

**ANALYSIS OF A COOPERATIVE DAIRY  
PRODUCER RISK MANAGEMENT  
PROGRAM**

by

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## **ABSTRACT**

Dairy Farmers of America (DFA) is national milk marketing cooperative. DFA's primary focus is to market the milk of the cooperative's 17,000 members. In addition, DFA offers its membership a number of farm services. The sole purpose of these services is to make it easier for DFA members to operate their businesses. One of the services offered provides members access to forward contracting alternatives for pricing their milk.

The objective of this research is to utilize demographic and other information related to the characteristics of individual dairy producers and determine how these characteristics impact the use (or lack thereof) of risk management marketing tools. More specifically, the focus of this research is to identify what types of dairy producers are most likely to use the DFA's forward contracting program.

The logit model estimated indicated that regional and demographic differences impact the use of DFA's forward contracting program. Members in the Mountain Area are most likely to use the program followed by members in the Central Area. Demographic differences that significantly impacted the use of forward contracting include age (older producers use forward contracts less than younger operators) and the size of operation, as measured by milk produced per year (larger operators were more likely to use forward contracting services).

While the estimated logit model did identify several factors related to the use of forward contracting services, relationships are not particularly strong and the percent of producers using the services is relatively low. Thus, the model is limited in its ability for identifying key factors and thus it will be difficult for DFA to base a targeted marketing effort at certain producers. DFA would need additional information about their members to successfully target for this farm service.

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## CHAPTER I: INTRODUCTION AND BACKGROUND

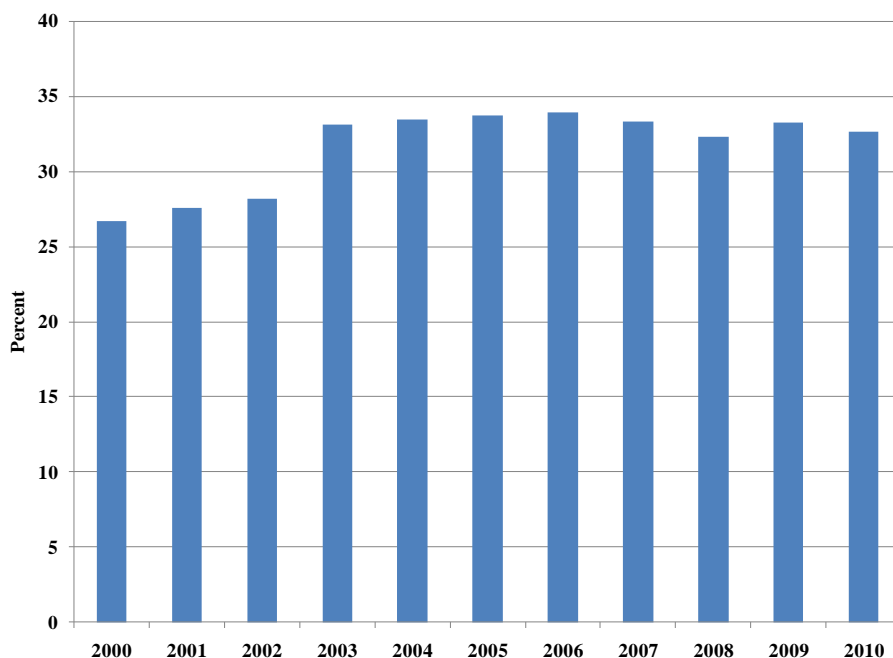
### 1.1 Research Objective

The objective of this research is to utilize demographic and other information related to the characteristics of individual dairy producers and determine how these characteristics impact the use (or lack thereof) of risk management marketing tools. More specifically, the focus of this research is to identify what types of dairy producers are most likely to use the DFA's forward contracting program.

### 1.2 Overview of Dairy Farmers of America

In 1998 four regional cooperatives, Associated Milk Producers, Inc., Mid-America Dairymen, Inc., Milk Marketing, Inc., and Western Dairymen Cooperative, Inc. merged to form the first and only national milk marketing cooperative, Dairy Farmers of America, Inc. (DFA). Today DFA serves and is owned by the 17,000 dairy farmer owners (equity holding members) marketing 32.7 percent of the nation's milk supply in 2010. Figure 1 displays DFA's share of the total U.S. milk production from 2000 through 2010. Since 2003, DFA's market share has consistently been in the range of 32 to 34 percent.

**Figure 1.1: DFA's Share of Total U.S. Milk Production, 2000 - 2010**

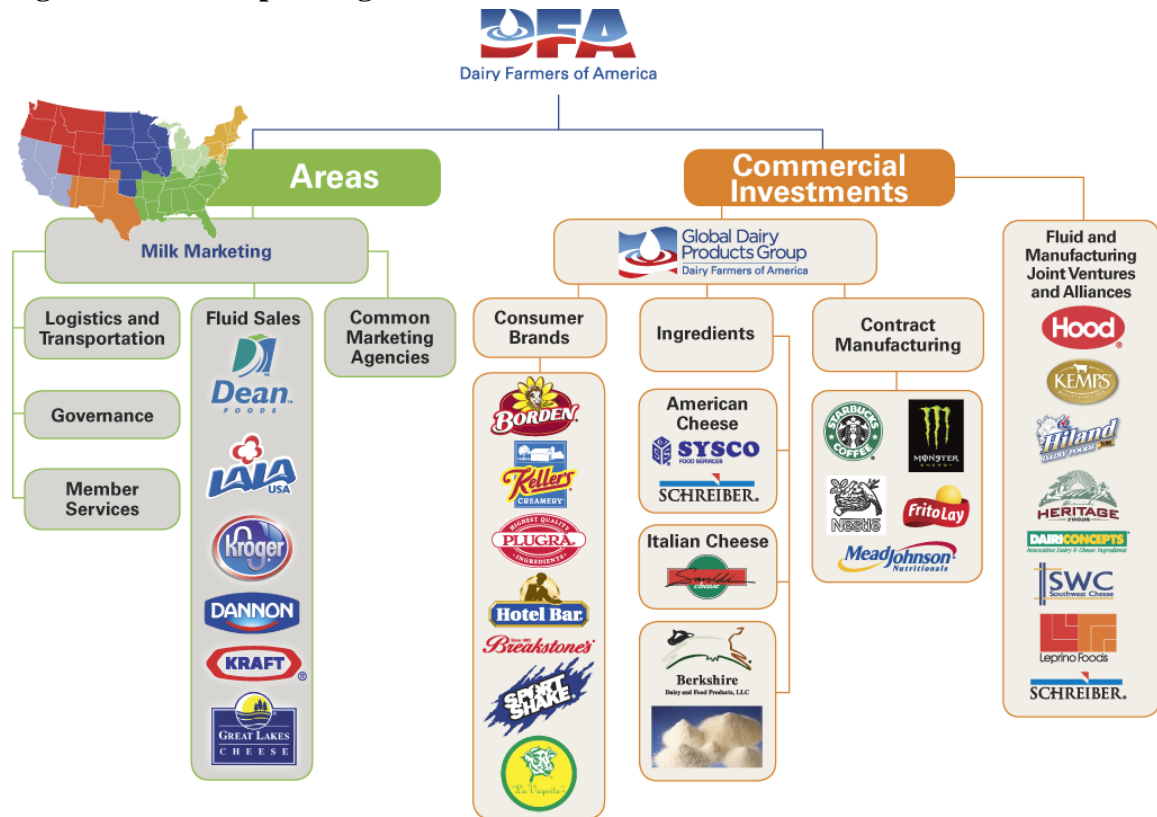




DFA’s diverse membership is located within all of the lower 48 states. Members range from small Amish farms milking less than 50 cows to large multi-site operations milking 10,000+ cows. Figure 1 displays DFA’s operating structure. On the left side of the figure are the Area Councils. Even though DFA is a national organization it is divided into seven geographical regions (Areas) ensuring members are represented at a more local or regional level. These regions include: Central, Mideast, Mountain, Northeast, Southeast, Southwest and Western. This “side” of DFA is focused solely on the membership and all the activities needed to run the organization.

The right hand side of figure 1 reflects DFA’s value added investments. These are investments made by the cooperative, intended to return value to the membership. Value added includes joint venture partnerships and alliances with fluid and manufacturing processors across the U.S.

**Figure 1.2: DFA Operating Structure**



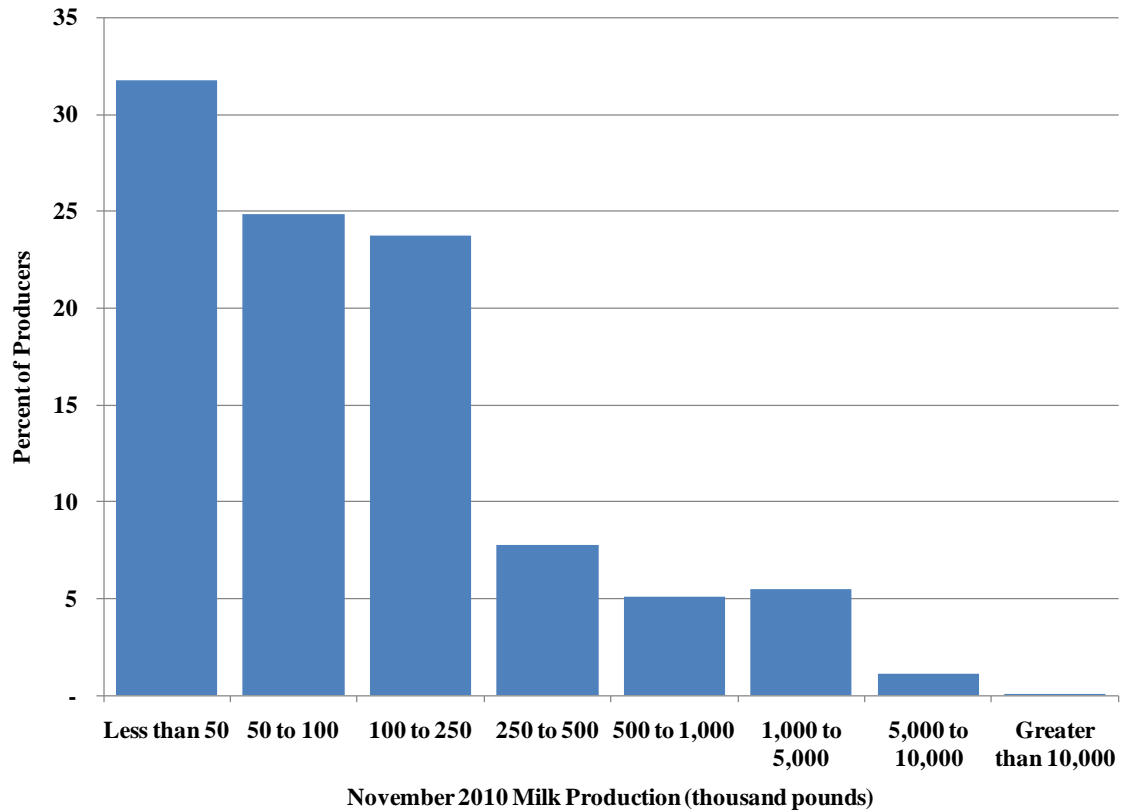
DFA offers its membership a number of farm services. The purpose of the services is to make it easier for DFA members to operate their businesses. Dairy Risk Management Services (DRMS) is one of those services offered to DFA members.

### **1.3 Overview of Dairy Risk Management Services (DRMS)**

Dairy Risk Management Services (DRMS) offers DFA members access to forward contracting services for pricing milk that they might not otherwise have access to. The risk management options for pricing milk using the Class III milk futures are limited for a number of DFA members simply because of the size of their operations. The Chicago Mercantile Exchange Group (CME Group) offers Class III and IV milk futures contracts for each month of the year, where each contract represents 200,000 pound of milk. DRMS allows members to forward contract Class III and IV milk futures in increments of as little as 20,000 pounds. This amount is significantly less than what the Chicago Mercantile Exchange requires. The smaller contract size gives smaller dairy operations the opportunity to forward contract a portion of their Class III or IV milk price.

As an example of why contract size is important, consider the following, for the month of November 2010, 76.5 percent (7,032) of DFA's nearly 9,200 active members producing milk produced less than 200,000 pounds of milk. Thus, if one of these producers were to hedge their milk production using a futures contract they would essentially be speculating on the amount of milk sold on the futures contract that exceeds their actual production. Figure 1.3 displays DFA member production for November 2010.

**Figure 1.3: Histogram of November 2010 DFA Member Milk Production**



## **1.4 Process of Forward Contracting**

DFA members who would like to use DRMS to forward contract their milk sales are required to have the necessary Agreement and Disclosure Statement on file prior to placing an order, see appendices A and B for a copy of the documents required. Once the necessary paperwork is on file, the member has the ability to place an order of any size (without exceeding contract limitations) for any given month currently trading at CME Group. In other words, milk can only be forward contracted for time periods where there is also a futures contract being traded or DRMS has found another party willing to purchase the contract being offered.

### **1.4.1 Contract Limitations**

- The minimum contract (or order) amount is 20,000 pounds increasing in 5,000 pound increments (e.g., 25,000, 30,000, 35,000) (DFA1 n.d.).

- When members place an order for less than 200,000 pounds (the size of a CME Group contract), DRMS “groups” this contract together with other smaller contracts in order to place an order at CME Group. In the event a member places an order for less than 200,000 pounds and there are no other orders working at the same price to group together, DRMS assumes the risk of the remaining pounds not assigned if the order is filled. For example, if a members places an order for 20,000 pounds 22 months into the future and this is the only order working in this month, DRMS places an order at CME Group and assumes the risk of the remaining 180,000 (200,000 – 20,000) pounds when the order if filled. When another member places an order for less than 200,000 pounds in this same month DRMS uses the open pounds (pounds not assigned to a contract) to fill this order when the price on the CME Group hits their target price.
- Additional pounds cannot be placed onto a contract once it is filled. The member must place an additional order, similar to the first it must be no less than 20,000 pounds (DFA1 n.d.).
- Members may have multiple contracts within any given month but the total contracted pounds may not exceed 75 percent of their 12-month rolling average production (DFA1 n.d.).

