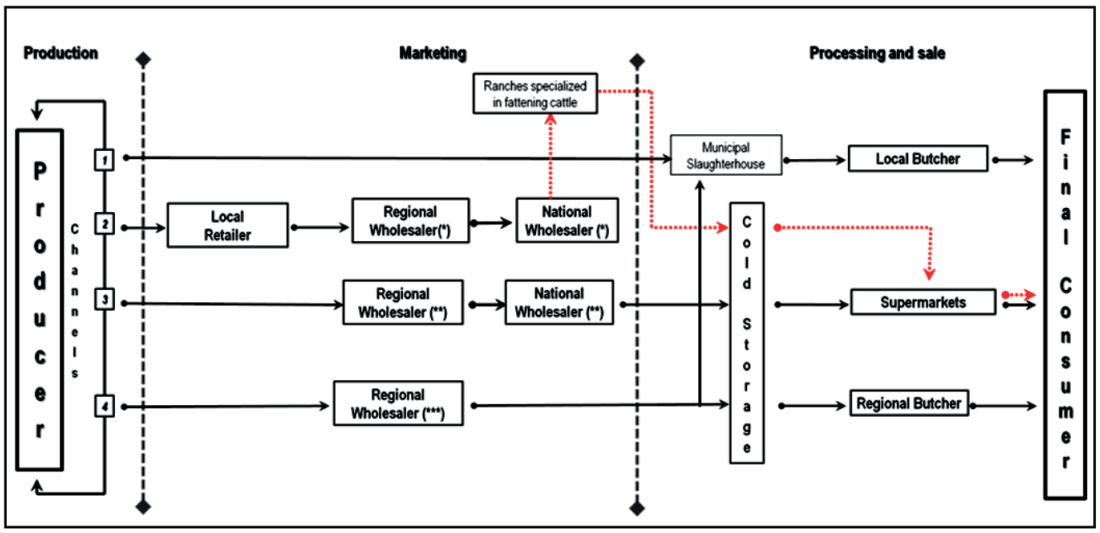
Links in the meat production chain

Analysis of the productive chain begins with description of the levels identified. The first level is made up of producers and cattle production systems. Historically, cattle raising in the municipality of Tecpatan has been based on extensive grazing, whose principal characteristics are diversified use of resources and a management calendar adapted to the variable environmental conditions. Animals are fed almost exclusively in grazing units with a broad tree gradient. Herd size of the cattle production units (CPU) ranges from 9 - 197.5 animal units, including 4 - 107 cows in reproduction. Producers sell 9 – 18 calves annually.

Based on type of product offered by the CPU, we identified three subsystems of beef production: i) CPU oriented toward production and sale of weaned calves; ii) CPU oriented toward fattening weaned calves for sale, some of which are produced on the farm and others of which are purchased; iii) CPU oriented toward fattening weaned calves for sale in which100% of animals are purchased from other cattle farms.

The second level of the productive chain is marketing, which includes local, regional, and national intermediary buyers who purchase and sell live calves, steers, heifers, and discarded cows. Based on type of products or animals marketed, in the study region we distinguished two principal types of intermediaries – specialized and non-specialized. The first are specialized in purchase of animals which comply with specific characteristics for weight and age, which are resold in regional and national specialized markets. By contrast, non-specialized intermediaries take advantage of opportunities which arise to purchase animals at very low prices, regardless of weight or age, such as steers, heifers, and discarded cows, in order to sell them in the local market.

The third level is processing and sale. This level includes butchers, whose activities consist of: i) processing live animals into



*Purchases live calves under 300 kg; ** Purchases steers and heifers over 300 kg; *** Purchases bulls over 450 kg.

