DATE: December 14, 2010

TO: United States Department of Agriculture's Dairy Industry Advisory Committee

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SUBJECT: Answers to DIAC Questions

SUPPLY MANAGEMENT

1. Where does the "cost" of volatility mitigation from the various supply management programs show up? This is not necessarily the same as where are the rents incorporated, although would it be possible to also provide that information? It has been suggested that the cost to mitigating volatility will show up in cattle values and that the increase in milk price will result in a decrease on the balance sheet in cattle assets. What do you think of that and what would be the net increase or decrease in equity (vs. income) under supply management.

It is important to understand that as supply management programs reduce milk price volatility, extreme highs in milk prices are going to be eliminated as well as extreme lows under a successful supply management program. One cost that will be seen is that producers will see the milk price highs cut off in exchange for pulling up the milk price lows. To the extent that alternative supply management programs pull up the average milk price, questions about equity are important.

Dairy equity increases can only exist if supply management proposals are strong enough to limit the extent to which new entrants can enter the market and current producers can expand. The more flexible alternative supply management proposals are regarding the response of milk supplies, the smaller the increase in equity we would expect to see.

Just as supply management proposals are expected to reduce milk price volatility, these proposals should also reduce the volatility in dairy cattle values as well. That will limit both the highs and lows in dairy cattle values relative to what has been experienced recently.

The outcome of these types of programs for individual dairy producers will be different. Those producers that have been able to successfully use futures markets or other forward marketing strategies to take advantage of high milk prices and low feed costs will more than likely have limited additional benefit under supply management alternatives and thus less equity effects, while those producers that have only relied on cash markets will see equity rise to the extent that average milk returns rise.

Consumers will see the cost of dairy products rise on average depending on the extent that average milk prices increase under the supply management alternative.

2. What are the risks of supply management programs? What are the possible unintended consequences? What are your key data points for cost-benefit analysis—what are the things to look at? You have done a lot of sensitivity analyses. What could go wrong? How do you calculate those probabilities?

The success of a supply management program rests to a large extent on the program's ability to manage future supplies in a way that tends to balance future demand. The largest issues that will be faced in a supply management program is how well future demand can be anticipated, and how quickly supplies can be balanced to the current demand situation, which can change drastically in a very short period of time. The dairy industry has seen large relatively unanticipated movements in milk prices which were in part based on demand events. These milk price movements were both for higher and lower milk prices. Remember that milk prices went from $19.30 per hundredweight in July 2008 to $11.60 per hundredweight in February 2009. For a supply management program to be "effective" in that price change environment, it has to have the ability to both predict the event and influence supplies rapidly. Both of these are going to be difficult.

The FAPRI modeling system has been upgraded to approach the forward-looking baseline in a stochastic framework. This is a two-stage process, where the first stage is a deterministic or point estimate approach that is our best estimate of the future based on conditioning assumptions. Primarily this is information regarding general economic activity around the globe, as well as policy parameters. The second stage begins with the deterministic baseline and then allows key exogenous factors to vary. These exogenous shocks are based on distributions derived from observed historical deviations. For example, corn yield draws examine historical deviations from trend yields over the past 25 years to develop a distribution to draw future exogenous shocks from. By drawing from each of these historical deviations 500 times and solving the system for each of the 500 outcomes, the stochastic baseline is formed.

There are two important components in judging whether the FAPRI stochastic baseline will provide an accurate measure of the milk price risk. First, regarding known sources of volatility, the past must be a reasonable indicator for future volatility. Second, sources of variability that have not yet occurred will need to be minimal, since the FAPRI process does not have a way of predicting new sources of volatility.

It is important to remember that when our analysis suggests a reduction in milk price volatility, that is not the same as saying that it will eliminate volatility in all cases. Reducing volatility and eliminating volatility are very different things.

International markets seem to be one of the areas that could prove the most difficult to predict. If global demand for US agricultural products changes rapidly, it will be difficult for supply management programs to adjust supplies quickly enough to avoid either near record-high or near record-low milk prices.

The triggers chosen to implement supply management, such as the milk/feed price ratio, are important, but perhaps more important are the size and timeliness of supply adjustments needed in response to movements in the ratio. If there is little flexibility in the milk supply system to implement needed adjustments as the milk/feed price ratio calls for changes, there will likely be periods when the cut in milk supplies is either too large or too small.

