



Meat consumption and consumer attitudes in México: Can persistence lead to change?

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ABSTRACT

Meat is an essential element of contemporary Mexican culture. Its consumption is linked to ancestral elements as well as to agri-food globalization. Currently, the three types of meat most consumed by Mexicans are chicken (35 kg/person/year), pork (20 kg/person/year) and beef (15 kg/person/year). The consumption of these types of meats is highly influenced by price, regional preferences and emerging trends related to health, environmental and animal welfare concerns. The Mexican diet also includes other types of meats such as turkey, horse, sheep, goat and rabbit; their consumption is related to factors associated with health, tradition and availability. Mexico is the Latin American country with the highest number of people who follow plant-based diets, with 19% being vegetarian, 15% flexitarian and 9% vegan. This overview shows that the persistence of meat consumption in the country is not a uniform phenomenon, where deep-rooted culinary traditions coexist with changes in the horizon influenced by globalization, health and environmental concerns, animal welfare and household income.

1. Introduction

In pre-Hispanic Mexico, the diet was based on roots, fruits and vegetables, especially corn, black beans and chili peppers (Long-Solis & Vargas, 2005). The consumption of animal protein was sporadic, festive or ritual, and came from native domestic animals (i.e. turkey, rabbit and hairless dog), hunting (i.e. deer, rodents and birds), and gathering (amphibians, reptiles, insects, fish, crustaceans and mollusks) (Azúa & Galicia, 2014). After the Spanish conquest in 1521 and the subsequent miscegenation, new vegetables, fruits and meat (beef, sheep, goat, pork and chicken) were introduced (Román, Ojeda-Granados, & Panduro, 2013). Over the following centuries, meat consumption has remained an essential element of Mexican cuisine and food culture (Pilcher, 2008). Gradually, new ingredients and food practices associated with migration, socio-political changes and a progressive food globalization that reached its peak with the entry into force of the North American Free Trade Agreement (NAFTA) in 1994 have been incorporated into the Mexican diet (Alcalde-Rabanal, Nieto, Carriedo, Mena, & Barquera, 2022; Gálvez, 2018). In 2010, Mexican food was the first cuisine of a country to be accepted by the UNESCO Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage on the Representative List of the Intangible Cultural Heritage of Humanity (Rojas-Rivas, Rendón-Domínguez, Felipe-Salinas, & Cuffia, 2020). Currently,

meat consumption in the country coexists between different dietary patterns that fluctuate between ancestral food traditions and the Westernized diet, and recently there has been a marked interest in healthy eating (Rodríguez-Ramírez, Martínez-Tapia, González-Castell, Cuevas-Nasu, & Shamah-Levy, 2022).

This paper presents a descriptive narrative review of consumers and their meat consumption patterns in Mexico. The methodology used in this study consisted of a search of two types of information sources. The first consisted of desk research using secondary data from statistical reports and knowledge from gray literature (Dagevos & Verbeke, 2022). The second consisted of a search of scientific literature focused on the period 2000–2021 in digital databases (Google Scholar, ScienceDirect, Scopus, Scielo, and Redalyc) published in English, Spanish and Portuguese. The search was delimited by the combination of the terms meat, consumption/consumers, and Mexico, and only those papers presenting direct evidence related to Mexican consumers were included. Therefore, this paper is organized as follows: We first summarized national meat consumption data, including regional differences associated with economic and sociodemographic factors, and the main motivations and preferences behind the consumption of chicken, pork, beef, sheep, goat, horse, and other meats. Then, we analyzed the drivers of change in meat consumption in the last decade were analyzed, including the growing consumer interest in sustainability, animal welfare, and low-meat or

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meat-free diets.

