

# SUPPLY CHAIN ANALYSIS OF AUSTRALIAN BEEF RETAILERS/WHOLESALERS

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## ABSTRACT

An empirical model was developed to analyse supply chain practice, antecedent cooperative behaviour (trust and commitment), and food quality as a supply chain performance indicator for Australian beef retailers/wholesalers. Based on the results of this analysis, alternative configurations for these supply chains that enhance performance of the businesses concerned are suggested in this paper.

Four elements of supply chain practice (information sharing, information quality, strategic supplier partnerships and commitment) have a significant positive correlation with food quality for Australian beef retailers/wholesalers. Strategic supplier partnerships have a strong positive correlation with food quality, therefore this study focused on this issue.

**Keywords:** information sharing, information quality, strategic supplier partnerships, commitment, food quality, supply chain practice

## **INTRODUCTION**

The Australian Meat Industry is an important industry as the fourth highest commodity export earner. The inclusion of overseas customers (over 100 countries around the world) is necessary in supply chain analysis given that Australia typically exports about 65 percent of its production. The value of the production of the Australian red meat industry has increased by \$2.4 billion in the last five years. In addition, the Australian red meat industry provides employment to more than 50,000 employees [1].

The beef sector in Australia is undergoing rapid change because of globalisation, a highly competitive beef market (local and export), increased production efficiency, quicker production cycle and delivery times and consequently reduced inventories, advanced quality assurance and better satisfy customer, a general speed-up of the rate of change in the business environment, a trend toward more outsourcing of activities, and the rapid development of IT [2]. In this type of business environment, advanced supply chain systems have been observed to have dramatic impact [3-5]. Hence such systems have the potential to provide significant contributions to Australian beef industry performance. The research reported focused on supply chain practice, antecedent cooperative behaviour (trust and commitment) and one supply chain performance indicator – food quality in the beef wholesalers and retailers. Based on the modeling work, suggested improvements are presented and analysed for beef retailers/wholesalers.

Combining knowledge of the rapid changes taking place in the beef industry with the supply chain management literature leads to the following problem statement: How do the antecedents such as strategic supplier partnership, customer relationship, information sharing, information quality, trust, commitment and a lean system [6] affect supply chain performance, as measured by food quality of Australian beef retailers?

## **AUSTRALIAN BEEF SUPPLY CHAIN MANAGEMENT**

Beef supply chain management is the integration of cattle producers, beef processors, retailers and end customers. The cattle move from farms/feedlot to processors who transform them into beef products and organise delivery into the hands of end customers.

There are four echelons of the Australian beef supply chain (see Figure1): cattle production, beef processing, beef retailing/wholesaling and final consumer. Other echelons in the Australian beef supply chain [7] are transport (transport specification, quality systems and price), product storage (storage specifications, quality systems, storage management practices), preparation and packaging (grading and packaging standards (such as AUS MEAT language specifications), quality systems and receipt standards and procedures), market access (statutory export regulations, and market access issues, quarantine).

