

The Brazilian beef meat sector into a domestic and international context: a Supply Chain Management (SCM) approach

El sector productor de carne bovina brasileño en un contexto nacional e internacional: un enfoque desde la gestión de la cadena de abastecimiento (SCM)

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ABSTRACT

The study of regional competitiveness of agricultural markets stresses the importance of market dynamics into a Supply Chain Management (SCM) framework. The aim of this paper was to carry out a descriptive analysis of the Brazilian beef meat sector focusing on the role of inter-firm collaboration as a source of value-added and competitive strength into the MERCOSUR context. It was applied two conceptual frameworks. The first one developed by Lambert and Cooper (2000) focus on an integration of the SCM and the second, proposed by Obersojer and Weindlmaier (2008) focus on an Efficient Consumer Response (ECR). From the first approach, it was identified structural problems that limit the integration of the SCM process of this sector, mainly due to difficulties to implement quality and safety standards due to its regional diversification. From the second, we concluded that distrust in the relationship between processing companies and retailers and a lack of strategic consumer orientation were the main obstacles for subsequent implementation of an ECR framework in the beef meat sector. Finally, it is desirable a management structure that enforces the capability of the different areas to increase the coordinating level among its respective chains.

Keywords

Agri-food chains • competitiveness • logistics • Brazil • MERCOSUR

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RESUMEN

El estudio de la competitividad regional es de fundamental importancia para analizar la dinámica de los mercados agrícolas. El objetivo de este artículo fue realizar un análisis descriptivo del sector brasileño de carne bovina focalizado en el rol de la cooperación entre empresas y unidades productivas como fuente de valor agregado y fuerza competitiva en el contexto del MERCOSUR. Fueron aplicados dos modelos conceptuales. El primero, desarrollado por Lambert y Cooper (2000) focalizado en la integración de la cadena de abastecimiento (SCM) y el segundo propuesto por Obersojer y Weindlmaier (2008) focalizado en la Respuesta Eficiente al Consumidor (ECR). Para el primer enfoque fueron identificados problemas estructurales que limitan la integración del proceso de SCM en este sector, principalmente debido a las dificultades en la implementación de padrones de calidad, seguridad y diversificación regional. Para el segundo se concluye que la desconfianza en la relación entre las firmas de procesamiento y retail, además de la falta de estrategia de orientación al consumidor son los principales obstáculos para la implementación de un cuadro de ECR en el sector de carne bovina. Finalmente, se sugiere una estructura de gestión empresarial que promueva la capacidad operativa y nivel de coordinación entre las respectivas áreas productivas y cadenas de abastecimiento.

Palabras clave

Cadenas agroalimentarias • competitividad • logística • Brasil • MERCOSUR

INTRODUCTION

Analysis of international trends and local competitiveness of the Latin American agribusiness sector stresses the importance of market dynamics. This concept is based on the increased food consumer demand, industrial structure and the highly competitive environment with strong rivalry between companies (3, 13).

Since comparative costs and market shares on agricultural products are frequently distorted by subsidies, traditional approaches of competitiveness analysis frequently show inconsistent results.

Our study uses another approach by discussing competitiveness in a dynamic way based on the comparative capacity of agribusiness chain coordination (14, 8). We focus on the Brazilian beef meat supply chain dynamics by describing and analyzing the dependence and impor-

tance of its main agents and sectors. Topics covered include recent supply chain management issues like logistics, information Exchange, quality control, safety assurance, and chain performance. Special attention is given to the interaction between horizontal collaboration (for instance in producer cooperatives) and vertical collaboration in international supply chains.

Brazil's negotiating position is shaped by both economic and political factors which are part of a larger, specific concept of the need for greater insertion in the international system (1). This view is dominated by political or long-term strategic concerns (4, 10). With the objective to study the competitive structure of the Brazilian agri-food system, we will present a case analysis of the Brazilian meat system. We will follow the

descriptive frameworks of Lambert and Cooper (2000) and Obersojer and Weindlmaier (2008).

Traditional studies are mostly based on methodologies that do not clarify the specific aspects of coordination as a source of competitive advantage. To the best of our knowledge, this is the first attempt to relate coordination and competitiveness within a supply chain framework by describing a specific sector. The article proceeds as follows: the next section describes the Lambert and Cooper (2000) and the Obersojer and Weindlmaier (2008) approaches, results and discussion lastly, section 4 concludes.