#### 1.4.2 Fee Structure

When a member places an order, DRMS uses CME Group milk futures to offset any potential risk. Members are not responsible for margin calls associated with a forward contract, DRMS is. In order to cover potential costs associated with margin calls, i.e., interest, DRMS charges members a per cwt. fee. The member will receive their forward contract price minus any fees associated with the transaction. When a member’s forward contract utilizes an option contract (i.e., Minimum price or Minimum / Maximum forward contract), DRMS applies an administrative fee in addition to the premium cost of the option (DFA1 n.d.). The following are current fees charged by DRMS for various forward contracting alternatives offered:

- Fixed Price Forward Contracts
  - One month: 10¢ per cwt.
  - Three to six months: 11¢ per cwt.
  - Seven to 12 months: 13¢ per cwt.
  - 13 to 24 months: 15¢ per cwt.
- Minimum Price and Upside Rider Forward Contracts
  - 5¢ per cwt.
- Minimum/Maximum Forward Contracts
  - 10¢ per cwt.
- Market Plus Minus Contracts
  - 5¢ per cwt.

### **1.5 How Milk is Priced**

Even though milk is a commodity, it has several unique characteristics unlike most commodities. First, milk is produced daily and it is highly perishable. This does not allow for the product to be stored for long periods of time in a fluid state. In addition, milk is not priced like commodities such as corn or soybeans. Milk is priced using discriminatory pricing, which allows different prices to be charged for the same product.

Milk is sold in four different Classes (I – IV). Class I is used in beverage products such as fluid milk, regardless of fat level or additional flavoring added. Class II is used to manufacture soft products such as ice cream and soft cheeses (cream cheese and cottage cheese). Class III is used to manufacture hard cheeses such as cheddar and Swiss, and Class IV is used for butter and dry products such as non fat dry milk or skim milk powder.

## **1.6 Forward Contracting Basics**

This section will focus on the basics of a milk forward contract and how a forward contract impacts a producer's milk price.

Before a DFA member can enter into a forward contract with Dairy Risk Management Services (DRMS) they must "be an active DFA equity-earning member and have a signed Master Agreement" (DFA1 n.d.).

When a DFA member forward contracts Class III milk they continue to ship their milk as normal, nothing changes regarding how their milk is marketed. The only difference for the producer will be on their milk check. At the time the milk is delivered (roughly), the producer receives the USDA announced price plus (or minus) the difference between their contracted price and USDA's announced price for that class of milk. This adjustment will be either positive or negative depending on whether the contracted price is higher or lower than USDA's announced price for the class of milk. Members' continue to receive all premiums or deductions the same as they would have had they not contracted their milk.

## **1.7 Impact of a Forward Contract**

When a dairy producer enters a forward contract they are locking in a price on a specified amount of Class III or Class IV milk for a predetermined timeline. This could be for as little as one month in the future or for as long as 24 months out. Practically speaking, the majority of members only contract 12 months in the future (Wills, 2011). For example, producer A, who produces 200,000 pounds of milk per month, decides to forward contract 100,000 pounds of Class III milk for the month of August 2011 at \$15.00 per hundredweight (cwt.). By entering into this forward contract, this producer has agreed to deliver 100,000 pounds of milk during the month of August 2011 and will receive a price of \$15.00 per cwt. regardless of what the market does between now and the time of delivery.

There are three ways for producer A’s milk check to be impacted: 1) the contracted price is higher than USDA’s announced price, 2) the contracted price is lower than USDA’s announced price, 3) the contracted price is the same as USDA’s announced price.

1.7.1 Contracted price is higher than the announced price.

Table 1.1 displays how a producer’s milk check is affected when the contract price is higher than the announced price. This producer has 200,000 pounds of monthly milk production. They have contracted half of their production, 100,000 pounds (1,000 cwt.) at \$15.00 per cwt. with the remaining 100,000 pounds not under contract. Given the member only contracted for one month, a 10 cent per cwt. fee will also be deducted. Therefore the price contracted will be reduced by this amount. The pounds not contracted will not be affected by the contract. This production will continue to be paid based on the Announced Class III price, which is assumed to be \$14.00 per cwt in this example.

The production forward contracted generated \$14,900 in gross income (100,000 pounds (1,000 cwt.) \* \$14.90 per cwt.). The amount not contracted generated \$14,000 in gross income (100,000 pounds (1,000 cwt.) \* \$14.00 per cwt.). As a result of the forward contract, this producer’s milk check increased \$900 gross, (\$14,900 - \$14,000) during this particular month.

**Table 1.1: Contracted Price Higher Than Announced Price**

	Forward Contract	Non Contract	Total
Pounds of Milk	100,000	100,000	200,000
Price Contracted Minus Fee	\$14.90		
Announced Class III Price		\$14.00	
Gross Revenue	\$14,900	\$14,000	\$28,900
Gain / Loss	\$900		

1.7.2 Contracted price is lower than the announced price.

Table 1.2 displays how a producer’s milk check is affected if the contract price is lower than the announced price. As before, the producer has 200,000 pounds of milk production per month. The contracted amount, 100,000 pounds, remained the same at

\$14.90 per cwt. including the assessed fee. But for this example the Announced Class III price of \$16.00 is higher than the contracted amount.

The production forward contracted generated \$14,900 in gross income (100,000 pounds (1,000 cwt.) \* \$14.90 per cwt.). The amount not contracted generated \$16,000 in gross income (100,000 pounds (1,000 cwt.) \* \$16.00 per cwt.). As a result of the forward contract, there will be a deduction of \$1,100 gross (\$16,000 - \$14,900) from this producer's milk check during this particular month. In this example, the producer gave up \$1,100 by agreeing to forward contract 100,000 pounds at a net price of \$14.90.

**Table 1.2: Contracted Price Lower Than Announced Price**

	Forward Contract	Non Contract	Total
Pounds of Milk	100,000	100,000	200,000
Price Contracted Minus Fee	\$14.90		
Announced Class III Price		\$16.00	
Gross Revenue	\$14,900	\$16,000	\$30,900
Gain / Loss	<b>(\$1,100)</b>		

1.7.3 Contracted price is the same as the announced price.

Table 1.3 displays how a producer's milk check is affected if the contract price is the same as the announced price. Once again, the producer has 200,000 pounds of milk production per month. The contracted amount, 100,000 pounds, remained the same at \$14.90 per cwt. including the assessed fee. In this case, during this given month the Announced Class III price is \$15.00, the same as the contracted amount.

**Table 1.3: Contracted Price Same as the Announced Price**

	Forward Contract	Non Contract	Total
Pounds of Milk	100,000	100,000	200,000
Price Contracted Minus Fee	\$14.90		
Announced Class III Price		\$15.00	
Gross Revenue	\$14,900	\$15,000	\$29,900
Gain / Loss	<b>(\$100)</b>		



The production forward contracted generated \$14,900 in gross income (100,000 pounds (1,000 cwt.) \* \$14.90 per cwt.). The amount not contracted generated \$15,000 in gross income (100,000 pounds (1,000 cwt.) \* \$15.00 per cwt.). As a result of the forward contract, there will be a deduction of \$100 (\$15,000 - \$14,900), the administrative fee from this producer's milk check during this particular month. As a reminder, the purpose of forward contracting is not necessarily to receive a higher price, but rather to reduce the variability in the price received.

## **1.8 Types of Forward Contracts**

DRMS offers members a number contracting options. Members can choose to use one or multiple contracts for a portion of their milk production not exceeding 75 percent of their rolling 12-month milk production average for one to 24 months in the future.

### **1.8.1 Fixed Price Contract**

The fixed price contract is the simplest of all contracts offered. It allows members to establish a fixed price on a portion of their milk production for one to 24 months in the future. The example in the previous section reflected a fixed price contract. For additional information refer to Appendix D.

### **1.8.2 Minimum Price Contract**

The minimum price contract allows members to establish a floor price with unlimited upside potential by paying a premium and DRMS's administrative fee. Essentially DRMS is purchasing a put option. This provides the member the right but not the obligation to sell at a specific price, determined by the member at the time of purchase. In the event the Announced Class III Price is less than the established floor price the producer exercises the option receiving the floor price minus the premium and administrative fee paid. When the Announced Class III price is higher than the established floor the producer forgoes the established floor given that there is no obligation and simply receives the higher Announced Class III price (less the premium and administrative fee paid). For additional information refer to Appendix D.

### 1.8.3 Minimum / Maximum Price Contract

The minimum / maximum (min/max) contract allows members to lock in a price range establishing both a floor and ceiling price for a given time period. Essentially DRMS is purchasing a put option and simultaneously selling a call option. As the seller of a call option, the member collects the premium but is obligated for anything above the price the contract was sold at. This strategy is less expensive compared to the minimum price contract because of the income received from selling the call option, but the result is limited upside potential. For additional information refer to Appendix D.

### 1.8.4 Market Plus Minus Contract

The market plus minus contract allows members to remove the commitment from previously contracted pounds. These pounds are paid the Announced Class III price minus the administrative fee plus or minus any gains or losses that exist on the contract position at the time the member gets out of their previous contract position. For additional information refer to Appendix D.

### 1.8.5 Upside Rider Contract

The upside rider contract is used in conjunction with another forward contract. This contract allows members to participate in upward movements in the market. This is accomplished by DRMS buying a call option to cover production previously contracted by a member. This call option gives the member upside potential with limited obligation (i.e., the premium of the call option) should markets decline. For additional information refer to Appendix D.

## CHAPTER II: LITERATURE REVIEW

The journal article “Survey results on Arkansas farmers’ use of hedging techniques” by Terry (1993) utilized a survey to identify farmers’ (cotton, rice and soybeans) knowledge and use of hedging techniques such as forward, futures or options contracts. The research found that slightly more than 50 percent of the farmers responding to the survey used at least one of the three techniques for their crops.

The survey Terry used included four sections (a copy of the actual survey was not published in the article). The sections included 1) production information, 2) financial information, 3) hedging activities of the producers, and 4) personal information.

Even though the use of hedging techniques was not utilized extensively, farmers did understand the advantages the products offered regarding reducing risk. Results of the survey identified that of the three products offered producers were twice as likely to use forward contracts compared to futures contracts (Terry 1993). They also used forward contracts considerably more than options as well.

Koo, Duncan and Taylor (1998) analyzed agricultures producers of all types in the areas of expansion, financial services and risk management strategies used. Data were collected from a nationwide survey of farmers who subscribed to *Top Operator* farm magazine. Their research found that 43 percent of respondents were organized as sole proprietorships, 40 percent were partnerships, and 15 percent were corporations. This is similar to what this research has found, where slightly more than 83 percent of respondents are organized as either a sole proprietorship or a partnership. Additionally, their research found that 37 percent of the farmers who participated in the survey used forward cash contracts. Although their research was not focused specifically on the dairy industry, this is a considerably use of forward contract than what was found in this research.

Franken and Pennings (2009) surveyed crop producers from December 2006 through 2007, who were members of the Illinois Farm Business Farm Management Extension program. The program collects production and accounting data annually and provides producers an analysis of their businesses through a computer-assisted processing

for income tax management. Their research was consistent with previous studies finding that older producers were less likely to adopt the use of futures or forward contracting as a method of risk management than their younger counterparts.

The article “Factors Affecting Maize Producers Adoption of Forward Pricing in Price Risk Management: The Case of Vaalharts” by Jordaan & Grové (2007) used a logistic model to examine the factors influencing producers decision to utilize forward pricing of the 2004/05 maize production season. The authors found that individuals with higher human capital resources were more likely to use forward pricing compared to those who have not. The results also suggest a perception that the marketing strategy of forward pricing is ineffective at managing price risk. As a result of this finding, they suggest future education programs should focus more on the use of alternative forward pricing methods opposed to the benefits forward pricing has to offer (Jordaan and Grové 2007).

## **2.1 Why producers use risk management tools**

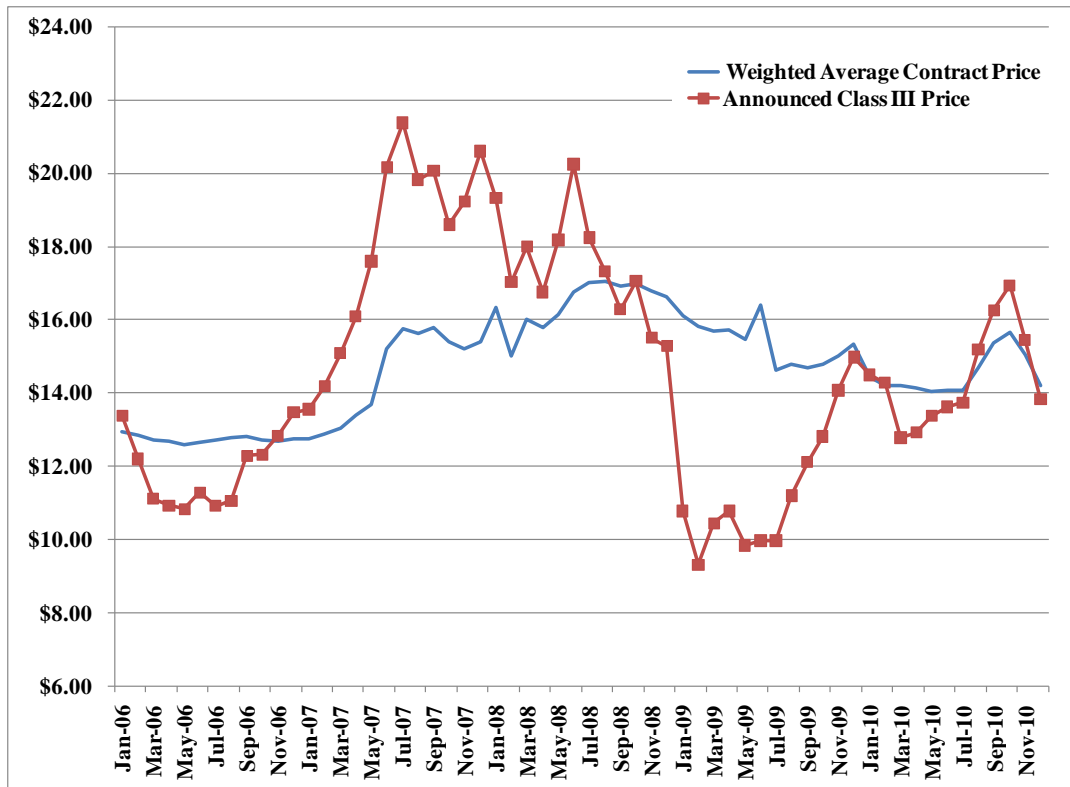
Why would a producer use forward contracts or any other type of risk management tool? Are these programs and strategies only for highly leveraged producers? If a producer uses a forward contract to minimize risk, are they also reducing the price received? Financial theory would say as you reduce risk you also will be reducing reward (income) and thus there might be a trade-off between managing price risk and profitability. While there are a number of reasons as to why producers use risk management tools such as forward contracts, applied research findings regarding the perceptions and implications of doing so are mixed.

