

Plurality of governance on cattle ranches: case studies in Brazil

Tharic Pires Dias Galuchi^{1,2} , Carlos Ivan Mozambani^{1*} , Mário Otávio Batalha¹ 

¹ Universidade Federal de São Carlos, Programa de Pós-Graduação em Engenharia de Produção, Grupo de Estudos e Pesquisas Agroindustriais, São Carlos, SP, Brasil.

² Imaflora - Instituto de Manejo e Certificação Florestal e Agrícola, Piracicaba, SP, Brasil.

*Corresponding author:
cmozambani@gmail.com

Received: March 19, 2018

Accepted: January 29, 2019

How to cite: Galuchi, T. P. D.; Mozambani, C. I. and Batalha, M. O. 2019. Plurality of governance on cattle ranches: case studies in Brazil. *Revista Brasileira de Zootecnia* 48:e20180003. <https://doi.org/10.1590/rbz4820180003>

Copyright: This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



ABSTRACT - The present article investigated the plural forms of governance that have been adopted in buying and selling transactions by cattle ranches with differentiated markets. In addition, it proposes to describe and explain which determinants influence this plurality, based on the theoretical principles of transaction cost economics. The analysis was based on the observation of both upstream transactions and commitments and agreements established downstream by two ranches, both specialized in beef cattle, but with different competitive strategies. The adoption of plural forms demonstrates diverse competitive advantages, insofar as both can meet the requirements of different distribution channels or increase production capacity. The results indicated that the governance structures adopted by the ranchers studied responded to the demands of the strategies adopted for their production units. Thus, the adopted governance structures should be aligned with their strategies for the cattle ranches to be successful.

Keywords: agribusiness, beef cattle, economy production system

Introduction

Brazilian beef production is mostly pasture-based, and ranches specialize in different stages of cattle life cycle, such as cow-calf production, stocker production, and finishing operations. This implies the occurrence of several transactions for a single animal from its birth until slaughter. Since the livestock market includes transactions between cattle ranches, prices paid for calves can vary due to seasonality of supply. In addition, prices may also be affected by physical characteristics such as age, breed, and weight (Christofari et al., 2008; Fornari et al., 2016).

Changes in consumption habits have increased opportunities in the Brazilian beef market by making the supply chain more complex and strategic options for ranches more varied. More demanding markets call for investments that increase asset specificity and uncertainty for cattle ranches (Vinholis et al., 2014, 2016).

From the perspective of transaction cost economics, the presence of asset specificity, uncertainty, and recurrence of transactions between agents affects transaction costs, which directly conditions the governance structures adopted by agents (Williamson, 1996). Mondelli and Zylbersztajn (2008) highlighted that transactions in the beef production sector are more likely to be associated with more complex governance structures as the specificity of the assets involved increases. Caleman et al. (2008) and Silveira et al. (2014) observed that the relationship between cattle ranches and slaughterhouses

is changing the governance structure. Silveira et al. (2014) pointed out that slaughterhouses are no longer purchasing raw materials only in the spot market, but have also resorted to formal and informal contracts and vertical integration.

When companies simultaneously adopt more than one governance structure to coordinate similar transactions, they are said to be using plural forms of governance (Bradach and Eccles, 1989). This can bring about benefits such as transaction cost reduction and synergy between different structures and better planning and control of production, supply, and distribution. These benefits are associated with efficiency gains and reduction of information asymmetries (Perrigot et al., 2009; Mello and Paulillo, 2010; Ménard, 2013).

As a contribution to this discussion, the present study aimed to investigate why and which plural forms of governance have been adopted by cattle ranches in their market differentiation strategy. Moreover, the main determinants of this plurality are examined.

Material and Methods

Multiple case study methodology was employed, which consists of a qualitative exploratory approach that allows for identification of hypotheses and deepening of research questions (Voss et al., 2002). The units of analysis were all the transactions in one year among cattle ranches, their suppliers, and their buyers.

