

Characterization of livestock and meat industry activities in the Maradi urban community

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Abstract

In addition to the importance of its livestock, the Maradi region has significant economic potential as a commercial hub and for the development of industrial animal production chains. The objective of this study is to characterize the activities of the livestock-meat sector in the Maradi Urban Community. Data were collected from 44 randomly selected stakeholders. The contours of the sector were identified using a technical approach to determining activities. The segment of the livestock and meat sector studied consists of three links (livestock supply, production of slaughter products and by-products, and processing of by-products). These links play important roles in the production, processing, and marketing of slaughter products. The activities employ exclusively men. Young actors are more prevalent, engaging in small-scale trade as a secondary activity. The proportion of actors who have received formal training is also very low. The governance of the sector is market-based. Activities are coordinated by actors with large production capacities. However, activities are not organized through coordination that takes into account the needs of the market and other stakeholders.

Keywords: Sector; Livestock; Animal Production; Characterization; Maradi

1. Introduction

In Niger, livestock farming plays an important role in national economic growth. It contributes 13% to GDP and 40% to agricultural GDP, and accounts for up to 25% of local authority budgets (1). However, despite this sector's significant contribution to wealth creation, it must be acknowledged that its exploitation generates many disadvantages, including low added value, the loss of hides and skins, and above all, the loss of the fifth quarter, a highly prized commodity in certain West African countries (2). However, according to some authors, traditional meat-based food products are increasingly gaining interest in different regions of the world (3-7). For several years, the exploitation of this livestock has been organized around several sectors: live cattle, meat, hides and skins, milk and derivatives. These sectors have been the subject of several studies. Recent research has focused on the economic importance of this sector, the development and improvement of the potential of local species, the development of private structures and marketing channels, and professional organizations (8-12).

This study aims to characterize the activities of the livestock and meat sector in the Maradi Urban Community. This unprecedented work seeks to highlight the socio-economic and professional characteristics of the actors in this sector at the local level. It will attempt to answer the following question: how are the activities of the livestock and meat sector organized in the Maradi Urban Community? The Maradi region has significant economic potential as a hub for economic

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interests, marketing channels, and the development of industrial production chains (13). These assets have led to strong growth in demand for the sector's products at the regional level, due to the concentration of the population, but also due to the existence of the refrigerated slaughterhouse, which is a reference center for production and processing. The results of this work would help to highlight the economic importance of the livestock and meat sector and how it operates in this locality.

2. Methodological approach

2.1. Study area

The study was conducted in three municipal districts of the Maradi Urban Community. It covered the main livestock markets in the area, the Maradi cold storage slaughterhouse, retail outlets selling raw and processed meat, and co-product processing sites. Figure 1 illustrates the geographical location of the study area.

