



Principles of Dairy Herd Management Economic Evaluation

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Outline

120 minutes

Principles of dairy herd management

Economic decision-making

Understanding basic methodologies

Economic models, simulation, optimization



Applications

Practical usage

Demonstration

Existing applications

Dairy farm economic management

Principles of dairy farm management

Making and implementing decisions

Maximum (production)
profit

Decisions at different levels

Different planning horizons
Cow, farm, region



Relies on agricultural economics

Subject to multiple
restrictions

Integrates various disciplines

Biology, physiology,
economics, crops, ...

Dairy farm economic management

Principles of dairy farm management

Farm is unit of concern

>13,000 kg/cow

Country Aire Farms

1,440 ha

850 heifers

Manure management

16 employees

1,800 cows

40-cow carousel parlor

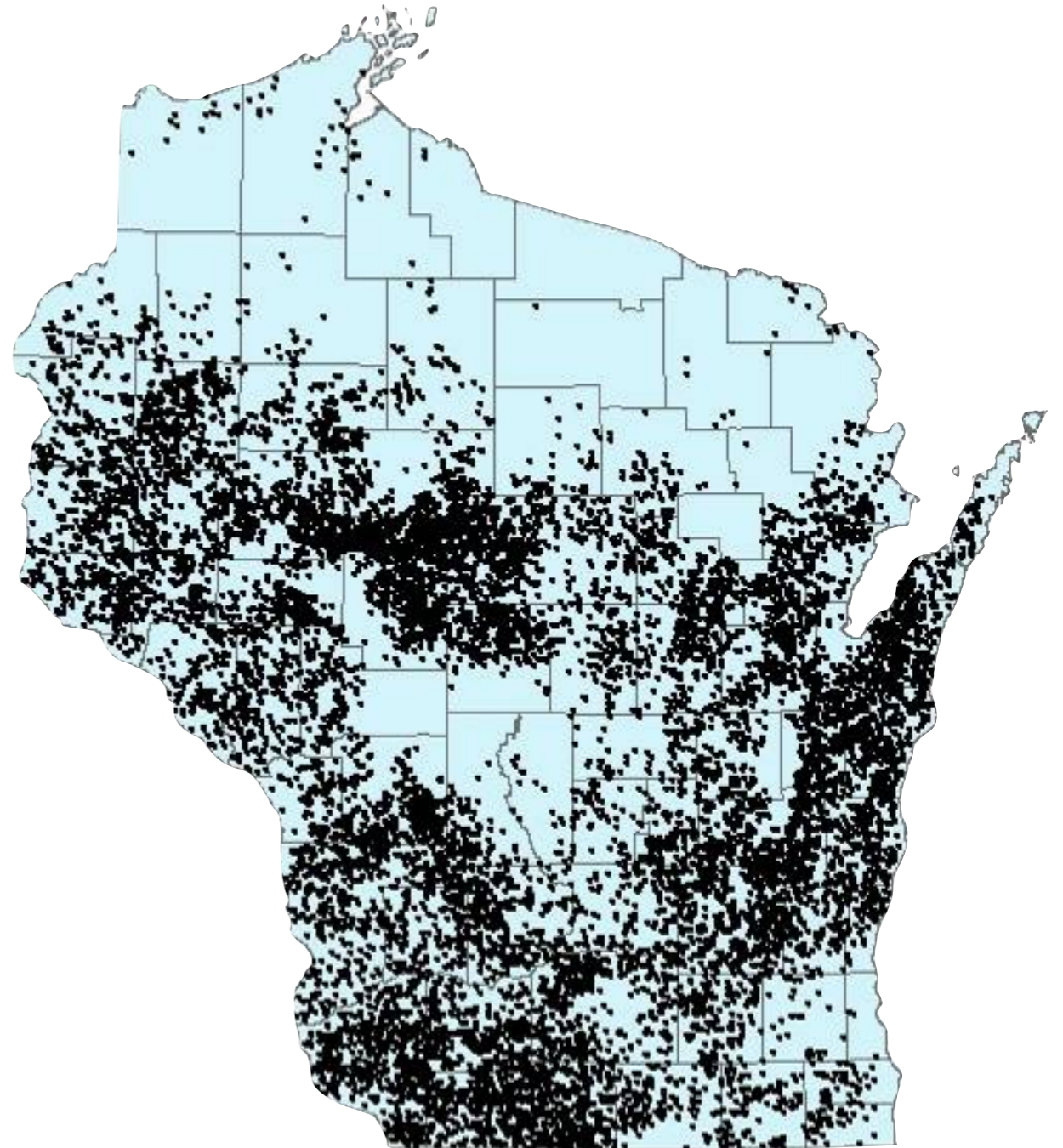


Dairy farm economic management

Principles of dairy farm management

Wisconsin

11,000 dairy farms



Dairy farm economic management

Principles of dairy farm management

Dairy cow

A complex system



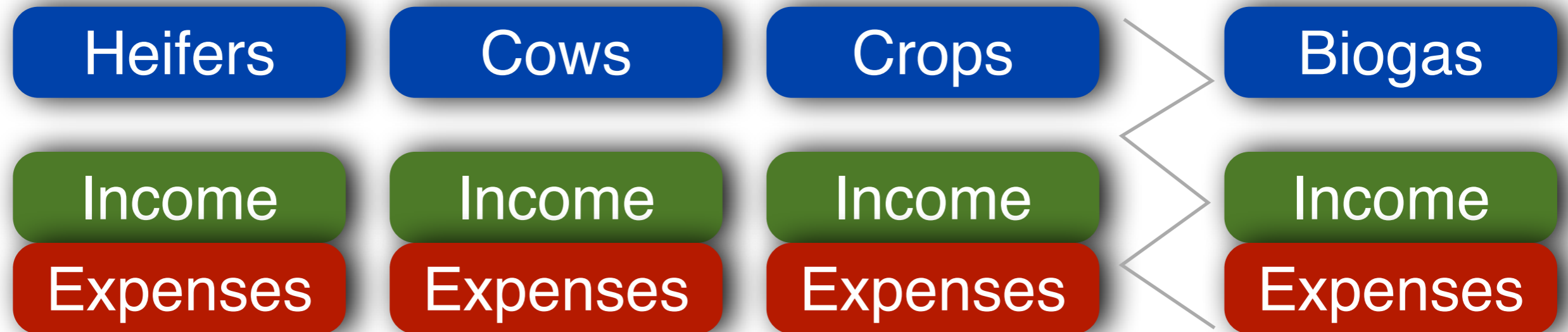
The dairy management cycle

Planning and analyzing outcomes



Enterprise budgets

Enterprises inside a dairy farm



Total gross margin

Total fixed costs

Net profit of a dairy farm

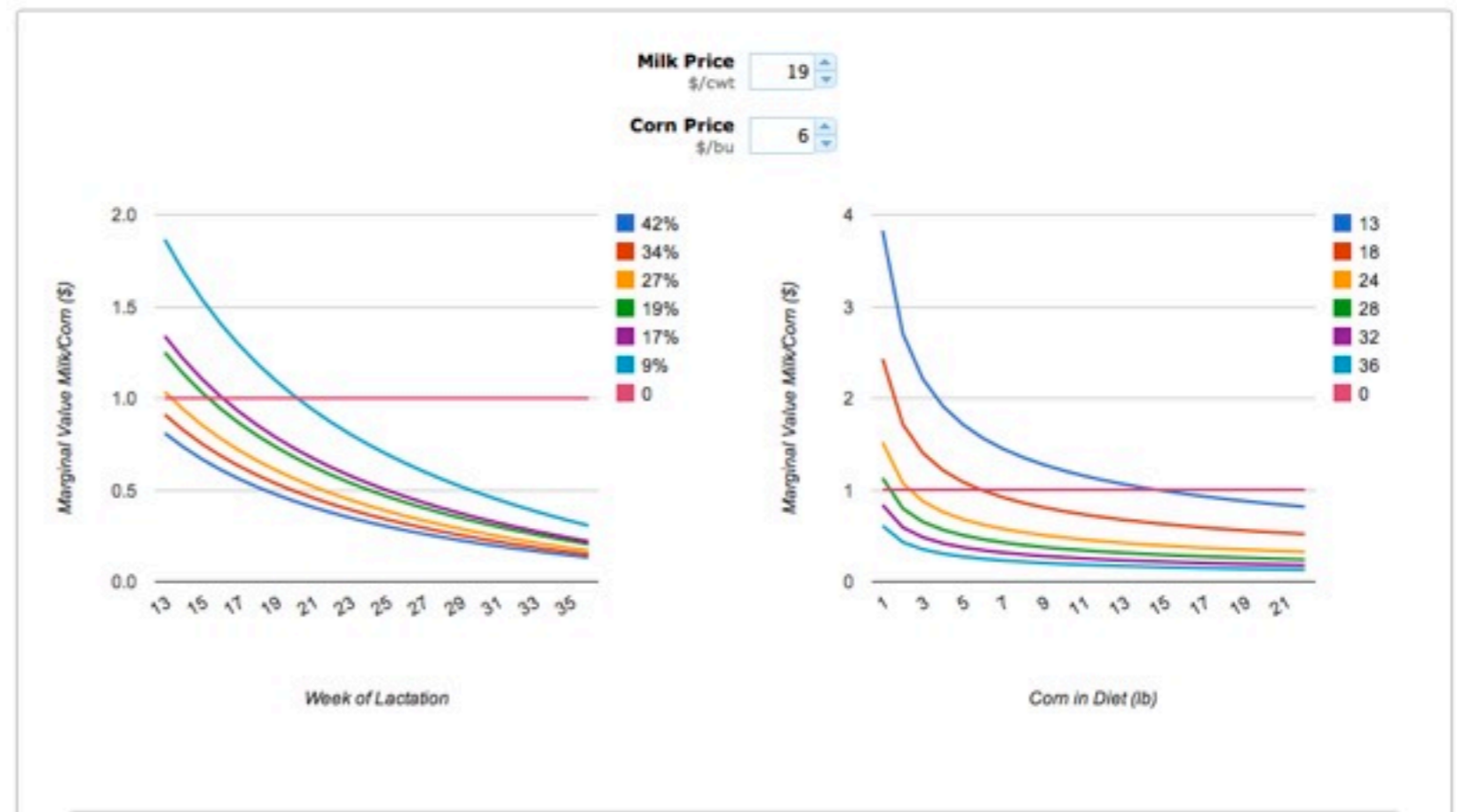
Partial budgeting

Effective when looking at one component

- + Additional Returns
- + Reduced Costs
- Returns Foregone
- Additional Costs



Strategic Alternatives to Corn Grain Feeding
Victor E. Cabrera, Department of Dairy Science



Cost-Benefit analysis

Useful for possible new investments

Costs &
Benefits

Discount
rate (β)



$$PV = FV \div (1 + \beta/100)^n$$

Decision
Criterion

NPV

Net present
value

C/B

Cost-benefit

IRR

Internal rate
of return



Cost-Benefit analysis

An example

| Year | Strategy A | | Strategy B | |
|------|------------|----------|------------|----------|
| | Costs | Benefits | Costs | Benefits |
| 1 | 20 | 0 | 2 | 1 |
| 2 | 10 | 8 | 2 | 3 |
| 3 | 7 | 14 | 4 | 6 |
| 4 | 0 | 23 | 6 | 14 |

| | |
|---------|----|
| β | 5% |
|---------|----|

Present
value

| | |
|-----------|--|
| PV | |
|-----------|--|

| | |
|------------|--|
| NPV | |
| C/B | |
| IRR | |

Decision analysis

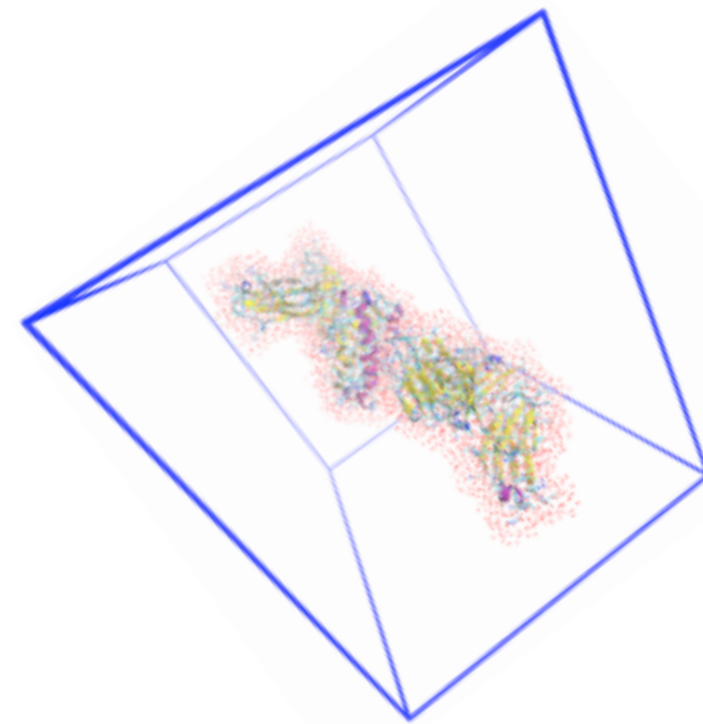
Include uncertainties

Mathematical techniques

Maximum (production)
profit

Payoff matrices

Maximum (production)
profit



Process diagrams

Maximum (production)
profit

Decision trees

Maximum (production)
profit

Mathematical techniques

Specific algorithms

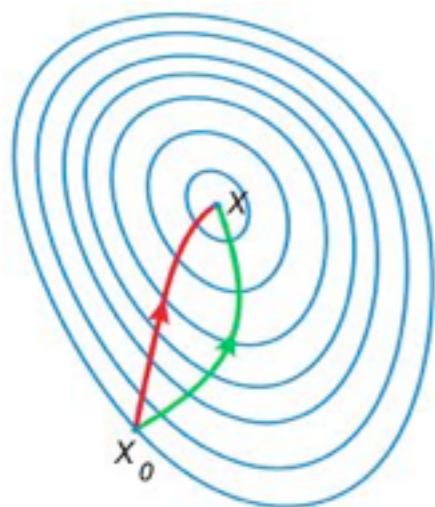
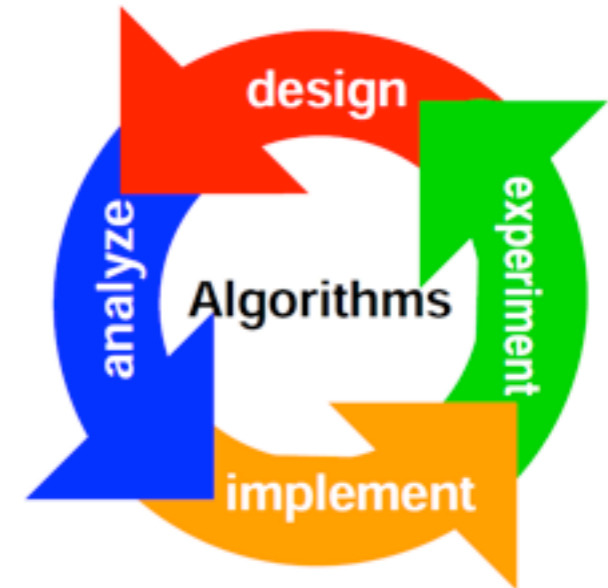
$$A_i = f(A_i, S_1 \dots S_j, P_1 \dots P_j, V_{i1} \dots V_{ij})$$

A_i = Decision option A_i (action)

S_j = State of nature

P_j = Probability of occurrence S_j

V_{ij} = Value option i for state j



$$\text{Max EMV } (A_i) = \text{Max } \sum_j (P_j V_{ij})$$

EMV = Expected monetary value

Maximum of weighted average


of all probabilities of occurrence

and their respective values

Mathematical techniques

An example

Reproductive programs

| Programs | | Outcomes | Probabilities | Values |
|----------------|-------------|--|---------------|--------------|
| A ₁ | Current |  | 0.16, 0.84 | \$631, \$409 |
| A ₂ | Alternative | | 0.25, 0.75 | |

| | | |
|------------------------|-----------------------------|----------------|
| EMV (A ₁)= | 0.16 x \$631 + 0.84 x \$409 | \$444.5 |
| EMV (A ₂)= | 0.25 x \$631 + 0.75 x \$409 | \$464.5 |

Conclusion

Alternative program brings
\$20/cow extra net return

Payoff matrices

Tabular data representation

Decision actions

Multiple results



| | |
|------|------|
| 1, 1 | 0, 0 |
| 0, 0 | 1, 1 |

Probabilistic outcomes

Uncertain possibilities

| State of nature | Value of outcome | Probability |
|-----------------|------------------|-------------|
| S_j | A_{ij} | P_j |

Payoff matrices

An example

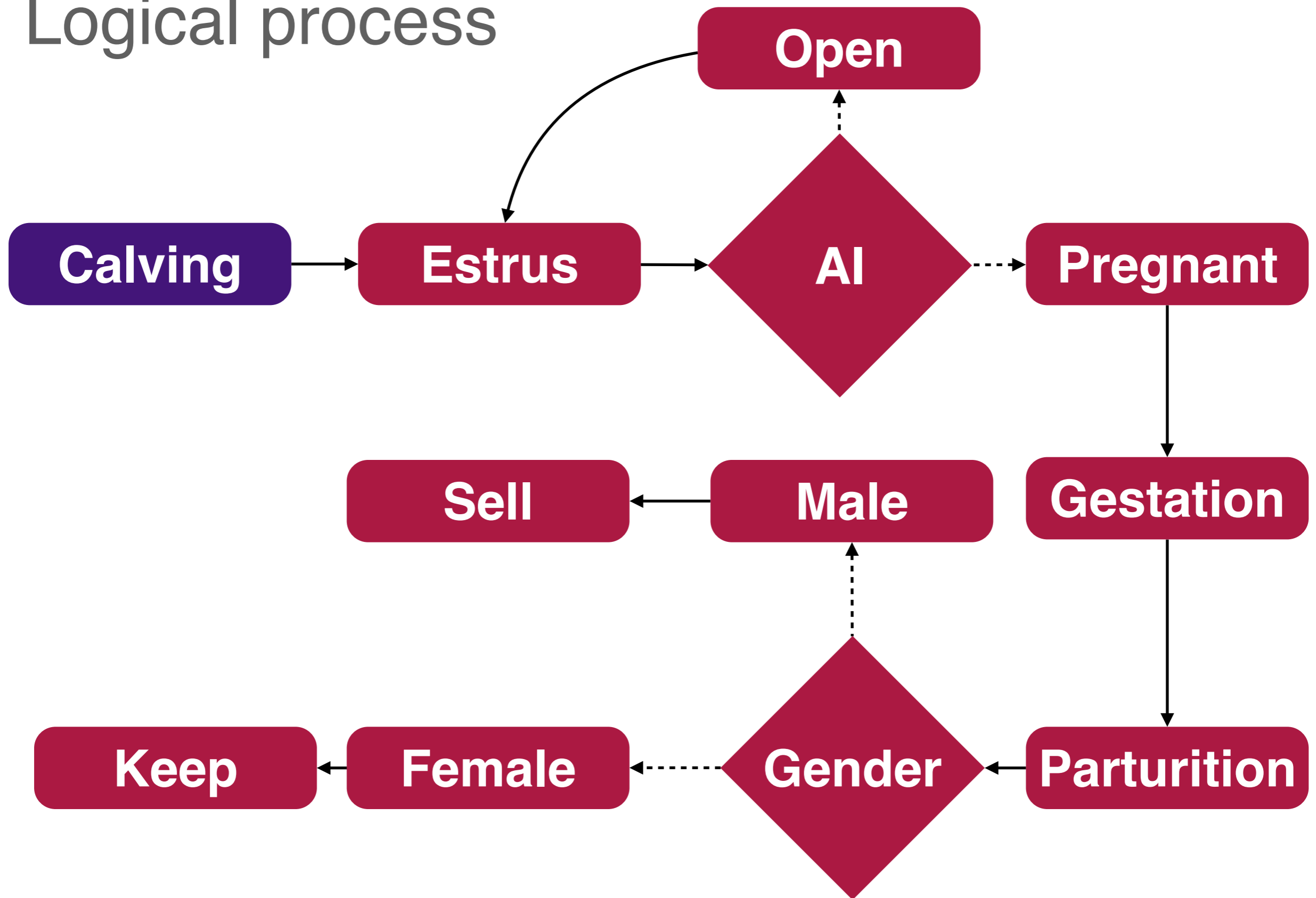
| | | Milk price (\$/cwt) | | | | | |
|--------------------|-----|---------------------|-----|------|------|------|------|
| | | 14 | 15 | 17 | 19 | 20 | |
| | | P_j | 0.1 | 0.1 | 0.1 | 0.4 | 0.3 |
| Corn price (\$/bu) | 6.1 | 0.1 | 741 | 1081 | 1421 | 1761 | 2101 |
| | 6.8 | 0.1 | 661 | 1001 | 1341 | 1681 | 2021 |
| | 7.6 | 0.2 | 581 | 921 | 1261 | 1601 | 1941 |
| | 8.3 | 0.3 | 501 | 841 | 1181 | 1521 | 1861 |
| | 9.1 | 0.3 | 421 | 761 | 1101 | 1441 | 1781 |

