The perishable supply chain management: The clients’ expectation factors at the chicken supply chain

Annibal Scavarda (annibal@esp.puc-rio.br)
Federal University of the State of Rio de Janeiro - Brazil

Gustavo Schiavo (gustavo.schiavo@bol.com.br)
University of Vale do Rio dos Sinos

Andre Korzenowski (akorzenowski@unisinos.br)
University of Vale do Rio dos Sinos

Abstract
This research develops a model for the implementation of the perishable supply chain management based on the clients’ expectation factors of the products. This study analyzes in special the processes of the chicken supply chain.

Keywords: perishables, supply chain management, expectation

Introduction
Companies are going through a revolution of new strategies and operational technologies implementation as an answer of the demand of the 21st century. In this way, companies have to overcome the clients’ satisfaction challenges that were waiting for high quality products with low prices. In this way, companies must be responsive to the clients’ demands. To deal with these demands, according to Gunasekaran et al (2008), companies are exploring the management supply chain concepts as a solution to improve their profits, providing high quality low prices items. Supply chain management consists of all activities associated with items flow and transformation, since the raw-material until the costumer (Handfield and Nichols, 1999; Shepherd and Günter, 2005).

Customer’s orientation emphases are regularly cited as catalysts for the high interest in supply chain management (Gunasekaran et al., 2001; Webster, 2002). The supply chain efficient management is treated as a key to build a sustainable competitive advantage trough the improvement of the inter and intra relationships of the companies (Ellinger, 2000).

The literature highlights the challenge of the perishable supply chain management where the product value deteriorates over time in the supply chain. The decrease of product prices due decrease of quality levels over time makes conventional supply chain management strategies inappropriate (Blackburn and Scudder, 2009). The food industry, in overall, and the beef industry, in particular, have observed great changes in their structures. Some examples are the market globalization, the technology improvement, smaller lifetime of products, and diversification of costumer demand (Lindgreen and Hingley, 2003; Fattahiet al., 2013).
On the chicken industry, as the best knowledge of the authors, there is not a study that points out a strategy for the supply chain management, even for products with more complex value time profile (Blackburn and Scudder, 2009). The contribution of this paper is to present the characteristics of this industry and related it with the traditional supply chain management strategies applied to the manufacturing industries. Results of the discussion highlight that the best strategy to be adopted for perishable industry is a mix of lean and agile strategies, as defined conceptually by Bruce et al. (2004).

Supply chain management applied on manufacturing

Supply chain management can improve the delivery of goods, services, and related information from supplier to customer. This type of management is concerned with the effectiveness of dealing with the demands of the end customer, i.e., the parties involved in providing product as a whole (Cooper et al., 1997). The supply chain consists of different levels of companies that influence each other and affect the performance of the other, i.e., suppliers, manufacturers, distributors and customers (Bigliardi and Bottani, 2010). One of the most significant changes in the paradigm of management and business is that companies no longer compete as autonomous entities but compete as supply chains (Lambert et al., 1998). With the increasing reduction of vertical business model, the supply chain has become a strategic step towards the creation of value (Gottfredson et al., 2005).

A range of benefits have been attributed to the supply chain management, including reduced costs, increased market share and sales as well as strong relationships with customers (Ferguson, 2000; Shepherd and Günter, 2005). The management of the supply chain is complex and challenging due to a number of factors, such as variety of products, products with smaller life cycles and increased use of suppliers or process steps outside national borders, for example (Lee, 2002). The choice of supply strategy depends on factors that are characteristics for the market in which the product is inserted and the type of inputs used. A strategy in the supply chain which is not suitable to the product characteristics, market or inputs is bound to fail. To outline a supply chain strategy, it is necessary to understand the sources of uncertainty and explore ways to reduce these uncertainties (Lee, 2002).

For many products, a decision on the supply chain strategy involves a choice between responsiveness and efficiency. The appropriate choice depends on how the product value changes over time, the time interval between production, and distribution to the client (Blackburn and Scudder, 2009). An emerging body of literature provides a framework that identifies three types of supply chain strategies: lean strategy, agile strategy, and leagile strategy based on in-depth case studies.

The main objective of a lean supply chain strategy is to reduce the cost and increase efficiency by eliminating waste in intra-organizational and inter-organizational processes. Lean supply chains are best combined with a relatively stable environment. In contrast, the goal of an agile supply chain strategy is to provide products to the customer quickly and with unique characteristics into the market in order to maintain a competitive advantage in a rapidly changing environment, based on speed, flexibility, pro-activity innovation, quality, and profitability (Qi et al. 2009).

While most authors focus on one of these two types of supply chain strategy, Bruce et al. (2004) identified a combination strategy called leagile. Leagile believes that lean and agile approaches will be combined at a point of dissociation for optimal management of the supply
The leagile strategy can operate profitably or in a lean way in the supply chain and responsibly to volatility or agile as the market needs (Bruce et al., 2004). Although authors have identified this approach and present some case studies, it is necessary to highlight that leagile strategy is likely a challenging due to the need to mix two different styles of management that sometimes are opposing each other (Qi et al., 2009).

Supply chain management applied on perishables

The challenge for companies in managing the supply chain of perishable foods is that the value of the product deteriorates significantly over time at rates that are highly dependent on the environment (Blackburn and Scudder, 2009). According to these authors, temperature and humidity are key factors in this process.

