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Competition Barriers to Paraguayan Beef Exports: An Economic Review

Paraguay's beef industry has suffered sustained damage in credibility directly related to meat quality and process hygiene standards over the past two decades. These factors alone, however, are not the primary cause of persistent price discounting in export markets. Paraguay's direct competitors have suffered similar export restrictions related to quality control but have since recovered to capture their original market share. We find that both a perceived and an actual absence of quality controls over beef production, coupled with the lack of an industry body representing Paraguay's beef sector, are the major impediments to growth in the export market. The lack of sustained support and marketing of export-quality beef has led to persistent price discounting, despite quality improvements across the supply chain. The capacity to gain international market share remains diminished due to the disaggregated approach in which Paraguayan beef is marketed to foreign buyers. An industry-wide effort to coordinate food safety and quality activities, as well as maintaining certification programmes, market intelligence, export promotion and research and development could offer some degree of competitive advantage to Paraguay's producers. While the idea of a central industry body has clear advantages, of greater value would be establishing meat quality standards that address the deficiencies in consumption-level responsiveness to meat quality. The establishment of an industry body would need to overcome the hurdles associated with related transaction costs across the alliance.

Keywords: Beef value chain, consumption trends, premium markets, diminished value, Paraguay
JEL classifications: Q11, Q17

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Introduction

Beef production and exports have become an important pillar of Paraguay's economy over the past 20 years. Exports have increased sixfold in 20 years, recently representing roughly 12 per cent of the Paraguayan total and contributing 6.6 per cent to national GDP (Arce, 2012; Arce and Arias, 2015). Since 1998, cattle numbers in Paraguay have grown from 2 million to 13 million (USDA, 2018). Growth in the Paraguayan beef industry has been a result of substantial efforts made by private operators to increase production as well as incrementally enhance product quality. Some producers have also invested heavily in genetic technology to improve production volume (Valiente, 2013). This has enabled greater access to premium beef markets (Latimori et al., 2008; Arce, 2012). Several countries now import Paraguayan beef that meets high quality standards, including Chile and several nations in the European Union (Lesmo Duarte et al., 2017; Arce, 2012; Valiente, 2013).

However, export growth has come at some cost. Paraguayan beef receives lower prices than that produced by its regional competitors (i.e. Brazil, Argentina and Uruguay) and this price discounting has persisted over the past 20 years (Asociación Rural de Paraguay, 2016). Schnettler et al. (2014) recently found that consumers consistently favour beef from Brazil or Argentina over Paraguayan beef, which implies a persistent weakness in price bargaining on the part of Paraguayan producers. Despite often maintaining equivalent standards in quality and quality control, the reasons underpinning the persistent price discounting of Paraguayan beef are unclear. Price discounting of Paraguayan beef in the export markets is the single greatest factor limiting the future growth of Paraguay's beef export industry.

Using an economic analysis of the value of consumer information relative to the level of consumer responsiveness to marketing quality standards, we will now address three questions:

1) What are the factors that have led to a persistent undervaluation of Paraguayan beef?
2) What factors differentiate the export marketing success of Paraguay's main competitors?
3) What marketing mechanisms are available to eliminate the value discounting of Paraguayan beef exports?

In this paper, we will analyse alternatives to reposition Paraguayan beef for international consumption at a price commensurate with its quality characteristics. While it is clear that investment in the sector has been extensive, little research attention has been paid to a deeper examination of value-added activities, including the appropriate marketing of major improvements to the sector. We have found that to overcome persistent price discounting, Paraguayan beef exporters need to simplify the content of information related to beef quality provided to consumers. Information simplicity will overcome the main barriers inhibiting consumer responsiveness to Paraguayan beef quality and will eventually eliminate the current price-volume disadvantage the industry faces.

The export beef market

Consumers are known to exhibit differing attitudes towards products based on country of origin (Pouta *et al*., 2010). Annual beef production for major exporting nations is provided in Figure 1.

While it is claimed that a lingering prejudice against non-British cattle breeds persists in Paraguay, this is difficult to prove. Although Argentina's reputation for high-quality beef stretches back decades, strategic branding of high-quality produce only commenced after 2000. Argentinian beef producers have thus been able to sustain and improve consumer perceptions and building an emotional connection with them based on heritage for a relatively short period of time ('Argentinian Beef: Beefing up the brand' 2007). Capped production of Argentinian beef – which is enforced by government – is caused by domestic price pressures. However, the cap in Paraguayan production is not due to internal restrictions, but rather a restriction in accessing export markets.

Figure 2 illustrates international export beef prices for major exporting nations. Figure 3 illustrates the quality-adjusted export beef price differential between Argentina and Uruguay relative to Paraguay. From this representation, it can be seen that Argentina and Uruguay both earn substantial and persistent price premiums relative to Paraguay.

