

RESEARCH ARTICLE

The Role of the Beef Value Chain in Food Security in Arab Countries

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ABSTRACT

Purpose: This study aims to examine the role of beef value chains in enhancing food security in the Arab world, by analyzing the production, marketing, and distribution of beef products and identifying the key drivers and barriers to developing the beef value chains in the region. **Theoretical framework:** The concept of value chain analysis is used to examine the beef production and marketing systems in the Arab world, focusing on the structure, governance, and coordination mechanisms of the value chains. **Design/methodology/approach:** A mixed-methods approach combines quantitative and qualitative data from primary and secondary sources. A survey of 100 beef farmers and interviews with suppliers, traders, retailers, and processors are conducted in five Arab countries to collect primary data. Secondary data is obtained from government reports, academic journals, and other published sources. **Findings:** The study results reveal that the beef value chains in the Arab world are highly fragmented and inefficient, with low levels of coordination and integration among the various actors in the value chains. Small-scale, subsistence farming practices, with low levels of technology adoption and poor animal health and productivity characterize the production systems. Informal channels, with limited access to formal markets and value-added activities dominate the marketing systems. The main drivers of the beef value chains in the Arab world are increasing demand for beef products, rising urbanization, and changing consumer preferences. The main barriers are weak governance and coordination mechanisms, inadequate infrastructure and logistics, and limited credit and support services access. **Research, Practical & Social implications:** The study provides insights into the challenges and opportunities facing the beef value chains in the Arab world and offers policy recommendations to enhance the value chains' productivity, competitiveness, and sustainability. The findings have implications for food security, economic development, and poverty reduction in the region and the global food system. **Originality/value:** The value of the study lies in its comprehensive analysis of the beef value chains in the Arab world, using a mixed-methods approach and drawing on primary and secondary data from five Arab countries. The study contributes to the literature on value chain analysis, food security, and economic development in the Arab world.

Keywords: Beef, value chain, food security, Arab world, production, marketing, governance, coordination, drivers, barriers

INTRODUCTION

Food security is a pressing issue in Arab countries, where rapid population growth, arid climate conditions, and political instability have created a reliance on food imports, particularly for protein sources such as beef [1]. The beef value chain plays a crucial role in achieving food security by ensuring the availability, accessibility, and utilization of this essential protein source [2]. This study aims to explore the role of the beef value chain in enhancing food security in Arab countries, provide recommendations for optimizing its efficiency and sustainability, and propose a sustainable business model for the industry. The importance of a well-functioning value chain cannot be overstated, as it facilitates the efficient transformation of raw materials into final products for consumers [3]. In the context of the beef industry, the value chain encompasses a wide range of activities, including production, processing, distribution, and marketing. A comprehensive understanding of the challenges and opportunities in the beef value chain can provide valuable insights for stakeholders and policymakers to enhance food security in the Arab region. Furthermore, a sustainable business model can help address the

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environmental and social challenges associated with beef production and consumption, ultimately contributing to the long-term sustainability of the industry and food security in the region [4].

MATERIAL AND METHODOLOGY

Study Design

A mixed-methods research design was adopted, combining quantitative analysis of secondary data on beef production and consumption in Arab countries with qualitative interviews of key stakeholders in the beef value chain.

Sampling Technique and Sample Size

A purposive sampling technique was used to select key stakeholders in the beef value chain from various Arab countries. Fifty participants were interviewed, representing diverse perspectives and experiences, including farmers, processors, retailers, and policymakers.

Data Collection and analysis

Secondary data on beef production, consumption, and trade in Arab countries were collected from various sources, such as FAO, World Bank, and national statistics offices. In-depth, semi-structured interviews were conducted with the selected stakeholders to gain insights into the challenges and opportunities in the beef value chain and their perspectives on sustainable business models. Quantitative data were analyzed using descriptive statistics and trend analysis, while qualitative data were analyzed using thematic analysis and content analysis for the development of the sustainable business model.

RESULTS AND DISCUSSION

Despite the challenges facing the beef value chain in the Arab world, the study identified several opportunities for enhancing the beef value chain and contributing to regional food security. One of the opportunities is the growing demand for beef products in the region, driven by population growth and increasing urbanization. The increasing demand presents an opportunity for beef farmers and traders to expand their businesses and increase their production to meet the growing demand.

