Ceres Dairy Risk Management

Farm Needs
- Control costs
- Manage milk prices
- Provide simple & straightforward strategies
- Measurable results

Processor Needs
- High-quality reliable reporting
- Focused reporting that connects the dots
- Timely information
- Full service support

Consumer Products Needs
- Straightforward reports
- Content that answers why markets move
- Seamless integration
- Working to keep costs predictable & manageable
Agenda

- Understanding your milk check & returns
- So why do I need risk management?
- Mid-point check in & lunch
- What are the tools available to dairy farms?
- Risk management approaches
- Let’s give it a try
- Wrapping it up
Milk Checks
Understanding the milk check & return objectives
The Influence of Price Discovery

The CME Spot Price.
Provides price discovery and a weekly average that can but used as a contract reference price, along with NDPSR, fixed prices and international references.

The Reference Price.
There are a variety of ways to price dairy products that include reference, basis, look back period.

Sales for defined products where the price is established within 30 days of manufacturer are included in the reporting.

Convergence.
By design, the markets will converge allowing hedges to settle within expectations – adjusted for basis.

Futures & Options.
The futures and options will, at times drive the spot markets, or price basis to spot. These contracts will settle to NDPSR.
Understanding cheese markets
...helps explain milk checks

2017 U.S. Milk Solids Use

**Cheese/Whey**
Each year more milk moves to cheese and whey processing with expectations in 2018 or 2019 half of the milk in the United States will move to this product category.

**Fluid milk**
Fluid milk remains the second largest single category with cheese edging out this category. In recent years, fluid milk has received challenges from alternative beverages that continues to reduce consumption.

**Butter/Powder**
This category has received considerable interest in recent years with the significantly larger butter demand and strong U.S. exports.

**Cultured**
While cultured products received a boost after the advent of Greek yogurt the category has started to slow in recent years.

- Cheese/Whey: 48%
- Fluid milk: 20%
- Butter/Powder: 18%
- Cultured: 4%
- Other: 5%
Butter packs a punch

- Between 2000 and 2013 butterfat contributed, on average $5.57/cwt. to the Class III milk price or 39% of the value.
- From 2014 to present butterfat has accounted for 52% of the Class III milk price contributing on average $8.49/cwt.
- This is no longer a U.S. phenomenon – European and Oceania dairy producers are seeing the same thing.
- But, for cheese makers the high cost of butterfat is challenging and can result in reductions to the Class III milk price as butterfat in cheese does not hold the same value as butterfat in butter. As cheese, butterfat was worth $6.97/cwt. between 2014 and 2018 – a $1.52/cwt. difference.

The market proxy:
- Cheese = Protein (41%)
- Butter = Butterfat (52%)
- Sweet whey powder = Other Solids (7%)

Source: AMS

Class III Milk Price

Class III Milk Price

• Protein
• Butterfat
• Other solids

$ per hundredweight

$0
$5
$10
$15
$20
$25

It’s biology –
only one-third of milk solids are butterfat

HOLSTEIN
Butterfat 29%
Solids nonfat 71%

JERSEY
Butterfat 34%
Solids nonfat 66%

2015 Components
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<td>Total Solids</td>
<td>12.4%</td>
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Source: ERS Per Capita Dairy Product Consumption, Sept. 2018; Holstein Association USA, Inc.

U.S. Butter vs. Margarine Per Capita Consumption

Source: ERS Per Capita Dairy Product Consumption, Sept. 2018; Holstein Association USA, Inc.
Whey impacts the Class III price

1-cent in whey = 6-cents Class III milk

NDPSR Monthly Whey Price

Class III Price: 2017/18 Whey Values

Source: AMS NDPSR Announced Prices
Understanding Costs at All Levels

Knowing all farm costs are important

- Feed
- Other On-Farm
- Transportation
On farm costs are rising

Other costs (interest, labor, compliance) are higher and cutting into farm returns

- **2015**
  Profitability was mixed this year and tended to favor cheese vs. powder milk as the world struggled with over supply.

- **2016**
  Cheese markets were relatively strong in 2016, but milk powder markets struggled given the amount of product from Europe.

- **2017**
  Milk price recovery in 2017 helped to lift EBITDA throughout the West and Midwest.

