



## Technological Weakness, Sanitary Barriers and Insufficient Skilled Labor in the Colombian Meat Chain.

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## **Technological weakness, sanitary barriers and insufficient skilled labor in the Colombian meat chain.**

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### **Summary:**

The meat production chain and meat products describe the production process that goes from the production of live cattle to the production of the next types of goods by Colombian manufacturing companies: fresh meat, refrigerated or frozen meat; dried meat, salty or smoked; meat derivatives (sausage, salami, blood sausage, mortadella); pates, ham, bacon and animal offal (DANE, 2012 cited by DNP, 2018).

The meat industry in the country has improved in recent years with the creation of more processing plants regulated by Colombian normativity, greater imports of specialized machinery for meat processing and greater diversification of the countries where this machinery comes from. However, there are some challenges such as few numbers of applied research, lack of specialized livestock centers, poor training in the sector, among others.

This article focusses on three mains problems that the Colombian meat production sector has had: weak technology, sanitary barriers, and finally low educational levels and insufficient skilled labor. In the development of the article, each of the problems will be deepened and at the end some recommendations will be given with the purpose that the chain improves and has a new approach.

### **Keywords:**

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Meat chain, technological weakness, unskilled labor, sanitary barriers.

Historically, the productive chain of the meat sector in Colombia has had some problems in the social dimension, such as the lack of recognition and identification of the population linked to the activity of meat farming; lack of opportunities for women that allow them better income and greater participation in decision-making; lack of recognition of the contribution of small producers to family farming; reduction of the population dedicated to the activity; high incident of poverty in the population linked to the chain; low educational levels; insufficient skilled labor; high labor informality of the activity in the first step of the chain; persistence of insecurity and armed conflict in some areas; inefficient concentration of land with livestock activity and a high degree of inequality in land (UPRA, 2020).

The crisis caused by the COVID-19 pandemic is affecting bovine livestock in Colombia, negative impacts are seen that affects the performance of value chains. The sector must understand and promote the formalization of the value chain and the communication with the consumer, the primary sector must be transformed towards a better sustainability and efficiency becomes increasingly urgent to face serious affects of climate change and combat inequality; in addition, digitalization and virtualization have become important means during the crisis in all links of the value chain, creating opportunities to increase the efficiency of the sector in a sustainable way (CIAT, 2020).

As mentioned in this introduction, historically the meat industry chain in Colombia has presented deficiencies in terms of investments and technological innovation, added to numerous problems such as poverty, informality, lack of good practices and an adequate

supply chain that can intensify in negative impacts with the pandemic caused by covid-19. For that reason, it is important to ask: Why has the meat chain In Colombia had historical institutional weaknesses?

**General Objective:**

Identify which are the main institutional problems in the industrial sector of the meat chain in Colombia.

**Specific objectives:**

1. Describe the phases of the meat industry in Colombia and the technological weakness that the country has.
2. Specify the main market players, the legal framework and safety barriers that the sector presents.
3. Determine why there are low educational levels and insufficient skilled labor in the meat industry.

**Process and transformation phases in the Colombian meat industry**

The Colombian livestock sector closed 2019 with a better balance than in 2018, an improvement is noted in the slaughter of cattle, with respect to a change in trend that had been declining since 2014. However, the loss of the sanitary status as a country free of aaptose fever reduced the dynamism of exports, causing the prices of the fat calf to stay low. In 2019, shipments abroad did not exceed 21 tons adding a value of USD73 million (FEDEGAN, 2020).

According to the official figures reported by the ICA of the Livestock Census in the second vaccination cycle of 2018, exist 24.413.227 heads in the country,

of these 17.4 million are females and 9 million males, with a tendency for fattening of 5.3 million., collects 10 million dual-purpose 9.2 million and 1.7 million dairy specialist. These cattle graze on 37.490.575 million hectares and 600.578 farms, of which 81.4% are farms with less than 50 animals (small farmers). According to the slaughter, 3.439.252 animals were slaughtered in 2018, producing 772.501 tons of meat. Per capita meat consumption in Colombia is 18.2 kilos, and 61.897 live animals and 18.471 tons of meat were exported to the United Arab Emirates, Egypt, Curacao, Jordan, Lebanon, Hong Kong, Russia and Vietnam (SIOC, 2020, parr 7).

