A RECOMMENDATION FOR THE CALIFORNIA DAIRY SYSTEM REFORM BASED ON A COMPARATIVE STUDY OF DAIRY MARKET STRUCTURING AND PRICING SYSTEMS OF SEVEN LEADING DAIRY INDUSTRIES IN 2014.

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ABSTRACT

A RECOMMENDATION FOR THE CALIFORNIA DAIRY SYSTEM REFORM BASED ON A COMPARATIVE STUDY OF DAIRY MARKET STRUCTURING AND PRICING SYSTEMS OF SEVEN LEADING DAIRY INDUSTRIES IN 2014.

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The objective of this paper is to examine the production and regulatory systems utilized by the largest dairy producers around the world in order to determine the best practices for dairy market structuring and pricing systems which California could model as the current dairy pricing system reforms are established. In this study, the California Order, the Federal Milk Marketing Orders, Idaho, Canada, European Union, New Zealand, and Australia will serve as the systems reviewed, and their procedural policies will serve as reference points in the following recommendation for the California dairy Industry.

The recommended Auction System is covered in detail, and is designed to enable California to replace the out of date regulation system currently in place. Adoption of the Auction System will promote domestic and international expansion of the California dairy industry. The proposed Auction System addresses the current dysfunctions plaguing the dairy industry today. This paper examines the current realities of the California dairy industry, and how the current regulatory system has contributed to today's realities. Finally, the paper briefly examined the three most popular recommendation for California reform to date.

Keywords: California Dairy Industry, Dairy Reform, World Dairy Systems, Dairy Pricing

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Chapter 1

INTRODUCTION

Background of Study

Since the transportation revolution of the early 1800's, the globalization of markets has steadily increased. Today all industries, agriculture included, have to adapt to the reality and impact of globalization. The products produced by California Agriculture no longer affect only those living in California and throughout the Unites States, but impact people living around the globe. The influence of the international market pressures has proven to be a new challenge leading to many structural changes to the food system worldwide. As the food system has become globalized, it has made the need for regulatory change in the California dairy industry apparent. As of the publishing of this paper, the California dairy industry continues to be regulated by systems that began development in the 1920's during a time of localized markets. As the food system globalized these regulations have become outdated and structural changes are on the horizon for the California dairy industry. With change eminent in California, a thorough analysis of the current regulatory systems has been conducted. As the realities of the dairy industry and regulatory system have been examined, there has been widespread debate about the correct path to choose in order to ensure future success.

For many years there has been discussion throughout the California dairy industry regarding the current regulatory systems, and those system's effects on the industry. The current regulatory systems in California were developed decades ago during a different time. With new political feelings, advanced technologies, product innovation, and global

market expansion, the current systems have proved to be a hindrance to forward progress. As the world's population continues to increase and the middle class continues to expand, the global demand for dairy products is increasing. According to the United States Department of Agriculture, in order to meet the increasing demand for dairy products worldwide, dairy production will need to increase between 1.65% and 2.45% annually year-over-year on an ongoing basis (USDA, 2014).

The California dairy industry is seen internationally as one of the dairy markets capable of the great expansion needed to meet global dairy demands. As the dairy industry worldwide looks to meet the rising demand, the need for structural reform in the California dairy industry has grown even more apparent. In September of 2012, California Agriculture Secretary, Karen Ross, announced the formation of the California Dairy Future Task Force. This task force was developed to aid Secretary Ross in finding a long-term solution for the California dairy industry. The focus of the task force's efforts is to develop a suggestion for a governmental reform which will eliminate the issues present within the dairy industry due to regulation, and to enable the California dairy industry to step into the international market as a key player.

This paper examines the production and regulatory systems utilized by the largest dairy producers around the world. The objective of this examination has been to determine the best practices for dairy market structuring and pricing systems upon which California could model as the upcoming dairy pricing system reforms are established. In this study, the California Order, the Federal Milk Marketing Orders, Idaho, Canada, European Union, New Zealand, and Australia have served as the systems reviewed, and their procedural policies have served as reference points in the recommendations made

for the California dairy industry. The paper also briefly examines the most popular recommendation for California reform to date. Note this paper and its proposal have focused on those regulations specific to California, and they have not touch on the federal support or export programs.

Chapter 2

REVIEW OF DAIRY SYSTEMS

What is Milk?

Before one can discuss the current milk pricing systems utilized around the globe, it is vital to understand what milk truly is. By first examining the question "what is milk," one will better understand the issues that face the dairy industry based on the raw material utilize. There are five key components to milk production which makes it unique from other commodities. These five components are:

1. Milk is a raw multipurpose ingredient that is highly perishable.
2. Milk is produced 24 hours a day, seven day a week, 365 days a year.
3. Milk production is in very specific regions based on feed availability, geography and climate.
4. Milk production has seasonal highs and lows which are in direct imbalance with consumer demand trends (USDA, 2010).
5. Milk is a highly nutritious substance which allows for potential milk quality issues. Milk needs to be handled properly to keep it from harboring unsafe Microbial levels.

To date, milk is the only major agriculture commodity with government-mandated pricing that is different depending on the end product it is being used for.

California Milk Market Order Evolution

Similar to all modern industries, the dairy industry has undergone an enormous transformation since the 1900's. The initial dairy farms in California looked very different from the commercial dairies we are accustom to today. Farms in the early days of dairy farming were small, inefficient operations which consisted of at most a handful of cows alongside multiple other commodities. Today, dairy production represents California's highest-grossing agriculture product at $6.9 billion annually (USDA, 2012). In 2013, California had 1,819,760 milking cows on 1,563 farms (USDA, 2012). The average California dairy in 2013 machine milked herds of 1,164 milk cows each producing an average of 23,457 pounds annually (USDA, 2012). Total milk production in 2013 was 41.801 billion pounds of milk (USDA, 2012). The California dairy industry has grown from little farm steads supporting families and small towns to the largest milk producer in the United States today.

As the California dairy industry has developed into the large scale production it represents today, the industry has undergone numerous regulatory changes to accommodate for the developing industry needs. In the late 1800's prior to regulation, the dairy industry was disorderly, it experienced large fluctuation's in price and in demand, it had little to no price discovery mechanisms, and it was plagued by inefficient milk movement. Each of these factors pushed the dairy industry towards developing a regulator system which would combat these issues.

The first step towards the regulation of the dairy industry was not in the form of a dairy specific regulation, but in the Capper Volstead Act of 1922 (Western United

Dairymen, 2012). The primary purpose of the Capper Volstead Act was to enable agricultural producers to market, price, and sell their commodity through private cooperatives, rather than individually (Western United Dairymen, 2012). These cooperatives where established to represent a group of producers in negotiating and establishing payments and purchase prices for those producers they represented. This Act allowed dairymen to collectively sell, process, handle and market their milk if they so choose (Western United Dairymen, 2012). The ability to unite as one much larger entity enabled dairy farmers to gain a significant amount of market control. This market control helped to combat some of the market price volatility by providing a market with transparency for both producers independently selling product, and those being represented by cooperatives. Those farmers who chose to join cooperatives received increased bargaining power, a method of price discovery, a consistent home for their milk, and financial incentives in the form of tax breaks (Bailey, 1997). Today, 92 years after enactment the Capper Volstead Act is still actively enabling cooperative such as California Dairies Incorporated, Land-O-Lakes, and Dairgold to thrive in the United States.

Although the Capper Volstead Act provided significant relief to dairymen, the onset of the Great Depression in the early 1930's made apparent the need for more change within the dairy industry. The dairy industry turned to the government for aid in saving the failing dairy industry. At this time the federal government responded by deeming milk nutritionally essential for humans, and took action to relieve the economic hardship of dairy farmers throughout the United States (Bailey, 1997). The first federal governments step towards regulating the dairy industry was in enacting temporary

regulation aimed at eliminate the surplus of milk that was driving the price of milk further and further down. President Roosevelt instructed dairymen to pour milk on the ground in order to eliminate the surplus, and to bring the market price back up (Bailey, 1997). At the time this action was poorly received by the general United States population, many of who were starving and suffering for malnutrition, but the action saved countless dairy farmers by stabilizing the dairy market.

It became clear that change in the dairy industry was essential for the industry's prosperity, and for its long term survival. Industry reports from the years prior to and during the onset of the Great Depression reveal that the regulating of the dairy industry had eight objectives:

1. Secure a stable fresh fluid milk supply for consumers.
2. Accommodate for the nature of milk and milk production; develop programs recognizing that although milk is continuous produced, it has seasonal highs and lows, there are specific regional requirements, and it is high perishable.
3. Develop market order between producer, handler, processor, and retailer.
4. Allow price transparency in order to establish a market value for milk.
5. Combat the revenue volatility experienced by producers due to raw milk prices changing virtually hourly.
6. Guarantee farmers a minimum price for milk produced.
7. Guarantee a buyer for milk to avoid disposal or dumping of milk.
8. Create efficient milk movement to plants which produce products fitting to consumers demand.

These eight objectives of regulating the dairy industry were implemented in a series of Acts. First was the Federal Agricultural Adjustment Act (AAA) of 1933, established by the Federal Government. In California the AAA implemented milk marketing agreements for Los Angeles, Alameda County, and San Diego (USDA, 2001). The AAA was enacted first in these three locations with the intention of expanding the act to other areas within California involved in dairy production (USDA, 2001). In 1934, the marketing agreements established in California where removed after courts declared them illegal on the grounds of Federal regulation of local markets with no interstate commerce involvement (USDA, 2001). With this declaration California became removed from the Federal Milk Marketing System. It is the Federal Milk Marketing System that still governs a majority of the United States' milk today.

With no regulation in place, dairymen and dairy distributors in California moved to form the necessary regulation to ensure market stability (USDA, 2001). In 1935 California passed the Young Act regulation to establish a minimum price to be received by all dairy producers in California. The Young act made the California Director of Agriculture responsible for the establishment of the minimum price paid for raw milk. The raw milk price established was based on three standards:

1. The current and prospective supply and demand relationships for fluid milk between producer, processor and consumer.
2. Assuring a continuous supply of wholesome milk at a reasonable price for consumers and producers.
3. Pricing that regulates a reasonable and sound economic relationship with the price of manufacturing grade milk (USDA, 2001).