Intuitively, producers who seek to reduce price risk are knowingly doing so at a lower average price. However, research conducted by Schroeder et al. (1998) and Terry (1993) found that producers disagreed with the risk reward theory. Both studies found that producers thought they could increase the price and stability of the price received with use of hedging tools such as forward contracts. That is, in responding to survey questions, producers felt that hedging not only reduced price variability, but it also increased net prices received.

According to DRMS data, members using forward contracts were able to reduce volatility while still receiving a similar price for their contracted production. DRMS data from 2006 to 2010 show that the average weighted price received for contracted milk was \$14.72 per cwt. compared to the USDA's Announced Class III price of \$14.62. The weighted average contract price was calculated from the price for all contracts for a respective delivery month, regardless of when the milk was contracted, weighted by the volume of milk for each contract. For example, a producer who had two contracts totaling 100,000 pounds for December 2010 delivery, one of the contracts (50,000 pounds) was initiated in December 2009 the other 50,000 pounds in September 2010. The average price of the two contracts would be included in the weighted average for December 2010, the delivery month. Based on a paired two tailed t-test of the means, the average difference of \$0.10 per cwt. was not statistically different from zero (p 0.7996).

The weighted average contract price had a high of \$17.05 and a low of \$12.60 with a standard deviation of \$1.41, compared to the USDA's Announced Class III price having a high of \$21.38, low of \$9.31 and standard deviation of \$3.24. Based on an F-test of the variances of the two price series, the variance of the Announced Class III price is significantly greater than the variance of the Weighted Average Contract Price ( $p < 0.001$ ). Producers who forward contracted during this time period not only received an additional \$0.10 per cwt. but received a more consistent milk price on the pounds contracted. Figure 2.1 shows the forward contract and Announced Class III (i.e., unhedged cash market) prices over this time period.

**Figure 2.1: Weighted Average Contract Price vs. Announced Class III Price**



Other research has found that as a producer increases the leverage position of their operations they increase the demand for sufficient cash flow to meet debt covenants. Franken and Pennings (2009), Shapiro and Brorsen (1988) and Musser, Patrick, and Eckman (1996) found that as a producer’s debt-to-asset ratio increases so did their use of futures and options.

Research from Nivens, Kastens and Dhuyvetter (2002) challenges the use of risk management. Their research found that producers who were better able to manage costs and other manageable factors consistently reaped higher profits compared to those with “persistently higher cash prices” (Dhuyvetter, Kastens and Nivens 2002). Specifically, they found that cost management and technology adoption played a larger role in explaining profitability differences over time between producers than did price differences.

## CHAPTER III: MODEL DATA

The primary data for this study were collected from DFA databases. The data are proprietary and unique to DFA members.

### 3.1 Model Data

Demographic data were collected through an on-farm survey performed by field representatives. In 2007 DFA launched an introductory animal care program named the Gold Standard Program. Part of the Gold Standard Program was to conduct a survey of DFA members. The survey was comprised of two parts, demographic data and animal care information. In the animal care section, questions were asked in the areas of milk safety, milk quality, dairy animal care, environmental stewardship, pathogen management, personnel management, and dairy beef safety and quality. Demographic data questions included type of business entity, primary farm internet access, whether or not the dairy managed price risk for inputs, and others. For a complete list of the survey questions refer to appendix C.

There were a total of 9,059 DFA members throughout the continental United States that voluntarily participated in the survey. The survey was administered over a 19-month time period (June 2007 to December 2008). Members who joined DFA after December 2008 would not have had the opportunity to participate. Of the 9,059 members participating, 6,956 were active shipping members in 2010. Field representatives were chosen to administer the survey in order to obtain the highest possible participation. Greater than 90 percent of DFA membership participated accounting for more than 95 percent of DFA's milk production.

The other primary source of information was data extrapolated from DFA's internal database regarding member milk production and participation in DRMS forward contracting programs.

Milk production data for the entire year of 2010 was used as a gauge of the dairy's size. Additionally the milk production for members who joined DFA during the year will only include their production while they were a DFA member. For example, if a producer

began shipping milk to DFA on March 1, 2010. In this case, their milk production will only include the 10 months that they were shipping milk to DFA. Ideally these data would be annualized, however this is not a major issue as less than 5 percent of the members in the sample did not produce milk in all of 2010, i.e. have production in each of the 12 months. Additionally, because seasonal (pasture based) dairies would not have production in each month annualizing production for dairies such as this would be inappropriate. Thus, it was decided not to annualize milk production in the model recognizing that this might result in the production used for some dairies (milk10) being slightly less than it should be.

### 3.2 Member Data

An explanation of all of the variables used in the model is described in Table 3.1.

**Table 3.1: Variable Descriptions**

<b>Variable</b>	<b>Description</b>
<i>partorsole</i>	Binary variable equal to 1 if the legal business entity is either a sole proprietorship or partnership, 0 otherwise
<i>freestall</i>	Binary variable equal to 1 if member's primary type of housing is freestall, 0 otherwise
<i>internet</i>	Binary variable equal to 1 if the farm has access to the internet, 0 otherwise
<i>asainsurance</i>	Binary variable equal to 1 if member received insurance through ASA, 0 otherwise
<i>age</i>	Age of the (most senior) member
<i>milk10</i>	Total milk produced in 2010
<i>inputriskmgt</i>	Binary variable equal to 1 if member manages price risk for inputs, 0 otherwise
<b>Area</b>	
<i>central</i>	Binary variable equal to 1 if central, 0 otherwise
<i>mideast</i>	Binary variable equal to 1 if mideast, 0 otherwise
<i>mountain</i>	Binary variable equal to 1 if mountain, 0 otherwise
<i>northeast</i>	Binary variable equal to 1 if northeast, 0 otherwise
<i>southeast</i>	Default Area
<i>southwest</i>	Binary variable equal to 1 if southwest, 0 otherwise
<i>western</i>	Binary variable equal to 1 if western, 0 otherwise
<b>Generations</b>	
<i>genone</i>	Binary variable equal to 1 if 1 generation has operated a dairy farm, 0 otherwise
<i>gentwo</i>	Binary variable equal to 1 if 2 generations has operated a dairy farm, 0 otherwise

Summary statistics for the 6,262 members who both shipped milk in 2010 and participated in the Gold Standard Program survey are reported in Table 3.2. The average DFA producer shipped 4,311,199 pounds in 2010. Fifty seven percent of members have



access to the internet. This compares to 68.7 percent of households in the U.S. having access to the internet at home in 2009 (U.S. Census Bureau, Population Division 2009). However, the lower access to the internet for dairy producers could be a timing issue as the survey took place in 2007 and 2008. It would be expected that this number would increase if the survey was taken today as people become more connected to the internet. Nearly 85 percent of operations have a legal business entity of either a partnership or sole proprietorship. The average DFA member is nearly 51 years old, ranging from 18 to 97 years of age (ages of less than 18 were excluded). More than 31 percent of members responded that they managed risk for inputs.

Before estimating the model, data were filtered to only include members who have the ability to use DFA's forward contracting service. The minimum amount of production a member can contract for a given month is 20,000 additionally the total contracted pounds may not exceed 75 percent of their 12-month rolling average production. Therefore members who produced less than 320,000 pounds annually  $((20,000/0.75)*12)$  were excluded from the study. This assumes the members have an equal amount of production in each month. Summary statistics for members who did and did not use DFA's forward contracting program in 2010 are reported in Tables 3.3 and 3.4, respectively. Dairies that used DFA's forward contract program in 2010 are considerably larger than those who did not use this service. On average, they produced nearly 17 million pounds for the year compared to 4.2 million pounds for those that did not use the service. Dairies that did not use DRMS in 2010 are less likely to operate as a corporation or limited liability company. Slightly more than 15 percent operate something other than a partnership or sole proprietorship, whereas, this increases to 43 percent of operations that use DRMS. Approximately half (51.1 percent) of members using DFA's forward contract program are within the Central Area. The Mountain Area has the second largest number of program participants with 18.2 percent followed by the Mideast Area with 17.4 percent. Members who used DFA's forward contracting program are more likely to have reported that they manage risk for inputs than those who do not. Nearly 73 percent of members using DFA's forward contracting program indicated they manage risk for inputs compared to 32 percent for members not using the program.

**Table 3.2: Summary Statistics for all DFA members that produced milk in 2010 and participated in the survey<sup>1</sup>**

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Min</b>	<b>Max</b>
<i>central</i>	6262	0.2641	0.4409	0	1
<i>midwest</i>	6262	0.2169	0.4121	0	1
<i>mountain</i>	6262	0.0498	0.2176	0	1
<i>northeast</i>	6262	0.1429	0.3500	0	1
<i>southwest</i>	6262	0.0449	0.2070	0	1
<i>western</i>	6262	0.0329	0.1784	0	1
<i>partorsole</i>	6262	0.8470	0.3600	0	1
<i>freestall</i>	6262	0.4155	0.4929	0	1
<i>internet</i>	6262	0.5744	0.4945	0	1
<i>asainsurance</i>	6262	0.1565	0.3634	0	1
<i>age</i>	6262	50.8483	11.8846	18	97
<i>genone</i>	6262	0.1321	0.3386	0	1
<i>gentwo</i>	6262	0.2873	0.4525	0	1
<i>milk10</i>	6262	4,311,199	11,500,000	865	160,000,000
<i>inputriskmgt</i>	6262	0.3181	0.4658	0	1

<sup>1</sup> This includes 683 operations that were not included in the model estimation due to production (*milk10*) not meeting a minimum threshold of 320,000 pounds.

**Table 3.3: Summary Statistics for members using DFA's forward contract program in 2010**

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Min</b>	<b>Max</b>
<i>central</i>	264	0.5114	0.5008	0	1
<i>mideast</i>	264	0.1742	0.3800	0	1
<i>mountain</i>	264	0.1818	0.3864	0	1
<i>northeast</i>	264	0.0152	0.1224	0	1
<i>southwest</i>	264	0.0417	0.2002	0	1
<i>western</i>	264	0.0492	0.2168	0	1
<i>partorsole</i>	264	0.5682	0.4963	0	1
<i>freestall</i>	264	0.6856	0.4652	0	1
<i>internet</i>	264	0.8295	0.3767	0	1
<i>asainsurance</i>	264	0.1818	0.3864	0	1
<i>age</i>	264	47.0833	10.9891	21	81
<i>genone</i>	264	0.0871	0.2825	0	1
<i>gentwo</i>	264	0.2386	0.4271	0	1
<i>milk10</i>	264	16,800,000	25,000,000	516,226	160,000,000
<i>inputriskmgt</i>	264	0.7273	0.4462	0	1

**Table 3.4: Summary Statistics for members who did not use DFA's forward contract program in 2010**

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Min</b>	<b>Max</b>
<i>central</i>	5315	0.2517	0.4341	0	1
<i>mideast</i>	5315	0.2102	0.4075	0	1
<i>mountain</i>	5315	0.0482	0.2141	0	1
<i>northeast</i>	5315	0.1449	0.3520	0	1
<i>southwest</i>	5315	0.0497	0.2173	0	1
<i>western</i>	5315	0.0363	0.1871	0	1
<i>partorsole</i>	5315	0.8453	0.3616	0	1
<i>freestall</i>	5315	0.4320	0.4954	0	1
<i>internet</i>	5315	0.5885	0.4921	0	1
<i>asainsurance</i>	5315	0.1627	0.3692	0	1
<i>age</i>	5315	50.7605	11.7529	18	97
<i>genone</i>	5315	0.1293	0.3355	0	1
<i>gentwo</i>	5315	0.2828	0.4504	0	1
<i>milk10</i>	5315	4,217,897	10,700,000	320,206	160,000,000
<i>inputriskmgt</i>	5315	0.3230	0.4677	0	1

## CHAPTER IV: METHODS

The objective of this study is to predict whether or not a DFA member is likely to participate in DFA's risk management program. More specifically, the objective is to identify those characteristics that increase the probability that a producer will forward contract milk. This was accomplished by estimating a logistic (logit) model in Stata 11. Logit models estimate the probability of a specific event occurring. More specifically, binary logit models determine whether or not the dependent variable will or will not occur.

This study used a binary logit model to predict whether or not members will use DRMS to forward contract future milk production. The dependent variable, *contract2010*, is derived from whether or not the member used DRMS to forward contract milk production in 2010.