MATERIAL AND METHODS

Agribusiness literature is increasingly emphasising the role of inter-firm collaboration as a source of value-added and competitive strength; this has led to the remarkable growth in the supply chain management (SCM) field. In this paper we apply two conceptual frameworks to carry out a descriptive analysis of the Brazilian beef meat sector.

First, the approach developed by Lambert and Cooper (2000), which involves the recent trend towards more integrated SCM in the core process of the agri-food industries, that is, under which conditions the main processing activities of each firm can be totally integrated.

Second, the Obersojer and Weindlmaier framework (2008) focus on an Efficient Consumer Response (ECR). Their ECR concepts combine three focal areas: enabling technologies (technological platform), category management (demand), and replenishment management (supply). An schematic figure representing the Lambert and Cooper (2000) and Obersojer and Weindlmaier (2008) approaches are presents in the figure 1.

The data were obtained from the Brazilian Supply National Company (CONAB), the Economic Institute of Sao Paulo State (IESP-Brazil), the Getulio Vargas Foundation (FGV-Brazil), the United States Department of Agriculture (USDA) and the Agricultural Integrated Agricultural Platform (SIIA).

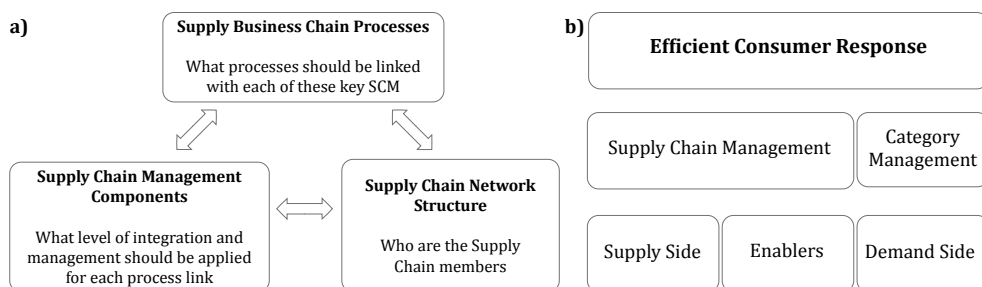


Figure 1. The Lambert and Cooper (2000) (a) vs Obersojer and Weindlmaier (2008) (b) approaches.

Figura 1. Los enfoques de Lambert y Cooper (2000) (a) vs Obersojer y Weindlmaier (2008) (b).

RESULTS AND DISCUSSION

The Lambert and Cooper Approach

As required by this approach, we will focus on a specific process of the Brazilian beef meat sector, that is, the slaughtering activities. This sector are going through an intense professionalization and modernisation trend, with a investment of R\$10 billion in the past few years in M&A (Mergers and Acquisitions) (13). From a certification perspective, until 2007, Brazilian exports are mainly targeted to countries that do not have high quality standards and, consequently, do not pay extra for the product (Russia, China, and Middle-East countries). However, this scenario has been changed and from 2008 the main importer country is USA followed by UK, Netherlands and Italy (table 1).

The most important benefit of the internationalisation process is that companies gain access to all world markets and even those to which Brazil cannot export (mainly because of sanitary restrictions). According to Lambert and Cooper (2000), this process enforces to equalize effort to integrative SCM process due to the requirement of high sanitary standards. From a commercial perspective, they receive international visibility and flexibility, ease of credit, and the possibility revise tariff barriers imposed by protec-

tionist markets such as the U.S. and European markets (5).

Since consumers are increasingly demanding and legislation is more stringent, meat-processing firms are strengthening their effort to improve, maintain, and control the quality and safety of its products. This effort is represented by the rapid growth in the number and scope of quality assurance (QA) systems, which are established to apply and verify quality control measures. Into the meat industry, a quality assurance system could help to compliance to legal requirements, risk reduction, marketing, and reduction of competition of the current market trend (2).

From our perspective, these assurance systems can be useful to ensure an efficient tracking system, reduce costs and strengthen the firm's reputation among consumers Accordingly, the introduction of a QA system is much more an issue of strategy and competition. From our perspective, the implementation of quality and safety requirements often involves non-trivial investments that go beyond what producers and other chain participants in Brazil can afford. According to (Schiefer, 2006), this situation leads to, first: low numbers of outsourcing firms

Table 1. Brazilian beef exports (1000 t), main destinations.