We examine Paraguay's export beef sector performance from 1988 to 2018, given that noticeable export growth in Paraguay's beef industry has only occurred during this period (Arce, 2012). Prior to 1990, Paraguayan beef was produced solely for the domestic market mainly due to the below-export-quality nature of its beef production (Valiente, 2013; Lesmo Duarte et al., 2017). Beef production increased markedly after 1990, when the exports of various processed beef cuts began to meet market expectations. However, this produce was exported to a very limited market, concentrated toward lower-quality demand centres (Valiente, 2013).

However, despite the significant effort devoted to improving product quality, Schnettler et al. (2014) have suggested that consumers who prefer Paraguayan beef do so because it is seen as a low-cost alternative to other main exporters. They further argue that the lack of branding and marketing practices by Paraguayan producers confuses the communication of quality characteristics to international consumers, leading to a persistent failure to achieve superior positioning

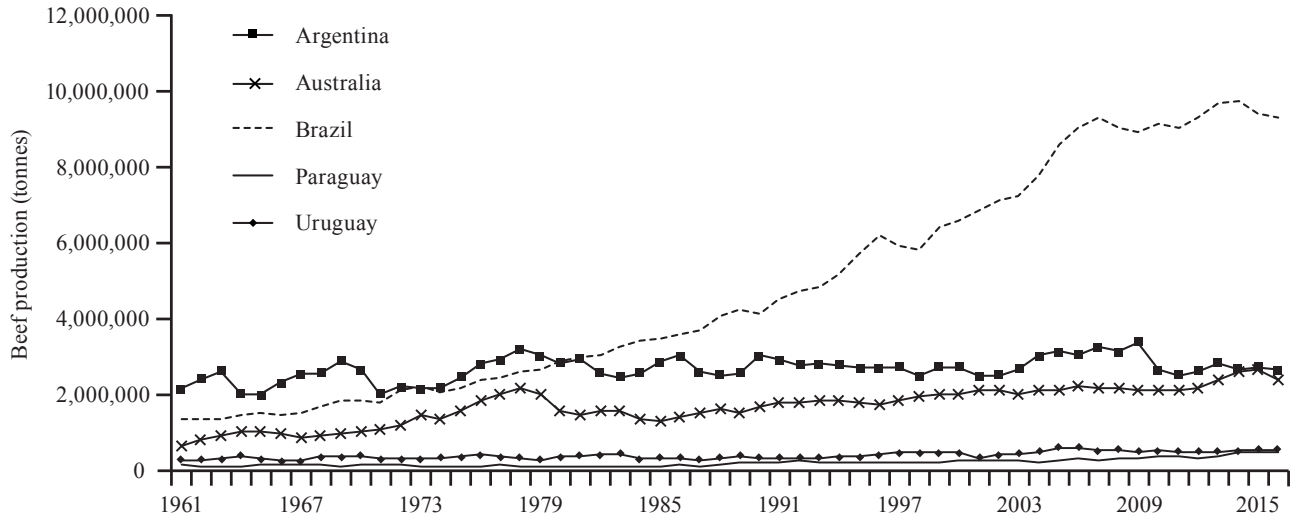

Figure 1: Beef production among major exporting nations (excluding the US), 1961-2018.
Source: FAO.

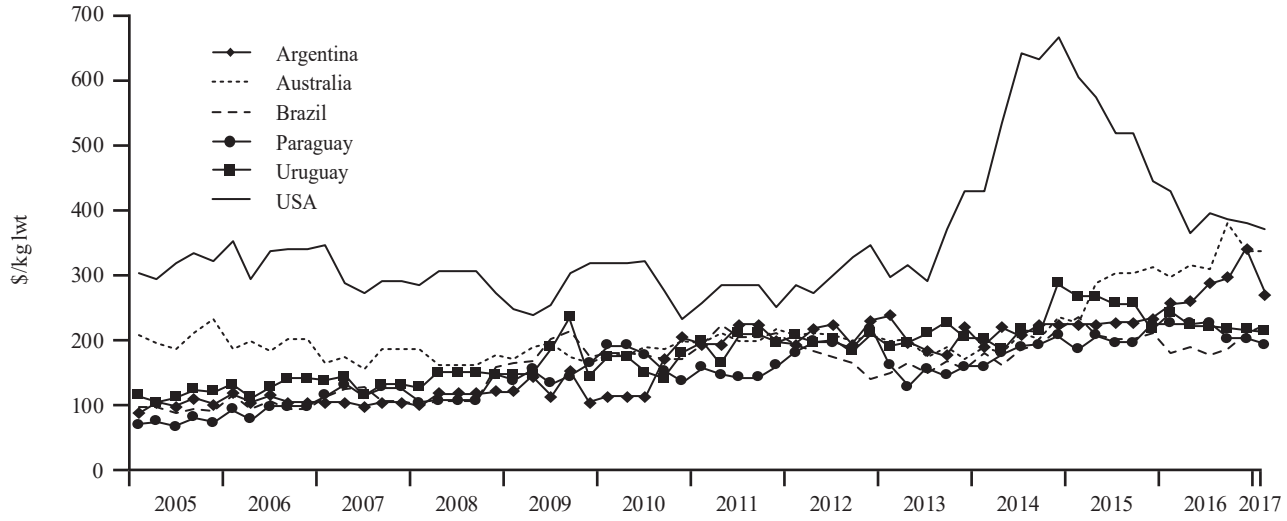

Figure 2: Beef prices (in AU$/kg lwt) among major exporting nations 2005-2018.
Source: IPCVA (Argentina, Paraguay), MLA (Australia), Esalq/Cepea (Brazil), INAC (Uruguay), USDA/Steiner Consulting Group (US).