2. Differentiating factors of meat consumption

In 2020 Mexico produced 7.4 million tons of meat, corresponding to 3.6 million tons of chicken, 2 million tons of beef, 1.6 million tons of pork and 112 thousand tons of other species (FAO, 2020). This places the country as the seventh largest meat producer in the world, being the seventh largest producer of chicken meat and the eighth largest producer of beef and pork. With >8.8 million tons of beef, pork and chicken consumed annually, Mexico represents 3.3% of world meat consumption and is the sixth largest meat consumer globally (COMECARNE, 2021; OECD, 2018). By species, Mexico is the world's fourth largest consumer of chicken, fifth of beef and eighth of pork. The annual per capita consumption of meat in Mexico is 72.8 kg, of which 34.9 kg correspond to chicken, 20.3 kg to pork, 14.8 kg to beef, 1.3 kg to turkey, 0.8 g to sheep and goat, 0.6 g to horse, and 0.1 g to rabbit. Fish and seafood consumption per Mexican per year is 13.8 kg (SIAP, 2020). According to SIAP (2022), average reference carcass prices for chicken were US \$1.75/kg, pork US\$2.30/kg, and beef US\$4.45/kg, while for turkey US \$3.44/kg, horse US\$2.26/kg, sheep US\$5.91/kg, goat US\$3.93/kg, and rabbit US\$3.68/kg. The consumption trends of the three most consumed animal species in Mexico in the last six years can be seen in Fig. 1. According to the COMECARNE (2020), the national consumption forecast for 2030 will have an annual increase of 2% and production of 1.7%. If this forecast proves to be true or close, annual per capita consumption of chicken meat will reach 42.3 kg, pork meat will reach 19.3 kg and beef meat will stagnate at 14.8%.

Beyond the national numbers, preferences and motivations for meat consumption in Mexico vary within the country, due to the socio-demographic and economic features of the Mexican population and to the cultural differences and traditional lifestyles that persist and combine with dietary patterns resulting from globalization. According to the National Health and Nutrition Survey -ENSANUT- 2018-2019 (INEGI, 2019), 34% of the Mexican preschool population (0–4 years), 40.5% of the primary school population (5 to 11 years), 50.0% of the adolescent population (12–19 years) and 64.5% of Mexican adults (>20 years) consumed some fresh meat (including beef, chicken, pork and fish) at least once during the week prior to the survey (Shamah-Levy et al., 2020). This proportion of consumers is significantly higher in

urban than in rural localities in all age ranges, and is higher for adult men than for women. Mexican households spend an average of 68 dollars per month on meat purchases, with butcher's shops accounting for 50% of retail sales. There is also a clear division between income level and expenditure, with the poorest families spending 31% of their income on meat, while for higher income families it represents only 3.9% of their income, even though they spend 41.8% more than the poorest families (COMECARNE, 2020). The influence of income on meat consumption is also manifested in the likelihood of eating meat, purchase frequency and portion size, which are markedly lower for those with the lowest income levels (Frank, Jaacks, Batis, Vanderlee, & Taillie, 2021; Huerta-Sanabria, Arana-Coronado, Sagarnaga-Villegas, Matus-Gardea, & Brambila-Paz, 2018). The amount and type of meat consumed in the country varies regionally. For example, the ENSANUT survey 2018–2019 (INEGI, 2019), reveals that the total consumption of fresh meats is less frequent in the adult population in the central and southern regions of the country, compared to the northern region and Mexico City.

Regarding the types of meat, data from the National Survey of Household Income and Expenditures or ENIGH (INEGI, 2021), show that quarterly household spending on beef, chicken and pork in 2020 ranged between 65 and 105 USD, 50 and 78 USD, and 45 and 95 USD, respectively. Households that spend the most on beef are located in the northern region of the country and are those that allocate a greater proportion of their meat expenditure to the purchase of beef. The households with the highest expenditures on chicken meat are located in the central and southern states of the country, and in the southern states chicken has a greater share of total meat expenditures. Finally, households that spend the most on pork are located in southern Mexico, although the highest percentages of pork purchases within meat expenditures are distributed in states of different regions. The strong cultural roots of meat consumption are one of the main factors that explain the level of consumption in some areas of northern or western Mexico, where meat consumption is an integral part of the identity of the people who have lived there (Ávila, Fernández, & Gómez, 2004; Bertran, 2010).

