



UNIVERSITY OF WISCONSIN, PLATTEVILLE

UNITED STATES OF AMERICA

The attached educational project, by Morgan Gruhlke, entitled COVID-19 AND CHANGING CONSUMER PREFERENCE'S IMPACT ON THE DAIRY SUPPLY CHAIN, when completed, is to be submitted to the Graduate Faculty of the University of Wisconsin-Platteville in partial fulfillment of the requirements for the (MASTER OF SCIENCE IN INTEGRATED SUPPLY CHAIN MANAGEMENT) degree.

Approved: *Xiaotong Liu* Date: 12/27/2020

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Suggested content descriptor keywords:

- Dairy Supply Chain
- Customer Preferences
- COVID-19
- Coronavirus

A Seminar Paper

Submitted to

the Graduate Faculty of the

University of Wisconsin - Platteville

in Partial Fulfillment

for the Degree of

MASTER OF SCIENCE IN INTEGRATED SUPPLY CHAIN MANAGEMENT

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Year of Graduation: Fall 2020

Abstract

This seminar paper is a review on how changing consumer preferences and the impact of Covid-19 will affect the supply chain for dairy products. The dairy supply chain is very broad and complex. This paper provides examples throughout the supply chain where consumer preferences and Covid-19 create an environment where change is needed by those in the supply chain in order to stay relevant to consumers and financially viable. Many trends have already taken place and supply chain stakeholders have had to adjust accordingly while other trends are still in their infancy and need to be monitored by leaders within the category. Change is an inevitable part of any supply chain and the following paper explores what, why and how these changes have taken place and their effect on the dairy supply chain.

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The Dairy Supply Chain

In any business, those that fail to change their business strategy due to changing consumer preferences risk losing profit, sales, and market share to their competitors. Resisting change after all of their competitors or supply chain partners have already adjusted can eventually lead to business failure. The following information will be a benefit to those with strategic influence within the dairy supply chain.

Milk first became a part of people's diets around 7,500 years ago in central Europe as genetic changes to the digestion of people of farming communities allowed the processing of milk sugar (lactose) without becoming sick (University College London, 2009). Historians believe cheese was created when traders used the stomach of a goat or sheep to transport milk. The natural enzymes in the belly of the animal caused the milk proteins to separate, creating the world's first cheese. People realized that this newly created food "cheese" had a much longer shelf life than liquid milk, was edible and nutritious. In essence, cheese was discovered by mistake, during the supply chain journey of fresh milk.

People have consumed dairy in a multitude of products created throughout history. Most people associate dairy with fresh milk, butter, yogurt, cheese, whole milk powder, and ice cream. Advancements of these essential dairy products have changed over time as marketers and manufacturers have sought ways to grow their businesses and add value to the dairy products they sell. Companies continue to investigate ways to innovate dairy products beyond the basic formats listed above. Recent developments in food technology have allowed consumers to utilize dairy products in forms such as whey or casein.

As dairy products have changed, dairy supply chains have had to adapt to meet the needs of the end consumer. In today's globalized market and ever-changing consumer preferences,

dairy supply chains must continue to change to stay relevant and economically viable. The dairy supply chain starts at the farmer level and extends through many different companies and manufacturing steps before being consumed by the end customer.

Consumer preferences in dairy go well beyond a consumer's appetite for Greek yogurt or full-fat milk. Their preferences are also related to the environmental and overall stewardship of the companies and supply chains of the products they consume. For example, some consumers prefer to buy organic or grass-fed dairy because of their perceived benefit to the earth. Some consumers prefer to buy from companies that work towards reducing their carbon footprint. These factors and more come into play when dairy companies develop their strategic plans and analyze their supply chains to make sure they fit within the changing preferences of the consumer.