Figure 2. Links of the beef productive chain and marketing circuits in the municipality of Tecpatan, Chiapas, Mexico.

carcasses; and ii) processing carcasses into different cuts of meat and meat sub-products (processed, salted, or seasoned meat, etc.) for sale to the final consumer. There are two types of butchers: local and regional. Local butchers market their products in ejidos and communities of the municipality of Tecpatan, and regional butchers in major cities of the State of Chiapas, including Tuxtla Gutierrez, San Cristobal de Las Casas, and Chiapa de Corzo. 100% of butchers interviewed have been in the business for over six years, and sell at least half a carcass daily. 36.4% of butchers interviewed sell the innards of the animals and none of them package or label the meat. Furthermore, 36.4% of butchers sell processed meats such as sausage. None of the local butchers have a vehicle adequate for transporting the carcass to their shops. Therefore, carcasses are transported in the same pick-up trucks used to transport live animals. Locally, no formal or informal butcher organization exists.

The fifth level consists of strategic support services in the productive chain; cattle raising associations and slaughterhouses were identified. Principal services provided by cattle raising associations include: carrying out physical and sanitary inspection of the animals; verifying their origin and weight; authorizing and issuing documentation required to transport animals (invoice, transport permit, proof of bath against ectoparasites), and endorsing the inspection certifying that the animals are free of brucellosis and tuberculosis.

Cattle raising associations in the study area are: i) Local Cattle Raising Association of the Grijalva, based in the ejido Luis Espinoza, with 325 members; ii) Local Cattle Raising Association of Raudales Malpaso, based in the town of Raudales Malpaso,

with 116 members; and iii) Local Cattle Raising Association of Los Volcanes, based in the municipal seat of Tecpatan, with 450 members. These local cattle raising associations have infrastructure (cattle yard, loading ramp, parking lot, scale, and sanitary inspectors) adequate for inspection and loading animals for shipment. After, the support services mentioned above are carried out, the animal inspector places a seal of guarantee on the door of the vehicle which will be used to transport the animals. The seal is valid only until the animals have arrived at their final destination. The package of support services provided by the cattle raising association has an approximate cost of $130 Mexican pesos (MXN) ($7 USD) per animal, which is paid by the buyer.

Another component of the level of strategic services consists of the slaughterhouses. Their objective is to provide adequate infrastructure for slaughtering the animals with appropriate hygienic-sanitary control. In the municipality of Tecpatan, we identified two municipal slaughterhouses, one in the municipal seat of Tecpatan, and another in the town Raudales Malpaso. It should be mentioned that not all animals are slaughtered in the slaughterhouses; some are slaughtered in an artisanal manner in the farmers´ homes.

On a regional level, there is only one federal inspection slaughterhouse, located in the city of Tuxtla Gutierrez; it is the only such operation in Chiapas, according to SENASICA (2008).

Marketing circuits in the meat production chain

From the point of view of the productive chain, the marketing circuit followed by producers is principally determined by the product offered (weaned calves, steers, heifers, or discarded cows), by the economic needs of the farmers and their families, and by sales opportunities which arise.

We identified four marketing circuits (Figure 1). Each circuit differs in terms of number of actors, type of actors participating in the purchase-sale relation, product marketed, and final destination market. Producers are organized in local and regional cattle raising associations, while buyers do not have any type of organization.

Marketing circuit 1 is the shortest and most diversified (non-specialized) in terms of type of animals which the producer destines for sale. It is principally characterized by purchase-sale of steers and heifers from 380 to 450 kg live weight, and discarded cows from 400 to 500 kg. Average price of live animals is $41 MXN ($2.2 USD) for discarded cows and $66 MXN ($3.6 USD) for steers per kg of live weight. These prices may vary according to the animals´ body condition, such that discarded cows in good form may be sold for $51 MXN ($2.75 USD) and steers for up to $71 MXN ($3.8 USD)/kg live weight. Producers mentioned that when the family has an urgent need for cash, they may sell animals below average price.

In circuit 1, producers sold animals directly to local butchers, who carry out the all of the following functions: i) purchase and transport of live animals to the municipal slaughterhouse, ii) payment for sacrificing animals, transport, storage, and processing (preparation of various cuts, processed meats, etc.), and iii) sale to the final consumer in the local market. On average, prices of

the different cuts were $183 MXN ($9.9 USD)/kg for boneless meat, and $125 MXN ($6.75 USD)/kg for meat with bone (extremities, back, and ribs).