The cases studied are typical cattle ranches in the Southeast region of Brazil. Case farms or typical farms are frequently used to analyze alternative farming practices on a whole-farm basis (Feuz and Skold, 1992). The two selected cattle ranches have differentiated marketing strategies from the sale of cattle. They breed animals, sell the cattle to produce beef with differentiated sensory quality, and have the Rainforest Alliance certification to ensure sustainability in the farm production.

The owners and operation managers responsible for buying and selling animals were interviewed using a semi-structured protocol adapted from a study by Silveira et al. (2014). The interviews aimed to identify transactions with suppliers and buyers, describe the attributes of the products in each distribution channel, and define the characteristics of transactions and the determinants of the adoption of each form of governance. Additionally, for both ranches, the balance sheets for cattle purchases and sales were analyzed, and the last audit reports for the socio-environmental certification performed in 2015 and 2016 were reviewed.

The theoretical contributions of Ménard (2013), which explain the occurrence of plural forms of governance, guided the field investigation. Ambiguity, complexity of monitoring transactions, and strategic behavior were examined relative to their ability to determine plural forms of governance. Ambiguity related to uncertainty about the benefits of the adopted forms was measured by the numbers of supplier contract breaches, supply and demand forecasts, and a proxy for characteristics of inputs. The aggregate complexity of monitoring transactions was verified by difficulties with producing one's own raw materials, different technologies used for production inputs, critical steps in the coordination of production, and variability in the quality of inputs. Strategic behavior in relation to difficulty in obtaining information and measuring the influence of players was analyzed through supplier characteristics, buying decisions, and competition levels.

The two ranches analyzed are family businesses that produce only cattle and have the common goal of producing high-quality bovines. In other words, they seek to produce animals distinguished for their sensory attributes or physical characteristics. Both ranches are located in traditional beef cattle-breeding regions and acquire heifers and calves from other ranches in the region. The cattle are sent to slaughterhouses in northwestern São Paulo State without the intention of exporting them. However, the two ranches have different productive and organizational characteristics.

Ranch A is located in the "Triângulo Mineiro" region (the state of Minas Gerais, Brazil). The animals are raised on grass with feed supplementation. Its productive capability is around 1,500 slaughtered

animals per year, mainly Nelore crossbreeds, with less than 5% of bull crossings (mainly Angus). Ranch B has a more complex organizational structure. The finishing stage ranch, where there is a feedlot, is in northwestern São Paulo state, but its productive area is a pasture system spread over eight properties in the states of Mato Grosso do Sul and São Paulo. The production is around 3,500 slaughtered animals per year, mainly Angus and Nelore crossbreeds, but also a few Wagyu crossbreeds. Buying transactions are performed by a hired manager who works in Mato Grosso do Sul, while sales are taken care of by another manager in São Paulo.

Results

This section is divided into three parts, in which the farms included in the case studies are compared. After a brief description of the cases, the buying transactions and distribution channels are analyzed, for final identification of the determinants of plural forms of governance.

The owner of Ranch A is responsible for all cattle transactions. The objective of the main marketing strategy is to achieve productive efficiency and economies of scale in terms of animal production and pasture availability. Ranch A product is traded as a commodity with prices set by market indicators related to this strategy. The commercialization of Nelore bulls for breeding is also an important revenue source. Animals that do not reach enough weight performance or do not have a breeding profile are sold to other cattle ranches as calves or heifers (Table 1).

Ranch B specializes in the production of beef with high sensory quality. The owners created a trademark for their products as a way to differentiate them for customers. Additionally, this allowed them to exclusively supply a beef retailer chain specialized in high-quality beef. The animals that do not reach the desired quality standard are sold to other cattle ranches or slaughtered by players in other distribution channels. To meet this market, Ranch B concentrates on the production of Wagyu and Angus crosses, as well as Nelore and Angus for slaughter (Table 1).

Ranch A production focuses on breeders with high performance in terms of weight gain and on the production of Nelore or its crossbreeds. Nelore is the most common breed in Brazilian herds because of its good adaptability to the edaphic conditions in most of the country (Barbosa et al., 2014). Two different forms of governance are adopted for the acquisition of these animals: production on the ranch through herd breeding management and purchase at regional auctions (Table 2). The main goal of Ranch B is to meet customer standards for desirable sensory quality. In this case, three different forms of governance are adopted (Table 2). The percentage of animals acquired by each ranch varies according to the different sales channels and the settled transactions.