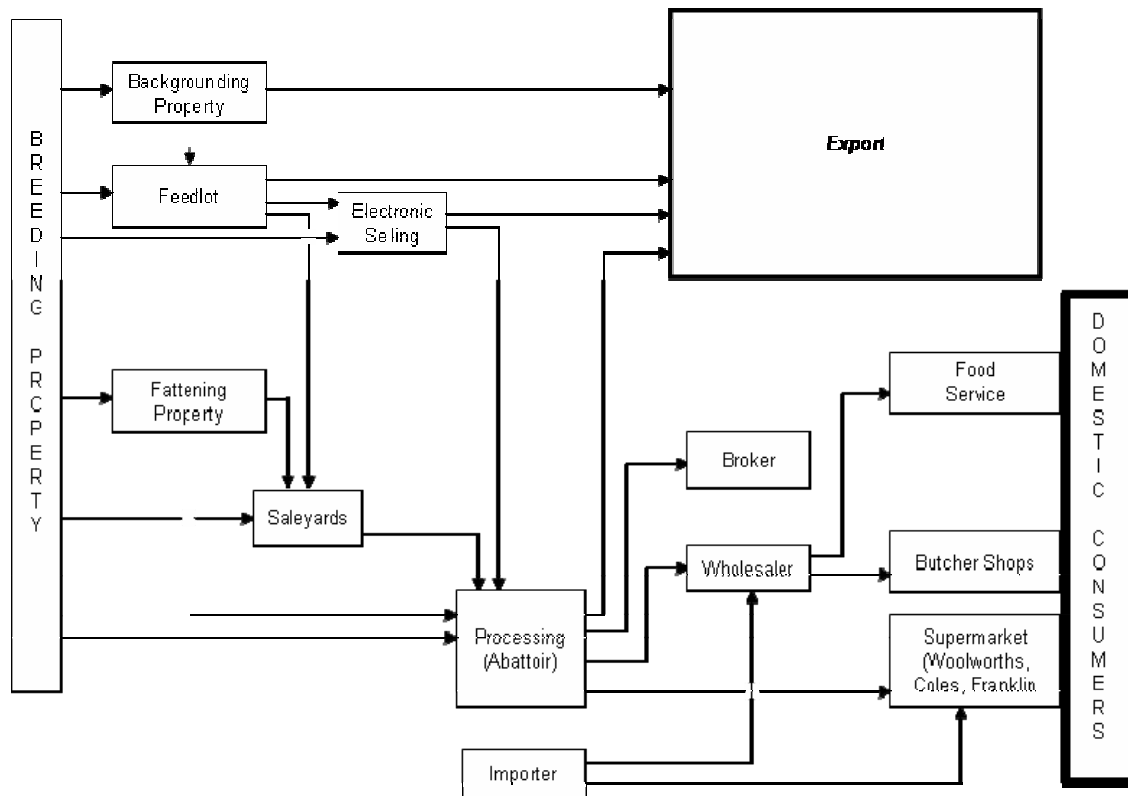


Figure 1. Australian beef supply chain framework

There are two types of integrated supply chains in the Australian beef enterprises. First, fully integrated supply chains which have cattle moving from feedlot/farms to processors who transform them into beef products and organise delivery into the hands of end customers. Large retail beef enterprises such as Woolworths and Coles have fully integrated supply chains. Second, partially integrated supply chains have supply chain activities only from slaughtering to end customers or from producing to slaughtering. Small and medium beef enterprises mainly contribute to these partially integrated supply chains.

## SUPPLY CHAIN PRACTICE

Supply chain practice is a set of activities undertaken in an organisation to promote effective management of its supply chain. There are many previous studies on supply chain practice in different sectors (see Table 1).

Table 1. Previous studies on supply chain practice

Author	Description
Li, 2002 [6]	Supply chain practice has been tested empirically. There are seven elements of supply chain practice: customer relationships, strategic supplier partnerships, lean system, information quality, information sharing, trust and commitment.
Donlon 1996 [4]	There are five elements of supply chain practice: strategic supplier partnerships, continuous

	process flow, information sharing, outsourcing and cycle time compression.
Tan <i>et al.</i> 1998 [8]	Supply chain practice has been tested empirically. There are three elements of supply chain practice: quality, customer relationships and purchasing.
Alvarado and Kotzab 2001 [9]	There are two elements of supply chain practice. First, application of EDI can be used in inter-organisational systems. Second, postponing customisation toward the end of the supply chain can eliminate the excess stock levels.
Tan <i>et al.</i> 2002 [10]	There are six elements of supply chain practice: supply chain integration, information sharing, supply chain characteristics, customer service, geographical proximity and JIT capability.
Chen and Paulraj 2004 [11]	Using supplier base reduction, long-term relationships, communication, cross-functional teams and supplier involvement to measure buyer-supplier relationships.
Min and Mentzer 2004 [5]	There are seven elements of supply chain practice: agreed vision and goals, information sharing, risk and award sharing, cooperation, process integration, long-term relationship and agreed supply chain leadership.

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A review of these studies reveals that five components are of major importance to the Australian beef industry: strategic supplier partnerships, customer relationships, information sharing, information quality and lean thinking. This is because those components generally exist on an intra or inter-organisational, for instance between producers and processors or processors and retailers. Moreover, those components can give many advantages for beef enterprises including improved responsiveness and flexibility, increase production efficiency, beef quality and better satisfy customers. Then it may lead to both greater customer satisfaction and higher profitability both by increasing revenues and reducing costs of firms in the beef supply chain.

