

Market Study of Meat Processing Industry in Manabí, Ecuador

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ABSTRACT

A meat market study was conducted in Bolivar canton, as part of this research. The population included in the study (380 persons) was taken from the total number of inhabitants of the canton (37 262). A number of questions were made about the meat market system in the city of Calceta and other areas in Bolivar canton. Supply analysis made to several other similar products available in the area explained the behavior through time. Also included in the study were national meat processing plants that sell cured meat cuts and other meat products, in general. The chain study concluded that 96 % of meat consumers preferred fresh beef from butchereries and traditional markets, though with an increasing perception to consume safer cuts with less supermarket packing. They were also more prone to buy up to 1.8 kg/week of trademark fresh beef, sausages and smoked meat. It revealed a higher inclination to develop a local university industry offering standard processed and meat products, reducing health risks due to wrong production practices at the local slaughterhouse.

Keywords: production chain, bovine, pig, analysis, quality, consumer

INTRODUCTION

Many slaughter houses in Latin America, including Manabí, in Ecuador, do not have standard high-end facilities and processing standards that guarantee functional and clean quality assurance to their products. Neither have they carried out initial marketing studies, or follow up studies based on the social demands, contrary to the common practice in cities of Europe, the United States, Asia and Oceania (Sepúlveda, Maza and Mantecón, 2008; Morris and Kenyon, 2014; Zakowska-Biemans *et al.*, 2017).

These sources also point out that beef is consumed in accordance with the purchasing power of the population, the feeding habits and diversification of the supply. Consumption continues to rise, especially in Argentina, Brazil, Uruguay, The United States, France, New Zealand, Australia and Poland. Other Latin-American countries are included in the top 20 countries with the highest beef consumption, where slaughter, marketing, traditions, hygiene and quality of the final product

also determine the consumption patterns, as well as prices and the purchasing levels (Lobato *et al.*, 2014; Morris and Kenyon, 2014; Ellies - Oury *et al.*, 2016; Zakowska-Biemans *et al.*, 2017).

In the US, Europe, and some Latin American countries (Brazil, Argentina, and Uruguay, with 25% of beef and pork consumption) different surveys are applied to consumer segments about item origin and quality, and other specifications, which have determined meat sales and consumption, like prices (Spain and Brazil) (Sepúlveda *et al.*, 2008; Barcellos *et al.*, 2012; Lobato *et al.*, 2014; Fonti-Furnols and Guerrero, 2014; Picasso, Modernel, Becoña, Salvo, Gutiérrez and Astigarraga, 2014).

Annual and even season market studies have become a necessity. The pressure of competition, nutritional requirements and consumption patterns make differences in terms of quality standards (Prime, select, and commercial), depending on the presentation, marbling, fat infiltration degree and the kinds of cuts (Sepúlveda *et al.*, 2008; Zakowska-Biemans *et al.*, 2017). It can be used as an example to other countries of the Americas,

particularly in South America, like Ecuador, that need such regional assessments to support decision making and diagnostic and technological intervention works throughout the chain to the end consumers, in order to rescue high quality sales (Sepúlveda *et al.*, 2008; Guevara, Curbelo and Soto, 2012; Lobato *et al.*, 2014; Ellies-Oury *et al.*, 2016).

The aim of this paper was to make integrated analysis of the meat market in Canton Bolívar, province of Manabí, in the Costa region of Ecuador.

MATERIALS AND METHODS

Demand analysis

The population of Bolívar, Manabí (37 262) was used in the study. Table 1 shows the current population, according to the 2001 census made by the National Institute of Statistics and Census (INEC, 2011).

Sample determination

To calculate the population sample in Bolívar, the 2010 data (Table 1.) were used, according to the corresponding formula, with an error margin of 5%, and a confidence level of 95%. The sample size achieved was 380 individuals. They were surveyed on the beef market chain in the city of Calceta and other areas of Bolívar. Supply analysis made to several other similar products available in the area explained time behavior. Also included in the study were the national meat processing plants that sell cured meat cuts and other meat products in general. The study was corroborated by visits to several facilities that sell the items.

Supply was determined by means of interviews to small meat markets, refrigerated areas, the municipal slaughterhouse and local supermarkets in other cities and regions, using the techniques suggested by Barcellos *et al.* (2012). The last issue tackled in the study was the strategy towards customers. Accordingly, several awareness campaigns were developed concerning the importance of beef consumption; in them, consumers were offered different small cut choices for free, for tasting.

RESULTS AND DISCUSSION

The surveyed individuals consumed beef (96.58%), and others abstained from eating it (3.42%). Since it is a usual item in most Bolívar

homes, there may be a relation with the increase in bovine meat consumption in the region, tending to rise higher in the future, though there are other alternatives (chicken, pork, and fish (Malafaia, Barcellos and Azevedo, 2006; Guevara, Curbelo, Soto, 2012; Lobato *et al.*, 2014).