Source: Hoard’s Dairymen, Oct. 2018
Feed Costs are on the Rise
Weather, trade and African swine fever are concerns

- On-farm economics are shifting as wet weather, trade and African swine fever are combining to drive market recovery.

- Higher operational costs along with feed prices on the move after a cold and wet winter could keep farm costs higher and appetite for growth limited – at least for now.
#2 Diesel on the Rise

- The U.S. Energy Information Administration #2 Diesel week price is on the rise again. That said, prices this week are 3.5% below the same time last year.

- Higher fuel costs could impact fuel surcharges for raw milk, fluid products and finished products.

- There is some momentum for states in allow for larger tankers to move milk – that could help mitigate rising costs.
What does the federal order regulate?

The federal order system regulates the movement of raw milk from farm to plant and plant to plant as well as fluid transfers between plants. It works to establish a price that processors pay to farms in the marketing area.
Federal Order #5
How the milk price functions

Class IV
Class IV tends to be the lowest price, so this reflects the value of butter and nonfat dry milk.
15%
7%
13%
Class III
Class III represents the value of cheese and whey.
65%
Class I
Since May, the Class I skim price is the average of the advanced Class III and Class IV milk price plus $0.74/cwt.
Class II
The Class II price is based on the Advanced Class IV price plus $0.70/cwt.
So what does this mean?

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**Breaking down income**

*Manage the controllable, minimize everything else*

### Income Statement

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**Out of farm control**

**Markets**

Milk-over-feed is largely market driven and needs to be managed to provide sufficient funds to cover the cost of operation.

**In farm control**

**Quality • Yield • Costs**

Operating costs are primarily within the control of the farm; however, unmanaged milk-over-feed costs can affect these costs.

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[NC & SE Risk Management]
Federal Order #5
Hedging is 61% Class IV – 39% Class III

Class IV
Class IV represents the current month futures.
15%

Class III
Class III represents the current month futures.
46%

Advanced Class III
Advanced prices need use the prior month for hedging – to Hedge July producers would use June Class IV contracts.
32%

Advanced Class IV
Advanced prices need use the prior month for hedging – to Hedge July producers would use June Class IV contracts.
7%
Risk Management
What is it & how does it work? Why do I need it?
Let’s talk about crop yield

There is a lot of uncertainty...

- Soil Moisture
- Temperature
- Precipitation
- Pests
- Timing of all of the above
- Disease

...but that doesn’t stop planting
Dairy risk management is a tough business

Organizational buy-in
There needs to be organizational buy-in throughout the company and within the family. Risk management must be built into decision making and planning efforts.

Discipline is a must
A good risk management program is structured and systematic. That is essential to providing stability in earnings and a counterbalance to market uncertainty.

Intelligent decision making
Risk management is iterative, dynamic and responsive to change. Varying market conditions and changing competitive environment will require modification.

Understand the tools
There is no-cookie cutter approach to managing a company’s risk as the objectives and risk tolerances are different.
Why Do Markets Rely on Price Discovery?

**Purpose of price discovery**

- **Definition #1**
  The process of determining the value of a commodity in the marketplace based on the interaction between buyers and sellers.

- **Definition #2**
  “The overall process, whether explicit or inferred, of setting the spot price.” - Investopedia

- **Definition #3**
  “Price discovery is the mechanism by which competing buyers and sellers determine the price of a security or an asset. Typically, this is done on an exchange.” – The Wall Street Journal
Price is Important, but…

It is just one part of the story; part two is the relationship

- December 2016 new barrel capacity added.
- July 2017 electronic trading begins.

Source: Dairy Market News/ CME Group
The Block-Barrel Spread Widens Out

- Between 2000 – 2016 the spread averaged 3.21¢
- Between 2017 – 2018 the spread averaged 10.12¢
- YTD 2019 – the spread averaged 12.81¢

This reflects a departure from market norms suggesting a change in conditions.

Source: Dairy Market News/ CME Group
What Causes Differences Between Cash & Futures?

- It’s Basis!
- **Basis** = Cash – Futures price
  - It is the risk that futures will not correlate with the underlying cash market.
  - Basis will expand and contract over the life of the hedge.
  - Most traders and hedgers want to know the basis for arbitrage or to understand the risk in their hedge.
  - Typically basis cannot be managed, but it still must be understood.
What drives markets?