Marketing circuit 2 is the longest, and is principally characterized by purchase-sale of weaned calves under 300 kg live weight (Figure 2). This circuit is made up of producers, buyers, ranches specialized in fattening cattle, cold storage, and slaughterhouses. It also includes supermarkets, which offer meat to the final consumer in various cuts, as well as marinated or seasoned meats, all of which come from their national distribution centers. In this circuit, producers of farms without ease of vehicular access or scales for weighing animals sell calves to local retailers, who purchase the animal without being weighed; rather price is assigned according to the animal´s size and body condition. Average sale price per calf is $21,550 MXN ($1164.9 USD) and price is fixed through bargaining. Later, the local retailer transports the animals to the cattle yard of the cattle raising association in order to sell them to a regional wholesaler.

The regional wholesaler specializes in purchasing calves with similar age and weight characteristics. Price of calves is set according to live weight and the going price per kg., and selected calves are set aside for later purchase. Once the regional wholesaler has assured purchase of approximately 200 calves, he contacts the national wholesaler, purchases, and resells the calves on site of the cattle raising association, thus obtaining great profits. The regional wholesaler takes charge of managing the necessary paperwork for sale and shipment of the animals before the cattle raising association. This includes: sanitary inspection of the animals, transport permit, hygienic-sanitary permit, invoice, and certification of brucellosis and tuberculosis tests).

Producers, intermediaries, and personnel from the cattle raising associations interviewed reported that the national wholesaler transports the calves to ranches specialized in fattening cattle, located in the States of Veracruz, Jalisco, Puebla, Morelos, Hidalgo, State of Mexico, Tabasco, Nuevo Leon, and Oaxaca. On these ranches, calves are fed with balanced feed in order to attain the desired weight in the least possible time. Later, some are slaughtered in the federal inspection slaughterhouses and others in municipal slaughterhouses, and the meat is principally distributed to in local meat shops and markets, as well as in supermarkets for sale to the final consumer in different cuts.

In marketing circuit 3, producers sell 300-400kg live steers and heifers directly to the regional wholesaler (Figure 2). The price of each animal is set according to live weight and regional going price ($MXN / kg live weight; average price during the study period was $66 MXN ±5 ($3.6 USD)/ kg live weight ($27,344 MXN ±225 ($1478 USD) (per animal). As with circuit 2, when the regional wholesaler assures purchase of 90 - 120 steers and/or heifers, he contacts the national wholesaler in order to purchase and resell the animals. Later, the same procedure and destination is followed as that described for circuit 2.

In marketing circuit 4, producers sell live bulls (over 450 kg live weight) to the regional wholesaler (Figure 2). Average price during the study period was $45 MXN ±2/ kg ($2.4 USD) live weight ($20,325 MXN ±3,262 ($1098.6 USD) per animal). Later, the regional wholesaler carries out the necessary paperwork before the cattle raising association and markets the animals to regio-

nal butchers. Animals are slaughtered in the federal inspection slaughterhouse of Tuxtla Gutierrez, and in municipal slaughterhouses in San Cristobal de Las Casas, Chiapa de Corzo, and other cities (Figure 2). The meat is sold in butcher shops located in these cities. Cuts offered to the public by regional butchers include: i) meat with bone (breast, ribs, etc.), ii) boneless meat, and iii) innards and extremities (liver, kidneys, lungs, heart, head, feet, etc.). Currently, skin, fat, and blood of animals slaughtered in the municipality of Tecpatan are low priced due to lack of demand in the local market. Average final sale price of boneless meat is $183 MXN ±21 ($9.9 USD)/kg, and $125 MXN ±5 ($6.7 USD)/kg of meat with bone.

Marketing margins in the meat productive chain

Table 1 shows income obtained by producers (level 1) per animal sold, and marketing margins per animal in the remaining levels (2, 3, and 4) of the meat productive chain in the municipality of Tecpatan, Chiapas.

