Agribusiness Cases in Supply Chain Management

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ABSTRACT

The paper uses case studies of three different agribusinesses to demonstrate the principles of supply chain management and how it is applied. Primary producers must learn to understand and take advantages of the opportunities available to them in the new systems of supply change management. The agribusiness cases demonstrate a practical application of supply chain management that can affect and be applied to farm businesses throughout the world.

INTRODUCTION

The paper begins by briefly explaining the theoretical base of supply change management. It then briefly describes three California agribusinesses and how these agribusinesses use supply chain management to meet consumer needs and expectations. It concludes by discussing how farm businesses need to adjust their thinking to fit into the new realities of supply chain management.

SUPPLY CHAIN MANAGEMENT DEFINED

Supply chain management is the cooperation between producers, processors, wholesalers, and/or retailers, to guarantee high quality and/or to minimize costs for a product or products. The study of supply chain management is done to discover the nature of the alliances between various players along a supply chain.

Much of the theory of supply chain management in this paper is based on the discussion of the subject in an excellent article by J.E. Hobbs entitled "A Transaction Cost Approach to Supply Chain Management" (1996). Supply chain

management can be defined as a combination of different arrangements occurring between various business entities involved in the production, procurement, processing, and marketing of a product or products. The arrangements include aspects of marketing, economics, logistics and organizational behavior.

NEW INSTITUTIONAL ECONOMICS

Traditionally economists have used neoclassical economic theory to explain the action and organization of firms in an economy. Neoclassical theory assumes all inputs & outputs are the same (labour is labour, wheat is wheat), all firms had perfect and costless information (no uncertainty), and the invisible hand of the market place usually worked.

Recently economists have turned to new institutional economics to explain the action and organization of firms in an economy. The basis of new institutional economics is transaction costs or the cost of using the market, that is, the cost of discovering prices, negotiating contracts, and organizing business. There are three main classes of transaction costs; information costs, negotiation costs, and monitoring or enforcement costs. Information costs are the costs of searching for information about products, prices, inputs, and buyers or sellers. Negotiation costs are the cost of negotiating and writing contracts (managerial expertise, lawyers, etc. or intermediaries such as auctioneers or brokers). Monitoring or enforcement costs arise after the exchange has been negotiated and may involve monitoring the quality and/or behavior to ensure that all terms are met. It also include the cost of legally enforcing a broken contract .

Transaction cost theory makes a number of assumptions. First, decision makers can't accurately evaluate all possible alternatives. Secondly, decision makers will act opportunistically, especially is they have market power. Thirdly, businesses investing in specialized assets have less power in negotiations. Finally, there is too much information to know it all and some know more than others, thereby

resulting in incidents of adverse selection and moral hazard. Adverse selection is based on opportunistic behavior where information is known prior to the transaction. For example, crop insurance; where guaranteed yields are low and farms with poor yields tend to enroll more than farms with high yields. Moral hazard occurs after the transaction because of hidden actions of individuals or firms. For example, again in crop insurance; some farmers enrolled in the program do not try to get their best yield as the guaranteed yield covers their costs.

TYPES OF SUPPLY CHAIN MANAGEMENT

Vertical Coordination versus Vertical Integration

Vertical coordination is the organization of economic activity including all the ways of harmonizing the various stages of production, processing, and distribution throughout the supply chain. Vertical Integration is full ownership of the various stages of production, processing, and distribution throughout the supply chain. Vertical integration is a subset of vertical coordination.

Vertical Coordination includes strategic alliances which are agreements mutually entered into by two independent firms to serve a common strategic objective. For example, a strategic alliance between a pork processor and pork producer to produce pigs via a certain method at a certain quality. Vertical coordination also includes formal written contracts. These contracts may be market specification contracts such as an agreement to buy a seller's output. They could also be production management contracts where the buyer participates in production management through inspecting production processes and specifying input usage. Finally the contracts could be resource providing contracts where the buyer supervises production and supplies key inputs. In resource providing contracts the buyer often owns the product and the seller is paid by volume, for example, the production of genetically modified (GM) crops.