Note that these three standards are the same as the federal standards established by the Federal Agricultural Marketing Agreement of 1937 (Jesse, et al, 2008).

The first and second standards where developed to address the federal government's declarations that fluid milk was essential to a nutritional diet. The first and in part the second standard where met through volume contracts issued to producers from the California Department of Food and Agriculture (CDFA). These contracts specified the exact volume of raw product which a fluid plant was to privately contract to producers in order to provide consumers with an adequate supply of fluid milk. The contracts where developed based on the population of California, and no fluid milk above the contracted amount was permitted for sale. All milk produced above the demands of the fluid market was to be unitized in manufactured dairy products.

The provision of the second standard regarding the requirement for a reasonable price, as well as, the requirements of the third standard are met by the system of classified pricing. This system establishes a standard for the minimum price paid for raw milk based on the end product into which the raw milk is being processed. When classified pricing was developed, the number of classes and the categorization of products in each class was vastly different from today's system. This change has come about as the advancements in technology have enabled new processed products to emerge onto the dairy market. Today the classified pricing system breaks dairy products into five categories:

1. Class 1 - representing fluid milk.
2. Class 2 - representing cultured products.
3. Class 3 - representing frozen products.

4. Class 4a - representing cheese products.
5. Class 4b - representing butter and powdered milk products.

As previously mentioned, the Federal Government deemed that fluid milk was essential for good nutrition, and that declaration led to fluid milk being given priority in the utilization of raw milk when compared to manufactured products (USDA, 2001). Producers servicing the Class 1, fluid market, received the highest price for their milk when compared to each of the subsequent classes. The value of raw milk servicing each subsequent class generally decreased in direct correlation to the class number which is being serviced (CDFA, 2007). The exact formulas which determine the price which each Class receives will be discussed later in the detail under the Federal Milk Marketing Order Evolution section.

The Young Act addressed the issue of California dairy producers being unable to sell their milk, but it failed to address the issue of product price equality (USDA, 2001). A producer generally serviced the processor closet to their dairy, yet under the Young Act, a producer servicing a higher Class processor received a higher price than a producer servicing a lower Class processor for virtually identical raw products. Two dairy producers, with similar milk quality, under this system would not receive comparable prices for their milk if one producer shipped to a fluid bottling plant, and the other shipped to a cheese plant. This discrepancy lead to a significant amount of disorder within the industry. Those producers who lived a great distance from a fluid bottling plant would attempt to ship greater distances to receive the premium price from a Class 1 processor, rather than service non-fluid plant in closer proximity (CDFA, 2007). This

unfair advantage and disorderly practice remained unaddressed in California until the late 1960's (CDFA, 2007).

In the mid 1960's two events occurred that pushed California towards developing a regulatory system to address the price discrepancy that had been experienced by producers for over 30 year. The first event was a shift in the market makeup which placed a significant amount of pressure on many processing facilities. Due to discrepancy in the price producers received for their product, and due to the expense of hauling raw milk that was being placed on the producer, many producers chose to open their own processing facilities (CDFA, 2007). A vast majority of these facilities serviced Class 1, fluid, markets. This vertical production shift in the distribution network caused a reduction in the number of Class 1 contracts available. This change to the producer operated fluid processing plants impacted the historic distribution system, and many commercial plants lost fluid contracting rights from the CDFA. This forced several processing plants to switch production to lower Class processing, and forced more producers across California to contract to plants utilizing lower classes of milk. This change greatly reduce the price received by numerous producers causing great unrest in the industry (CDFA, 2007).

The Second event which encouraged new regulation was a federal court ruling stating that no minimum price would be set for the resale of milk purchased by the military (CDFA, 2007). The military's lower price would then be subsidized by producers through funds taken from non-military milk transactions. This allowed the military to pay less than the minimum price for the lowest valued manufacturing grade milk to producers (CDFA, 2007). The discrepancy in price forced other producers to bare the economic

burden of the government contracts they serviced (CDFA, 2007). In great part, the added stress on the dairy industry which ensued from these two events lead to the development of The Gonzales Milk Pooling Act.

The Gonzales Milk Pooling Act of 1967 was developed to combat the discrepancy between the price producers received for their milk, and it became operational in 1969 (CDFA, 2007). The Gonzales Milk Pooling Act developed the price pooling system, the quota system, and the local differential system (CDFA, 2007). The price pooling system made it so a producer was no longer paid based on the class utilization of the plant which they serviced (CDFA, 2007). A producer was paid based on the amount of product they supplied into the statewide pool.

Under the Gonzales Milk Pooling Act all processing facilities in California provide the Milk Pooling Branch of the CDFA with a statement that reports the total volume of milk utilized, and the amount of that total milk used in the production of products in each of the given Classes 1through 4b (CDFA, 2007). The Milk Pooling Branch then reports back to the processor the amount that is due to the statewide pool based on the processors Class utilization. All processor pay into the pool to establish the statewide money pool from which the CDFA pays producers for their contribution to the stateside supply. The pay received by each producer is based upon the measurement "per hundred pounds" (i.e.: hundred weight or unit) of milk they contributed to the statewide pool (CDFA, 2007). This system is such that processors that service higher valued Classes pay a larger sum into the statewide pool, thus subsidizing processors servicing lower valued Classes in order for all producers to receive the same price for their milk. The producer was now paid based on three variables; allocated quota, base, and overbase

prices (CDFA, 2007). Allocated quota and base payments where based on an individual producers quota holdings and production volume contracts (CDFA, 2007). The payments for allocated quota where determined based on the individual producer's holdings of all State issued quota (CDFA, 2007). To determine the base payment an individual producer's received prior to the $1.70 increase per hundred weight of quota holdings, the producers contracted quota milk is removed from non-quota production and evaluated as a percentage of the statewide pool (CDFA, 2007). If the producer's production volume is greater than the volume covered by their allocated quota and base volume, the excess production is assigned the overbase price (CDFA, 2007). The overbase prices reflected the poolwide unitization for all the classes, not specifically the plant which the producer services (CDFA, 2007).

The system of quota was developed in order to appropriately compensate dairy farmers who had contracts to service fluid bottling plants prior to The Gonzales Milk Pooling Act (CDFA, 2007). Quota was given to processors who had been servicing the fluid market prior to the Gonzales Milk Pooling Act in order to provide compensation for the loss in product value the new regulation would impose on these producers. To eligible producers quota allocation was based on either (i) their production history and Class 1 utilization during July 1966 through December 1966, or (ii) for the entirety of the 1967 year (CDFA, 2007). Each producer individually selected which time period was more favorable for their own business (CDFA, 2007). Today, quota represents a $1.70 increase in value per hundredweight of milk produced (CDFA, 2007). It is easiest to think of quota as stocks, not every dairy farmer has purchased stocks, but those who have purchased stock receive a financial benefit based on the amount of quota they have

invested in. Some producer's entire production receives the $1.70 quota premium while others have only a fraction of their total production receiving quota premium, or even have none.

The Gonzales Milk Pooling Act effectively removed the incentive for a producer to service a fluid bottling plant, and encouraged shipping to local plants (CDFA, 2007). With the removal of the fluid plant incentive, the formation of location differentials was used to incentivize producers to service fluid plants (CDFA, 2007). Prior to 1983 location differentials were payments added to or removed from quota payments by processing plants in order to aid in offsetting the cost of transporting milk to distant fluid plants when local supply was insufficient (CDFA, 2014). Location differentials have now been replaced by the Regional Quota Adjuster (RQA) system (CDFA, 2007). RQA's are a deduction off quota payments received by producers based on each hundredweight of quota milk produced (CDFA, 2007).

Federal Milk Marketing Order Evolution

In many regards the history of the Federal Milk Marketing Orders (FMMO's) is similar to the California Milk Marketing Order (i.e.: California Order). Until 1934, when the Federal Marketing Agreements were ruled illegal in California, the development of the dairy industry in California and the Federal system where identical (USDA, 2001). At the time California adopted the Young Act in 1935 the two paths of development diverged forming two of the systems we have today.

Jumping back in time to the Agricultural Marketing Agreement Act of 1937, we will begin to exam the evolution of the FMMO's. The Agricultural Marketing Agreement Act,

made it so that participation in the FMMO's was not mandatory, but voluntary (Jesse, et al, 2008). As previously noted, the Agricultural Marketing Agreement Act of 1937 established the same three primary objectives for the FMMO's as enacted by the Young Act in California:

1. The current and prospective supply and demand relationships for fluid milk between producer, processor and consumer.
2. Assuring a continuous supply of wholesome milk at a reasonable price for consumers and producers.
3. Pricing that regulates a reasonable and sound economic relationship with the price of manufacturing grade milk (USDA, 2001).

These three objectives are accomplished through two federal systems known as Classified Pricing and Pooling (Jesse, et al, 2008).

Classified Pricing establishes the minimum price paid by processors into the pool for milk and milk components based upon which dairy products are being produced (Jesse, et al, 2008). The federal system has four classes, which represent specific dairy products, to establish minimum pricing:

1. Class I - representing fluid milk,
2. Class II - representing cultured and frozen products,
3. Class III - representing cheese products,
4. Class IV - representing butter and powdered milk products.

The federal Class system is similar to the one used in California today, but has a few key differences. An easily identified distinguishing reference marker is found in that the federal system uses roman nomenclature to distinguish the dairy class, while the

California system uses Arabic nomenclature. Additionally, and more significantly, the federal system combines the cultured and frozen dairy classes, while these classes stand alone in the California system (Western United Dairymen, 2012).

The system of Classified Pricing has undergone many transformation since being established in 1937. The system of Parity Pricing (aka Fairy Exchange Value) was the predominant pricing system used by the United Stated dairy industry until the middle of the Great Depression (Bailey, 1997). The Parity Pricing system functioned under the basic premise that the selling price of dairy products should go up and down in direct correlation with the costs of all inputs utilized to produce the product (Bailey, 1997). The system was phased out between 1919 and 1933 when the dairy industry saw a 67% price decline for dairy products with no change in the cost of production. Today if the Parity Pricing system was active, the price of raw milk in November 2012 would have been $52.10/cwt or $4.50/gallon (Bailey, 1997). This pricing system would be unrealistic in today's dairy industry, but the concept behind Parity Pricing is still alive today in the form of the Commodity Credit Corporation (CCC) which is discussed further herein under the sections addressing dysfunctions of the current regulations (Bailey, 2002).

