

## **SUPPLY CHAINS: WHAT ARE THEY AND WHY BE INTERESTED?**

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### **1. Introduction**

Changes in the competitive environment for food and fibre products have led to interest in supply chains. Research work in this area has accelerated in the last five years; most current work is in the developed world, led by Dutch, English and US researchers with discipline backgrounds in IT and business management, food business management and agricultural economics respectively. All the work is being conducted in partnership with industry stakeholders, but rather than the commodity orientation that we traditionally have adopted in agricultural research the focus is on agribusiness units and business to business relationships.

This paper introduces the current work, touching on the drivers for interest in supply chains, some key issues in supply chain management, and the likely benefits for primary producers. The focus then shifts to two areas that are comparatively unexplored – the impact of a supply chain orientation on R&D planning and management, and the relevance of supply chain management concepts in the developing world.

### **2. Trends in the competitive environment**

There are two key trends which affect the competitive environment in which farmers operate. The first is globalisation and the trend, albeit slow, towards free trade. One key feature relevant to this discussion is the rise of international corporations (both selling internationally and sourcing products internationally) in the food industry. Another feature is reductions in trade barriers and improvements in market access, resulting in domestic suppliers around the world being challenged on price and quality by imported products in their home markets. (This includes imports from one developing country to another, for example, bananas from central and south American countries entering Asian countries.) Both international food retailers and growing exports of fresh foods (enabled by post harvest technologies, amongst other developments) bring a trend towards “world” standards in food quality and safety.

The second trend is the declining terms of trade affecting agriculture. Last century, Marx recognised that as economic development occurs the value of agricultural product falls steadily as a proportion of both weekly spending at the household level and GDP at the national level. Since the price of inputs into agriculture tends to keep pace with the growth in the economy as a whole but the returns to agriculture do not, it follows that farmers will experience declining terms of trade.

### **3. What is supply chain management?**

Supply chain management simply refers to the management of the entire set of production, distribution and marketing processes by which a consumer is supplied with a desired product. Some prefer the term demand chain on the grounds that this places the key focus on the consumer's requirements. However, while the consumers may determine the market size and preference, they do not play an active role in the management of the chain. In practice, for the competitive performance of the chain to improve one or more of the supplier members of the chain must take the initiative.

### **4. Drivers of interest in supply chains in the developed world**

Interest in supply chains is linked to the concentration which has occurred at all levels of the supply chain in developed countries, led initially by concentration in the domestic retail sector. This is clearly evident in Australia, where three food retailers supermarkets represent more than 80% of food retail sales. Fresh foods represent an increasing proportion (currently around a third) of retail food sales through supermarkets in Australia. Hence businesses supplying fresh fruit and vegetables to the domestic market in Australia are already involved in issues of supply chain management.

The retail business is very cost sensitive with an annual margin across supermarket sales of 2-3%. Faced with declining terms of trade for farmers and tight margins for food retailers, there has been enormous competitive pressure. There are only two sources of competitive advantage - cost leadership and differentiation. Concentration has been largely in pursuit of competitive advantage; it is simply the process of seeking economies of scale to minimise costs. Once the costs in each step of the chain are minimised through achieving scale, the next area to look for cost reductions is in the links between the functions. Once again the immediate interest is in cost reduction through reduced transaction costs. Again concentration is an advantage because the number of transactions are minimised and the cost of each transaction is minimised in the context of an established relationship.

While there is no doubt that cost leadership provided the initial incentive for tightly managed supply chains, there are other trends and requirements to which this approach is well suited. Developed country consumers want products which recognise demographic features of modern societies - individual portions, high convenience, freshness, taste and value. They are interested in products packaged with services, and in the regional/ethnic identity of the product. Increasingly they demand ethical foods - meeting desired management standards in relation to the environment, animal welfare, and fair trade. Supply chain management provides the tools for ensuring that these and future desired consumer values can be identified and preserved throughout the chain.

New technologies are a further driver. For example, the commercialisation of GM products will increase the trend to link the management of input supplies with the marketing of the farmed product and its eventual commercial use. Supply chain management will facilitate this commercial process. Embedded issues of product development, product integrity and efficacy, and product segregation, will be facilitated by technical and scientific skills and judgements linked into the business management processes.