The Covid-19 global pandemic sent shock waves through most industries all over the world in early 2020. It is still too early to tell what long term affects Covid-19 may have on the dairy industry and overall consumer purchasing trends in the food space. The dairy industry set record low and record high cheese prices between March and July of 2020. During this time, farmers went from growing their herd to dumping milk (Yaffe-bellany & Corkery, 2020) and expanding milk production again within several months. Dairy manufacturers that sold heavily into the foodservice industry were forced to shut down their plants for days, if not weeks at a time. In contrast, other manufacturers did not have the labor or capacity to keep up with the demand from their customers.

The following information tries to better understand what the future will hold for the dairy product supply chains based on recent consumer trends. Understanding these changes will help certain supply chain partners drive the change needed not only for themselves, but to drive

supply chain surplus throughout the entire system. Some trends may be short-term and come from out of nowhere; others may have more impact long-term and should be visible to those that look for them. Matching one's supply strategies to consumer trends of the present and future will help companies be successful over time. This success not only benefits the entire supply chain but inevitably benefits the mass consumer with better products, at a better price, with better quality.

Literature Review

Academics and businessmen alike have sought to improve supply chain surplus and performance in all industries including dairy. Both proactive and reactive approaches have been taken by those that make strategic supply chain changes. Short term changes to meet the initial needs of the consumer have been reactive in nature, while the long-term trends around healthy eating and sustainability are proactive adjustments necessary for the success of the supply chain. Literature on these topics often point towards specific trends and how they could impact purchasing patterns or behaviors. If successful, these changes are critical to the financial health of the supply chain and overall business. These successes should lead to improved customer satisfaction in the product and or service.

Costs of goods sold directly impacts the price of products sold to consumers. Covid-19's impact on dairy pricing, specific to cheese in the United States has been extremely volatile in 2020. Farmers that supply milk into cheese plants are paid based off of complex formulas using a lagging average of cheese sold on the Chicago Mercantile Exchange (CME). The five-year average monthly price range of block cheese sold on the CME from 2015 to 2019 is \$1.52 to \$1.74. The block cheese price range in 2020 was between a low of \$1 and a high of \$3 (CME, 2020). The price instability of 2020 has created a whipsaw effect on the dairy cost structure,

impacting everyone along the dairy supply chain, from the farmers getting paid for their milk, to the consumer buying cheese at the grocery store.

The global pandemic of 2020 has led to speculation as to how consumer behavior will change in the future years. Some of the predicted behavior can be seen currently through different trends in the marketplace. Lewis (2020) discusses consumers' tendency to move down in Maslow's Hierarchy of Needs towards the basics of food, security, and safety during times of crisis. Maslow's theory was that human beings have a number of certain needs that can be arranged in a hierarchy with basic needs (food, water, shelter) towards the bottom of the pyramid going up to one's need to be creative (Self Actualization) at the top of the pyramid (Burton, 2012). Manufacturers that supply basics such as food saw increases in purchases in 2020 while people were less likely to spend on luxury items or experiences such as vacation via airline travel. Consumers short term needs during the crisis were driven towards their need to survive and not their self-actualization and ego needs that many will strive for under more normal social and economic conditions.

Covid-19 has been a net benefit to sales numbers for many companies within the dairy supply chain due to the above-mentioned consumer trends towards basic needs such as food. However, the chaos of Covid-19 created disruption in the marketplace for many throughout the dairy supply chain. Newman and Maltais (2020) quote several dairy professionals regarding the struggles they have seen during the pandemic:

- Tim Barr, VP of Supply Chain for Marco's Pizza "*Cheese is by far, our highest food cost item*"
- Jeff Schwager, Chief Executive at Sartori Co "*Some weeks we're literally working seven days a week, running 24 hours per day. Other days we're looking for work*"

- Nate Donnay, Dairy Economist with StoneX Group *“Some milk buyers have been warning farmers – who have begun rebuilding their herds – that they may be asked to curb production again”*

Although many pizza chains, cheese manufacturers, and farmers have been successful through the pandemic, there is still a lot of business uncertainty and chaos. Balancing the unknowns around supply and demand, combined with uncertain economic conditions along with some of the challenging labor conditions (due to Covid-19) have many dairy supply chain executives, business managers and farmers making supply chain decisions that they have never had to consider in a pre Covid-19 world.