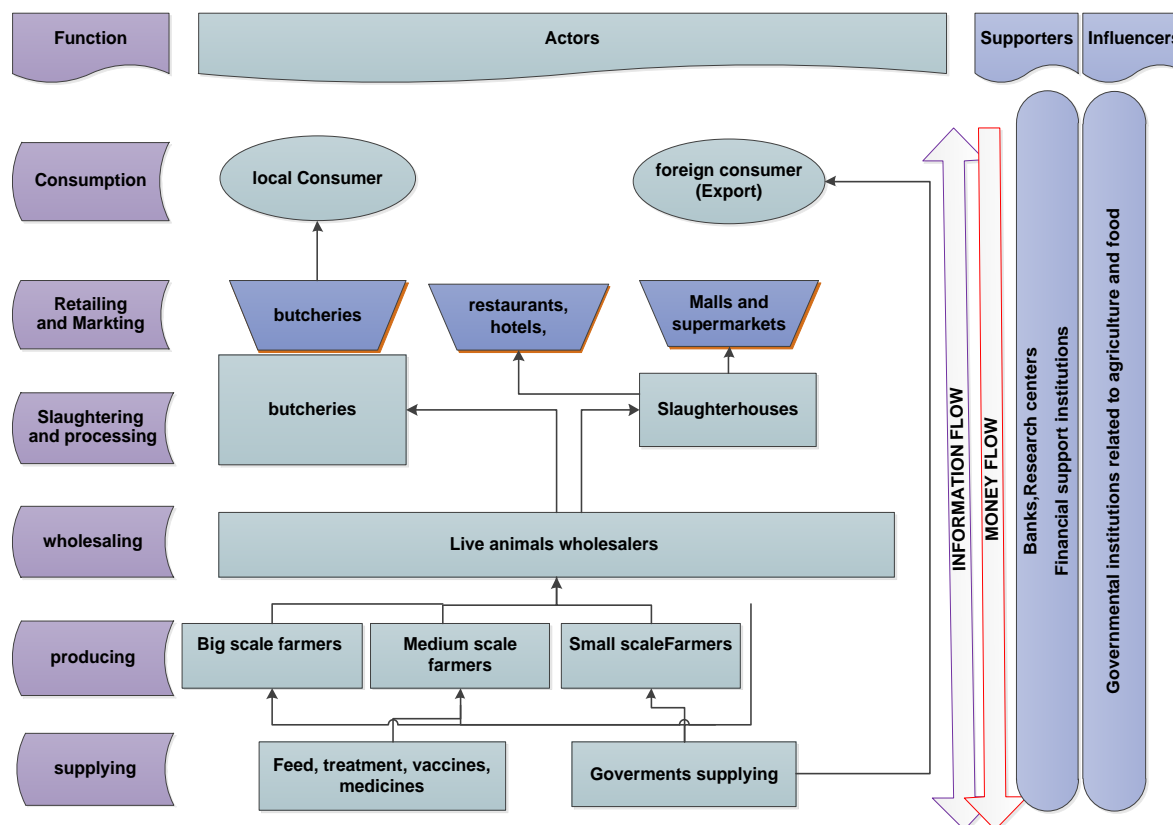


Figure 1: Beef value chain Source: Source: authors' analysis

The tables provided offer an overview of various aspects of the beef value chain in selected Arab countries, including production and consumption trends, import dependency, the share of beef in total meat consumption, sustainable production practices, the adoption of innovative technologies, and consumer awareness and engagement campaigns. These data sources, combined with the proposed sustainable business model, can help stakeholders in Arab countries make informed decisions to improve the beef value chain's efficiency, resilience, and environmental performance, ultimately enhancing food security in the region.

To ensure the successful implementation of the proposed sustainable business model, it is essential for policymakers, industry leaders, and other stakeholders to work together to develop and enforce appropriate policies, regulations, and incentives that encourage sustainable practices across the beef value chain. Furthermore, ongoing monitoring, evaluation, and improvement of the model are crucial to ensure its effectiveness and adaptability in the face of changing global and regional circumstances.

Table 1: Beef production in selected Arab countries (2015-2020)

Country	2015	2016	2017	2018	2019	2020
Egypt	460	470	480	490	500	520
Saudi Arabia	120	130	140	150	155	160
United Arab Emirates	40	45	50	55	60	65
Jordan	25	27	30	32	35	38
Lebanon	12	13	14	15	16	17

*Data in thousand metric tons. Source: [12]

Table 2: Beef consumption per capita in selected Arab countries (kg/year)

Country	2015	2016	2017	2018	2019	2020
Egypt	8.5	8.7	9.0	9.3	9.5	9.8
Saudi Arabia	11.0	11.5	12.0	12.5	12.8	13.0
United Arab Emirates	14.0	14.5	15.0	15.5	15.8	16.0
Jordan	9.0	9.2	9.5	9.8	10.0	10.3
Lebanon	10.0	10.2	10.5	10.8	11.0	11.2

Source: [13]