After the expiration of the Parity Pricing system, the dairy industry began to use two payment systems. The first was based simply on the volume of milk produced (Bailey, 1997). This method was unfavorable due to its potential encouragement of producer tampering with milk through the addition of water. Such tampering in fact become common practice by some in the industry (Bailey, 1997). Due to the frequent tempering of milk, the industry began to use volume and milk fat percentage to determine the value of each hundredweight of milk (Bailey, 1997). This method was made possible

by the Babcock Test (Bailey, 1997). The Babcock Test, which measures the level of fat in the milk, was developed in 1890, but not widely used until after the Great Depression (Bailey, 1997). The Minnesota-Wisconsin Pricing system (M-W) revolutionized the way in which milk was paid for in the early 1960's (Bailey, 2002). By averaging the price paid for manufacturing milk by various processing plants located though out Minnesota and Wisconsin, the M-W Price was established. M-W Price was reported by the National Agricultural Statistical Service (NASS) monthly, and was then used to establish a base milk price throughout the FMMO's. The M-W Pricing system allowed the milk price for each class to be determined on a month-to-month bases, and it took into account many adjustment factors to adjust the competitive pay price (Bailey, 1997). The M-W Pricing system underwent minor changes prior to being replaced in 2000 by the End Product Pricing system used today (Bailey, 1997).

The End Product Pricing System was designed to make a more level playing field for all producers by paying each producer based on their share of the final product produced in any given month (Bailey, 1997). This system has processors pay into a market wide pool based on the class of products they are producing in order to determine the milk price received by all producers. The pricing formulas are highly complex taking into consideration multiple factors. Some of the components used to calculate the End Product Price formulas include; milk fat and protein standards, processor make allowance (a safety net established by the CDFA equal to a portion of the cost of processing all dairy products), prices obtained from the Chicago Merchant Exchange (CME) for the wholesale of butter and cheese, and the weighted average price for California Non Fat Dry Milk Powder (NFDMP). Due to the complexity of the formulas the pricing system is

difficult to work with, and it is not widely understood. In an informal survey I conducted of dairy producers in the central valley, one out of thirteen native English speaking producers was able to explain any portion of the formulas used to determine producer milk price. This lack of understanding is only exacerbated by the periodic changes to the formulas to account for new industry factors.

The overall federal system of Pooling had been designed with the goal to eliminate destructive competition between farmers. This is accomplished by making the value of raw milk the same for all producers regardless of the end utilization of the producer's milk. The pooling price is used to determine the price a producer receives for raw milk. The value is determined by adding the value of all milk used in every Class, and then dividing it by the total milk deliveries, resulting in the Blend Price. This Blend Price is the weighted average price paid to dairymen regardless of how their milk was utilized.

Since the system was first implemented in 1937, the number of FMMO's has greatly reduced over the last 77 year. Initially the FMMO consisted of 31 orders, however today there are only 10 orders remaining (Western United Dairymen, 2012). The reduction to less than a third of the original FMMO's is due more to the consolidation of FMMO territories rather than regions choosing to secede from the Federal program. With today's technological advancements, milk is able to travel great distances without concerns of contamination or perishing which made the reduction to 10 FMMO's possible (Western United Dairymen, 2012).

Idaho Dairy Industry

Upon Idaho's seceding from the Western Federal Milk Marketing Order in April 2004, the Idaho dairy industry became deregulated. The termination of the Western FMMO in 2004 has made it difficult for individuals to access information regarding Idaho's dairy industry. Due to the limited publication of information the dairy industry in Idaho will not be covered in great detail.

The milk classification system adopted in Idaho after seceding from the Western FMMO is similar in structure to that seen in California and also in the FMMO's. Idaho's system has four classes identical to the FMMO classes, which represent specific dairy products produced under each Class (DeKruyf, 2012b):

1. Class I - representing fluid milk.
2. Class II - representing cultured and frozen products.
3. Class III - representing hard cheese products.
4. Class IV - representing butter and powdered milk products.

These classes are used to differentiate product value, as well as, to track production within the state.

According to the dairy statistics published by Progressive Dairymen in 2012 Idaho's dairy industry is thriving in deregulation. As of 2012 Idaho has a total of 565 dairies, 580,000 cows, and produces 6,163,413 metric tonnes (13,588 million pounds) of milk annually. According to Glanbia Foods, Idaho is producing more milk per capita, and it is the third largest milk producer in the United States, the Idaho dairy industry is continuing to grow. Currently of Idaho's milk supply 69% becomes cheese, 25% becomes powder, and 6% becomes fluid or cultured and frozen products (DeKruyf,

2012b). The growth in the Idaho dairy industry is made apparent by the recent expansion in dairy processing facilities in the state. Chobani foods opened a new Greek Yogurt facility in Twin Falls, Idaho in 2012 representing a $450 million dollar investment (Chobani, Inc., 2014).

Canadian Dairy Industry

Today, Canada has 1.4 million cows and 12,529 dairies (CDC, 2012-2013). The national average is 77 cows per farm, with each cow producing 9.780 kg of milk annually (CDC, 2012-2013). Canada consists of 10 provinces, and in the 2012-2013 dairy year, the Eastern provinces of Quebec and Ontario (two of the Eastern provinces) had 82% of dairy farms, followed by the Western provinces at 13%, and the Atlantic provinces (i.e.: remaining Eastern provinces) at 5% (CDC, 2012-2013). Of the raw milk produced, 40% goes into processed fluid milk, and 60% goes into industrial (aka manufacturing) milk (USDA, 2013). Of the milk designated for industry purposes 60% goes into the production of butter, cheese, yogurt, and ice cream (USDA, 2013). Approximately, 75% of all dairy processing is done by Saputo, Agropur, and Parmalat (USDA, 2013).

Similar to the situation across the United States, Canada has seen a large reduction in the number of dairy farms over the last decade. The Canadian Dairy Commission reported in the early 1970's having 130,000 dairy farms, in 1999 this number was 109,640, and today there are 12,529 dairies (CDC, 2012-2013 & USDA, 2013). Since 1999, the number of farms has decreased by 36% while the number of cows has increased by 30% (USDA, 2013). The 2012 cost of production per hectoliter of milk (227.3 pounds of milk or just over two hundredweights) was $77.79, and the price is projected to have increased in 2013 (USDA, 2013).

The Canadian dairy industry is primarily governed by the Canadian Dairy Commission (CDC). The CDC uses a classified system similar to those found under the various United States dairy governances. The Canadian system of classification has similar groupings, but a larger array of subcategories than found in the United States systems;

1. Class 1 (a-d) - representing fluid milk,
2. Class 2 (a-b) - representing cultured and frozen products,
3. Class 3 (a-d) - representing all cheese products,
4. Class 4 (a,a1,b,c,d,m) - representing butter, concentrate, powdered milk, and more products,
5. Class 5 (a-d) - representing all dairy ingredients products (CDC, 1994).

The pricing formula for each of the various Classes of milk is determined based on butterfat content, protein content, and other solid components in raw milk (CD, 1994).

Canada is broken into ten provinces, each of which has a provincial milk marketing board (USDA, 2013). These provincial milk marketing boards each set fluid milk production limits, product pricing formulas, quota policies, and other specialized regulation for their region (USDA, 2013). Although the individual provinces set their fluid milk production limits, the CDC set a national industrial milk production limit. The CDC utilizes a supply management system based on Canadian milk market demands to determine the national industrial milk demand. The CDC then allocates industrial milk production to the various provinces through the Market Sharing Quota formula (USDA, 2013).

The Market Sharing Quota formula allows for industrial milk allocation to be done based on various dairy products needs for butterfat (USDA, 2013). Quota is allocated on a butterfat basis to the various provinces from the Canadian Milk Supply Management Committee (CMSMC) (USDA, 2013). The CMSMC determines each province's Market Share Quota from the terms set in the National Milk Marketing Plan (USDA, 2013). Once quota is allocated to the individual provinces, each province then allocates quota to producers based on their individual pooling agreements (USDA, 2013). Quota is observed on a monthly basis and is adjusted every two months in order to meet Canadian milk market demands (CDC, 2011-2012).

The system of quota pooling at the CDC level is designed to pool the market and producer returns in order to diminish financial risk as the domestic dairy market fluctuates (CDC, 2012-2013). The system consists of three agreements in order to reduce market risk (CDC, 2012-2013). The three agreements are the comprehensive agreement on pooling of milk revenues, the agreement on the Eastern Canadian Milk pooling, and the Western Milk Pooling Agreement (CDC, 2012-2013).

The Canadian Comprehensive Agreement on pooling of milk revenues was developed under the 1995 Special Milk Class Permit Program (CDC, 2012-2013). This program provides the means for the market revenue returns from the sale of milk for special class purposes to processors to be shared among the dairy producers of all ten provinces (CDC, 2012-2013). The agreement on the Eastern Canadian Milk pooling is an agreement for producers in Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island to ensure that all revenues from all milk sales are pooled and evenly distrusted to farms based on their milk contribution (CDC, 2012-2013). The Western

Milk Pooling Agreement is an agreement in Manitoba, Saskatchewan, Alberta and British Columbia allows for the sharing of all markets and returns from dairy sales in the Western region (CDC, 2012-2013).

When the CDC sets limits for industrial milk, it is set based on Canadian demand without consideration of projected international demands (USDA, 2013). The CDC setting milk production limits based on internal Canadian milk market demands allows for little to no fluctuation in the production limits from year to year and no room for the Canadian dairy industry in response to global demands (USDA, 2013). The CDC's domestically introspective way of producing milk production limits is in part due a 2002 ruling of the World Trade Organization (WTO) (USDA, 2013). The WTO capped subsidized exports of dairy products from Canada leading to a limited quantity of dairy products which can be exported from Canada (USDA, 2013). In 2012, the main dairy products exported from Canada were cheese, ice cream, whey, and skim milk powder (USDA, 2013).

