



# Helping dairy farmers to improve economic performance utilizing data-driven DSS tools



UW-Dairy Management  
Decision Support TOOLS

**Victor E. Cabrera**  
University of Wisconsin-Madison

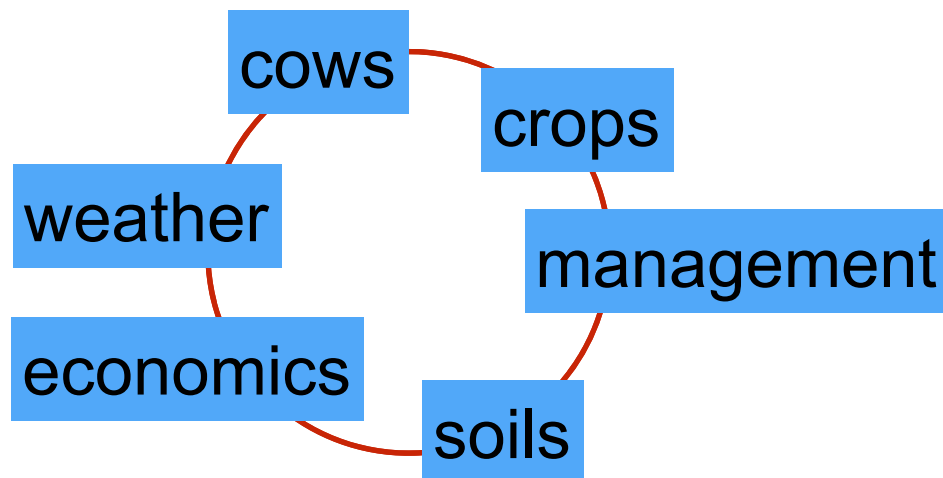
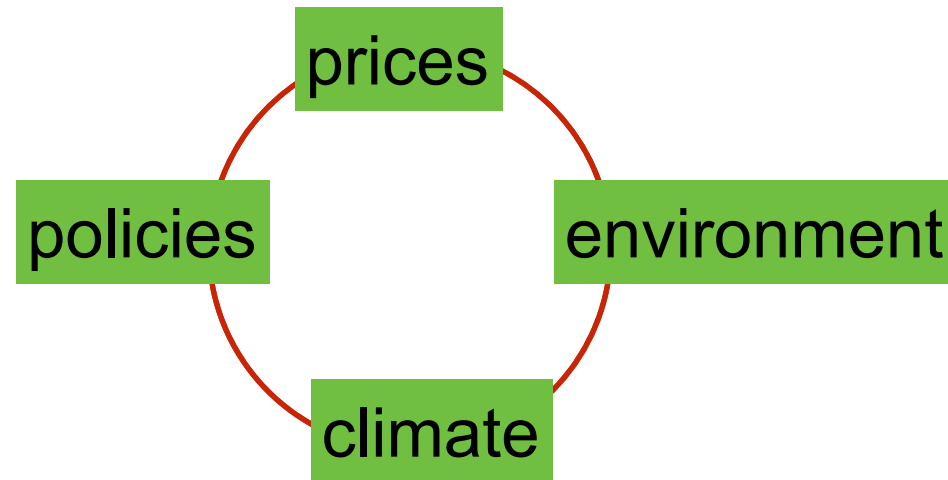


Supported by several USDA National Institute of Food and Agriculture and Hatch  
USDA Grants from College of Agriculture and Life Sciences from the University of  
Wisconsin-Madison



# Rationale - dairy farming decision-making

Highly **dynamic**  
Always changing



Highly **integrated**  
Interrelated components

# Successful dairy farming decision-making

Meaningful **DATA**  
Records

**Decision Support Systems**  
DSS Tools

**Integrated System Approach**



# Outline - description

## Describe DSS development

- DairyMGT.info
- > 40 DSS tools
- assist dairy farm decision makers
- decision-making and problem solving
- describe sample tools by management area



UW-Dairy Management  
Decision Support TOOLS

## Methods

- no single or special
- combination
- adaptation
- empirical



# Outline - description

## Overarching goal

- farm specific
- user-friendly
- scientifically sound
- relevant throughout time



## Providing answers

- fast
- concrete
- simple
- relevant

# Outline - description

## Innovative DSS tools

- many areas of dairy farm management
- practical and real-life applications
- impact documentation
- DSS tools performance



## Vision for the future

- new technologies
- opportunities
- challenges



This site is designed to support dairy farming decision-making focusing on model-based scientific research. The ultimate goal is to provide user-friendly computerized decision support tools to help dairy farmers improve their economic performance along with environmental stewardship.



UW-Dairy Management  
Decision Support TOOLS

## University of Wisconsin

- [University of Wisconsin - Madison](#)
- [UW - Cooperative Extension](#)
- [UW - Dairy Science](#)
- [Dairy Cattle Reproduction](#)
- [Dairy Cattle Nutrition](#)
- [Milk Quality](#)
- [UW Dairy Nutrient](#)
- [Understanding Dairy Markets](#)
- [UW Center for Dairy Profitability](#)

## Latest Projects

- [Improving Dairy Farm Sustainability](#)
- [Genomic Selection and Herd Management](#)
- [Dairy Reproduction Decision Support Tools](#)
- [Strategies of Pasture Supplementation](#)
- [Improving Dairy Cow Fertility](#)

## Contact



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Victor E. Cabrera, Ph.D.



## Helpful Link

[Repro Money Program](#)

### Tweets


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 **UW-Madison** [@UWMadison](#) 11 Apr

Drop everything, this time-lapse will make you want to shout from the mountaintops, "I love Madison!" [youtu.be/\\_8cGpjARTvw](https://youtu.be/_8cGpjARTvw)

↳ Retweeted by Victor E. Cabrera

[Show Media](#)

 **Victor E. Cabrera** [@vecabrera](#) 18 Mar




[wisc.edu](https://wisc.edu) [fb.me/6KXw7HaFF](https://fb.me/6KXw7HaFF)

Tweet to [@vecabrera](#)

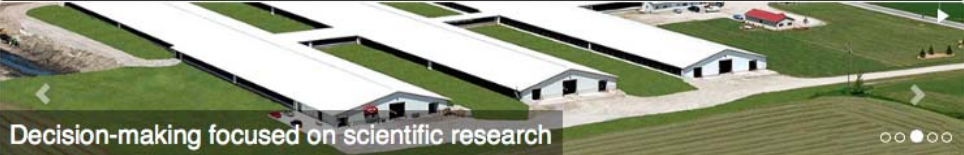




**Dairy Management**

[Home](#)
[Tools -](#)
[Projects](#)
[Publications](#)
[Presentations](#)
[Links](#)



**Decision-making focused on scientific research**

**Tools**

A collection of the state-of-the-art and scientific-based dairy farm management decision support tools that are user-friendly, interactive, robust, visually attractive, and self-contained. These tools count with associated documentation and video demonstrations. Technical support on their application is also available upon request.

**Feeding**

- > [FeedVal 2012](#)
- > [Grouping Strategies for Feeding Lactating Dairy Cattle](#)
- > [Optigen® Evaluator](#)
- > [Income Over Feed Supplement Cost](#)
- > [Dairy Extension Feed Cost Evaluator](#)
- > [Corn Feeding Strategies](#)
- > [Income Over Feed Cost](#)
- > [Dairy Ration Feed Additive Break-Even Analysis](#)

**Heifers**

- > [Heifer Pregnancy Rate](#)
- > [Cost-Benefit of Accelerated Liquid Feeding Program for Dairy Calves](#)
- > [Economic Value of Sexed Semen Programs for Dairy Heifers](#)
- > [Heifer Replacement](#)
- > [Heifer Break-Even](#)

**Reproduction**

- > [Wisconsin-Cornell Dairy Repro: A Reproductive Programs Economics Analysis Tool.](#)  
*Replaces previous tools UW-DairyRepro\$ and UW-DairyRepro\$Plus.*
- > [The Economic Value of a Dairy Cow](#)
- > [Economic Value of Sexed Semen Programs for Dairy Heifers](#)
- > [Exploring Timing of Pregnancy Impact on Income Over Feed Cost](#)
- > [Dairy Reproductive Economic Analysis](#)
- > [Heifer Pregnancy Rate](#)
- > [Retention Pay-Off \(RPO\) Calculator](#)

> 40 tools

**Production**

- > [Characteristics of organic, grazing, and conventional dairy farms in the state of Wisconsin](#)
- > [Milk Curve Fitter](#)
- > [Decision Support System Program for Dairy Production and Expansion](#)
- > [Economic Analysis of Switching from 2X to 3X Milking](#)
- > [Lactation Benchmark Curves for Wisconsin](#)
- > [Economic Evaluation of using rbST](#)
- > [Alfalfa Yield Predictor: Using a Computer Application to Predict Irrigated Alfalfa Yield](#)

**Replacement**

- > [The Economic Value of a Dairy Cow](#)
- > [Value of a Springer](#)
- > [Heifer Replacement](#)
- > [Heifer Break-Even](#)
- > [Herd Structure Simulation](#)
- > [Retention Pay-Off \(RPO\) Calculator](#)

**Health**

- > [Economic Evaluation of CholiPEARL](#)
- > [Improve Milk Bulk Tank SCC](#)