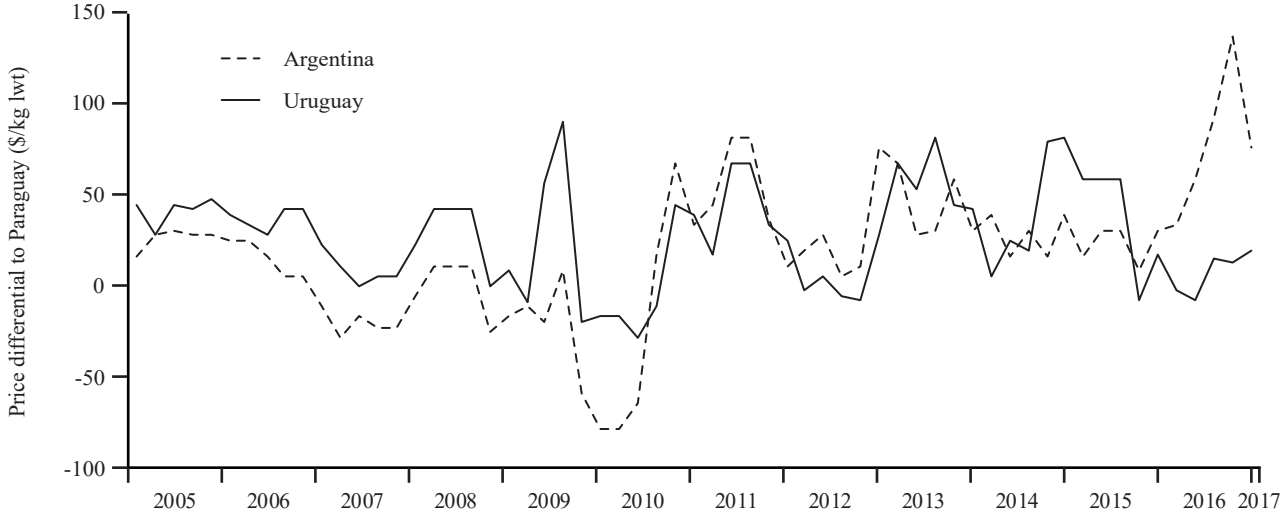

Figure 3: Beef prices (in AU$/kg lwt) among major exporting nations 2005-2018.
Source: IPCVA (Argentina, Paraguay), MLA (Australia), Esalq/Cepea (Brazil), INAC (Uruguay), USDA/Steiner Consulting Group (US).

of beef products aligned to the true level of export quality now manifest in the market.

Some evidence shows that strategic decisions and targeted investments can heavily impact a country's brand image. For instance, De Tavares Canto Guina and De Moura Engracia Giraldi (2014) argue that forging a country image and brand could successfully link environmental credentials with the sense of product quality. Entire supply chains are now becoming increasingly important for building food brands. The capacity to access premium beef markets using a premium brand must therefore be accompanied by the appropriately targeted marketing of ethics, environmental sustainability and animal welfare.

Quality control

A first step towards the control of food processing standards and maintaining stable hygiene practices is the strengthening of legal and other powers granted to entities responsible for maintaining such standards (Munoz et al. 2015). Investments in infrastructure, laboratory equipment and training embedded within a controlling authority would also yield positive returns to help secure the quality standards of export beef supply chains. Without centralisation of these functions, Paraguayan beef exporters will remain at the mercy of beef farmers and processors to self-enforce hygiene and quality control standards through the supply chain.

Paraguay has made some progress towards addressing quality control concerns. For instance, Paraguay has implemented a national traceability system. But in isolation, this is not sufficient to translate improvements of brand image into sustained export price premiums.

An efficient value chain, where chain economic surplus is maximised, is one in which no single chain participant can be made better off without another participant being made potentially worse off. The differential between a chain's potential maximum and actual economic surplus quantifies the extent of chain underperformance. The value chain implications of each grading approach introduced above can have vast impacts on the beef industry.

Sustainability

Many Paraguayan beef farmers remain insensitive to international standards in building sustainability into their contribution within the sector. Sustainability and profitability are perceived by many beef producers as being incompatible (Verijdt, 2015). This has created a degree of friction in some quarters, where the incentive to increase farmland availability has resulted in high rates of deforestation, raising concerns around the level of sustainability in greater beef production for export markets (Huang et al., 2007; Munoz et al., 2015). Consumer concern over sustainability has become a key plank in price negotiations, particularly in the premium beef market (Henchion et al., 2014). Thus, failing to address these issues will lead to the further erosion of value for exporters.