The productive chain of the meat sector is divided in two parts, the first describes the first process from reproduction to the commercialization of standing cattle, and the second stage refers to the industrial process from the entry of the cattle to the factories to the packaging of products (DNP, 2018).

First process:

The process of starting the production chain of the meat sector begins with the reproduction stage, where the insemination of the female is carried out, care is given for pregnancy and childbirth. Then the rearing stage begins, where at birth the calves must be breastfed by the mothers to receive all the nutrients to grow strong. After that they must be vaccinated to avoid the development of diseases. Finally, in the raising and fattening stages it is pretended that the males reach a weight between 450 and 500 Kilograms to be ready in the commercialization stag (DNP, 2018).

Figure 1:

Industrial production process of the meat chain and meat products



DPN. 2018. Industrial production process of the meat chain and meat products. [screenshot]. Recovered from <https://colaboracion.dnp.gov.co/CDT/Estudios%20Economicos/471.pdf>.

The animals are received in the processing plants, where after being weighted, they are taken to corrals to rest (minimum 12 hours in accordance with INVIMA regulations), after a period of rest the animals go through to an ante-mortem inspection. Once they have been inspected, they are bathed to reduce dirt and impurities. Then they are stunned by an electric shock causing the loss of consciousness of the animal, the body is washed very well and the skin is removed (DNP, 2018).

In the transformation stage, the meat arrives to the de-stemming plant where excess fat is removed bruises are cleaned and the meat is separated from the bone system which is cut and classified according to different cuts, there are cases where some cuts of meat are taken and it goes to an additional stage of preparation in which meat products transformed into

sausages. In the preparation stage, the meat selected for the different types of meat products and sausages is mixed with products that allow the stabilization and preservation of sausages, such as condiments, spices and additives (DNP, 2018).

Finally, in the packaging stage, the packages can be classified into three different types; the primary are those that are in direct contact with the product and are responsible for protecting it, the secondary that are those that contain the primary packaging and contain technical information about the products, and the tertiary are those that contain the secondary packaging and are used mainly for the transport of products (DNP, 2018).

Some of the problems in technology is the reduction in the number of institutions dedicated to applied research in the sector, the lack of a center specialized in livestock and meat, insufficient technology transfer without defined and specific indicators, inadequate dissemination for appropriation of the knowledge generated through research, only the country invests 0.5% of its GDP in general research and there is not enough innovation. In the research process there are issues that are not included in the category of technology such as: cost of production, productivity and genetics, health, evolution, prevalence and impact of diseases; environmental impact, waste and adaptation to climate change; innocuousness; social components of production; soil and water management; grassland management and soil biology; use of by-products and waste and, finally, there are not adequate technologies for the treatment of meat products edible and inedible (ANDI, 2020).

**Legal Framework and actors of the Colombian market in the meat sector**

Table 7:  
Regulations of meat chain

Decree	Description
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<b>Decree 2278 de 1982</b>	Title V of Law 09 of 1979 is partially regulated according to the slaughter of animals for public consumption or for human consumption and the processing, transportation and commercialization of meat.
<b><u><a href="#">Resolution 18119 de 2007</a></u></b>	The requirements of the Gradual Compliance Plan are regulated for the processing plant and slaughtering of bovines and buffaloes.
<b><u><a href="#">Resolution 2905 de 2007</a></u></b>	The technical o the health and safety requirements of meat and edible products of bovine and buffalo species destined for human consumed is established.
<b><u><a href="#">Resolution 072 de 2007</a></u></b>	The manual of good practices for the management of production obtention of bovine and buffalo leather is established
<b><u><a href="#">Decree 1500 de 2007</a></u></b>	The technical regulation is established through which the Official System of Inspection, Surveillance and Control of Meat, Edible Meat Products and Meat derivatives destined for human consumption is created.

3.