Table 1 - Type of product and percentage of animals commercialized by each ranch

Type of products	Ranch A	Ranch B
Nellore (slaughter)	88%	9%
Angus (slaughter)	0%	75%
Crossbreed Wagyu and Angus (slaughter)	0%	11%
Calves/Stocker	8%	4%
Bull	4%	0%

Table 2 - Forms of governance in the acquisition of raw material

Channel of commercialization	Ranch A	Ranch B
Vertical integration	50%	65%
Anonymous supplier (spot market)	50%	17%
Known supplier (hybrid relational)	0	18%

The two firms use more than one form of governance for the acquisition of animals. The cow-calf operation is considered a type of vertical integration, given that the ranches considered specialize in finishing animals. On Ranch A, fixed-time artificial insemination (FTAI) is employed to seek better performance in terms of weight gain. This requires investments in physical assets and human resources, generating some specificity in transactions and forcing Ranch A to vertically integrate part of its production. As for Ranch B, assets from FTAI need to be added to existing breeds in the transactions coordinated within vertical integration. The presence of breeds associated with better sensory quality beef (e.g., Angus and its crossbreeds with Wagyu) increases the specificity of transactions even more and influences the vertical integration adopted by the ranch.

Vertical integration is used by both firms as a complement to guarantee the supply of animals with desired characteristics, along with production and quality performance, throughout the year. In both cases, the beef cow-calf phase was considered the most critical stage, confirming that specific investments influence the adoption of a hierarchical governance structure. Moreover, internalizing production reduces supply uncertainties, guaranteeing the provision of beef to customers. These results are similar to those of Vinholis et al. (2014), which highlighted that partial or full internalization of cattle production is strongly influenced by uncertainty in obtaining that input in the market.

The traditional cattle spot market is the other form of governance used by both firms (Table 2). In this scenario, cattle ranches try to buy the overall volume of required raw materials from anonymous or unknown suppliers to reach the desired or demanded production. In both cases, besides prices and term, suppliers require a minimum level of quality.

The third form of governance, hybrid relational, was only verified for Ranch B (Table 2). In this case, know-how is transferred to some cattle ranches, including recommendations on the technologies to be used. The technological information transferred from Ranch B to known suppliers generates what Williamson (1985, 1996) and Ménard (2004) identified as a coordination mechanism, in which a shared incentive motivates players to adopt more complex forms of coordination. In this case, Ranch B invests in human resources with the know-how capable of producing inputs with the desired quality and provides this know-how to its suppliers, which also start to produce a more specific product. This generates a closer relationship between the players than they would have in the traditional spot market. Therefore, this credible commitment causes the suppliers to prefer to sell to Ranch B, even without formal contracts, as stated by the manager therein: "There is no contract, but we have bought from these farmers for more than three years, and they always ask us before offering their animals to others."

Historically, Ranch A has sold most of its slaughter cattle to a big slaughterhouse. The current owner, who took over the management less than two years ago, did not change this practice, only because of the historical relationship with the cattle buyer. Besides slaughter cattle, Ranch A commercializes bulls, heifers, and calves with other anonymous cattle ranches. The main goal of these transactions is to select good breeding bulls that are sold to other farms at higher prices (Table 3).

Two governance structures were observed in Ranch A sale transactions: the spot market and the hybrid form (Figure 1). In the first case, it was noted that cattle ranches were mainly motivated by price mechanisms. No formal relationship between players was verified, and negotiation terms such as price, term of payment, and delivery of product were defined simultaneously. Transactions with the

Table 3 - Channels of commercialization and percentage of sold animals

Channel of commercialization	Ranch A	Ranch B
Large slaughterhouse (spot market)	86%	2%
Regional medium slaughterhouse	2%	8%
Own trademark	0	11%
Retailer	0	75%
Cattle breeder (spot market)	12%	4%