Tabla 1. Exportaciones brasileñas de carne de vacuno (1000 t), principales destinos.

	USA	UK	Netherlands	Italy
2008	19.351	36.424	23.278	28.255
2009	22.041	41.363	15.990	13.026
2010	31.178	44.401	22.368	17.070
2011	47.108	63.005	32.543	22.552

Source: Brazilian Institute of Statistics (IBGE), 2012.

Fuente: Instituto Brasileño de Estadísticas (IBGE), 2012.

that fulfil these quality standards and second, some important trends concerning barriers to new technologies mainly on product appearance and durability.

Finally, from a domestic perspective, it was identified some important structural problems in the Brazilian beef meat sector that limit the integration of its SCM process.

Due to the over-scale of operations, logistics costs, or distortions provoked by inter-state tariffs, the pattern of competition have led to a process of adverse selection. This situation excluded some companies from the sector.

For example, some big players, such as Anglo, Swift, Kayowa, and Sadia have left the beef chain or have drastically reduced their position in the market. For instance, Sadia have defined strategies to specialise in poultry and pork production (under contracts).

The Obersojer and Weindlmaier Framework

We found that distrust in the relationship between processing companies and retailers and a lack of strategic consumer orientation are the main obstacles for subsequent implementation of a ECR framework in the beef meat sector. It is necessary to identify and create ECR indicators to help into the SCM process of this sector. Some proposed examples are: product availability (diversification level), quality (by categories), responsiveness (by time), reliability and costs or profits (by processing sector).

An ECR oriented process could lead to two strategic groups that are motivated by either cost leadership strategies or value-adding strategies. A method to measure these multiple indicators, specifically designed for chains, is the Supply-Chain Operations Reference. This method provides most of the metrics needed for chain performance, but does not attempt to address every chain process (2).

In spite of incentives to change, in Brazil informal abattoirs still persist, which are characterized by low technology, non-standard products, tax evasion practices, and overall low quality (6).

Since geographical reallocation is also taking place in the Brazilian agri-food system, new units are moving towards the Central West inland areas.

Proximity to the cattle raising areas is an advantage, especially because of the new legal requirements to cut and pre-pack the product. According to the previous information and following the Obersojer and Weindlmaier Framework, a list of cost leadership and value-adding strategic groups of the Brazilian slaughtering companies was defined (table 2, page 238).

Operations management in meat supply networks is complex because of primary input variability and product perishability (13). To prevent food quality and operations problems, early warning and proactive control systems can be used.

Schiefer (2006) suggests that a data mining process can help to efficiently find relationships between performance indicators and variables related to operational processes and ECR oriented responses.

When we consider the relevant transport network found in Brazil, this tool can be very useful to anticipate demand and supply cycles. In addition, there are other procedures that involve customized electronic SCM applied to the agri-food system to improve efficiency and coordination in complex supply networks. Several efficiency improvements can be carried out here by a customized and embedded SCM platform (8, 11).

Table 2. Value-adding strategic classification of Brazilian agri-food firms.
Tabla 2. Clasificación de la estrategia de generación de valor de las empresas agroalimentarias brasileñas.

Market product characteristics	Products	Necessary strategic efforts
Weaknesses of product differentiation	Sale of carcasses or unbranded cuts	Economies of scale
Choice guided by prices	Packaged beef	Low idle capacity
In some cases, orientation to industrial markets (external/internal)	Branded products	Efficient logistics (supply and distribution)
Lower price elasticity of demand		Process innovation
Value-added product		Strictly coordinated subsystems (alliances)
Specific quality attributes		Market segmentation
Traceability, certification, and standardisation		

CONCLUSION

This article presents a general description of the MERCOSUR agri-food system with a focus on the beef meat sector. It explains the key role of Brazil as an international player in this bloc and a descriptive analysis of the main productive and competitive elements related to the supply and demand structure of the Brazilian meat chain based on the Lambert and Cooper and Obersojer and Weindlmaier Descriptive Frameworks.