**Financial**

- > [LGM-Dairy Analyzer](#)
- > [Working Capital Decision Support System](#)
- > [The Wisconsin Dairy Farm Ratio Benchmarking Tool](#)
- > [Decision Support System Program for Dairy Production and Expansion](#)
- > [Least Cost Optimizer](#)
- > [LGM-Dairy Premium Sensitivity](#)
- > [Return to Labor](#)
- > [Estimate Your Mailbox Price](#)
- > [LGM Dairy Feed Equivalent Calculator](#)
- > [Net Guarantee Income Over Feed Cost for LGM-Dairy](#)

**Price Risk**

- > [LGM-Dairy Premium Sensitivity](#)
- > [Least Cost Optimizer](#)
- > [LGM Premium](#)
- > [LGM Dairy Feed Equivalent Calculator](#)
- > [Milk Component Price Analysis](#)

**Environment**

- > [Dairy Nutrient Manager](#)
- > [Grazing-N: Application that Balances Nitrogen in Grazing Systems](#)
- > [Seasonal Prediction of Manure Excretion](#)
- > [Dynamic Dairy Farm Model](#)

# Decision support tools

## Farm-specific assessments

**Farm conditions change**

Decisions should adjust

**Every farm is different**



**Market conditions  
change permanently**

Prices and cost  
impact decisions



**Applications should  
be user-friendly**

Still scientifically sound  
and robust

# Elements of Decision Support Tools

## UW-Dairy Management

Category

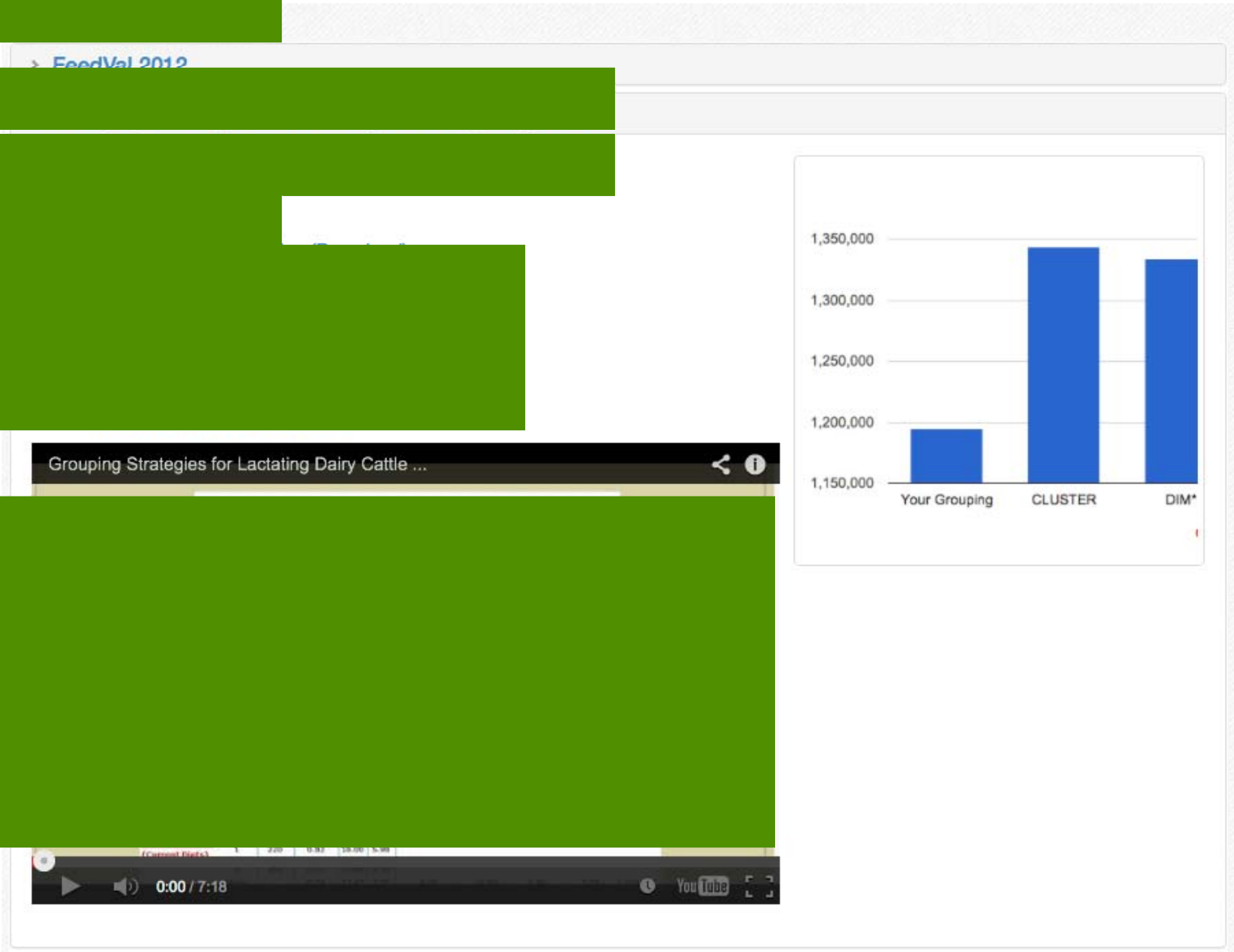
Name

Short description

Link

Supplementary  
documentation

Video  
demonstration



# FeedVal

## Actual value of dairy feed ingredients

**FeedVal v6.0**  
V. E. Cabrera, L. Armentano, R. D. Shaver

Overview **Tool** Help

---

### Upload Data

**Template Spreadsheet:**

**Upload data as Excel file:**  
 no file selected

### Select Nutrients and Date

**Select nutrients:**  
4 selected ▾

**Price date:**  
2016-07-26

---

### Perform Analysis

Remove nutrients with negative predicted unit costs.

|   | <input type="checkbox"/>            | Ingredient             | Nutrients |       |               |         | As-Fed Basis |       |                | Calculated              |                                      |
|---|-------------------------------------|------------------------|-----------|-------|---------------|---------|--------------|-------|----------------|-------------------------|--------------------------------------|
|   |                                     |                        | RUP %     | RDP % | NEI3x Mcal/lb | peNDF % | DM %         | Unit  | Price* \$/Unit | Predicted Value \$/Unit | Actual Price as % of Predicted Value |
| 1 | <input checked="" type="checkbox"/> | Shelled Corn           | 4.5       | 4.5   | 0.91          | 0       | 86           | ton ▾ | 142.86         | 199.795/ton             | 72                                   |
| 2 | <input checked="" type="checkbox"/> | Soybean Meal 48%       | 21        | 33    | 1             | 0       | 89           | ton ▾ | 399            | 378.132/ton             | 106                                  |
| 3 | <input checked="" type="checkbox"/> | Soybean Meal 44%       | 17.5      | 32.5  | 0.97          | 0       | 89           | ton ▾ | 387            | 347.858/ton             | 111                                  |
| 4 | <input type="checkbox"/>            | Soybean Meal, expeller | 30        | 16    | 1.09          | 0       | 92           | ton ▾ |                | 446.189/ton             |                                      |
| 5 | <input checked="" type="checkbox"/> | Soybeans, raw          | 12        | 28    | 1.25          | 0       | 87           | ton ▾ | 323            | 347.753/ton             | 93                                   |
| 6 | <input type="checkbox"/>            | Soybeans, heated       | 22        | 21    | 1.24          | 0       | 92           | ton ▾ |                | 425.998/ton             |                                      |
| 7 | <input checked="" type="checkbox"/> | Good Quality Hay       | 6         | 14    | 0.6           | 35      | 87           | ton ▾ | 184            | 161.065/ton             | 114                                  |
| 8 | <input checked="" type="checkbox"/> | Poor Quality Hay       | 4.8       | 11.2  | 0.5           | 50      | 87           | ton ▾ | 100            | 127.297/ton             | 79                                   |

farm specific  
**DATA**

referee  
**NUTRIENTS**

FeedVal v6.0  
V. E. Cabrera, L. Armentano, R. D. Shaver

Overview Tool Help

Upload Data

Template Spreadsheet:  
Download

Upload data as Excel file:  
Choose File no file selected

Upload

Select Nutrients and Date

Select nutrients:  
4 selected

Price date:  
2016-07-26

ingredients  
nutrients  
prices  
**DATA**

**PRICES**  
daily for midwest US  
as reference



market  
**PRICE**

**ACTUAL**  
price

Perform Analysis

Analyze Download Results Convert all to kg Refresh

Remove nutrients with negative predicted unit costs.

|   | <input type="checkbox"/>            | Ingredient             | Nutrients |       |               |         | As-Fed Basis |      | Calculated     |                         |                                      |
|---|-------------------------------------|------------------------|-----------|-------|---------------|---------|--------------|------|----------------|-------------------------|--------------------------------------|
|   |                                     |                        | RUP %     | RDP % | NE13x Mcal/lb | peNDF % | DM %         | Unit | Price* \$/Unit | Predicted Value \$/Unit | Actual Price as % of Predicted Value |
| 1 | <input checked="" type="checkbox"/> | Shelled Corn           | 4.5       | 4.5   | 0.91          | 0       | 86           | ton  | 142.86         | 199.795/ton             | 72                                   |
| 2 | <input checked="" type="checkbox"/> | Soybean Meal 48%       | 21        | 33    | 1             | 0       | 89           | ton  | 399            | 378.132/ton             | 106                                  |
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| 4 | <input type="checkbox"/>            | Soybean Meal, expeller | 30        | 16    | 1.09          | 0       | 92           | ton  |                | 446.189/ton             |                                      |
| 5 | <input checked="" type="checkbox"/> | Soybeans, raw          | 12        | 28    | 1.25          | 0       | 87           | ton  | 323            | 347.753/ton             | 93                                   |
| 6 | <input type="checkbox"/>            | Soybeans, heated       | 22        | 21    | 1.24          | 0       | 92           | ton  |                | 425.998/ton             |                                      |
| 7 | <input checked="" type="checkbox"/> | Good Quality Hay       | 6         | 14    | 0.6           | 35      | 87           | ton  | 184            | 161.065/ton             | 114                                  |
| 8 | <input checked="" type="checkbox"/> | Poor Quality Hay       | 4.8       | 11.2  | 0.5           | 50      | 87           | ton  | 100            | 127.297/ton             | 79                                   |