- Weather
- Natural Disaster
- International Markets
- Policy
- Supply & Demand

All in varying degrees each year
Stocks reflect the imbalance in the system

Excluding working inventory, if the system is perfectly in balance there would be no stocks. If there is a surplus stocks exceed working inventory. When there is insufficient milk to produce dairy products stocks are depleted.
Unpacking Dairy Supply & Demand

Supply
- On-farm economics
- Stockpiles
- Location
- Production & Imports

Demand
- Food Service
- Exports
- Retail
- Trends
Speculative traders are short
That could have implications if markets increase

- As mentioned last month, market sentiment is shifting as weather takes center stage displacing, for now, escalating trade concerns.

- As speculative traders look to reposition or exit their shorts they could cause markets to rally for a bit before settling back down.

- That could cause a disconnect for “basis” and that could be beneficial for farms.
The pace of slaughter high
...will it continue into the summer?

- As cow slaughter remains elevated some slaughter houses are reporting lack of capacity to process. Markets may be misinterpreting the data.
  - There are anecdotal reports of appointments set weeks in advance.
  - In some instances, operations are particularly choosy about the animals headed to slaughter and have been turning some away.
  - The lack of capacity could keep the pace of slaughter unseasonably high as the summer approaches.
- Cull cow values are increasing.

![Weekly Dairy Cow Slaughter](in 1,000 head)
Dairy cows are cheap
...and getting cheaper at the start of 2019

- Replacement cow values dropped to $1,140/cow this year – the lowest value since 1998.
  - The lowest values were in Virginia $975/cow where farms have been exiting dairying at a quickened pace.
  - Kansas had the highest average value at $1,300/cow. Oregon and Texas were close seconds with values of $1,275.
  - Minnesota: $1,180/cow
  - Wisconsin: $1,125/cow
African swine fever

- African swine fever (ASF) is having mixed impact on markets.
  - Presently ASF is spreading, causing countries to cull more pigs to contain the disease. Estimates are that the world could lose 30-40% of its hog herd this year.
  - That is lifting pork and beef futures.
- Given the global protein shortfall, that event could support higher cheese, NDM and milk prices this year.
- At the same time, ASF is depressing whey powder, lactose and permeate prices.
Trade dispute worsens

- The United States stepped up its pressure on China last week announcing a new round on tariffs by increasing tariffs to 25%, up from 10%, on another $200 billion in goods.
  - Estimates suggest the latest round of tariffs could increase the cost to U.S. households from $490 to $800.
  - That could put a drag on the U.S. economy.
- China retaliated increasing its tariffs and expanding the list of affected products.
  - Dairy had few impacts with lactose moving from 15% to 20% and infant formula moving from 15% to 30%.
  - Pork was not impacted.
- During the first week of May, the European Union announced that agriculture would not be part of any trade negotiations.
  - Senator Chuck Grassley, Iowa-R stated that was a non-starter.
  - As of May 15, the Trump Administration will postpone auto tariffs by up to six months according to CNBC.
- USDA is exploring new rounds of subsidy but that was not well received by farms and unlikely to have much impact for dairy using last year’s payments as a baseline.

[Trade war impact diagram]
Global milk production flat
Milk production remains flat as some recover and other falter

• In February, the major exporting countries and Brazil produced 0.33% more milk than last year.
  • The Southern Hemisphere is headed into the end of season quickly as Australia, and Argentina fall below prior year levels and New Zealand output in February flatlines.
  • Europe broke a five-month losing streak when Eurostat reported February milk output +0.1%

• As milk output falters and demand remains robust price are starting to rise as some become concerned about supplies later this year.
For the first time since December 2013

- For the first time in 63 months, the United States fell below prior year levels in March (excluding February 2017)
  - March milk was down 0.4% compared to 2018. Output totaled 18.9 billion pounds.
  - Texas and California led production gains.
  - Losses from Pennsylvania more than offset increases from Texas.

- Slaughter rates are elevated with year-to-date culling outpacing last year by 5.1%
The February 2019 milk-over-feed forecast margin (DMC) averaged $8.22/cwt.
- That compares to $6.88/cwt. last year.
- Substantially higher milk prices are causing the year-over-year (YOY) change on modestly higher feed costs.

