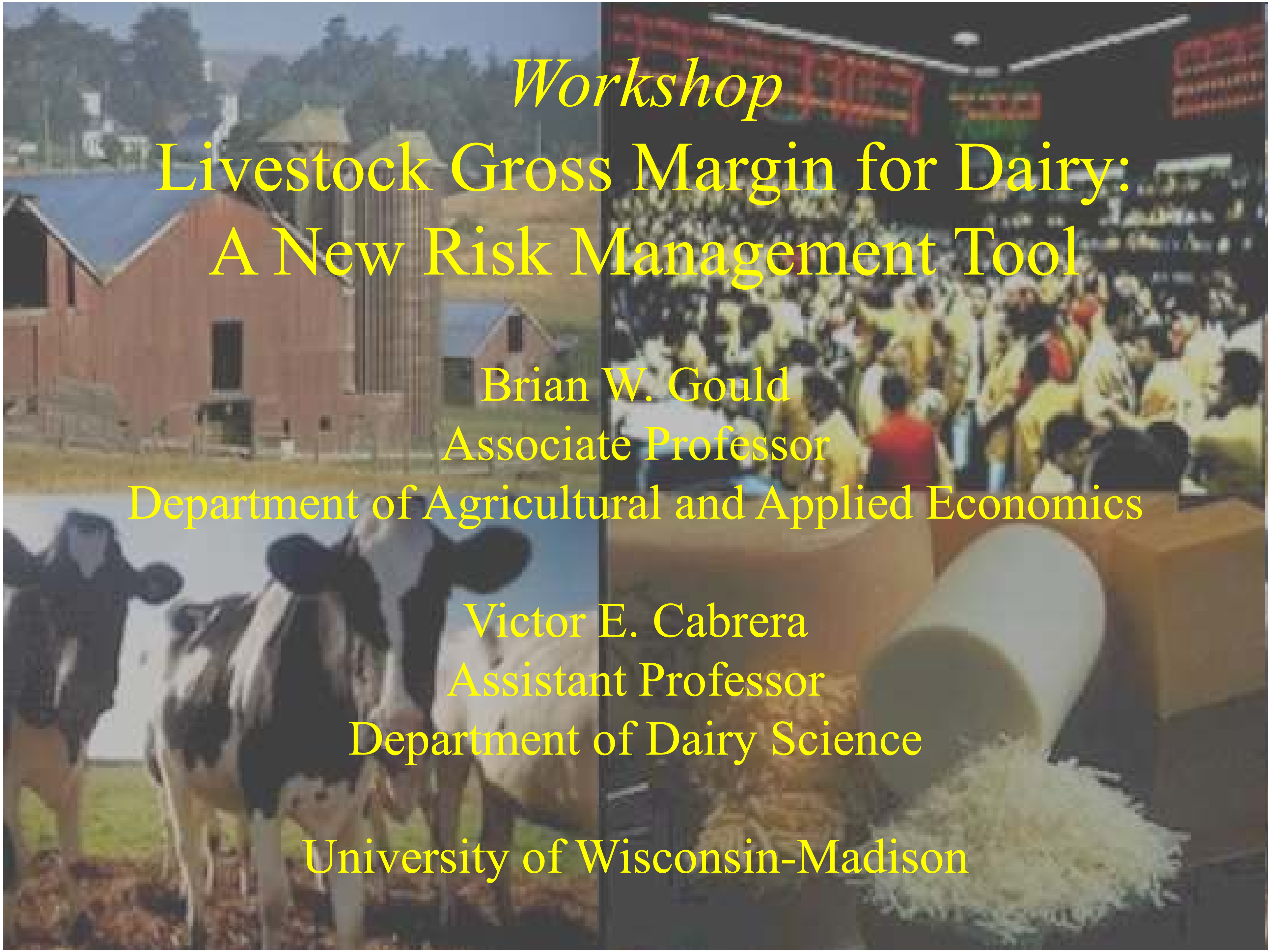

Workshop

Livestock Gross Margin for Dairy: A New Risk Management Tool

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Overview of Our One-Day Workshop