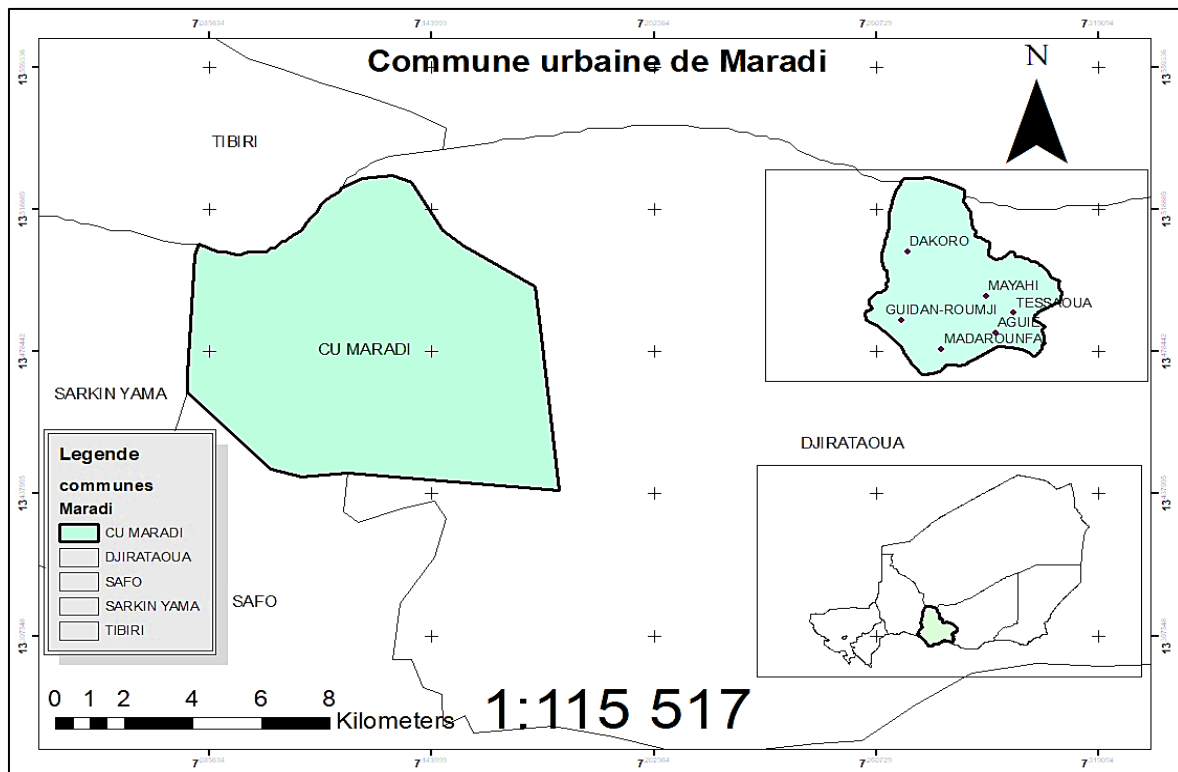


Figure 1 Study area

2.2. Sampling

The parent population for this study is all stakeholders involved in livestock marketing, meat production, and the processing of by-products in the livestock and meat sector in the city of Maradi. A probabilistic sample was drawn using the snowball method, taking into account the criteria of direct involvement in the sector, membership of a professional organization, and production capacity. A total of 44 stakeholders were surveyed.

2.3. Data collection

Data was collected using a mixed approach including literature review, semi-structured interviews, and formal surveys (focus groups and individual interviews). Secondary data was obtained from the literature and information provided by resource persons. This approach provided information on the study area, the structure of the sector, and the marketing channels for livestock and animal products. Primary data were collected from formal, cross-sectional surveys. The questionnaires provided information on the identification of stakeholders, the characterization of activities, product and monetary flows, professional organizations, and the difficulties encountered.

2.4. Analysis of the functional structure of the sector

The contours of the livestock and meat sector were identified using a technical approach. This approach, used by several authors, makes it possible to construct the links in a sector from upstream to downstream, starting from the first stage of production, based on the different techniques used to produce and process a product (14,15). On the one hand, it makes it possible to track the product downstream through the various marketing channels and processing stages to the consumer markets. On the other hand, this method makes it possible to identify upstream the main suppliers of inputs and services that contribute to production (14). Generally speaking, the logic leads to the end consumer or export. However, in the context of this study, investigations are limited to the segment ranging from the supply of live cattle to the processing of slaughter products and by-products. Governance within the sector was determined using the analytical approach to governance typology developed by Gereffi et al. (2005) and through the nature of the relationships between the actors (16–18). Excel software was used to process the data collected.

3. Results

3.1. Socio-economic characteristics of stakeholders

Direct activities in the livestock and meat sector in the city of Maradi are exclusively male-dominated. Furthermore, the majority of those involved in this sector are Hausa (87.9%) and Fulani (12.1%). The level of formal education is very low (only 12% have completed primary school). Table 1 provides information on the socio-economic characteristics of the stakeholders surveyed.

Table 1 Socio-economic characteristics of stakeholders

Age of actors (%)	20 to 40 years old	69.7
	Over 40 years old	30.3
	Total	100
Level of education (%)	Primary school	12.1
	Koranic school	57,6
	Traditional education	30.3
	Total	100
Secondary economic activity (%)	Small business	45.5
	Agriculture	24.2
	Livestock farming	20.1
	Sewing	10.2
	Total	100

3.2. Analysis of the sector structure

Table 2 Functions of the livestock and meat sector

Links	Functions	Actors	Products
Marketing	Livestock marketing	Breeders, retailers	Goats, sheep, cattle, camels
Production	Production of meat and slaughter by-products	Butchers	Raw meat, hides, skins, phalanges, fresh heads
Processing	Processing of co-products	Processors, collectors	Processed hides, heads, and phalanges

The livestock and meat sector segment studied consists of the links in the chain involving livestock supply, the production of slaughter products and by-products, and the processing of by-products. Table 2 shows the functional structure of the sector.

Activities in the livestock and meat sector are carried out informally. However, stakeholders from different trades are organized into formal professional structures. The stakeholders surveyed are members of cooperatives (livestock dealers) or unions (in the case of butchers). From a sectoral perspective, all stakeholders are members of the Association of Livestock and Meat Sector Professionals. This large-scale organization brings together stakeholders from different activities with a view to creating an inter-professional structure. In Maradi, vertical business relationships between stakeholders are based on market fluctuations. There are no contracts for the supply of inputs or the purchase of production between stakeholders. Sources of information are also based on traditional channels (radio, market). Figure 2 shows the proportion of stakeholders in the different links of the sector.