2.1. Chicken

In general, chicken has consolidated its position as the most produced and consumed meat in the country (OECD, 2018). The domestic

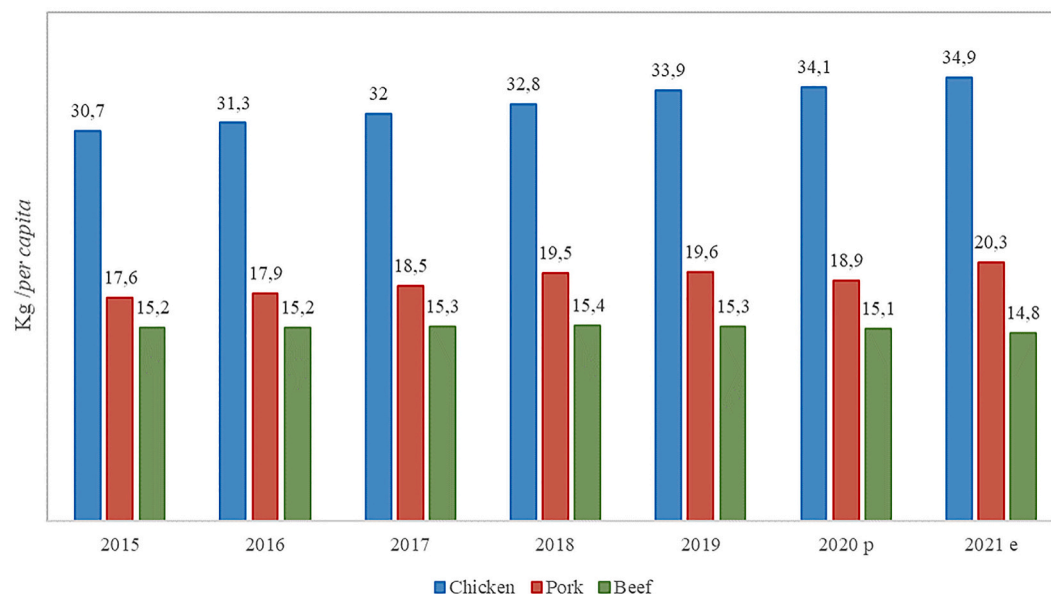


Fig. 1. Per capita meat consumption in Mexico in the last five years (2015–2021).

p: preliminary; e: estimated. Source: COMECARNE (2020) with information from SIAP, INEGI, Aduanas SAT ONU and USDA.

industry covers 81% of the national demand and the deficit is covered by imports exclusively from the USA (95%), Chile (3%) and Brazil (2%), making Mexico the third largest importer of chicken meat in the world with some 830 thousand tons per year (COMECARNE, 2020). Chicken meat exports are still marginal, with 6000 tons per year, sent mainly to Hong Kong (51%), Cuba (14%), USA (10%) and Ghana (7%) (COMECARNE, 2021). The downward trend in the real price of chicken meat during the last two decades in Mexico is one of the main reasons behind the increase in per capita consumption during this period (Rebollar-Rebollar, Rebollar-Rebollar, Mondragón-Ancelmo, & Gómez Tenorio, 2019). For example, the lower price of chicken meat compared to other meats has been referred to as one of the main motivations for its consumption in the Valley of Mexico (Téllez, Mora, & Martínez, 2016), and the Metropolitan Zone of Monterrey (Alvarado, Luyando, & Téllez, 2012). Other motivations for consuming chicken in the country include taste, ease of cooking, the perception that it is healthier than other meats, and its versatility to replace other meats (i.e. game meat or more expensive meats) in traditional recipes (Alvarado et al., 2012; Téllez et al., 2016). It is possible that the current high acceptance of Mexican consumers for this meat is due to the fact that pre-Hispanic diets included the consumption of native poultry (i.e., turkeys, quails) and a large amount of waterfowl (Williams, 2020). Most of these culinary preparations are based on the boiling of these meats for the subsequent incorporation of hot sauces that are traditionally a mixture of chilies, tomatoes, spices and seasonings (Rojas-Rivas et al., 2020). At the same time, rotisserie chicken has positioned itself since the mid-20th century as one of the most consumed fast food dishes in Mexico (Garza-Montoya & Ramos-Tovar, 2017).