- General Structure of the LGM-Dairy Program
- Detailed Michigan LGM-Dairy Example
- Overview of University of Wisconsin LGM-Dairy Website and Software Systems
- Comparison of LGM-dairy and Bundled options
- Overview of Greenstone's Procedures for Issuing LGM-Dairy Contracts

Today's Presenters

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Introduction to the LGM-Dairy Program

GreenStone LGM-Dairy Workshop
(Section I)

Overview of Workshop Section I

- General structure of the LGM-Dairy program
  - Insurance program objectives
  - Characteristics of LGM-Dairy
  - Factors impacting insurance premiums

- Derivation of expected gross margin (GM) and gross margin guarantee (GMG)
  - Expected milk price and feed costs
  - Actual milk price and feed costs
  - Role of insurance deductible

- How is an indemnity determined

Dairy Price Risk Management

- How can dairy farm operators establish a floor on their dairy-based *Gross Margin Revenue*?
  - Gross Margin = milk revenue – feed costs
  - Class III put option: Establish a floor on milk price (and revenue if you have stable production)
  - Corn and Soybean Meal call options: Establish a feed cost ceiling
    - Problems of contract size and sporadic contracts still exist
    - Feed not usually purchased monthly
  - Bundling both puts and calls could achieve this

Dairy Price Risk Management

- Instead of options, what if one could purchase an insurance policy to guarantee that gross margin?
  - Similar to auto and life insurance you hope you do not have to use it
    - ✓ → Economic conditions are better than thought when insurance was purchased
  - Coverage (+) and deductible (-) impact premium like any other insurance contract

- Such an insurance program exists: *Livestock Gross Margin Insurance for Dairy* (LGM-Dairy)

LGM-Dairy: An Overview

- *LGM-Dairy*
  - Available starting in August 2008
  - Protects against unanticipated declines in *Gross Margins* where
    - ✓ Gross Margin = Milk Revenue – Feed Costs
- Purchased from insurance firms selling Federal crop insurance products
  - Need to be certified to sell *LGM-Dairy*

LGM-Dairy: An Overview

- LGM-Dairy represents an extension of existing LGM-Cattle and LGM-Swine products
  - Provided protection against loss of gross margin
  - Indemnity paid if gross margin guarantee (GMG) greater than actual gross margin (AGM)
    - ✓ GMG = *Expected* Market Value – *Expected* Feed Costs
    - ✓ AGM = *Actual* Market Value – *Actual* Feed Costs
  - Both available for Michigan producers

LGM-Dairy: An Overview

- LGM-Cattle Insurance Policy
  - Uses feeder cattle and corn futures prices to determine expected and actual gross margins
  - 11-month insurance period (10 covered months)
  - Price received/paid by producer not used