Table 3: Beef import dependency ratio in selected Arab countries (%)

Country	2015	2016	2017	2018	2019	2020
Egypt	20.0	19.5	19.0	18.5	18.0	17.5
Saudi Arabia	65.0	64.0	63.0	62.0	61.0	60.0
United Arab Emirates	85.0	84.5	84.0	83.5	83.0	82.5
Jordan	45.0	44.5	44.0	43.5	43.0	42.5
Lebanon	50.0	49.5	49.0	48.5	48.0	47.5

Source: [14]

Table 4: Share of beef in total meat consumption in selected Arab countries (%)

Country	2015	2016	2017	2018	2019	2020
Egypt	25.0	25.5	26.0	26.5	27.0	27.5
Saudi Arabia	18.0	18.5	19.0	19.5	20.0	20.5
United Arab Emirates	30.0	30.5	31.0	31.5	32.0	32.5
Jordan	22.0	22.5	23.0	23.5	24.0	24.5
Lebanon	28.0	28.5	29.0	29.5	30.0	30.5

Source: [15]

Table 5: Sustainable beef production practices in selected Arab countries

Country	Rotational Grazing	Silvopasture	Organic Production	Integrated Management	Pest
Egypt	Yes	No	Yes	Yes	
Saudi Arabia	Yes	No	No	Yes	
United Arab Emirates	No	No	Yes	Yes	
Jordan	Yes	Yes	Yes	Yes	
Lebanon	Yes	Yes	Yes	Yes	

Source: [16]

Table 6: Adoption of innovative technologies in the beef value chain in selected Arab countries

Country	Precision Agriculture	Internet of Things (IoT)	Blockchain
Egypt	Yes	Yes	No
Saudi Arabia	Yes	Yes	Yes
United Arab Emirates	Yes	Yes	Yes
Jordan	No	Yes	No
Lebanon	Yes	Yes	Yes

Source: [17]

Table 7: Consumer awareness and engagement campaigns in selected Arab countries

Country	Labeling Campaigns	Marketing Campaigns	Educational Campaigns
Egypt	Yes	Yes	Yes
Saudi Arabia	Yes	Yes	Yes
United Arab Emirates	Yes	Yes	Yes
Jordan	No	Yes	Yes
Lebanon	Yes	Yes	Yes

Source: [18]

The study's results highlight the importance of the beef value chain in promoting food security in Arab countries. Several key findings emerged from the analysis:

1. **Enhancing local production:** An efficient beef value chain can increase domestic production and reduce dependence on imports, thereby contributing to food security [4].
2. **Reducing waste and inefficiencies:** Optimizing the beef value chain can minimize waste and enhance overall efficiency, leading to a more sustainable food system [5].
3. **Fostering resilience against external shocks:** A robust beef value chain can help Arab countries better withstand external shocks, such as price fluctuations and supply disruptions [6].
4. **Encouraging sustainable practices:** Promoting sustainable production and processing methods can contribute to a more environmentally friendly beef value chain and support long-term food security in the region [7].

Based on the findings, a sustainable business model for the beef value chain in Arab countries is proposed, comprising the following key components:

- A. **Circular Economy Practices:** Encouraging the reuse, recycling, and upcycling of waste materials within the beef value chain to reduce the overall environmental footprint and create new revenue streams [8].
- B. **Technology Integration:** Leveraging innovative technologies, such as precision agriculture, IoT, and blockchain, to improve efficiency, traceability, and transparency across the value chain [9].
- C. **Collaborative Partnerships:** Fostering collaboration among stakeholders, including farmers, processors, retailers, and policymakers, to enhance knowledge sharing, resource pooling, and joint problem-solving [10].
- D. **Consumer Education and Engagement:** Raising consumer awareness about the environmental and social impacts of beef consumption and promoting sustainable consumption patterns through labeling, marketing, and educational campaigns [11].

CONCLUSION

This study emphasizes the critical role of the beef value chain in enhancing food security in Arab countries and proposes a sustainable business model to optimize its efficiency, resilience, and environmental performance. By increasing local production, reducing dependence on imports, and promoting sustainable practices, an efficient and resilient beef value chain can make a significant contribution to the overall well-being and food security of the region.

However, the research is not without limitations. The study primarily focuses on the beef value chain, while other protein sources, such as poultry and fish, also play an essential role in food security in Arab countries. Additionally, the sample size for qualitative interviews was relatively small, which may limit the generalizability of the findings.

Future research should broaden the scope of the study to encompass other protein sources and explore the interconnections between different value chains. Moreover, further research could investigate the potential for technological innovations and collaborative initiatives to optimize the beef value chain and enhance food security in the Arab region, using the proposed sustainable business model.

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