## **SUPPLY CHAIN PERFORMANCE INDICATOR**

Based on the existing and previous studies over the years in different sectors (see Table 2), the most relevant indicators for measuring the performance of the integrated supply chain appeared to be: efficiency (costs, assets, profit, net income, return on investment, waste reduction), customer service, flexibility (volume and delivery flexibility), responsiveness (lead time and on time delivery), reliability, product availability, product and process quality. A review of these studies reveals that efficiency, flexibility, responsiveness and quality should be included in the conceptual framework of the Australian beef supply chain performance indicators. They are of

major importance to the Australian beef industry. This is because they can capture the characteristics of beef supply chain including organisational level (cattle producers, beef processors and retailers) as well as other financial and non-financial indicators. Furthermore, they are easy to quantify the measures.

Table 2. Previous studies on supply chain performance indicators

<b>Author</b>	<b>Descriptions</b>
Beamon [12, 13]	There are three supply chain performance indicators: efficiency, customer service and flexibility.
Gunasekaran <i>et al.</i> [14]	Develop a conceptual framework for supply chain performance indicators at three levels: strategic, tactical and operational.
Persson and Olhager [15]	Simulation is able to analyse two supply chain performance indicators (quality and short lead time).
Berry and Naim [16]	There are two suggested configurations to improve efficiency performance indicator: reducing lead time and information sharing.
Lai <i>et al.</i> [17]	There are several supply chain performance indicators in transportation: responsiveness, reliability, costs and assets, efficiency, service effectiveness for shippers.
Van der Vorst [18]	There are five food supply chain performance indicators: product availability, quality, responsiveness, delivery reliability, total supply chain costs.

## METHODS AND FINDINGS

A supply chain management survey of the Australian beef industry was conducted by distributing a mail questionnaire to beef retailers/wholesalers. The survey asked participants in the industry to express their views on various aspects of the supply chain, with focus being placed on the indicators. The effective response rate was 23%.

Using Cronbach's alpha [19], to test internal consistency, values of 0.6-0.87 were obtained. While 0.7 or above is desirable [20], 0.5-0.6 is sufficient [21]. In this project, the majority of items are based on established scales that have already been subjected to tests of content validity [6, 13, 22-24]. In addition, the pre-test confirmed that a group of industry experts viewed the scales as acceptable.

Discriminant and convergent validity were assessed by using factor analysis. Again the results fell within the acceptable range and hence division into beef retailing/wholesaling was appropriate. Finally, stepwise multiple regression analysis was performed. Australian beef retailers' supply chain practices (strategic supplier partnerships, information quality, information sharing, customer relationships, lean

thinking, trust and commitment (independent variables) were regressed on the supply chain performance indicator – food quality (dependent variable).

### Regression modelling of Australian beef retailers’ supply chain

The results are based on an analysis of the views expressed in the survey by retailers/wholesalers. The estimated regression model equation is (t- statistics are given in parentheses):

$$Y_{scp\_fqual} = \alpha + \beta_1 * SSP + \beta_3 * IS + \beta_4 * IQ + \beta_7 * Commitment + e_i$$

$$Y_{scp\_fqual} = 5.171 + 0.823 * SSP + 0.243 * IS + 0.402 * IQ + 0.182 * Commitment + e_i \quad (1)$$

(10.302)
(3.733)
(5.454)

(2.574)
**Rsquare = 0.89**

NOTE: Y<sub>scp\_fqual</sub> – supply chain performance food quality (dependent variable)  
 SSP – strategic supplier partnerships  
 IS – information sharing  
 IQ – information quality  
 Commitment – commitment

Based on the regression model, strategic supplier partnership, information quality, information sharing and commitment have a significant influence on food quality as a measure of retailers’/wholesalers’ supply chain performance.

## DISCUSSION

Four elements of supply chain practice (information sharing, information quality, strategic supplier partnerships and commitment) have a significant positive correlation with food quality. *Strategic supplier partnership* has a very strong positive correlation with food quality. Therefore, strategic supplier partnerships are discussed in this section.

There are nine suggested configurations designed to build strong strategic supplier partnerships between retailers and their suppliers:

1. Teamwork, Collaboration and Synergising  
 The first configuration to build strong strategic supplier partnerships is to build good teamwork as a collaborative and *synergising* approach involving top management. The forms of teamwork as a collaborative and synergising approach are formal or informal networks, long-term contracts, joint ventures and acquisitions. These configurations might solve the current problems retailers and their suppliers are experiencing, for instance product waste, product contamination, skill shortages, product availability, and government regulations. Thompson [25] agreed that solving problems can influence the successful establishment of a partnership. A delay in solving problems may create disruption.