2.2. Pork

After chicken meat, pork is the second most consumed meat in the country and the third most produced (OECD, 2019). The domestic industry covers 55% of the local demand and the deficit is compensated by the import of 1 million tons per year, especially from the USA (88%) and Canada (12%), making Mexico the third largest importer of pork in the world (COMECARNE, 2020). On the other hand, the high sanitary status of Mexican pork production has allowed the country to be the fifth largest exporter in the world with 345 thousand tons per year, concentrated in shipments to Japan (44%), China (40%), USA (11%) and South Korea (3%) (COMECARNE, 2021). As with chicken, the high consumption of pork in Mexico is due to three important factors: first, as a protein substitute for other meats in dishes with high symbolic and ritual value from pre-Hispanic times, such as *pozole* and *cochinita pibil*. Secondly, the integral use of pork as a contribution of Spanish gastronomy to Novo-Hispanic cuisine, such as *carnititas* (pork meat fried in its own lard). Another example of this is the charcuterie that can be found in Mexico and Spain with some variations in seasonings but not in the basic preparation techniques (i.e. green chorizo vs. red chorizo). In addition, there is a deep-rooted custom of consuming pork skin fried in its own lard. Pork is also versatile in Mexican cuisine due to its incorporation into traditional stews, as is the case of chicken. Third, price, which enables its consumption by middle and low-income households (Cortés, Mora, García, & Ramírez, 2012). There are few studies that address consumer characteristics and preferences regarding pork consumption. Ngapo, Lozano, and Varela (2018) found that consumers in Mexico City, Guadalajara, Merida and Veracruz surveyed in the point of meat purchase, had similar strategies for pork choice. The most important selection criteria were color and fat cover, with color ranging from dark to light red and lean fat cover preferred. Marbling and drip were less commonly employed, but nevertheless played a role in customer choice, with 21% of consumers using three or four criteria to make their purchase decision.

2.3. Beef

In the last 20 years, per capita beef consumption has gradually decreased due to the sustained increase in beef prices, which has led to an increase in chicken meat consumption, and to the recovery of pork consumption in recent years. Mexico, with 355,000 tons per year, is the ninth largest beef exporter in the world, with its main trading partners being the USA (86%), Japan (6%), Hong Kong (4%) and South Korea (4%) (COMECARNE, 2021). The domestic industry covers 89% of local demand and the deficit is offset by imports of 135 thousand tons per year, especially from the United States (83%), Canada (9%), Nicaragua (5%) and Australia (2%) (COMECARNE, 2020). Mexican consumers' perceptions of beef have been studied more extensively in comparison with other meats. The most recent review on this topic was conducted by Parra-Bracamonte, Lopez-Villalobos, Morris, and Vázquez-Armijo (2020), where beef price has been identified as the main determinant of the purchase decision and is directly related to consumer income. This effect is clearly observable among low-income consumers who, despite liking this meat, buy it less often and tend to replace it with lower-cost meat such as pork or chicken (Huerta-Sanabria et al., 2018). Parra-Bracamonte et al. (2020) mention that there is no evidence of a preferred beef cutting style across Mexico, and that intrinsic characteristics of color, flavor, odor, consistency, juiciness, and freshness have also been identified as factors influencing Mexican beef consumption. However, Ngapo, Varela, and Lozano (2017) report that consumers' beef purchase preferences are the result of the combination of several of these attributes, and that regional variations may be related to beef consumers' preferences and purchase decisions, especially between the north (preferring marbled meats) and the rest of the country (preferring leaner meats). There is a boom in the supply of select beef for high-income consumers looking for certified meats according to production system (i.e. pasture), origin (i.e. region or country), special cuts (i.e. *Arrachera* or hanger steak) and some breeds (i.e. Wagyu, Angus or Hereford).