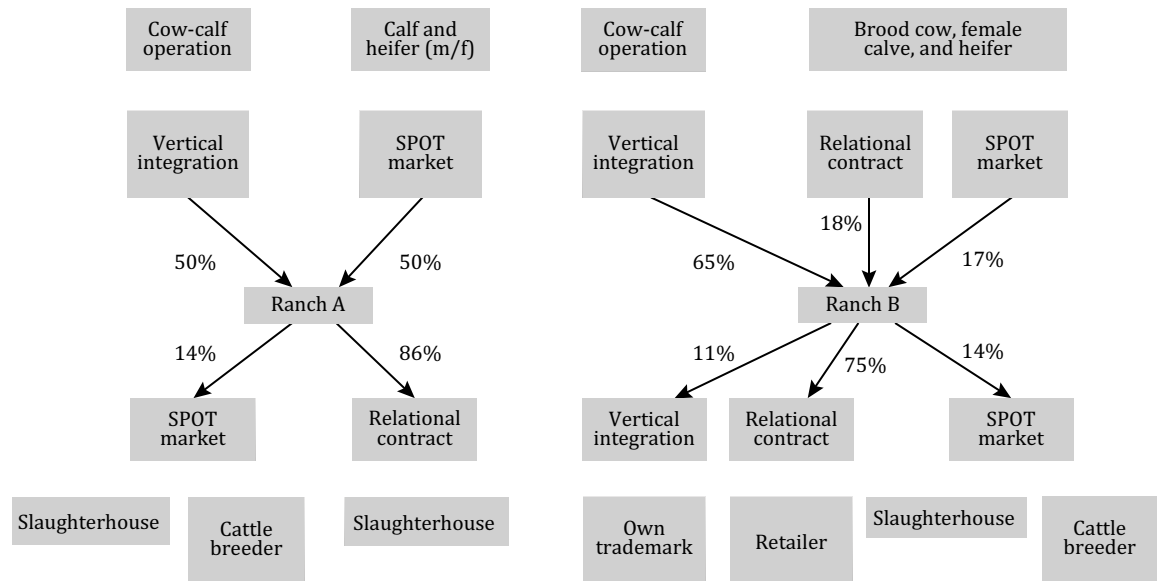


Figure 1 - Percentage of acquired and sold animals in each form of governance.

large slaughterhouse underpinned some reputation effects, highlighted by the owner's statement that the reason for choosing this buyer was the continuation of transactions for over two years. This is in line with the suggestion by Williamson (1985) that the construction of a good reputation by the buyer becomes a coordination mechanism between players, which distinguishes them from those in the spot market. A good reputation is defined by Ripperger (1998) as voluntary and anticipated acceptance of a risk investment through the abdication of explicit contractual mechanisms for safety and control, under the expectation that the other party will not behave opportunistically.

The distribution channels adopted by Ranch B also include large and medium-sized regional slaughterhouses (Table 3), chosen based on payment conditions and price. These channels are used to sell discarded breeding females and animals that did not reach the quality standard of the ranch's own trademark or that required by retailers. Ranch B has no formal relationships or established commitments with these slaughterhouses. The prices are agreed at the same time that the transactions occur. Payment is made in cash, resulting in a spot market type of coordination. The same happens with cattle ranch transactions (Figure 1).

Over the last three years, Ranch B has supplied a weekly retail chain with a fixed number of animals with informally agreed-upon quality and characteristics. Despite the higher number of animals and the higher sale frequency, the main strategic goal of the ranch is to consolidate its own trademark, which provides larger margins and fosters customer loyalty (Table 3). Transactions with the ranch's own trademark and with the retailer entail the intermediation of a slaughterhouse, which works according to the requirements of the distribution channel and of the cattle ranches. However, the relationship between the ranch and its own trademark was considered to be vertical integration, while that with the retailer was considered a type of hybrid relationship (Figure 1). The latter differs from the spot market, since the cattle ranch has credible commitments in terms of amount and quality of the product delivered, despite being only informally agreed on. These commitments provide better predictability and reduce, at some point, market uncertainty. Additionally, three years of transactions helped build a reputation effect between the retailer and Ranch B. As already shown in the previous section, such an effect generates a coordination mechanism that makes such transactions different from those occurring in the spot market.