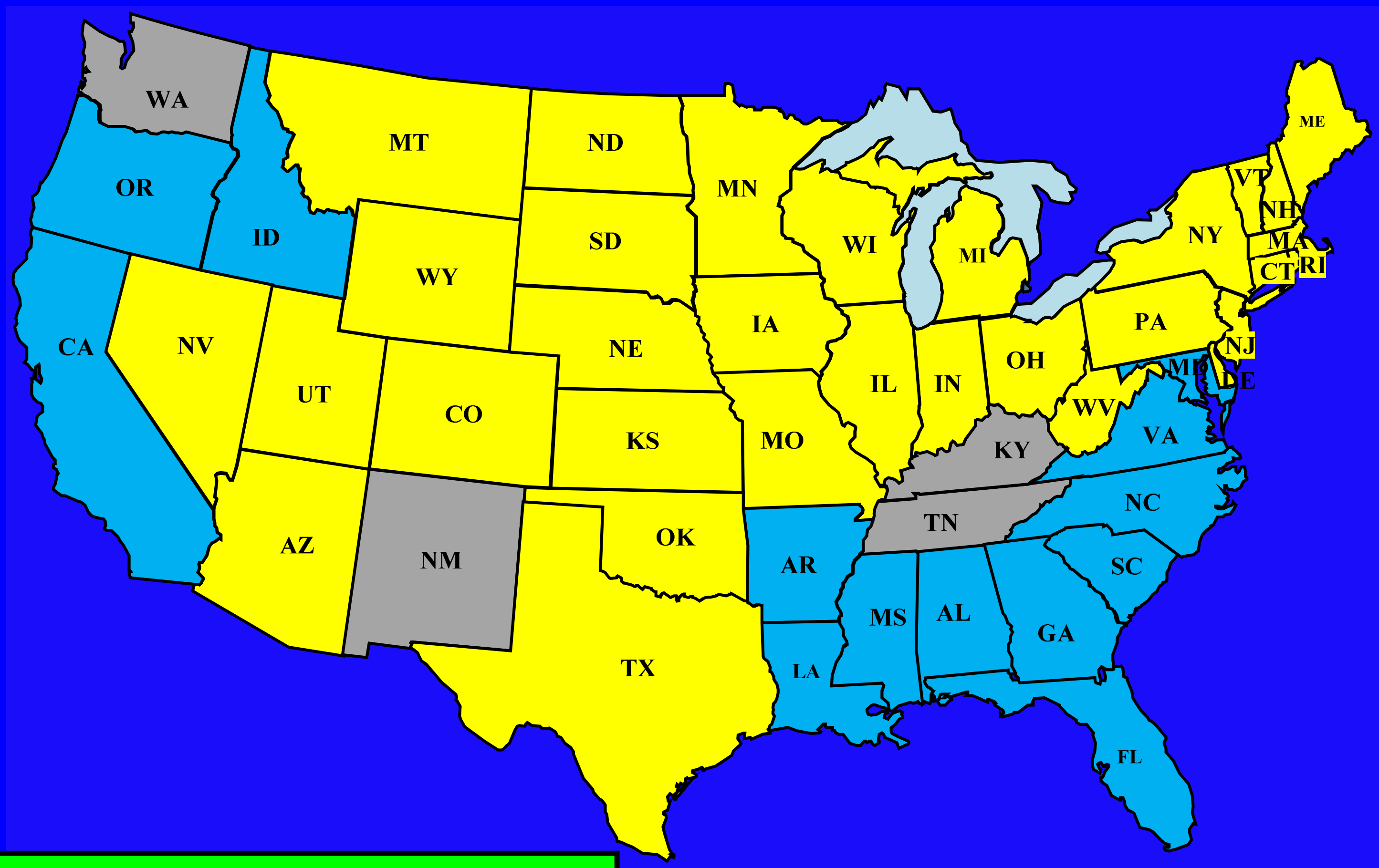
- LGM-Swine Insurance Policy
  - Uses lean hog, corn, and SBM futures prices to determine expected and actual gross margins
  - 6-month insurance period (5 covered months)
  - Prices received/paid by producer not used

LGM-Dairy: An Overview

- Similar to other products *LGM-Dairy* has the following characteristics:
  - Adjusted Class III, corn, and soybean meal futures prices determine expected and actual gross margins
    - ✓ Futures prices adjusted via state and month specific All-Milk and corn basis
    - ✓ Starting with July contract no basis used
  - 11-month insurance period (up to 10 covered months)
  - Prices received/paid by producer not used

LGM-Dairy: An Overview

- Who is eligible to purchase LGM-Dairy?