The independent variables used in the model include: *central*, *mideast*, *mountain*, *northeast*, *southwest*, *western*, *partorsole*, *freestall*, *allinternet*, *asainsurance*, *age*, *genone*, *gentwo*, *milk10* and *inputriskmgt*. The expected signs for all of the variables used in the model are reported in Table 4.1.

The first six variables (*central*, *mideast*, *mountain*, *northeast*, *southwest* and *western*) are regional dummy variables based on the location of the farm. DFA has seven Areas providing local management of DFA's milk supply chain, including member services, fluid milk marketing and financial accounting. It was expected that members in the Southeast Area would not use DRMS to forward contract as much as the other areas as a higher percentage of their milk production is priced in the fluid (Class I) market. Producers believe the Class III futures are not as closely related to their actual pay price.

The next variable, *partorsole*, is a dummy variable based on whether or not the dairy is a partnership or a sole proprietorship. The expected sign for this variable is negative as the dairies have not taken the additional steps to reduce additional (legal) risk as those who are organized as a corporation or a limited liability company have. This is consistent with Koo, Duncan and Taylor as they found that 40 percent of farms organized

as a corporation used forward cash contracts compared to only 38 percent of sole proprietors and 35 percent of partnerships.

*freestall*, is a binary variable if the member's primary housing type was freestall barns. This type of housing is more expensive compared to dry lots and therefore it is assumed that the member is taking on additional debt compared to other operations. The additional debt may influence the members need for consistent cash flow to meet their debt obligations and thus increase the need for price risk management thus a positive sign is expected. Previous studies from Shapiro and Brorsen (1998) and Musser, Patrick, and Eckman (1996) found that the proportion of crop hedged and forward priced increase with the debt-to-asset ratio.

The next binary variable, *internet*, displays whether or not the farm has access to the internet. Members who have access to the internet are considered to be faster at adopting new technologies. This variable also reflects a source of information needed to make educated decisions on whether or not to forward contract future milk sales, therefore a positive sign is expected.

DFA offers a number of farm services in addition to DRMS. Agri-Services Agency (ASA) is one of them. ASA offers DFA members, their families and employees access to insurance programs. The variable for participation in other services (*asainsurance*) is a binary variable equal to 1 if the member received insurance through ASA and 0 otherwise. It is hypothesized that members purchasing insurance from ASA will be more likely to use DFA's forward contracting program and thus a positive sign is expected on this variable.

The age of the member (*age*) was also included as a variable. The effect age has on the use of forward contracts is expected to decline as a member's age increases. It is hypothesized that older members are more established and do not want or need the risk management in order to sustain. A squared term (*agesqr*) was included to determine if there was a non-linear age effect. The squared term was not significant and was thus dropped from the final model estimated.

The next two variables, *genone* and *gentwo*, are binary variables if the dairy is operating in the first and second generation, respectively. There are no prior expectations as to the signs on these variables.

The variable *milk10* displays the total amount of milk produced in the year 2010 and is included as a measure of the size of the operation. While it would be expected that larger operators would be more likely to hedge milk than smaller operators due to the size of CME futures contracts (as discussed earlier), that is not necessarily an issue with the smaller forward contracts offered through DRMS. Thus, there are no prior expectations as to the sign on *milk10*.

The binary variable *inputriskmgt* reflects if the member managed risk for inputs. This variable did not have any boundaries in the survey so each member may interpret this differently. That is, this was a self-defined variable by each producer in the producer survey. Regardless, if the member indicated that they manage their risk for inputs, it is assumed that they will be more likely to manage the risk for milk sales.

**Table 4.1: Expected Signs for Variables**

<b>Variable</b>	<b>Expected Sign</b>
<i>partorsole</i>	Negative
<i>freestall</i>	Positive
<i>internet</i>	Positive
<i>asainsurance</i>	Positive
<i>age</i>	Negative
<i>milk10</i>	Unknown
<i>inputriskmgt</i>	Positive
<b>Area</b>	
<i>central</i>	Positive
<i>midwest</i>	Positive
<i>mountain</i>	Positive
<i>northeast</i>	Positive
<i>southwest</i>	Positive
<i>western</i>	Positive
<b>Generations</b>	
<i>genone</i>	Unknown
<i>gentwo</i>	Unknown

## CHAPTER V: RESULTS

### 5.1 Model Results

Table 5.2 displays the results of the estimated binary logit model. Of the 5,579 observations in the model, 5,315 were 0's (i.e., members not contracting) and 264 were 1's (i.e., members forward contracting). The model correctly predicted 4.6 percent of the 264 1's and nearly 100 percent of the 0's. In total, the model correctly classified 95.2 percent of the observations. This prediction accuracy is based on a cutoff value of 0.5 (predicted values  $> 0.5$  are classified as 1's and those  $< 0.5$  are classified as 0's), which is standard (Studenmund 2011). However, (Featherstone, Roessler and Barry 2006) found that the more appropriate cutoff would be the mean of the sample due to the low participation in DFA's forward contracting program. Thus, the cutoff was reduced to 0.05, similar to the participation in the program (264/5,579). Using this cutoff the model correctly predicted nearly 80 percent of the 264 1's and 77 percent of the 0's. In total, the model correctly classified 77.3 percent of the observations with the lower cut off. The likelihood ratio chi-square value of 551.56 is highly significant (p-value  $< 0.0001$ ) indicating that the model as a whole fits better than a model with no predictors.

Table 5.3 displays the average marginal effects for continuous variables and the change in probability (going from 0 to 1) for binary variables of the logit model. These values reflect the marginal effect, or change in probability a variable will have on a producer using DFA's forward contracting program. Consistent with earlier findings, this research found that as producers age they are less likely to participate in a forward contracting program (Franken and Pennings 2009). The model determined that for every one year increase in age a producer is 0.10 percent less likely to use DFA's forward contracting program holding everything else constant. Figure 5.1 displays the predicted probability that a producer will use forward contracting services for ages 30 to 70. It can be seen that the marginal effect of an additional year decreases slightly as age increases. The coefficients on variables *genone* and *gentwo*, although not statistically significant at the 95 percent confidence level, indicate that members who have operated a dairy farm for one or two generations, respectively, are less likely to forward contract than those who have operated a dairy farm for three or more generations.



According to the model, as the size of the operation increases, as measured by milk production, the more likely a producer is to use DFA's forward contracting program in 2010. The model displays that for every million pound increase in annual milk production a member is 0.08 percent more likely to forward contract holding everything else constant. Figure 5.2 displays the probability of a producer using a forward contract as the level of milk produced in 2010 varies.

The coefficient on *freestall* was positive and statistically significant indicating producers with freestall facilities are more likely to forward contract. To the extent that *freestall* is an indicator of debt level, this would suggest that producers with higher debt levels are more likely to use DFA's forward contracting program. However, while this result is true statistically speaking, the expected probability of a producer with freestalls as their primary housing type using forward contracts is only slightly more than 2 percent more than those without freestalls. This suggests that DFA should place little emphasis on facility type when targeting producers that might potentially use DRMS forward contracting services.

There were three variables included in the model *partorsole*, *asainurance* and *inputriskmgt* related to other risk management. The variables *partorsole* and *inputriskmgt* were statistically significant at the 95 percent level while *asainurance* was not. Of the three whether or not a producer managed their risk for inputs had the largest impact, these members are 5 percent more likely to forward contract than the member who do not. As expected, members organized as corporations or limited liability companies are more likely to forward contract than those organized as sole proprietors or partnerships.

The variable *internet* was statistically significant at the 95 percent level. The model indicated that members who have access to the internet are more likely to forward contract than those who do not, but the probability was quite small (1.2%).

There were six regional variables based on the location of the farm included in the model. Of the variables, *central*, *mideast*, *mountain*, *northeast*, *southwest* and *western*, only *northeast* and *southwest* were not statistically significant at the 95 percent level,

though *southwest* was significant at the 90 percent level. According to the model, members in the Mountain Area are the most likely to forward contract followed by members in the Central Area.

**Table 5.2: Binary Logit Estimates**

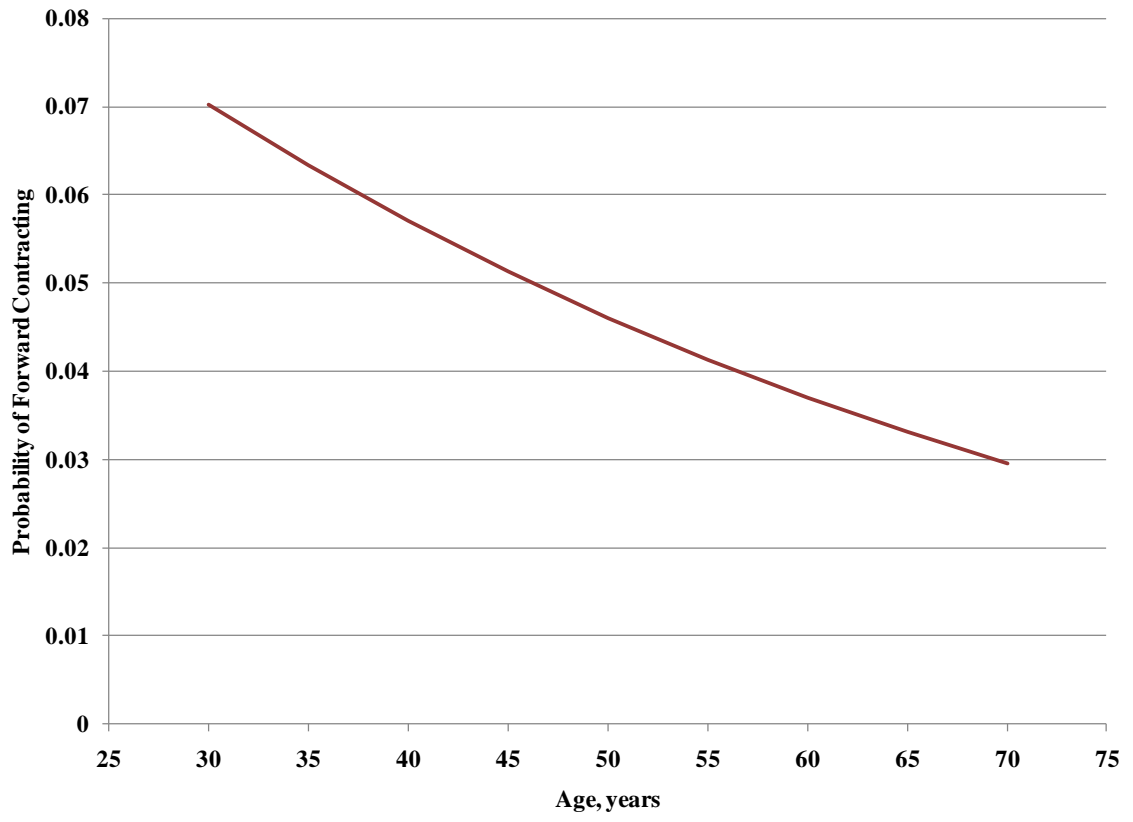
Logistic regression	Number of Observations = 5579
	LR chi2(15) = 509.83
	Prob > chi2 = 0.0000
Log likelihood = -808.15403	Pseudo R2 = 0.2398

<b>contract2010</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>P-Value</b>	<b>[95% Conf. Interval]</b>	
<i>central</i>	2.8392	0.3944	0.000	2.0661	3.6123
<i>mideast</i>	1.7761	0.4172	0.000	0.9584	2.5938
<i>mountain</i>	2.5211	0.4304	0.000	1.6776	3.3646
<i>northeast</i>	0.3869	0.6332	0.541	-0.8541	1.6279
<i>southwest</i>	1.3679	0.5286	0.010	0.3319	2.4039
<i>western</i>	1.7981	0.5092	0.000	0.8001	2.7961
<i>partorsole</i>	-0.5426	0.1591	0.001	-0.8544	-0.2308
<i>freestall</i>	0.5664	0.1564	0.000	0.2599	0.8728
<i>internet</i>	0.3168	0.1823	0.082	-0.0405	0.6741
<i>asainsurance</i>	-0.0609	0.1850	0.742	-0.4234	0.3016
<i>age</i>	-0.0263	0.0064	0.000	-0.0389	-0.0137
<i>genone</i>	-0.1537	0.2494	0.538	-0.6425	0.3351
<i>gentwo</i>	-0.0063	0.1640	0.969	-0.3278	0.3151
<i>milk10</i>	0.0242	0.0040	0.000	0.0164	0.0319
<i>inputriskmgt</i>	1.2625	0.1537	0.000	0.9613	1.5637
<i>constant</i>	-4.6940	0.5427	0.000	-5.7576	-3.6305