Conclusion

Return to labor =
\$1,451/cow per year

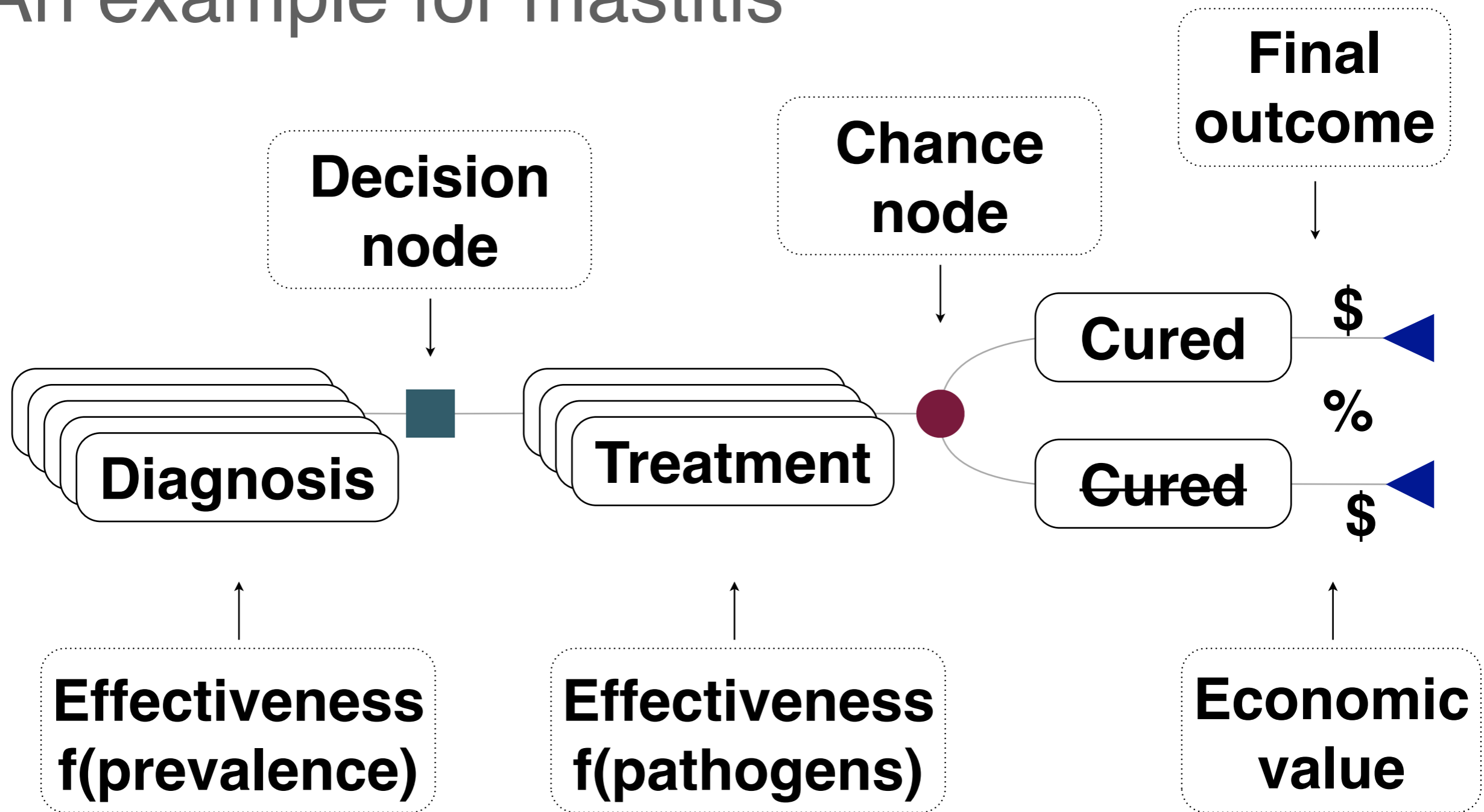
Process diagrams

Logical process



Decision trees

An example for mastitis



Simulation of dairy farm systems

Whole or part of the system

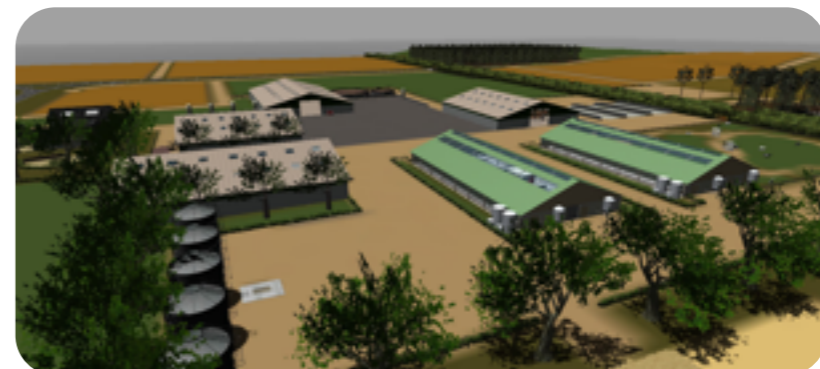
Essential for informed
decision-making

Detect need or lack of
**science-based
knowledge**

Useful to describe
interrelated system parts

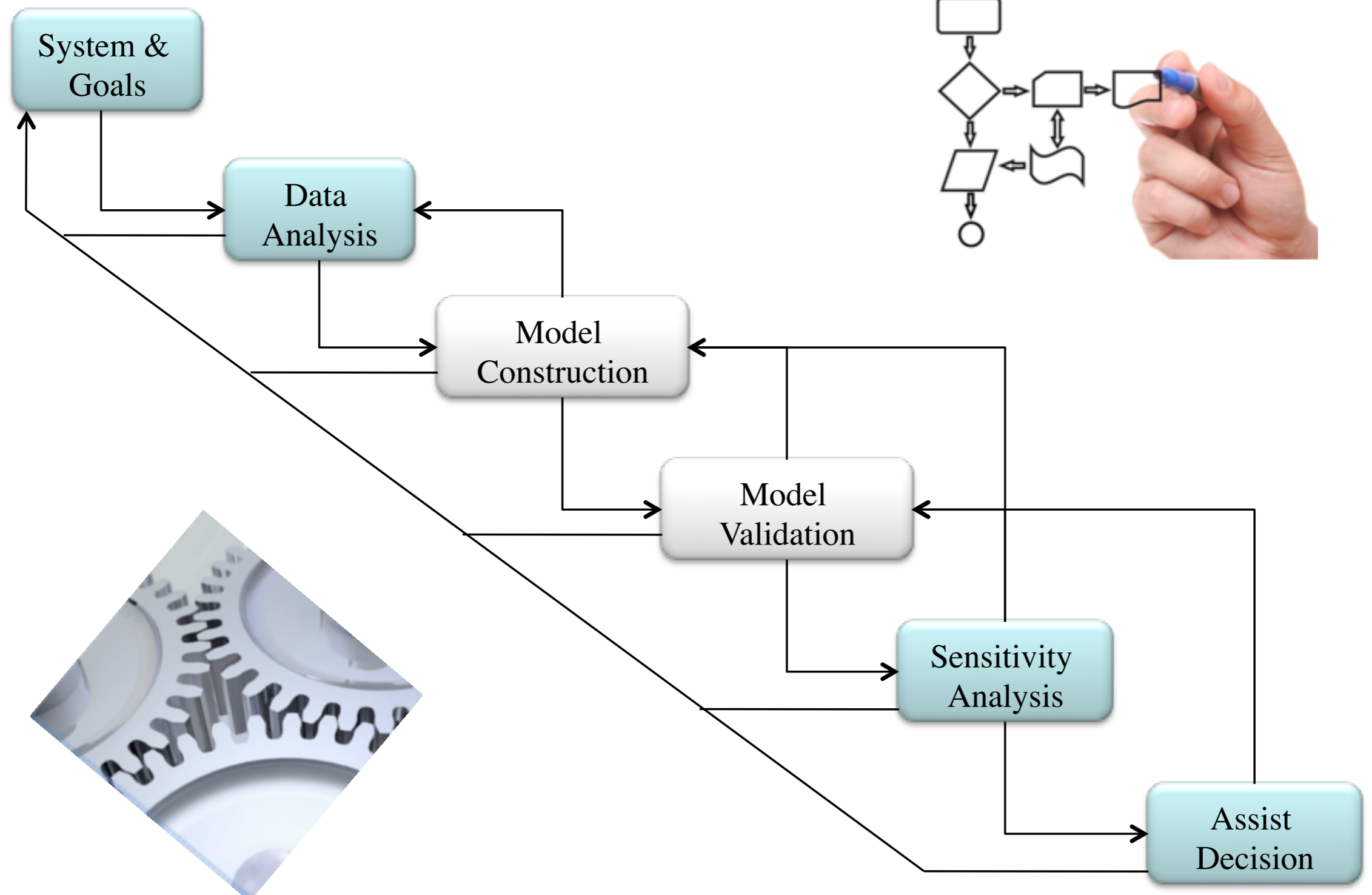
Assist management
**control of dairy farm
systems**

Basis for assessing &
assimilating **available
information**



Simulation of dairy farm systems

The process



Simulation techniques

Dairy farm systems

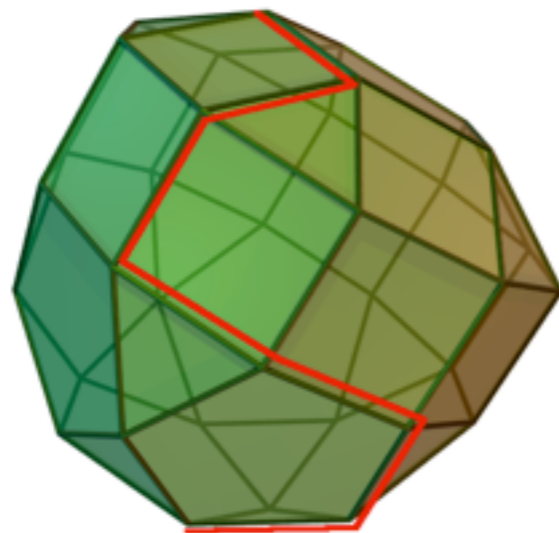
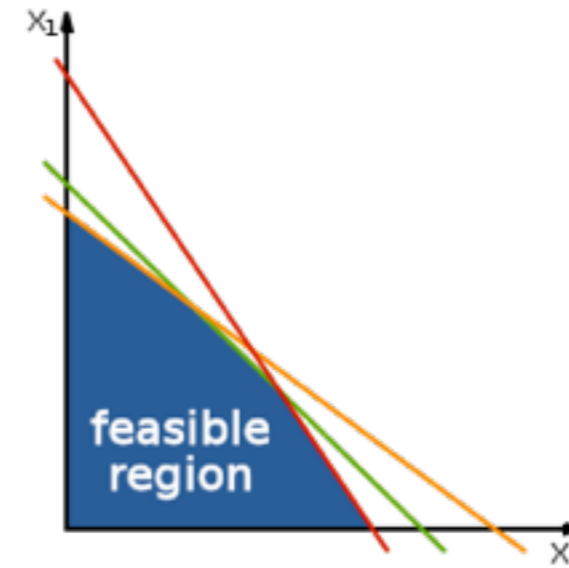
| | <i>Static</i> | <i>Dynamic</i> | <i>Deterministic</i> | <i>Probabilistic</i> | <i>Random</i> | <i>Simulation</i> | <i>Optimization</i> |
|---------------------|---------------|----------------|----------------------|----------------------|---------------|-------------------|---------------------|
| Gross margin | ✓ | | ✓ | | | ✓ | |
| Partial budgeting | ✓ | | ✓ | | | ✓ | |
| Cost-benefit | | ✓ | ✓ | | | | |
| Linear programming | ✓ | | ✓ | | | | ✓ |
| Dynamic programming | | ✓ | | ✓ | | | ✓ |
| Markov-chain | | ✓ | | ✓ | | ✓ | |
| Monte-Carlo | | ✓ | | | ✓ | ✓ | |

Linear programming

Optimize objective function

Principles

- Function to optimize
- Limited resources
- Several ways to use



Elements

- Objective function
- Constraints
- Solving algorithm
- Feasible solution

Linear programming

An example

Problem

- Maximize IOFSC = $Max(\text{Milk Value} - \text{Feed Cost})$
- Limited resources = Corn, SBM, RUP, RDP

| | | Upper limit | |
|------|------|-------------|------|
| | \$/T | kg/cow/d | % |
| Milk | 396 | - | - |
| Corn | 228 | 7.7 | - |
| SBM | 363 | 11.0 | - |
| RUP | - | - | 6.5 |
| RDP | - | - | 12.0 |

Linear programming

An example

Milk Value

Milk production x Milk price



Milk production

f (RUP, RDP)



Feed Cost

Feed used x Feed prices



Linear programming

An application = IOFSC

| 3 | | Set Source of Energy Supplements and Prices | | | |
|-----|---------------|---|-------------------|------------------|--------------|
| | | Price (\$/bu) | Current Diet (lb) | Upper Limit (lb) | Optimal (lb) |
| 3.1 | 27-Corn-CGG | 6 | 16 | 17 | 16.66 |
| 3.2 | 8-Barley-BGR | 4.8 | | 0 | 0.00 |
| 3.3 | 116-Wheat-WGR | 7.4 | | 0 | 0.00 |

| 4 | | Set the Source of Protein, Byproduct Supplements and Prices | | | |
|-----|---------------------------------|---|-------------------|------------------|--------------|
| | | Price (\$/ton) | Current Diet (lb) | Upper Limit (lb) | Optimal (lb) |
| 4.1 | 106-Soybean Meal-SBM | 330.00 | 5 | 6 | 5.17 |
| 4.2 | 25-Corn Gluten Meal-CGM | 550.00 | | 0 | 0.00 |
| 4.3 | 24-Corn Gluten Feed-CGF | 160.00 | | 0 | 0.00 |
| 4.4 | 23-Corn Distiller Grains-CDG | 140.00 | | 5 | 5.00 |
| 4.5 | 109-Soybean Whole Roasted- HSB | 318.00 | | 0 | 0.00 |
| 4.6 | 104-Soybean Meal Expellers-SBMx | 402.00 | | 0 | 0.00 |
| 4.7 | 14-Blood Meal Ring Dried-BMRD | 900.00 | | 0 | 0.00 |
| 4.8 | Urea | 635.00 | | 0 | 0.00 |

| 5 | | Set the Upper Limits for RUP and RDP, and Milk Price | | | |
|-----|------------|--|--------------|-------------|----------------|
| | | | | Upper Limit | Amount in Diet |
| 5.1 | RUP | Rumen Undegradable Protein | % of Diet DM | 6.50% | 6.16% |
| 5.2 | RDP | Rumen Degradable Protein | % of Diet DM | 12.00% | 12.00% |
| 5.3 | CP | Crude Protein | % of Diet DM | 18.50% | 18.17% |
| 5.4 | Milk Price | | \$/cwt | 18 | |

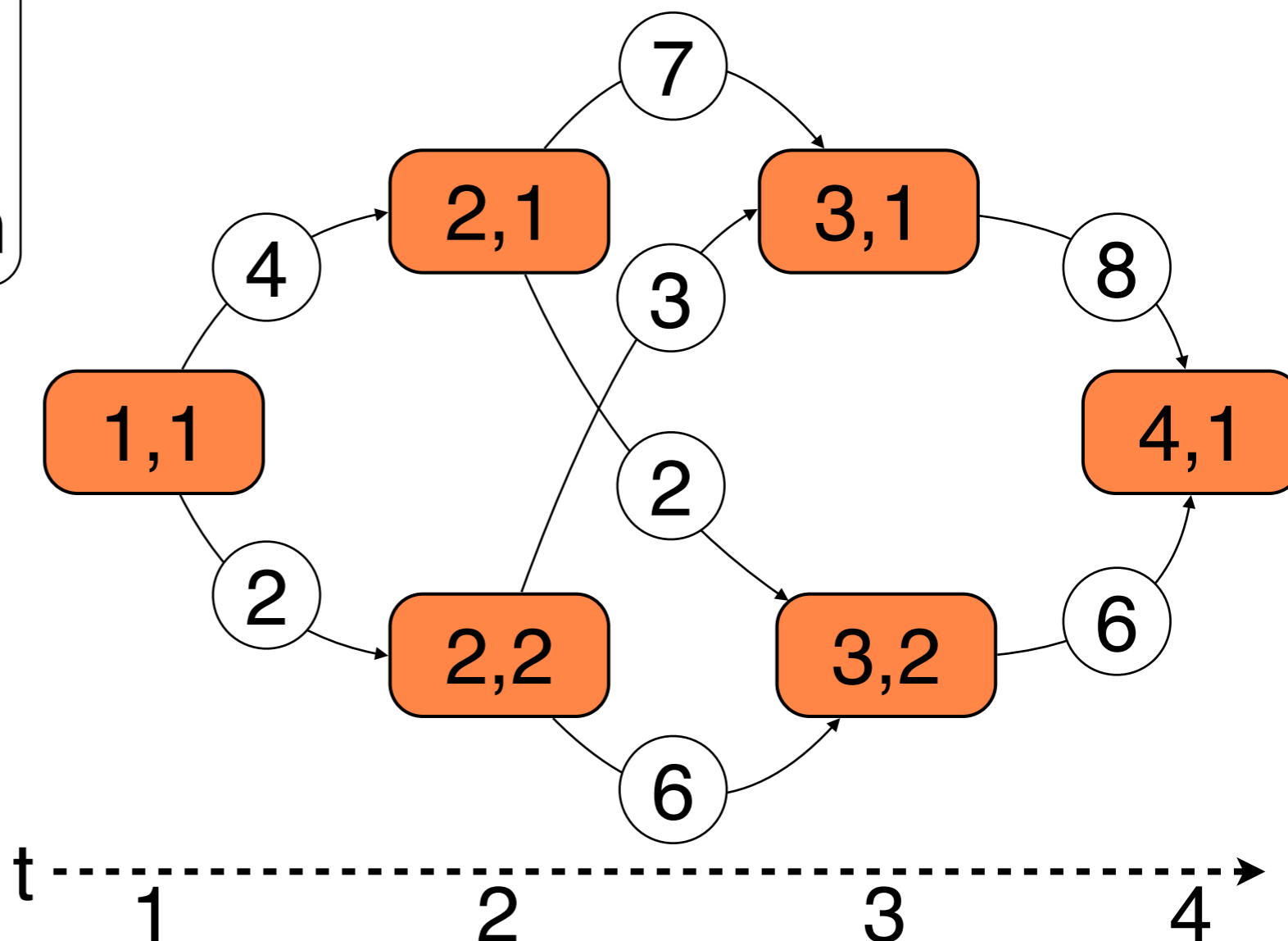
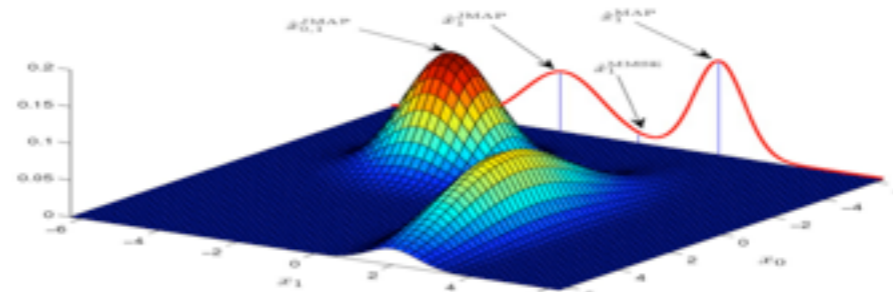
| 6 | | Perform Optimization, Maximize IOFSC | | |
|-----|---|--------------------------------------|------------------|------------------|
| 6.1 | Click the button to maximize the Income Over Feed Supplement Cost (IOFSC) | | Maximize IOFSC | |
| 6.2 | Expected Milk Production (E-MP) | lb/cow/day | Current 81.00 | Optimal 82.46 |
| 6.3 | Maximum Income Over Feed Supplement Cost (IOFSC) | \$/cow/day | 11.69 | 11.86 |

Dynamic programming

Sequential optimization

Principles

- Optimal policy
- Stage = time
- State = cow
- Objective function



Markov chains

Sequential simulation

Principles

- Stage = time
- State = cow
- Transition probabilities
- Steady state

| | Lactation 1 | | | | | | | | | |
|----|-------------|------|------|------|------|------|------|------|------|------|
| 1 | 0.02 | | | | | | | | | |
| 2 | 0.02 | | | | | | | | | |
| 3 | 0.01 | 0.00 | | | | | | | | |
| 4 | 0.01 | 0.00 | 0.00 | | | | | | | |
| 5 | 0.01 | 0.00 | 0.00 | 0.00 | | | | | | |
| 6 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | |
| 7 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 0.00 | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 0.00 | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16 | 0.00 | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 0.00 | | | | | | 0.00 | 0.00 | 0.00 | 0.00 |
| 18 | 0.00 | | | | | | | 0.00 | 0.00 | 0.00 |
| 19 | 0.00 | | | | | | | | 0.00 | 0.00 |
| 20 | 0.00 | | | | | | | | | 0.00 |