Discussion

This section discusses the determinants of the adoption of plural forms of governance within transactions between suppliers and cattle ranches. The related downstream chain, that is, sale

transactions between the cattle ranch and its customers, was also observed. The number of available animals for both ranches varies throughout the year. Specifically, in the driest period, more animals are offered for sale, and, consequently, prices are the lowest. The two cattle ranches can benefit from buying animals in the spot market when more animals are offered for sale. In contrast, when fewer animals are offered and prices increase, it is more advantageous to internalize production to guarantee the supply over the whole year.

If only the offering strategy is considered, the adoption of plural forms of governance by both ranches can be explained by the effect of ambiguity, as described by Ménard (2013). However, it should be pointed out that relative uncertainty about the offer of animals during the year does not represent a relevant challenge for cattle ranches. Even though prices may oscillate, both ranches are in traditional cattle-breeding regions and do not generally have difficulty in acquiring animals. This mitigates the effect of ambiguity on the selection of plurality within buying transactions.

According to Ménard (2013), the complexity of monitoring is another determinant of adoption of plural forms of governance. Silveira et al. (2014) suggested that this determinant can be justified by considering three aspects: quality of inputs, critical phases in the production process, and production technologies employed. Even in the absence of formal contracts, Ranch B monitors the quality of inputs of its suppliers to guarantee the desired standard for their beef. However, monitoring is not considered to be difficult, since it focuses on few technical characteristics, such as breed, gender, weight, health, and conformation. Additionally, the animal profile sought by Ranch B requires suppliers to employ more sophisticated technology than Ranch A does. Only a few Angus crossbreed animals are offered in the market, while “Nelore-like” animals are more common. Both ranches confirm an increasing national trend for Angus crossbreeds; this calls for better physical structure and use of technologies such as FTAI and genetic selection. However, there is significant technological heterogeneity and, as a consequence, there are quality variations in calf production in the regions covered by the two ranches. This aspect is emphasized in Ranch A, since it is in a traditional region for dairy cattle that supplies low-quality slaughter cattle to the beef market.

The variability in the quality of inputs directly affects the presence of Ranch B in the market. It should be noted that the ranch's own brand comes exclusively from animals born on the ranch; to comply with retailer requirements, Ranch B selects relational suppliers or buys animals from anonymous sources. For Ranch A, the slaughter cattle market accepts any quality of product, even though there is a direct negative impact on the price received for low-quality animals. Ranch A is characterized by low complexity, since there is no need to monitor transactions with the suppliers. In contrast, Ranch B monitors its suppliers to process similar products but with different degrees of quality to comply with the various distribution channels. Although this results in higher complexity, Ranch B succeeds in evaluating the best genetic crossbreeds for the production of the desired beef and in incentivizing its relational suppliers to do the same. These two factors allow, to a great extent, reductions in monitoring and, consequently, complexity. This also mitigates complexity as a potential motivation for the adoption of plural forms of governance.

Relational suppliers for Ranch B are considered strategic regarding with whom they exchange information to achieve superior-quality animals. Ranch A considers prices to be as important as quality at the time of purchase, and all exchanges come from auctions, although they only take place if the minimum quality is met. In contrast, Ranch B considers quality more important than price, so it is more likely to pay more if the raw materials reach the high desired quality standard. Therefore, Ranch B buys at auctions, but only when suppliers are known and the raw materials meet the highest quality standards.

The multiple forms of buying transactions of Ranch B (Figure 1) are focused on meeting the demand for quality beef. In other words, this strategic behavior motivates Ranch B to use different organizational forms simultaneously. Indeed, the ranch could face difficulties if it only relied on relational suppliers or on the spot market and could be at risk of opportunism in both cases, and even be unable to honor its demand commitments. Therefore, the ranch could vertically integrate its production, using cow-calf

and stocker operation of the desired breeds, by increasing its physical investments (more land and human resources, among others), compromising profitability.