First, traceability systems that were created to measure information about the origin, movement, hygiene/sanitation and nutrition of cattle would need to be advertised and information be made more transparent for external verification. This is already required for the entry into most international markets (USDA, 2008) so this needs to be addressed at a minimum level. The single existing traceability programme in Paraguay has been in operation since 2004 (SITRAP) and has been largely successful. However, out of a total of almost 148,000 beef producers, only 419 are signed up to the programme (SENACSA, 2017), representing less than 1 per cent of the market. Most of the industry thus operates outside the monitoring of hygiene standards.

Second, unlike other major beef exporters, Paraguayan producers do not use hormones for accelerating the growth of cattle (Labraga, 2016). Almost all Paraguayan beef is produced in pastureland under natural conditions. Previous attempts to implement 'Natural Beef' certification programmes have been unpopular because the added cost in developing the programmes did not translate into an immediate consumer response (de Belmont, 2015). The reasons for this are discussed below.

Competing jurisdictions

Australia

Support of the major agricultural groups receives strong government support in Australia. A total of 15 agriculturally-focused industry bodies are enshrined in Federal Government legislation. Of the 15 rural development corporations (RDCs), five are statutory corporations or authorities, owned by the Federal Government while the remaining 10 are industry-owned, not-for-profit companies. Funds are sourced through levies imposed on market participants, who can become members or shareholders and participate in strategic decisions. The RDCs form a network that enables primary producers through effective research, development and extension, and delivers substantial benefits at the farm gate and across the economy.

One of the significant bodies supporting Australian meat production is Meat and Livestock Australia Limited (MLA), which provides research and development activities as well as a centralised marketing function to represent the interests of Australia's cattle producers (Meat and Livestock Australia, 2016). A key contribution of MLA is research addressing the main factors influencing eating quality and consumer satisfaction. In response to questions over quality control, MLA developed the Meat Standard Australia (MSA) grading regime, which is flexible enough to continually update such standards and ultimately improve export quality. Marketing efforts for Australian beef focuses on attributes such as nutrition qualities, provenance of the product, animal welfare, sustainability of production systems and eating quality (Meat and Livestock Australia, 2016). This has resulted in a 30 per cent increase in gross income per kilogram of beef exported (Henchion et al., 2014).

These attributes are essential and valuable characteristics in the premium consumer segments of the market (Henchion et al., 2014) with ready access to all global premium beef markets. For instance, MLA has implemented programmes to create awareness in North American consumers of the benefits of buying grass-fed Australian beef; Australian producers now dominate the niche market for grass-fed products in North America. With the entire beef industry representing a united front for promotion of products to the export markets, Australian producers are able to take advantage of the evolution in consumer tastes.

United States

The American beef industry is built on a foundation of the family ranch, despite the corporatized-level of beef production that dominates production volumes. Promotional campaigns leveraging the 'cowboy halo' effect to connect with consumers have proven very effective (National Cattlemen's Beef Association, 2015). While being the largest producer of beef in world, the United States remains a net importer. Exports of high-quality grain-fed beef are offset by imports of low-value beef used to produce processed meat (USDA, 2018). The US beef industry also has a competitive advantage from the use of genetic research to improve quality and taste.

Several outbreaks of Bovine Spongiforme Encephalopathy (BSE) between 2003-12 resulted in an immediate end to beef exports. However, a centralised approach to disease control and management, along with marketing efforts to rescue the image of American beef, have largely countered the sustained decrease in export demand. Systems and safeguards adopted to eradicate BSE by the USDA were shown to be effective with disease impact declining by 99 per cent after each outbreak (USDA, 2018).

Brazil

Expansion of Brazil's export beef market is supported by the Brazilian Association of Beef Exporters, which was incorporated to develop technical excellence and market information flow, as well as build promotional capability (Marques and Traill, 2008). The creation of a common brand, 'Brazilian Beef,' greatly increased the bargaining power of Brazilian exporters and offset the competitive advantage initially gained by Australian and New Zealand exporters. Their aim is to jointly increase both the volume and the quality of exported beef products (Steiger, 2006). The industry also promotes the use of grass-fed production systems, natural beef and environmental sustainability as image-enhancing efforts to create further value for its exporters (Marques and Traill, 2008).

Uruguay

The beef industry in Uruguay is supported by the National Meat Institute (INAC). This institute was created to promote, regulate, coordinate and oversee the production, processing and marketing of meat products. They also promote the research and development, education, innovation and communication to add value for the beef export sector (INAC, 2018). Uruguayan beef maintains access to around 120 countries, many of them in the premium sector. The diversity of supply acts as a source of insurance for the sector, diminishing the effects of damaged to relations in particular markets (INAC, 2018).

Uruguayan beef producers have taken a leadership position in promoting quality coupled with low cost (INAC, 2018) while promoting the benefits of traceability and sustainability in its production process (INAC, 2018). The industry body maintains a robust health service management and disease eradication capability (Zurbriggen and Sierra, 2017) as well as traceability systems and certification programmes (Gorga and Mondelli, 2014). Moraes and Viana (2015) claim that this resulted in an increase of 11 per cent in annual export prices over 2001-2013.