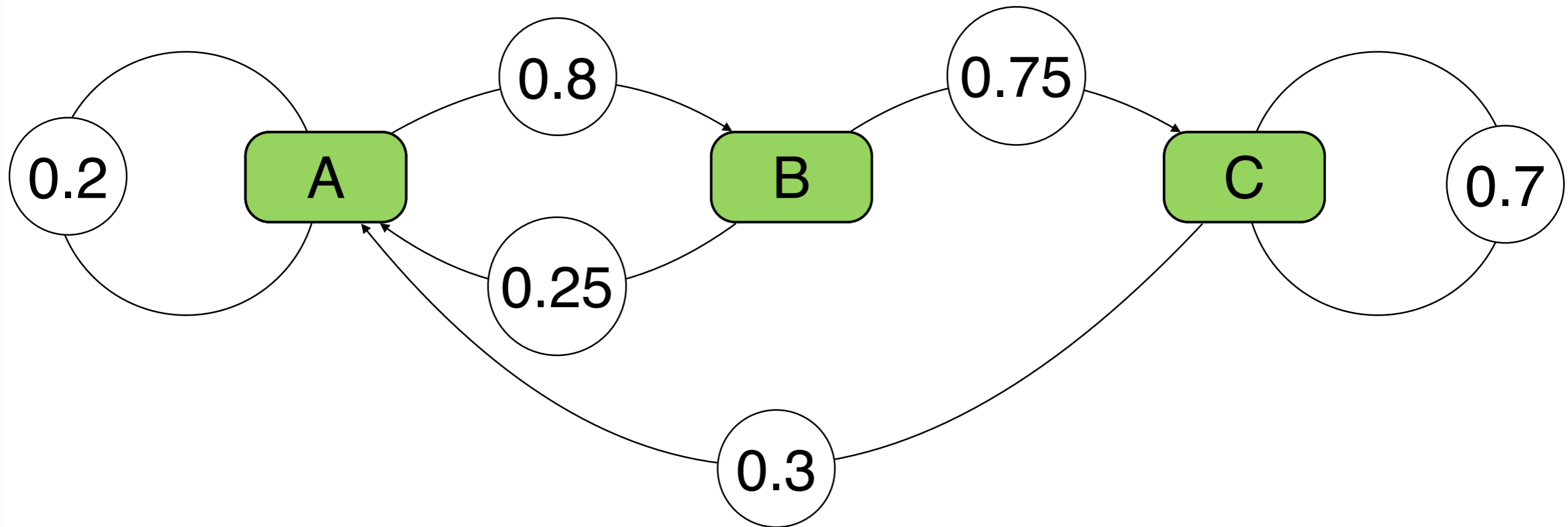
| Month in Milk | Month in Pregnancy | | | | | | | | | |
|---------------|--------------------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | Lactation 1 | | | | | | | | | |
| 1 | 3.54 | | | | | | | | | |
| 2 | 3.39 | | | | | | | | | |
| 3 | 2.70 | 0.59 | | | | | | | | |
| 4 | 2.17 | 0.48 | 0.59 | | | | | | | |
| 5 | 1.77 | 0.38 | 0.47 | 0.57 | | | | | | |
| 6 | 1.45 | 0.31 | 0.38 | 0.46 | 0.55 | | | | | |
| 7 | 1.20 | 0.26 | 0.31 | 0.37 | 0.44 | 0.54 | | | | |
| 8 | 0.99 | 0.21 | 0.25 | 0.30 | 0.35 | 0.43 | 0.53 | | | |
| 9 | 0.82 | 0.17 | 0.21 | 0.24 | 0.29 | 0.35 | 0.43 | 0.53 | | |
| 10 | 0.67 | 0.14 | 0.17 | 0.20 | 0.24 | 0.28 | 0.34 | 0.42 | 0.52 | |
| 11 | 0.55 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.28 | 0.34 | 0.42 | 0.52 |
| 12 | 0.01 | | 0.12 | 0.14 | 0.16 | 0.19 | 0.23 | 0.28 | 0.34 | 0.41 |
| 13 | 0.01 | | | 0.11 | 0.13 | 0.16 | 0.19 | 0.23 | 0.27 | 0.33 |
| 14 | 0.01 | | | | 0.11 | 0.13 | 0.16 | 0.19 | 0.22 | 0.27 |
| 15 | 0.00 | | | | | 0.11 | 0.13 | 0.15 | 0.19 | 0.22 |
| 16 | 0.00 | | | | | | 0.11 | 0.13 | 0.15 | 0.18 |
| 17 | 0.00 | | | | | | | 0.10 | 0.13 | 0.15 |
| 18 | 0.00 | | | | | | | | 0.10 | 0.12 |
| 19 | 0.00 | | | | | | | | | 0.10 |

States

- Parity
- Days in milk
- Pregnancy
- Production levels
- Disease
- ...

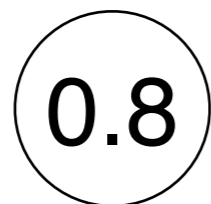
Markov chains

An example



B

State of nature. E.g., Diseased cow



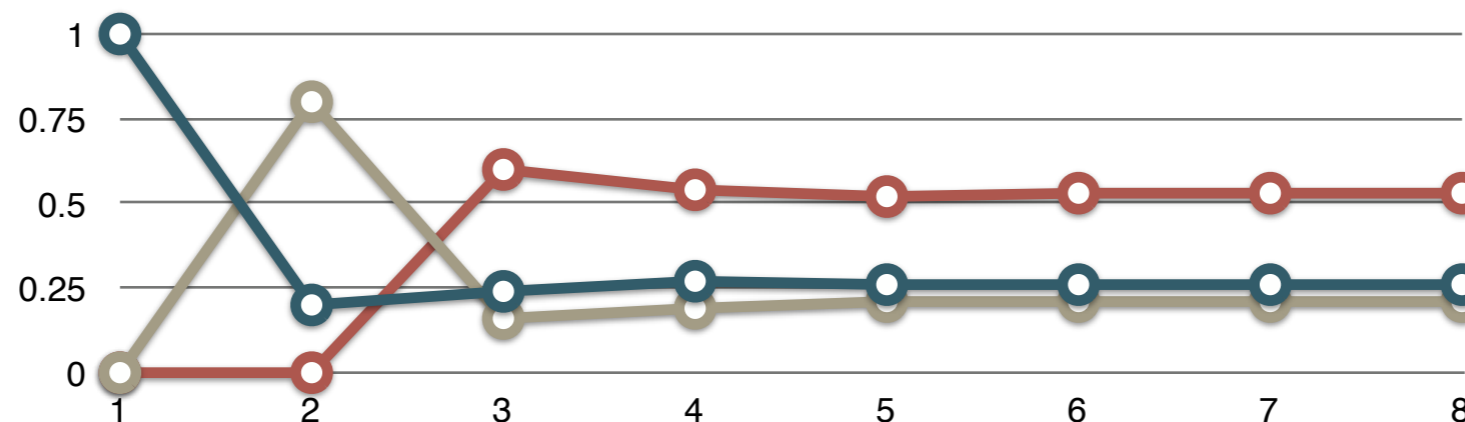
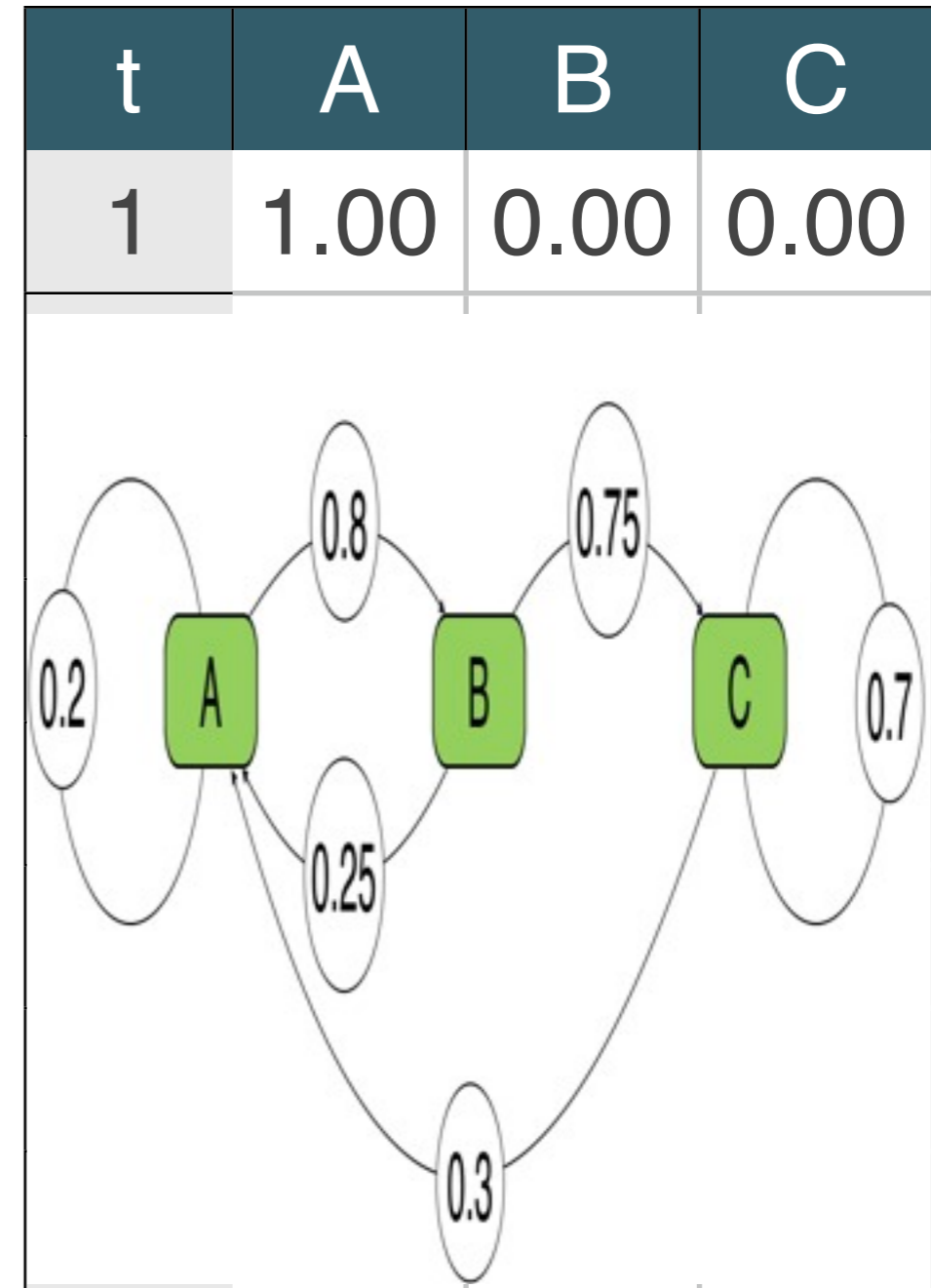
0.8

Transition probability

Markov chains

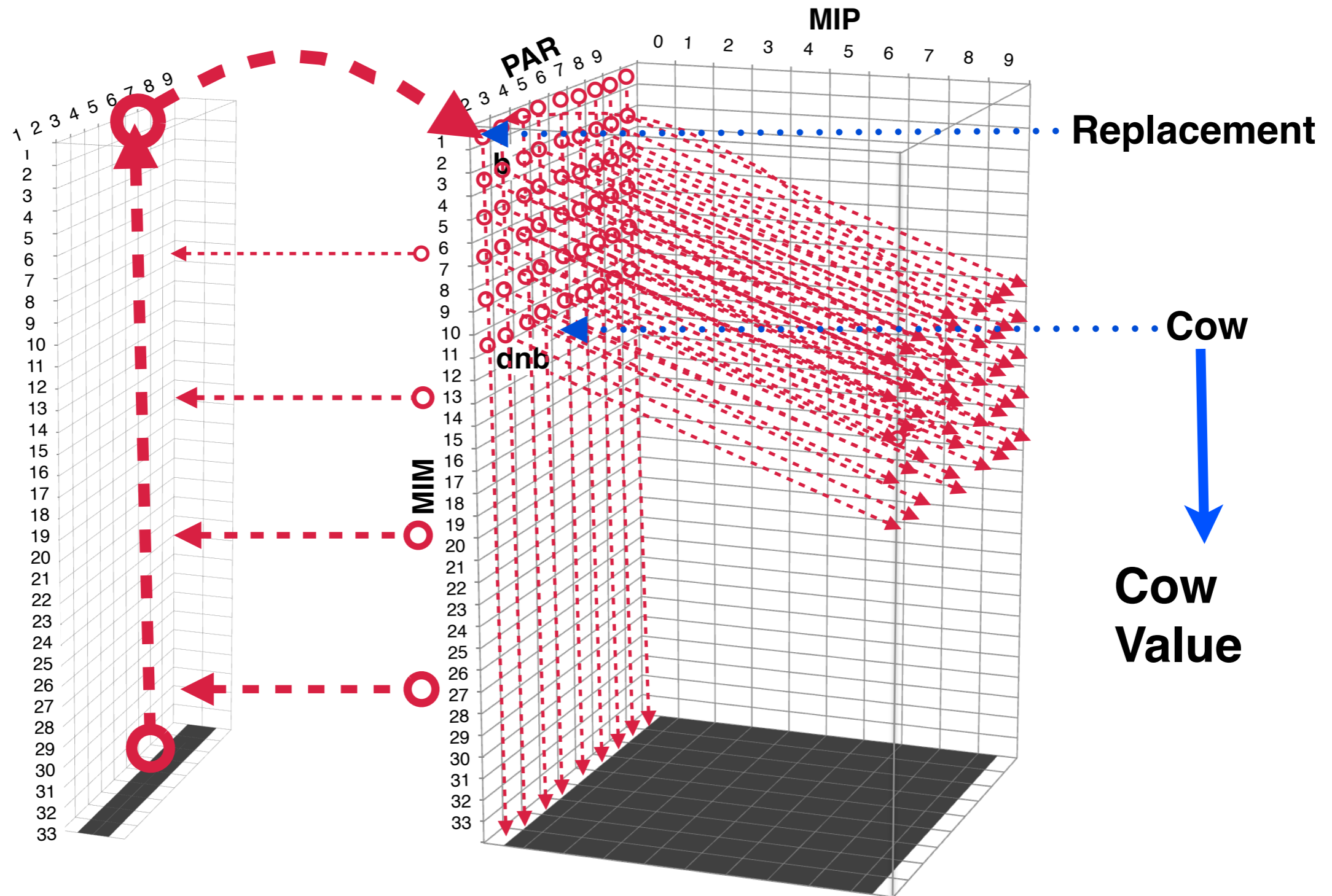
An example

| | A | B | C |
|-------|------|------|------|
| A | 0.20 | 0.25 | 0.30 |
| B | 0.80 | 0.00 | 0.00 |
| C | 0.00 | 0.75 | 0.70 |
| Total | 1.00 | 1.00 | 1.00 |



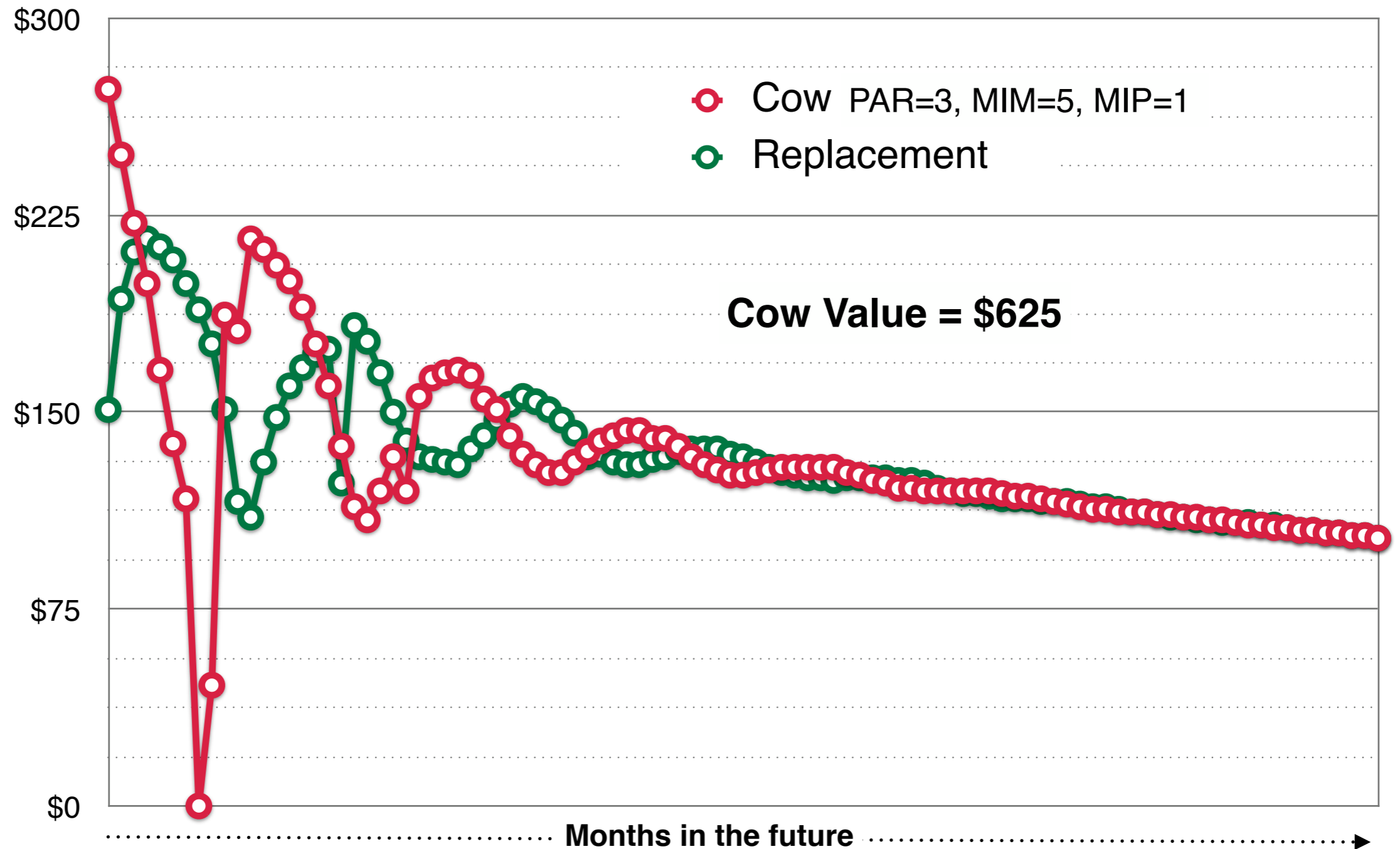
Markov chains

An application



Markov chains

An application



Markov chains

An application

WISCONSIN UNIVERSITY OF WISCONSIN-MADISON
The Economic Value of a Dairy Cow
Victor E. Cabrera, Department of Dairy Science
UW Extension University of Wisconsin-Extension

Overview **Single Cow Analysis** Herd Analysis US English US Metric UK

INPUTS - Edit Values in This Block

Evaluated Cow Variables

| | |
|---|-----|
| Current Lactation | 2 |
| Current Months after Calving | 1 |
| Current Months in Pregnancy | 0 |
| Expected Milk Production Rest of Lactation, % | 100 |
| Expected Milk Production Next Lactations, % | 100 |

Replacement Cow Variable

| | |
|---|---|
| Expected genetic improvement, % additional milk | 0 |
|---|---|

Herd Production and Reproduction Variables

| | |
|--|--------|
| Herd Turnover Ratio, %/year | 35 |
| Rolling Herd Average, lb/cow per year | 24,000 |
| 21-d Pregnancy Rate, % | 18 |
| Reproduction Cost, \$/cow per month | 20 |
| Last Month After Calving to Breed a Cow | 10 |
| Do-not-Breed Cow Minimum Milk, lb/day | 50 |
| Pregnancy Loss after 35 Days Pregnant, % | 22.6 |
| Average Cow Body Weight, lb | 1306 |

Herd Economic Variables

| | |
|--|-------|
| Replacement Cost, \$/cow | 1300 |
| Salvage Value, \$/lb live weight | 0.38 |
| Calf Value, \$/calf | 100 |
| Milk Price, \$/cwt | 15.88 |
| Milk Butterfat, % | 3.5 |
| Feed Cost Lactating Cows, \$/lb dry matter | 0.1 |
| Feed Cost Dry Cows, \$/lb dry matter | 0.08 |
| Interest Rate, %/year | 6 |

Analyze

OUTPUTS - Interactive Results

Value of the Cow, \$ 897

Compared Against a Replacement, \$

| | |
|-----------------------------|------|
| Milk Sales, \$ | 535 |
| Feed Cost, \$ | -238 |
| Calf Value, \$ | -2 |
| Non-reproductive Cull, \$ | -85 |
| Mortality Cost, \$ | -16 |
| Reproductive Cull, \$ | 4 |
| Reproduction Costs, \$ | -5 |
| Replacement Transaction, \$ | 704 |