According to the market players, different organizations were found in the different steps of the chain:

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<sup>3</sup> Fedegan. <https://www.fedegan.org.co/normatividad/cadena-carnica>



1. First Step of the chain: Asociación Colombiana de Criadores De Búfalos (ASOBÚFALOS); Federación Colombiana de Ganaderos (FEDEGÁN); Unión Nacional de Asociaciones Ganaderas Colombianas (UNAGA); La Nueva Federación de Ganaderos (NFG); Federación Nacional de Fondos Ganaderos (FEDEFONDOS).
2. Animal commercialization sector: Asociación de Subastas Ganaderas de Colombia (ASOSUBASTAS); Bolsa Mercantil de Colombia (BMC).
3. Processing plant sector: Asociación Colombiana de Industriales de la Carne (ACINCA); Asociación Nacional de Empresas Cárnicas (ASOCARNICAS); Asociación de Frigoríficos de Colombia.
4. Industrial sector: Asociación Nacional de Empresarios de Colombia (ANDI); Sector transportador: (ASISTRANSPORT SAS).

Colombia has the fourth largest cattle in Latin America, the cattle inventory and genetics are the basis of the potential of the Colombian meat, the geographical location of the country allows cattle to be grazed throughout the year, respecting the cycle of natural development and fattening of animals; silvopastoral system have been implemented to continue with the development of sustainable livestock; the country has maritime ports in the Caribbean Sea and the Pacific Ocean allowing logistics facilities with cold chain infrastructure for the export of bovine chain. In the last years investment has increased in the improvement of refrigerators near to the productions centers to obtain admissibility and offer higher quality standards; development of greenfield projects for the manufacture of products derivatives from the bovine industry and productive alliance with local partners to develop and increase current production (Invest in Colombia, 2020).

Although Colombia has some regulations focused on the meat chain in Colombia and there are several public and private sector associations such as unions, ministries, civil organizations and has improved in the economic update, the country has health and safety barriers.

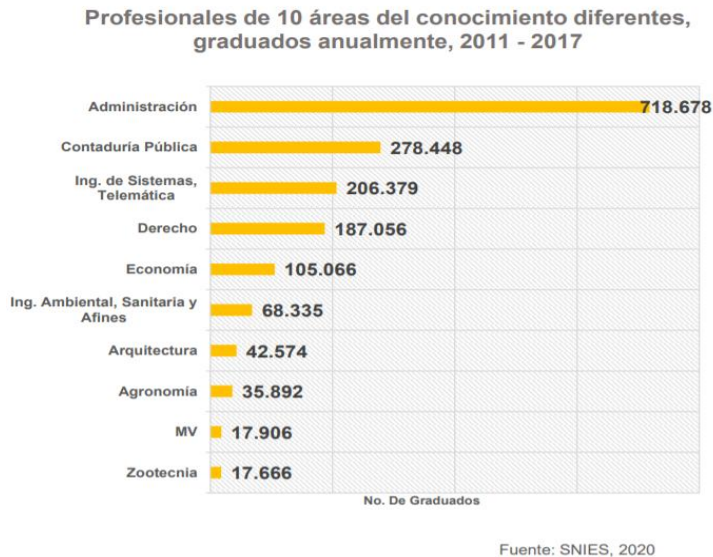
In 2018 there were 8 outbreaks of foot-and-mouth disease, 54 of bovine brucellosis, 39 of tuberculosis, 241 of stomatitis and 101 of rabies of wild origin. The ICA found faults such as insufficient attention to diseases, a deficient culture of control and prevention "passive surveillance", there are no studies of prevalence or economic impact little complaint about the implication of slaughter even with partial compensation, there are no preventive actions for highly prevalent diseases, there is not enough epidemiological information, among others (ANDI, 2020).

### **Low educational levels and insufficient skilled labor**

In Colombia there is a trend of young people who choose professional careers such as business administration, accounting, law, economics, among others. These elections generate that there are no incentives to study specialized careers in agricultural sciences or operators that can influence technological innovation and qualified labor in the country's industrial chain.

Figure 2:

Professionals from 10 different areas of knowledge, graduated annually 2011-2017



ANDI. 2020. Professionals from 10 different areas of knowledge, graduated annually 2011-2017. [Screenshot]. Recovered from [http://www.andi.com.co/Uploads/20200918\\_PPT\\_AnalisisSituacionalCarne\\_Corta\(1\).pdf](http://www.andi.com.co/Uploads/20200918_PPT_AnalisisSituacionalCarne_Corta(1).pdf)

Between 2011 and 2017, of the graduates, 6% completed a specialization in livestock sciences, 1.8% masters and only 0.7% doctorates, there is a large gap. Working conditions in the rural sector (represented by the primary chain) are lower than those in the urban sector the lack of profitability of the livestock activity prevents paying better wages, some people who have worked in formal sectors and are not interested in returning a In the field, there are no incentives for people to stay in the field, they lack an adequate health and education system, among other problems (Contexto livestock, 2018).