2.4. Sheep and goat meat

Traditionally, the demand for sheep meat has exceeded the national production capacity, which stands at 64,758 tons in 2020 and an inventory of 8.7 million head, although the deficit is small and does not exceed 7000 tons (SIAP, 2020). Imports of frozen meat come mainly from the USA (90%), Australia (3%), New Zealand (2%), and Chile (1%) (COMECARNE, 2021). Sheep production in Mexico has historically been destined to satisfy domestic demand of lambs and adults due to its link with traditional cuisine, especially *Barbacoa*, a traditional dish cooked by steaming in brick ovens under the ground, that is deeply rooted among the populations from the center of the country. Goat production is much more limited and its consumption is restricted to certain geographic regions of the country, especially among peasants for self-consumption and festivities. Mexican goat meat production reaches 40 thousand tons per year and there is no history of exports or imports (COMECARNE, 2021). The most demanded categories are kid goat for *Cabrillo* or oven-roasted kid (Nuevo Leon), chevon and adult goats for *Barbacoa*, and for other dishes restricted to regions such as *birria* (Jalisco and Zacatecas), *mole de caderas* and *chito* (Puebla, Oaxaca and Guerrero). The *Mole de caderas* and *Cabrillo* have recently been questioned by consumers and public opinion, due to the fact that in the first case the slaughter method is considered cruel (slaughtered without stunning at a festival) and in the second case for slaughtering suckling animals (Venegas & López, 2018).

Sheep production in Mexico is still traditional and low tech, besides being an integral part of the livelihoods of many rural and peri-urban families (Estévez-Moreno et al., 2019). Thus, the national sheep meat industry is incipient and there are two productive clusters in the State of Hidalgo and the most dynamic in the State of Mexico (Calpulhuac), both focused especially on *Barbacoa* production (Pulido, Estévez-Moreno, Villarroel, Mariezcurrena-Berasain, & Miranda-De la Lama, 2019).

Although in recent years there are efforts by livestock farmers and retailers to boost the market for cuts and sausages, the demand for these products is still restricted to the gourmet market in big cities. For Mexican consumers, sheep and goat meat are part of certain occasional dishes and are restricted to large celebrations such as weddings, baptisms and birthdays. However, in the last ten years, *Barbacoa* has become an expensive dish for weekend family consumption. There are very few studies on Mexican consumers' preferences for sheep meat. Alanís et al. (2022) found in a survey of diners in several sheep meat restaurants that consumers perceive it as a food with unique sensory attributes, coming from animals that are healthier than other species and with traditional traits. Their willingness to pay more is subject to the assurance that the meat is safe, free of hormones and antibiotics and, to a lesser extent, certified organic. The multivariate analysis of this study suggested there are three clusters or consumer profiles named "passive," "whole-hearted," and "deep-rooted," which explained the associations among attitudes, some demographic variables, and consumption frequency.

2.5. Horse meat

Mexico is the fourth largest horsemeat producer in the world, with 76, 996 thousand tons annually (FAO, 2020). Horse meat production was boosted by the 2007 ban in the USA by the American Horse Slaughter Prevention Act, whereby the vast majority of live horses are regularly shipped to Mexico (and Canada) for slaughter (Miranda-de la Lama et al., 2021). As a result, in a few years Mexico became one of the largest exporters of horsemeat in the world. However, in 2014 the EU imposed a conditional ban on horsemeat imports from Mexico (EUR-Lex, 2014). Therefore, exports to Europe (the largest buyer) were suspended, while smaller volumes are currently still being shipped to China, Vietnam and Russia. In contrast, the large volume of meat that is not exported is sold on the Mexican domestic market normally labeled as beef, as demonstrated in an interesting study by Lozano et al. (2020). Mexican consumers are especially reluctant to consume horse meat and its consumption is related to its low prices compared to beef, and especially to fraudulent sales in processed meat products such as pre-cooked hamburgers, sausages and/or in food prepared for street sale (Flores-Munguía, Bermudez-Almada, & Vázquez-Moreno, 2000).