There are also three general types of vertical integration. Quasi-vertical integration includes long term contractual obligations where both parties invest resources into the relationship. For example joint ventures, franchises, and licencees. Tapered vertical integration is when a firm obtains a portion of its inputs through backward integration with a supplier. For example, a beef processor gets some of its cattle from its own feedlot. Full vertical integration is when one firm owns all of the various stages of production, processing, and distribution throughout the supply chain.

One determinant of the extent of vertical coordination potential in an industry is the nature and level of transactions costs. There is more vertical coordination if there is more uncertainty in transactions, for example the product has changing quality levels. There is more vertical coordination if the products are specific and produced with specialized assets, for example, potatoes grown for McDonalds. Finally there is more vertical coordination if there is more infrequent transactions and information may not be equally known between parties.

THE AGRIBUSINESS CASES

There are three agribusinesses examined in this paper. The first is Niman Ranch, a natural beef, pork, and lamb processor contracting with farmers and marketing directly to restaurants and upscale grocery stores (Brown, 2000a). The second is Phil Foster Ranches, an organic fruit and vegetable producer marketing its own branded produce directly to upscale and organic grocery stores (Brown 2000b). The third is the Raisin Administrative Committee, the worldwide marketing facility for California Raisins (Brown, 2000c).

Niman Ranch - A Natural Meat Processor

Niman Ranch supplies upscale restaurants and grocery stores in the San Francisco Bay area and over the last few years, as far away as New York and Atlanta, with gourmet-quality beef, pork, and lamb. It prides itself in offering the highest

quality "natural" meat products produced from livestock raised on family farms. Niman Ranch contracts with family farms to raise their animals in a natural environment without the use of drugs or hormones. It pays higher than commodity prices for its beef (market plus $0.06/lb.), pork (market plus $0.06/lb. with a floor of $0.40/lb.), and lamb and sells the loin and other prime cuts at a 100% premium over regular meat prices. From 30% to 80% of the remaining carcass is being sold at lower commodity prices. Niman Ranch has not experienced a shortage of customers for its loin cuts, despite its pricing policy. Its customers almost universally agree the Niman Ranch meats are higher quality, more natural, and tastier than other meats and worth the extra price. Most of the customers also agree with Niman Ranch's philosophy of contracting with family farms and compensating them for the extra costs of raising the animals in a humane manner. Niman Ranch is so committed to the family farm philosophy that it sees itself as the processing and marketing operation for about 100 family farms.

The beef cattle are fed at Niman Ranch's own feelot in northern California and slaughtered at a plant in Idaho. The carcasses are cut into primal cuts, chilled, not frozen, aged for a week, and transported to Niman Ranch's own processing facility in Oakland, California where the loins are further aged for 4 to 5 weeks for extra tenderness. Periodic shipments are also taste tested.

The hogs used by Niman Ranch are raised free range, that is, pastured out doors or kept in deeply bedded pens, treated humanely, and fed natural feeds including corn and soy meal on about 65 family farms in Iowa and California. The hogs are transported to and processed humanely at a contracted plant close to most of the farms in Iowa. The carcasses are cut into primal cuts and shipped fresh, never frozen, to Niman Ranch's facility in Oakland, where they are taste tested and further processed into chops, loins, hams, and other pork products. In the past Niman Ranch grew only as fast as the whole animal could be sold. This strategy

has worked well with the beef and lamb portions of the business. In 1998 Niman Ranch was given an opportunity to supply 20 Fresh Fields grocery stores in the eastern U.S. with pork loins. Unfortunately, the contract has thrown the pork portion of the business out of balance and Niman Ranch has found itself with an over supply of bacon, hams, and other pork products that have been sold at commodity prices, which are below the company's cost.

Niman Ranch uses supply chain management extensively. It vertically coordinates the supply chain with contracts and uses tapered vertical integration by owning its own beef feedlot. Niman Ranch needs to coordinate production because its products are specific (very high quality) and to reduce the uncertainty of not getting high quality. The contracts are the production-management type as Niman specifies how animals are to be raised and will do inspections.