**REFEREE**  
ingredients  
(market price)

**VALUE**  
good or bad  
ingredient purchases

# SPECIFIC location & time

| FeedVal v6.0 predicted dairy feed prices and rankings for June 2016 <sup>1</sup> |      |      |                       |           |   |                     |
|--|------|------|-----------------------|-----------|---|---------------------|
| V.E. Cabrera, P. Hoffman, and R. Shaver  |      |      |                       |           |   |                     |
| Ingredient   | DM % | Unit | Feed Prices (\$/Unit) |           | Actual Price as %<br>of Predicted Value | Best-buy<br>Ranking |
|  |      |      | Market                | Predicted |   |                     |
| Wheat Middlings  | 89   | ton  | 95.0                  | 192.9     | 49                                      | 1                   |
| Hominy   | 89   | ton  | 102.0                 | 199.4     | 51                                      | 2                   |
| Corn Gluten Feed   | 89   | ton  | 128.0                 | 222.7     | 57                                      | 3                   |
| Soy Hulls  | 89   | ton  | 110.0                 | 177.6     | 62                                      | 4                   |
| Distillers Dried Grains  | 89   | ton  | 185.0                 | 292.3     | 63                                      | 5                   |
| Shelled Corn   | 86   | ton  | 142.9                 | 200.0     | 71                                      | 6                   |
| Corn Silage  | 35   | ton  | 40.0                  | 53.9      | 74                                      | 7                   |
| Poor Quality Hay   | 87   | ton  | 89.0                  | 117.7     | 76                                      | 8                   |
| Oats   | 89   | ton  | 155.0                 | 194.2     | 80                                      | 9                   |
| Wheat  | 89   | ton  | 172.7                 | 213.0     | 81                                      | 10                  |
| Sunflower Meal   | 89   | ton  | 170.0                 | 202.8     | 84                                      | 11                  |
| Barley   | 89   | cwt  | 9.0                   | 9.7       | 92                                      | 12                  |
| Soybeans, raw  | 87   | ton  | 323.0                 | 348.0     | 93                                      | 13                  |
| Blood Meal   | 94   | ton  | 750.0                 | 786.9     | 95                                      | 14                  |
| Beet Pulp  | 89   | ton  | 160.0                 | 166.4     | 96                                      | 15                  |
| Cottonseed Meal  | 89   | ton  | 315.0                 | 318.7     | 99                                      | 16                  |
| Urea   | 99   | ton  | 472.0                 | 466.6     | 101                                     | 17                  |
| Canola Meal, expeller  | 89   | ton  | 301.0                 | 296.1     | 102                                     | 18                  |
| Soybean Meal 48%   | 89   | ton  | 399.0                 | 378.3     | 105                                     | 19                  |
| Molasses   | 89   | ton  | 185.0                 | 168.7     | 110                                     | 20                  |
| Soybean Meal 44%   | 89   | ton  | 387.0                 | 348.0     | 111                                     | 21                  |
| Good Quality Hay   | 87   | ton  | 172.0                 | 154.4     | 111                                     | 22                  |
| Corn Gluten Meal   | 89   | ton  | 605.0                 | 522.1     | 116                                     | 23                  |
| Tallow   | 99   | cwt  | 29.0                  | 21.4      | 136                                     | 24                  |
| Whole Cottonseed   | 89   | ton  | 308.0                 | 221.7     | 139                                     | 25                  |
| Linseed Meal   | 89   | ton  | 420.0                 | 267.0     | 157                                     | 26                  |
| Soybean Meal, expeller   | 92   | ton  |                       | 446.3     |   |                     |
| Soybeans, heated   | 92   | ton  |                       | 426.2     |   |                     |
| Earlage/Snaplage   | 60   | ton  |                       | 125.0     |   |                     |
| High-Moisture Corn   | 70   | ton  |                       | 164.9     |   |                     |
| Straw  | 85   | ton  |                       | 76.2      |   |                     |
| Canola Meal, solvent   | 89   | ton  |                       | 266.1     |   |                     |
| Hi-Pro Distillers  | 89   | ton  |                       | 350.4     |   |                     |
| Wet Distillers   | 45   | ton  |                       | 141.5     |   |                     |
| Brewers Dried Grains   | 89   | ton  |                       | 269.9     |   |                     |
| Wet Brewers  | 25   | ton  |                       | 71.3      |   |                     |
| Malt Sprouts   | 89   | ton  |                       | 219.0     |   |                     |
| Wheat Bran   | 89   | ton  |                       | 180.5     |   |                     |
| Corn Stover  | 80   | ton  |                       | 60.9      |   |                     |
| Whey   | 20   | ton  |                       | 40.1      |   |                     |

**BEST**  
purchases

**WORST**  
purchases

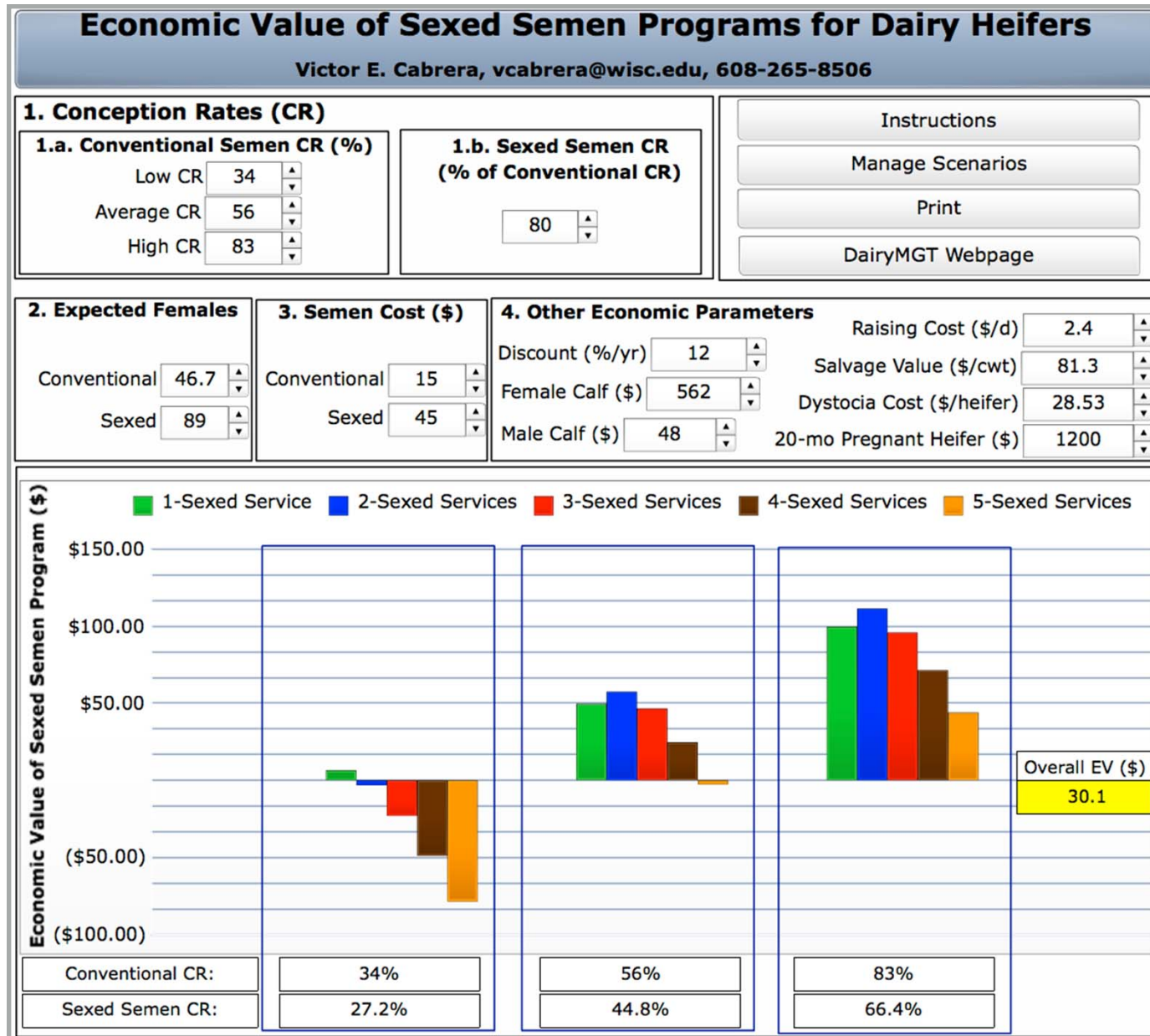
**NON-REFEREE**  
ingredients

**CALCULATED**  
prices

<sup>1</sup>Analysis performed using UW-Madison FeedVal v6.0: [http://dairymgt.info/tools/feedval\\_12\\_v2/index.php](http://dairymgt.info/tools/feedval_12_v2/index.php) including 26 feed ingredients displayed in top part of the table, 4 nutrients: RUP, RDP, NEL, and peNDF; and using general wholesale FOB Midwest input prices. These results might change substantially depending on: local input prices, nutrients, and feed ingredients used for price formation. For more in-depth analyses please use the FeedVal v6.0 decision support tool and local input prices.