Herd Structure at Steady State

| | |
|--------------------------------|-----|
| Days in milk | 224 |
| Days to Conception | 122 |
| Percent of Pregnant | 52 |
| Reproductive Culling, % | 8 |
| Mortality, % | 3 |
| 1st Lactation, % | 43 |
| 2 nd Lactation, % | 27 |
| > 3 rd Lactation, % | 30 |

Economics of an Average Cow, \$/year

| | |
|-------------------------------|-------|
| Net Return, \$ | 1969 |
| Milk Sales, \$ | 3806 |
| Feed Cost, \$ | -1522 |
| Calf Sales, \$ | 60 |
| Non-Reprod. Culling Cost, \$ | -198 |
| Mortality Cost, \$ | -38 |
| Reproductive Culling Cost, \$ | -59 |
| Reproductive Cost, \$ | -80 |

\$897

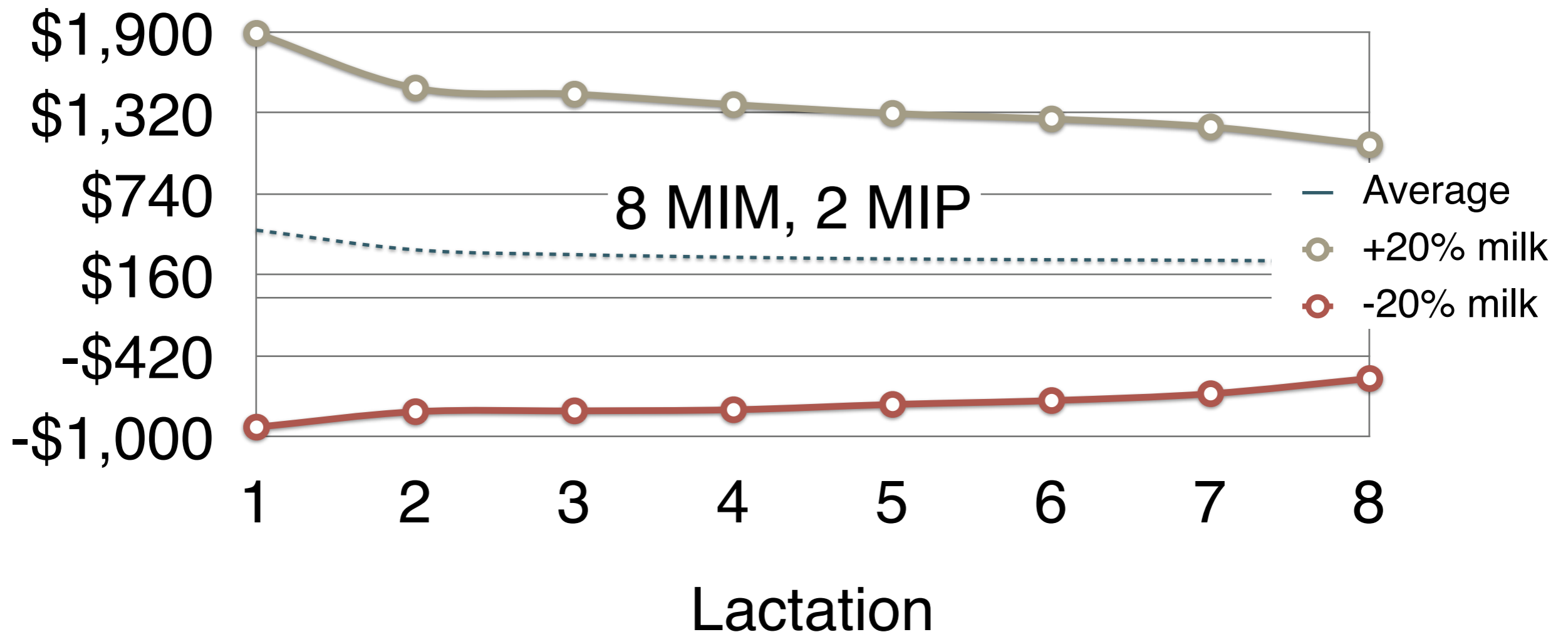
Economic value of a non-pregnant cow in second lactation one month after calving

Economic value of a dairy cow

Practical decision-making

Cull or not cull

Positive cow value indicates cow brings more value than replacement

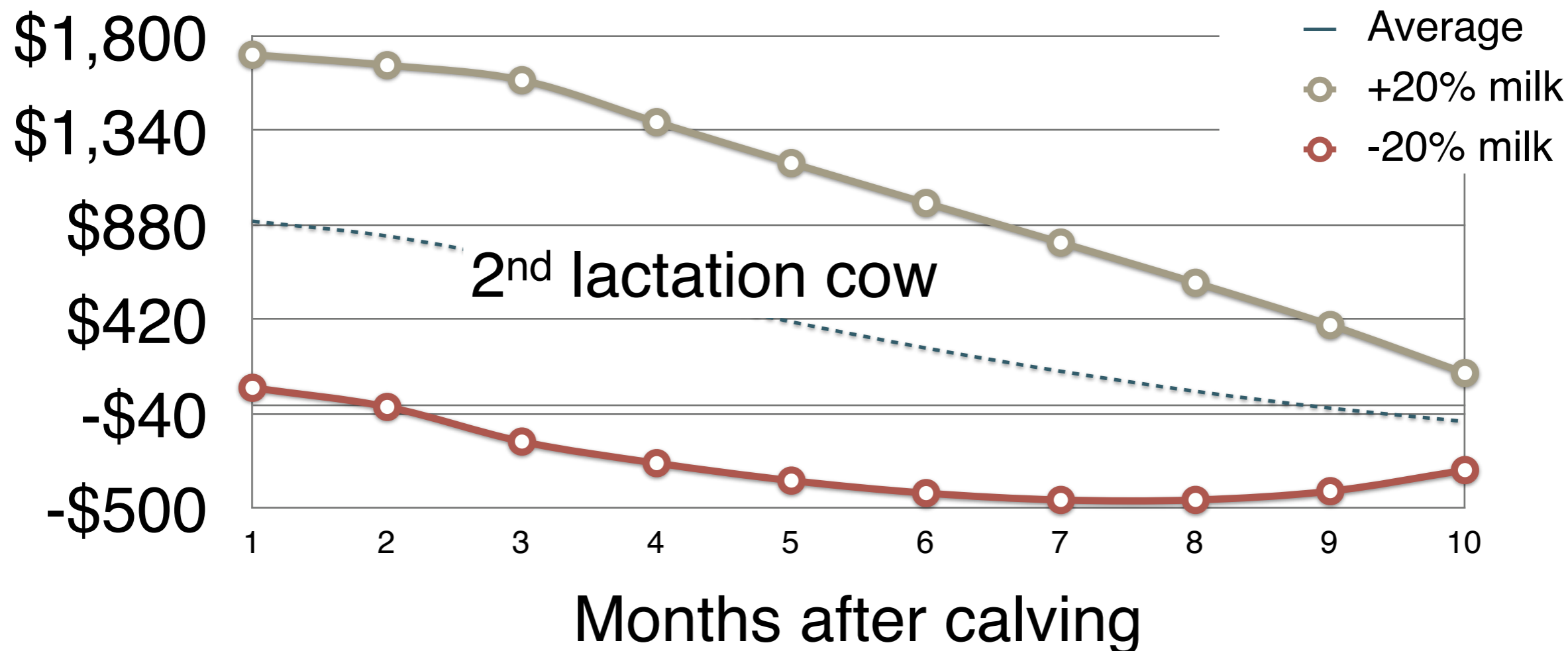


Economic value of a dairy cow

Practical decision-making

Breed or not breed

Better chance for higher value cows

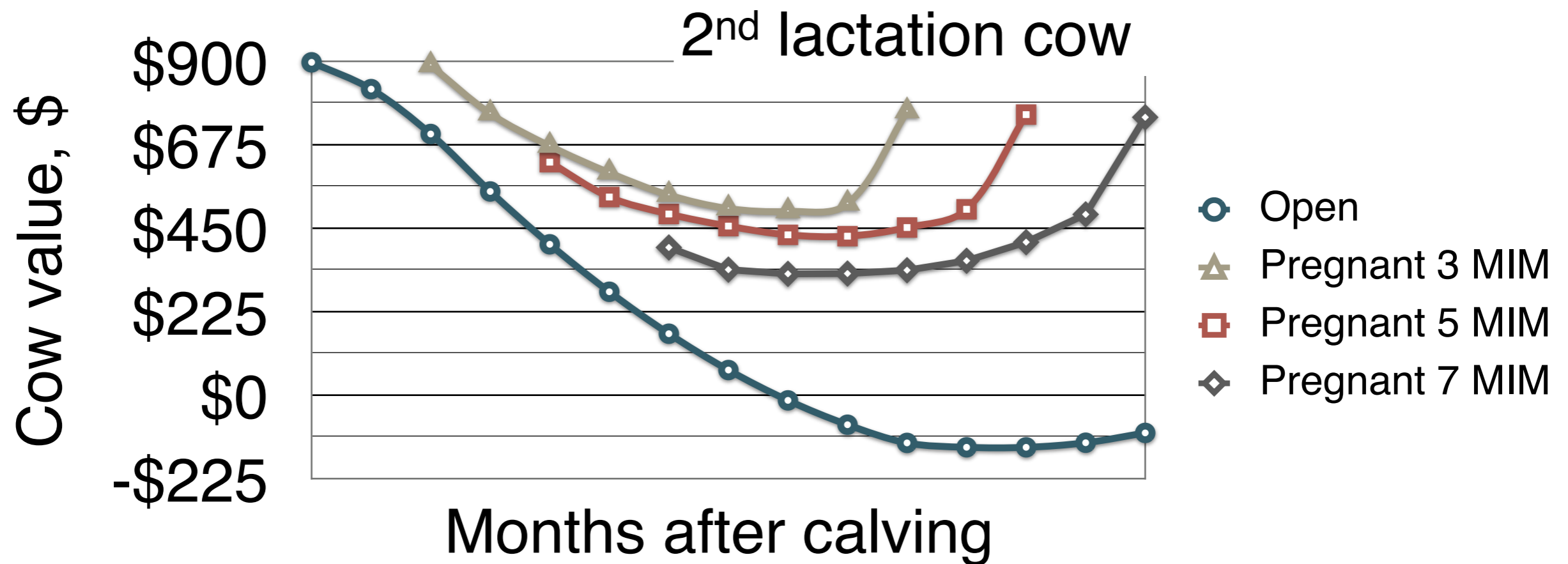


Economic value of a dairy cow

Practical decision-making

Treat or not treat

More investment allowed
in higher value cows



Economic value of a dairy cow

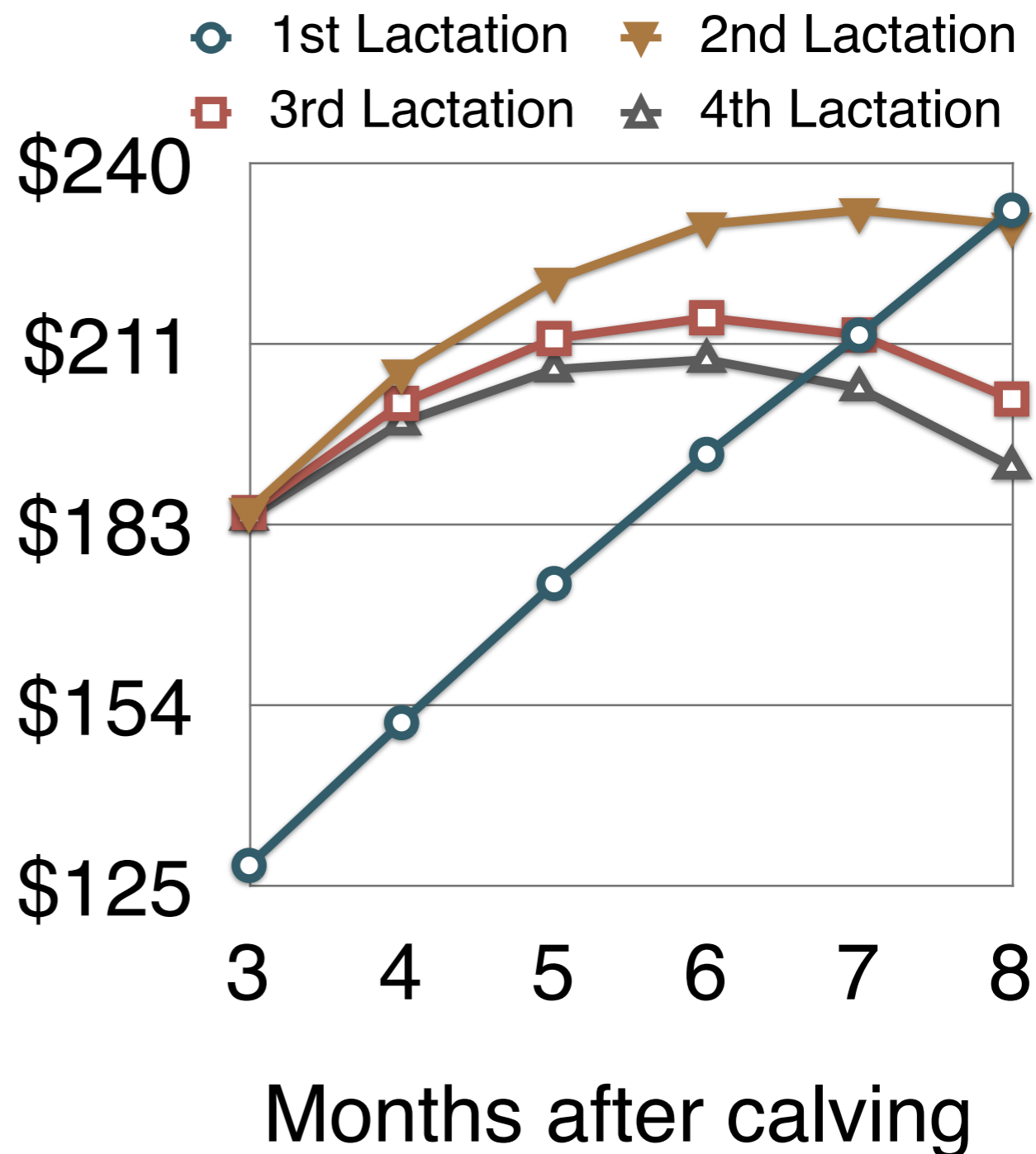
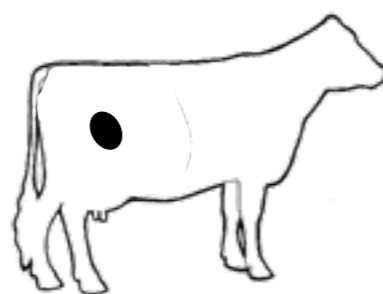
Practical decision-making

Calculate the value of a pregnancy

Difference between pregnant and non-pregnant



vs.

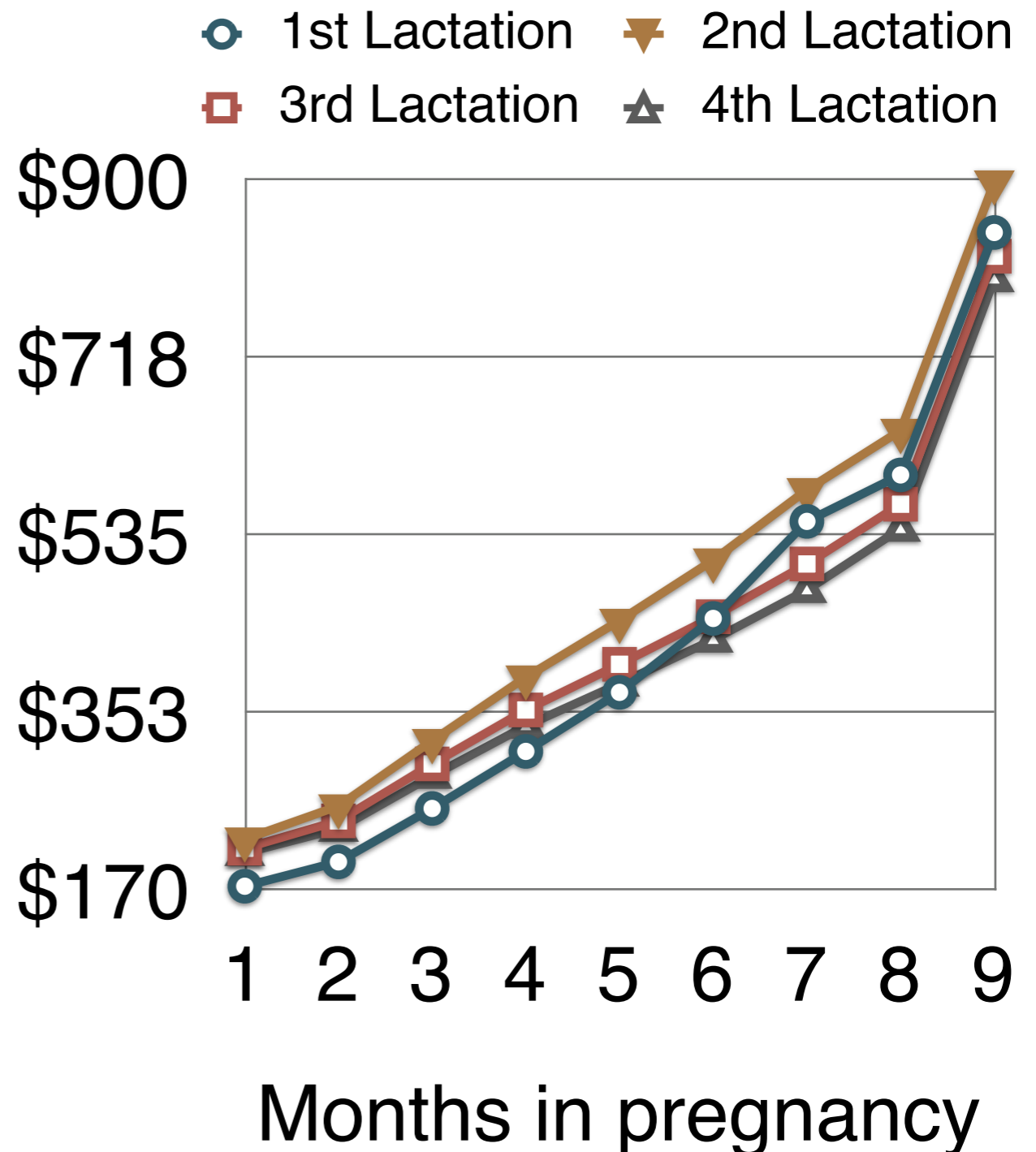
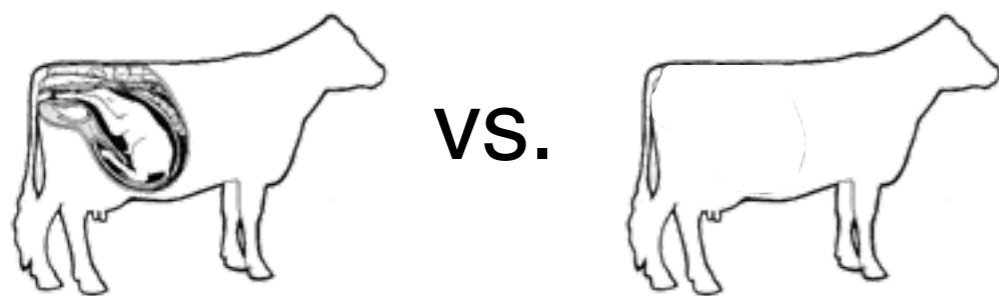