In marketing circuit 1, the producer obtains an average income of $24,150 MXN ±649 ($1305 USD) for sale of a live animal, while the local butcher, who carries out all the necessary procedures in the productive chain in order to transform live animals to meat for sale in local shops, obtains a per carcass income of $38,398 MXN ($2075 USD) and a marketing margin of $13,705 MXN ($741 USD).

In marketing circuit 2, the producer obtains an average income of $21,550 MXN ±866 ($1165 USD) for sale of a weaned calf. Intermediaries obtain a marketing margin of $1099 to $2262 MXN ($59-122 USD) per animal sold. In this manner, upon purchasing 200 weaned calves, the regional wholesaler may obtain a marketing margin of $439,600 MXN ($23762 USD), and the national wholesaler $219,800 MXN ($11881 USD).

In marketing circuit 3, the producer obtains an average income of $27,344 MXN ±1500 ($1478 USD) for sale of a live steer or heifer, while average marketing margins per animal sold were $1,821 MXN ($98 USD) for the regional wholesaler and $902 MXN ($49 USD) for the national wholesaler. Thus, upon purchasing 120 steers or heifers, intermediaries may obtain a marketing margin of $218,520 MXN ($11812 USD) (regional wholesaler) or $109,260 MXN ($5906 USD) (national wholesaler).

Finally, in marketing circuit 4, the producer obtains an average income of $20,325 MXN ±3,263 ($1099 USD) for sale of a live bull. In this circuit, the regional wholesaler obtains an average marketing margin per animal of $813 MXN ($44 USD). Meanwhile, the regional butcher obtains a marketing margin per carcass of $11,319 MXN ($612 USD).

DISCUSSION

The biological principles of animal production, such as growth and development, are based on the scientific knowledge provided by applied biology, which is put into practice in the production of animal food and byproducts for the benefit of humanity. This is especially important for contributing to the food security of the human population and the sustainability of livestock agroecosystems.

Levels	Production	Marketing			Support services	Processing and sale		
Marketing circuit	Producer	Local retailer	Regional Wholesaler	National Wholesaler	Slaughterhouses and cattle raising associations	Local Butcher	Regional Butcher	Supermarkets
Circuit 1								
Sale price	24,150[1]	-	-	-	-	38,398[6,7]	-	-
Marketing margin	-	-	-	-	413[5]/130[8]	13,705	-	-
Circuit 2								
Sale price	21,550[2]	23,812	26,010	27,109	*	-	-	*
Marketing margin	-	2,262	2,198	1,099	*	-	-	*
Circuit 3								
Sale price	27,344[3]	-	29,165	30,067	-	-	-	*
Marketing margin	-	-	1821	902	-	-	-	*
Circuit 4								
Sale price	20,325[4]	-	21,138	-	744[9]	-	31,713[6,7]	-
Marketing margin	-	-	813	-	-	-	10,575	-

[1] Average price of steers and discarded cows; [2] Average price per live weaned calf; [3] Average price of steers and heifers; [4] Average price of bulls; [5] Cost of slaughter of each cow in the municipal slaughterhouse; [6] Average carcass weight = 190 kg. In order to calculate this, we assumed a 60% yield of the carcass (this high yield is due to the fact that data are principally from large heifers in good form, of the Zebu breed crossed with Simmental, Swiss, and Holstein); [7] Average price of boneless meat = $48MXN /kg, and of meat with bone = $28MXN /kg; [8] Payment per animal to the cattle raising association for all services (obligatory documentation); [9] Approximate cost for or slaughter of each cow in the federal inspection slaughterhouse. * Route of the live calf to the final consumer.

Table 1. Average marketing margins of different actors participating in the beef productive chain in the municipality of Tecpatan, Chiapas, Mexico (Mexican pesos, MXN).

Marketing cattle in the municipality of Tecpatan is influenced by various factors, including geographic dispersion of the cattle farms, the small scale of production, and the precarious highway and transportation infrastructure. As Castro-Samano *et al*. (2019) point out in Mexico, García *et al*. (2007) in España, Barua *et al*. (2021) in the Bangladesh coast and Dagys *et al*. (2025) in Mongolia, this situation determines which marketing circuit the producer opts for, as well as the degree of favorableness of the purchase-sale operation.