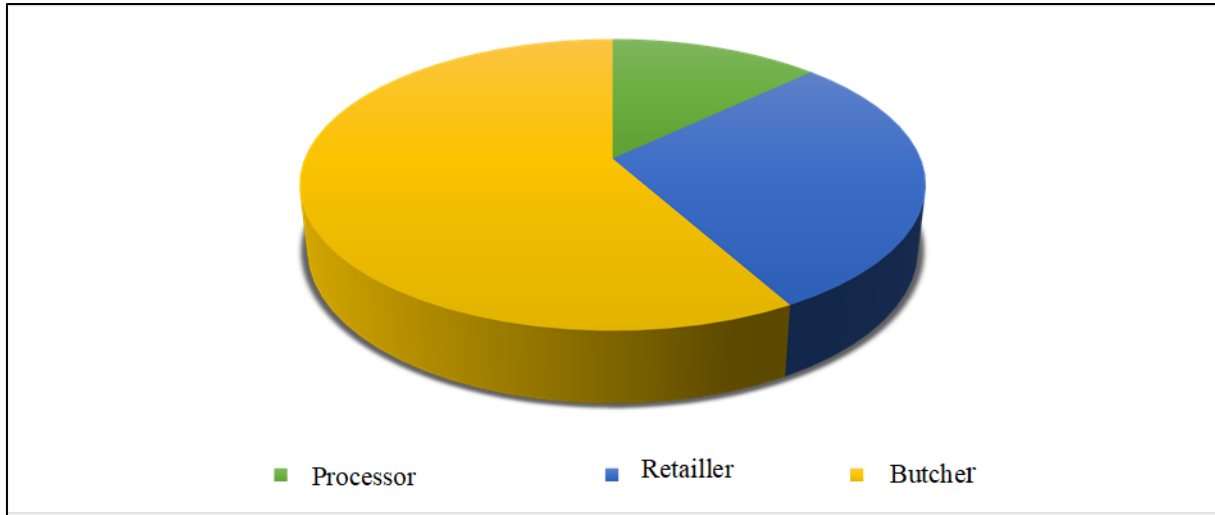


Figure 2 Proportion of stakeholders surveyed

3.3. Analysis of the links in the supply chain

3.3.1. Livestock marketing

Livestock is mainly marketed at weekly markets in and around towns and cities and at specialized markets in surrounding areas. Livestock suppliers are mainly traders and farmers. Livestock is purchased by wholesale butchers who slaughter large quantities of animals. Livestock traders also differ according to the species of ruminant and the season. Among the actors surveyed, 87% are traders of small ruminants. In these markets, livestock is sold by the head. The selling price varies according to species, breed, sex, age, and fatness. The selling price of small ruminants varies on average from 20,000 to 65,000 CFA francs. However, for large ruminants, the price can average more than 100,000 CFA francs. In addition to direct actors (livestock dealers and butchers), the sale of animals involves other indirect actors (brokers, transporters, municipal agents).

3.3.2. Production of meat and by-products

Meat and co-products are produced at the modern slaughterhouse in Maradi and at slaughter areas. However, these products may come from other sources, such as illegal slaughterhouses. Only controlled production has been taken into account in this study (photos 3, 4, 5). The direct actors involved in this link are butchers (product suppliers) and processors (retail butchers, by-product collectors). Slaughter by-products consist of the fifth quarter. Offal, heads, phalanges, hides, and skins are generally sold together by butchers. Their selling price varies according to the species, the size of the animal, and the quality of the by-products. The indirect actors in this link are apprentice butchers, secondary collectors, transporters, municipal agents, and slaughterhouse agents.

**Photo 3** Viscera of large ruminants**Figure 4** Heads and phalanges of small ruminants**Figure 5** Skins produced

3.4. Processing of by-products

By-product processors consist of leather and hide collectors, head and phalanx processors, and horn and hoof processors (Figure 5). Offal is purchased at an average price of 2,000 CFA francs for small ruminants and 12,500 CFA francs for large ruminants. Heads and phalanges are sold at average prices lower than those of offal. The purchase prices for heads and phalanges average 1,250 CFA francs per unit for small ruminants and 4,000 CFA francs for large ruminants (Figure 4). Hides and skins are the most profitable by-products of the fifth quarter. Prices vary on average from 500 to 1,000 CFA francs for small ruminants (goats and sheep) and from 5,000 to 11,000 CFA francs for large ruminants. The hides and skins produced follow two consumption paths (Figure 4). They are either exported to Nigeria (for higher quality products) or processed and consumed locally (lower quality). Like higher quality hides and skins, horns and hooves are exported and sold on the market in northern Nigeria.