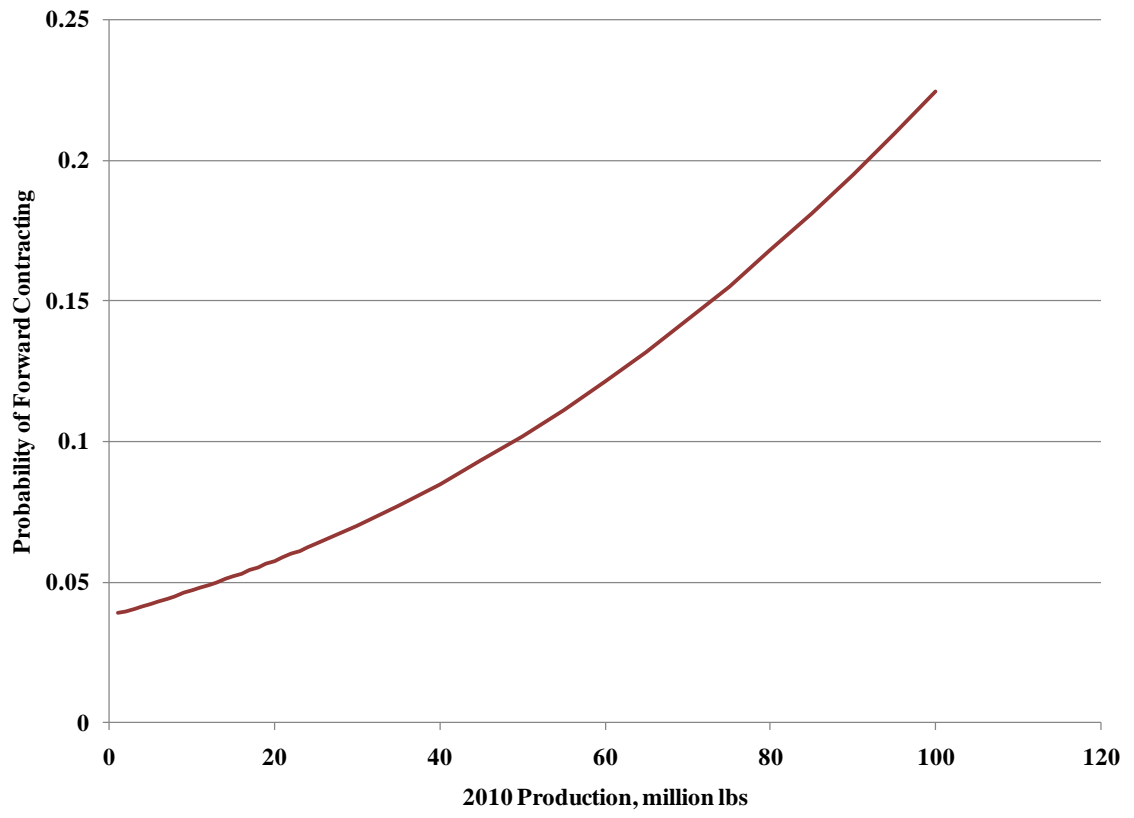
**Table 5.3: Binary Logit Estimates – Marginal Effects (continuous variables) and Change in Probability (binary variables)**

<b>Variable</b>	<b>dy/dx</b>	<b>Std. Err.</b>	<b>P-Value</b>	<b>[ 95% C.I. ]</b>	
<i>central</i>	0.1610	0.0316	0.000	0.0990	0.2230
<i>midwest</i>	0.1021	0.0325	0.002	0.0383	0.1658
<i>mountain</i>	0.1949	0.0512	0.000	0.0944	0.2953
<i>northeast</i>	0.0169	0.0312	0.588	-0.0442	0.0780
<i>southwest</i>	0.0805	0.0433	0.063	-0.0043	0.1653
<i>western</i>	0.1195	0.0498	0.016	0.0220	0.2171
<i>partorsole</i>	-0.0229	0.0074	0.002	-0.0374	-0.0085
<i>freestall</i>	0.0212	0.0057	0.000	0.0100	0.0324
<i>internet</i>	0.0115	0.0063	0.066	-0.0008	0.0238
<i>asainsurance</i>	-0.0023	0.0069	0.738	-0.0158	0.0112
<i>age</i>	-0.0010	0.0002	0.000	-0.0015	-0.0005
<i>genone</i>	-0.0056	0.0088	0.519	-0.0228	0.0115
<i>gentwo</i>	-0.0002	0.0063	0.969	-0.0126	0.0121
<i>milk10</i>	0.0009	0.0002	0.000	0.0006	0.0012
<i>inputriskmgt</i>	0.0500	0.0063	0.000	0.0377	0.0624

**Figure 5.1: Probability of Using Forward Contracts vs. Age**



**Figure 5.2: Probability of Using Forward Contracts vs. Milk Production**



## CHAPTER VI: CONCLUSIONS AND IMPLICATIONS

The objective of this thesis was to determine how the demographics of DFA members impacted their use (or lack thereof) of DFA's forward contracting program. It is obvious there are a number of factors influencing a member's decision to use DFA's forward contracting program in 2010. Even though the model estimated did not identify all of them, it does provide some insight and complements others findings as to why a member may decide to use a forward contracting program to forward price milk sales.

The model identified that there are regional differences in use of DFA's forward contracting program. Members in the Mountain Area are most likely to use the program followed by members in the Central Area. Additionally the model confirmed that older members were less likely to use the program. The size of the operation also had an impact on whether or not a member would use the forward contracting program, members producing more milk per year being more likely than their counter parts producing less.

While the percent of producers using DFA's forward contracting services is relatively low, the logit model estimated did identify several factors related to the use of these services. However, the relationships are not particularly strong, and thus the model is limited in its ability for identifying key factors that will enable DFA to base a targeted marketing effort at certain producers. DFA would need additional information about their members to successfully target for this farm service.

Futures research that looks to build upon this thesis might consider collect additional producer characteristic data if possible. Specifically, information from individual producers that would be quite useful would include their perception of risk and their risk tolerance. Additionally information regarding debt level and financial ratios would be a great addition to this study. The author however realizes and respects the fact that accessing this information may be difficult as it may be too intrusive for most members to share. Lastly, current information regarding a producer's plans for future growth of the operation would benefit this study with the assumption that future growth will be financed thus requiring more consistent cash flows to meet those debt obligations.

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## APPENDIX A

### DAIRY FARMERS OF AMERICA, INC. FORWARD CONTRACT FOR DELIVERY MASTER AGREEMENT

This Master Agreement, is made effective the \_\_\_\_\_ day of \_\_\_\_\_, 200\_, by and between DAIRY FARMERS OF AMERICA, INC. (“DFA”) and \_\_\_\_\_, a \_\_\_\_\_ (“Member”). The parties hereto have entered and/or anticipate entering into one or more transactions (each a “Transaction”) that are or will be governed by this Master Agreement, which includes the confirmation (each a “Confirmation”) exchanged between DFA and Member confirming the Transactions.

Accordingly, DFA and Member agree as follows:

1. All Transactions are entered into in reliance on the fact that this Master Agreement and all Confirmations form a single agreement between DFA and Member (collectively, this “Agreement”), and DFA and Member would not otherwise enter into any Transactions.
2. Member agrees to deliver to DFA from Member’s milk production facility the agreed upon weight of unprocessed fluid milk, hereinafter referred to as “Milk”. Each Transaction for a given month shall be a minimum of 20,000 pounds (200 hundredweight), with additional increments of 5,000 pounds (50 hundredweight) as set by DFA at the time the Transaction is agreed upon. Member represents and warrants that Member is a producer of Milk of sufficient quality and quantity to perform Member’s obligations under this Agreement, and in accordance with the Membership and Marketing Agreement entered into by and between DFA and Member (“Membership Agreement”) which is incorporated herein by reference.
3. Member’s production during any period in which Member has an obligation to deliver Milk hereunder shall be delivered first in performance of such obligation until such obligation is fulfilled.

4. The parties shall agree upon a price or formula price per hundredweight of Milk for each Transaction. This price or formula price shall be the “forward contract price”, hereinafter referred to as “FCP”. The parties shall also agree upon the calendar month or months when delivery of Milk will be required for each Transaction. Each such calendar month shall be a “Delivery Period.” Payment of the FCP may be made as follows:

A. For all Transactions other than the Announced Blend Price Contract, when Member is compensated by DFA pursuant to this Agreement for Milk delivered during the Delivery Period(s), payment shall be made by adjustments to Member’s milk check. Member’s milk check shall be adjusted by an amount (a) equal to the difference (which may be positive or negative) between the FCP and the Class III Milk Price or the Class IV Milk Price as the case may be, times the volume contracted and (b) pursuant to DFA Bylaws and Board Policies and Procedures. In addition, any applicable premiums and administrative fees pursuant to this Agreement, as identified in the applicable Confirmation, will be deducted from Member’s milk check. The Class III Milk Price or Class IV Milk Price, as the case may be, shall mean the monthly per hundredweight price of milk of that class as announced by the United States Department of Agriculture (USDA) on the “Pricing Date.” For purpose of this Agreement, the Pricing Date shall be the date the USDA announces the Class III or Class IV Milk Price, as the case may be, for the Delivery Period. The Pricing Date is generally the first Friday on or before the fifth day of the month following the end of the Delivery Period.

B. For the Announced Blend Price Contract and the Flat Price Contract with No PPD, payment to the Member shall be made by substituting the FCP for the price per hundredweight of milk that would otherwise be paid in Member’s milk check absent a Master Agreement.

C. At the option of DFA, from time to time other Transaction types may be offered by DFA. Such Transaction types shall be more particularly described in an applicable Confirmation.

5. Payment by DFA is conditioned upon Member’s completion of delivery of the total

weight of the class of Milk agreed upon during the delivery period. Any payment by DFA made prior to completion of delivery is merely an accommodation to Member. In making such accommodation, DFA does not waive any conditions of this Agreement to be performed by Member or any of DFA's rights or remedies hereunder. Proper rejection of Milk by DFA shall not release Member from its obligations to deliver Milk under the terms of this Agreement.

6. Member agrees to pay to DFA damages for default in delivery of Milk as agreed hereunder through the date a default is declared. Member shall be liable to DFA for all direct, consequential and incidental damages as DFA may prove were reasonably incurred by DFA as a result of Member's breach of any of Member's representations or warranties herein or the default by Member in the performance of any of Member's obligations hereunder.

- A. DFA may declare Member in default hereunder if any one or more of the following occurs:
  - (1) the Member fails to deliver the Milk on the date required by the Transaction;
  - (2) the Member attempts to cancel or modify the Transaction;
  - (3) the Member becomes insolvent or is adjudged bankrupt;
  - (4) the Member is no longer a member of DFA;
  - (5) the Member has not complied with the terms and conditions of this Transaction; or
  - (6) the Member fails to provide adequate assurance of performance after demand for such assurance by DFA.
- B. In the event of the Member's default, DFA may elect one or more of the following remedies:
  - (1) cancel the Transaction;
  - (2) terminate the Transaction as to the portion in default and recover from the Member the excess of the market price for an equal quantity of Milk of the same kind and grade over the purchase

price contracted by the Member, plus any incidental losses or expenses, including reasonable attorneys' fees;

- (3) terminate the Transaction as to any unshipped balance and recover from the Member as liquidated damages a sum equal to 1% of the per hundredweight contract price multiplied by the number of hundredweights remaining unshipped, plus any incidental losses or expenses, including reasonable attorneys' fees; or
- (4) an offset against Member's equities or other amounts due Member by DFA.

7. Member and DFA agree that the sole procedure for the resolution of any and all disagreements or disputes arising under or relating to this Agreement shall be first through mediation by the appropriate DFA Area Council or a committee from that Council, as contemplated in the Membership Agreement, and thereafter, should such mediation fail to resolve the disagreement or dispute, through arbitration proceedings pursuant to the Commercial Arbitration Rules of the American Arbitration Association ("AAA") with such arbitration to be held in the city with an AAA office designated by DFA. The decision and award determined through such arbitration shall be final and binding upon Member and DFA, and judgment upon the arbitration award may be entered and enforced in any court having jurisdiction thereof.

8. The Forward Milk Price Contracting program being offered by DFA is not a guarantee of higher milk prices. DFA is providing this program as a planning option for its members. Acceptance of a forward milk price contract in any given month by DFA should not be construed as an endorsement by DFA of forward contracting on the relevant date. The Member assumes all risks in forward milk price contract price fluctuations. Member represents that Member has made its own independent decision to enter into each Transaction and as to whether such Transaction is appropriate or proper for it based on its own judgment. Member is not relying on any communication (written or oral) of DFA as advice or as a recommendation to enter into such Transaction. At Member's request, DFA may express an opinion as to present or future market conditions, but DFA shall receive no compensation for such opinion and Member agrees not to rely on such opinion as an accurate forecast of present or future events. Member further represents that Member is

capable of assessing the merits of and understanding, on its own behalf, and understands and accepts the terms, conditions, and risks of each Transaction and is capable of assuming and assumes such risks. Member understands that DFA is not acting as Member's fiduciary with respect to this Master Agreement or any Transaction entered into hereunder.

9. Member represents that Member has full authority to enter into this Agreement and any related Transactions and Confirmations. If Member is a corporation, partnership or other entity that is not a natural person, the undersigned represents that he or she is an authorized signatory of Member and has the authority to bind Member in connection with this Agreement and that all necessary action has been taken to authorize the entering into this Agreement by said entity.

10. Member represents and warrants that the Milk delivered under this Agreement shall be free and clear of all claims, liens, charges, encumbrances and penalties, governmental or otherwise, and that lawful custody and control of the Milk is being conveyed to DFA. If any security interests or other liens are made known to or discovered by DFA prior to delivery of the Milk, acceptance of the Milk shall be at the option of DFA. Member expressly agrees that DFA has the right to issue multiple-party checks for payment of the Milk should DFA have any reason to believe that any third party has or may assert a lien, encumbrances or other charges against the Milk delivered under this Agreement. Member understands that a lien, encumbrance or other charge may exist with respect to all production on Member's farm, regardless of whether such production belongs to Member personally.

11. Neither DFA nor Member is obligated to enter into Transactions by virtue of being a party to this Master Agreement. DFA shall have absolute discretion to determine whether to enter any particular Transaction, to determine Delivery Periods, and to determine units of deliverable quantity of Milk.

12. Any notice required or desired to be delivered under this Agreement shall be in writing and shall be delivered by courier service, postage prepaid mail, facsimile, telex,

telegram or other similar means and shall be effective upon actual receipt by the party to which such notice shall be directed, addressed as follows:

If to Member:

Name:

Address:

Phone:

Fax:

If to DFA:

Name: Shonda Wills

Address: P.O. Box 909700  
Kansas City, MO 64190-9700

Phone: 816-801-6412

Fax: 816-801-6594

13. This Agreement shall be governed by and construed in accordance with the laws of the State of Missouri without regard to principles of conflicts of laws.

14. This Agreement constitutes the final, entire, complete and exclusive statement of the Agreement between the parties regarding the subject matter hereof and may not be amended, supplemented or waived, except in writing signed by both parties. The terms of the Agreement and information supplied in connection with it by the Member shall be held in confidence by the parties.