Marketers and supply chain managers within a dairy organization could look at the consumer trends towards basic need products as a positive for their overall sales given dairy products fit the “food” requirement on the low tier of Maslow’s Hierarchy of Needs. These managers though should take a deeper dive into this macro trend and how they could manage their product portfolios more efficiently. Companies that sell both commodity type and valued added dairy products could benefit from putting more resources towards the basic food items consumers are familiar with rather than new innovative product launches that often carry a higher price point and are unfamiliar to the customer in the market place. Kraft Heinz is one company that has benefited from this trend, per their Chief Executive, Miguel Patricio, “We are holding on to new households and consumers at a greater rate than before” (Gasparro, 2020). This quote points towards a consumer trend of purchasing more from well-known brands they are familiar with during the Covid-19 pandemic.

Matching a supply chain to meet changing consumer trends is often about finding a balance. It can be challenging to balance between meeting consumer expectations and costs to

the supply chain, but it is necessary to both grow sales and hold onto consumer confidence in a brand. Many consumers have changed their buying behavior based off the perceived environmental impact of a good or service and the company and or supply chain they purchase the product from. Under current economic and societal conditions, it could be easy for a company to switch focus away from sustainability programs that may not see financial benefits for many years into the future.

Altmann discusses the importance of the sustainability trend, even in today's world impacted by Covid-19. In the pre Covid-19 world, the National Restaurant Association noted that environmental sustainability was one of the top menu trends of 2018 and as of March of 2020, Consumer Packaged Goods (CPG) products that promoted their sustainability aspects experienced a 56% increase in sales during the beginning of the pandemic lockdown in March (Altmann, 2020). This is a very interesting trend that shows that many consumers still value products that they perceive as better for the environment during times of economic uncertainty. These trends will undoubtedly continue, which means dairy supply chains need to continue to put resources towards becoming more environmentally sustainable.

Health trends continue to be an important trend in the food industry. Askew (2020) discusses an example of this in the United Kingdom, where investors urged the UK's largest retailer, Tesco, to increase their targets of healthy food and drink sales. Though certain comfort food brands saw growth in 2020, a larger consumer base is striving to eat healthier. Healthy eating trends can be driven by individual preferences or by government regulation and guidelines. Dairy is often targeted by groups as being unhealthy while other groups and even governments recommend daily consumption of dairy as part of a balanced and nutritious diet.

Dairy companies need to review these trends and promote the benefits their products bring to consumer's health to grow sales and consumer acceptance in the marketplace.

Consumer trends and their impact on the dairy industry and supply chain are a broad topic with many varying viewpoints and conclusions that can be taken from the literature on the topic. Companies and supply chains often must make assumptions and change strategies based on information that is not 100% conclusive. The ones that do this best will expand, while others that take the wrong path may falter and even fail if the competing trends inevitability prevails. Throughout this analysis and strategy alignment, companies and supply chains need to balance what makes economic sense for themselves while meeting the often-unpredictable changing consumer trends. This can be a very challenging endeavor, but for those that do it right, it will be extremely rewarding.

Dairy Supply Chain Changes Discussion

The dairy supply chain can be very complex and involves many stakeholders that are essential to the food supply chain of the United States. Per the literature on the topic, there are varying paths for businesses to try and improve their efficiency and effectiveness within the supply chain. The following trends have led dairy companies to change their short, mid, and long-term strategies to stay relevant financially and to the consumer.