2.6. Other meats

Turkey meat has ancestral roots in Mexico, placing it as the 5th largest consumer in the world (consuming 163 thousand tons per year), importing 95% of the meat to satisfy the demand (SIAP, 2020), especially from the USA, Brazil, Canada and Chile (COMECARNE, 2021). Turkey meat is traditionally consumed for weddings, christenings and Christmas, although in the last ten years its consumption has become popular because it is a low-fat and highly nutritious meat and is therefore considered a healthy product (Portillo-Salgado, Herrera Haro, Bautista-Ortega, Chay-Canul, & Cigarroa Vázquez, 2022). Mexican rabbit meat production reaches 16,000 tons per year and there is no history of exports or imports (SIAP, 2020). Rabbit is mostly consumed in the center and south of the country, although in urban areas its consumption is increasing because it is considered a white and healthy meat. Its production is concentrated in small and medium-sized family-run farms, many of them located in rural areas, but also in peri-urban areas (Soto, 2019). In a survey of regular rabbit meat consumers in 8 countries (Spain, Italy, France, Poland, Hungary, China, Brazil and Mexico) by Szendrő, Szabó-Szentgróti, and Szigeti (2020), they found that Mexicans value both frozen and fresh rabbit meat well, as long as they can see the carcass, and the loin was their preferred piece. Interestingly, Mexicans prefer prepared meat products (roasted, smoked and semi-finished) more than consumers in the other seven countries. In this same study, the authors found that Mexican consumers had two major concerns regarding rabbit production systems: feeding and slaughter. Finally, game meat is in disuse and remains a subsistence activity in poor

rural areas, in addition to being legally regulated in the last 30 years, the depopulation of edible wild mammals and birds is substantial (Ibarra et al., 2011).

2.7. Emerging issues as drivers of meat consumption change

Mexico is immersed in a public health crisis closely related to the gradual change in the national diet. Beginning in the 1960s and 1970s, consumers were more exposed to industrial foods such as refined sugar, oils and soft drinks. Since the northern free trade agreement NAFTA in the 1990s, the consumption of industrialized foods has been accompanied by an increase in the supply and demand for dairy products, eggs and especially meat (Denham & Gladstone, 2020). Whereby, the increase in the consumption of industrialized foods and meat, combined with a more sedentary lifestyle in the last three decades, has led to a staggering increase in the prevalence of health problems such as obesity, type 2 diabetes, heart disease and metabolic syndrome; with type 2 diabetes being the leading cause of death and disability in Mexico (García-Chávez, Castellanos-Gutiérrez, Sinclair, Colchero, & Rivera-Dommarco, 2018). In general, there is a consensus among public health care-related institutions in the country on the need to reduce the consumption of processed meats (Batis, Sánchez, García, Rodríguez, & Ramírez, 2018). However, the nutritional significance of fresh meat continues to be recognized, being a food group recommended for daily consumption by the ENSANUT 2018–2019 (Shamah-Levy et al., 2020). The effects of insufficient intake of fresh meats by low-income people, children and pregnant women is still considered a public health issue in Mexico (Rivera-Dommarco, Barrientos-Gutiérrez, & Oropeza-Abúndez, 2021). The need to maintain current meat consumption in sub-populations such as rural or indigenous households, whose consumption is not excessive, is also recognized (Castellanos-Gutiérrez, Sánchez-Pimienta, Batis, Willett, & Rivera, 2021). However, beyond these population subgroups, the general recommendation has evolved in the last decade towards moderation of fresh meat consumption, especially of red meats, based on considerations about the impact on health of the overconsumption of these products (Ramírez-Díaz, Alvarez-Bañuelos, Robaina-Castellanos, Castro-Enríquez, & Guzmán-García, 2021), and the environmental impacts associated with their production (Batis et al., 2018; Ibarrola-Rivas & Nonhebel, 2019; Lares-Michel et al., 2021).

The National Inventory of Greenhouse gases shows that in Mexico, 6.3% (47,252.38 Gg of CO₂ eq) of greenhouse gas originates from livestock production, and 75% of this value specifically arises from cattle (Huerta, Güereca, & Lozano, 2016). Thus, the Mexican Dietary Guidelines published in 2015 (Bonvecchio et al., 2015) included, in response to a sustainability criterion, a recommendation on the reduction in the consumption of foods of animal origin, particularly ruminants that undergo enteric fermentation. But those Guidelines also stressed the need to include meat in the diet of children and pregnant women, and recommended the consumption of lean pork and beef, and skinless chicken and turkey. However, the overconsumption of meat by Mexicans when compared with the recommendation of the Healthy Reference Diet presented by the EAT-Lancet Commission in 2019 (Castellanos-Gutiérrez et al., 2021), suggests that the official recommendations will evolve towards an even greater reduction of meat consumption in the coming years.