Economic value of a dairy cow

Practical decision-making

Calculate the cost of a pregnancy loss

Difference between non-pregnant and pregnant

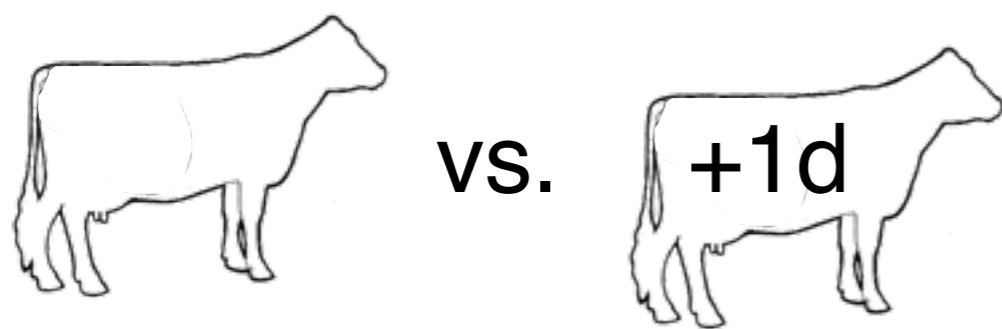


Economic value of a dairy cow

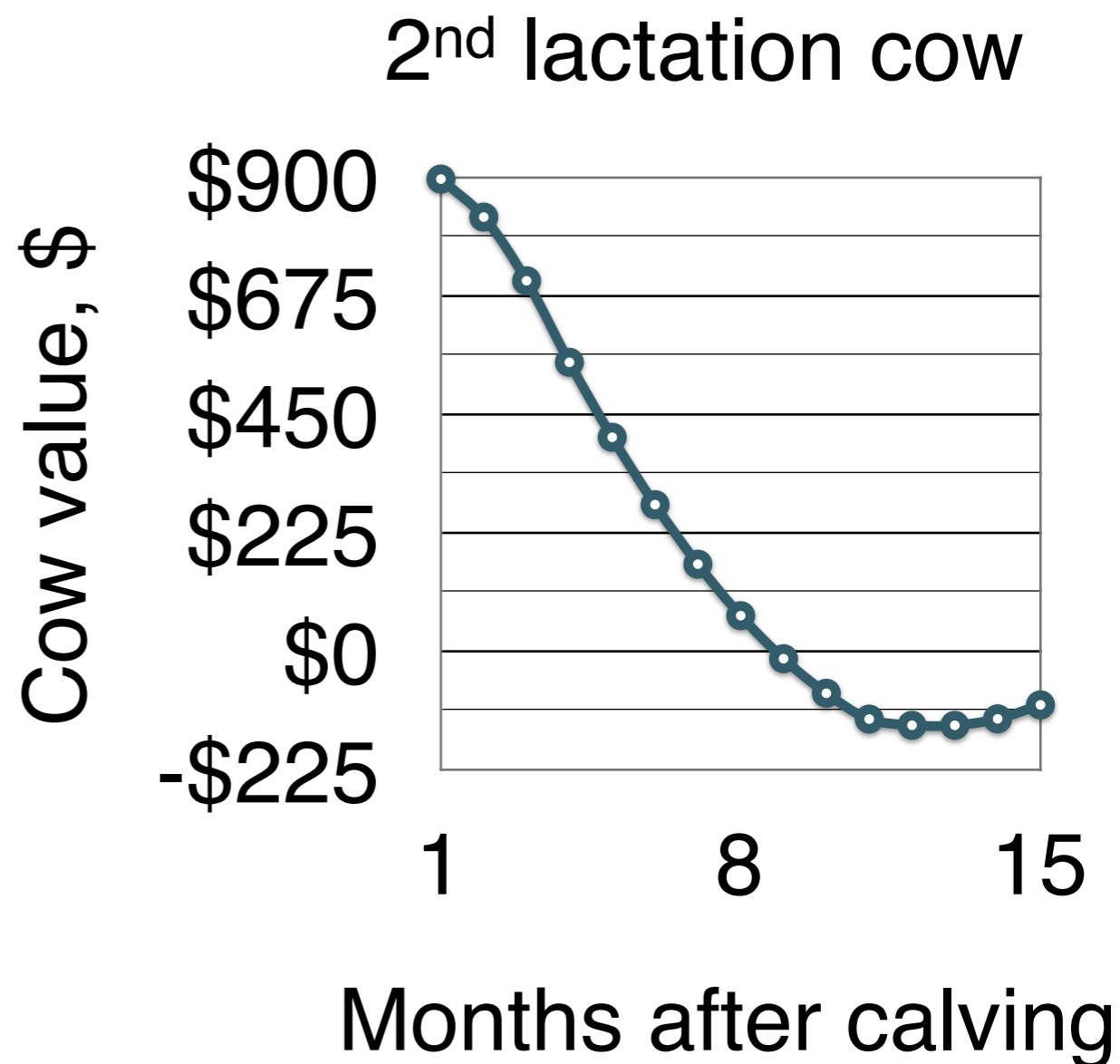
Practical decision-making

Calculate the cost of a day open

Difference between value of non-pregnant cow in 2 successive days

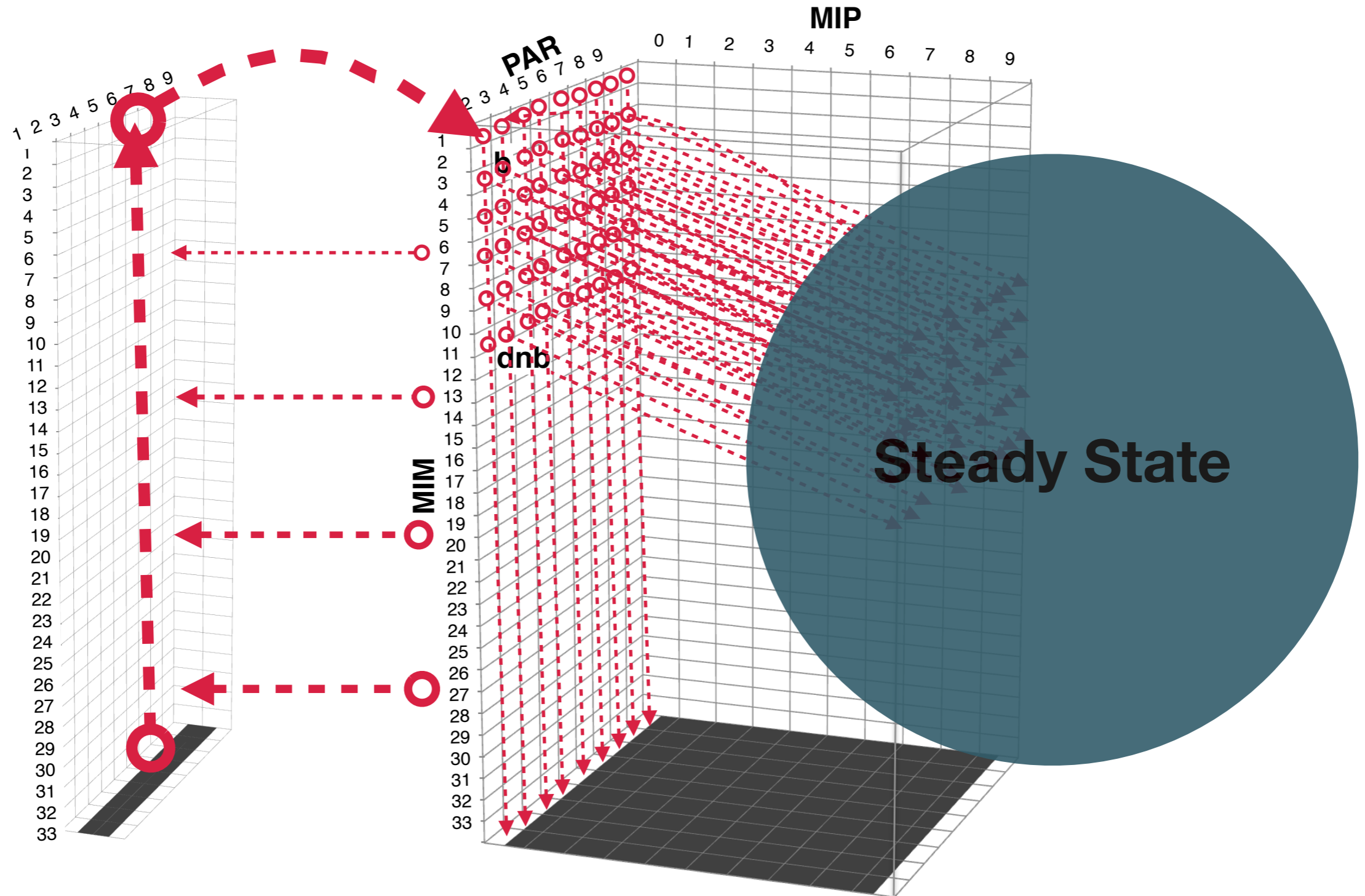


E.g., \$5.16 (month 2-3)
and \$4.26 (month 5-6)



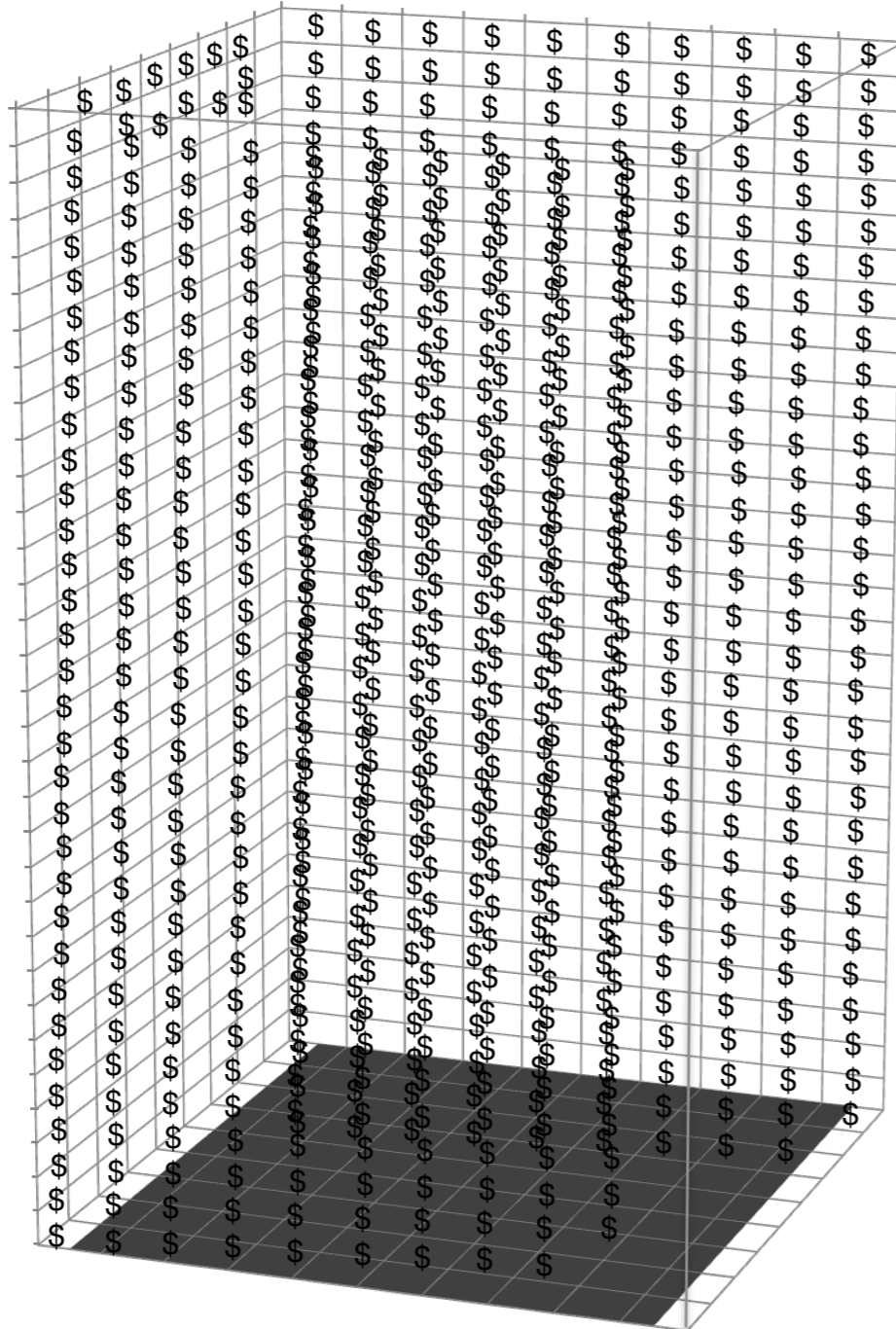
Markov chains

Another application: Herd value



Markov chains

Another application: Herd value



Herd net return (\$)

Aggregation of individual cow's net return

Markov chains

Herd value calculation

WISCONSIN UNIVERSITY OF WISCONSIN-MADISON | **The Economic Value of a Dairy Cow** | Victor E. Cabrera, Department of Dairy Science | **UW Extension** University of Wisconsin-Extension

Overview | **Single Cow Analysis** | Herd Analysis | US English | US Metric | UK

INPUTS - Edit Values in This Block

Evaluated Cow Variables

| | |
|---|-----|
| Current Lactation | 2 |
| Current Months after Calving | 1 |
| Current Months in Pregnancy | 0 |
| Expected Milk Production Rest of Lactation, % | 100 |
| Expected Milk Production Next Lactations, % | 100 |

Replacement Cow Variable

| | |
|---|---|
| Expected genetic improvement, % additional milk | 0 |
|---|---|

Herd Production and Reproduction Variables

| | |
|--|--------|
| Herd Turnover Ratio, %/year | 35 |
| Rolling Herd Average, lb/cow per year | 24,000 |
| 21-d Pregnancy Rate, % | 18 |
| Reproduction Cost, \$/cow per month | 20 |
| Last Month After Calving to Breed a Cow | 10 |
| Do-not-Breed Cow Minimum Milk, lb/day | 50 |
| Pregnancy Loss after 35 Days Pregnant, % | 22.6 |
| Average Cow Body Weight, lb | 1306 |

Herd Economic Variables

| | |
|--|-------|
| Replacement Cost, \$/cow | 1300 |
| Salvage Value, \$/lb live weight | 0.38 |
| Calf Value, \$/calf | 100 |
| Milk Price, \$/cwt | 15.88 |
| Milk Butterfat, % | 3.5 |
| Feed Cost Lactating Cows, \$/lb dry matter | 0.1 |
| Feed Cost Dry Cows, \$/lb dry matter | 0.08 |
| Interest Rate, %/year | 6 |

Analyze

OUTPUTS - Interactive Results

Value of the Cow, \$ 897

Compared Against a Replacement, \$

| | |
|-----------------------------|------|
| Milk Sales, \$ | 535 |
| Feed Cost, \$ | -238 |
| Calf Value, \$ | -2 |
| Non-reproductive Cull, \$ | -85 |
| Mortality Cost, \$ | -16 |
| Reproductive Cull, \$ | 4 |
| Reproduction Costs, \$ | -5 |
| Replacement Transaction, \$ | 704 |

Herd Structure at Steady State

| | |
|-------------------------|-----|
| Days in milk | 224 |
| Days to Conception | 122 |
| Percent of Pregnant | 52 |
| Reproductive Culling, % | 8 |
| Mortality, % | 3 |
| 1st Lactation, % | 43 |
| 2nd Lactation, % | 27 |
| > 3rd Lactation, % | 30 |

Economics of an Average Cow, \$/year

| | |
|-------------------------------|-------|
| Net Return, \$ | 1969 |
| Milk Sales, \$ | 3806 |
| Feed Cost, \$ | -1522 |
| Calf Sales, \$ | 60 |
| Non-Reprod. Culling Cost, \$ | -198 |
| Mortality Cost, \$ | -38 |
| Reproductive Culling Cost, \$ | -59 |
| Reproductive Cost, \$ | -80 |

\$1,969/cow per year

Average net return of a cow in the herd according to herd production, reproduction, and economic variables

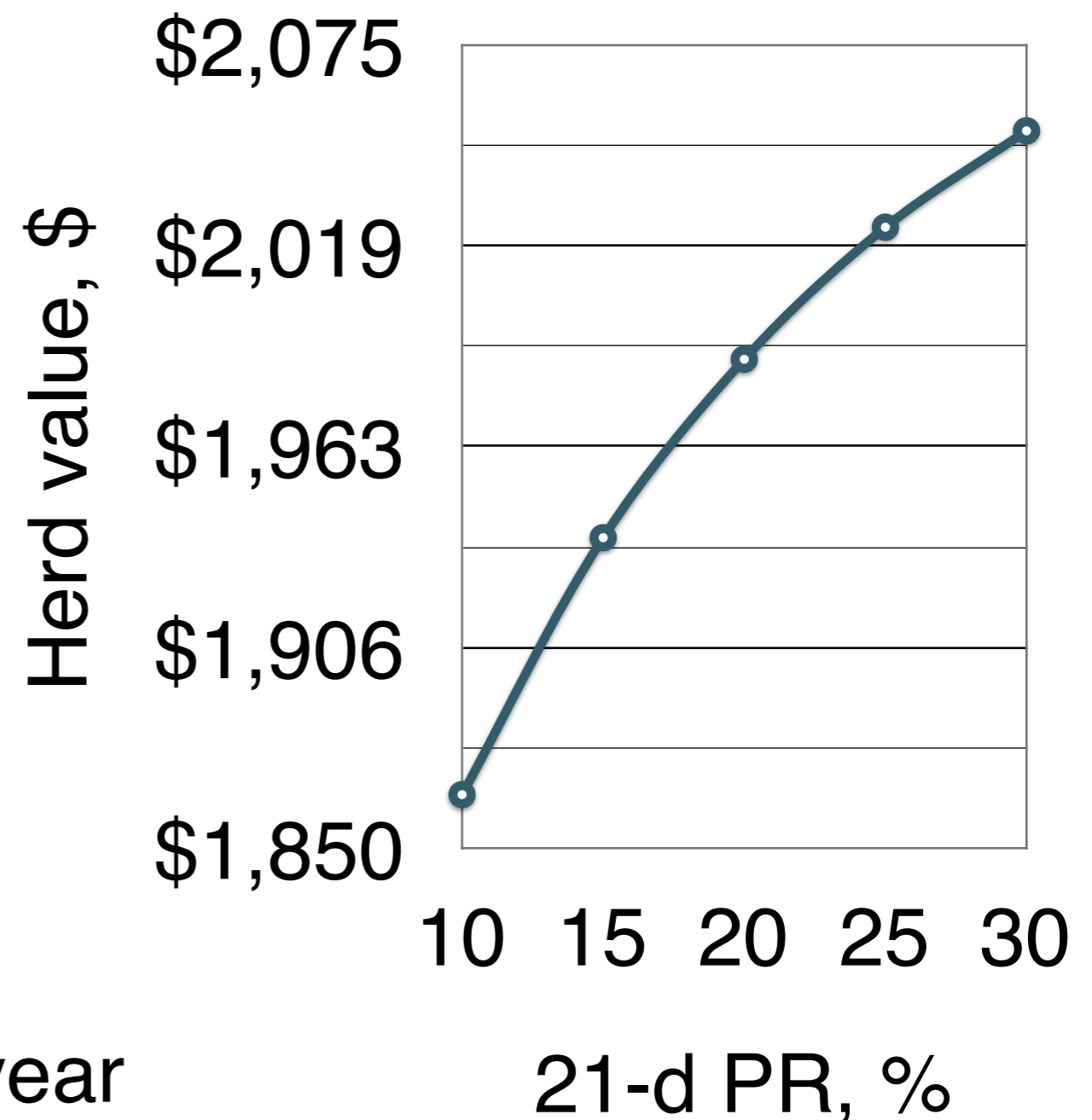
Herd value

Practical decision-making

Calculate the value of improved reproductive performance

Herd value difference of reproductive efficiency

E.g., value of improving 21-d pregnancy rate from 15 to 20% is **\$50/cow per year**