Under this regulatory system the Canadian dairy industry announced on October 18, 2013 a new agreement with the European Union regarding export cheese (USDA, 2013). Through this agreement the European Union is granting dairy concession that more than doubles the current Canadian access level (USDA, 2013).

European Union Dairy Industry

The European Union (EU) is a representative body that consists of 28 Member States today. These 28 Member States produce various commodities to support the entire European Union. Of the agricultural commodities produced in the European Union, milk

accounts for 15% of the European Union's total agricultural production, and milk ranks as the third largest rural industry (European Commission, 2014). The European Union's main dairy producing Member States are Germany, France, the United Kingdom, the Netherlands, Italy and Poland; together they account for more than 70% of the EU total milk production (European Commission, 2014). Total EU milk production in 2013 was just over 138.5 million metric tonnes (152.3 million tons) and represented, an increase from 134.2 million metric tonnes (147.62 million tons) in 2009 (European Dairy Association, 2013). As with each of the dairy systems examined in this paper, there has been a reduction in the number of dairy cows in the EU in recent years. In 2009 there was 23.566 million dairy cows in the entire European Union, and as of 2013 there were 22.600 million dairy cows (European Dairy Association, 2013). In 2011 on average each of these cows produced 6500 kg of milk annually (European Commission, 2014).

As dairying within the EU covers a vast variety of geographical areas, it is hard to say that any one style of dairying is most commonly utilized. Throughout the EU there are numerous examples of free stall farms and pasture based farms; some with thousands of cows and other with just a few hundred cows. The variety both in geography and in management practices utilized presents the EU with a unique challenge when regulating the dairy industry. The main governing body of the EU dairy industry is the Common Market Organization's Dairy Division (CMO) (European Commission, 2011).

Under the CMO, the regulation of the dairy industry throughout the EU has undergone drastic change in recent years (European Commission, 2011). The main body of legislation which regulates not only the dairy industry, but all agriculture is the Common Agricultural Policy (CAP) program (European Commission, 2011). The CAP

program began in 1962 as a system which would purchase farmers goods when market prices fell below a set level (European Commission, 2011). The goal of the CAP was to create and maintain stable market conditions for the EU agricultural producers and processors (European Commission, 2012c).

Throughout the EU the processing and selling of fluid milk is commonly done directly by the producer on farm or by farmer-owned cooperatives for direct sale to the consumer (European Commission, 2014). There are some Member States where the majority of raw processing is done not by the producer or cooperative, but by private companies (European Commission, 2014). In the processing of manufactured dairy products, a majority of processing is done through cooperative owned facilities or by private companies. The EU producer's milk price is based upon a complex set of factors including: supply and demand on the internal EU market, world dairy product prices, currency exchange rate fluctuation, quality requirements and demands of specific products, the competition situation in the food chain, and finally the support for the dairy market and the farmers from the CAP (European Commission, 2006). The EU System that includes many of the markets variables in the pricing system which determines the producer's milk price is designed to allow greater opportunity for market signaling and transparency in demand. Although the pricing system aims for transparency, the system is still promoting mixed messages.

This CAP program has undergone various changes since 1962 which have increased the program's involvement in the agriculture sectors of the EU (European Commission, 2011). By 1970, the CAP program was so heavily subsidizing the agriculture industry that it accounted for around 87% of the European Union's budget

(European Commission, 2011). As the program was quickly spiraling into an unsustainable future, major reform to the program ensued. Since its implementation in 1962, the CAP program has undergone many reformations with the two most recent occurring in 2003 and 2013 (European Commission, 2011).

The reform in 2003 focused on farmer payments from CAP subsidy programs. Previously, payments from the CAP where not paid directly to the farmer, but as of 2003 a majority of the subsidies paid by CAP go directly to individual farmers (European Commission, 2011). This reform is still in place today, representing an enormous portion of the CAP's budget. In 2013, 57.5 billion euros out of the total EU budget of 132.8 billion euros was used in the form of direct farm subsidies and rural development projects (European Commission, 2011).

The most recent CAP 'health check' reform of 2008 was implemented in 2010, and it is a multiphase reform that is to be completed in mid-2020 (European Commission, 2011). Specific to the dairy industry, the 2008 CAP reform focuses on the milk quota system developed in 1984 (European Commission, 2011). The quota system set in place by the EU CAP system was implemented to control the issue of over production which was plaguing the dairy industry (European Commission, 2006). Under this quota system each Member State is provided with a portion of the total EU raw product volume needed to satisfy the demands of all Member States (European Commission, 2006). The allocated quota correlates with the size of the dairy industry in the given Member State. Once the Member State receives their quota volume allocation, it is contracted to the Member State's producers in accordance with the individual state's regulation (European Commission, 2006). If producers of a Member State produced more than their quota

allotment, under this system the Member State is penalized for overproduction based on volume, and they are fined (European Commission, 2006). This penalty for over production is then passed down to the cooperative and their individually contracted producers (European Commission, 2006).

This quota system has been widely unsuccessful in controlling the overproduction issue within the EU dairy industry. This is in part due to the lack of consistent contracting between producers and their cooperative or private processors. Presently, with no succinct mandatory contracting system at the Member State to producer level, the lack of market consistency is creating a volume management issue. The volume which a producer is going to be producing in any given season changes based on many factors, such as, feed quality and weather. As many of these factors are being insufficiently planned for, the resulting over or under production creates great havoc for the EU dairy industry as a whole (U.K. Parliament, 2014). Many of the contracting systems currently active between producers and processors of various Member States merely create the obligation of the producer to deliver all raw product produced (i.e. no a set volume to the contracted processor) (U.K. Parliament, 2014). Similarly, the contract outlines the obligation of the processor to take all the raw product produced by contracted producers even if it is more than is necessary for production demand (U.K. Parliament, 2014). In a system where both sides have no signal or system for controlling the production volumes, the quota system has been ineffective (U.K. Parliament, 2014).

As the quota system has been unsuccessful in controlling the issue of over production of milk in the European Union, the 2008 CAP reform adopted a new system to control production. Under the 2008 CAP reform, the system of quota is being

completely eliminated by start of 2015. The removal of the current quota system is being done through a series of quota increases over six years (European Commission, 2012d). This six year phase out of quota is designed to slowly remove the dependency within the dairy industry on quota by increasing quota yearly. Starting April 1, 2008, milk quota throughout the EU was increased by 2% representing the start of the six year plan (European Commission, 2012d). For each subsequent year until quotas expiration in 2015, there will be a 1% increase in milk quota totaling 5% guaranteed increase in quota volume (European Commission, 2012d). The guaranteed 5% increase will be coupled with an additional adjustment for the fat correction factor (European Commission, 2012d). The adjustment for the fat correction of milk is used to establish an average fat level in all milk from all cattle breeds, and in 2009 actually effectively represented an additional 1% increase in the quota increase (European Commission, 2012d). As the quota level has been annually increasing for several years, the producers of many Member States have been falling short of quota, thus making the impact of the quota program far less than was historically experienced (European Commission, 2012d).

As quota is being phased out, the EU has approved the Milk Package. The Milk Package is a temporary optional piece of regulation that applies to the dairy industry until mid-2020 (U.K. Parliament, 2014). The milk package is designed to target the issues identified by the 2010 Dairy Commission study. These issues include: lack of price transparency along the food chain; the valued added processing of some products (such as whey) are not making their way back to producers; the minimal planning regarding raw milk supply volume; the current contracting obligation language for both producers and processors; and the underutilization of formalized written contracts between

producers, processors, and retailers (U.K. Parliament, 2014). This Milk Package includes a series of measure that aim to enhance the transparency in the market, to allow for producer and processor response to the market demands, and to share the financial realities of the dairy market (European Commission, 2012b). One of these measures outlines written contracts between producers and processors, for a specified period of time, which clearly outlines a set price or price formula, a set volume, and the collection schedule (European Commission, 2012b). These contracts allow producers and processors to negotiate terms as long as the contract does not account for more than 3.5% of the European Union's production or 33% of the national production volume (U.K. Parliament, 2014). Productions that represent more than 3.5% of the European Union's production or more than 33% of the national production volume are governed specifically by the CMO. Although all contracts and measures implemented under the Milk Package will be eliminated upon the completion of the CAP reform in 2020, the EU is encouraging the entire EU dairy industry to adopt these models (European Commission, 2012b).

Since the 2008 CAP reform programs implementation in 2010, the EU has seen significant changes in the dairy industry. The largest change reported has been in regards to the supply and demand relationship of milk (European Commission, 2011). The supply of milk is now moving in accordance with the true representative value of milk on the market, and not being as driven by the value of quota in the majority of the Member States (European Commission, 2011). In the 2012-2013 dairy year, only five of the Member States produced more than their quota limits (European Commission, 2012c). Austria, Germany, Denmark, Poland, and Cyprus each exceeded their quota limits and

are paying approximately 46 million euros in fines. Although five Member States exceeded their quota limit, the total EU production remained 6% below total allocated quota (European Commission, 2012c). The reduction in surplus throughout the EU correlates directly with the reduction in subsidies, and reveals that the majority of Member States are responding to the market demands and are producing accordingly.

Along with the reform to the quota system, the 'health check' CAP reform aims: to ensure European money is being spent on the European public goods and not moving across the boarders; to focus on environmental programs; to significantly reduce the CAP's budget expenditures; and to develop stronger national oversight of Member State farm policies (Valentin Zahrant, 2010). The success of the CAP reform at controlling milk supply and creating market stability through transparency is apparent in the continuous increase in milk prices since 2010. The 2013 annual average for the EU milk price was 37.81 euro/ 100kg (36). After experiencing continuous growth in international trade since 2008, the EU experienced the first decline in exports in the first quarter of 2013 (European Dairy Association, 2013). Exports declined by 2.5 billion pounds as a result of growing domestic market demands throughout the EU (McKinsey & Company, 2007).