These sources also indicate that in several Latin American countries, slaughtering, seasoning, marketing, traditions, hygiene and quality also determine consumption patterns, prices and purchasing levels (Barcellos *et al.*, 2012; Lobato *et al.*, 2014; Picaso *et al.*, 2014).

High consumption of beef (40.26%) and pork (36.32%) was observed (Table 3.). It showed that these animals are the main sources of highly demanded items, which is strongly rooted worldwide, corroborated by Ellies-Oury *et al.* (2016) in France; Zakowska-Biemans *et al.* (2017), in Poland; Malafaia, Barcellos and Azevedo, 2006; Barcellos *et al.*, 2012; and Lobato *et al.*; 2014, in Brazil.

Customers chose to buy their meat cuts in small markets (44.48%), the municipal market (29.47%), and the supermarkets (22.63%) (Table 4.)

This question is critical for the study, because it facilitated estimation of meat consumption today. The results are as follows, 45% consumed approximately 1.84 kg per week/home; 38.95% consumed approximately 0.92 kg per week/home; 12.63% consumed about 2.76 kg per week/home (Table 5.). Obviously, 52.1% wanted the product because of its quality; 26.32% chose the product because of the price, coinciding with other meat studies in Spain, Brazil, Uruguay, France, Poland and Germany, based on buyer-consumer surveys and the owners of the grocery stores and supermarkets, depending on the meat quality perception, labeling and prices (Barcellos *et al.*, 2012; Picaso *et al.*, 2014; Ellies-Oury *et al.*, 2016; Zakowska-Biemans *et al.*, 2017; Risius and Hamm, 2017).

Clearly, 45.58% of the sample considered that slaughtering and environmental conditions were terrible; 32.1% said the work was average; 16.58% considered it was good; whereas 4.74% thought it was very good; and 0% said it was excellent (Table 6).

The impact ESPAM MFL has on education, culture, society, and economy activities was highly regarded; as well as a job provider in town. The

gratitude of Bolivar people was 96.05% acceptance; 3.93% said the opposite (Table 7.). Most surveyed (96.0%) said they would like to consume meats and their by-products made at the university facility, using standard processes and products, which also coincided with other studies in other areas (Barcellos *et al.*, 2012; Ellies-Oury *et al.*, 2016; Zakowska-Biemans *et al.*, 2017; Risius and Hamm, 2017).

The survey also showed that 29.21% consumed sausages; 26.84% consumed mortadella; 20.26% consumed ham; and 14.22% chorizo. Table 8 shows the individual preferences in packages of 500 g (42.37%); 200 g (24.74%); and 1 kg (20.79%). Pork sausages were the most popular.

Projection of meat and sausages demand

It is important to identify the project's operational life, considering the results of the investigation in Bolivar and the data provided by INEC (2001), with a projection to 2010 and 2020, linking meat and sausage consumption to population increases for those years (Table 9). The increasing annual population growth rate suggested the demand will rise 5% yearly. Therefore, projections for the 2010-2019 period have already been estimated.

Supply analysis

It included other similar products (cuts and cured meats) offered by different national providers, which was corroborated in different facilities. It allowed for identification of time behavior because there are national industries that produce several cut choices of cured meat and other meat-derived items, which was corroborated on-site by the project's authors. The information of the volume produced by the industry is limited, so determination of the supply was made through interviews in the small meat markets, refrigerated warehouses, the municipal markets, and local supermarkets in other cities, which is common practice in the meat market (Barcellos *et al.*, 2012; Lobato *et al.*, 2014; Lucher *et al.*, 2016; Zakowska-Biemans *et al.*, 2017).

Meat processing Plants and industrial capacity

The meat processing plants are located in the Inter Andes Trail, to the mid-north of the Andes mountain range (Pichincha, Cotopaxi, Chimborazo, etc.). Some of them are Plumrose, Alimentos Don Diego (Table 10), La Italiana, La Danesa, Juris, La Europea, and other smaller plants.

Concerning prices, the main actors are the small meat markets and supermarkets in Bolivar (\$ 4.84, estimated price per kg). But the AKI supermarkets in the city of Chone, 20 minutes from the city of Calceta offer special meat cuts vacuumed packed, at \$ 5.72 a kg. These prices vary depending on the quality of cuts, and have wider acceptance in terms of quality and health risks (Malafaia, Barcellos and Azevedo, 2006; Barcellos *et al.*, 2012; Lucher *et al.*, 2016; Zakowska-Biemans *et al.*, 2017).