15. This Agreement or any rights or interests here under may not be pledged, made the subject of a security interest or otherwise encumbered, transferred, or assigned by Member unless express written consent is first obtained from DFA.

16. This Master Agreement may be terminated by either party upon thirty (30) days' written notice to the other party; provided, however, that termination of this Master

Agreement shall not be effective until Member and DFA have performed their obligations with respect to every Transaction entered into under the terms of this Master Agreement.

17. This Agreement (and each amendment, modification, and waiver in respect of it) may be executed and delivered in counterparts (including by facsimile transmission), each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

18. Notwithstanding any other paragraph of this Master Agreement, DFA and Member intend to be legally bound by the terms of each Transaction from the moment they agree to those terms (whether orally or otherwise). Member authorizes DFA to tape record all conversations with Member without further notice, consents to such tape recordings, and agrees that any such tape recordings shall be admissible in any court or arbitration proceeding. A Confirmation shall be sent by DFA to Member as soon as practicable and shall be executed and returned to DFA as soon as practicable on or after the Transaction date. Provided, however, that Member's failure to return an executed Confirmation shall not relieve Member of Member's duties to perform each and every one of Member's obligations under this Agreement with respect to the Transaction as agreed. Confirmations may be exchanged by mail, courier or facsimile transmission.

19. This Master Agreement supersedes and replaces all prior master agreements for forward contracts between DFA and Member, and each Transaction entered into between DFA and Member on or after the date of this Master Agreement shall be governed by the terms hereof. This Master Agreement shall not affect any prior transactions entered into under prior master agreements, and each such prior transaction shall continue to be governed by the master agreement in effect at the time the Member entered into the transaction with DFA.

20. If, during the period of time after a Transaction is entered into and prior to the Delivery Period for that Transaction, there is a material change in or elimination of the USDA's formula for determining the Class III or Class IV Milk Price for the Delivery Period, then the Class III or Class IV Milk Price, as the case may be, will be determined for

the Delivery Period according to the formula used by the USDA at the time the Transaction was entered into. Similarly if, during the period of time after a Transaction is entered into and prior to the Delivery Period for that Transaction, there is a material change in or elimination of the USDA's determination of the timing of the Pricing Date for the Delivery Period, the Pricing Date for the Delivery Period will be the date corresponding to what it would have been if the material change or elimination had not occurred.

21. Member authorizes DFA, prior to entering into any Transaction and thereafter as reasonably determined by DFA in the exercise of its discretion, to conduct a full credit check on Member, including but not limited to obtaining a credit report on Member from one or more commercial credit reporting agencies.

The parties and/or their authorized representatives set forth their agreement to the terms of this Agreement:

Name of Member:

[Authorized Signature of a «Legalentity»]:

\_\_\_\_\_

Name of signatory: \_\_\_\_\_

Title of signatory: \_\_\_\_\_

DAIRY FARMERS OF AMERICA, INC.

[Authorized Signature]:

or his designee \_\_\_\_\_

Name of signatory: Shonda Wills



Title of signatory: Director – Dairy Risk Management

Additional persons who may execute Confirmations on behalf of Member:

[Authorized Signature(s)]: \_\_\_\_\_

Name of signatory: \_\_\_\_\_

Title of signatory: \_\_\_\_\_

[Authorized Signature(s)]: \_\_\_\_\_

Name of signatory: \_\_\_\_\_

Title of signatory: \_\_\_\_\_

## APPENDIX B



Dairy Farmers of America

March 25, 2011

Dear DFA Member:

DFA has received numerous requests, from both our Members and our customers, to expand the length of time for which transactions ("Transactions") under the Forward Contract for Delivery ("Forward Contract") may be executed. Currently, Transactions under the Forward Contract program ("Program") have been limited as to length of term (i.e., generally for one (1) year). This term limitation was imposed out of an abundance of caution after close review of DFA's Consent Decrees. These Consent Decrees prohibit DFA from "entering into or enforcing any membership or marketing agreement with any member" which has "a term in excess of one (1) year."

As you are aware, one of the requirements of the Program is that the producer remains a Member of DFA for the entire contracted term. Thus, even though the Forward Contract is not a membership or marketing agreement within the meaning of the Consent Decree, if the Forward Contract term is longer than one (1) year, DFA legal counsel was concerned that it could be argued that DFA was in potential violation of its Consent Decrees because of the relationship between the Forward Contract and the applicable DFA membership and marketing agreement. In other words, in order for a Member to be in compliance with the Forward Contract, the Member must continue membership in DFA for the full length of the term of the Forward Contract. Because of the numerous requests, as above mentioned, this Consent Decree compliance concern has been revisited. DFA legal counsel, after consultation with DFA's antitrust attorney, has concluded that the Forward Contract term can be expanded, provided that the Member who desires to participate in the Program is fully aware of the implications that such an expanded Forward Contract term may have to that Member:

1. Each Member remains free to terminate the DFA membership and marketing

agreement on an annual basis, consistent with the terms of that membership and marketing agreement and the Company's By-Laws. Nothing in the expanded term of the Forward Contract alters this legal right. However, termination of the DFA membership and marketing agreement by the Member does constitute a breach of that Member's Forward Contract. See Paragraph 7.A.(4) of the Dairy Farmers of America, Inc. Forward Contract for Delivery Master Agreement ("Master Agreement").

2. As you know from the Program documents, any breach of the Forward Contract (including a breach for ceasing to be a DFA Member) may subject the Member to DFA's choice of remedies to reimburse DFA for damages and/or losses sustained as the result of such a breach. Such potential remedies could include, for example, the recovery from the Member of the costs associated with acquiring milk to replace the milk that had been committed by the Member and is no longer available. See Paragraph 7.B. of the Master Agreement. Depending on the market price of such replacement milk and the price at which the Member had committed to supply milk under the Forward Contract, such costs may be substantial.
3. Accordingly, any Member that desires to engage in the expanded term Forward Contract must consider the effect that such Forward Contract may have on the Member's potential desire in the future to terminate its membership and marketing agreement with DFA. Members with any questions about the foregoing should consult their own advisors about the merits, risks and consequences of the expanded term Forward Contract. DFA cannot, and is not, acting as the Member's fiduciary in regard to the Member's decision to enter into the expanded term Forward Contract. This is a business decision to be made solely by the Member without direction from DFA.
4. By signing below, the Member is acknowledging that the Member has made its own independent decision to enter into the expanded term Forward Contract and recognizes the termination of its membership and marketing agreement with DFA will constitute a breach of any then-outstanding Forward Contracts and will subject the Member to claims from DFA. Member, further acknowledges, that its decision to enter into the expanded term Forward Contract is a voluntary action, based on its own judgment regarding the merits, terms, conditions, and risks of such Forward Contract.

Name of Membership:

Signature of Authorized Representative: \_\_\_\_\_

Title of Authorized Representative: \_\_\_\_\_

## APPENDIX C

### INFORMATION OBTAINED FROM GOLD STANDARD PROGRAM SURVEY

#### Demographic Questions

- 1 Member Operating Division
- 2 Membership Number
- 3 Membership Name
- 4 Farm Location
  - Street
  - City
  - State
  - Zip
- 5 Membership Phone Number
- 6 Membership Fax Number
- 7 Membership E-mail Address
- 8 Type of legal business entity
  - Sole proprietorship
  - Partnership
  - Corporation
  - Limited Liability Company
  - Other
- 9 Farm Manager / Herdsman Name
- 10 Farm Manager / Herdsman Phone Number
- 11 Farm Manager / Herdsman Fax Number
- 12 Farm Manager / Herdsman E-mail Address
- 13 Farm Veterinarian Name
- 14 Farm Veterinarian Phone Number
- 15 Farm Veterinarian Fax Number
- 16 Farm Veterinarian E-mail address
- 17 Farm Nutritionist Name
- 18 Farm Nutritionist Phone Number
- 19 Farm Nutritionist Fax Number
- 20 Farm Nutritionist E-mail address
- 21 Number of Dairy Animals on Farm
  - Milking Cows
  - Dry Cows
  - Heifers
  - Bulls / Steers
- 22 Type of Animal Housing
  - Stanchion
  - Free Stall
  - Dry Lot
  - Other

- 23 Milking Parlor Type  
Herringbone  
Parallel  
Rotary  
Tandem  
Tie Stall  
Other
- 24 Number of animals capable of milking at one time
- 25 Milk Storage Units & Capacity  
Bulk Tank 1 Capacity  
Bulk Tank 2 Capacity  
Bulk Tank 3 Capacity  
Bulk Tank 4 Capacity  
Bulk Tank 5 Capacity
- 26 Employees  
Family Full Time  
Part Time  
Non-family Full Time  
Part Time
- 27 Feed Supply (either typically used, or currently used)
- |                        |       |           |      |          |
|------------------------|-------|-----------|------|----------|
| Corn (grain)           | Grown | Purchased | Both | Not Used |
| Corn (silage)          | Grown | Purchased | Both | Not Used |
| Hay (alfalfa)          | Grown | Purchased | Both | Not Used |
| Hay (other)            | Grown | Purchased | Both | Not Used |
| Soybean Meal           | Grown | Purchased | Both | Not Used |
| Cottonseed             | Grown | Purchased | Both | Not Used |
| Dried Distillers Grain | Grown | Purchased | Both | Not Used |
| Wet Distillers Grain   | Grown | Purchased | Both | Not Used |
| Beet Pulp              | Grown | Purchased | Both | Not Used |
| Canola                 | Grown | Purchased | Both | Not Used |
| Complete feed mixes    | Grown | Purchased | Both | Not Used |
| Other                  | Grown | Purchased | Both | Not Used |
- 28 Primary Waste Collection Method  
Scrape  
Flush  
Vacuum  
Other
- 29 Primary Waste Storage Method  
Pit  
Above ground storage  
Composting  
Lagoon  
Lagoon, covered  
Lagoon, covered, with a digester  
Digester  
Other

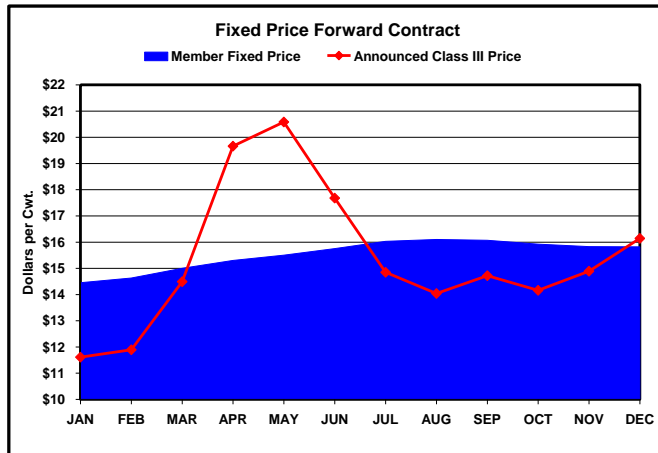
- 30 Primary Deadstock handling:  
 Renderer  
 On-farm burial  
 On-farm composting  
 Other
- 31 Primary Cattle Breed  
 Holstein  
 Jersey  
 Brown Swiss  
 Guernsey  
 Ayrshire  
 Milking Shorthorn  
 Cross-bred  
 Other
- 32 Primary Farm Internet Access  
 Dial-up  
 Cable High Speed  
 Telephone High Speed  
 Satellite  
 None
- 33 Other Questions (Yes or No)  
 Animals are primarily registered  
 Cows are primarily grazed  
 Farm has a digester  
 Participates in YC programs  
 Is certified Organic  
 Uses rbST  
 Manages price risk for inputs  
 Manages price risk for milk sales  
 Has cloned animals  
 Received financing through Agri-Max  
 Received insurance through ASA  
 Established a 401k through DFA  
 Feeds wet distillers grain  
 Feeds dry distillers grain  
 Has a premise identification registration number  
 Raises own replacements  
 Raises bull calves  
 Direct ships milk (milk is stored on a tanker)  
 Practices Johne's control activities  
 Other 1  
 Other 2  
 Other 3  
 Other 4  
 Other 5
- 34 Member's years of dairy experience

- 35 Number of generations that have operated dairy farms
- 36 Member Ethnicity
  - Caucasian
  - Asian or Pacific Islander
  - Black
  - American Indian or Alaskan Native
  - Hispanic / Latino
- 37 Member Age (most senior member)
- 38 Member Future Expectations (next 5 to 10 years)
  - Same owner, same number of cows
  - Same owner, larger number of cows
  - Next generation owner, same number of cows
  - Next generation owner, larger number of cows
  - Farm will not be milking cows
- 39 Fieldstaff name
- 40 Fieldstaff phone
- 41 Fieldstaff fax
- 42 Fieldstaff e-mail
- 43 Date

**APPENDIX D**  
**VARIOUS DRMS CONTRACTS**  
**FIXED PRICE FORWARD CONTRACT**

Without a price risk management plan, members are vulnerable to the volatility that is common to the Class III market.

The fixed price forward contract program allows members to lock in a fixed price for a portion of their milk for one month to 24 months. For the specified number of months, members will receive the contracted Class III price, regardless of the swings the announced Class III prices may incur.



Graph 1

FIXED PRICE FORWARD CONTRACT			
MONTH	FUTURES PRICE at TRANSACTION	MEMBER FIXED PRICE	Announced Class III Price
JAN	\$14.55	\$14.45	\$11.61
FEB	\$14.73	\$14.63	\$11.89
MAR	\$15.10	\$15.00	\$14.49
APR	\$15.40	\$15.30	\$19.66
MAY	\$15.60	\$15.50	\$20.58
JUN	\$15.85	\$15.75	\$17.68
JUL	\$16.13	\$16.03	\$14.85
AUG	\$16.20	\$16.10	\$14.04
SEP	\$16.17	\$16.07	\$14.72
OCT	\$16.02	\$15.92	\$14.16
NOV	\$15.93	\$15.83	\$14.89
DEC	\$15.92	\$15.82	\$16.14

Table 1

Graph1 is an example of monthly fixed price levels compared to USDA announced monthly Class III prices.