LGM-Dairy eligible states shown in yellow, future states (July 2009) in gray

LGM-Dairy: An Overview

- *LGM-Dairy* is similar to a bundled option risk management system
  - Sets a milk revenue *floor* and feed cost *ceiling*
    - ✓ Put option limits milk price downside risk
    - ✓ Call option limits feed cost upside risk

- Given similarity to a bundled option
  - If milk price is higher than expected or
  - Feed costs less than expected
  - "Bundled option" obtained via LGM-Dairy may have no value
    - ✓ Owner may not receive an indemnity

LGM-Dairy: An Overview

- Unlike use of Class III, Corn or SBM options individually
  - *LGM-Dairy* is customizable as to amount of milk produced
    - ✓ Upper limit of 240,000 cwt over 10 months
    - ✓ Production of approximately 1,500 dairy cows

LGM-Dairy: An Overview

- In contrast to purchase of Corn and SBM Options
  - Can use LGM-Dairy to insure *any month*
  - No contract size lumpiness

- LGM-Dairy customizable with respect to:
  - Under 1 contract can insure from 1 to 10 months
    - ✓ This has been a major point of confusion
  - % of monthly gross margins (production) covered
  - Can stack multiple LGM-Dairy Contracts
    - ✓ Cannot exceed certified production capacity

LGM-Dairy: Coverage Calendar

- Example of one possible insurance strategy
  - Purchase insurance in May

Possible Production Months Covered

May '09	Jun '09	Jul '09	Aug '09	Sep '09	Oct '09	Nov '09	Dec '09	Jan '10	Feb '10	Mar '10	Apr '10
		1	2	3	4	5	6	7	8	9	10
Purchase at End of Month	No Cover-age	Insurance Contract Period									
Covered Months		Jul 50%	Aug 25%	Sep 75%				Jan 50%	Feb 90%	Mar 100%	

LGM-Dairy: Coverage Calendar

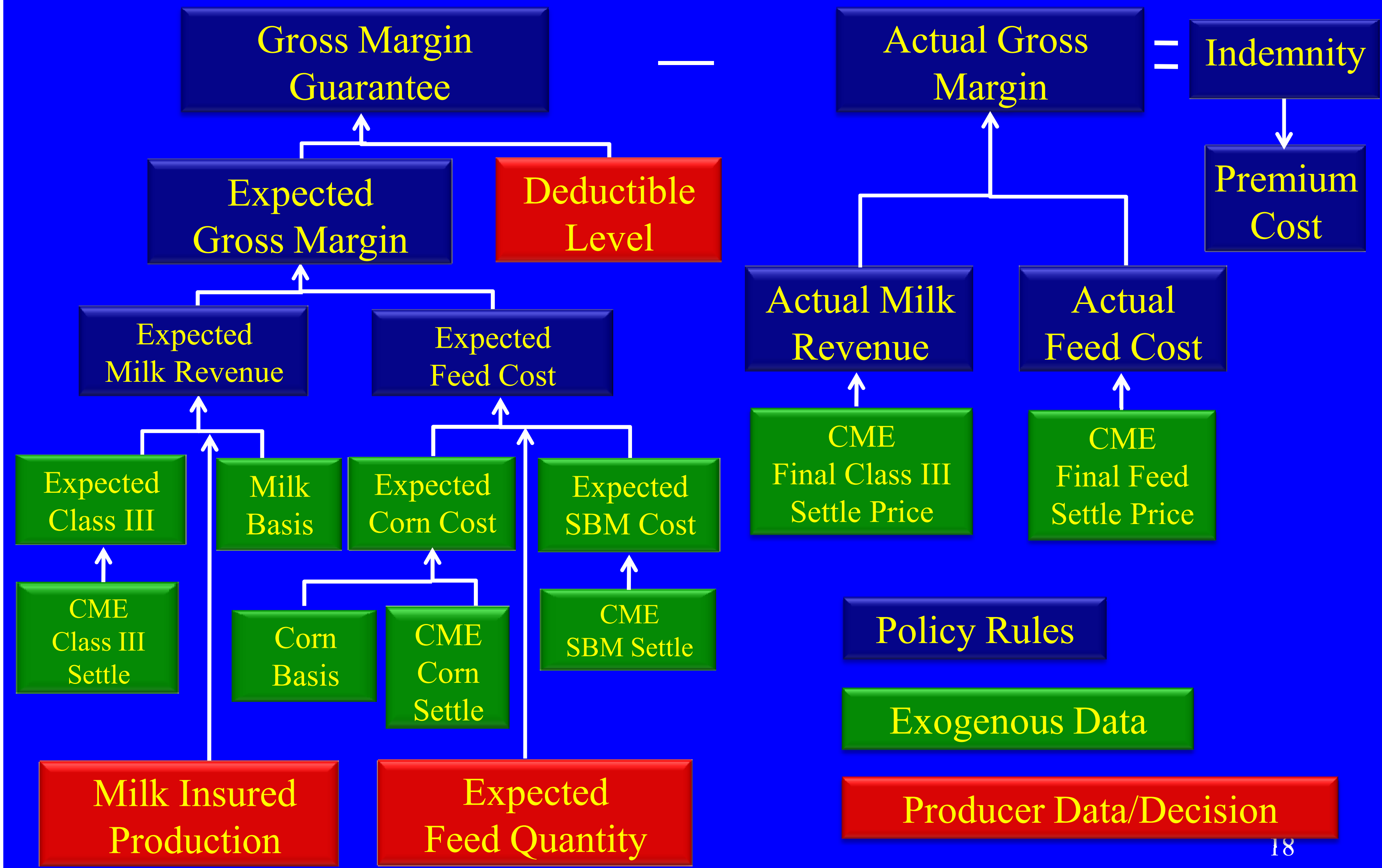
- Another Example of a possible insurance strategy
  - Purchase insurance in June