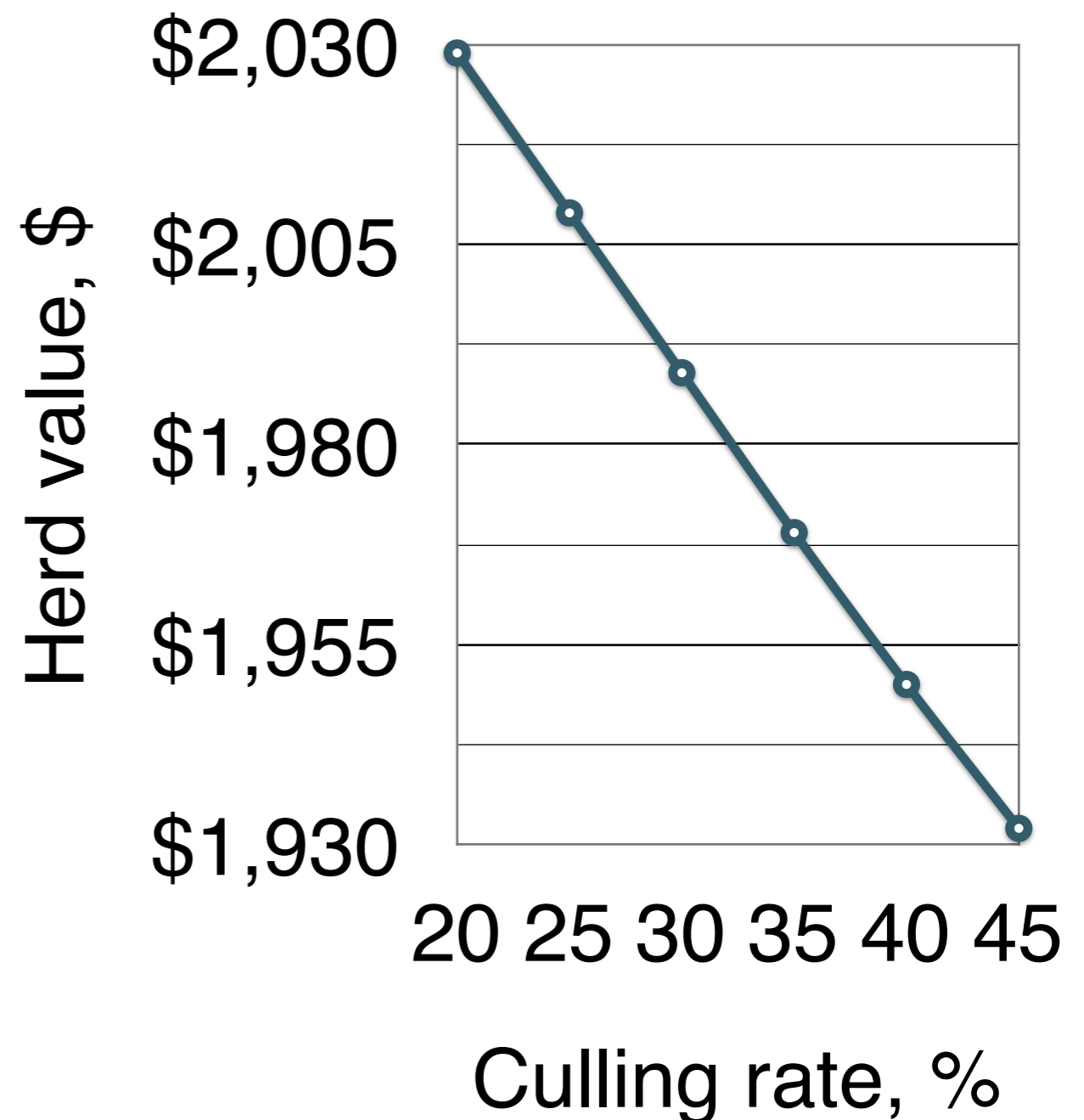
Herd value

Practical decision-making

Calculate the value of decreased culling rate

Herd value difference of changed culling rate

E.g., value of decreasing culling rate from 40 to 35% is **\$19/cow** per year



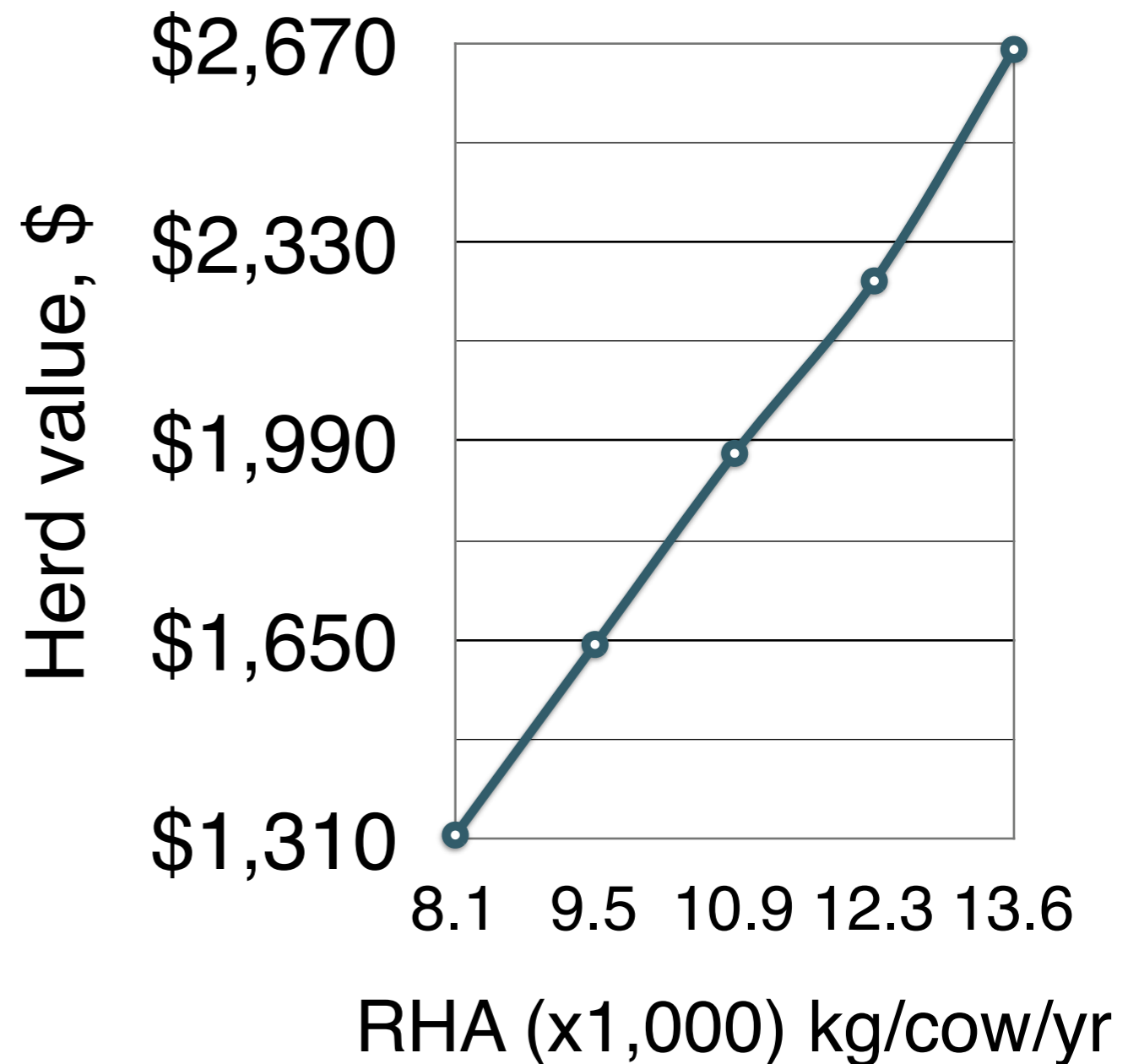
Herd value

Practical decision-making

Calculate the value of increased productivity

Herd value difference of changed rolling herd average (cow average production in a year)

E.g., value of improving RHA from 10.9 to 12.3 kg/cow per yr is **\$295/cow per year**



Dairy feed cost evaluator

Benchmarking income over feed cost

Income over feed cost

Milk value - feed cost
(very simple concept)

Important to benchmark

Against historical data

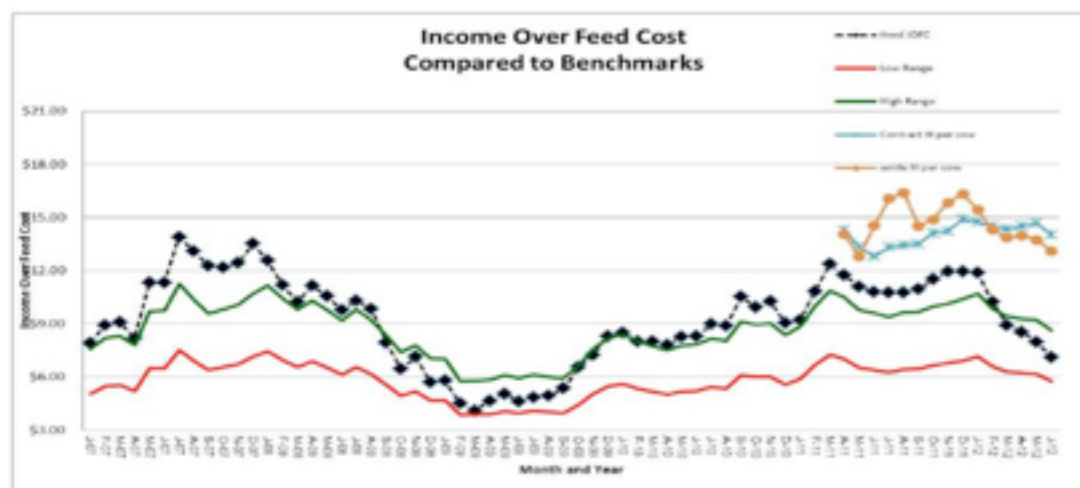
Against peers

Dynamic procedure

Permanent cycle of data collection, analysis, and decision making

Enables informed decisions

purchase feeds, price risk management, ration adjustment, etc.



Dairy feed cost evaluator

How to benchmark IOFC

Collect farm data



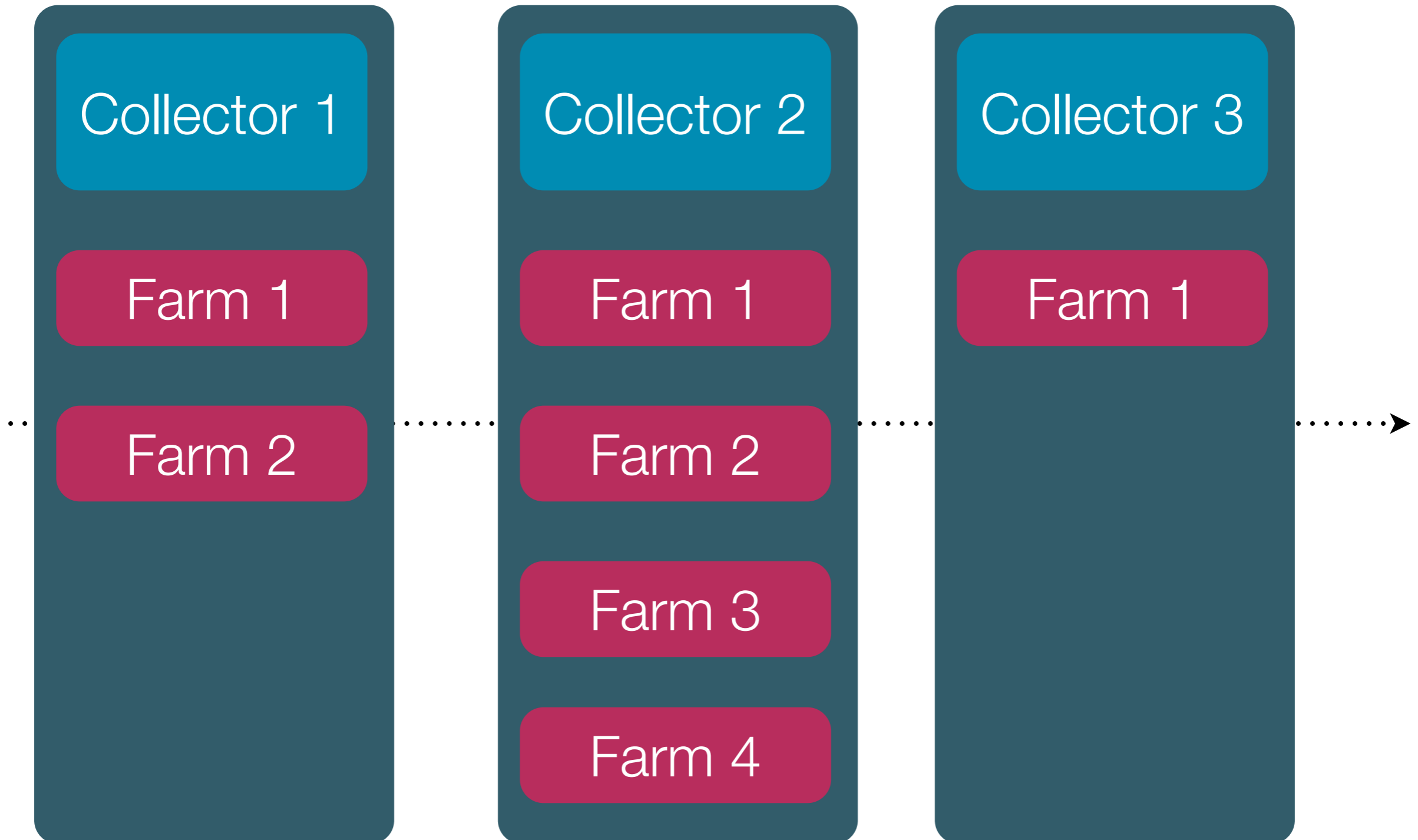
Analyze farm data



Compare farm data

Dairy feed cost evaluator

Data collection scheme



Dairy feed cost evaluator

Data collection scheme

The screenshot shows the web application interface for the Dairy Extension Feed Cost Evaluator. At the top, there is a green header with the title "DAIRY EXTENSION FEED COST EVALUATOR" and the subtitle "UWEX-DAIRY MANAGEMENT". Below the header, there are five circular navigation buttons: "Farms", "Ingredients", "Rations", "Summary", and "Analysis". A "LOGOUT" button is located in the top right corner. The main content area is titled "FARMS" and includes a "View & Edit Farms" link. On the left side, there is a list of farm names, each in a yellow button: Superior Farm 2, Griswold, Rosy-Lane, Superior Farm, JK23, Bomaz, Wallerman, Vlasak, metzger, Brovont, R2, R1, Trial1111, Trial123, TrialAlpha, TrialAlpha1, Trickeru, Finalise, and costa rica. A "Save" button is at the bottom of this list. On the right side, there is a form with a "Farm Name" input field and an "Add Farm" button. Below the form, there is a section titled "FARMS" with the subtitle "(View existing farms, add new farms, and delete farms)". Underneath, there is a section titled "IOFC DATABASE" with a welcome message and four numbered steps for using the system.

DAIRY EXTENSION FEED COST EVALUATOR
UWEX-DAIRY MANAGEMENT

Farms Ingredients Rations Summary Analysis LOGOUT

FARMS
View & Edit Farms

Farm Name

Superior Farm 2
Griswold
Rosy-Lane
Superior Farm
JK23
Bomaz
Wallerman
Vlasak
metzger
Brovont
R2
R1
Trial1111
Trial123
TrialAlpha
TrialAlpha1
Trickeru
Finalise
costa rica

Save

Farm Name Add Farm

FARMS
(View existing farms, add new farms, and delete farms)

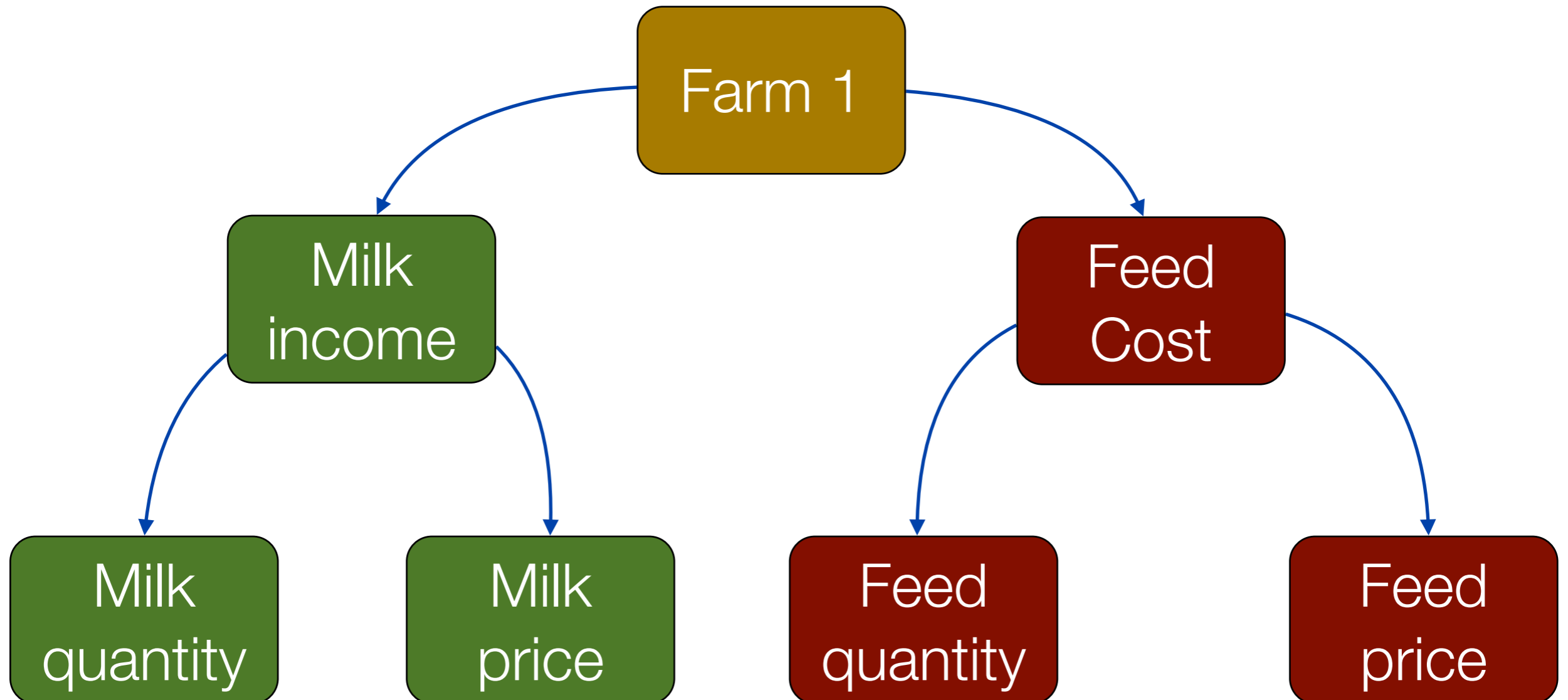
IOFC DATABASE

Welcome to IOFC Database. These are the suggested steps for using the system.

1. In this page, you can add or delete farms. To add a farm enter a farm name and select the county where the farm is located and click "Add Farms". To delete a farm, delete the farm name and click save.
2. Once the farms are defined, you can start defining the "Ingredients" on the ingredients page, their DM composition, and prices used on each particular farm.
3. Once the ingredients are entered, you can define the rations for different group of cows in the "Ration" page.
4. Once you have defined all ingredients and rations, you can see the IOFC summary at the "Summary" page. On this page, you would first need to enter the milk production and price.

Dairy feed cost evaluator

Data collection scheme



Dairy feed cost evaluator

Data collection scheme

| Forage | %DM | Price As Fed \$/ton | Price DM \$/ton |
|-----------------------------------|-----|------------------------|--------------------|
| Corn Silage 1 | | | |
| Hay Forage 1 | | | |
| Mx. Silage-MxSi | | | |
| Hay Forage | | | |
| Silage Mature >46% NDF-Si50 | | | |
| Silage Mid-mature 40-46% NDF-Si43 | | | |
| Silage Inmature <40% NDF-Si40 | | | |
| wheat straw | | | |
| aggregate | | | |
| | | | |
| | | | |

Dairy feed cost evaluator

Data collection scheme

Farm Name

Finalise

Month

February 2013

| Ration Group Information | Name | Number | Milking |
|---------------------------------|-------------|---------------|--------------------------|
| Ration Group 1 | Ration 1 | 0 | <input type="checkbox"/> |
| Ration Group 2 | Ration 2 | 0 | <input type="checkbox"/> |
| Ration Group 3 | Ration 3 | 0 | <input type="checkbox"/> |
| Ration Group 4 | Ration 4 | 0 | <input type="checkbox"/> |
| Ration Group 5 | Ration 5 | 0 | <input type="checkbox"/> |
| Ration Group 6 | Ration 6 | 0 | <input type="checkbox"/> |
| Ration Group 7 | Ration 7 | 0 | <input type="checkbox"/> |
| Ration Group 8 | Ration 8 | 0 | <input type="checkbox"/> |
| Ration Group 9 | Ration 9 | 0 | <input type="checkbox"/> |

Dairy feed cost evaluator

Data summary

| | Ration 1 | | Dry | | | Milking | Dry |
|------------------------------|-----------|----------|------------|------|---|---------|-----|
| | Purchased | | Home-Grown | | | | |
| | DMI | Cost | DMI | Cost | | | |
| Forage | 0 | 0 | 0 | 0 | | | |
| Energy/Protein Supplem | 0 | 0 | 0 | 0 | | | |
| Min-Vit & Additive Supp | 0 | 0 | - | | | | |
| Total Feed | 0 | 0 | 0 | | | | |
| DMI (lb/cow/d) | 0 | | | | | | |
| Feed Costs (\$/cow/d) | 0 | | | | | | |
| Number of Cows (#) | 0 | | | | | | |
| | | | | | Summary | | |
| | | | | | DMI (lb/cow/day) | | |
| | | | | | MILK/DMI | 0 | |
| | | | | | FCM/DMI | 0 | |
| | | | | | ECM/DMI | 0 | |
| | | | | | INCOME OVER FEED COSTS (IOFC) (\$/cow/day) | 0 | |
| | | | | | Income over Feed Costs per CWT(IOFC/cwt) (\$/cwt) | 0 | |
| | | | | | Feed Costs per DMI (\$/cwt) | 0 | |

Dairy feed cost evaluator

Data analyses

ANALYSIS

(Perform Analysis on Multiple Farms)

| Farm | Milking Cows | Month | Compare all your farms with all farms from |
|-------|------------------|------------|--|
| Farm1 | Less than 100 | June 2010 | cabrera |
| Farm2 | 100 to 350 | May 2010 | Dyk |
| Farm3 | 350-500 | April 2010 | |
| Farm4 | Greater than 500 | | |
| Farm5 | | | |

(Ctrl + Click to Make Multiple Selection)