The dairy supply chain was and continues to be essential in feeding Americans during the chaos caused by the Covid-19 pandemic outbreak. Covid-19 precautions were quickly implemented by the dairy industry, with best practices shared between companies. Food safety and finding ways to feed the American people during the global pandemic were not viewed as a competitive advantage by most within the supply chain. The International Dairy Foods Association (IDFA) is one of the top dairy organizations that supports companies in the dairy

food supply chain, from farmers to restaurants and grocery stores. The IDFA was essential in supporting companies seeking help in implementing Covid-19 strategies to keep their employees safe as well as the products they were producing. Their website listed at <https://www.idfa.org/news/coronavirus>, has resources related to best practices around workforce, supply chains, and travel during this crisis (IDFA, 2020). These resources allowed dairy companies to make quick adjustments to protect the supply chain without needing to use or seek extra internal resources to find answers. By accumulating this information, IDFA was able to reduce some of the stress companies had while seeking clarity on Covid-19 guidelines and best practices in the industry.

Consumer's changing behaviors have affected company's strategies in all industries and dairy is no different. Even farmers have had to adjust their strategies to stay economically viable. A recent change trend that farmers have had to adjust to over the last several years has been the consumer response to the use of recombinant bovine somatotropin (rBST). rBST is a hormone that farmers inject into certain cows to increase milk production per cow. As cows age, their milk production decreases and rBST allowed for farmers to increase milk production from cows that would have otherwise had been culled or led to reduction in the farmers milk check due to the lower milk output. Though rBST was FDA approved and determined to be safe and undetectable in milk and other dairy products, consumers saw the use of rBST as a reason to reduce or eliminate their dairy consumption since it was an added hormone. In 2008, the largest conventional supermarket operators in the US, Kroger Co. required that milk used in their private-label milk would be certified rBST free (Sung, 2011).

Ever since Kroger moved to rBST free for their private label milk, many companies have done the same to the point that rBST use is very limited at the farm level domestically. Many

dairy finished goods now make an rBST free claim on their packaging as well. This trend was truly one that changed the industry and the start of the dairy supply chain as many farmers used rBST to increase milk production per cow without having to change food rations to do so. Many would argue that the use of rBST greatly improved the dairy supply chain's efficiency for the farmer and would be a net positive for the consumer. However, marketers saw that consumers were trending towards cleaner labels and more "pure or natural" food products and that the use of rBST took away from dairy's appeal to some consumers. This has also led to growth in organic and grass-fed dairy products that some consumer view as healthier, better for the cows and more environmentally friendly. Though those claims can and have been debated, consumer perceptions often drive supply chains to change despite whether evidence proves contrary to their beliefs. The Global Organic Milk Market report produced by the Industry Research Biz Organization (2020) projects that the global organic milk market size will reach \$6,852.8 Million USD by 2026 increasing from the \$4,817.3 Million USD market size in 2020.

The requirement for a farm to move from conventional to organic certified is a three-year process in the US. Though farmers are often paid much more for their organic milk than conventional, there are other challenges organic farms face that conventional farmers do not, specific to feed and outlets for their milk. Farmers that are looking for ways to become more profitable may have to review organic milk consumption trends and if an organic farm business model and level of risk is right from them. Questions around projected consumer demand, manufacturing/processing outlets, milk costs, and feed costs need to be closely reviewed and analyzed before farmers decide to become organic certified, remain conventional or even go from an organic farm back to conventional.

Farmers produce milk that is sold into a multitude of processing and manufacturing plants. The Midwest is well known for their cheese plants though some of the largest, most efficient plants are located in the Southwest. Farmers may sell their milk into bottling plants or powder plants that produce products such as whole milk powder or nonfat dry milk. Milk processing plants have also been forced to and will continue to need to adapt to changing consumer trends. An example of a milk processing company that struggled to adapt and ultimately ended up going bankrupt was Borden Dairy. Borden operated 12 plants in the US and filed for bankruptcy protection in January of 2020. They were founded in 1857 but were greatly challenged by changing American tastes as milk consumption which has decreased by more than 40% since 1975 (Durbin, 2020). Though Borden's traditional liquid milk products faltered in the market due to these changing consumer tastes and strong competition, other companies emerged in the liquid milk space and have seen growth.