# Economic Value of Sexed Semen

Value of using sexed semen on dairy heifers



farm specific  
reproductive  
performance  
**DATA**

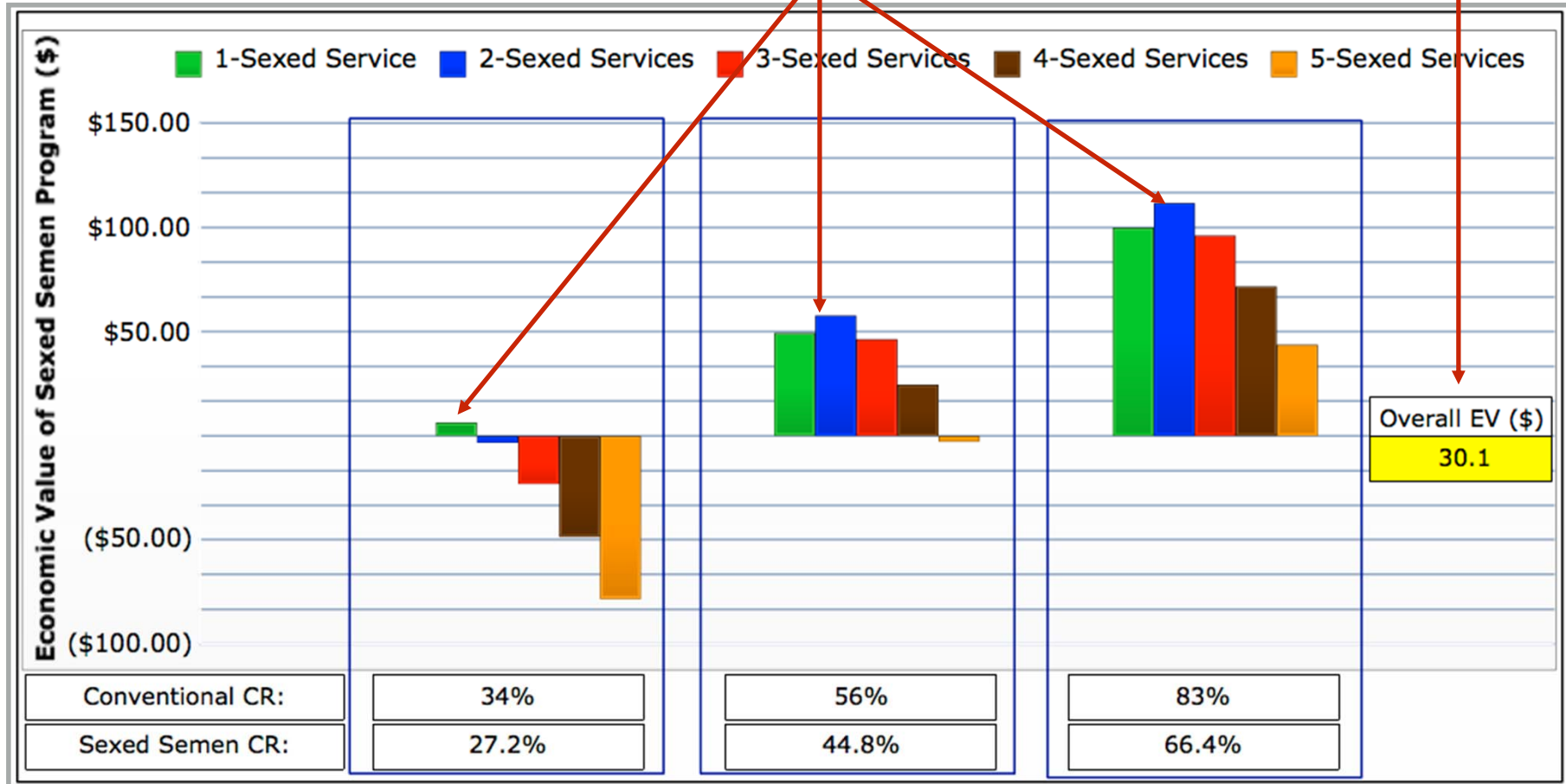
**EXPECTED**  
performance  
with sexed  
semen

| <b>Economic Value of Sexed Semen Programs for Dairy Heifers</b> |      |   |       |
|---|------|---|-------|
| Victor E. Cabrera, vcabrera@wisc.edu, 608-265-8506              |      |   |       |
| <b>1. Conception Rates (CR)</b>                                 |      |   |       |
| <b>1.a. Conventional Semen CR (%)</b>                           |      | <b>1.b. Sexed Semen CR (% of Conventional CR)</b> |       |
| Low CR  | 34   |   |       |
| Average CR  | 56   |   | 80    |
| High CR   | 83   |   |       |
|   |      | Instructions                                      |       |
|   |      | Manage Scenarios                                  |       |
|   |      | Print   |       |
|   |      | DairyMGT Webpage                                  |       |
| <b>2. Expected Females</b>                                      |      | <b>3. Semen Cost (\$)</b>                         |       |
| Conventional  | 46.7 | Conventional                                      | 15    |
| Sexed   | 89   | Sexed   | 45    |
|   |      | <b>4. Other Economic Parameters</b>               |       |
|   |      | Discount (%/yr)                                   | 12    |
|   |      | Female Calf (\$)                                  | 562   |
|   |      | Male Calf (\$)                                    | 48    |
|   |      | Raising Cost (\$/d)                               | 2.4   |
|   |      | Salvage Value (\$/cwt)                            | 81.3  |
|   |      | Dystocia Cost (\$/heifer)                         | 28.53 |
|   |      | 20-mo Pregnant Heifer (\$)                        | 1200  |

**ADDITIONAL**  
production and economic information

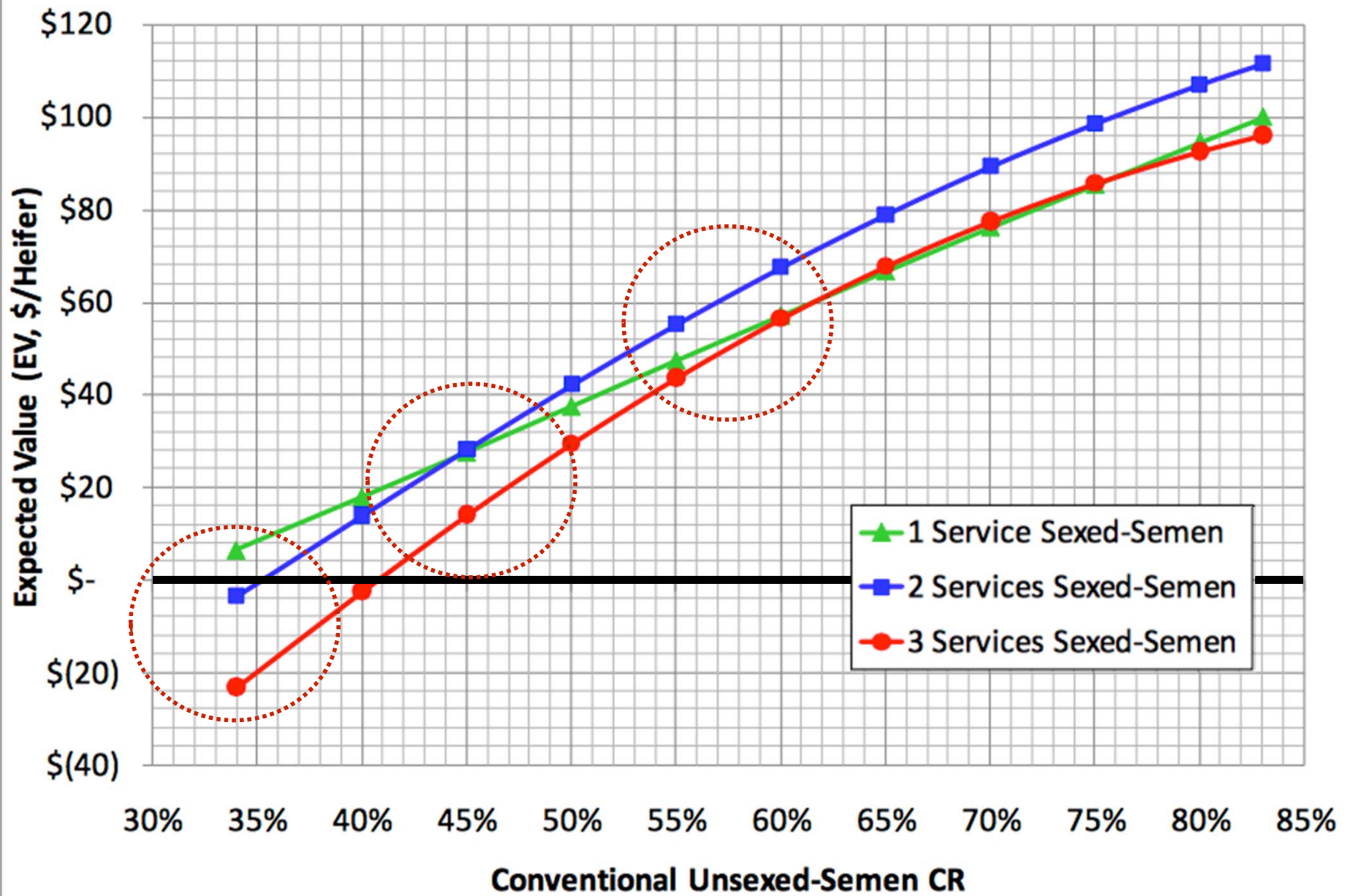
best  
**DECISIONS**

overall  
**VALUE**



**SCENARIOS**  
plausible for a farm









# Wisconsin-Cornell Dairy Repro\$

## Value of specific reproductive programs

**Herd Description** **About & Help**




**Cornell University**  
Department of Animal Science

**Wisconsin-Cornell Dairy Repro\$**  
(UWCURepro\$)  
Version 1.3.3.0


**Developed By:**  
Afshin S. Kalantari, Julio O. Giordano and Victor E. Cabrera

**Copyright © Protected**

**Acknowledgments**  
This project was supported by Agriculture and Food Research Initiative Competitive Grant no. 2010-85122-20612 from the USDA National Institute of Food and Agriculture.