It should also be noted that Ranch A is oriented to a strategic behavior of adoption of plural forms of governance. The main goal of the ranch is to produce bulls with a quality genetic pattern and serve customers who seek animals of excellent quality. Therefore, the ranch performs FTAI and selects genetic material. This strategy generates many discards, that is, animals that do not meet the high-quality standard required by the bull market. To maintain production capability and avoid downtime for the underutilization of pastures, the ranch complements its herd with animals bought on the spot market and sends the discards and extra acquired animals to large- and medium-sized slaughterhouses (Figure 1). It should be noted that discards meet the quality standard required by slaughterhouses. The acquisition strategy through the market is justified because the ranch looks for lower-cost animals with known characteristics, without committing to future trades. In the two cases studied, plurality guarantees the supply of the volumes and required quality that maximize the gains in efficiency and scale, which is the main justification for the strategic behavior of the ranches.

Carrer et al. (2014) argued that most empirical studies of plural forms of governance have focused on one sector or production chain and that few studies have been devoted to plurality within one company. Nonetheless, the authors concluded that little attention has been given to the impacts of differentiation of products or distribution channels in terms of adoption of plural forms of governance. The present study highlights the importance of governance plurality in terms of strategies for the animal supplies for both ranches, although they adopt different strategic behaviors.

One of the ranches in the present case study pointed out that they seek high productivity and mainly produce excellent breeds to sell in the spot market. However, this production system generates many animals that do not meet the desired standards and are designated for slaughter. To scale up and avoid pasture downtime, their strategy is acquiring animals at auctions by looking at predefined characteristics without taking on future commitments with these suppliers. In contrast, the ranch that supplies distribution channels that are characterized by highly specific quality products uses three forms of governance in its purchases: the spot market with less known or unknown suppliers, hybrid relational forms, and vertical integration with live cattle supply. The adoption of plural forms results in remarkable competitive advantages for both ranches because, in this way, they can comply with the requirements of different distribution channels and raise production capacity. In the case studies analyzed, plurality is justified by strategic behaviors as described by Ménard (2013).

Strategic behavior whose objective was to achieve and maintain these benefits was the determinant for the adoption of plural forms of governance by the cattle ranches, mainly when compared with the problems of control of the parts involved in transactions. The importance of this determinant has been confirmed in other studies (Silveira et al., 2014; Feltre and Paulillo, 2015; Dias et al., 2016; Foschaches et al., 2016). However, the majority of these studies have focused on agroindustry. Little attention has been paid to rural properties as the object of analysis of plurality in governance.

Conclusions

The present study reveals that plural forms of governance are adopted in the cattle ranches analyzed, with differentiated market strategies. The adoption of plural forms of governance brings advantages to cattle ranches, mainly because of the resulting flexibility of supply and customers' assets with different specificities. These plural forms are mainly due to the strategic behavior of ranches.

Acknowledgments

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001.