February was higher than January also by 23¢.

While margins are showing signs of improvement and forecasts are positive it could still be challenging for dairies after months of lower than expected margins.
Cheese output below year ago
Total cheese production dropped below 2018 in March

- Cheese production was 1.1 billion pounds in March, 0.7% less than the prior year.
  - U.S. Cheddar cheese production was 3.5% less than the prior year.
  - Mozzarella production increased 1.8%. That number could increase as Agropur’s plant expansion comes on line.
  - Hard Italian cheese production fell 7.8% below last year.

- Domestic U.S. cheese consumption was below the prior year in March.
  - In March, commercial disappearance was -1.9% vs. the prior year.
  - The year-over-year disparity could be related to the late Easter-holiday in 2019 compared to last year.

- Cheddar cheese production continues to struggle and that could be the reason behind the recent increase in price. That could suggest more price hikes later in the year.
Stocks are flat
...seasonal trends are absent from cheese stock data

- In 2017 and 2018 the difference between January and March stocks was 46 to 70 million pounds difference – this year it is a scan 12 million pounds reflecting the truly flat quality of current data.

- Cheese stocks should be headed toward their season peak in June or July, but at the current pace there may be very little seasonal build – that would be consistent with Midwest milk supplies this year.

- In March, cheese stocks totaled 1.38 billion pounds up 4.3% vs. the prior year.
U.S. cheese exports strong

U.S. cheese exports are a bright spot despite trade disputes

• In March, U.S. cheese exports totaled nearly 82 million pounds, 9.9% more than last year and the highest monthly total on record.
  • That is a strong export number given 2018 was a pre-tariff period.
  • Higher volumes to South Korea and Japan offset lower volumes to Mexico and Australia. U.S. exporters also made headway into the Middle East in March.

• U.S. cheese imports totaled 31 million pounds, up 9.4% compared to the prior year.

• This week the Trump Administration pushed off the tariffs on automobiles.
  • Given the market response to the deteriorating trade relationship with China – it could make the likelihood of tariffs on European products less likely at this time.
  • Hearings are underway this week.
Butter lower than last year

Production remains low as other products command cream

- U.S. butter production totaled 174.8 million pounds in March, down 4% vs. prior year.
  - Butter output from California and Pennsylvania remains lower than 2018. Land O’Lakes is one of the largest butter processors in both states. Given the nature of the business that could put them in the hunt for bulk butter for micro-fixing.
  - Anecdotal reports suggest there is a lot of competition for butterfat in milk, high-fat products and cheese leaving butter plants to remain less than full or paying up for cream.
  - Hard ice cream production increased in March.
- EU January butter production totaled 390 million pounds, +1.8% vs. the prior year.
Butter build on track

Stocks are similar but lower than the past two years

- U.S. butter stocks are rising and expected to near the peak in the next month or so. Stocks totaled 270.2 million pounds, down 1.4% compared to the prior year.

- The days on hand, in terms of production, totaled 48 days at the end of March – the lowest since 2010, but marginally higher than 2017. The Easter holiday could be creating some comparison issues.

- That same calculation based on commercial disappearance was 54.5 days for the end of March, the highest since 2010.
Cream multipliers on the rise
Post-Easter and in the flush multipliers are higher

- With Easter demand behind markets and in the midst of the spring flush, cream multipliers throughout the country are rising.
  - That could be an indication of potentially stronger markets on the horizon.
  - Traditionally, this is a time that butter plants busy themselves with the final push before the depletion season begins in the summer.
  - This year butter plants are faced with cream demand on several fronts and ice cream season starting up at a faster pace this year.
- That could portend higher cream multipliers this summer to entice West Coast cream to the Midwest.
China’s stocks replenished
Still, the lowest stocks for March over the last 3 years

• China’s stocks are replenished headed into the spring.
• Typically these stocks provide a buffer as New Zealand head into the end of its season.
• Still, these are the lowest for this time of year in sometime – that could keep China buying this summer at a higher pace.
Key take-away

• The block-barrel spread remains near historic levels and that could buoy Class III prices.
• Milk output still flat – with robust demand that could drive higher prices later in the year.
• U.S trade remains day-to-day and tenuous at best – that could impact dairy and feed markets this summer.
• Stronger U.S. dollar creates a challenge for exporters and higher milk prices.
• Butter markets could surprise later this year if supplies remain limited.
Items to watch