United States Department of Agriculture  
National Institute of Food and Agriculture



THE UNIVERSITY  
of  
**WISCONSIN**  
MADISON

This research was also supported by Hatch project to V.E.C. WIS01577.

### Overview

Reproductive performance greatly impacts dairy farm profitability. Optimal reproductive performance improves milk productivity because cows take better advantage of the most productive part of their lactations, decreases replacement costs due to less reproductive failure, increases the number of offspring, and decreases reproductive costs per pregnancy. Normally, farmers and consultants can keep detailed records and compute meticulous reproductive costs. They can also know herd's reproductive performance. However, it is difficult to assess the actual monetary value of alternative reproductive programs. Therefore, in a multi-state collaboration, we have created the Wisconsin-Cornell Repro\$ (UW-CURepro\$) to assist dairy farm decision-makers perform advanced reproductive analyses by studying the economic value of intended reproductive management strategies. The UW-CURepro\$ is a complex daily Markov chain model inspired on Giordano et al., 2012 (J. Dairy Science 95:5442) that daily simulates every single cow and her economics, and computes the net return associated to reproductive performance parameters. Luckily, this tool has been designed as a user-friendly decision support tool and users only need to define: 1) productive, reproductive, and economic parameters to represent their own farm particular conditions and 2) potential reproductive strategies to be implemented. The decision support tool takes care of the rest!

[UWCU-DairyRepro\\$.Instructions.pdf](#)

Check for Updates



J. Dairy Sci. 95:5442–5460  
<http://dx.doi.org/10.3168/jds.2011-4972>  
© American Dairy Science Association®, 2012.

**A daily herd Markov-chain model to study the reproductive and economic impact of reproductive programs combining timed artificial insemination and estrus detection**

J. O. Giordano,<sup>1</sup> A. S. Kalantari, P. M. Fricke, M. C. Wiltbank, and V. E. Cabrera<sup>2</sup>  
Department of Dairy Science, University of Wisconsin-Madison 53706

farm specific

**DATA**

Herd Description   **Reproduction**   Results   About

**Herd Parameters**

Herd Size (#)   100

Average Body Weight (lb)   1,400

Involuntary Culling (%/yr)   35.0

Mortality Rate (%/yr)   4.0

Stillbirth (%)   4.9

Pregnancy Loss (%)   10.0

**Economic Parameters**

Milk Price (\$/cwt)   18.50

Cost Feed Lactating (\$/lb DM)   0.13

Dry Period Fixed Cost (\$/d)   0.06

Female Calf value(\$)

Male Calf value (\$)

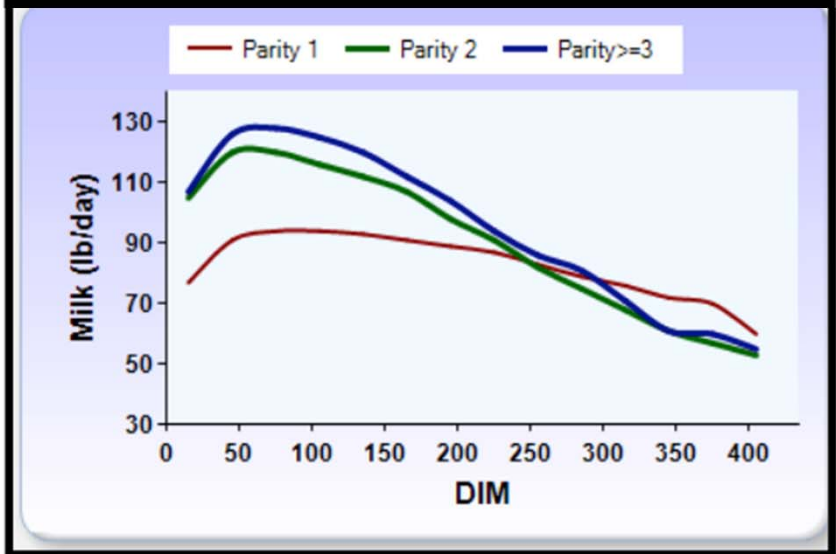
Heifer Replacement Value(\$)

Salvage Value (\$/lb)

**Lactation Curves (lb/cow/test)**

Own Farm Lactations (Enter/Edit NUMBERS Below)

| DIM | Parity 1 | Parity 2 | Parity ≥3 |
|-----|----------|----------|-----------|
| 15  | 77       | 105      | 107       |
| 45  | 91       | 120      | 126       |
| 75  | 94       | 120      | 128       |
| 105 | 94       | 116      | 125       |
| 135 | 93       | 112      | 120       |
| 165 | 91       | 107      | 112       |
| 195 | 89       | 98       | 104       |
| 225 | 87       | 91       | 94        |
| 255 | 83       | 82       | 86        |
| 285 | 79       | 75       | 81        |
| 315 | 76       | 68       | 71        |
| 345 | 72       | 61       | 61        |
| 375 | 70       | 57       | 60        |
| 405 | 60       | 53       | 55        |





test

**ALTERNATIVE**  
strategies

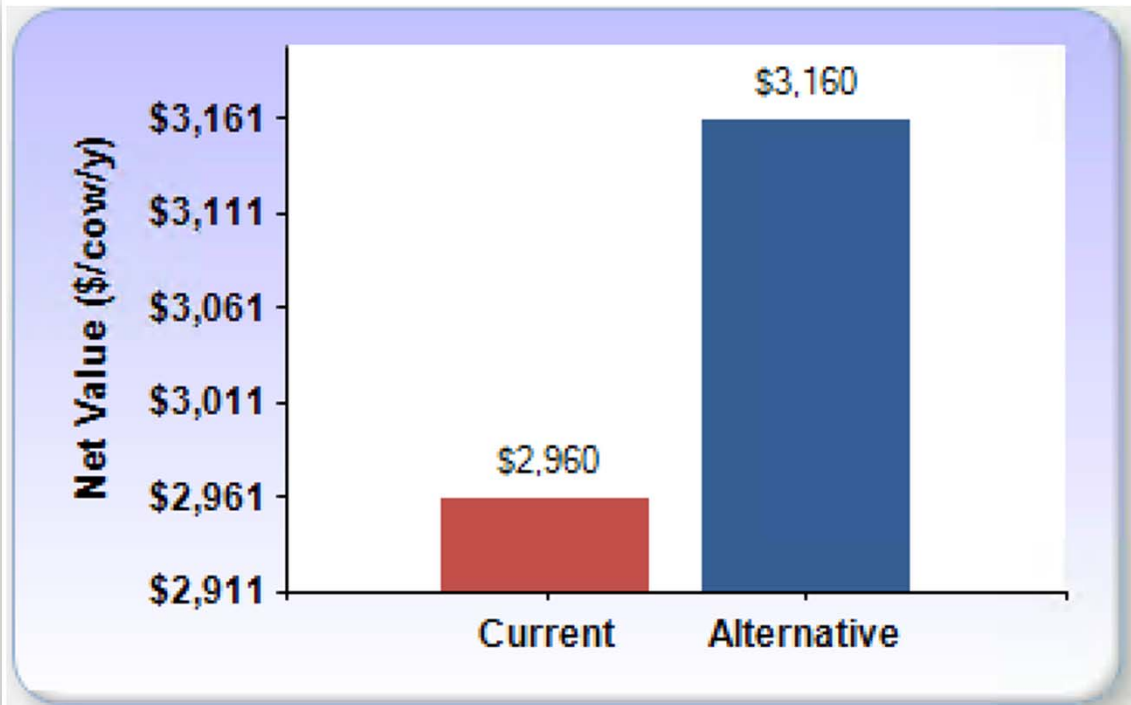
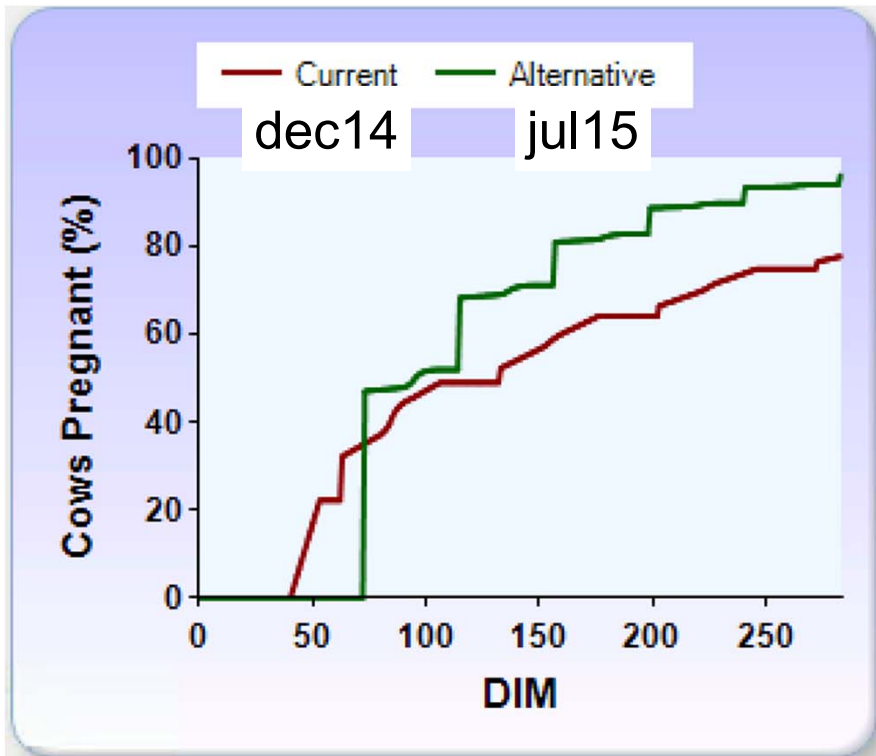
farm specific  
reproductive  
detailed  
**DATA**