Figure 4 depicts willingness to pay (WTP) data collected in conjunction with consumer testing for several beef consuming countries. This shows that unsatisfactory beef is rated at half the value of good quality with better than average quality rated around 1.5 times and premium quality rated 1.8 to 3 times the average price.

Price premiums available in Japan and the US are attractive motivators for improving brand and quality information. However, the marketing of quality standards does not result in uniform increases in prices or sales volumes on its

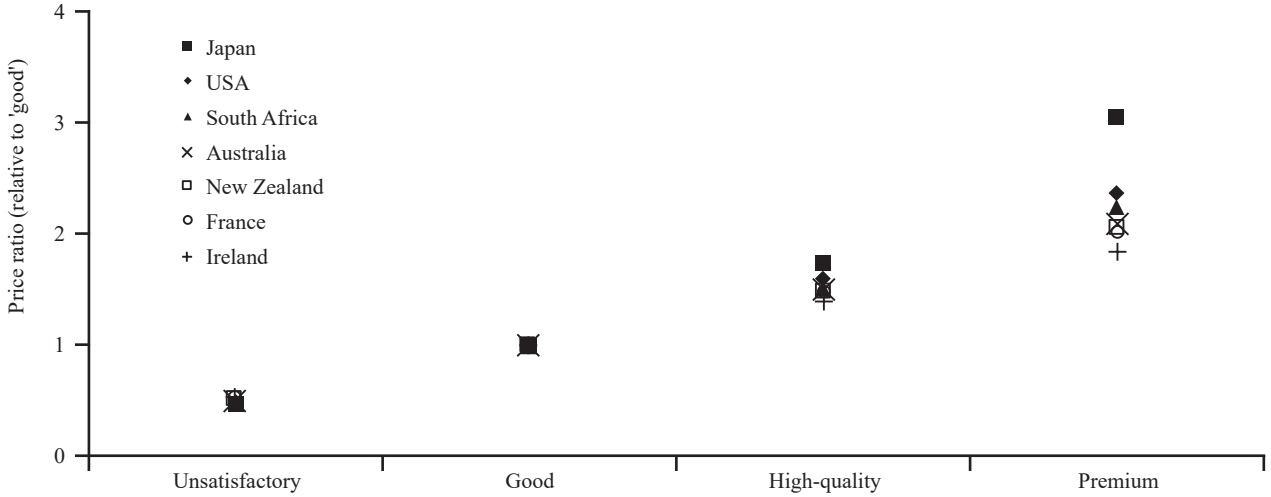

Figure 4: Willingness to pay ratios for beef (relative to average quality) for several countries.
Source: Polkinghorne et al (2014).

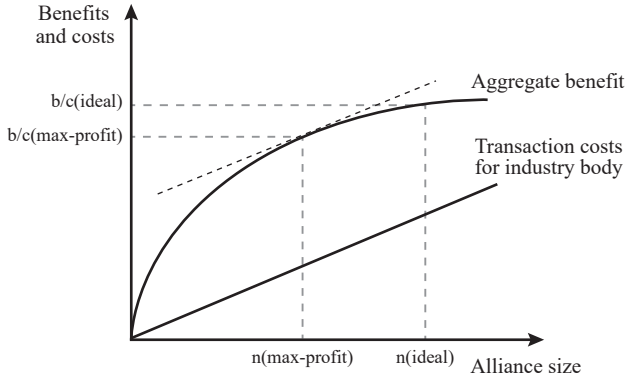

Figure 5: Industry body establishment with low transaction costs.
Source: Adapted from Swann (2003).

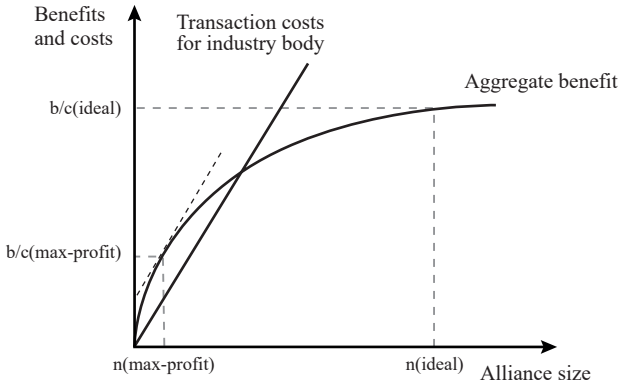

Figure 6: Industry body establishment with high transaction costs.
Source: Adapted from Swann (2003).

own. The notion of 'what' information is shared is just as important as 'how' it is shared. We will discuss this issue below.