## **5. Issues in supply chain management**

The first issue in supply chain management is the relationship between members of the chain. This issue is informed by a substantial business and management literature on strategic alliances, but by relatively little literature on the process in relation to agriculture and agribusiness. Relationship issues to be considered include:

- sharing long term development goals and seasonal business planning,
- the relationships between operational staff within the businesses on issues such as timing, amount, ripeness and temperature of deliveries,
- the development of shared quality and safety standards and how they will be measured and monitored;
- the information systems to track product and standards.

The relationship may include shared access to inventory control systems and to sales performance data.

At the farmer level a key preliminary step is often the development of relationships between individual farmers to create a trading entity with capacity to supply sufficient quantity and continuity to be a credible supply chain member. This may be championed by a farmer, by another member of the chain, or by an external facilitator or manager. Hence the technical and professional issues in supporting the operation of supply chains may include facilitating:

- the development of relationships between farmers to allow their participation
- the development of relationships between members of the supply chain
- information flows between members of the supply chain
- establishing common standards between members of the supply chain
- optimising performance within each level of the supply chain and in the linkage processes.

Why might individual farmers choose not to be part of a supply chain? Key barriers appear to be fear of loss of independence, the possible need to break existing relationships, and a culture built up around spot transactions. In the spot transaction culture, the objective has been to increase the share of the existing pie (the value generated by the chain) while the supply chain culture depends on attempting to share the benefits of growing the pie.

It is increasingly clear that in the developed world, competition for market share is between chains. New technologies such as biotechnology will further define the chain and will increase the focus on the chain as a location for competition and innovation. Using the information within the chain to innovate in both products and processes will provide opportunities for competitive advantage based on differentiation as well as cost leadership. As a result there is increasing interest in creating exclusive relationships within chains and on building feedback and learning processes into chains.

## **6. Benefits for primary producers operating within chains**

For Australian horticultural producers, an established relationship within either a domestic or export chain can provide a way to plan quantity and timing of supply, and to have an agreed pricing arrangement. For producers operating with very tight margins and employing significant numbers of staff, chain plans which allow forward planning of labour requirements and can

underpin investment decisions are an important advantage.

Few retailers are providing chain members with detailed analysis of their point of sale data. However, access to inventory information and ordering requirements represents a significant improvement for a horticultural producer compared with sending fruit to a distant wholesale market with very limited knowledge of the amount or quantity of product with which it will compete on a given day. The relationship ensures immediate feedback on holding quality and presentation and feedback is more likely to be consistent when it comes from a category manager for a major chain. An important feature which has been identified in the increasing concentration of chains is the so-called “paradox of power” (Fearne, 1997). An initial driver of chains, as noted earlier, was the concentration of retailing in response to very tight margins and the need to contain costs by achieving economies of scale. At this point size and power were concentrated in the retailers. However, as suppliers and other chain members have also concentrated, it is clear that the inequalities of size and negotiating skills have reduced. More importantly, the possibility of replacing a key supplier in the short term has also reduced. Consequently, retailers now depend on their suppliers in a similar way to the dependence of a supplier on a retailer. The result is evident in negotiations of price (for example, based on cost of production plus profit margin) which increasingly share value between chain partners. Such negotiations recognise the need to invest in ongoing loyalty to the relationship and to ensure that all players have an incentive to continue to operate.

Closer relationships also provide opportunities for farmers to extend their operations along the chain. For example, additional grading which improves product shelf life and reduces wastage (and the associated labour costs for retailers to “pick over” shelves) represents extra value added by the farmer and can be recognised with higher payment by retailers, offset by their savings in labour costs. Similarly, a farmer who develops the capacity to pack onto consumer friendly polystyrene trays is assisting the retailer to manage product safety and reduce the risk of in-store contamination of the product. If the packaging also carries a bar code the cost of weighing product at the check out and of training check out staff to identify fresh produce is also saved.

## **7. Benefits for R&D in adopting a supply chain framework**

To this point I have focused on the development of supply chain management for the retailing of food products (and in particular fresh fruit and vegetables) in the developed world. An area in which the concept of supply chain management has had relatively little impact is in R&D planning. Most agricultural R&D planning has been focused at the production end, and while it considers consumer trends, it does so in the context of broad industry changes. As deregulation proceeds, there are very few business entities which embody the industry in the marketplace. In reality, R&D processes need to support change by business entities, designed to make better or more reliable profits. Supporting decisions about improving business performance requires R&D planners to become involved in greater segmentation of the market. It requires clear understanding of which partners in the chain need to be involved and how the value of any change can be apportioned to encourage the partner making the adjustments. This analysis is only possible if R&D providers work with businesses, including farmers, and become part of the information flow within a supply chain.