Efforts to coordinate chains regarding quality control, supply chains improvement, or designing specific supply chain strategies/systems (SCSs) can improve the competitiveness of this sector. This type of capabilities needs to be locally developed, and can introduce a very sophisticated dynamic aspect to the coordination analysis to generate more competitive gains in the supply chain structure.

From both frameworks, we can conclude that an organisation's ability to apply systematic supply chain improvements depends of each organisation. From an internal perspective, is desirable a management structure that enforces the capability of the different areas to increase the coordinating level among its respective chains.

Moreover, an environment that supports organisational integration among processes empowers sectors, generates cross-functional teamwork, and produces more efficient supply chain management.

Further research agenda focus on the use and evaluation of grades and standards for quality and safety in (international) agri-food chains and the role of public and private institutions on the QA regulations and implementation of the meat sector.

REFERENCES

1. Aggarwal, V.; Espach, R. 2003. The strategic dynamics of Latin American trade. Woodrow Wilson Center Press. 312 p.
2. Bijman, J.; Omta, S.; Trienekens, J.; Wijnands, J.; Wubben, E. 2011. Management and organization in international agri-food chains and networks. *International agri-food chains and networks: Management and organization*. Vol 5 (2): 67-75.
3. Da Motta, P. 2005. Brazil's trade policy: moving away from old paradigms?. In Lael Brainard and Leonardo Martinez-Diaz (eds.), *Brazil as an Economic Superpower? Understanding Brazil's Changing Role in the Global Economy* (Washington, D. C.: Brookings Institution Press, forthcoming).
4. De Barcellos, M.; Kügler, J.; Grunert, K.; Van Wezemael, L.; Perez-Cueto, F.; Ueland, Ø.; Verbeke W. 2010. European consumers' acceptance of beef processing technologies: a focus group study. *Innovative Food Science and Emerging Technologies*. 11: 721-732.
5. Devlin, R. 2011. The free trade area of the Americas and MERCOSUR-European Union free trade processes: can they learn something from each other?. Paper 6. *Intal ITD*. 32 p.
6. Franceschi, L.; Benin, G.; Guarienti, E.; Marchioro, V.; Martin, T. 2009. Pre-harvest factors that affect wheat technological quality. *Ciência Rural*. 39(5): 1624-1631.
7. Fritz, M.; Hausen, T. 2009. Electronic supply network coordination in agrifood networks barriers, potentials, and path dependencies. *International Journal of Production Economics*. 121(2): 441-453.
8. Lambert, D.; Cooper, M. 2000. "Issues in Supply Chain Management". *Industrial Marketing Management*. 29: 65-83.
9. Obersojer, T.; Weindlmaier, H. 2008. About the preparedness for dairy companies for ECR. In *International Agrifood Chains And Networks: Management and Organization*. Wagenigen Academic Publishing. 442 p.
10. Ponzio, A.; O'Keefe, E. 2011. Mercosur Agreement. IBI - The Institute of Brazilian business & public management issues theory and operation of a modern national economy minerva program. Georg Washington University Research Paper. 46 p.
11. Saab, M.; Armando, E.; Neves M. 2007. Cadeia de carne suína no Brasil e no Canadá: uma comparação. in: x semead seminário de administração, 2007, São Paulo. *Anais do X Seminário de Administração*.
12. Schiefer, G.; 2006. Information management in agri-food chains. In: Ondersteijn, C. J. M.; Wijnands, J. H. M.; Huirne, R. B. M., van Kooten, O. (Eds.), *Quantifying the Agri-Food Supply Chain*. Springer, Dordrecht. p. 135-144.
13. Schnettler, B.; Sepúlveda, N.; Sepúlveda, J.; Orellana, L.; Miranda, H.; Lobos, G.; Mora, M. 2014. Consumer preferences towards beef cattle in Chile: Importance of country of origin, cut, packaging, brand and price. *Revista de la Facultad de Ciencias Agrarias de la Universidad Nacional de Cuyo, Mendoza, Argentina*. 46(1): 143-160.
14. United States Agriculture Service (USDA). 2013. The dynamics of the agribusiness sector in Brazil. Available in: http://www.usda.gov/wps/portal/usda/usdahome?navid=AGENCY_REPORTS.
15. Van der Vorst, J. 2000. Effective food supply chains. Generating, Modelling and Evaluating Supply Chain Scenarios. Dissertation, University of Wageningen, The Netherlands.

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