Centralization to create competitive advantage

The above examples demonstrate that the use of a dedicated industry body charged with the development of its beef industry and engaged in activities to support that goal is a key success factor in maintaining access to export markets. The Paraguayan beef sector lacks a central organisation representing the beef sector, a fact which puts Paraguay at a constant disadvantage. Even minor projects focused on research into quality control, improvements in the production cycles, market intelligence and promotion of products would benefit the entire sector. Instead, many of these activities are developed piecemeal and by private operators, which has only a limited impact on the industry (Asociacion Rural del Paraguay, 2015).

Maintaining food safety and quality is not the only task of an industry body. Its extended duties would need to implement marketing programmes aimed at value creation. Through the enforcement of certification programmes Paraguayan beef has the potential to seize a share of the growing premium market.

One scenario related to the economic impacts of funding research and development through an industry body is depicted in Figures 5 and 6. Value chains seek to maximise profits by setting marginal benefit to the marginal cost, but this may not be the case for every participant in the chain. Figure 5(a) shows that low transaction costs in a chain with few alliance members means that the profit-maximising alliance level is high relative to an 'ideal' level (Swann, 2003). This would be achieved where every new member added to the alliance could be conducted at a low marginal cost.

In contrast, Figure 6 shows that the benefits to the profit-maximising alliance is low relative to the ideal level when the marginal cost of adding new members to the alliance is high. Positive benefits to an industry are therefore most effective when participation in an industry alliance is not costly and accessibility is not limited to any part of the value chain. So, a centralized industry body would offer qualified advantages to the Paraguayan beef sector, highly dependent on the transaction costs associated with alliance participation.

Economic implications of quality standards

Quality standards across an industry to promote the taste of its products are typically voluntary grading systems designed to predict eating quality. The MSA meat grading system was introduced in the domestic market in Australia in 1999/2000 (Griffith et al., 2010). The MSA grades are based on taste panel responses from 'normal' consumers (Griffith and Thompson, 2012) while the system itself uses a 'total management approach,' from animal genetics through to cooking method (Polkinghorne et al., 1998; Thompson, 2002).

An alternative to this approach is to construct a more comprehensive measure, along the lines of a 'paddock to plate' standard, which measures the treatment of produce through the whole value chain (Polkinghorne et al., 2010). This approach ensures correct emphasis is placed on the most critical phase in the beef production process, from the start of the final muster on the farm to several hours after slaughter at the abattoir. Cattle that are poorly treated and transported to a processor in dirty and crowded trucks may cease easting and start to lose weight. Within a day, cattle can lose up to five percent of their weight, which can transform the meat from high-quality to a below-standard product (Polkinghorne et al., 2010). A 'paddock to plate' style standard could emphasise traceability, quality effects at each point in the value chain and contributes to brand identification. It can form a more comprehensive metric. However, it does come at a higher cost, especially in terms of information content, and does not translate into immediate price and sales volume outcomes.

Single metric standards

The rationale for investing in research and development activities that establish quality standards (such as the MSA model in Australia) was that beef consumers were turning away from beef because each time they purchased beef, they could not be guaranteed the same eating quality experience. Eating quality is subjective and based on vague notions of breed, age and feeding regime and the relationship between consumer preferences, willingness to pay and quality differentials is difficult to reconcile. Ways of classifying beef carcases, and therefore ways of describing quality, varies across suppliers. Brands are of little use to retailers when there is no objective, uniform system to provide the guarantee that consumers expect (Griffith and Thompson, 2012).

The value of a meat grading scheme is concentrated at the retail level where consumers are willing to pay a premium for beef cuts that are guaranteed to offer desirable characteristics in contrast to ungraded beef (Griffith et al., 2009; Doljanin, 2012; Griffith and Thompson, 2012). The differences in WTP between beef consuming countries in Figure 4 highlights this fact. The emphasis on carcass quality provided by registered producers facilitates consistency in both beef production and consumption. Poorly functioning beef grading schemes, coupled with asymmetric information in favour of producers leads to adverse selection and moral hazard.

The processing of large volumes of beef matched to thousands of consumer taste tests is typically too large to be performed by a single firm, so an industry-wide approach is needed to bridge the need for cohesion between beef producers. The grading of beef is assessed using a single metric that assesses beef carcass attributes for all producers, matched to consumer expectations.

Analysis of beef quality can be achieved by transforming the axes for assessing production possibilities from volume measures to value measures. Using Weaver (2010), the definition of production as the 'production of value' enables the representation of increases in output through quality improvement as upward shifts of the production possibility frontier (PPF). Changes in product quality characteristics resulting from new technologies are viewed as exogenous demand shifts, a perspective which assumes that consumers will demand more of the product for a given price if quality is improved.[1]

We now demonstrate the economic implications of implementing a single-metric for beef quality standards. Point A on the initial production possibility frontier (PPF_1) in Figure 7 represents the optimal throughput under a conventional marketing system with no compensation for increasing the level of responsiveness in the value chain to consumer preferences. The PPF is used to determine the extent of scope economies between consumer-level responsiveness and low cost for two channels (graded and non-graded beef) within a value chain. Inefficient value chains lie inside the frontier.