The marketing circuit involving the greatest number of animals is circuit 2, in which principally weaned calves are marketed. This is followed by circuit 3, in which steers and heifers are marketed, then by circuit 4, in which bulls are marketed for slaughter, and finally circuit 1, which is the most diversified, due to the fact that all types of cattle are marketed in this circuit, though in lesser quantities. In the municipality of Tecpatan, an average of 1000 head of cattle of all ages are marketed monthly, and demand for animals is highest from November to May (Orantes, 2010).

The number of weaned calves sold is strictly related to size of the cattle production unit – that is, to land surface, herd size, and number of reproductive cows.

The greatest income per animal sold is obtained by producers participating in marketing circuit 4 (sale of bulls), followed by producers of circuit 3, who sell steers and heifers. Nevertheless, these producers must invest more time, effort, and money compared to producers who sell weaned calves (marketing circuit 2). Therefore, cattle raisers who prefer to sell steers, heifers, and bulls obtain their greatest incomes every 30-42 months. By contrast, those who sell weaned calves obtain income every 13-14 months. The difference between the two cases in terms of time invested to sell an animal is almost three to one, but this is not reflected in the income per animal sold. This suggests the need to meticulously analyze cost of production for each type of animal sold, with the goal of obtaining the net utility margin, and generating proposals for reducing operational and structural costs.

The greatest marketing margins per animal sold were obtained in the levels of processing and sale to final consumer at a local and regional level (with an average of $12,140 MXN ($656 USD)/carcass) in marketing circuits 1 and 4, respectively. It is likely that this tendency also occurs in circuits 2 and 3, though it is not currently possible to demonstrate this due to lack of information regarding processing and sale of animals in their final destinations points on a national level. Following this, the marketing levels with a lesser marketing margin (an average of $1,853 MXN ($100 USD)/animal) include local and regional intermediaries of circuit 2, and national wholesalers of marketing circuit 3. Those intermediaries who obtain the least income per animals are the national buyers. Nevertheless, these agents buy animals in large quantities, allowing them to obtain a marketing margin greater than $180,000 MXN ($9730 USD) for each tractor trailer they load with over 180 calves for shipment. Throughout the municipality of Tecpatan, 2 or 3 tractor trailers of animals are loaded and shipped weekly to other Mexican states, of the same way that other regions of Mexico (Castro-Samano *et al*. 2019)

The difference between initial sale price by the producer and final sale price by butchers is 157%, an elevated marketing

margin which does not benefit the producer. This is similar to that mentioned by Hobbs *et al.,* (2000), Lundy (2003), Castro-Samano *et al*. (2019), and Bischoff and Seuring (2021) who point out that the producer, upon not becoming involved in the marketing chain, passively observes how the intermediaries give value added to their product and obtain large profits in a short time.

With respect to the high level of intermediaries in marketing live cattle and meat, Suarez-Dominguez and Lopez-Tirado (2005) describe how in Mexico, there exists a chain of 5 to 10 intermediaries for marketing live calves, from the moment of purchase from the producer to fattening and marketing the meat in different cuts to the final consumer. Participation of these intermediaries in the productive chain lasts from one day (in the case of buyers and butchers) to 4 to 18 months (in the case of breeders and producers specialized in fattening cattle).

Factors which inhibit that producers maintain their animals on the farm until the stage of fattening include low socioeconomic level of the producers, precarious technology of the production systems, lack of infrastructure, low economic reinvestment, lack of consistent government support programs, and variable environmental conditions throughout the year. This leads producers to feel obligated to sell their animals before being fattened, and they become completely dependent on intermediaries. This situation puts this level of production at a disadvantage compared to the other levels of the productive chain. The advantage of the producers is that generally they receive income from animal sales in cash up front when the cattle is sold, while some levels of intermediaries confront the risk of not receiving payment on time for sale of live animals and carcasses, despite prior agreement.