Members can provide more consistency to their Class III price while giving up some of the highs and lows of the market. Table 1 illustrates the calculation of the member's fixed price. The Member Fixed Price in the table is the price shown on the contract confirmation sent to members at the time the forward contract order is fulfilled.

Scenario: On November 20, a member locks in a fixed price at \$15.00 per hundredweight for 200,000 pounds of March delivered milk.

- The Class III price announced by the USDA for March is \$14.49 per hundredweight. The member will have added \$0.51 per hundredweight to the final milk check for the contracted pounds. This would calculate to an additional \$1,220 on the contracted 200,000 lbs.  
 $(200,000/100) \times (\$15.00 - \$14.49) = \$1,020$

-----FORWARD CONTRACTING PRICING INFORMATION-----							
FIXED	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
	200,000			\$15.00	\$14.49	\$0.51	\$1,020.00
FORWARD CONTRACT SUBTOTAL							\$1,020.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****							
* The Pay Price Adjustment is dependent upon the original pay price in the final milk check.							

- If the Class III price is announced at \$15.00 per hundredweight, which has no effect on the member's final milk check for the forward contract.
- If the Class III price for the month is announced at \$15.89 per hundredweight. The member's milk check will show a deduction of \$1,780 for the contracted pounds.  
 $(200,000/100) \times (\$15.00 - \$15.89) = -\$1,780$

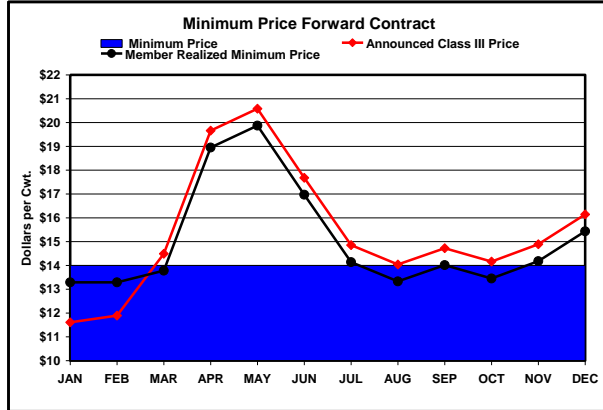


-----FORWARD CONTRACTING PRICING INFORMATION-----							
	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
FIXED	200,000			\$15.00	\$15.89	-\$0.89	-\$1,780.00
					FORWARD CONTRACT SUBTOTAL		-\$1,780.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****							
* The Pay Price Adjustment is dependent upon the original pay price in the final milk check.							

## MINIMUM PRICE FORWARD CONTRACT

The minimum price forward contract allows members to choose any month(s) currently trading on the Chicago Mercantile Exchange (CME) and establish a minimum or floor price for the specified month(s) by paying a premium. The level of protection purchased is known as a strike price and works much like insurance. The member decides the strike price based on the floor price they wish to protect, and after the premium and fee are deducted, the minimum price is established.

If, at the end of the contracted month(s), the market has moved higher than the established minimum price, members forego the minimum price and participate in the higher Class III cash price, BUT the premium and the administrative fee are still assessed with the higher market prices. The premium cost and fee are deducted from the final milk check for the contracted month.



Graph 3

MINIMUM PRICE FORWARD CONTRACT				
MONTH	STRIKE PRICE LEVEL	PREMIUM / FEE	Announced Class III Price	REALIZED CLASS III PRICE
JAN	\$14.00	(\$0.71)	\$11.61	\$13.29
FEB	\$14.00	(\$0.71)	\$11.89	\$13.29
MAR	\$14.00	(\$0.71)	\$14.49	\$13.78
APR	\$14.00	(\$0.71)	\$19.66	\$18.95
MAY	\$14.00	(\$0.71)	\$20.58	\$19.87
JUN	\$14.00	(\$0.71)	\$17.68	\$16.97
JUL	\$14.00	(\$0.71)	\$14.85	\$14.14
AUG	\$14.00	(\$0.71)	\$14.04	\$13.33
SEP	\$14.00	(\$0.71)	\$14.72	\$14.01
OCT	\$14.00	(\$0.71)	\$14.16	\$13.45
NOV	\$14.00	(\$0.71)	\$14.89	\$14.18
DEC	\$14.00	(\$0.71)	\$16.14	\$15.43

Table 3

The minimum price forward contract is illustrated in Graph 3. The realized minimum price is the strike price minus premium plus fee and would establish the lowest Class III price the member would receive on the contracted volume. When the Class III price exceeds the contracted strike price, the realized Class III price the member receives is the cash Class III price minus (premium + fee).

Scenario: On September 29, a member locks in a minimum price of \$14.00 per hundredweight at a cost of \$0.71 per hundredweight for 200,000 pounds for January-December delivered Class III milk establishing a \$13.29 minimum realized Class III price.

- The Class III price announced by the USDA for January is \$11.61 per hundredweight. The member will have \$1.68 per hundredweight added to the final milk check for the contracted pounds.  
 $(200,000/100) \times ((\$14.00 - \$0.71) - \$11.61) = \$3,360$

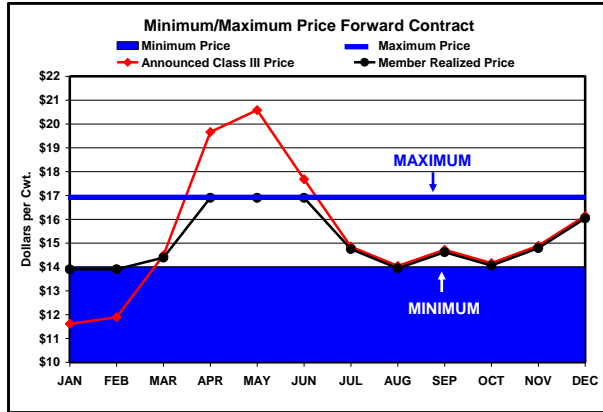
FORWARD CONTRACTING PRICING INFORMATION							
MINIMUM	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
	200,000	\$14.00		\$0.71	\$13.29	\$11.61	\$3,360.00
FORWARD CONTRACT SUBTOTAL						\$1.68	\$3,360.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING .....							
* The Pay Price Adjustment is dependent upon the original pay price in the final milk check.							

- The Class III price is announced for March at \$14.49 per hundredweight. The milk check will show the \$0.71 deduction on their final milk check on the contracted pounds, or a \$1,420 deduction.  
 $(200,000/100) \times -\$0.71 = -\$1,420$
- The USDA announced the June Class III price at \$17.68 per hundredweight. The member will have a deduction of \$1,420 on their milk check for the contracted pounds, but will be able to participate fully in the \$17.68 per hundredweight milk price. The producer will essentially receive \$16.97 per hundredweight for the forward contracted pounds of production.  $(\$17.68 - \$0.71 = \$16.97)$

-----FORWARD CONTRACTING PRICING INFORMATION-----								
	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM	CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
MINIMUM	200,000	\$14.00		\$0.71	\$16.97	\$17.68	-\$0.71	-\$1,420.00
						FORWARD CONTRACT SUBTOTAL		-\$1,420.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****								
								* The Pay Price Adjustment is dependent upon the original pay price in the final milk check.

## MINIMUM / MAXIMUM FORWARD CONTRACT

The minimum / maximum (“min/max”) forward contract allows members to lock in a price range instead of a fixed price forward contract (a single price). This contract can be at a smaller cost to members than a minimum price forward contract. The reason is, the member is still locking in a floor (minimum price) but does not have full participation in the market upside. With the min/max forward contract, members also place a maximum in the futures market. When purchasing a min/max forward contract, members choose a floor price and a ceiling price. Members receive the price within the floor/ceiling range when the contract is settled based on the USDA announced Class III price.



Graph 4

MINIMUM/ MAXIMUM PRICE FORWARD CONTRACT					
MONTH	MINIMUM PRICE LEVEL	MAXIMUM PRICE LEVEL	MIN/MAX PREMIUM /FEE	Announced Class III Price	REALIZED CLASS III PRICE
JAN	\$14.00	\$17.00	(\$0.10)	\$11.61	\$13.90
FEB	\$14.00	\$17.00	(\$0.10)	\$11.89	\$13.90
MAR	\$14.00	\$17.00	(\$0.10)	\$14.49	\$14.39
APR	\$14.00	\$17.00	(\$0.10)	\$19.66	\$16.90
MAY	\$14.00	\$17.00	(\$0.10)	\$20.58	\$16.90
JUN	\$14.00	\$17.00	(\$0.10)	\$17.68	\$16.90
JUL	\$14.00	\$17.00	(\$0.10)	\$14.85	\$14.75
AUG	\$14.00	\$17.00	(\$0.10)	\$14.04	\$13.94
SEP	\$14.00	\$17.00	(\$0.10)	\$14.72	\$14.62
OCT	\$14.00	\$17.00	(\$0.10)	\$14.16	\$14.06
NOV	\$14.00	\$17.00	(\$0.10)	\$14.89	\$14.79
DEC	\$14.00	\$17.00	(\$0.10)	\$16.14	\$16.04

Table 4

In Graph 4, the realized minimum price has taken some of the price volatility away if the Class III prices move lower. At this point, with the minimum price set, the contract is basically a minimum price forward contract. A maximum price was included to reduce the cost of the strategy and creating the min/max strategy. The maximum price has limited the member’s upside, but the member will participate in prices within the min/max range less any premium and fee costs. Table 4 reflects the Min/Max strike prices, costs and realized Class III price.

Scenario: On June 1, a member locks in a min/max contract (\$14.00 - \$17.00) for the following January through December at a cost of \$0.10 for 200,000 pounds.

- The Class III price is announced by the USDA for February at \$11.89 per hundredweight. The member will have \$2.01 per cwt. (minimum price less announced price less the contract cost) added to the final milk check for the contracted pounds.

$$(200,000/100) \times ((\$14.00 - \$0.10) - \$11.89) = \$4,020$$

-----FORWARD CONTRACTING PRICING INFORMATION-----								
MIN/MAX	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM	CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
	200,000	\$14.00	\$17.00	\$0.10	\$13.90	\$11.89	\$2.01	\$4,020.00
FORWARD CONTRACT SUBTOTAL								\$4,020.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****								
xxx								
* The Pay Price Adjustment is dependent upon the original pay price in the final milk check.								

- In March, the Class III price is announced at \$14.49 per hundredweight, between the minimum price of \$14 and the maximum price of \$17. The member will have the \$14.49 per cwt. Class III price BUT there will be a deduction of \$0.10 per hundredweight (\$200 for the 200,000 contracted pounds) for the cost of the forward contract on the final milk check.
- With the May announced Class III price at \$17.68 per cwt., the member would not be able to participate in the upside between \$17.00 per cwt. and \$17.68 per cwt. BUT would have a \$16.90 Class III contracted price. (In this scenario, \$16.90 per cwt. can be viewed as the fixed price because of the \$0.10 cost involved.) The member would see a deduction of \$1,560 on the final milk check.

$$(200,000/100) \times ((\$17.00 - \$0.10) - \$17.68) = -\$1,560$$

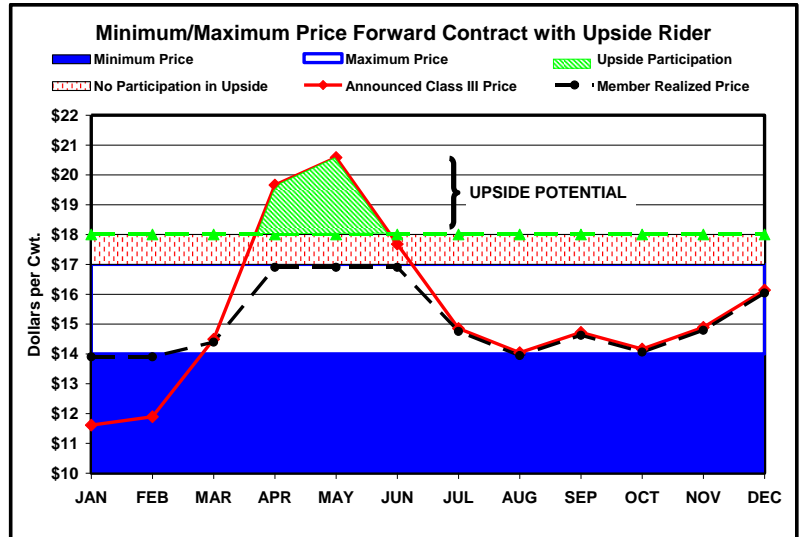
-----FORWARD CONTRACTING PRICING INFORMATION-----								
	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM	CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
MIN/MAX	200,000	\$14.00	\$17.00	\$0.10	\$16.90	\$17.68	-\$0.78	-\$1,560.00
FORWARD CONTRACT SUBTOTAL								-\$1,560.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****							xxx	
* The Pay Price Adjustment is dependent upon the original pay price in the final milk check.								