An increased willingness to pay for graded beef over ungraded beef is given by the iso-revenue curve IC_1 representing a linear relationship, which implies no reduction in 'demand uncertainty' from responsiveness. The iso-revenue curve reflects the fact that a value chain is likely to achieve higher prices when it is more responsive to consumer preferences. In the linear iso-revenue case, producers receive no additional payoff for being responsive, but this relationship becomes more elastic and shifts in favour of a responsive approach as beef consumers are willing to pay more for reduced demand uncertainty, forming curve IC_2. Figure 7 illustrates a shift of the frontier from PPF_1 to PPF_2 towards higher levels of responsiveness associated with greater throughput of graded beef (A_g to B_g) and away from ungraded beef (A_n to B_n).

In isolation, this type of metric does not explicitly contribute to improvements in quality across the beef value chain. However, it does help with improving information throughput along the value chain because it serves as a form of compliance. Increased consumption is due to the substitution of ungraded beef by graded beef, assuming a 'closed' economy for beef. Information embedded in compliance with a single metric would therefore improve beef quality through changes in on-farm management practices and supply chain processes (Griffith and Thompson, 2012).

[1] There are a number of difficulties in establishing an objective measurement of quality in output (Alston et al. 1995). Quality measures do not necessarily equate to added consumer willingness to pay extra for a higher-quality beef. So, the PPF will not be wholly symmetric, especially given that higher-quality products are sold into niche markets which do not share the same opportunities to exploit scale economies as mainstream channels.

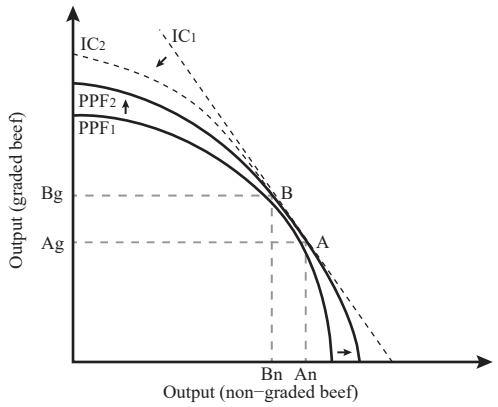

Figure 7: Single metric export beef grading systems with differences in eating quality.
Source: Adapted from Griffith and Thompson (2012).

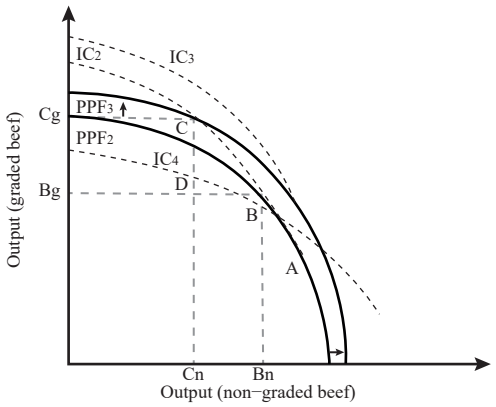

Figure 8: Single metric export beef grading systems with differences in eating quality.
Source: Adapted from Griffith and Thompson (2012).

The basic framework of a meat grading system should markedly differ in only the eating quality between graded and non-graded beef. That is, the metric needs to be as simple as possible. It is possible to invoke value-based models that offer price differentials across multiple grades of quality. However, a key problem in conventional beef value chains, like Paraguay, is the existence of network externalities among participants at different levels in the chain, resulting in poor levels of information exchange. The provision of feedback on meat quality is generally viewed by processors as an administrative overhead that can be costly, which results in them providing minimum information back through the chain (Doljanin, 2012), which is a predominant value constraint for Paraguay's supply chain.

Grading systems require commitment from the bulk of producers matched to consumer expectations, which requires additional resources. But the value of benefits using this approach can be substantial, which is evident in Figure 7.

In contrast, multiple sources and uses of information defining beef quality is a concern because they cannot be reduced to a single factor for reliably describing carcass quality. A simple carcass index helps to alleviate information overload by providing a single tool to assess on-farm genetic progress, something that also allows for a comparison of the impact of different processing activities (Thompson et al., 2012). A comprehensive, single metric that meets this requirement however requires further development in the beef sector. This is a challenge facing Paraguay's producers in the present climate.

Whole-of-value-chain quality standards

In Figure 8 the change in relative prices from IC_2 to IC_3 represents the higher premiums paid for added responsiveness features using a whole-of-value chain system instead of a single quality compliance measure. Additional responsiveness is the outcome of information transfer in the value chain facilitated by traceability throughout the processing stages (Doljanin, 2012).

A whole-of-value chain standard can more fully establish information channels and provide value-based pricing outcomes (Polkinghorne et al., 2008) at each stage in the production system. Information about the product could be provided across the value and allow full traceability from producer to consumer. Standards could be established for each chain participant, who in turn would receive an adjustable percentage of the retail value based on the attribution of value from their impact on the quality of the final product.