Standardized Farm/Mailbox

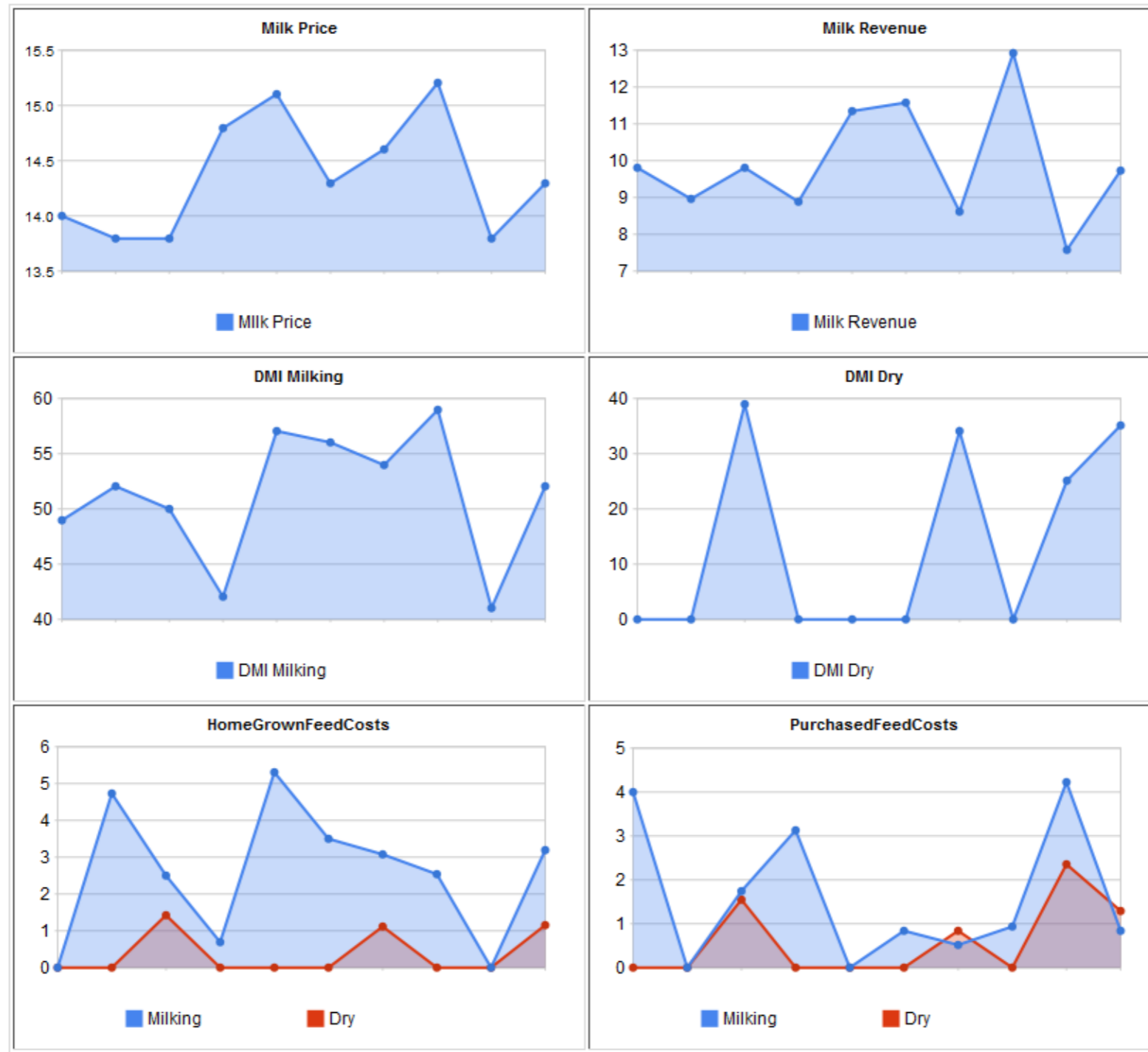
Analyze

Clear Selections

Dairy feed cost evaluator

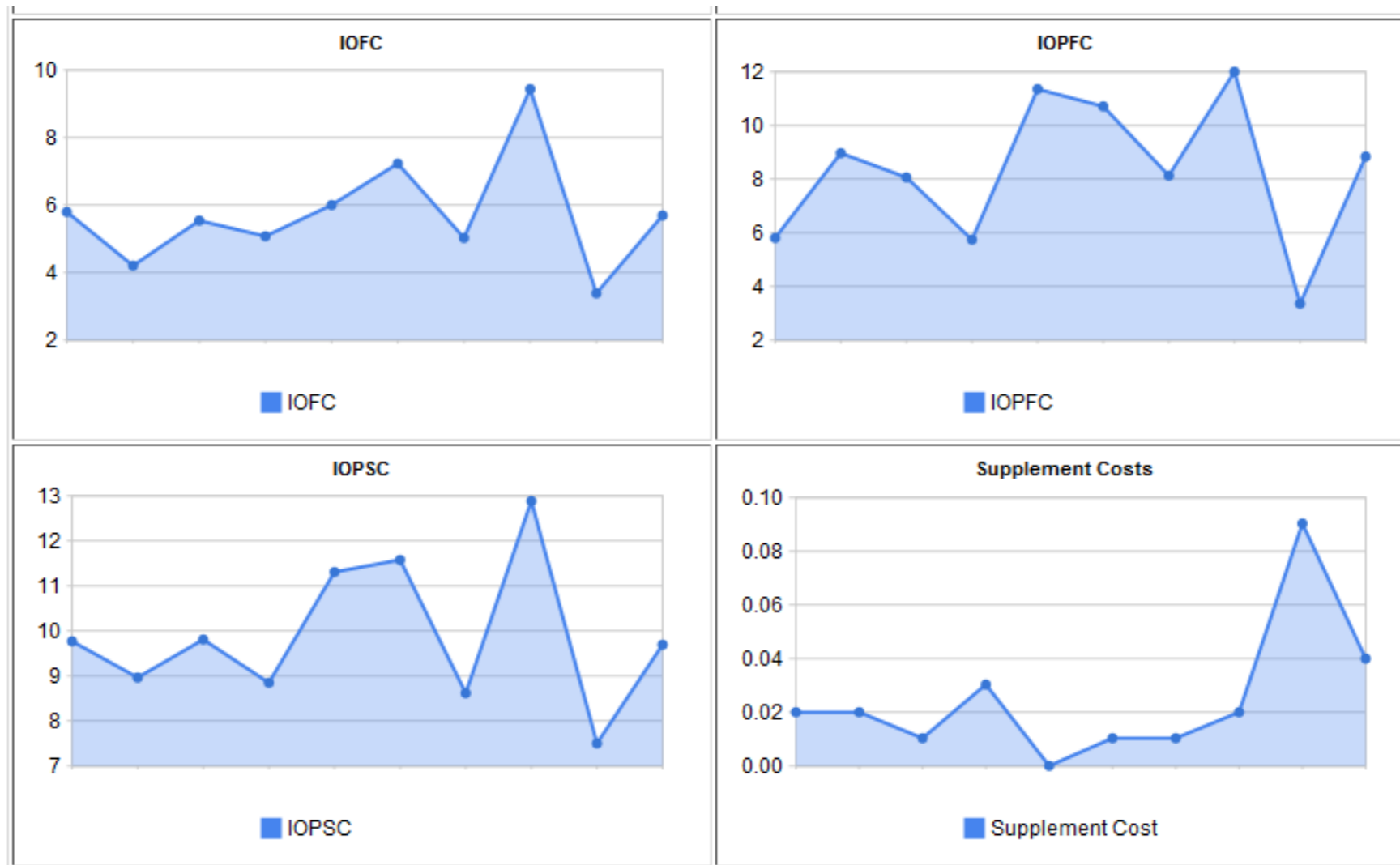
Data analyses

Graphical Representation
(Click on the Data Point for more information)



Dairy feed cost evaluator

Data analyses



Dairy feed cost evaluator

Case study

9 Wisconsin dairy farms

Around 12,000 cows

Fond Du Lac

Central East part of the State

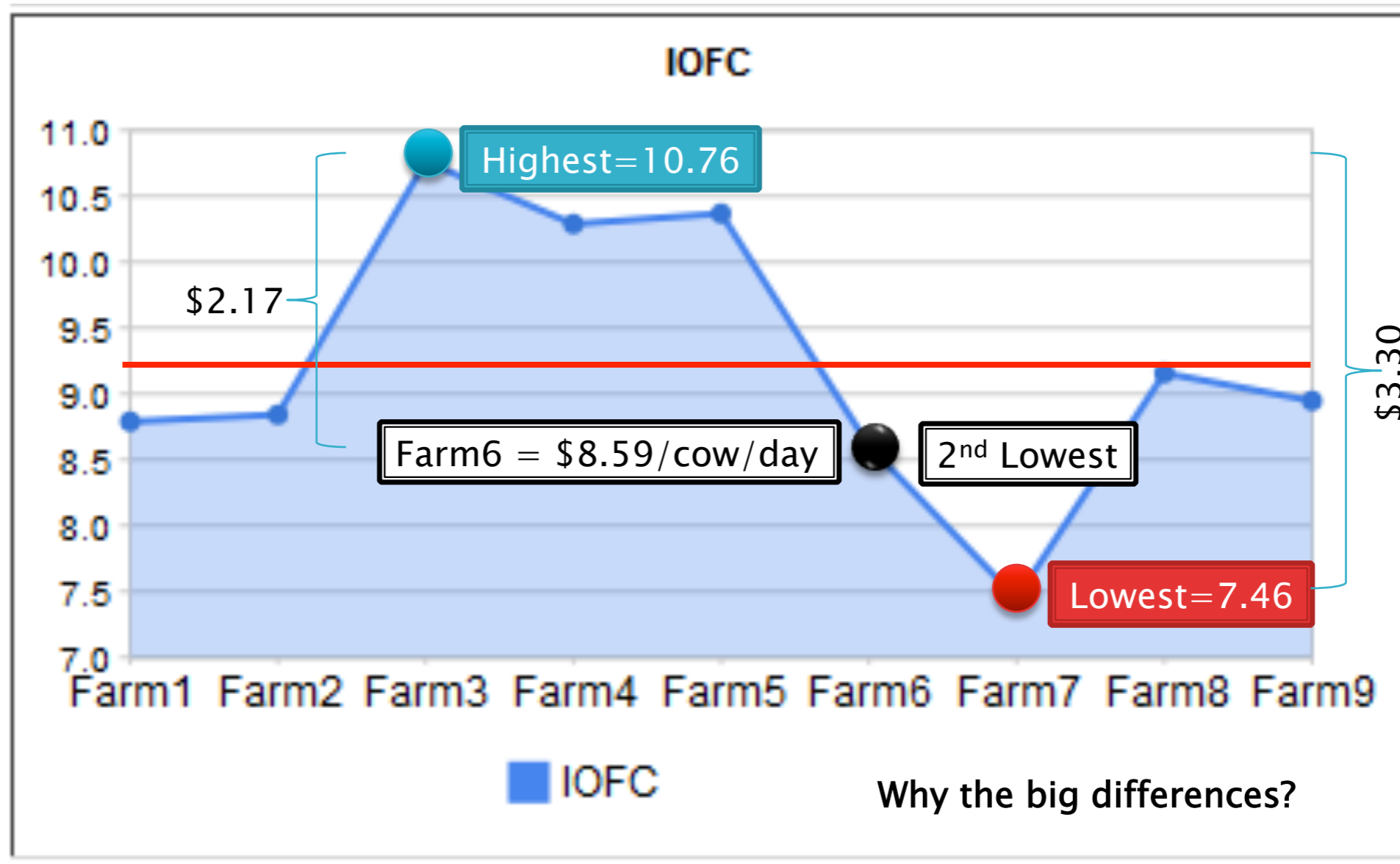
Collector

Paul Dyk (former
Extension agent)