Fairlife is a company that manufactures liquid milk options to the consumer that better meets changing consumer preferences. Fairlife specialized in milk that is lactose free and has a higher percentage of protein and calcium than traditional liquid milk. This marketing and business model led to Fairlife growing their sales by 79% in 2016 (Watson, 2017). Their innovative marketing and production added value to the traditional milk category that has been trending lower for over thirty years. This added value through the health benefits of lower sugar and higher protein has led to their growth in sales while other liquid milk process companies have had their sales and market share decrease significantly. When looking at fluid milk sales declines over the last thirty years, many would hesitate to enter into this market, but Fairlife was able to capitalize on consumer trends that led to growth and stability within the dairy supply

chain. Fairlife's success not only benefits themselves, but also those throughout the supply chain that can capitalize on the success of others.

Pre Covid-19 consumer trends have been magnified by Covid-19's impact on how consumers shop and buy their products. At the end of the dairy supply chain, consumers buy dairy at grocery stores and restaurants. It may be in a form independent from other items, like a gallon of milk, or a bag of shredded cheese. Dairy is also sold as an ingredient in many other items, like cheese on a pizza or whey protein in baby formula. No matter how it is sold to the end consumer, consumers buying habits have been changing. As people's lives get busier convenience is key, and with Covid-19, contactless shopping has skyrocketed. As of August of 2020, 67% of retailers accept some form of no touch payment and 58% accept contactless cards for payment (Walk-Morris, 2020). Sales growth in traditional sit-down restaurants has decreased in 2020 while those that specialized or have adapted to a takeout or delivery model have been more successful.

Papa John's is a restaurant that has succeeded in meeting consumer trends and is adding stores during the 2020 pandemic as their sales surge. By increasing their store count, they have access to a larger consumer base. They also focused on increasing their digital platform, adding three million new customers in the second quarter of 2020 and have had 70% of their orders coming digitally (Rogers, 2020). Consumers are becoming more accustomed to purchasing food products (many of which contain dairy), via online options making this trend an important one for both groceries and restaurants. This can be a complex dilemma though for marketers in the dairy industry. Instore promotions and advertisements will not reach those customers that buy their products online or through phone apps. Different marketing approaches need to be explored as the way consumers purchase their products change.

Summary of Research

While many trends are often unpredictable this research has shown that there are consumer trends, some at their infancy, that could eventually impact the dairy supply chain at all levels. Companies like Borden's failed to innovate as consumers gravitated towards similar, but more value-added milk options offered by new companies such as Fairlife. Innovation comes in the form of marketing new ideas but also comes in the form of changing the supply chain and logistical strategy. This can be seen by those that take advantage of consumers who want to order products digitally.

The potential trends that affect the dairy supply chain are endless, but businesses must focus on trends they deem relevant to their supply chain and are also most likely to be long term and lead to supply chain surplus overtime. This paper focused on some of the current trends and ones that are more visible and openly discussed among those in the industry. With additional time and resources, certain niche trends or trends that will impact the supply chain many years into the future would have been discussed. Though this type of research would lead to much more speculation and could lead to more qualitative and opinionated output. Due to the broad nature of this topic, time could have been spent on one facet of the supply chain and how a dairy company may need to change to stay relevant. This though, could have had such a narrowed focus that may only have been relevant to those in a specific field (i.e. Dairy Procurement Manager or Warehouse Manager). The broad approach gives both the author and the reader the ability to see the significant consumer trends and Covid-19's impact on the dairy supply chain as a whole.

Conclusion

The dairy supply chain is a crucial part of America's food supply chain. Its success is not only good for those that rely on it to make a living, but also for those consumers that eat dairy on a regular basis. The dairy supply chain kept producing products during the initial Covid-19 shutdowns and safety measures were taken to make sure the people making the products were staying safe and making products that were safe for the consumer during their time of need. Being a vital part of America's food supply chain does not guarantee success. Ever changing consumer trends need to be built into the strategy development of all departments within a company that is part of this supply chain. Those within the supply chain that can see and react to the trends better than their competitors will continue to grow and flourish in their business over those that do not change their strategy or change too late.

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