In addition, these configurations can help decision making regarding short or long-term partnership strategies or tactical approaches.

Formal networks between retailers/wholesalers and processors can be encouraged by using simple language in written agreements or contracts that clearly outline the expectations and outcomes for those parties. Involving top management should be achieved with strong, motivated leadership and commitment. For example, Marks and Spencer (M&S) which is one of the UK's most successful retailers has worked together for more than 25 years to share a high level of mutual dependence with Northern Foods (the largest food manufacturer in UK). Their relationship is based on value-adding partnership which works through 'centers of excellence' (people, products and technology) with food safety and quality as their key elements. Australian beef retailers could learn from this example.

In another example, the collaborative and synergising approaches of the teamwork between the Organic Meat Company (located in Sydney, NSW) and its suppliers may improve high-quality meat, hygiene and also reduce the impact of seasonal variations in product availability. The Organic Meat Company's supply partners are focused on sourcing in a clean, green, safe and natural environment. Sanger, one of the suppliers of the Organic Meat Company, provides on-time deliveries of high quality meat which in turn enables the firm to better manage the inventory position. Additionally, Sanger is in regular contact with this firm and hence it contributes information to provide feedback continuously to the Organic Meat Company, to make production decisions according to demand. *"Through long-term partnerships with major supplying processors, Sanger has built a strong competitive edge in the meat industry, exporting 15 percent of Australia's meat last year alone"* [26, p.1].

## 2. Communication and Networks

The second configuration is to have good communication and networks between retailers and supply partners. One structure of good communication between retailers and suppliers is a joint-strategy meeting every six months to discuss internal or external business strategy. Such strategy discussions are often about food safety and traceability between retailers and their suppliers. Food safety and traceability is now important in the red meat industry. A trace back system must be developed from the end customer to the retailer's supplier [27]. For example, Tasmanian Meat Wholesalers Pty. Ltd has good communication with suppliers (by management approval and it is assessed regularly at Management Review meetings) to ensure that the suppliers meet the high quality standards of meat products and food safety standards, free from contamination [28].

There are several studies which confirm that communication and networks are essential for trading partners. Palmer [29] suggested that there are 3 C's (*commitment, communication – of the purpose, continuity – of efforts*) to develop effective business linkages between retailers and their suppliers. Thompson [25] agreed that communication may influence the successful establishment of a partnership and alliance.

Peypoch [30] stated that networks that can drive close relationships with suppliers can ensure that acceptable product is sourced (in terms of logistics and lead times in sourcing product for purchase orders). Also, in the process, partners can identify the value of the partnership to them.

Wisner [31] suggested that a partnership is not only a relationship between organisations, but it is a relationship between specific individuals. In other words, personal relationships in strategic supplier partnership are important as well as the relationships between trading partners. Interpersonal relationships between retailers and processors or producers are important since they may communicate and make things happen.

### 3. Share Benefits and Financial Commitment

To have clear sharing of benefits [25] and financial commitment between retailers and supply partners is another component of strong strategic supplier partnership. Partnering in beef retailers should result in a win-win situation, which can only be achieved if both trading partners have compatible needs. The mutual needs can establish an environment conducive for partnership or alliance as well as an increased innovation. Also, if trading partners clearly share the benefits of the partnership, it leads to a productive and long lasting relationship. Moreover, a partnership should not end up with another partner feeling under pressure. It means that trading partners are all to be winners as well as to share benefits so that the reputation of each will be enhanced. Fearne [32] confirmed that the relationships should be cooperative rather than confrontational (for example fighting over prices at the margin). In addition, he confirmed that trading partners should work together to deliver a high quality and safe products to the final consumer.

There is a good example from Ralph's Meat Company which was established in 1908. Ralph's Meat Company is a 100 percent family owned business located in Altona, Victoria. This firm wants to establish long-term, mutually beneficial relationships with suppliers and customers alike. The purpose is *"to have different groups in the company working together to the best of their ability producing high quality safe products for customers by using all resources to their fullest capacity"*. Another objective is *"to be innovative in identifying productivity, growth and value adding to our products downstream and upstream of our current business"* [33].