Australian Dairy Industry

The dairy industry in Australia is largely pasture based unlike the dairy industry in the United States. Today, the Australian national herd consists of 1.65 million cows, with an average herd size of 258 cows each producing 5.525 liters annually (Dairy Australia, 2012-2013b). As seen in all major dairy industries, Australia has experienced a

reduction in the number of operational dairies along with a reduction in the number of cows nationally (Dobson, et al, 2000). In 1975 Australia had 30,000 dairy farms, in 2000 there were 14,000 dairy farms, and today there are 6,398 registered dairy farms (Dairy Australia, 2012-2013b). Dairy production is the third largest rural industry in Australia representing $13 billion (Dairy Australia, 2012-2013b). The Australia dairy industry controls 7% of the international dairy trade with the dairy industry exports representing 40% of the total milk production, and valued at $2.76 billion in 2012-2013 (Dairy Australia, 2012-2013b).

Dairy production in Australia is seen in each of their seven states in order to supply fresh fluid milk domestically, but a majority of the Australian dairy industry is located in the south-east states (Dairy Australia, 2012-2013b). Australian milk utilization is greatly influenced by the international demands for dairy products. Today, 88% of milk is processed into three products; two of which are highly demanded internationally. Of all processed milk: 33% is processed into cheese; 28% into skim milk powder (SMP) and butter; and 27% into fluid milk products for domestic sale (Dairy Australia, 2012-2013b). The main importers of Australian dairy products include China at 129,000 metric tonnes, Japan at 125,000 metric tonnes, and Singapore at 84,000 metric tonnes (Dairy Australia, 2012-2013a)). It is important to note that both Malaysia and Indonesia also import a significant volume of Australian Dairy products, but at lower volumes than China, Japan, or Singapore (Dairy Australia, 2012-2013a)).

Today, the Australian dairy industry is governed by the Australian Government's Department of Agriculture under the Australian Dairy Industry Council (ADIC). The current regulatory system in Australia is commonly known as "Deregulated Australia".

This Deregulated system was adopted July 1, 2000 upon the disbanding of the Domestic Market Support Scheme (DMS) enacted in 1995 (Dobson, et al, 2000). The deregulated system divides dairy processing into two systems, fluid milk and manufacturing milk. This division serves a similar purpose to the Class System in the California Order, and ensures that consumers have an adequate supply of fluid milk year round.

Prior to the deregulation of 2000, the supply of milk and the pricing of all dairy was regulated by both the Australian Government and the State (Dairy Australia, 2012-2013a). The Government regulations focused on foreign affairs and trade, taxation, and food safety, while the State regulations controlled sourcing, distribution and milk pricing (Dairy Australia, 2012-2013a). The objective of this multi-tiered, highly regulated system was to ensure year round supply of fresh drinking milk in a seasonal pasture based dairy industry, as well as, a higher producer price (Dairy Australia, 2012-2013a). In the early 1990's prior to the DMS program or Deregulation, the Australian Government conducted an independent survey of the competition policy within the Dairy Industry (AGDA, 2011). This survey hinged on the idea that government regulation should not restrict competition in a market unless the regulation was the only effective way to protect public interest (AGDA, 2011). The study revealed that the highly regulated dairy industry (specifically in the Victorian State, the largest dairy producing state) had a negative effect on public investment (AGDA, 2011). As the Victorian State choose to deregulate for public interest, the other states followed in order to remain competitive with producers in the Victorian State (AGDA, 2011).

During the transition into the deregulated system the Dairy Adjustment Program offered four relief options to dairy producers designed to aid in the orderly deregulation

of the dairy industry (Dobson, et al, 2000). The four programs to provide the transition relief were names, the Dairy Structural Adjustment Program, the Supplementary Dairy Assistance Program, the Dairy Exit Payments Program, and the Regional Assistance Program. Each program provided producers with differing avenues for deregulation and are discussed below (Dobson, et al, 2000).

The Dairy Structural Adjustment Program and the Supplementary Dairy Assistance Program were designed to provide all producers in the Australasian system as of September 28, 1999, with financial assistance for continued operation (Dobson, et al, 2000). These program provided approximately $1.6 billion to the dairy industry over 8 years on 32 quarterly based payments (Dobson, et al, 2000). The level of assistance provided to each producer was determined by individual milk production and sales during the dairy year of 1998 -1999 (Dobson, et al, 2000). The support payments represented nearly $20,000 each month to producers throughout Australia (Dobson, et al, 2000). These payments where funded through an 11 cent per liter sales tax levy placed on consumers of dairy products (Dobson, et al, 2000). This levy did not apply to export dairy products, and was in effect domestically from July 8, 2000, to February 22, 2009 (Dobson, et al, 2000).

Those producers who choose to exit the industry, but had been an active producer in the dairy year of 1998-1999 where eligible for the third relief program. Under the Dairy Structural Adjustment Program, the Dairy Exit Payment Program offered financial incentive to producers exiting the production industry (Dobson, et al, 2000). The Dairy Exit Payment Program provided up to $45,000 tax free aid to dairy farmers exiting the industry (Dobson, et al, 2000). The amount each producer received was determined on an

individual basis upon criteria developed by the Australian Assistance Program. Of the entire Australian dairy industry, only 7% of producers chose to utilize the Dairy Exit Payment Program and leave the dairy business (Dobson, et al, 2000).

The fourth piece of the Australian Assistance Program was the Regional Assistance Program. This program did not focus on the producers themselves, but rather on the communities in which dairy production represented a significant economic facet (Dobson, et al, 2000). The program provided funds for diversification to communities previously reliant upon the dairy industry, and which had been impacted by the reduction in the Australian dairy industry (Dobson, et al, 2000).

The Dairy Adjustment Authority (DAA) established in 2000 under the Dairy Produce Act of 1986 was designed to regulate the Adjustment Programs, and to ensure a smooth deregulation (Dairy Australia, 2012-2013b). The DAA worked with all sides of the dairy industry to review the systems designed to aid in the transition to deregulation, as well as, to rework aspects of regulation which proved ineffective. The DAA also oversaw the implementation of two levy systems that were removed in 2009 (AGDA, 2011). The first levy was implemented by retailers and paid by consumers focusing on fluid milk consumed domestically, and was paid directly to producers (Dobson, et al, 2000). The second levy was placed on manufactured dairy products for domestic sale (Dobson, et al, 2000). This levy also was paid to processors, but was expected to be pass onto domestic dairy consumers in the form of a reduced price for domestic goods (Dobson, et al, 2000). This levy was designed to reduce the disadvantage that domestic processors faced due to low cost imported goods (Dobson, et al, 2000). Today there is only one active levy in Australia (AGDA, 2011). The Dairy Product Levy is placed on

milk sent to a manufacturer and provides funds for marketing, animal health programs, and research and development projects (AGDA, 2011).

Under the deregulated system, the price paid to producer is set entirely by market forces. There is no minimum price set and no legislative controls placed on the price which a processor must pay a producer (Dairy Australia, 2012-2013b). The price producers receive for milk is based on the milk fat and protein content of the milk they produce as defined by individual contracting (Dairy Australia, 2012-2013b). All producers and processors prices are established by the market demands, and both sectors of the industry share the burden of market fluctuations.

Having moved towards deregulation 14 years ago, Australia has served as a live model for other dairy systems, such as California, to examine the results of choosing a path of deregulation. Results of deregulation in 2000 have been significant across all facets of the dairy industry. As the Australia dairy industry began its deregulation in 2000 when the dairy market internationally was extremely strong, it is commonly assumed that overall deregulation was made easier by the strong global market (Dobson, et al, 2000). With incentives to those servicing the fluid milk supply combined with programs providing financial aid during the transition, the overall results of moving to the deregulated system have been a decreased supply surplus and increase in prices in the Australian dairy industry (McKinsey & Company, 2007).

When comparing the production side of the industry pre and post deregulation, it can be deduced that fewer producers are now milking larger and more efficient herd. The price that the producer is receiving today is 33% less than the averages prices seen under the highly subsidized programs prior to 2000 (Dairy Australia, 2012-2013a)). The

national average price a producer received for raw milk in 2013 was $5.7 per kilogram of milk solids (Dairy Australia, 2012-2013b). This price was the lowest received since the 2008-2009 dairy year when producers averaged $4.98/kg of milk solids, and far below the high of 2007 -2008 of $6.68/kg of milk solids (Dairy Australia, 2012-2013b). A farm survey conducted by Abares revealed that, although the price received was down 33% from dairy years 2011-2012 to 2012-2013, the milk price fell only 2% below the average of the preceding 10 dairy years. The survey of the past 10 years of producer price reveals the true stability in the market price under a deregulated system. The stability of milk price was a topic of great concern prior to deregulation, and this survey result proves that while minor fluctuations occur, the price remains less volatile than had been feared. As lower profits have been the reality of the deregulated system since the international market crisis of 2009, there has been a reduction in the number of producers looking to invest in facility improvements (Dairy Australia, 2012-2013a).

The processing sector of the dairy industry has also been significant change since deregulation. Today there are many more small processing plants which concentrate in specialty products than had been historically operating (Dairy Australia, 2012-2013a). The number of small on farm fluid processing facilities has greatly increased especially on farms outside of the south-eastern region (Dairy Australia, 2012-2013a). Throughout the processing sector there has been substantial increase in the diversity of products being produced. This diversification has encouraged multi-purpose plants, and has increased innovation. The processing sector now reacts in accordance with the market and international demands more effectively. This is illustrated by the rapidly increased in the number of plants producing lactoferrin in order to meet the increasing demands of the

Asian market (Dairy Australia, 2012-2013a). It has also become common practice throughout the industry for processors to develop initiatives to support the productivity of their producers (Dairy Australia, 2012-2013a).

New Zealand Dairy Industry

New Zealand is a country in the Oceana region consisting of two islands. Although a significant international dairy player, New Zealand releases very limited information regarding the dairy industry. As their public publication are limited, the review of the New Zealand dairy industry is limited. Specific information on product production and exports are not included in detail as the information is not publicly available. It is known that the dairy sector directly accounts for $5 million or 2.8% if the New Zealand national GDP (Fonterra, 2010). New Zealand dairy production accounts for approximately 2% of the global production of milk (in comparison to the United States at 12%). Yet, New Zealand dairy products account for approximately a third of all international dairy products. Of the total New Zealand dairy production, 95% is made for export (Evens, 2004). New Zealand products are exported to 151 countries with major market shares in China, the United States, Japan, and the European Union (Ministry For Primary Industries, 2013). Although these countries represent key markets for New Zealand dairy exports, the destination for 72% of dairy products exported was to various developing countries (Ministry For Primary Industries, 2013).