required  
additional  
specific  
**DATA**

| Herd Description                                  | Reproduction   | About               |
|---|----------------|---------------------|
| <b>Reproductive Programs</b>                      |                |                     |
|   | <b>Current</b> | <b>Alternative</b>  |
| First AI postpartum                               | Ovsynch        | Presynch-Ovsynch-12 |
| Second and sub. AI                                | Ovsynch        | Ovsynch             |
| Resynch before preg check                         | NO             | YES                 |
| <b>Programs Description</b>                       |                |                     |
| VWP (d)   | 50             | 50                  |
| Estrous Cycle Duration (d)                        | 22             | 22                  |
| Maximum DIM for Breeding                          | 300            | 300                 |
| Do-not-Breed Minimum Milk (lb/d)                  | 50             | 50                  |
| DIM first injection for first AI sync program (d) | 60             | 36                  |
| Weekday first injection                           | Monday         | Tuesday             |
| Interbreeding interval for TAI services (d)       | 49             | 42                  |
| Heat bred before first service TAI (%)            | 60             | 65                  |
| CR heat bred before first service TAI (%)         | 33             | 35                  |
| CR first service TAI (%)                          | 30             | 30                  |
| Heat bred after first service TAI (%)             | 60             | 60                  |
| CR heat bred after first service TAI (%)          | 32             | 32                  |
| CR second and subsequent services TAI (%)         | 28             | 30                  |

# case study in WI

estimated whole herd: **\$188,000/year**



## Contribution to Net Value

| Item                         | Current | Alternative | Diff  |
|------------------------------|---------|-------------|-------|
| Total Net Value (\$/cow/y)   | 2,960.0 | 3,160.0     | 200.0 |
| IOFC (\$/cow/y)              | 3,132.6 | 3,202.8     | 70.2  |
| Replacement Cost (\$/cow/y)  | -243.4  | -192.4      | 51.0  |
| Reproductive Cost (\$/cow/y) | -79.6   | -46.0       | 33.6  |
| Calf Value (\$/cow/y)        | 150.4   | 195.6       | 45.2  |

# Integrated Genomic Testing Tool

## Value of using genomic testing on heifer calves

 **WISCONSIN**  
UNIVERSITY OF WISCONSIN-MADISON

**Integrated Genomic Testing for Jersey Heifer Calf Decision Support Tool**

V.E. Cabrera and K.A. Weigel, Department of Dairy Science

 **UW Extension**  
University of Wisconsin-Extension

**Overview** **Genomics Calculator** File Manager User's Instructions Guide **Logout**

**Step 1: Enter your Data**

Data from Heifer Calves < 12 Months old.  
 JPI  NM\$

**Download Data Entry Excel File**  
[Download Data Entry File](#)

**Upload Data Entry as Excel File**

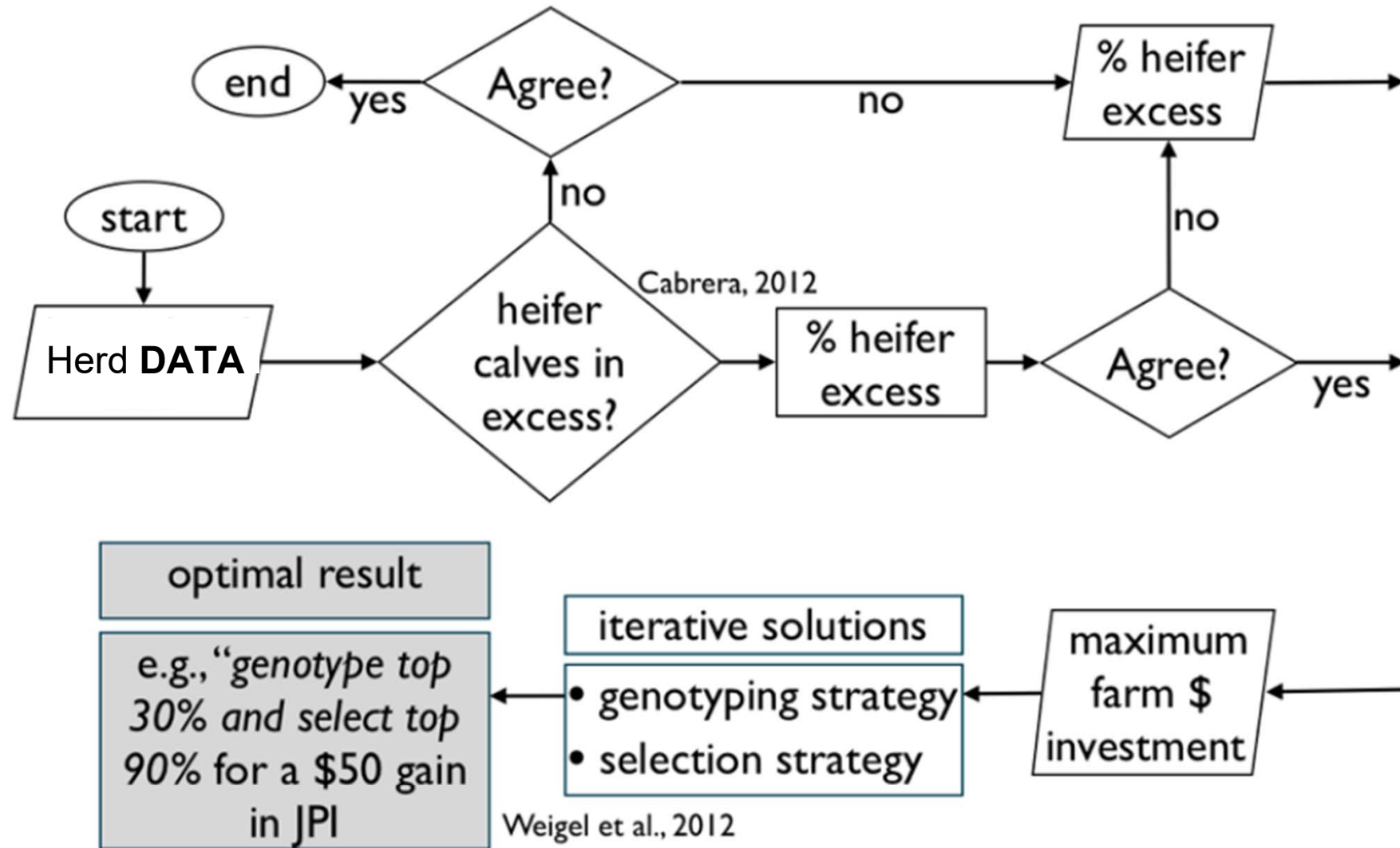
[Download generated Data](#)  
Data generated.



| Percentile Level | Average NM\$ Value |
|------------------|--------------------|
| 0-10             | 420                |
| 10-20            | 375                |
| 20-30            | 345                |
| 30-40            | 320                |
| 40-50            | 300                |
| 50-60            | 280                |
| 60-70            | 250                |
| 70-80            | 220                |
| 80-90            | 180                |
| 90-100           | 120                |

**Step 2: Calculate Percentage of Calves to Maintain Herd Size**

|                                    |    |  |       |
|------------------------------------|----|--|-------|
| Herd Turnover Ratio, %/year        | 35 | Services Heifers using Sexed Semen         | 0     |
| Adult Cows 21-d Pregnancy Rate, %  | 20 | Sexed Semen Conception Rate, %             | 44    |
| Females with Conventional Semen, % | 47 | Females Offspring Ratio Sexed Semen, %     | 90    |
| Heifer Conception Rate, %          | 55 | Premium Cost Sexed Semen, \$               | 10    |
|                                    |    | Estimated Calves to Maintain Herd Size, %: | 72.03 |



**Ovals**=starting and ending actions, **parallelograms**=user-entered information, **diamonds**=binary decisions (yes/no), and **rectangles**=results calculated by the decision support system. **JPI**=Jersey Performance Index.



farm specific  
**DATA**

visual display  
**DATA**

**Step 1: Enter your Data**

Data from Heifer Calves < 12 Months old.  
 JPI  NM\$

**Download Data Entry Excel File**  
[Download Data Entry File](#)

**Upload Data Entry as Excel File**

[Download generated Data](#)  
Data generated.