- Global milk production that remains flat
- CME block-barrel spread at “normal” levels
- Signs of a U.S. recession.
- Trade wars expanding or impacting economy
- Strong U.S. dollar
- Stronger U.S. commercial disappearance
- Rising oil prices – positive for export market
- Sharply higher prices could slow demand
- Poor on-farm margins driving exit from business
- Reduced stockpiles of dairy products
Class III & IV milk

Class III Milk Forecast

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USD$ per cwt

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CME Cheese

Cheddar Blocks Forecast

Cheddar Barrels Forecast

(USD$ per pound)
Butter and NDM

Butter Forecast

Non-fat Dry Milk Forecast

USD$ per pound

Markets were similar last year

Source: CME Group
Why do you need risk management?

• Ups and downs are fun on a roller coaster, not your business.

• Risk management makes your business more manageable and puts control over returns back in the hands of the farm.

• Unmanaged margins can negatively impact controllable costs.
Why use risk management?

**Fixed Prices**
With fixed pricing, the milk volume and price are all established on the same day

**Risk Management**
Using risk management separates determination of price and the physical delivery

**Sales**
This allows a farm use the best combination of pricing factors to establish a manageable margin
The Tools

What are the various ways to manage price risk?
What tools are available to farms?

**DAIRY MARGIN COVERAGE**
Revamped Dairy Margin Protection Program. Minimum coverage $100. For less than 5 million pounds per year, premiums have been reduced and for more than 5 million the new program provides tiers.

**DAIRY RP**
New crop insurance program that started Oct. 2018. The program functions on a quarterly basis, fees assessed after the fact, protection based on components or milk.

**FUTURES, OPTIONS & FORWARDS**
Dairy Margin Coverage (DMC)

- Eligibility:
  - Produce and commercially market milk from cows located in the United States; and
  - Provide proof of milk production at the time of registration.

- Dairy may have more than one owner;

- Owner must share in risk of producing milk and make contributions to the operations;

- Operations must comply with the highly erodible land and wetland conservation provisions;

- Producers may have more than one dairy, but they must be separate organizations.
DMC pays off for Q1

DMC 2019

DMC Margin
In Q1 2019 the DMC margin was below the $9.50 insurance levels

DMC Payment
Estimated payment of $23,000 in Q1 19 for an 8,000,000 per year farm less a premium cost of $5,725
Dairy RP
Program is promising, but needs some review

• Dairy RP is a revenue program – that means it is a function of volume and price.
  • The volume is based on the “pool” comparing the forecasted yield to actual output-per-cow.
  • Settlements are based on estimates.
  • There are two pricing alternatives – components and class.
• The U.S. government subsidies some of the premium.
• Coverage is quarterly.
• Premiums are not deducted until the settlement.
• Price should match milk check – not just the highest price.

<table>
<thead>
<tr>
<th>Coverage Level %</th>
<th>80</th>
<th>85</th>
<th>90</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium Subsidy %</td>
<td>55</td>
<td>49</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>
Dairy RP Example

<table>
<thead>
<tr>
<th>Producer Declarations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared covered milk production</td>
<td>1,500,000</td>
</tr>
<tr>
<td>State</td>
<td>N Carolina</td>
</tr>
<tr>
<td>Declared Share</td>
<td>100%</td>
</tr>
<tr>
<td>Expected milk production per cow</td>
<td>5,162</td>
</tr>
<tr>
<td>Coverage level</td>
<td>0.95</td>
</tr>
<tr>
<td>Protection Factor</td>
<td>1.00</td>
</tr>
<tr>
<td>Subsidy rate</td>
<td>44%</td>
</tr>
<tr>
<td>Declared class price weighting factor</td>
<td>0.4</td>
</tr>
<tr>
<td>Expected class III milk price</td>
<td>$16.26</td>
</tr>
<tr>
<td>Expected class IV milk price</td>
<td>$17.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Premium Calculation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Liability/Revenue Guarantee</td>
<td>$239,828</td>
</tr>
<tr>
<td>Premium Rate</td>
<td>$0.0161</td>
</tr>
<tr>
<td>Gross Premium</td>
<td>$2,868.00</td>
</tr>
<tr>
<td>Subsidy</td>
<td>$1,701.92</td>
</tr>
<tr>
<td>Producer Premium</td>
<td>$2,166.08</td>
</tr>
</tbody>
</table>
Dairy RP Example – Higher Production Lower Price