The New Zealand dairy industry is a seasonal pasture based system similar to that seen in Australia. The dairy industry's production is tied very closely to the severity of the rainy season. In years of drought the volume of production, as well as, the protein and

fat components of the milk produced decreases significantly altering the processing sectors production capabilities. Today the New Zealand dairy industry consists of 11,891 farms milking 4.78 million cows (DairyNZ, 2013). The annually average production for each cow in 2012-2013 was 3,947 liters which represented a decrease of 4.9% from 2011-2012 (DairyNZ, 2013). It is important to note that production level of New Zealand cows is highly volatile due to the pasture management and feed issues, and in 2012-2013 New Zealand experienced a drought. As New Zealand is on a pasture based system, the industry is also very seasonal in its production ability as is apparent by the breakdown of production averages. In October, at the height of dairy production, the average cow produced 22.96 liters daily versus in April, the lowest point of dairy production when the average was 11.77 liters daily (DairyNZ, 2013).

The number of farms in New Zealand was declining at an average of 170 herds per year from 1980 to 2008 (DairyNZ, 2013). This reduction correlated with an increase in the size of individual producers which has tripled over the last 30 years (DairyNZ, 2013). These trends are similarly to the other dairy industries reviewed in this paper; that is true until this year. In 2012-2013 an additional 93 dairy farms opened in New Zealand (DairyNZ, 2013). In 2012-2013 the number of dairy cows in New Zealand increased by 150,000 in large part due to the increased number of farms. The size of herds throughout New Zealand varies greatly based on region. With 75% of farms located in the North Islands, and 62% of cows located in the South Island, it is difficult to use a country average to accurately depict farm size (DairyNZ, 2013). Just over 50% of New Zealand herds are between 150-300 cows, while 26% of herds are 500 cows or more (DairyNZ, 2013). A decade ago only 32% of all dairies had 300 cows or more (DairyNZ, 2013).

During 2012-2013, even in a year of drought, New Zealand saw the highest volume of production in history. In the 2012-2013 dairy year, New Zealand processed 18,883 million liters of milk in various dairy products (DairyNZ, 2013). Production of 2009-2010, a non-drought year, was 16,483 million liters, and in dairy year 1989-1999 when production was 10,563 million liters. From the volume of production it is clear New Zealand dairy production is greatly expanding (DairyNZ, 2013).

The governing of the New Zealand dairy industry has been dominated by cooperative since 1871 (Dairy Companies Associates of New Zealand, 2014). The number of active cooperative within New Zealand has been steadily declining over the years due to improved technologies and increased cost efficiency (Dairy Companies Associates of New Zealand, 2014). Today Fonterra, Tatua, and Westland are the three main cooperative that control the dairy industry in New Zealand (Ministry For Primary Industries, 2013). Fonterra which represents the largest receiver and processor of milk, will be the focus for the remained of this review of New Zealand.

Until the end of the 2000-2001 dairy year, the Total Payout Program provided producers with advanced and final payment for the products they produced (DairyNZ, 2013). This program was developed and regulated by the New Zealand Dairy Board to ensure that producers were paid their portion of the Dairy Boards subsidy, as well as, for dairy processing efficiency, increased product mix, and investment policies (DairyNZ, 2013). In 2001, the Dairy Industry Restructuring Act (DIRA) paved the way for New Zealand's largest dairy cooperatives to form mergers (DairyNZ, 2013). As a result, Kiwi Cooperative Dairy Company, New Zealand Dairy Group, and many smaller cooperatives

merged to form the Golden Dairy Company now known as the Fonterra Dairy Board (DairyNZ, 2013).

The 2001 DIRA was not formed to be an active regulator of the cooperatives, but aimed to ensure two key items for the New Zealand dairy industry were controlled. One item was that all cooperatives function under the policy of open entry for any prospective producer, as well as, a cost neutral and timely option for exiting (Evens, 2004). This open policy was to be regulated by the Commerce Commission, and aimed to protect producers from becoming forced suppliers of any given cooperative (Evens, 2004). The second key aspect of the DIRA was a requirement set on Fonterra to supply up to 400 million liters of raw milk to other cooperative and independent processors on competitive terms (Evens, 2004).

Fonterra has been a wildly successful company which today controls 96% of the New Zealand milk supply (Ministry For Primary Industries, 2013). Owning and operating 25 plants in New Zealand and another 30 plants around the globe, Fonterra is a significant global player in the international dairy market (Evens, 2004). As a whole Fonterra produced 2.4 million metric tonnes of dairy ingredients last year, of which 2.1 million metric tonnes was produced in New Zealand (Fonterra, 2014). Fonterra with revenues of $15.7 billion ranked fourth in the Rabobank 2012 Global Dairy Top 20 report following Nestles at $25.9 billion, Danone at $19.5 billion, and the Unites States at $18.8 billion (Fonterra, 2014). In order to manage prices and inventory in response to global demands, Fonterra has invested heavily in the development of processing facilities, technologies and product innovation (McKinsey & Company, 2007). As a result Fonterra has seen a

40% increase in their cooperative owner share value, and until recent years a continuous increase in the milk price received by producers (McKinsey & Company, 2007).

New Zealand producers receive no subsidies. They are paid based on a formula which considers milk fat and protein levels with adjustments based on the volume of production (DairyNZ, 2013). This method of payment with no subsidies has led to the increasing focus of low-cost, high productivity farming systems (DairyNZ, 2013). The payment system is not government controlled or dictated which allows Fonterra, based on sheer size, to set the national price for producer's milk. Fonterra uses the fair-value share pricing to establish the payment received by their producers (Fonterra, 2014). It is important to note that the fair-value share pricing is contracted out and calculated by an independent company this is overseen by the Fonterra Shareholders Council (Fonterra, 2014). The price received by producers has been declining over the past two years from $8.02/kg in 2010-2011 to $6.18/kg today (DairyNZ, 2013). This decline coupled with the increasing strength of the international dairy market has led to the New Zealand dairy industry questioning the way in which Fonterra is setting the milk price. As a result of uncertainty, the 2001 DIRA was amended in 2012 to address the rumors of misconduct (Evens, 2004).

The 2012 reform aimed to increase transparency in the market, improve confidence in Fonterra's producer payments, and ensure value added profits were shared with producers (Evens, 2004). The amendment to the DIRA gave power to the Commerce Commission to: continue to regulate the policy of open entry and exit; ensure the issuing and redeeming of cooperative shares to members; ensure payments to producers are received

within 30 days of product receipt; and finally ensure no special treatment is given to members based on seniority (Evens, 2004).

It is important to note that Fonterra also plays a significant role in the exporting of nonfat dry milk powder (NFDMP) produced in the United States (Jesse, et al, 2008). Starting in 2005, when a worldwide shortage of dry milk protein occurred, the United States NFDMP exports began to increase rapidly (Jesse, et al, 2008). Under the United States Milk Price Support Program, the CCC historically purchased a majority of the NFDM produced domestically (Jesse, et al, 2008). This provided a stability in producing NFDMP not seen in the manufacturing of other dairy products. This stability lead too many cooperatives investing in NFDMP plants in order to service the CCC, and thus have a more stable market (Jesse, et al, 2008). As a vast majority of the dairy cooperatives in the United States are members of the federal cooperative, Dairy America, when the worldwide dry milk protein shortage occurred the focused shifted to servicing global market needs (Jesse, et al, 2008). As Fonterra controlled a significant portion of the international dairy export market, Dairy America formed a joint venture with Fonterra in 2005 (Jesse, et al, 2008). This joint venture contracts Fonterra to handle all of Dairy America's exports (Jesse, et al, 2008). The joint venture does not ensure a set volume of NFDMP for the CME spot market, as the primary function of Dairy America is to service the export market to meet international needs for NFDMP (Jesse, et al, 2008). Dairy America has been widely criticized for this enterprise due to the impacts felt in the domestic NFDMP market (Jesse, et al, 2008).

Chapter 3

PROPOSAL

Auction Proposal

Today all industries, agriculture included, have to adapt to the reality and impact of globalization. The products produced by California Agriculture no longer affect only those living throughout the Unites States, but impact people living around the globe. As the markets have become globalized, it has made apparent the need for regulatory change in order to effectively adapt to the new market scope. The California dairy industry is currently regulated by systems that began development in the 1920's during a time of localized markets. To enable California to step onto the global stage free of these out of date regulation there are benefits to reap in adopting a new system which removes the end product pricing system, and that removes the current quota system. The formation of a dairy industry regulator system which is market driven in California will develop healthy competition for raw milk, encourage farm and processing efficiency, create production based on market demand not government subsidy, and it will provide clear market demand signals to all facets of the industry.

Currently California produces the largest volume of milk in the United States, and when rank against all foreign countries' 2012 production, California is the eight largest producer of dairy in the world. Despite this impressive level of production, California continues to have opportunities for dairy industry expansion. California's coastal location enables the California dairy industry to use maritime shipping to supply the world with dairy products in a cost effective way. These strategic advantages place California's dairy industry in a position of great power and great opportunity. To seize this opportunity

there needs to be significant change within the California dairy industry. This change has the potential to allow California to enter into world markets that are currently being left unsatisfied. As the European Union international dairy market's influence has begun shrinking, the international supply and the international demand for dairy products continues to grow, and the need for international dairy players increases. According to the United States Department of Agriculture, in order to meet the increasing demand for dairy products worldwide, dairy production will need to increase between 1.65% and 2.45% annually year-over-year on an ongoing basis (USDA, 2014).

It is important to remember that change is something that is both inevitable and challenging. Change is upon California, whether it be in the form of further regulation of the current system, or in adopting a new system. Inherently, as with any change, there are going to be individuals who support the change and those who do not. It is important to realize that working to please and save everyone in the dairy industry is impossible, and in fact could lead to irreversible damage to the entire California dairy industry. It is important that the governing bodies do what is best for the industry as a whole. It is inevitable that there will be those who win and those who lose in the transition.