### 4. Vision, Future Plans and Objectives

To share their vision, future plans and objectives [31] will assist in cementing a partnership. If the vision and objectives are not well aligned or overly optimistic, it can lead to the failure of strategic supplier partnerships or alliances. All partnerships should state viewpoints of the buyer and supplier, reasons and goals of the partnership, and future plans for the dissolution of the relationship. The focus must move beyond tactical issues and toward a more strategic path to corporate success.

There is a good example from Coles supermarkets to share the vision, future plans and objectives in building strong strategic supplier partnerships. Coles communicates the supply chain vision and future plans to assist align suppliers'



strategies and visions as they move forward together. In addition, Coles shares progress of the supply chain projects with its suppliers, so they might find of interest and value [34].

#### 5. Joint Training Programs

Thompson [25] confirmed that implementation of lessons learnt from supply partners through joint training programs can produce benefits in other business areas for each partner. Also, joint training programs are important to mitigate skills and knowledge shortages in the Australian red meat industry [27].

#### 6. Using Alliance Experience to Capture Different Areas of Expertise

Using good alliance experience a firm can draw-in expertise to develop new product specification.

A good example from The Organic Meat Company that is located in Sydney, NSW. This firm has strategic alliances with supply partners which are located in South Burnett in QLD, Bindaree in NSW and G.H. Keily in Victoria. *“Through the alliance experience, the firm can also offer shelf ready mapped (modified atmosphere packaging) product, which allows excellent presentation and a guaranteed seven days shelf life. All our processors are Certified Organic, and have in house quality assurance systems in place so they can consistently supply export quality meat that guarantees our customers are getting what is expected.”* [26, [www.theorganicmeatcompany.com.au](http://www.theorganicmeatcompany.com.au) ].

#### 7. Applying Best Practices

Establishing best practices in trading between retailers and suppliers is facilitated by the presence of optimism, flexibility, mutual trust and respect [25, 35], a lot of hard work and full commitment. An example is Ozzy Meat Exporters (Halal products) located in Greenacre, NSW which is working closely with the suppliers to ensure contracted beef products are delivered to the customers in a timely manner [36]. As a member of the Australian Meat Industry Council and an export licence holder through the Australian Quarantine and Inspection Service, this firm and the suppliers *“adhere to strict food safety and hygiene controls to ensure that we remain at the forefront of industry, customers’ requirements and technological developments. Comprehensive quality assurance programs are overseen by AUS-MEAT and are maintained by each individual supplier, ensuring that product quality, licensing, labelling, testing, religious slaughter, health and certification requirements are all completed”* [36, [www.ozzymeatexporters.com.au](http://www.ozzymeatexporters.com.au)].

#### 8. Evaluate the Suppliers

Retailers should evaluate their own suppliers. A good example to learn from is Oakdale Meats Company. Oakdale Meats Company was established in 1967 and is a fully owned and operated family business. This company which is located in Dandenong in the south eastern suburbs of Melbourne only purchases from approved suppliers. This means that *“all suppliers are evaluated and continually monitored to ensure our standards are maintained”* [37].

## 9. Monetary Incentives

Trading partnership can be based on monetary incentives [38], for instance market price and bonus, thus leading to maintaining long-term relationships between retailers and suppliers. For instance, suppliers can provide special market prices and bonuses for retailers during Easter, Christmas or special events. Also, suppliers can provide 'free' advice to retailers in order to get more consistency in the beef product delivered [38].

## CONCLUSION

Based on regression analysis, four elements of supply chain practice (IS, IQ, SSP and commitment) have a significant positive correlation with food quality. *Strategic supplier partnerships* had a strong positive correlation with food quality, therefore the study reported in this paper.

Nine suggested configurations to build strong strategic supplier partnerships for beef retailers/wholesalers are as follows:

1. To build good internal teamwork as a collaborative and synergising approach involving the top management level.
2. To have good communication and networks between retailers and supply partners.
3. To have clear sharing of benefits and financial commitment between retailers and supply partners.
4. To share their vision, future plans and objectives.
5. To develop and implement joint training programs with industry partners.
6. To have good alliance experience and different areas of expertise to develop product specification.
7. The presence of optimism, flexibility, mutual trust and respect, a lot of hard work and full commitment in trading between retailers and suppliers.
8. Retailers should evaluate their own suppliers.
9. Trading partnerships could be based on monetary incentives for instance market price and bonus, thus leading to maintaining long-term relationships between retailers and suppliers.

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