Consumer attitudes towards farm animal welfare are not a one-dimensional phenomenon; they entail various attitudinal and social dimensions related to ethnicity, agri-food culture, ethics, purchasing power and beliefs (Estévez-Moreno, Miranda De La Lama, & Miguel-Pacheco, 2022). In this context, welfare of farm animals has been an emerging concern among Mexican consumers over the last decade, especially among college-educated consumers and women (Miranda-De La Lama et al., 2017; Santurtún, Tapia, González-Rebeles, & Galindo, 2012). The main concerns of these consumers are the leniency of Mexican farm animal welfare laws, the lack of information on the subject, and the need for reliable private labels (Miranda-De La Lama et al.,

2017). In a segmentation study of Mexican consumers based on how they perceive welfare and their willingness to pay for animal welfare friendly products, [Miranda-de la Lama et al. \(2019\)](#) found three profiles that were named “skeptical” (30% of the sample), “concerned” (15% of the sample) and “ethical” (56% of the sample). Those profiles were independent of gender, age and origin (urban or rural), although high school and college education was a defining factor. Finally, in a cross-cultural study comparing the attitudes of Spanish and Mexican consumers towards farm animal welfare [Estévez-Moreno, María, Sepúlveda, Villarroel, and Miranda-de la Lama \(2021\)](#) found that Spaniards are more utilitarian and perceive animal welfare as a market and meat quality differential, while Mexicans seem more idealistic and sensitive to the “animal abuse” in the way animals are raised, transported and slaughtered. This Mexican view of animal welfare may explain the tendency to reduce or abandon meat consumption in the country.

Since the 1980s, Mexico has had a reputable track record in teaching and research in the science of animal welfare, which was initiated and led by the Faculty of Veterinary Medicine of the National Autonomous University of Mexico, and is now taught in the country's 50 veterinary schools ([Mota-Rojas et al., 2018](#)). In addition, Mexico shares with Chile and Uruguay the OIE collaborating center in the Americas in animal welfare. However, the leadership in animal welfare has not been able to make major changes in the meat industry or at the legal level, if compared to other countries in the region such as Chile or Brazil ([Gallo & Huertas, 2016](#)). The most influential NGOs in Mexico are international (i.e. Human Society International, Mercy for Animals, *Igualdad Animal*, The Humane League), and although they have campaigns on companion and working animals, they have recently focused major efforts on the elimination of cage production systems in the poultry and swine industry ([Shields, 2021](#)). Their impact on changing government policies towards farm animals is still limited, but they have managed to change the social responsibility policies of many service companies (i.e. ALSEA, Bimbo, Unilever) and retailers in the agri-food sector, so that they in turn put pressure on their suppliers ([Bracke, Vermeer, & van Emous, 2019](#)).

3. Reduction of meat consumption

Nilsen Ibope's “Global Health and Ingredient Perception Study” ([Nielsen, 2016](#)) shows that Mexico is positioned as the Latin American country with the most people consuming plant-based diets: 19% are vegetarians, 15% flexitarians and 9% vegans. A study by [Vanderlee et al. \(2022\)](#) that surveyed 41,607 adults from Australia, Canada, Mexico, the United Kingdom, and the United States found that Mexicans ($n = 8110$), compared with respondents from the other countries, were more likely to make efforts to consume less meat. Moreover, these efforts were not associated with educational level or age, as was the case for the other four countries. The growing popularity and spread of diets with less products of animal origin can be noticed by the vegan dishes in gastronomic meetings or festivals, and in the emergence of vegetarian or vegan recipes, many of which also highlight traditional elements of Mexican cuisine. Mexico's abundant agrobiodiversity allows the inclusion of different foods of plant origin in vegan/vegetarian dishes, improving the attractiveness of these diets.