Phil Foster Ranches - An Organic Vegetable Farm

Phil Foster Ranches is a 252 acre, organic vegetable, fruit, and nut farm in the Central Coast Valley of California, about 30 miles south of San Jose. Most of the sales up to 2 years ago were to a number of produce brokers that sold Phil's produce for him in the wholesale market on a commission basis. The brokers also charged Phil for cooling and loading the produce. Phil thought he could get better prices by selling direct to retailers. Between 5 and 10 percent of the produce had also been sold at local farmer's markets over the last number of years and although time consuming, showed good returns for the effort. In addition, a local delivery route to small grocery stores, wishing to sell organic produce was started 2 years ago. The delivery route required packing, cooling and handling facilities and refrigerated transportation and now requires significant further investment of both time and money if it is to be maintained and expanded. In addition, Phil feels, with the local delivery route, the farm should produce a large variety of crops annually so that it can offer a full range of produce to its customers and diversify its rotation enough to handle production risks.

Phil owns 30 acres on which he has located his home and business office. The rest of the land is rented. All but 10 acres of this rented land is certified organic by the California Certified Organic Farmers (CCOF) organization. These 10 acres will be certified organic by 2001. Phil says that the total organic certification fees have been running around $7,000 per year over the last few years.

The farm grows over 60 different varieties of vegetables, fruits, and nuts. The acreage of any one crop is quite small when compared to commercial vegetable production and seems to fly in the face of conventional wisdom with respect to economies of size. Crop acreage plans are prepared 1 to 2 years in advance and are subject to rotation restrictions. However, more recently the acreage of individual crops is being influenced by the demand expressed by the local delivery route customers.

The farm has a full line of machinery and irrigation equipment. There is currently adequate cold storage on the farm, but more will have to be built when the apples enter full production in 3 years and if sales through the farmer's markets and the local delivery route are expanded. There is also a packing line for onions and peppers, but garlic is custom separated and packed. The packing line will also have to be expanded if the local delivery route is expanded.

The field labor complement can range from a low of 12 to 15 people to a high of 32 to 35. There are 12 to 15 laborers from December to February, 25 from March to July, 35 from August to October, and 25 for November. Most of the laborers are local people of Hispanic background and receive between $7.75 to $9.00 per hour. In addition to wages all the workers are covered with a health insurance program that includes family members if they are local residences. The health Insurance premium is $30,000 per year.

Phil Foster Ranches has a registered brand name "Pinnacle" and most of the vegetables sold on the delivery route are labeled as such. The farm also custom packs for some customers.

Phil Foster Ranches vertically coordinates its supply chain with vertical integration into the delivery truck and contracts directly with retailers. It needs to coordinate because products are specific (organic) and to reduce the uncertainty of dealing with brokers. The contracts are the market specification type.

Raisin Administrative Committee

The Raisin Administrative Committee (RAC) was established in 1949 as a federal marketing order under the Agricultural Marketing Agreement Act of 1937 (Nef, 1998). It is an industry based committee composed of raisin producers and handlers or packers and is the administrative body of the federal marketing order. The marketing order gave the RAC the power to market raisins in an orderly manner and to control minimum grade and condition standards.

Annually, by mid August, the RAC must compute the year's "trade demand" for all varieties of raisins. The percentage of raisin production (trade demand) that will be sold as "free" tonnage is based on last year's sales (disposition) of "free" tonnage adjusted for desired carry-out inventory. That is to say, if the desired carry-out inventory at the end of the year is to be lower (higher) than the carry-in inventory at the beginning of the year, the difference is subtracted (added). The resulting calculation is called the "trade demand".

The tonnage designated as "free" is sold relatively soon by producers to packers and usually at a higher price. Whereas "reserve" tonnage is marketed by the RAC for the producer's account at various times over the next year or until the "reserve" is all sold, which may take as long as 2 to 2 1/2 years. The RAC accounts for the production and distribution of raisins by the crop year during which they are acquired by handlers or packers. Even though raisins from one

crop year may be carried over and disposed of during a subsequent crop year, they are accounted for as "free" or "reserve" tonnage for the crop year during which they were acquired.