### Producer Declarations
- **Declared covered milk production**: 1,500,000
- **State**: N Carolina
- **Declared Share**: 100%
- **Expected milk production per cow**: 5,162
- **Coverage level**: 0.95
- **Protection Factor**: 1.00
- **Subsidy rate**: 44%
- **Declared class price weighting factor**: 0.4
- **expected class III milk price**: $16.26
- **expected class IV milk price**: $17.21
- **Actual class III milk price**: $15.45
- **Actual class IV milk price**: $16.00
- **Actual milk production per cow**: 5,193
- **Milk Marketings**: 1,500,000

### Indemnity Calculation
- **Covered Milk Production**: 1,500,000
- **Final class pricing milk revenue**: $252,450
- **Final revenue guarantee**: $239,828
- **Yield adjustment factor**: 1.006
- **Class pricing actual milk revenue**: $238,102
- **Indemnity on class pricing policy**: $1,725

### Settlement with Higher Output / Lower Price

- **Jan**: $15.65, **Feb**: $15.70, **Mar**: $15.75
- **Output per cow**: 5,000, 5,050, 5,100, 5,150, 5,200, 5,250
- **US$/cwt.**: $15.60, $15.65, $15.70, $15.75, $15.80, $15.85, $15.90, $15.95, $16.00, $16.05

The chart shows the estimated and actual output per cow for each month, with the actual prices and revenue guarantees compared to the estimated prices and indemnity on class pricing policy.
Dairy RP Example – Lower Production Slightly Lower Price

### Producer Declarations

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared covered milk production</td>
<td>1,500,000</td>
</tr>
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</tr>
<tr>
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<td>$ 15.45</td>
</tr>
<tr>
<td>Actual class IV milk price</td>
<td>$ 16.00</td>
</tr>
<tr>
<td>Actual milk production per cow</td>
<td>5,105</td>
</tr>
<tr>
<td>Milk Marketings</td>
<td>1,500,000</td>
</tr>
</tbody>
</table>

### Indemnity Calculation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Covered Milk Production</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Final class pricing milk revenue</td>
<td>$ 252,450</td>
</tr>
<tr>
<td>Final revenue guarantee</td>
<td>$ 239,828</td>
</tr>
<tr>
<td>Yield adjustment factor</td>
<td>0.988957768</td>
</tr>
<tr>
<td>Class pricing actual milk revenue</td>
<td>$ 234,069</td>
</tr>
<tr>
<td>Indemnity on class pricing policy</td>
<td>$ 5,759</td>
</tr>
</tbody>
</table>