According to the survey ($n = 600$) carried by *Gabinete de Comunicación Estratégica* ([Gabinete de Comunicación Estratégica, 2014](#)), in 2014 36.5% of Mexicans surveyed knew someone close to them who had stopped eating meat, 17.2% knew someone completely vegan and 35.8% knew a restaurant specialized in vegetarian/vegan food. In addition, 56% of respondents strongly agreed that a family member should become vegan, 80.2% strongly agreed that a family member should become vegetarian, and 51.3% agreed with the recommendation that children should acquire vegetarian diets ([Gabinete de Comunicación Estratégica, 2014](#)). Additionally, the survey by [Vegan-Police \(2016\)](#), shows that vegans make up a heterogeneous group of people in terms of how long they have adopted the diet, which fluctuates

between <6 months to >40 years. As for the time it took them to abandon the consumption of animal origin products, more than half reported having achieved it in less than a month, 35.3% lasted between a month and a year, and the remaining 8.6% claim to have taken more than a year. The main motivations reported by Mexican vegans to stop consuming animal origin products were ethical concerns including love and respect for animals and care for environment (82.4%). Other motivations were related to health (14.8%), religious beliefs (2.5) and fitting in with some group or person (0.4%). This survey showed a great concern of vegans for animal welfare, with >80% admitting to having ever discussed animal rights with non-vegans. In addition, >80% of respondents reported having a pet at home and 60% reported participating in animal rights campaigns.

In Mexico there are several local movements that have contributed to the spread of veganism. Markedly urban in nature, these movements are organized through social networks ([Fonseca, Aguirre, & Emerson, 2017](#)) but also take advantage of diverse spaces such as flea-markets and alternative markets ([Cabrera, 2020](#)). The preparation and selling of vegan and vegetarian foods, is also part of the practices of food self-determination of certain groups and collectives, which reflects their vision, values and emotions around human nutrition ([Gravante, 2019](#)). In line with the above, 53.1% of Mexican vegans surveyed ($n = 3316$) by [Vegan-Police \(2016\)](#) stated having learned about veganism mainly through the internet (radio stations, podcasts, videos or websites) or a friend, most have vegans in their social circle (57.8%), have cooperated with some association specialized in the protection of animals or dissemination of veganism (62.6%), or belong to vegan online groups (86.8%).

Another national trend to reduce the impacts of meat production is the return to insect feeding, because entomophagy is a culturally accepted habit in Mexico (there are >500 identified edible insect species), although it is not part of the usual diet ([Baigts-Allende et al., 2021](#)). Thus, its consumption is related to self-subsistence, local-regional trade, alternative consumption movements and select markets where it reaches high prices ([Reyes-Prado & Moreno, 2020](#)). However, a limitation for mass consumption is that there are no production systems with commercial capacity and demand is satisfied with seasonal harvesting ([Valerino-Perea, Lara-Castor, Armstrong, & Papadaki, 2019](#)). Finally, cultured meat has received much attention worldwide as an alternative to livestock farming. In the case of Mexico, there is still no commercial supply of cultured meat. However, the survey conducted by [Siegrist and Hartmann \(2020\)](#) in 10 countries shows that Mexican consumers are among the most likely to consume cultured meat, possibly because Mexicans are more open to trying new foods due to the high cross-breeding of Mexican cuisine. These results suggest that future demand for this type of product has some potential for development in the domestic market.

4. Conclusions

In today's Mexico, different trends and beliefs coexist, strongly contrasting, with respect to meat consumption. On the one hand, the evolution of consumption has been linked to the relationship between the price of each type of meat and the purchasing power of the population, which is one of the determining factors of consumption decisions, especially for middle- and low-income households. This suggests that at least for a sector of the Mexican population, meat consumption continues to have an aspirational nature, being associated with positive perceptions in organoleptic and nutritional aspects, with an important cultural load. The strong roots of meat consumption in Mexican cuisine strengthen the trend towards an increase in total meat consumption, although there are regional differences in the intake of different types of meat. Simultaneously, during the 21st century, Mexican society has become increasingly concerned about the negative effects of meat on health, animal welfare and the impacts of livestock production on the environment. This has resulted in the expansion of flexitarianism,

vegetarianism and veganism, especially in urban environments. Both trends unfold amidst criticism of the obesogenic food environment prevailing in the country, marked by excessive consumption of red and processed meats, and the cultural appreciation of meat as a central element of traditional Mexican cuisine.

CRedit authorship contribution statement

Laura X. Estévez-Moreno: Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Visualization.
Genaro C. Miranda-de la Lama: Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Visualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the study reported in this paper.

Data availability

No data was used for the research described in the article.

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