The price for the "reserve" tonnage is usually lower than the "free" tonnage price. The "free" tonnage percentages are based on estimates of tonnage produced during the year and the "trade demand" is computed from current and historical information about demand.

In late September the Raisin Bargaining Association (RBA), a producer cooperative, bargains a field price for the "free" tonnage of its members with the packers. The RBA represents a little over 40% of raisin producers and raisin production, however, the bargained price essentially results in the field price for all "free" tonnage raisins. The bargaining process is supposed to be completed by the first week of October. Packers have 7 days to accept or reject an RBA offer. If the second RBA offer is not accepted arbitration is started. Arbitration has not been used to date.

Once the "free" tonnage field price has been accepted and announced, on or before October 5, the preliminary percentage to be allocated as "free" tonnage is calculated. The announced "trade demand" for that crop year is multiplied by 85% and the resulting number is divided by the estimated total production of each variety of raisin for the year to give the preliminary percentage to be allocated as "free" tonnage. A raisin farmer delivering 100 tons of raisins to a packer will receive, within 10 days, the "free" tonnage price for the preliminary "free" tonnage percentage of the raisins delivered. On or before February 15 of the following calendar year the RAC computes a final crop estimate and recommends the final "free" tonnage percentage to be established by the United States Department of Agriculture (USDA). The final "free" tonnage percentage has always been either equal to or larger than, and cannot be less than the announced

preliminary percentage. The packer then pays this difference in percentage, within 10 days, to those producers who have already delivered.

The remainder of the raisins from that crop year's production are identified as "reserve" pool under the control of the RAC and sold when possible at prices set by the RAC either for "free" use, government programs, or export markets. The prices received by producers for any crop year's production is a combination of the price received for both "free" and "reserve" tonnage and is not determined until the year's production is disposed. In some years it has taken as long as 2 to 2 1/2 years to completely dispose of the "reserve" pool. Not all the "reserve" raisins are necessarily sold at lower prices. From time to time after mid November the RAC must offer the packers "reserve" tonnage for "free" use, at more than the "free" tonnage price. These offers amount to 20% of the prior year's shipments and are known in the industry as the 10 + 10 offers. The packers do not have to take these additional raisins, but if they do, these raisins are released to the packers when paid for from the "reserve" tonnage controlled by the RAC and used by the packers as "free" tonnage.

Exports may be from "free" tonnage and a combination of "free" and "reserve" tonnage. Exports from "free" tonnage may require the RAC to give packers a "cash back" payment if the exports are documented. The "cash-back" payments are money the RAC gives back to the packers when they export raisins to countries for less than the "free" price. From time to time the RAC decides on export prices for raisins and may change the export price depending on the importing country. Originally the packers bought the raisins from either growers or the RAC and paid the "free" price or more for the raisins. When these raisins are exported at a lower price the RAC gives the packer cash-back for the difference. For example if a packer acquired raisins for $1,300/ton and sold them to Japan for the RAC suggested price of $900/ton, the RAC would give "cash-back" for documented exports to Japan of $400/ton.

The RAC vertically coordinates the supply chain of raisins with contracts between farmers, processors, wholesalers and consumers. It needs to coordinate because the product is specific (sun dried raisins) and transactions infrequent (once per year at harvest). The contracts are the market specification type.

FARM BUSINESSES AND SUPPLY CHAIN MANAGEMNT

Farm businesses all over the world are entering into various agreements with off farm businesses as part of the movement toward increased supply chain management. Farm business managers will need to adjust their thinking from producing uniform commodities, such as wheat and beef calves, to producing products such as GM canola and natural beef cattle. Farm business managers will also have to adjust their thinking with regards to independence and dependency. If the farm business manager wants to stay independent and free, they have that right, but it also means increased risks and the freedom to go bankrupt. If the farm business manager is willing to give up some independence to reduce risks and perhaps assure the long term viability of the farm business, then he/she should become involved in supply chain management. Supply chain management at the farm level will not mean easier management. Farm business managers will still have to coordinate and fine tune their production and financial decisions but they will be assisted in these and marketing decisions by off farm alliances.

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