### Settlement with Lower Output / Lower Price

```
<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output per cow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$16.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.75</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$15.70</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$15.65</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

- **Blue**: Estimate
- **Orange**: Actual
- **Gray**: Est. Price
- **Green**: Est. Actual
### Dairy RP Example – Lower Production Much Lower Price

#### Producer Declarations

<table>
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<tr>
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</table>

#### Indemnity Calculation

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<tr>
<td>Final revenue guarantee</td>
<td>$239,828</td>
</tr>
<tr>
<td>Yield adjustment factor</td>
<td>0.988957768</td>
</tr>
<tr>
<td>Class pricing actual milk revenue</td>
<td>$228,449</td>
</tr>
<tr>
<td>Indemnity on class pricing policy</td>
<td>$11,378</td>
</tr>
</tbody>
</table>

#### Settlement with Lower Output / Lower Price

<table>
<thead>
<tr>
<th>Output per cow</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USD/cwt.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$15.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$16.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$16.10</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>$16.20</td>
<td></td>
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<tr>
<td>$16.30</td>
<td></td>
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<tr>
<td>$16.40</td>
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<td></td>
</tr>
<tr>
<td>$16.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$16.60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graph:**
- **Estimate**
- **Actual**
- **Est. Price**
- **Est. Actual**
## The Tools

<table>
<thead>
<tr>
<th>Description</th>
<th>Fixed Price</th>
<th>Futures</th>
<th>Options</th>
<th>Swaps (OTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counterparty</strong></td>
<td>Handler provides a fixed price contract for a firm volume, price and time.</td>
<td>A contract obligating the parties to take or to make delivery of a commodity on a specific date in the future.</td>
<td>A right to take (call) or make (put) delivery of a commodity on a specific date in the future.</td>
<td>A contract obligating the parties to take or to make delivery of a commodity on a specific date in the future – all contracts are cash settled.</td>
</tr>
<tr>
<td><strong>Terms</strong></td>
<td>Coop or Processor – default pricing</td>
<td>Cleared by a regulated exchange.</td>
<td>Cleared by a regulated exchange.</td>
<td>Private companies, banks and brokers</td>
</tr>
<tr>
<td><strong>Collateral Requirements</strong></td>
<td>Goes to delivery, customary terms &amp; conditions apply</td>
<td>All terms of a Futures contract are standardized – prices is the only variable.</td>
<td>All terms of a Futures contract are standardized – prices is the only variable.</td>
<td>Cash settled. All terms are negotiable.</td>
</tr>
<tr>
<td><strong>Fixed Price</strong></td>
<td>Requires initial and maintenance margin. Performance for Futures Contracts is guaranteed by the Clearinghouse.</td>
<td></td>
<td>Requires premium for buyers and initial and maintenance margin for sellers. Performance for Futures Contracts is guaranteed by the Clearinghouse.</td>
<td>Less than market cleared products, but margin could apply.</td>
</tr>
</tbody>
</table>
Which Tool? It’s a trade off.
The Approach

One size does not fit all for risk management
Risk Management 101

TRY

SUCCESS

TRY AGAIN

FAIL
The Risk Management Process

Risk Management Overview

Sales Process

Risk Management

Sales & Operations

Selling Requirements

Establish a relationship directly with a processor and cooperative based on price & fees.

Establish budget targets for inputs

Work with farm to review markets to develop comprehensive budget targets.

Engage in hedge to lock in costs

Use hedging and risk management to lock-in costs at levels that will support budget.

Create a milk pricing strategy

Look to various milk pricing alternatives – fixed, spot, min/max to determine the optimum combination for pricing targets.

Produce milk & crops

Work on quality, yield and cost management to drive returns at the farm level.

Sell Milk

Sell milk to cooperative or processor.

NC & SE Risk Management
Futures, Swaps & Forward Contracts

Futures, swaps and forward contracts have very little costs to an organization to enter and, in most cases, have very little on-going costs.

- **Pros:**
  - Allows a farm to lock-in a fixed product prices
  - Provides 100% protection against negative price moves
  - No upfront or on-going costs
  - No Credit or collateral is required (most of the time)

- **Cons:**
  - These types of contracts do not benefit from favorable market moves resulting in high opportunity costs
  - Introduction of counter-party risk

---

Swaps, Future or Forward

Regardless of where the CME Class III market trades during the settlement period, the contracted price will be the same.