Others do not consider consumer opinions and sell their products at \$ 0.88 less a kilogram; others more concerned about innocuousness, low quality risks and optimum nutrient use, a common trend in the market, demonstrated by research in other countries (Brazil, Holland, Poland, the US, and other parts of Europe), including enthusiasts and ultraconservative populations of consumers-customers (Velho, Barcellos, Lengler, Elias and Oliviera, 2009; Barcellos *et al.*, 2012; Lobato *et al.*, Lucher *et al.*, 2016; Zakowska-Biemans *et al.*, 2017).

Supply projection

Vacuumed packed meat cuts is limited for Bolivar, the only way to access is purchasing the product is at the local supermarket in Chone. Therefore, Bolivar does not offer a significant amount of the above mentioned item, but researched revealed that several important supermarkets that sell 6 500 kg weekly, have 10% of their orders from Bolivar (650 kg weekly). It corroborates the growing trend to more safety, hygiene and less risks, provided by the industrial packages in comparison to the tailored cuts, but with less protection.

It coincides with studies made to consumer groups and technical reports by commercial and consumption organizations in different areas of Latin America; such as Brazil, the United States and Europe (Malafaia, Barcellos and Azevedo 2006; Lucher *et al.*, 2016; Lobato *et al.*, 2014; Turp, 2016; Zakowska-Biemans *et al.*, 2017). Today, various public awareness campaigns are being held concerning the contribution of every nutrient contained in meat.

Additionally, it rebuts every myth about the harmful effects of meat consumption, found in the literature, not to mention the effects of overconsumption (Guevara, Curbelo and Soto, 2012; Font-i-Furnols and Guerrero, 2014; Lucher *et al.*,

2016). Those studies highlight the advantages of buying-consuming beef from grazing animals, lower price/kg, and better hygiene acceptance, improved beef tenderness and appealing color (Picasso et al., 2014, in Uruguay, and Risius and Hamm, 2017, Germany).

CONCLUSIONS

The chain study made concluded that 96% of meat consumers preferred fresh beef from small markets and traditional markets, though with an increasing perception to consume safer cuts, with better supermarket packing. They were also more inclined to purchases of up to 1.8 kg/week of trademark fresh beef, sausages and smoked meat. It revealed more inclination to develop a local university industry that provides standard processes and meat products, thus reducing health risks due to wrong practices of slaughtering at the local slaughterhouse.

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Table 1. Bolivar Canton Population projection (2001-2010)

Year	Population of Bolivar
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Año	
2001	35 627
2002	35 805
2003	35 984
2004	36 164
2005	36 344
2006	36 526
2007	36 709
2008	36 892
2009	37 077
2010	37 262

Source: INEC (2001)

Table 2. Amount of people (%) that consume meat in the area studied

Alternatives	Values	%
Yes	367	96.58
No	13	3.42
Total	380	100.00

Table3. Most commonly consumed meat types in the area studied (%)

Alternatives	Values	%
Beef	153	40.26
Pork	138	36.32
Chicken	76	20.00
None	13	3.42
Total	380	100.00

Table 4. Common origin of meat bought and consumed (%)

Alternatives	Values	%
Supermarkets	86	22.63
Small store	169	44.48
Market	112	29.47
None	13	3.42
Total	380	100.00

Table 5. Weekly amount of meat consumed by inhabitant (kg)

Alternatives	Values	%
0.92 kg.	148	38.95
1.84 kg.	171	45.00

2.76 kg.	48	12.63
No consumption	13	3.42
Total	380	100.00

¹(0.46 kg =1 lb)

Table 6. Animal slaughter conditions (%) at the industrial slaughterhouse in the city of Calceta

Alternatives	Values	%
Excellent	0	0.00
Very good	18	4.74
Good	63	16.58
Average	122	32.10
Awful	173	46.58
Total	380	100.00

Table 7. Would you agree to eat meat products from the local university (ESPAM-MFL) possible facility that meets the good practices of slaughtering, with highly skilled personnel, and quality products to the people?

Alternatives	Values	%
Yes	365	96.05
No	15	3.95
Total	380	100.00

Table 8. Types of sausages and smoked products that you consume (%) most frequently

Alternatives	Values	%
Sausage	111	29.21
Mortadella	102	26.84
Ham	77	20.26
Chorizo	54	14.22
Smoked cuts	23	6.05
None	13	3.42
Total	380	100.00

Table 9. Projection of meat demand (2010-2019)

Year	Consumption kg/week
2010	2869

2011	3012
2012	3163
2013	3321
2014	3487
2015	3661
2016	3844
2017	4036
2018	4238
2019	4450
2020	3916

Table 10. Products manufactured by Don Diego

Range of meat products	Net weight (gr)	Cost \$
Viennesse sausage	200	0.96
Viennesse sausage	500	2.40
Frankfurter	200	1.60
Frankfurter	500	4.01
Large Mortadella	200	0.90
Large Mortadella	500	1.94
Sanduche ham	200	2.13
Sanduche ham	500	5.32
JAMONETA	200	1.20
JAMONETA	500	3.01