In order to capitalize on the enormous global opportunity on the horizon, I believe that the California dairy industry needs to adopt a new system similarly to one of the proposals featured in the 2007 McKinsey report. The adoption of a Dutch Auction Marketing System will enable the California dairy industry to thrive, and to become a global market leader. This system is based on a two milk classifications, fluid and manufacturing. As discussed below, the division of fluid milk and manufacturing milk will enable the California dairy industry to continue to provide an adequate supply of

quality fluid milk to the market without competing with other dairy products for raw milk. By lumping all manufactured dairy processors into one class, the system will promote production of processed products in accordance with consumer demands.

The Auction System allows for hundred weights of raw milk (units of milk) to be sold in a stock market style system. On the Monday of the final full week of each month for a twenty four hour period, the California Department of Agriculture (CDFA) would open an electronic database in which every California dairy producer or their representative body would report their projected month's production. This projection will include the producers contracted quota milk, and any production not under contracted quota (contracted quota discussed later). Simultaneously, all fluid dairy producers would enter a database and report the volume of milk which they desire to purchase at the set fluid price (fluid price discussed later). The CDFA will then distribute the month's supply contracts to all fluid processors based on the submitted utilization projections. By providing fluid processors the opportunity to purchase as many units of raw milk as desired from the statewide milk supply before opening the market to the dairy manufacturing class, the system ensures consumers an adequate fluid milk supply.

Upon the removal of the fluid milk allocation from the statewide pool, the CDFA will now allocate the remaining milk to the manufacturing class processors. The following day, again for a twenty four hour period, all dairy processors in California servicing a non-fluid market will enter a database in which they report the number of raw milk units they would like to purchase in a given price range. This system will allow manufactures to place a higher or lower value on different volumes of raw milk units based on their individual manufacturing requirements and an overall market reality.

By ranking all manufacturing class bids for units of milk in order from highest to lowest the CDFA will determine what unit value will clear the entirety of the projected month's milk pool. If this unit value is level to or less than what an individual processor bid per unit of raw milk, then the processor will be required to pay for each bid upon milk unit at that price which clears the market. If a manufacture bid at a price per unit lower than the unit value price which clears the market the processor will receive an electronic notice stating the market cleaning price per unit for the month and is then given the option to purchase units at this higher price. The processor will have twelve hours to respond to the CDFA with the number of units which they would be willing to purchase at the reported price. The CDFA will then take these volume requests and allocate the remaining milk in the pool to those processors. If the pool does not have sufficient volume remaining to meet the requested units, then the processors will receive as many units as can be supplied.

This bidding system will ensure that raw milk moves to its highest valued and best use within the manufacturing class. The Auction System enables healthy competition for milk throughout the manufacturing sector, as a processor must be willing and financially able to bid at a sufficient unit price to obtain milk or their plants will be processing below capacity or remaining ideal, which is very costly. To avoid processor collusion regarding the price per unit of milk, the taskforce (discussed below) will set a minimum bidding price per unit of milk. This base price will be derived from and set in relation to the average cost of production, and will be review by the taskforce annually.

The price per unit of milk received by a producers for contracted quota milk, would be determined monthly by the unit price at which the market cleared. Each

producer would be paid in accordance with the number of units of milk they provided to the statewide pool regardless of which class their milk services. Those producers who produced over their contracted quota, are paid for the over production at the reduced value established by the CDFA. How the CDFA establishes the reduced price for milk produced above contracted quota is detailed later in this proposal.

Today many processors have adopted a system of premium payment in order to attract milk with desirable components and quality for the products they manufacture. This practice is one that under the Auction System would still be possible through private side contracting. With all California milk production entering the statewide utilization pool for auctioning, private contracts for components and quality would be complex. The Auction System would leave no guarantee that a given processor would obtain the needed units of milk to receive milk from the producers with whom they have private premium contracts. This reality would need to be addressed in the development of the private contracts at the discretion of the producer and processors. Such contacting would continue to allow premiums to be paid if a producer supplies a better suited product to the individual processors need.

The price paid per unit of raw milk for fluid production would be set by the California Department of Food and Agriculture through field research. Conducting a yearly survey of consumer prices for fluid milk throughout the state, the CDFA would be able to develop a statewide average price per unit of consumer ready fluid milk to serve as a baseline. This baseline would then be used to establish the minimum price for units of raw milk purchased on the auction. The CDFA would adjust the baseline price each year in accordance with fluctuations in the prices paid by consumers, for changes in milk

consumption, and for changes in cost of fluid production. The baseline would serve as a price floor which no fluid milk could be sold below by a retailer, but no ceiling would be set. Along with establishing the base price, a regulatory component would be developed to ensure that fluid milk retailers paid processors based on a set percentage of revenues received per unit of milk. Unlike in today's system, by tying the regulation to a percentage of revenues, the CDFA will ensure that both the retailers and processors share the profits and market fluctuations equally.

Under the current system California producers who hold quotas essentially own milk stocks. The producer has received or purchased the right to a premium price per hundredweight of milk equal to the quota they own. This quota can be bought, sold, and traded in a similar manor to stocks. Under the Auction System, today's quota system would no longer exist. The current system of quota would be phased out through a five year plan similar to that seen in the European Union CAP reform. Producers who own quota under the current system would be compensated for the loss of investment over a period of five years. One possible option for producers is to choose to invest the equivalent value of their quota in things such as facility renovation or expansion. Another potential option is for producers to receive contracts allowing for herd expansion equivalent to the volume of milk cover by their current quota holdings. These contracts would guarantee that all expansion contracted in this manner would receive contracted quota under the new system. Both of these options would promote efficacy and expansion to the California dairy industry which is essential for success on the global stage. These are two possible solutions, but further research would be required to understand if these or other options would best benefit the entire industry.

The new system of contracted quota would be implemented based on the volume of milk each producer within the state is currently producing. Herds undergoing expansion currently would receive contracted quota for the volume of milk being produced in the six months prior to the issuing of the contracts. Producers not undergoing expansion would be allocated contracted quota based on the previous year's production. Contracted quota is the number of raw milk units a producer is allowed to produce and still receive the statewide pool price for each unit produced. A producer would be allowed to produce more than their contracted quota, but the producer would receive less than the statewide pool's value for each unit of over production. The CDFA would establish a set value which would be subtracted from the market clearing unit value of raw milk in order to establish a consistent penalty system. The subtracted value would be between 20% and 35% of the market clearing value. The exact penalty percentage would be determined by such factors as the producer's number of over production offenses in the given year and the volume of over production. A processor bidding on the over produced milk units would still be required to pay the same unit price as all other milk in the market. The difference between what the processor pays and what the producer receives will be collected by the CDFA to provide funding for dairy industry improvements.

The system of contracted quota would ensure that producers are not incentivized to produce more milk than was needed by the demands of the processing sector. If the market was to experience an increased demand in the processing sector for units of raw milk, more contracted quota could be issued by the CDFA. These quota expansions

would be granted to those who have requested an increased contract, and who have been deemed by the CDFA to have adequate facilities for such expansion.

Today in California the organic dairy industry is growing substantially, and it is gaining a significant consumer following. The niche market of servicing and consuming organically raised milk will also be traded through the proposed Auction System described above. Organic producers, processors, and fluid retailers will utilize a separate pool and set fluid price based on the organic market.

Both throughout the transition period and in the years to follow, it is essential to develop a monitoring system for the industry as a whole. Through the formation of an industry taskforce this need can easily and effectively be met. The taskforce will be responsible for meeting annually to discuss the dairy industry and how various components of the industry are faring. At each annual meeting the taskforce will determine the health of the dairy industry and its governing systems. If the taskforce feels that to maintain stability and order there is a potential need for intervention within the industry, then meetings will ensue to evaluate and provide potential solutions.

The taskforce would consist of individuals representing each facet of the dairy industry. The need for a minimum of two processors, one from each the fluid and the manufacturing classes, and ideally representing a different array of processed products and markets. A minimum of two producers, one representing an individually marketed farm and the other representing a cooperative. The taskforce should also have individuals who are connected to international trade regulation, the California Department of Agriculture, and the California Dairy Commission.

This taskforce will consist of seven or more individuals, always representing an odd number of members to provide a tie breaker in voting situations. The individuals on the taskforce will be selected through a committee within the CDFA dairy division. Individuals can apply or be nominated as potential taskforce members. The application/nomination process will include written explanation of the individual's qualification, industry association, and other such relevant information. The CDFA committee will review applicants and conduct further screening of candidates through interviews and other means as necessary.

When an individual is brought forth to represent any given chair on the taskforce, they will be committing to a minimum of five years and no more than ten years of service. The service periods of the individual's terms on the taskforce will need to be on a rotational schedule to ensure that no more than three representatives change in any given year. These term limits placed on the taskforce will ensure three things. First, the taskforce will have adequate time to develop a team dynamic. Second, individuals will achieve a level of comfort in voicing the opinions of the facets they represent. Finally, by limiting the term to ten years the taskforce is guaranteed to have systematic introduction of new, fresh views from the industry entering the evaluation process.

Chapter 4

DYSFUNCTIONS AND OTHER PROPOSALS

Current Industry Dysfunctions

The Auction System would replace many of the regulatory systems that are in place today. With the termination of end product pricing, quota, and the current form of pooling, the California dairy industry will eliminate many of the systems that inhibit the market today. Today the California dairy industry suffers from a regulatory structure which causes a variety of issues including: lack of healthy competition in the industry, lack of incentive to move milk to its highest and best use, lack of transparency between market supply and demand, lack of price discovery, lack of incentive to innovate, lack of risk management tools, continuous price volatility, and lack of controlled expansion.

The current regulatory system does not allow for healthy competition between producer and other producers, or between processors and other processors. As each producer receives the same market price for each hundred weight of milk regardless of quality or components there is no incentive to improve raw product. If a producer invests in improving the milk quality and components of his milk, whether that be through targeted genetics programs or management practices, they are not directly rewarded in for these efforts under the current system. A producer with higher bacteria counts, lower fat levels, and lower protein levels will receive the same price as a producer with far superior numbers. Under a system where one is not paid for good management which is costly to implement, what incentive is there for a producer to adopt good management practices. It is important to again note that some processors are now privately contracting and paying

producers for milk quality and components levels that best suit their individual processing needs, but this is a practice of choice and is not mandated.