Possible Production Months Covered

Jun '09	Jul '09	Aug '09	Sep '09	Oct '09	Nov '09	Dec '09	Jan '10	Feb '10	Mar '10	Apr '10	May '10
		1	2	3	4	5	6	7	8	9	10
Purchase at End of Month	No Cover-age	Insurance Contract Period									
Covered Months			Sep 25%								

In May had covered 75% of expected Sept. production

LGM-Dairy: How it Works



LGM-Dairy: When Purchased?

- *LGM-Dairy* purchased during limited time period at the end of each month
  - Currently: Purchased starting at end of 3rd to last business day of a month
    - Starting with *July '09* contract: Purchase day will be last business Friday of the month
  - Currently: Sales period ends at 9:00 AM CDT the following business day
    - Starting with *July '09* contract: Sale period ends at 8:00 PM CDT Saturday night

LGM-Dairy: Definition of Gross Margin

- Definition of Gross Margin
  - Gross Margin = Total Value of *Covered* Milk – Total *Purchased* Feed Costs
    - ✓ Feed does not actually need to be purchased but valued as if purchased
    - ✓ Does not include cost of growing home-grown feed (e.g. labor cost, energy cost, pesticides)
  - Both milk value and feed cost *NOT* based on actual farm prices
    - ✓ Milk price used: State All-Milk Price
    - ✓ Feed prices used: State Corn Price
U.S. Soybean Meal Price

LGM-Dairy: Definition of Gross Margin

- Definition of Gross Margin
  - With the changes in the *July '09* contract offering
    - ✓ Milk price used: Futures-based Class III Price
    - ✓ Feed prices used:

      Futures-based Corn Price

      Futures-based Soybean Meal Price

LGM-Dairy: Expected Gross Margin

- Expected Gross Margin for *entire* contract period determined at sign-up
  - Expected Gross Margin
    - ✓ Sum over all contract months of *Expected* Value of Milk – *Expected* Feed Costs
  - *Expected* Value of Milk in a particular month
    - ✓ That month's *Expected* Milk Price x *Expected* Monthly Production
  - *Expected* Feed Costs in a particular month
    - ✓ That month's *Expected* Feed Price x *Expected* Amount of Feed Used

LGM-Dairy: Expected Gross Margin

- Each month's *Expected Gross Margin* :
  EGM = Expected milk revenue – Expected feed costs

- Total contract *Expected Gross Margin* (EGM)
  - Sum of expected Gross Margins over contract life:
    $EGM = EGM_1 + EGM_2 + EGM_3 + \ldots. + EGM_{10}$