<table>
<thead>
<tr>
<th>Month</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>$17.00</td>
</tr>
<tr>
<td>Feb</td>
<td>$16.75</td>
</tr>
<tr>
<td>Mar</td>
<td>$16.50</td>
</tr>
<tr>
<td>Apr</td>
<td>$16.25</td>
</tr>
<tr>
<td>May</td>
<td>$16.00</td>
</tr>
</tbody>
</table>

NC & SE Risk Management
Purchased Options Contracts

Purchased put options provide the right, but not the obligation, to sell milk at a specified price (strike).

- **Pros:**
  - Allows a farm to set a minimum price for products while fully-participating in lower markets
  - Provides 100% protection against negative price moves below the strike price
  - No on-going costs
  - Limited counter-party risk

- **Cons:**
  - Cost of options can be costly and must be considered as a cost of the hedge
  - Earnings are still affected by market conditions as would not be locked into a milk price

Paying a premium for full protection from prices falling below $16.50/cwt. but participates in all markets above $16.50.
Zero-Premium Options Collars

Zero-premium collars provide protection against adverse moves in the dairy markets while allowing for some downside participation.

• **Pros:**
  - Allows a farm to set a minimum price for milk while participating in higher markets up to a predetermined level.
  - There is considerable flexibility in determining the range between protection and participation.
  - Provides 100% protection against negative price moves above the protection level.
  - Limited counter-party risk.
  - There are no upfront costs.

• **Cons:**
  - Despite no upfront costs, similar to futures contracts a short option contract may incur negative maintenance margin during an counter move to the position.
  - Earnings are still affected by market conditions but only within the participation / protection level range.
It’s not easy but it is worth it

Trading in the Crystal Ball for tools, organizational buy-in, consistency & discipline is the key to a successful risk management program.
Let’s give it a try

Where to go and what to do
Hedge worksheet

Milk per month 637,500
Butterfat test 3.70%

<table>
<thead>
<tr>
<th>Milk Composition</th>
<th>%</th>
<th>Pounds/mo</th>
<th>To hedge</th>
<th>Futures Mo.</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Class III</td>
<td>32%</td>
<td>204,000</td>
<td>200,000</td>
<td>$ 16.04</td>
<td>$ 16.37</td>
<td>$ 16.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Class IV</td>
<td>46%</td>
<td>293,250</td>
<td>400,000</td>
<td>$ 16.95</td>
<td>$ 17.10</td>
<td>$ 17.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class III</td>
<td>7%</td>
<td>44,625</td>
<td>-</td>
<td>$ 16.37</td>
<td>$ 16.66</td>
<td>$ 16.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class IV</td>
<td>15%</td>
<td>95,625</td>
<td>-</td>
<td>$ 17.10</td>
<td>$ 17.30</td>
<td>$ 17.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butterfat</td>
<td></td>
<td></td>
<td></td>
<td>$ 2.70</td>
<td>$ 2.72</td>
<td>$ 2.74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Wt. avg               | $ 16.64 | $ 16.87  | $ 17.10 |
| Class I Differential  | $ 3.27  | $ 3.27   | $ 3.27  |
| % Class I             | 65%     | 65%      | 65%    |
| Est. Differential     | $ 2.13  | $ 2.13   | $ 2.13  |
| Est. Pay price        | $ 18.77 | $ 18.99  | $ 19.23 |
| Plus Bfat adjustment  | $ 0.54  | $ 0.54   | $ 0.55  |
| (Less) Deductions     | (2.75)  | (2.75)   | (2.75)  |
| Net milk check        | $ 16.56 | $ 16.79  | $ 17.03 |
## Settlement

<table>
<thead>
<tr>
<th>Futures Settlement</th>
<th>Contract</th>
<th>Close</th>
<th>Gain/(Loss)</th>
<th>Ext. Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class III</td>
<td>$ 16.04</td>
<td>$ 16.25</td>
<td>$ (0.21)</td>
<td>$ (420)</td>
</tr>
<tr>
<td>Class IV</td>
<td>$ 16.95</td>
<td>$ 17.15</td>
<td>$ (0.20)</td>
<td>$ (800)</td>
</tr>
</tbody>
</table>

Net futures gain/(loss) $ (1,220)

### July

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing Uniform (Blend Price)</td>
<td>$ 18.96</td>
</tr>
<tr>
<td>Futures adjustment</td>
<td>$ (0.20)</td>
</tr>
<tr>
<td>Gross milk price</td>
<td>$ 18.76</td>
</tr>
<tr>
<td>Est. gross milk price</td>
<td>$ 18.77</td>
</tr>
</tbody>
</table>
Challenges

**Market Data/Information**
There is a lot of dairy data – hedging decisions needs to be informed and realistic to be successful.

**Option 01**
Work with consultant, extension or others to get good information.

**Option 02**
Understand depooling – never hedge more than a set percentage.

**Option 03**
Set realistic goals - adjust.

**Option 04**
Adjust the model for seasons and changes in utilization. Models are meant to be updated.

**Depooling**
High markets can be challenging as it presents opportunities for some groups to exit the FMMO for a time – that can change ratios.

**Basis Issues**
This is the toughest of all issues – but good assumptions help.

**Utilization**
Changing milk demand can impact milk production & utilization in a state.
That’s a wrap

Any final questions
Thanks for your Time

Address: PO BOX 2440
SUN VALLEY, ID 83353

Contact Number: 206-216-1918

Email Address: sara@ceresdrm.com