The lack of competition between processors is a problem that in of itself creates many other problems for the industry. As a processor's minimal margins are set by the make allowance built into the End Product Pricing formulas, a processor has no incentive to compete for raw milk. Processors producing a product which is receiving a very low value on the market will still receive their minimal margin for each unit produced even if it is beyond the market's needs. Thus a processor is not incentivized to lower production and redistribute their contracted milk to other higher demand products under this guaranteed margin system. For a processor producing a product under high demand and drawing a high market price, there is no system to allow for competitive bidding for more units of raw milk. The processor producing the highly demanded product is still allocated the same volume of milk their contracted producers can supply regardless of the increased demand for the end product. The lack of incentive to move milk to its highest and best use inhibits processors from competing for milk which leads to surplus of lesser demanded and valued products, as well as, shortages of highly demanded and valued products. By eliminating the make allowance, processors will be incentivized to allow milk to flow to sectors of high demand.

The narrow focus of the End Product Pricing formulas provides processors limited opportunity to manage risk when processing products not specifically tied into End Product Pricing. The End Product Pricing formulas utilize commodity values reported by the CME to establish processor payments for all dairy products to the pool regardless of what dairy product they produce. As the CME is the domestic spot market

for only cheddar cheese and butter, the End Product Pricing formulas are far from representative of all dairy products produced. As the End Product Pricing formulas focus on only these two commodities, it is difficult for processors not producing cheddar cheese or butter to manage changes in the price of the commodity which they are actually producing. When a processor produces any product that is not utilized directly by the minimum price formulas, they increase their marginal risk as the fluctuations in the value of the product they produce is not guaranteed to be in accordance with the CME commodity by which the price is established. It is also difficult for processors servicing the international market to have their payments price tied to domestic value of the commodity.

With no incentive to compete for milk, with a set minimum margin, and with the lack of risk management for processors, the dairy industry suffers from a significant reduction in processors willingness to innovate. The high cost and risk associated with innovation and product development has led to a limiting of the California dairy industry. Although some processors still choose to build processing facilities capable of the further processing to produce value added products, such as whey protein and isolates, it is risky. The current systems do not encourage or protect a processor producing value added products as the pricing formulas and make allowance do not include such products. The absence of incentive to innovate has made it so California dairy production covers a narrow spectrum of products, many of which are demanded in a very limited capacity worldwide.

Under the End Product Pricing system producers are forced to bare the majority of the dairy markets fluctuations. The End Product Pricing formulas are established by

numerous factors, but do not consider the price of raw milk production. The formulas ensure all processors minimum return margin based on the established make allowance, but the formulas provide no such security for producers. Although a processor can experience increased margins when commodity prices are high, the make allowance ensures processors will have a significant percentage their cost of production covered. This safety net is inherent in the End Product Pricing formulas. When commodity prices fall the amount which processors pay into the state wide pool falls leading to a reduction in the statewide pool. This reduction in turn lowers the value of each hundred weight of milk in the pool, lowering producer payments and forcing producers to bare the cost of market fluctuations. As seen during the economic down turn of 2009, the prices received by producers can fall far below their cost of production, and the current system provides producers with limited resources to raise their milk price to at least break even with costs of production. The government raw milk price supports are set at a value per hundred weight far below the cost of production making the support system virtually useless for producers. The current system's unequal sharing of market risk forces producers to bare virtually all the market fluctuations while protecting processors profitability.

Under the current system which pays each producer based on their individual contribution to the statewide pool, the only way outside of private contracts for a producer to increase profits is to increase production. By producing a larger volume of milk a producer will receive a larger monthly milk check reflective of this increased volume. The main issue with this system is its ability to encourage over production of raw milk. As the system pays only on total production and raw milk is guaranteed a home in cooperatives, many producers choose to expand their herds to increase farm revenues.

This in turn floods the raw milk market with surplus milk, and that leads to lower producer milk prices on a per unit basis. By adopting a system which pays producers based on the demand for milk, the dairy industry will be able to send clear market signals regarding production expansion or contraction in response to market demands. This transparency in supply and demand will enable producers to receive a more stable milk price per unit and avoid production of surplus milk.

Other Industry Proposals

As outlined above the California dairy industry is suffering from the unintended consequences of the current regulatory system. It is apparent that regulatory change is needed for the success of the California dairy industry. Today there are many proposed solutions to the problems plaguing the California dairy industry. I will briefly highlight the three proposed solutions most widely discussed today, and address the disadvantages inherent in each of the proposed solutions.

First, the idea of adopting a two class market system influenced by end product payments into the pool is widely debated today, and it is perhaps the second best option for the California dairy industry. With the formation of a fluid milk class and a manufacturing milk class, many of the issues of today's multiclass regulatory system would be relieved. Having only two classes of milk would promote healthy competition among processors biding for raw milk, and in turn would lead to more clarity in market demand signals. The two class system would also ensure fluid milk continues to receive milk in quantities sufficient to adequately meet market demands. The two market system would not address the current issues being faced due to end product pricing formulas,

milk quota, or the lack of innovation. For this reason I believe it is unwise for California to adopt the two market dairy system with pool payments based on end product utilization.

Second, if California chooses the path of increased regulation, the results should be similar to those that have been seen in Canada. The California dairy industry will likely see reduced competitiveness on the global market, and will be unable to expand to meet the international demands. Though examination of agricultural markets throughout the United States and Canada, it is also apparent that each layer of regulation added not only forces smaller entities out of business, but also drives larger companies to move to less regulated areas for production. It is vital for the survival of the California dairy industry for government to choose a path of minimized regulation to both save the small producers and processors, as well as, encourage continued large scale production and processing within the state.

Third, the widely discussed and seemingly popular idea of California moving to become part of the FMMOs is one that could ultimately destroy California's competitive edge domestically. California's greatest advantage in the domestic marketing of milk has been in the ability to maneuver the industry in ways outside of the FMMOs regulations. With this more flexible system, California has been able to overcome the extremely high regulatory fees and shipping disadvantages which would cripple the California dairy industry if California was to join the FMMO. With the FMMO regulations and policies currently in place, joining the FMMO would force California to compete on a level playing field with states with far lower regulatory and shipping costs. For California's long term success, if the state were to join the FMMOs, it would be important to have

negotiated important policy exceptions to compensate for California's higher regulatory and shipping costs.

Chapter 5

CONCLUSIONS

Conclusions

Regardless of which system is adopted, policy changes that allow for risk management in accordance with both domestic and international market demands while avoiding signaling that promotes overproduction is very important for the future of the California dairy industry. Reforming the California dairy industry has the potential to provide the foundation needed for California dairy producers and processors to utilize their competitive advantage over the rest of the United States in capturing both the domestic and international dairy markets.

It is necessary to note that transitioning to any proposed system is likely to push several more California dairies, as well as, many processors out of production. The reduction seen initially will allow only the most efficient and effective establishments to survive; thereby laying a stronger foundation for the industry to build from. I believe the adoption of the Auction System will allow California in the end to rise above all other markets, and to step into the position of global leader.

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APPENDIX

Appendix 1- Dairy System Production Comparative Chart

	CA MMO	Entire US	IDAHO	CANADA	EU	AU	NZ
Number of Cows	1,819,760	9,233,000	580,000	1,400,000	22,600,000	1,650,000	4,780,000
Number of Farms	1,563	49,331	565	12,529	UNK	6, 398	11,891
Average Number of Cows Per Farm	1,164	Varies greatly across 52 States	1,027	77	Varies greatly in the 28 Member States	258	Varies greatly in various regions
Average Production Per Cow	23,457 lbs	21,642 lbs	23,376 lbs	18,913 lbs	13,491 lbs	13,381 lbs	8,934 lbs
Total Annual Production 2012	41,801 million lbs	199,648,576 million lbs	13,558 million lbs	18,628,870 million lbs	308,644,000 million lbs	22,079,069 million lbs	44,859,201 million lbs

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Appendix 2 – Comparative Chart of Dairy System Realities

	CA MMO	FMMO	IDAHO	CANADA	EU	NZ	AU
Ability For International Market Influence Expansion	Limited, due to regulations & lack of processing capabilities	Limited, need processing able to meet global specifications	UNK	Limited, due to government caps on expansion	Limited currently, but upon reform will emerge very strong & able to meet global demands	Limited, due to seasonal production & inability for great expansion	Limited, due to seasonal production & inability for great expansion
Subsidized	Yes	Yes	UNK	Yes, Heavily	Yes, but decreasing	Yes	No
Domestic- Market Demand Responsiveness	Limited	Limited	UNK	High	Limited	Limited	Limited
International- Market Demand Responsiveness	Limited	Moderate	UNK	Very Low	Moderate	High	High
Government Control (High, Mid, Low)	Medium	Medium	UNK	High	High, but decreasing	High	Low
Ability To Increase Production And Processing	Yes	Yes	UNK	No	Yes, but minimally	No	No
Market Transparency & Price Transmission Down The Food Chain	Limited	Limited	UNK	No	Limited	Limited	Yes
Active Competition Between Processors	Limited	Limited	UNK	No	No	No	Yes
Healthy Competition Between Producers	No	No	UNK	No	No	No	Yes
Ability To Service Markets (Based On Geographical Location & Shipping Cost)	High	High, regional	UNK	Low	Medium	High	High
System Which Encourage Innovation	Low	Low	UNK	Low	Medium	High	High
Market Risks Bared By (Producer, Processor, Both, or Government)	**Producer**	**Both**	**UNK**	**Government**	**Government**	**Both**	**Both**

Appendix 3 – Basic USA Standard and Metric to Standard Conversion Chart

USA Standard	
1 Pound	1 Pound
1 Gallon	8.6 Pounds
1 Hundred Weight (i.e. CWT)	100 Pounds
1 Ton	2000 Pounds

Metric	**Standard**
1 Liter	0.264172 Gallons
1 Kilogram (i.e. kg)	2.20462 Pounds
1 Metric Tonnes	1.10231 Ton