Figure 6 Horns and hooves

3.5. Analysis of indirect activities in the sector

The direct activities of the sector are supported by indirect activities. Indirect actors include transporters, brokers, and resellers of secondary production inputs (salts, tannins, wood). Livestock transporters transport animals purchased at weekly markets in surrounding localities to markets in the municipality and outside the country, particularly to Nigeria, Burkina Faso, and Benin. They generally work with wholesale traders who transport large quantities of products. In addition to livestock, these indirect actors transport slaughter by-products (horns, hides, and skins) mainly to Nigeria. Brokers are involved in the process of buying and selling livestock by seeking to establish an acceptable price between two people who do not necessarily speak the same language.

4. Discussion

4.1. Socio-economic characteristics of actors

The livestock and meat sector employs a variety of actors. Unlike other sectors (19,20), only men are employed in the direct and indirect activities of this sector. These activities are mainly carried out by the Hausa (butchery, processing of by-products) and Fulani (livestock production and marketing) ethnic groups. In addition to being lucrative (21), these activities are a legacy, passed down from generation to generation within these ethnic groups. The proportion of actors with a formal education is very low, although the majority of actors have received Koranic and traditional training. The lack of formal training is a limiting factor for innovation and a constraint on the modernization and formalization of activities in the sector. This characteristic is common to several sectors and rural activities in West African localities, as reported by several studies (18,22–25). However, those involved in the sector are relatively young. Nearly 70% of them are aged between 20 and 40. All those surveyed have a second source of income. However, more than 40% are involved in small-scale trade, unlike those in rural areas, where agriculture is the most common occupation.

4.2. Structure and governance of the sector

The livestock and meat sector segment considered in this study consists of three links. These links form a chain of functions (livestock supply, meat, and slaughter by-product production) and players. Several authors have examined the interactions between the various actors involved in the production, processing, and distribution of goods and services, as well as the factors that influence their competitiveness and performance (13–16). The actors in the livestock sector can be divided into several categories according to the nature of their activity and their productive capacities (20). Following the technical approach of limiting the contours of a sector (19), livestock supply is the first link in the livestock-meat sector. This link is characterized by the diversity of actors involved in the supply and demand of livestock. In addition to the direct actors (livestock dealers and butchers), livestock supply involves a significant number of indirect actors (transporters, brokers, and conveyors). The latter offer intermediation, transport, livestock security, and transaction services. The second link is the production of meat and slaughter by-products. This link brings together butchers as suppliers of raw materials, processors of slaughter products, and indirect actors (apprentice butchers, secondary collectors). This is how, among smoked meat producers, various actors are involved due to different treatments such as boiling, smoking, and drying, which can influence its sanitary quality (26-29). The final link is occupied by processors of by-products. Consumers of slaughter by-products include restaurateurs, tanners, and

processors of horns and hooves into art objects. It should be noted that a large proportion of these by-products (leather, hides, horns, and hooves) is mainly exported to Nigeria. Vertical relationships between actors in the sector are informal. Business links are based on the law of supply and demand in the market. Transaction codification is weak, as is the complexity of information and transactions, and the capacity of the supply base. Actors in the various links of the chain know each other and identify each other based on the nature of their activity. Direct exchanges of commercial information are important between suppliers and buyers. These conclusions are similar to those observed by Tiétambou et al. (2020). According to the value chain governance theory established by Gereffi et al. (2005), the governance mode of this sector is market-based. Despite the interdependence of the sector's functions, these activities are not coordinated, and their informal and artisanal nature makes them less competitive. In general, the sector's activities are carried out informally. Nevertheless, professional organizations such as the Interprofessional Association for livestock, meat, leather, and hides are taking steps to organize their trades within a sector-based approach. Indeed, stakeholders are members of professional organizations (cooperatives, associations, and unions). Finally, the sector's activities are supported by state and municipal technical services.

5. Conclusion

The livestock and meat sector plays an important role in the production, processing, and marketing of slaughter products and by-products. The three links in the sector studied employ exclusively men. Young people are more prevalent, engaging in small-scale trade as a secondary activity. However, the proportion who have received formal training is very low. Nevertheless, these actors play a crucial role in the exploitation and promotion of livestock and animal products. The interdependence of these activities also creates indirect activities such as intermediation, transport, and service provision, which are crucial to the smooth functioning of the sector. From a governance perspective, the sector is driven by actors with large production capacities. Activities are not organized through coordination that takes into account the needs of the market and other stakeholders. The professional organizations present are making efforts to better organize and consolidate activities. The results of this study highlight the lack of structure and the informal nature of activities. However, the size of the sample did not allow for investigations to be extended to other links in the chain, such as the export of by-products. Future research could also focus on the economic performance and profitability aspects of these activities. In light of these results, it is important that policies for restructuring and developing local processing links be prioritized in order to increase the sector's potential for creating added value and employability.

Compliance with ethical standards

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Disclosure of conflict of interest

There are no conflicts of interest.

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