In the other steps of the chain only 59% of producers only has the primary level and 34% of the workers in transformation are graduates, although 4% of this population is affiliated with health. and 77% of the transformation into a contributory regime (ANDI, 2020).

Figure 3:

Poverty indicator in the Colombian meat chain

Participación de hogares según condición de pobreza por el IPM calculado por la UPRA para los ocupados de la cadena, por actividad y variable – 2014.

Indicador de pobreza	Cría especializada	Producción, procesamiento y conservación	Todas las actividades
Empleo informal	85%	46%	51%
Bajo logro educativo	23%	9%	12%
Rezago escolar	7%	4%	4%
Sin aseguramiento salud	34%	23%	25%
Hacinamiento crítico	4%	2%	2%
Analfabetismo	19%	6%	9%
Barreras acceso salud	4%	4%	11%
Desempleo larga duración	88%	53%	71%
Trabajo infantil	19%	16%	16%
Sin acceso agua	10%	11%	12%
Inadecuada eliminación excretas	30%	3%	8%
Pisos inadecuados	2%	6%	6%
Inasistencia escolar	17%	4%	6%
Paredes inadecuadas	2%	1%	2%
Barreras primera infancia	13%	17%	12%
<b>Hogares pobres por IPM</b>	<b>33%</b>	<b>10%</b>	<b>17%</b>

Fuente: GEIH- DANE (2014) @UPRA (2020)

ANDI. 2020. Poverty indicator in the Colombian meat chain. [Screenshot]. Recovered from [http://www.andi.com.co/Uploads/20200918\\_PPT\\_AnalisisSituacionalCarne\\_Corta\(1\).pdf](http://www.andi.com.co/Uploads/20200918_PPT_AnalisisSituacionalCarne_Corta(1).pdf).

**Final Recommendations:**

Colombia is one of the best environments in Latin America to do business, as well as being one of the most competitive in the entire region. According to the World Bank's Doing Business 2020 report, Colombia ranks third among the best countries to do business in Latin America, after Chile and Mexico, as well as being one of the largest recipients of FDI in Latin America (Invest in Bogotá, 2020). The technological infrastructure allows it to position itself as the second country in the region with the best connectivity, transmission and stability, an example of this is how the national government has supported the creation of the first center of the fourth industrial revolution in Latin America, According to Doing Business

of the World Bank, Colombia is ranked number 9 among the top 10 developing economies receiving foreign direct investment (FDI) and number 23 in the world (Invest in Colombia, 2020).

Colombia in terms of investment, connectivity and infrastructure has improved significantly in recent years in various sectors of economic activity, however, this has to be improved in the several supply chains of the country's industry. Through this article it was identified that historically there has been an institutional weakness in the meat chain in areas such as technological weakness, sanitary barriers and low educational levels associated with insufficient qualified labor.

One of the first recommendations is to increase technology and innovation throughout the productive chain of meat sector from the livestock process, the industrial process, the commercialization process and the transportation process. It should be noted that not only this increase must be implemented in the short term through direct foreign investment or public spending by the State, but also an increase in technical research in universities and different institutions so that in the long term the number of trained workers from different areas of knowledge who can innovate and help the sector grow.

Another recommendation is that the private sector and the public sector have a better articulation throughout the meat chain, Due to the fact that even though there is extensive legislation for the sector and several actors participate both directly and indirectly, particular interests sometimes overlap with those of others. It is vital to generate public policies where all the actors can contribute to an improvement of the chain so that there is greater added value and it is more attractive for consumption, investment and diversification.

Colombia has the fourth largest cattle in Latin America, the cattle inventory and genetics are the basis of the potential of Colombian meat, so as a last suggestion it is proposed to continue promoting programs that prevent diseases in cattle so that the doors are not closed at the international level to the export of meat, and Colombia continues to be seen with the meat potential it has shown in recent years.

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