For example, if R&D results in new on-farm management strategies to increase shelf life of a product this could be used to reduce costs within the chain or could be used to increase the attractiveness of the product to the consumer. Unless the chain members can agree on how the value is to be realised from the innovation and are able to capture the value and apportion it appropriately, there is not necessarily any incentive for change and improvement by the chain members. In this circumstance there is also little point in the R&D because its adoption is unlikely. Alternatively, if it is clear which partner can capture the value and how, there is a strong incentive for change and a potential negotiation point for contribution to and/or involvement in the research process. There is also a clear starting point for commercialisation of the technology and for management of its commercial value.

One of the consequences of an R&D focus on the farm is that it is principally based on the biological, economic and social science skills traditionally oriented towards agriculture and rural resource management. Yet futurists suggest that the new major new technologies for the next 25 years will be in information technology, materials technology, genetics, & energy technologies. It is not hard to see how IT and genetics fit in the picture of supply chains that I have been painting, and post harvest specialists work on packaging characteristics of new membranes and polymers. It is also not hard to see how radical changes in energy costs could shift the economies of supply, or to see the application of more sophisticated alternative energy sources on the capacity for reliable electricity for on-farm refrigeration or refrigerated transport in many developing country situations. The capacity to generate energy from waste products may also become a high priority if requirements for alternative energy, renewable energy and waste management are further strengthened. Other countries such as the Netherlands are pulling together much wider teams of R&D skills than we are yet envisaging. Linking new skill sets is one of the possibilities of analysing problems, opportunities, and priorities for improvement in the context of supply chains.

## **8. Drivers of interest in supply chains in the developing world**

A key question for ACIAR is what is the value of a supply chain approach to problems facing the developing world. Farmers in the developing world face the cost price squeeze which affects farmers in the developed world. The necessity to feed rapidly growing populations tends to result in policies to keep food prices low, making innovation and investment unattractive even if the necessary capital and management capacity are available. However, one opportunity available to developing country farmers is the expanding size of the consuming class. At least in the short term, this group can be expected to spend more on higher quality and more varied produce than do their counterparts at lower income levels. Projections by the OECD on future trends suggest that in terms of volume, most of the growth in demand for food will be middle class consumption in World 2 (the large countries of the developing world including China, India, Indonesia and large countries in South America). Much of this demand will be met domestically by World 2 countries but against competition from exporting countries. The primary basis of competition will be price but the presence of exporting competitors will also mean the gradual adoption of “world” quality standards.

The supply chain partners will include the major global retailers who will build retail facilities throughout World 2. Retail developments are most profitable when they are located in areas of high population, high population growth rate of people with incomes at consumer level, high income

growth rates, and low supermarket penetration. This is the perfect description of long term trends in much of Asia. Like their counterparts in the developed world, the competition will be based on cost. International players will also seek to provide food safety and health standards similar to the west. The risk of a major accident is serious for a global retailer — both in terms of their international reputation and because their pockets are perceived to be very deep in relation to compensation and penalty payments.

Similarly the use of new technologies in developing countries (especially biotechnology, which has the potential to contribute to food quantity and quality) seems likely to be based on commercial relationships which will require some form of coherence and control of the supply chain.

This scenario implies that there is an opportunity for supply chains in the developing world to ensure their future competitiveness by beginning to develop the capacity to supply the retailers and consumers of the future. In much of the developing world supply chains are fragmented, indirect, and characterised by poor information flows from the market back to the producers. In aspiring to help developing country farmers take advantage of the growth opportunity to supply the consuming classes, the aim should be to build the capacity of domestic producers to match the products which our farmers (and others) will be aiming to put into Asian markets. To not attempt to equip third world farmers to do so would see them cut out of the major growth sector in food markets in the world. Their displaced product would depress domestic prices for lower class consumption and further exaggerate the cost-price squeeze.

## **Reference**

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