## UPSIDE RIDER

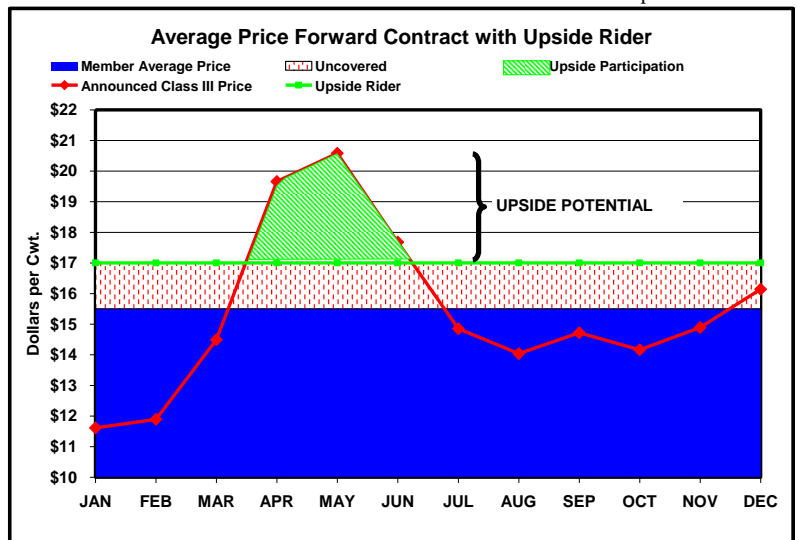
An upside rider is a tool used in conjunction with a fixed price forward contract, an average fixed price forward contract or a min/max forward contract. This tool gives members the ability to participate in the upside movements of the market for a premium cost. With the upside rider, members pay a premium for an upside rider, which in turn enables members to benefit from price spikes above the purchased upside rider price.

DRMS illustrates scenarios in Graph 5 on a min/max forward contract and Graph 6 on a fixed price forward contract. In Graph 5, the underlying min/max forward contract price protects against the low milk prices seen in the first months of the year. The min/max provides upside potential to \$17.00, but the member decides to purchase additional protection to the capture Class III prices if they exceed the \$17.00 maximum in the min/max transaction. In this example, the upside rider was purchased for January through December at an \$18.00 strike price (excludes cost). The upside rider gives members the ability to participate in prices above the realized upside rider price (strike price plus premium and fee) if the market rallies above that price level. The member does **not** have participation in prices between the maximum contract level and the realized price but has unlimited participation above the realized price. The additional dollars that are captured with the upside rider are in turn added to the forward contract price on the milk check for the corresponding month. Table 5 shows a min/max contract price with upside rider levels, costs and the realized upside rider price.

On Graph 6, the member is protected against Class III prices below \$15.50 and has upside potential after \$17.50 as reflected in Table 6.



Graph 5



Graph 6

AVERAGE PRICE FORWARD CONTRACT WITH UPSIDE RIDER						
MONTH	AVERAGE PRICE FORWARD CONTRACT	UPSIDE RIDER STRIKE	PREMIUM/FEE	Announced Class III Price	Increased Value to Max Price	REALIZED CLASS III PRICE
JAN	\$15.50	\$17.00	(\$0.50)	\$11.61		\$15.00
FEB	\$15.50	\$17.00	(\$0.50)	\$11.89		\$15.00
MAR	\$15.50	\$17.00	(\$0.50)	\$14.49		\$15.00
APR	\$15.50	\$17.00	(\$0.50)	\$19.66	\$3.16	\$18.66
MAY	\$15.50	\$17.00	(\$0.50)	\$20.58	\$4.08	\$19.58
JUN	\$15.50	\$17.00	(\$0.50)	\$17.68	\$1.18	\$16.68
JUL	\$15.50	\$17.00	(\$0.50)	\$14.85		\$15.03
AUG	\$15.50	\$17.00	(\$0.50)	\$14.04		\$15.03
SEP	\$15.50	\$17.00	(\$0.50)	\$14.72		\$15.03
OCT	\$15.50	\$17.00	(\$0.50)	\$14.16		\$15.03
NOV	\$15.50	\$17.00	(\$0.50)	\$14.89		\$15.03
DEC	\$15.50	\$17.00	(\$0.50)	\$16.14		\$15.03

Table 5

MIN/MAX FORWARD CONTRACT with UPSIDE RIDER							
MONTH	Minimum Price Protection	Maximum Price Protection	UPSIDE RIDER STRIKE	PREMIUM/FEE	Announced Class III Price	Increased Value TO Max Price	REALIZED CLASS III PRICE
JAN	\$14.00	\$17.00	\$18.00	(\$0.50)	\$11.61		\$13.90
FEB	\$14.00	\$17.00	\$18.00	(\$0.50)	\$11.89		\$13.90
MAR	\$14.00	\$17.00	\$18.00	(\$0.50)	\$14.49		\$14.39
APR	\$14.00	\$17.00	\$18.00	(\$0.50)	\$19.66	\$2.16	\$19.06
MAY	\$14.00	\$17.00	\$18.00	(\$0.50)	\$20.58	\$3.08	\$19.98
JUN	\$14.00	\$17.00	\$18.00	(\$0.50)	\$17.68	\$0.18	\$17.08
JUL	\$14.00	\$17.00	\$18.00	(\$0.50)	\$14.85		\$14.75
AUG	\$14.00	\$17.00	\$18.00	(\$0.50)	\$14.04		\$13.94
SEP	\$14.00	\$17.00	\$18.00	(\$0.50)	\$14.72		\$14.62
OCT	\$14.00	\$17.00	\$18.00	(\$0.50)	\$14.16		\$14.06
NOV	\$14.00	\$17.00	\$18.00	(\$0.50)	\$14.89		\$14.79
DEC	\$14.00	\$17.00	\$18.00	(\$0.50)	\$16.14		\$16.04

Table 6

Additional scenarios on the following page will give a more detailed explanation of the contract possibilities and pricing.

Scenario: On June 1, a member locks in a Min/Max Forward Contract with a \$14.00 minimum and \$17.00 maximum at \$0.10 per hundredweight for 200,000 pounds for January-December of the following year. The member also purchases an upside rider for the same time period at \$18.00 per cwt. for 200,000 pounds for a premium plus fee of \$0.50 per hundredweight or an \$18.50 realized upside potential as reflected in Table 6.

- The Class III price announced by the USDA for February is \$11.89 per hundredweight. The member will have \$2.01 per hundredweight (minimum price less announced price less the premium and fee) added to the final milk check for the contracted pounds. At the same time, the member has purchased an upside rider for \$0.50 per hundredweight. The upside rider cost is subtracted out of the gain even though the upside rider was not used. An additional \$0.50 per hundredweight cost is deducted from the final milk check for a net gain of \$1.51 per hundredweight.

FORWARD CONTRACTING PRICING INFORMATION								
	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM	CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
MIN/MAX	200,000	\$14.00	\$17.00	\$0.10	\$13.90	\$11.89	\$2.01	\$4,020.00
UPSIDE RIDER	200,000	\$18.00		\$0.50	\$18.50	\$11.89	-\$0.50	(\$1,000.00)
FORWARD CONTRACT SUBTOTAL								\$3,020.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****								xxx

- The Class III price is announced by USDA for June at \$17.68 per hundredweight. The member will not be able to partake in the upside because of the uncovered area between \$17.00 per cwt and \$18.50 per hundredweight (the realized upside rider price). A total deduction of \$2,560 for the 200,000 contracted pounds will occur on the June final milk check for the cost of the upside rider and the difference between the realized max price and the announced Class III price.

FORWARD CONTRACTING PRICING INFORMATION								
	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM	CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
MIN/MAX	200,000	\$14.00	\$17.00	\$0.10	\$16.90	\$17.68	-\$0.78	-\$1,560.00
UPSIDE RIDER	200,000	\$18.00		\$0.50	\$18.50	\$17.68	-\$0.50	-\$1,000.00
FORWARD CONTRACT SUBTOTAL								-\$2,560.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****								xxx

- USDA announced the Class III price for May at \$20.58 per hundredweight. The member would not be able to partake in the upside between \$17.00 per hundredweight and \$18.50 per hundredweight. The member would see the maximum price deduction on the milk check for \$7,360.  $(200,000/100) \times ((\$17.00 - \$0.10) - \$20.58)$  On the next line, the member would see a credit for the upside rider portion of the contract. A credit of \$4,160 for the 200,000 contracted pounds would be added.  $(200,000/100) \times (\$20.58 - (\$18.00 + \$0.50))$  The deductions and credits would net a \$3,200 deduction for the member versus a \$7,360 deduction without the benefit of the upside rider.

-----FORWARD CONTRACTING PRICING INFORMATION-----								
	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM	CONTRACT PRICE	ANNOUNCED PRICE	ADJ	AMOUNT
MIN/MAX	200,000	\$14.00	\$17.00	\$0.10	\$16.90	\$20.58	-\$3.68	-\$7,360.00
UPSIDE RIDER	200,000	\$18.00		\$0.50	\$18.50	\$20.58	\$2.08	\$4,160.00
					FORWARD CONTRACT SUBTOTAL			-\$3,200.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****							xxx	



## MARKET PLUS MARKET MINUS

The market plus/minus tool is used in conjunction with a fixed price forward contract, an average fixed price forward contract, or a buyer forward contract. The tool gives members the ability to amend the current fixed price transaction into the applicable DFA pay price for the applicable delivery period. In other words, the member can essentially “lock their losses or gains” which leaves those contracted pounds once again open to the DFA pay price at the end of the specific delivery period and the market plus/minus deduction/addition on the specific delivery period’s milk check. The tool is beneficial to members in markets with possible upside movement available. At the same time, the member is also susceptible to lower market movements as they are open to the DFA pay price like other production pounds that have not been forward contracted. DRMS illustrates this scenario in the graph. The underlying fixed forward contract price protects against the possibility of low milk prices but in this scenario the market moved higher. The member decides to amend the fixed price transaction to participate in the higher moving milk market in July, August and September. The member’s previously contracted pounds will now be priced with the DFA pay price. Figure 2. shows a table with the fixed price the member originally placed and the current CME futures price where the MPM was executed. A gain was recognized with this tool as the Class III market moved higher after the MPM contract was executed. Additional scenarios on the following page will explain the contract possibilities and pricing in more depth.

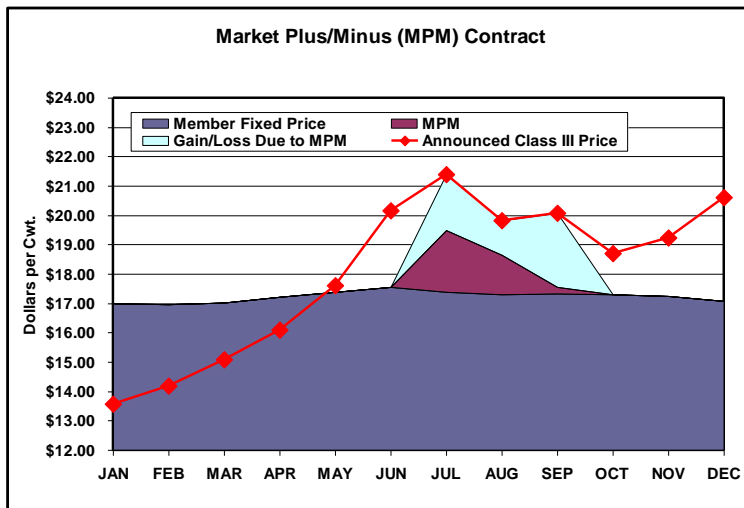


FIGURE 2.

MARKET PLUS/MINUS CONTRACT (MPM)					
MONTH/YEAR	MEMBER FIXED PRICE	CURRENT CME FUTURES PRICE WHEN EXECUTED	MARKET PLUS/MINUS TRANSACTION	DFA PAY PRICE AT END OF DELIVERY	NET GAIN/LOSS DUE TO MPM
JAN	\$16.98				
FEB	\$16.97				
MAR	\$17.03				
APR	\$17.22				
MAY	\$17.39				
JUN	\$17.56				
JUL	\$17.38	\$19.50	-\$2.17	\$21.38	\$1.83
AUG	\$17.30	\$18.65	-\$1.40	\$19.83	\$1.13
SEP	\$17.34	\$17.55	-\$0.26	\$20.07	\$2.47
OCT	\$17.30				
NOV	\$17.23				
DEC	\$17.07				

Scenario: On November 1, a member locks in a fixed price of \$17.38 per cwt. for 50,000 pounds for July. Later, the member decides to initiate a market plus/minus transaction with possibilities of the market moving higher throughout the remainder of the year. The member executes the MPM tool for July at current CME futures prices, \$19.50 per cwt., for 20,000 pounds of the original 50,000 forward contracted pounds.

1. The member will first receive a deduction of \$2.12 per cwt. (fixed price transaction – CME futures price for which the market plus/minus was initiated and fee) on the July milk check for the 20,000 market plus/minus pounds. If the USDA announced Class III price for July is \$16.00 per

cwt., the member's previously contracted pounds will be paid according to the DFA Pay Price (which will be lower than where the market plus/minus transaction was initiated). There will be a gain of \$414 on the remaining 30,000 pounds of contracted milk that did not use the MPM contract.

2. The member will first receive a deduction of \$2.12 per cwt. If the USDA announced Class III price for July is \$18.60 per cwt., the member's previously contracted pounds will be paid according to the DFA Pay Price. (depending on the member's pay price but could be slightly higher/slightly lower than where the market plus/minus transaction was initiated).

3. The member will first receive a deduction of \$2.12 per cwt. USDA announced the Class III price for July is \$21.38 per cwt., the member's previously contracted pounds will be paid according to the DFA Pay Price which will help the member gain over their initial market plus/minus deduction. There would also be a deduction of \$1200 due to the remaining 30,000 pounds of contracted milk that did not use the MPM contract.

The example below is an extension of Scenario 3.

-----FORWARD CONTRACTING PRICING INFORMATION-----							
	WEIGHT	MIN/STRIKE	MAX/STRIKE	PREMIUM CONTRACT PRICE	ANNOUNCED PRICE	ADJ/ per CWT	AMOUNT
MARKET PLUS/MINUS	20,000			-\$2.12	\$0.00	-\$2.12	-\$424.00
FIXED	30,000			\$17.38	\$21.38	-\$4.00	-\$1,200.00
				FORWARD CONTRACT SUBTOTAL			-\$1,624.00
PAY PRICE ADJUSTED BY FORWARD CONTRACT PRICING *****						11.4402	
* The Pay Price Adjustment is dependent upon the original pay price in the final milk check.							