**Total Number of Animals= 480**

| Percentile Level | Average NM\$ Value |
|------------------|--------------------|
| 0-10             | 450                |
| 10-20            | 375                |
| 20-30            | 340                |
| 30-40            | 310                |
| 40-50            | 290                |
| 50-60            | 260                |
| 60-70            | 230                |
| 70-80            | 190                |
| 80-90            | 140                |
| 90-100           | 100                |

(Top) Percentile Level (Bottom)

**Step 2: Calculate Percentage of Calves to Maintain Herd Size**

|                                    |    |  |       |
|------------------------------------|----|--|-------|
| Herd Turnover Ratio, %/year        | 35 | Services Heifers using Sexed Semen         | 0     |
| Adult Cows 21-d Pregnancy Rate, %  | 20 | Sexed Semen Conception Rate, %             | 44    |
| Females with Conventional Semen, % | 47 | Females Offspring Ratio Sexed Semen, %     | 90    |
| Heifer Conception Rate, %          | 55 | Premium Cost Sexed Semen, \$               | 10    |
|                                    |    | Estimated Calves to Maintain Herd Size, %: | 72.03 |

replacements  
**AVAILABLE**

farm specific

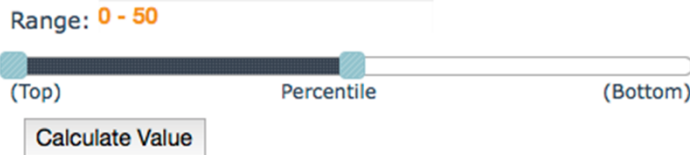
**DATA**

Step 3: Genetic Selection Protocol

Required Calves to Maintain Herd Size, % **72.03**  
Test Cost, \$ **40**

Parentage Error, % **15**

Customized Selection



Optimized Selection

Optimize

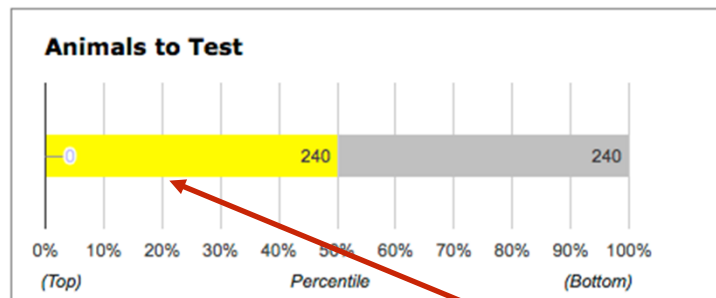
net profit  
**OPTIMIZED**

net profit  
**CUSTOMIZE**  
**D**

|  | Genomics | Traditional |
|--|----------|-------------|
| Selected Calves, \$                    | 638.48   | 629.18      |
| Tested Calf, \$                        | 16.83    | 0.00        |
| Average Net Value, Selected Calves, \$ | 621.65   | 629.18      |

Number of Animals to Test: 240  
Average Gain per Tested Calf, \$/calf: -7.53  
Total Revenue, \$: 7,793  
Total Test Expenses, \$: 9,600  
Total Net Revenue, \$: -1,807  
Additional Expenses of Using Sexed Semen, \$: 0  
Net Profit, \$: -1,807

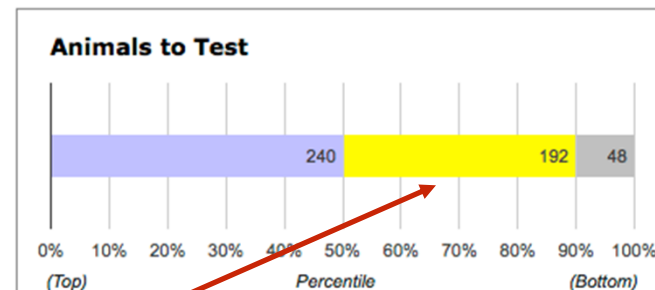
Download Selected Data



|  | Genomics | Traditional |
|--|----------|-------------|
| Average NM\$ of Selected Calves, \$    | 651.56   | 629.18      |
| Test Cost per Selected Calf, \$        | 13.46    | 0.00        |
| Average Net Value, Selected Calves, \$ | 638.10   | 629.18      |

Number of Animals to Test: 192  
Average Gain per Tested Calf, \$/calf: 8.92  
Total Revenue, \$: 9,393  
Total Test Expenses, \$: 7,680  
Total Net Revenue, \$: 1,713  
Additional Expenses of Using Sexed Semen, \$: 0  
Net Profit, \$: 1,713

Download Selected Data



animals to  
**TEST**

# The Economic Value of a Dairy Cow

## Projected net return of a cow vs. replacement

### The Economic Value of a Dairy Cow

V.E. Cabrera, UW-Madison Dairy Science

English  Spanish  Czech  Units:  US English  US Metric  UK  Czech

Overview  Single Cow Analysis  Herd Analysis

#### INPUTS - Edit Values in This Block

**Evaluated Cow Variables**

Current Lactation: 3

Current Months after Calving: 5

Current Months in Pregnancy: 1

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

#### OUTPUTS - Interactive Results

**Value of the Cow, \$** 627

**Compared Against a Replacement, \$**

Milk Sales, \$: 147

Feed Cost, \$: -157

Calf Value, \$: 26

Non-reproductive Cull, \$: -126

Mortality Cost, \$: -24

Reproductive Cull, \$: 12

Reproduction Costs, \$: 45

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

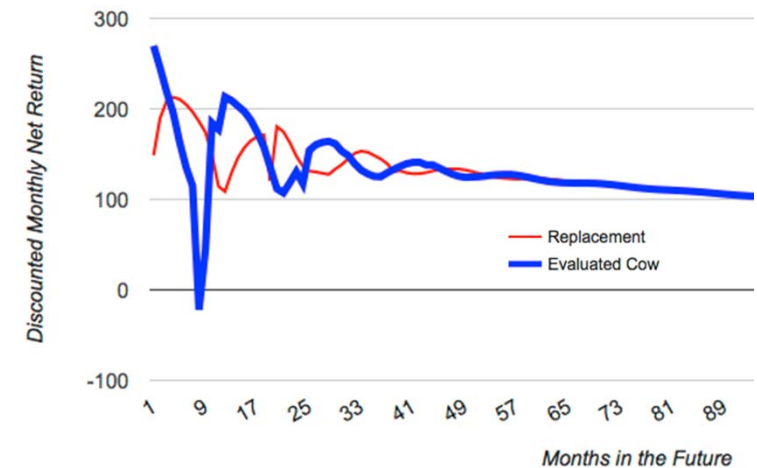
Calf Sales, \$: 60

Non-Reprod. Culling Cost, \$: -198

Mortality Cost, \$: -38

Reproductive Culling Cost, \$: -59

Reproductive Cost, \$: -80



farm & herd  
specific  
**DATA**

Overview Single Cow Analysis Herd Analysis

**INPUTS - Edit Values in This Block**

**Evaluated Cow Variables**

|   |     |
|---|-----|
| Current Lactation                             | 3   |
| Current Months after Calving                  | 5   |
| Current Months in Pregnancy                   | 1   |
| 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     |

**COW**

**REPLACEMENT**

**HERD**

**ECONOMICS**



## cow specific RESULTS

| OUTPUTS - Interactive Results               |       |
|---|-------|
| Value of the Cow, \$                        | 627   |
| <b>Compared Against a Replacement, \$</b>   |       |
| Milk Sales, \$                              | 147   |
| Feed Cost, \$                               | -157  |
| Calf Value, \$                              | 26    |
| Non-reproductive Cull, \$                   | -126  |
| Mortality Cost, \$                          | -24   |
| Reproductive Cull, \$                       | 12    |
| Reproduction Costs, \$                      | 45    |
| Replacement Transaction, \$                 | 704   |
| <b>Herd Structure at Steady State</b>       |       |
| 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    |
| <b>Economics of an Average Cow, \$/year</b> |       |
| 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   |