    Monthly expected gross margins

  - Some of the EGM_i's will be 0 if no milk chosen to be covered during that month

LGM-Dairy: Expected Gross Margin

- Expected Gross Margin
  - As long as actual covered production within 75% of expected production no adjustments
  - Producer should be able to justify expected milk production

- Expected Feed Use for each month specified by producer at contract sign-up
  - Feed Use adjusted by the % of each month's production covered by contract

LGM-Dairy: Expected Price Calculation

- Calculation of Expected Prices
  - On purchase day *Expected Prices* are available for the months associated with the insurance contract
  - No problem for Class III
    - ✓ Futures contracts available for all months
  - A problem for Corn and SBM
    - ✓ For some months there are no futures contracts
    - ✓ For missing months average of surrounding futures contracts used in *Expected Price* determination

LGM-Dairy: Expected Price Calculation

- April purchase month example
  - Futures contracts used in *Expected Price* calculation

	LGM Insurance Contract Month									
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Class III	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Corn	May, Jul	Jul	Jul, Sep	Sep	Sep, Dec	Sep, Dec	Dec	Dec, Mar	Dec, Mar	Mar
SBM	May, Jul	Jul	Aug	Sep	Oct	Oct, Dec	Dec	Jan	Jan, Mar	Mar

LGM-Dairy: Expected Revenue Calculation

- With calculation of *Expected Milk Price* for each month one can now calculate *Expected Milk Revenue* (EMR)
  - EMR = (Expected Class III price + Milk Basis) x Expected covered production
  - Milk Basis = All-Milk – Class III futures price
    - ✓ Varies across state and month
  - With changes in the *July '09* contract:
    - ✓ EMR = Expected Class III price x Expected Covered Production

LGM-Dairy: Expected Feed Costs

- With estimation of
  - Corn and SBM equivalents and expected corn/SBM prices
  - Each month's *Expected Feed Costs* (EFC) is
    - ✓ EFC = (Expected corn price + corn basis) x corn equivalents + expected soybean meal price x soybean meal equivalents
  - Corn Basis = Corn price – corn futures price
    - ✓ Varies across state and month
  - With the changes in the *July '09* contract:
    - ✓ EFC = Expected corn price x Corn Eq. + Expected SBM price x SBM Eq.

LGM-Dairy: Feed Equivalents Conversion

- Producer needs to convert *Expected* feed use to Corn and SBM equivalents
  - Corn: Energy source
    SBM: Protein source
  - Program rules specify feed equivalents need to be in very broad ranges:
    - ✓ Corn: 0.00364–0.02912 tons/cwt
      - 0.13 – 1.04 bu/cwt
    - ✓ SBM: 0.000805–0.006425 ton/cwt
      - 1.61 – 12.85 lb/cwt
  - *Each Month's* feeding rates must be within limits

LGM-Dairy: Feed Equivalents Conversion

- Feed conversion example: 140 bu of oats
  - Step 1: Convert feed to tons
    - ✓ 140 bushels of oats x (32 pounds/bushel of oats) X (1 ton/2000 pounds) = *2.24* tons
  - Step 2: Use any acceptable conversion rates for Corn and SBM equivalents
    - ✓ 0.120 tons SBM/ton of oats
    - ✓ 0.779 tons corn/ton of oats
  - Feed Equivalents
    - ✓ *2.24* tons x 0.120 = *0.269* tons SBM equiv.
    - ✓ *2.24* tons x 0.779 = *1.745* tons corn equiv.