Traceability and record keeping suggests that a value for each 'primal[2]' can be established. The 'live' inventory value, yield and eating quality information creates the opportunity to optimise the return of primals by choosing how they would be processed on any given day. This level of traceability facilitates the flexibility necessary for the business to respond to changing consumer demands requiring alternative inventory use, isolating quality assurance breaches and, most importantly, translating into value for each participant in the supply chain. Point B on PPF_2 in Figure 8 represents the initial optimal levels of production for both a single retail standard and whole of value chain standard.

If we considered how data from a whole-of-value chain approach could inform farm-level production decisions, we could identify short-term responses (e.g., assessment and management of fat distribution in meat) and long-term responses (e.g., breeding and management strategy changes) (Polkinghorne et al., 2008). Long-run production responses are represented by an upward shift in production value from PPF_2 to PPF_3 while consumer preference results in an increase in WTP represented by a shift in the iso-revenue curve from IC_2 to IC_3. The new optimal point at C represents a substantial shift in value for the entire industry.

The 'value' of beef is governed by substantial complexity in many factors that influence eating quality (Griffith and Thompson, 2012). Beef value chains are known to experience high variability in production processes, something that introduces risks to value right across the value chain. While information made available to consumers is shown to be clearly valuable, the provision of too much information is known to create inefficiencies. This is illustrated in Figure 8 where, at D, the value chain is technically inefficient relative to the PPF. At this point, value chain participants are adding information characteristics (to generate a consumer

[2] Beef carcass primals are a combination of the three primary tissues of muscle, fat and bone, according to the boning priorities of individual processing facilities.

response) to meat of insufficient quality to warrant such a response. Revenue earned along IC_4 is less than that revenue earned for the original ungraded beef sold through the conventional system in the non-graded beef chain operating at point A. This outcome illustrates that a complex combination of consumer-specific information may in fact undermine the total value of beef sold to consumers. In this circumstance, the best way to achieve a gain in value is returning to the non-graded beef chain. This has the effect of reducing the degree of consumer-level response while expanding output. Figure 8 highlights that the optimal outcome would be to increase efficiency under the whole-of-value chain approach and move to C, which is on a higher IC than A, than to revert to the conventional system. The preferred way for this to occur would be to simplify information exchange.

If Paraguayan producers are unwilling or unable to adapt the export beef industry to become more responsive to consumer tastes complemented by comprehensive graded beef programme, then the capacity to fundamentally capture this value will remain structurally constrained. The measurable premium embedded in consumer responsiveness that promotes graded beef relative to ungraded beef will remain suppressed and the expected value premium may not recover the additional costs needed through the value chain to restructure towards a graded beef programme. This is portrayed as an extreme flattening of both the production frontier and the iso-revenue curve in Figure 9. If the higher reward for quality is only marginal, then the incentive for the value chain to produce more of the higher value product and less of the lower value product will be limited. An industry unable or unwilling to make sustained quality improvements over a broad scale may be structurally constrained from capturing value in the consumer responsiveness dimension. This could forever consign the industry to be a low-cost producer and limit the value creation capacity of high-quality producers within it.

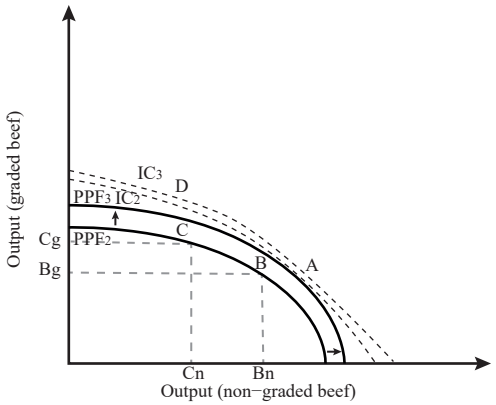

Figure 9: Single metric export beef grading systems with differences in eating quality, constrained by capacity to address quality.
Source: Adapted from Griffith and Thompson (2012).

Conclusion

We have found that both a perceived and an actual absence of quality controls over beef production, coupled with the lack of an industry body representing Paraguay's beef sector are the major impediments to growth in the export market. The lack of sustained support for, and marketing of, export quality-beef has led to persistent price discounting despite quality improvements implemented across the supply chain.

The capacity to gain market share remains diminished due to the disaggregated approach in which Paraguayan beef is marketed to foreign buyers. An industry-wide effort to coordinate food safety and quality activities as well as maintaining certification programmes, market intelligence, promotion and research and development could offer some competitive advantage to Paraguay's producers. While a central industry body has clear advantages, of greater value would be the establishment of meat quality standards addressing the deficiencies in consumption-level responsiveness to meat quality. The establishment of an industry body would also need to overcome the hurdles associated with transaction costs across the alliance.

Establishing meat quality metrics as a priority, however, offers the industry a potential gain in competitiveness, as long as information dissemination to consumers is matched to their level of demand responsiveness. Focusing on meat quality embedded in a relatively simple metric would provide an optimal outcome for Paraguayan beef producers, at the lowest cost. However, this structural change would need to be addressed across the entire beef sector to and not simply introduced to small pockets of producers, in order to ensure that the margins available to high-quality operators are fully realised.

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