3. Do your models include an investment component indicating the attractiveness of the industry for growth? In particular, could it be assumed that if there is a situation where profitability is unchanged and risk is reduced (as projected in most of the risk management results) then the industry is more attractive for investment by farmers or outsiders and that those additional resources would push prices or margins down.

The system maintained at FAPRI moves milk supplies by looking at historical profitability. The supply side of the model tends to fit the historically observed movements in dairy cows and milk production relatively well. However, the supply side of the FAPRI model is simplistic in nature in terms of using historical returns as a proxy for supply movements.

If a supply management program were enacted that substantially reduced risk, then the potential for significant outside investment would exist. Under this scenario, the level of risks and returns to dairying would need to be considered relative to risks and returns of other potential investments that "outside" investors could make. If dairying returns had a favorable risk/return relationship relative to the other alternatives, outside investment would likely be a factor and would eventually drive return on investment lower.

4. Do the models incorporate risk return tradeoffs in any way?

The FAPRI modeling system does not explicitly incorporate any risk reduction in determining the supply response to the alternative policy proposals. That does not mean that we do not recognize the potentially different response that could occur for two proposals with the same long run average returns that differ in volatility, but empirically incorporating such effects has proved challenging with economic models that tend to rely in large part on historical relationships between key industry factors. There needs to be more research in the area of producer response under alternative risk to fully account for these risk return tradeoffs.

5. Will there likely be a long term decline in average returns to farming if risk is reduced?

If risk to dairying is successfully reduced, it should result in a long term decline in average returns to dairying, especially if the resulting level of average returns would be too high relative to other investment opportunities of similar risk.

MILC

1. If the MILC trigger was changed to an all milk income/feed costs margin, what effect will that have on payments to farmers?

The choice of the exact trigger for any of these programs is very important. Currently, the MILC trigger is adjusted by 45 percent of the percentage that the USDA reported dairy ration value exceeds $7.35 per hundredweight. The 45 percent factor is important to the effect the dairy ration

value has on the MILC trigger. Although the primary origin of the 45 percent factor may have been selected to limit government outlays on the MILC program, it is instructive to delve further into its effect. Feed costs today represent about 60 percent of total milk variable production costs. If the dairy ration value was a perfect measure of US feed costs, then using a percentage adjustment greater than 60 percent in the MILC trigger adjustment would have made dairy producers better off once the dairy ration value exceeded $7.35 per hundredweight, whereas the current 45 percent does not completely offset the increase in feed costs.

Important in the current MILC calculation is the dairy ration value. The USDA reported dairy ration value is derived by using corn, soybean and alfalfa prices. The use of the soybean price may or may not be a good proxy for the soybean meal or other protein meals used in milk production. At times when the vegetable oil market is the primary driver of oilseed prices, using the soybean price could prove to be a poor proxy for the cost of protein meal.

The use of a ratio of milk income to feed costs can yield a different effect for milk producers than milk income less feed costs. Suppose the milk price is $12 per hundredweight and feed costs were $7.20 per hundredweight (60 percent of the milk price). That would give us a ratio of milk income to feed costs of 1.67 while the milk income less feed costs would tally $4.80 per hundredweight. Now suppose the milk price is $18 per hundredweight and feed costs are $10.80 per hundredweight (60 percent of the milk price). The ratio would remain at 1.67 while the milk income less feed costs would rise to $7.20 per hundredweight. A trigger using the difference of milk income to feed costs could yield a different result than a ratio of milk income to feed costs.

2. How low would the cap have to go with MILC where the payments would be too small to have any effect?

First, any additional dollars that flow to the industry are likely to cause some sort of additional milk supply. Although some in the industry have often felt the effects of the current MILC program have been relatively large, FAPRI analysis has shown repeatedly that on average the class III price has averaged only about $0.25 per hundredweight lower as a result of the program. While in periods of extremely low milk prices the effect has been larger, at other times during high milk prices the effect has been zero.

3. Any data on how many farms are still in business because of MILC payments?

It is difficult to isolate the effects the MILC program has had on farms remaining in business because there are many other factors that are also changing over the period. Many of the comparisons made by looking at the change in dairy farm loss before and after the enactment of MILC are in many cases not good estimates of the effects of MILC. The path of adjustment in farms numbers may be different, but in the long run the number of farms will likely be similar with or without MILC.