LGM-Dairy: Feed Equivalents Conversion

- Any reasonable conversion system acceptable to RMA
  - UW *Understanding Dairy Markets* Website has conversion software available with extensive database of forages and concentrates:
    - ✓ Spreadsheet:

future.aae.wisc.edu/lgm-dairy/excel_files/feed_conversions_2.xls

    - ✓ Web-Based

      http://future.aae.wisc.edu/conversion/grains
  - Based on 1995 Dairy Reference Manual Data (NRAES Publication #NRAES-63)

LGM-Dairy: Feed Equivalents Conversion

- With the changes starting with *July '09* contract:
  - Default feed coefficient values available per cwt of milk produced
    - ✓ 0.5 bushels of corn (0.014 tons)
    - ✓ 4 lbs of soybean meal (0.002 tons)
  - Producers can still input their own feed amounts

LGM-Dairy: Premium Price Calculation

- Above calculations done automatically when accessing RMA Premium Calculator website: *www.rma.usda.gov/tools/premcalc.html*
  - Purchase data only available at the end of EPM

- Wisconsin's LGM-Dairy Premium Calculators
  - Historical and updated the day after purchase date
    http://future.aae.wisc.edu/lgm_dairy.html#2
  - Forward looking system which uses previous days futures/options data to estimate next month's LGM-Dairy premiums
    http://future.aae.wisc.edu/lgm_premium/

LGM-Dairy: Insurance Deductible

- Producer chooses amount of gross margin not covered by contract
  - Referred to as *Insurance Deductible* (DL)
    - ✓ \$/cwt of Gross Margin Not Insured
    - ✓ Similar to your auto insurance deductible
  - Allowed to exclude \$0 - \$1.50/cwt *Gross Margin* from insurance coverage
  - Higher deductible →
    - ✓ Lower premium
    - ✓ You are assuming more risk as deductible portion of gross margin not guaranteed

LGM-Dairy: Premium Determination

- Unlike Federal crop insurance, *No Producer Premium Subsidy*
  - RMA simulates Gross Revenues using data obtained during *EPM*
  - 5,000 simulations of Class III, Corn and SBM prices for 10 insured months
    - ✓ 5,000 simulated payout profiles
    - ✓ Futures settles → mean prices
    - ✓ *At-the-Money* options → price variability
  - Simulated Payout = Max(0, Total GMG – *Simulated* Total Gross Margin)
  - Premiums = *Average* of simulated payouts + 3%

LGM-Dairy: What Impacts Premiums

- What Impacts Total Insurance Premium?
  - Amount of Milk and Feed Insured (+)
  - Proportion of Gross Margin/cwt Not Covered Under LGM-Dairy Contract (–)

Determined by Producer

  - Expected Milk Price (+)
  - Corn and Soybean Meal Prices (–)
  - Expected Price Volatility (+)

Determined by Futures/Options Settle Prices at Sign-Up → Beyond Producer Control

Determining Actual Indemnities

- Actual Prices Determined as Futures Expire
  - Average Futures Settle Prices From 1st, 2nd, and 3rd days *prior to last trading day*

- *Actual Gross Margin* (AGM) = Actual Revenue – Actual Feed Costs
  - Actual Prices: State Average *NOT* Farm Price

- With changes starting with *July '09* contract
  - Actual Prices will be the above average futures settle prices

Determining Actual Indemnities

- LGM-Dairy Actual Indemnity:
  - If *Total* GMG > *Total* AGM → Indemnity paid
    - ✓ *Total* Refers to Sum Over All Months
  - Possible for producer to receive an indemnity if last covered month is prior to the 10 month of the contract

LGM-Dairy: Summary

- LGM-Dairy a flexible insurance program
  - Need not insure all months or all production in covered months
  - Could make sense to overlap contracts

- Analogous to a combined use of Class III Puts and feed price Calls
  - Premiums are sensitive to deductible chosen

- LGM-Dairy Drawbacks
  - Short sign-up window at the end of each month
  - Total contract premium due at sign-up

Contact Information

- Univ. of Wisconsin Dairy Marketing Website:
  http://future.aae.wisc.edu

- Livestock Gross Margin Insurance:
  http://future.aae.wisc.edu/lgm_dairy.html

- To join the LGM-Dairy Mailing List:
  http://future.aae.wisc.edu/lgm_dairy.html#5

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