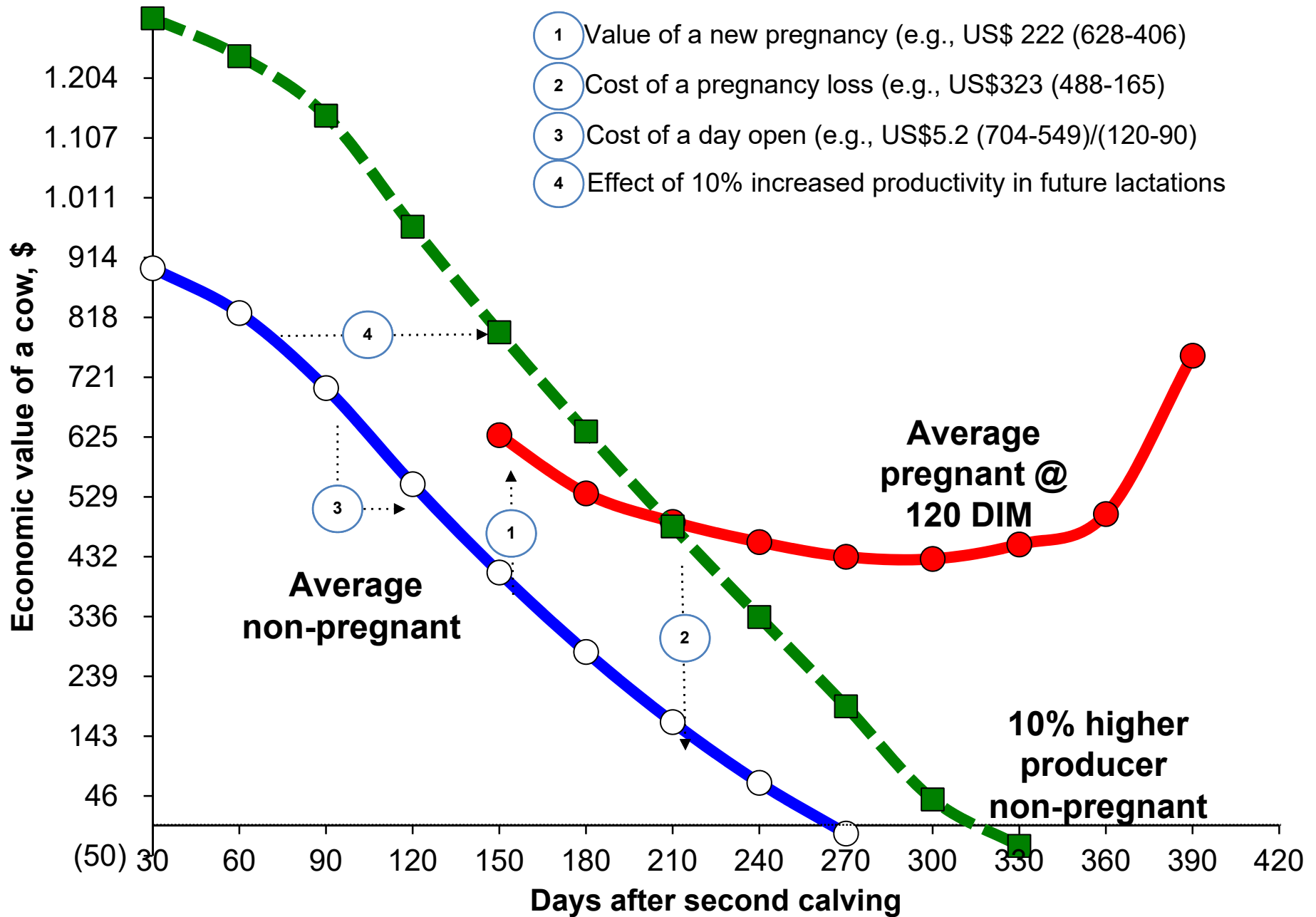
**COW VALUE**

**VALUE**  
components

**HERD**  
structure

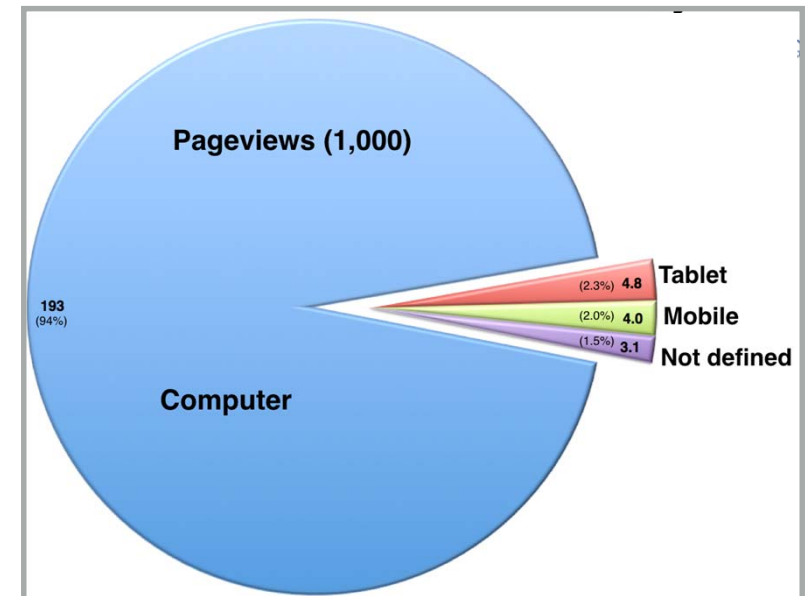
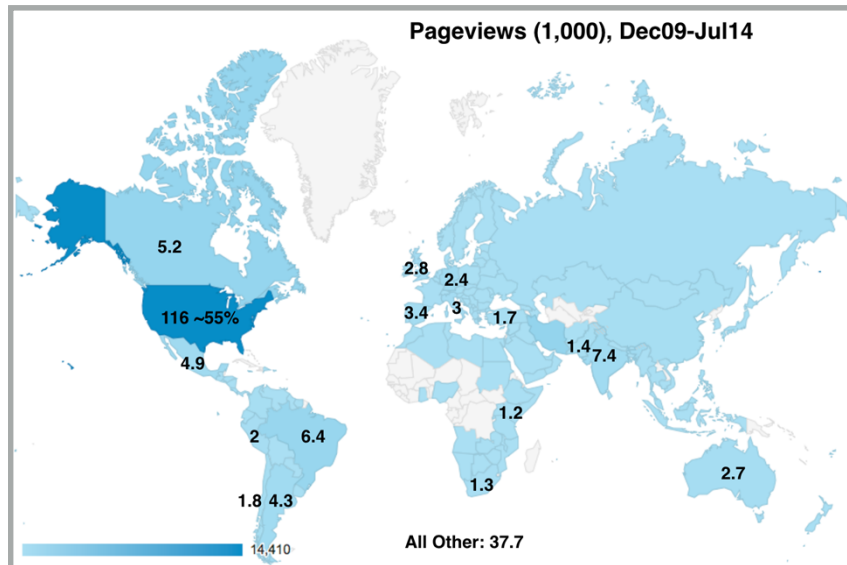
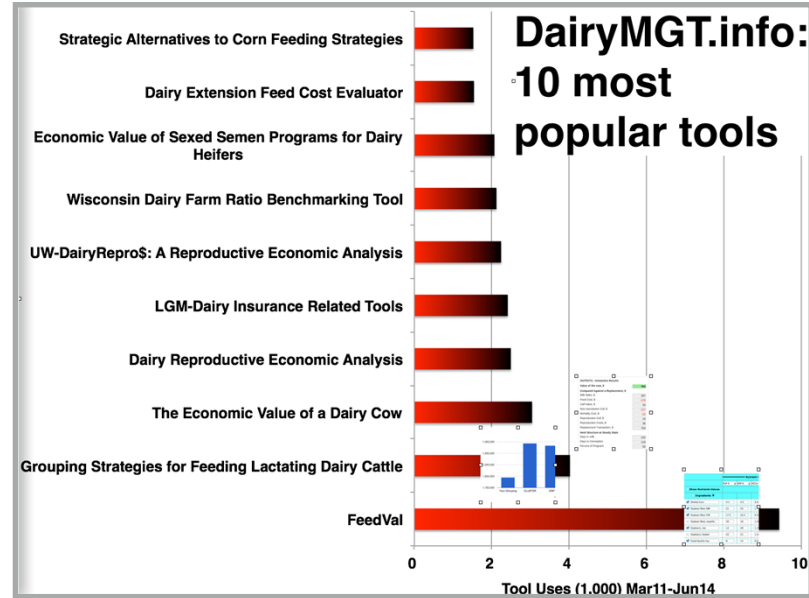
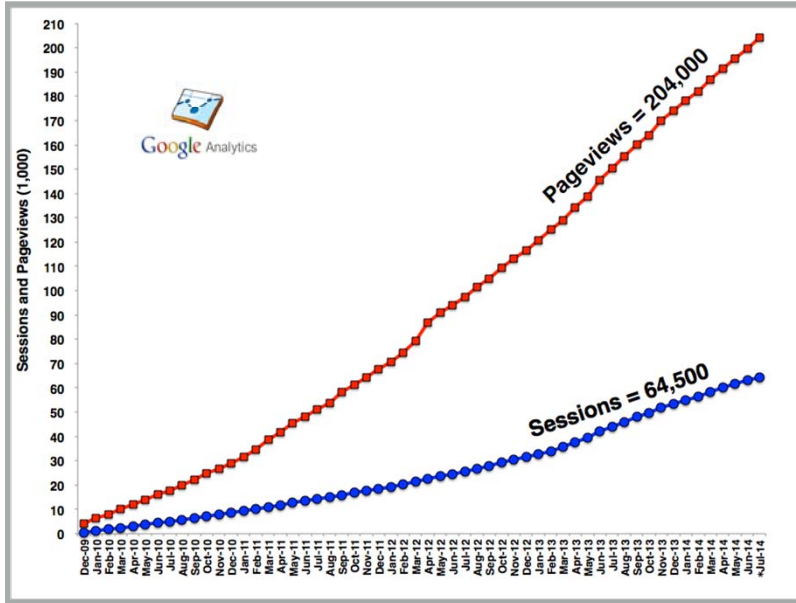
**HERD**  
net return

# The value of a cow



# DairyMGT.info

## Quick stats



# A vision for the future

Keep up with the needs

## INTEGRATION

- cows
- crops
- heifers
- ...
- hardware
- software
- ...
- financial
- ...
- environmental
- ...

## TECHNOLOGY

- tablets
- smartphones
- sensors
- monitors
- AMS
- precision feeding
- ...



## FUNCTIONALITY

- beyond record keeping
- decision-making
- artificial intelligence
- ...





**Thanks**