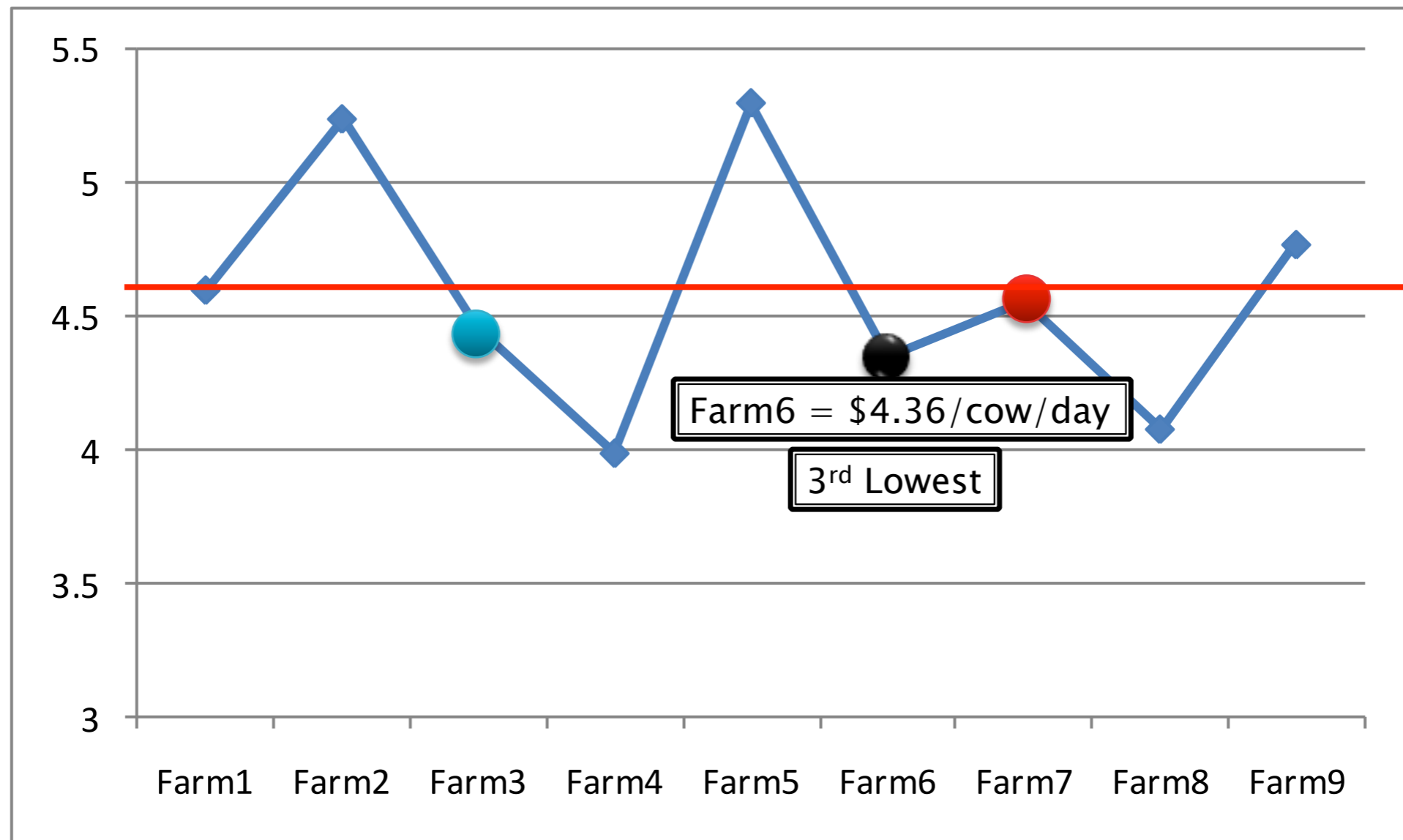
Dairy feed cost evaluator

Wisconsin case study



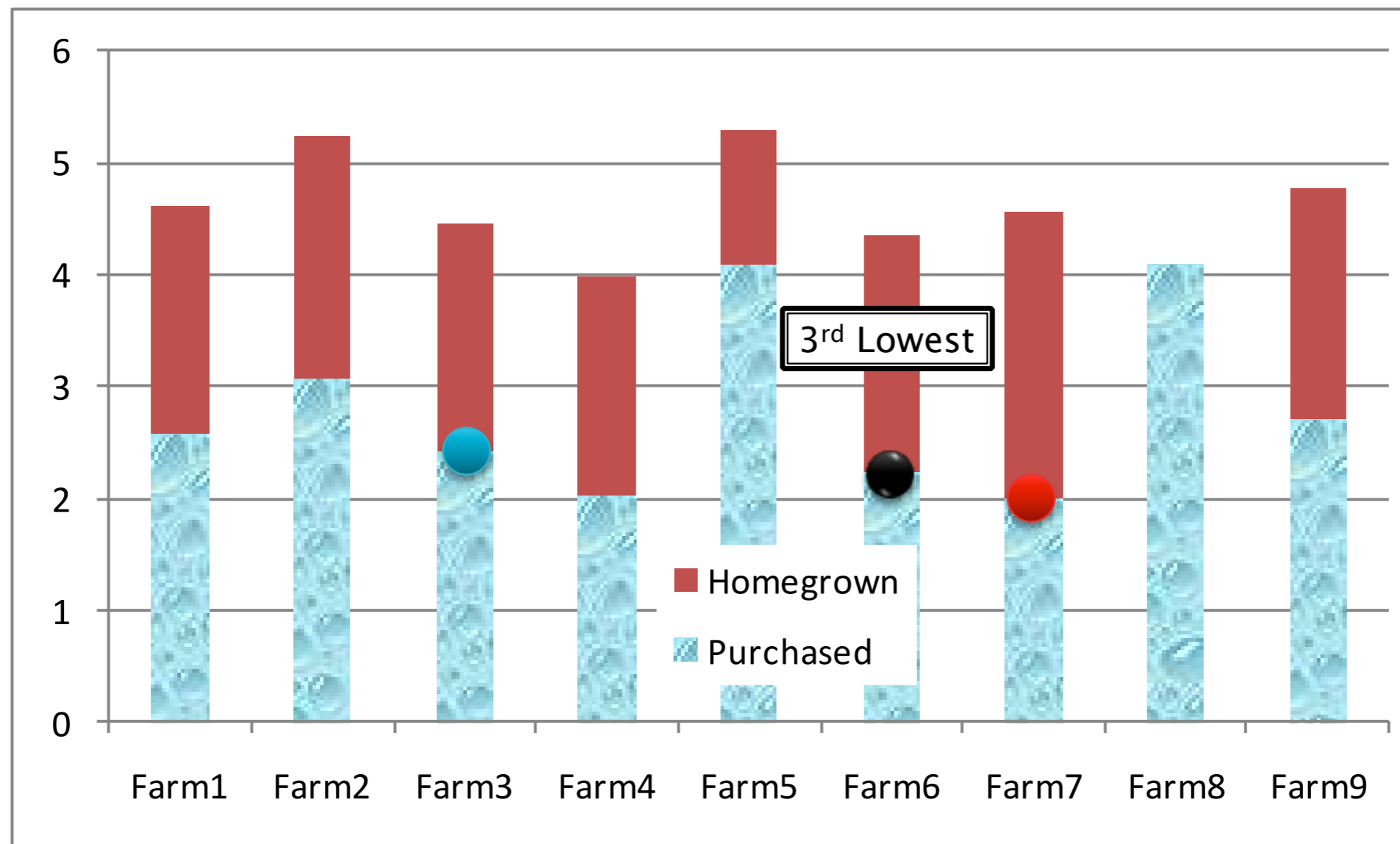
Dairy feed cost evaluator

Wisconsin case study: Feed costs



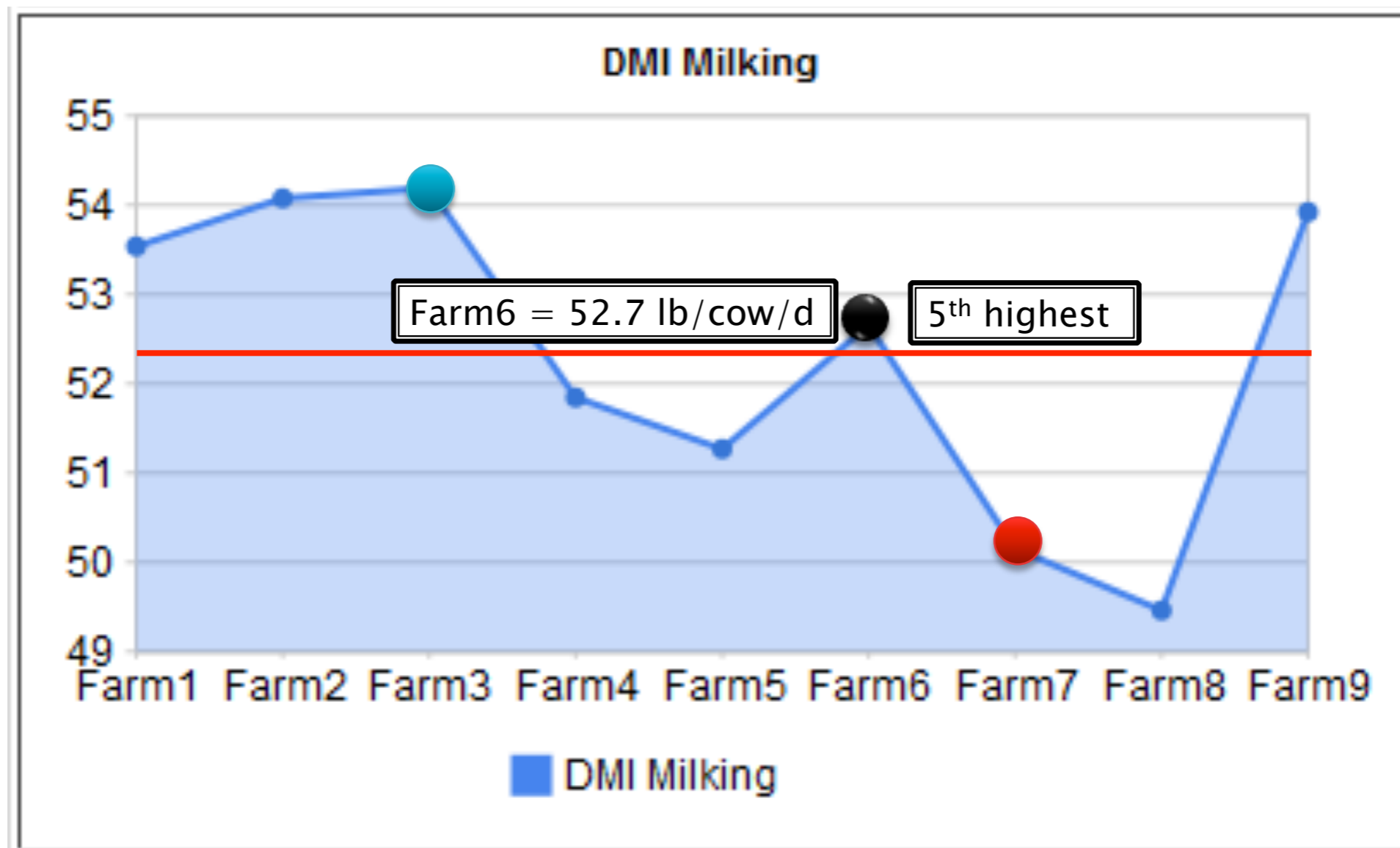
Dairy feed cost evaluator

Wisconsin case study: Feed costs



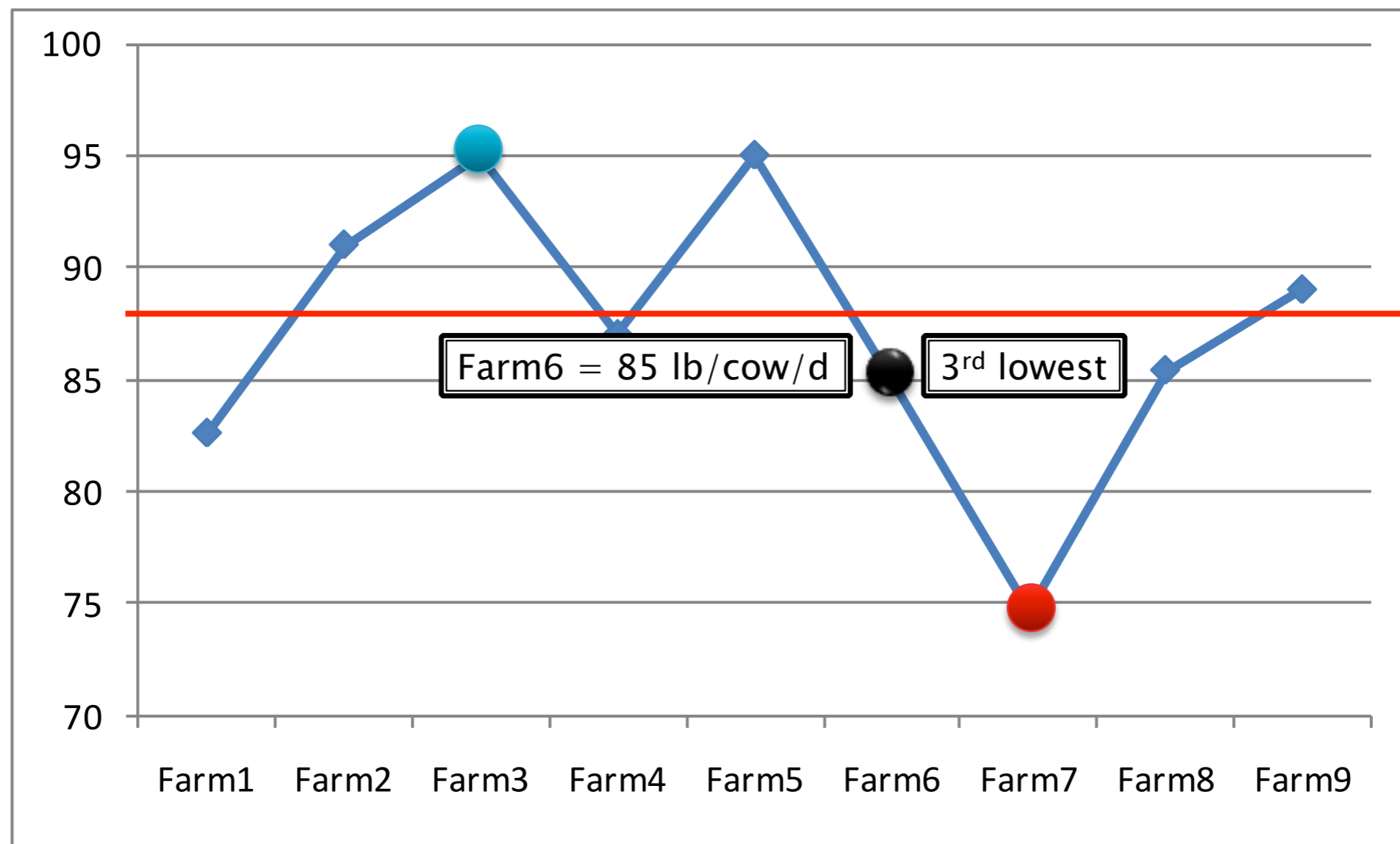
Dairy feed cost evaluator

Wisconsin case study: Dry matter intake



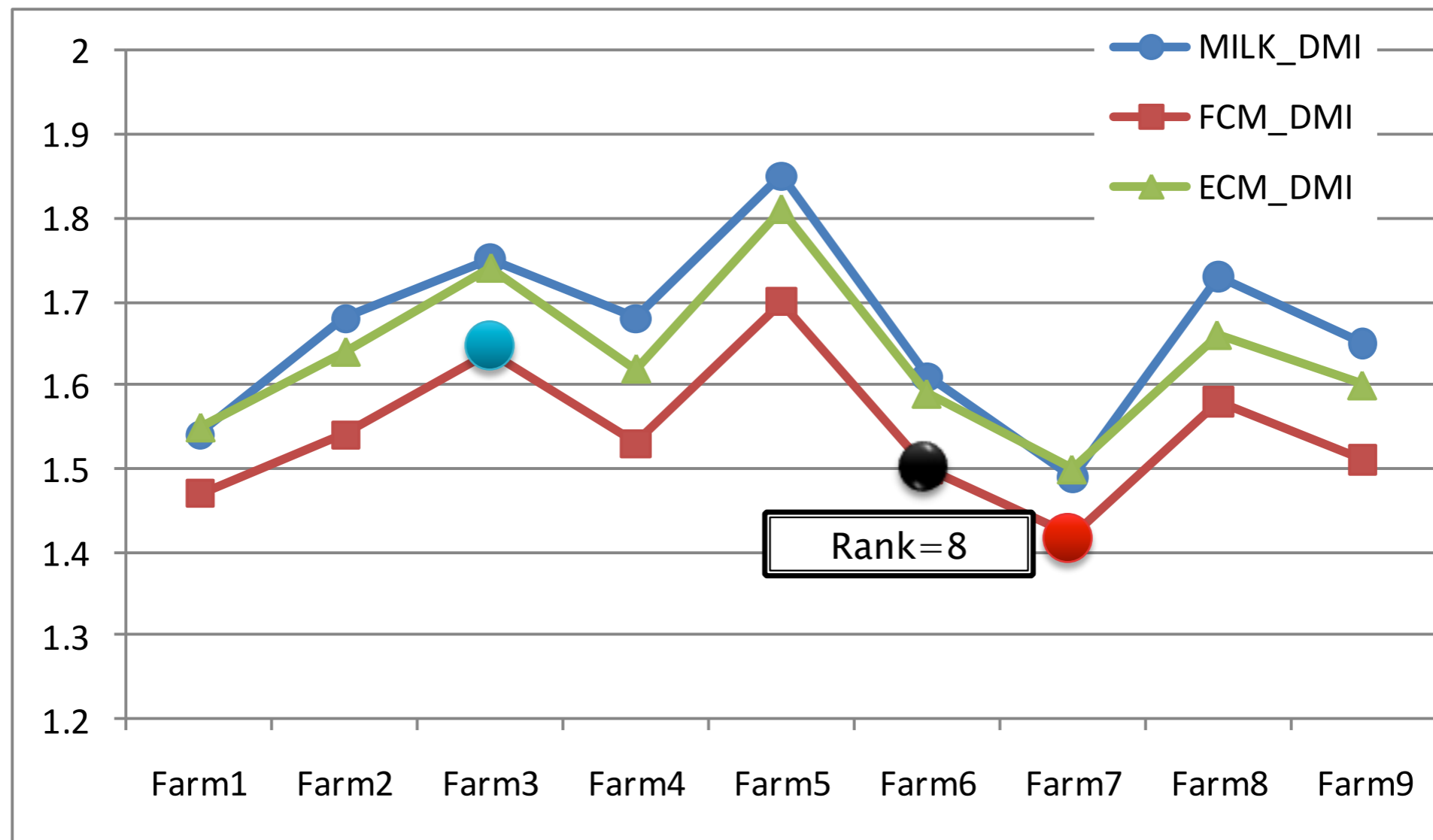
Dairy feed cost evaluator

Wisconsin case study: Milk (lb/cow per d)



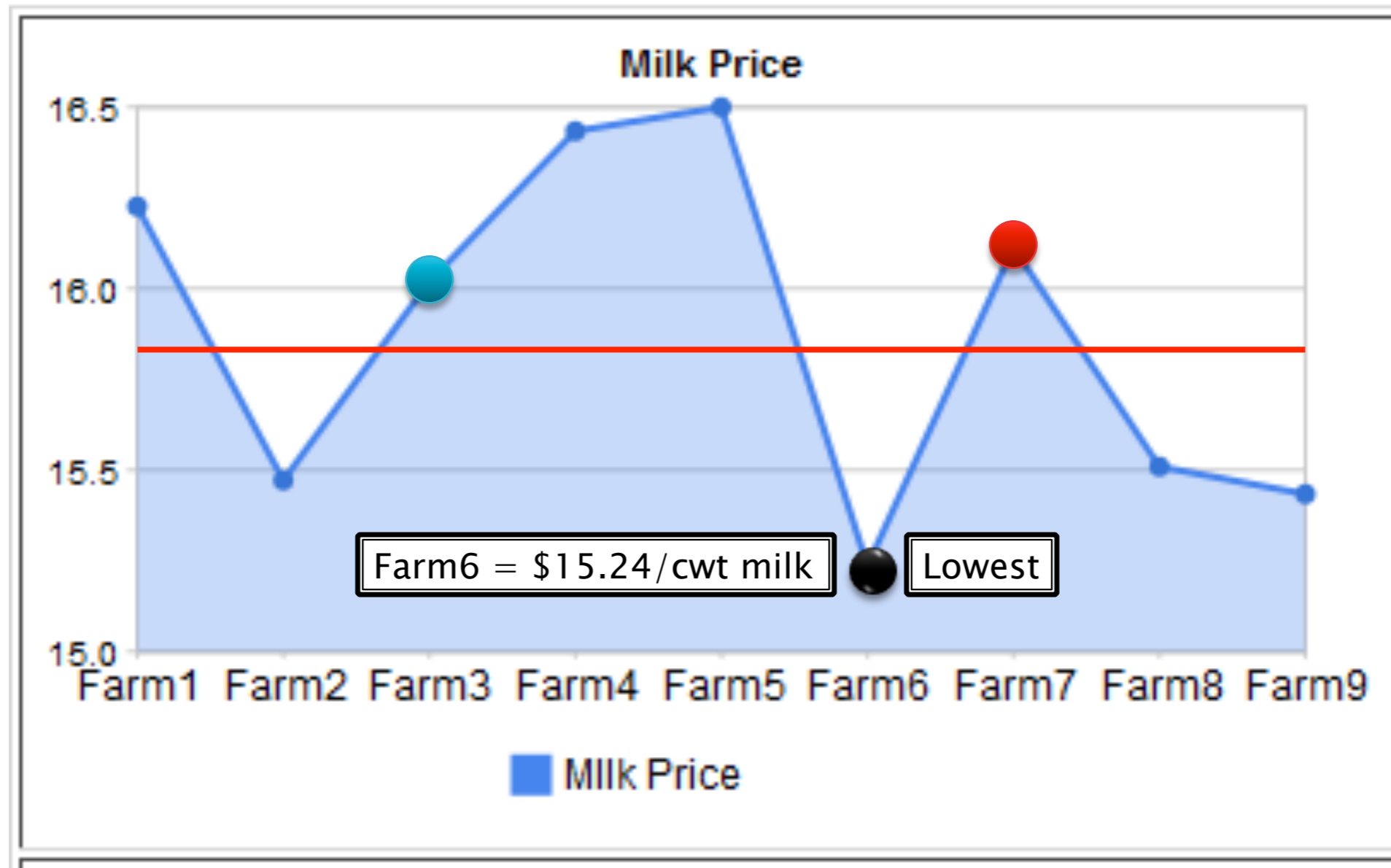
Dairy feed cost evaluator

Wisconsin case study: Feed efficiency



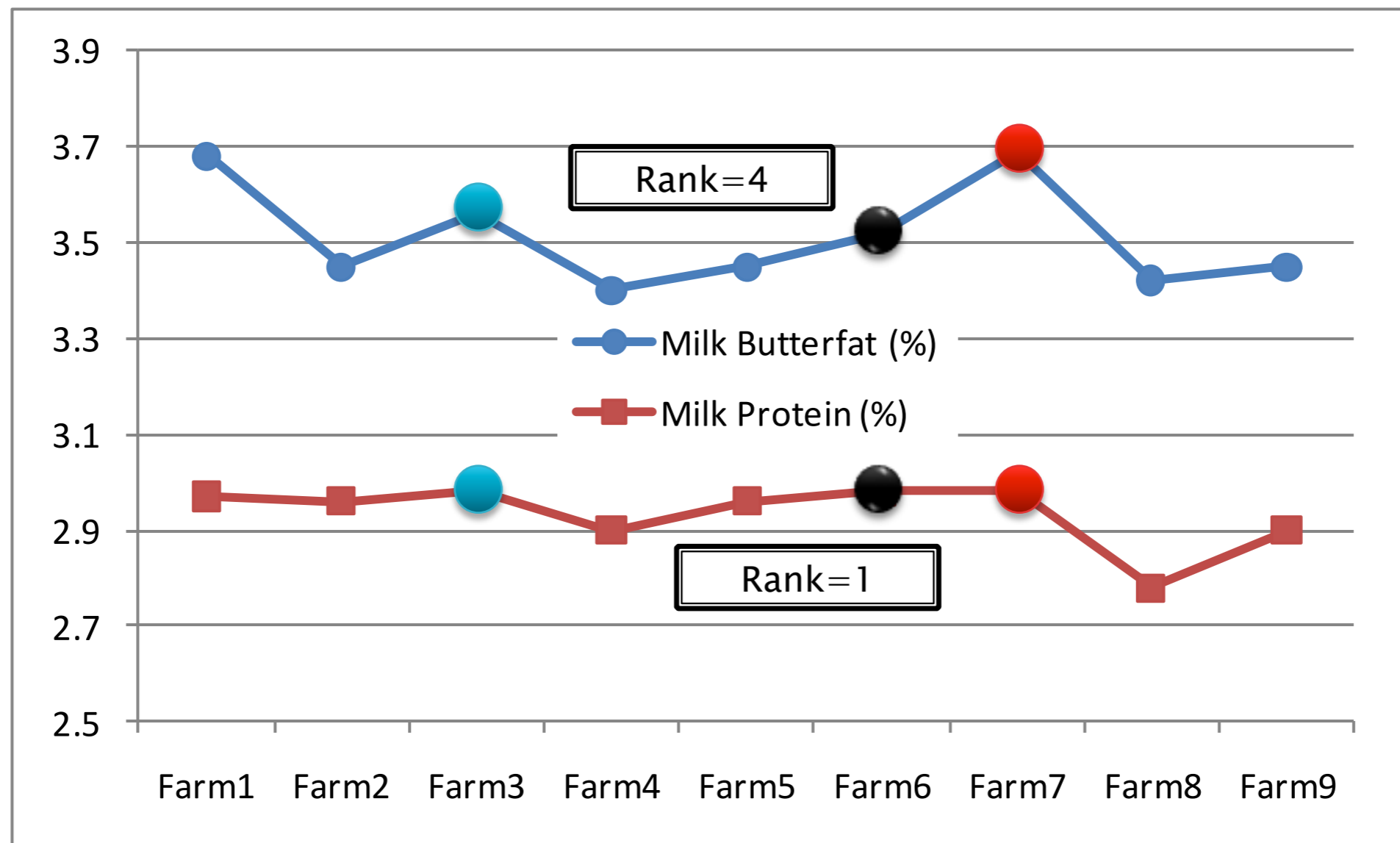
Dairy feed cost evaluator

Wisconsin case study: Milk price



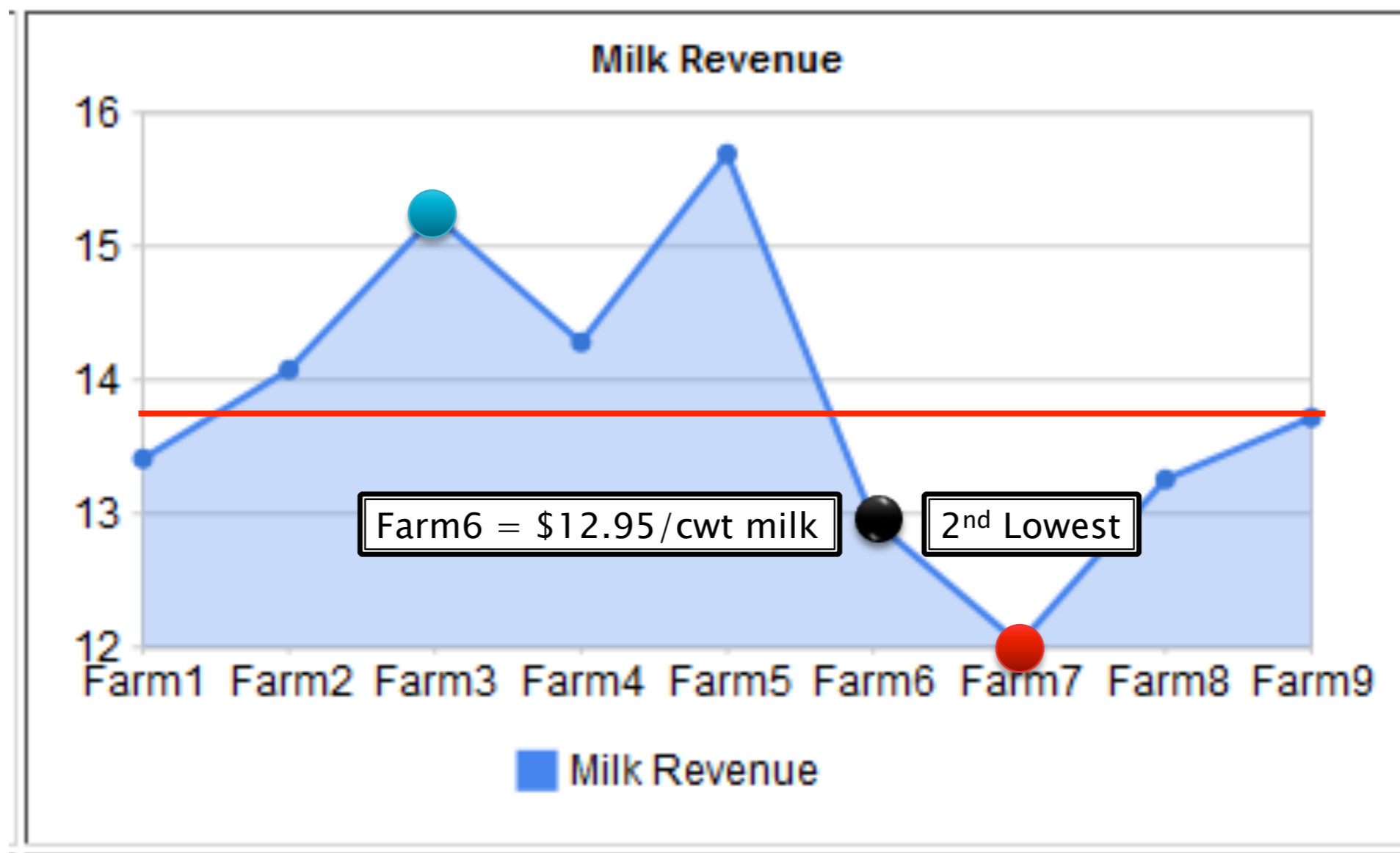
Dairy feed cost evaluator

Wisconsin case study: Milk components



Dairy feed cost evaluator

Wisconsin case study: Milk revenue



Dairy feed cost evaluator

Farm6 improvement plan

Look for better milk price

Good milk components,
but lowest price received:
Opportunity to negotiate

Reduce feed costs

Homegrown and
purchased
Forages and concentrates

Improve feed efficiency

Look for enhanced
production at DMI level
Maintain production at
lower DMI level
Check feed quality
permanently



Thanks