This study demonstrates the existence of relations of interdependence rather than strategic relations of integration among cattle raisers, intermediary buyers, and meat processers. A program of permanent integration is necessary which includes financial support, advisory, and training for the different actors participating in the different circuits of production-marketing-processing, so that the productive chain gradually transitions toward a chain of value. For this to come about, three elements are necessary:

i) a permanent public policy directed toward resolving problems of the productive chain which focuses on avoiding intermediaries prevalent in marketing meat, from sale of the live animal to final sale of the meat to the consumer. This could improve strategic relations among producers, marketing agents, and processors.

ii) a well structured organization which allows different actors of the productive chain to adopt strategies which permit and justify employment of marketing professionals who help to solve difficulties of the marketing circuits (Garcia *et al*., 2007).

iii) a competitiveness strategy in the productive chain (Lundy *et al.,* 2004).

In the current context, the competitiveness strategy is highly important in management of a chain of value. In a globalized world, any change in supply and demand of agro-food products directly affects primary producers, generating uncertainty, losses, and even abandonment of the business. Nevertheless, such change also generates new opportunities and challenges to adapt to the current globalized economy. Therefore, it is important to question not only the

possible trajectories of existing markets and products, but also opportunities which arise in new markets, and possibilities of developing new products and markets (Lundy *et al.,* 2004; Dagys *et al*., 2025), which contributes to the sustainability of food security (Bischoff and Seuring, 2021; FAO, 2022) From this perspective, organic production represents an opportunity for cattle raisers of Tecpatan, as this could increase competitiveness of the productive chain as a whole. For this, it is necessary to take into account criteria for product differentiation; that is, cattle production systems must comply with the organic standards, as pointed out by Nahed *et al*. (2009), and Mena *et al.* (2011), Nahed *et al*. (2013) and Valdivieso *et al*. (2019): i) feed management, ii) sustainable grassland management, iii) organic soil fertilization, iv) ecological weed control in grasslands and crops, v) ecological pest control in grasses and crops, vi) veterinary prevention and care, vii) breeds and reproduction, viii) animal well-being, xi) food safety, and x) ecological marketing and management. Considering these criteria also contributes to food security and sustainability of the beef marketing circuits (FAO, 2022; Nahed-Toral *et al*., 2024)

In the dual purpose cattle raising system of Tecpatan, Chiapas, a group of producers of the ejido Emiliano Zapata has attained organic certification for milk production. Therefore, we believe that meat production could be relatively easily certified organic, and expect that such certification could favor the producer in the purchase-sale relation, and favor integral functioning of the productive chain. A sustainable value chain approach to livestock farming is required, as proposed by Barua *et al.* (2021).

CONCLUSIONS

Analysis of current structure and functioning of the beef productive chain of ejido cattle raising in the municipality of Tecpatan, Chiapas demonstrates its limits, potentials, and opportunities for development.

The principal limits of the producers´ purchase-sale operations are related to geographic dispersion of the cattle raising units, small scale of production, and precarious highway and transportation infrastructure.

We identified four marketing circuits, differentiated by type and quantity of animals marketed. The circuit involving the greatest number of live animals is that in which principally weaned cattle are marketed. The greatest marketing margin is obtained by intermediaries who participate in the levels of marketing, processing, and sale to the public. The principal beneficiaries are regional and national wholesale buyers of the shortest circuit which is diversified in terms of type of animals purchased from the producer. This reflects the low level of participation of the producers in the productive chain.

A public policy of permanent support is required in order to strengthen alliances among actors, as well as a competitiveness strategy oriented toward product differentiation. Cattle farms whose milk has been certified organic have great potential for their animals destined to meat to be certified and marketed as organic. It is also necessary to promote establishment of criteria for classifying live cattle and carcasses; such criteria should be respected by actors participating in all levels of the chain as tools for differentiating the product in order to generate differentiated prices. Such a classification could serve as an incentive toward genetic

improvement and improving management of cattle sent to market. These measures represent opportunities to improve the functioning of the current productive chain, and gradually transform it into a chain of value, that contributes more to food security and the sustainability of beef marketing circuits.

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