References

- Barbosa, B. R. P.; Santos, S. A.; Abreu, U. G. P.; Egito, A. A.; Comastri Filho, J. A.; Juliano, R. S.; Paiva, S. R. and McManus, C. 2014. Tolerância ao calor em bovinos das raças Nelore branco, Nelore vermelho e Pantaneira. *Revista Brasileira de Saúde e Produção Animal* 15:854-865. <https://doi.org/10.1590/S1519-99402014000400010>
- Bradach, J. L. and Eccles, R. G. 1989. Price, authority, and trust: from ideal types to plural forms. *Annual Review of Sociology* 15:97-118. <https://doi.org/10.1146/annurev.so.15.080189.000525>
- Caleman, S. M. Q.; Sprosser, R. L. and Zylbersztajn, D. 2008. Custos de mensuração e governança no agronegócio: um estudo de casos múltiplos no Sistema Agroindustrial da carne bovina. *Organizações Rurais e Agroindustriais* 10:359-375.
- Carrer, M. J.; Souza Filho, H. M. and Vinholis, M. M. B. 2014. Plural forms of governance in the beef industry: a case study in Brazil. *British Food Journal* 116:643-661.
- Christofari, L. F.; Barcellos, J. O. J.; Costa, E. C.; Oaigen, R. P.; Braccini Neto, J. and Grecellé, R. A. 2008. Tendências na comercialização de bezerros relacionados às características genéticas no Rio Grande do Sul. *Revista Brasileira de Zootecnia* 37:171-176. <https://doi.org/10.1590/S1516-35982008000100025>
- Dias, D. T.; Fagundes, M. B. B. and Caleman, S. M. Q. 2016. Formas plurais de governança: relação entre indústrias e suinoculturas em Mato Grosso do Sul. *EBSCO* 20:45-60.
- Feltre, C. and Paulillo, L. F. O. 2015. Plurality in different groupings: sugarcane supply in Brazil. *British Food Journal* 117:2265-2281.
- Feuz, D. M. and Skold, M. D. 1992. Typical Farm Theory in Agricultural Research. *Journal of Sustainable Agriculture* 2:43-58. https://doi.org/10.1300/J064v02n02_05
- Fornari, G. B.; Menegassi, S. R. O.; Pereira, G. R.; Oliveira, T. E. and Barcellos, J. O. J. 2016. Factores affecting the selling prices of calves in auctions in Santa Catarina State, Brazil. *Revista Brasileira de Zootecnia* 45:632-638. <https://doi.org/10.1590/S1806-92902016001000009>
- Foscaches, C.; Saes, M. S. M. and Vacari, G. F. J. 2016. Formas plurais na aquisição da matéria-prima: uma análise do setor de torrefação e moagem de café no Brasil. *Organizações & Sociedade* 23:507-520. <https://doi.org/10.1590/1984-9230788>
- Mello, F. O. T. and Paulillo, L. F. O. 2010. Formas plurais de governança no sistema agroindustrial citrícola paulista. *Revista de Economia e Sociologia Rural* 48:135-159. <https://doi.org/10.1590/S0103-20032010000100007>
- Ménard, C. 2004. The economics of hybrid organizations. *Journal of Institutional and Theoretical Economics* 160:345-376. <https://doi.org/10.1628/0932456041960605>
- Ménard, C. 2013. Plural forms of organization: where do we stand? *Managerial and Decision Economics* 34:124-139. <https://doi.org/10.1002/mde.2578>
- Mondelli, M. and Zylbersztajn, D. 2008. Determinantes dos arranjos contratuais: O caso da transação produtor-processador de carne bovina do Uruguai. *Revista de Economia e Sociologia Rural* 46:831-868. <https://doi.org/10.1590/S0103-20032008000300010>
- Perrigot, R.; Cliquet, G. and Piot-Lepetit, I. 2009. Plural form chain and efficiency: insights from the French hotel chains and the DEA methodology. *European Management Journal* 27:268-280. <https://doi.org/10.1016/j.emj.2008.11.001>
- Ripperger, T. 1998. *Ökonomik des Vertrauens: Analyse eines Organisationsprinzips*. Tübingen.
- Silveira, R. L. F.; Carrer, M. J.; Carvalho, T. B.; Foscaches, C. A. L. and Saes, M. S. M. 2014. Formas plurais de governança: uma análise das transações de suprimento entre frigoríficos e pecuaristas. *Revista de Economia e Sociologia Rural* 52:761-782. <https://doi.org/10.1590/S0103-20032014000400008>
- Vinholis, M. M. B.; Souza Filho, H. M.; Carrer, M. J. and Chaddad, F. R. 2014. Transaction attributes and adoption of hybrid governance in the Brazilian cattle market. *Journal on Chain and Network Science* 14:189-199. <https://doi.org/10.3920/JCNS2014.0239>
- Vinholis, M. M. B.; Souza Filho, H. M.; Carrer, M. J. and Chaddad, F. R. 2016. Determinants of recognition of TRACES certification as valuable opportunity at the farm level in São Paulo, Brazil. *Production* 26:78-90. <https://doi.org/10.1590/0103-6513.146513>
- Voss, C.; Tsikriktsi, N. and Frohlich, M. 2002. Case research in operations management. *International Journal of Operations & Production Management* 22:195-219.
- Williamson, O. E. 1985. *The economic institutions of capitalism: Firms, markets, relational contracting*. The Free Press, New York, NY.
- Williamson, O. E. 1996. *The mechanisms of governance*. Oxford University Press, New York.