An additional latent concern about food production and distribution systems around the world is that they must to be more reliable than manufactory traditional systems. Supply chain of perishables is more susceptible to economic chocks, environmental changes, or even to management errors supported by lack of knowledge (Evans, 2009). The literature had indicated that in the future food system will have to joint four major characteristics: resilience, sustainability, competitiveness, and ability to manage and meet customer expectations (Leat, 2013). Due to diseases related to food ingestion and food production globalization (Nepstad et al., 2006), costumers had become more conscious of origin and nutritional contents of their own foods. As a consequence of that, an increase of interest on traceability, freshness, and high quality patterns of food is demanded. At the same time, productors have expanded products choice in order to attend costumers’ wishes. The combination of these factors results in more complicated batch size decisions and increase of transportation costs (Soysal et al., 2012).

Another major concern is that the population is getting continuously older in a not structured way. This will certainly impact in food security and food availability. According to Soysal et al. (2012), this is one of the reason of supply chain management becomes an important issue in the public and corporate diaries. In this view, fresh products as alive seafood, fresh fruits and vegetables, and also flowers become a difficult operation at high risk levels. Both, producer and distributor may suffer substantial losses.

Ketzenberg and Ferguson (2006) noted that grocery stores in developed Western economies may incur losses of up to 15 percent due to damage and deterioration of perishable products. In less developed countries that lack sophisticated means of products transportation, the transport of fresh products can cause even greater losses (Cai et al., 2010). Changes in food retailing over the past four decades have produced a quiet revolution in the status of certain foods in the diet of Western consumers. In this context, application of the supply chain management principles for the delivery of a variety of standardized low cost perishable food products for mass markets is a big deal. One of the most dramatic examples is found in the supply chains of chicken. Food retailers support the change to high quality white meat, ensuring food and then positioning it as a central offer. The change in consumption was witnessed in most Western economies. Chicken was the main meat consumed in the U.S. at 37 kg per person in 2003 according to American Meat Institute (2005). Australia, with less than a tenth of the U.S. population, reported similar consumption per person (35 kg in 2002-2003) according to ABARE (2004). Chicken meat began to gain prominence in Western diets in the mid of 70s as the real price fell quickly and, also, access to this kind of food on the retail stores were expanded. Although the increase in consumption of chicken meat is well documented, there is not enough
knowledge about the process by which the agri-food supply chains were configured to create value in the form of meat products (Insch, 2008).

**Manufactory versus Perishables: Challenges on supply chain management**

Supply chain management on manufacturing has concerns about which strategy may be best used on deliveries, services, and information. Now, applications of these concepts in the perishable food industry are still a challenge. The management of the supply chain in manufacturing addresses the importance of choosing a strategy focused on the characteristics of the market in which the product is inserted, as well as characteristics of the product. The way the product changes value over time and the time interval between production and customer delivery are relevant factors for the choice of strategy. On supply chain applied to perishable food, products deteriorate themselves over time in rates highly dependent on temperature and humidity and its situation might be similar in some aspects in comparison with applications on manufacturing.

Considering the strategies of the supply chain management (lean, agile, and leagile), decision of which one will be adopted depends on the kind of market, type of product, or costumer quality demand. The lean strategy is best applied to relatively stable markets and aims to reduce costs and increase efficiency by eliminating waste in the intra-and inter-organizational process. The strategy of agile supply chain best meets the most dynamic markets through flexibility, speed, proactive innovation, quality, and profitability. Although it is challenging to dominate different strategies and sometimes even conflicting as lean and agile, a combination of styles is discussed in the literature as possible to operate at a point of dissociation that provides optimal management of the supply chain.

Resilience, sustainability, competitiveness, and ability to understand and manage consumers’ expectations are characteristics that guide the food market. To meet the needs of consumers, the food market shows an expansion in product assortment, which makes the production design and lot sizes definition more complex. Concern over food security, the growing interest in traceability, freshness, and quality combined with highly perishable nature of these products are characteristics that require attention when choosing a strategy for the supply chain. Comparing the reality of supply chain management in manufacturing and perishable foods, both lean and agile manufacturing strategies have fundamental characteristics for proper manage the supply chain in this type of industry.

The industry of slaughtering pigs, chickens, and other small animals, according to data from the Brazil Ministry of Labor and Employment, has 417 companies only in Southern Brazil and it is responsible for 123,581 direct jobs. These data, coupled with consumption information presented in section 3, show that this is an important segment within the Brazilian industry of food production. Brazilian government also has established rules for these products market. These rules do not just attempt about lifetime or production specifications, but also conditions of transportation, origin, and nutritional contents.

Companies in the food industry have to deal with the government requirements, customer demands, and shareholders interests. Reduce costs and avoid losses in all processes are fundamental for the success. On the other hand, perishable food companies need to provide products as fast as they can to maintain their competitive edge advantages, since products are very susceptible to environmental changes. Note that, as in the leagile strategy for manufactory, interests must conflict. The particular characteristics of this type of industry make it challenging to establish a unique way of managing the supply chain in this context.
Final Remarks

In the context of supply chain management, the main strategies adopted within the framework of the manufacturing industry were presented. Considering the perishable food industry, the goal is to identify the main characteristics of both the market and product types. These factors are generally used when choosing the supply chain management strategy. It was found that increase in the variety of products and perishable foods characteristics lead supply chain management to adopting a lean strategy. However, the food market generally requires features overhanging the interest of managing the supply chain for agile strategy. With the characteristics of the product and market requirements facing in opposite strategies, the combination of both should be considered when choosing the strategy.

References


