Dairy Management

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

DEPARTMENT OF DAIRY SCIENCE
University of Wisconsin-Madison

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University of Wisconsin-Extension

Critical aspects to maximize dairy farm profitability

UW-Dairy Management
Decision Support TOOLS

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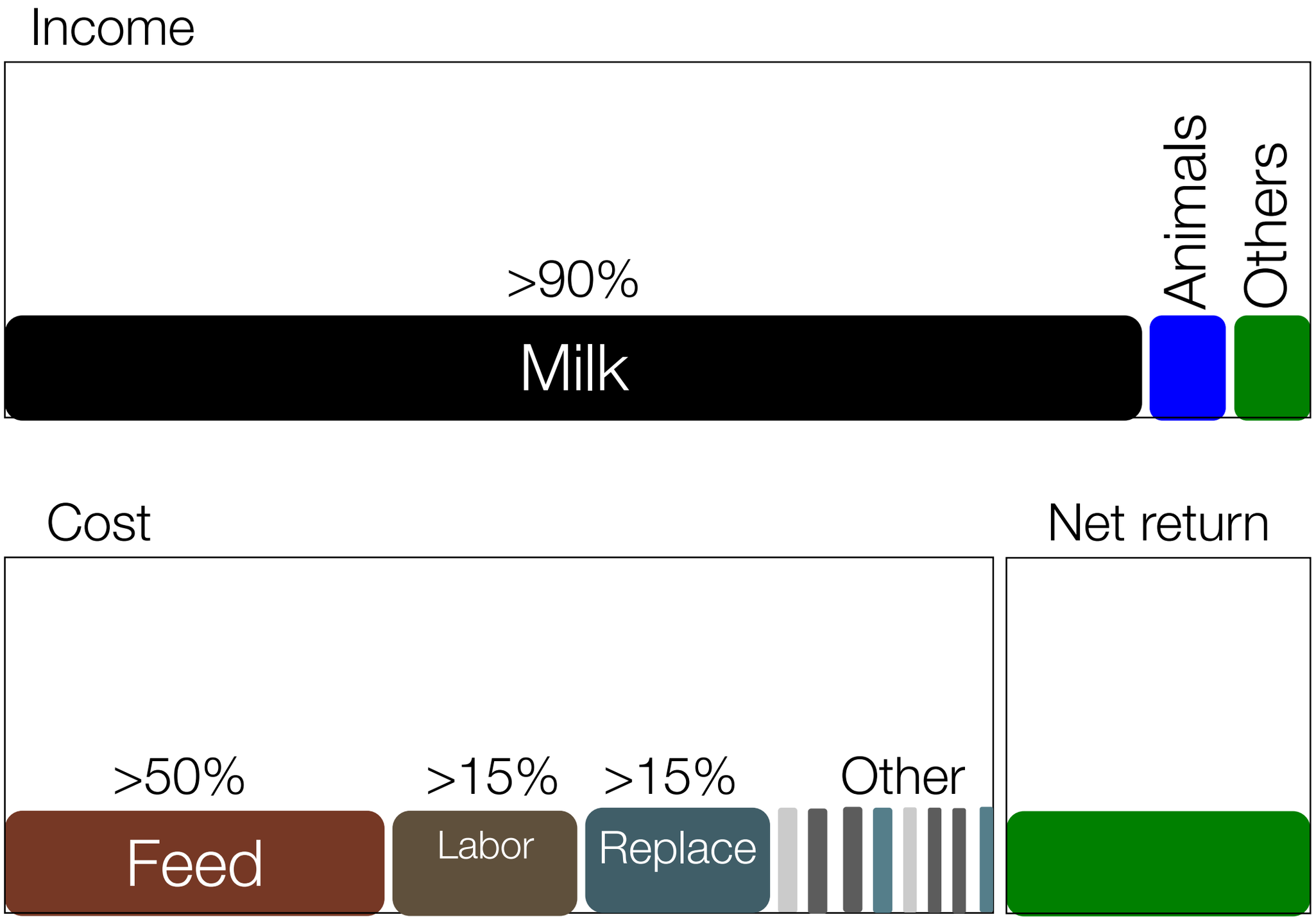
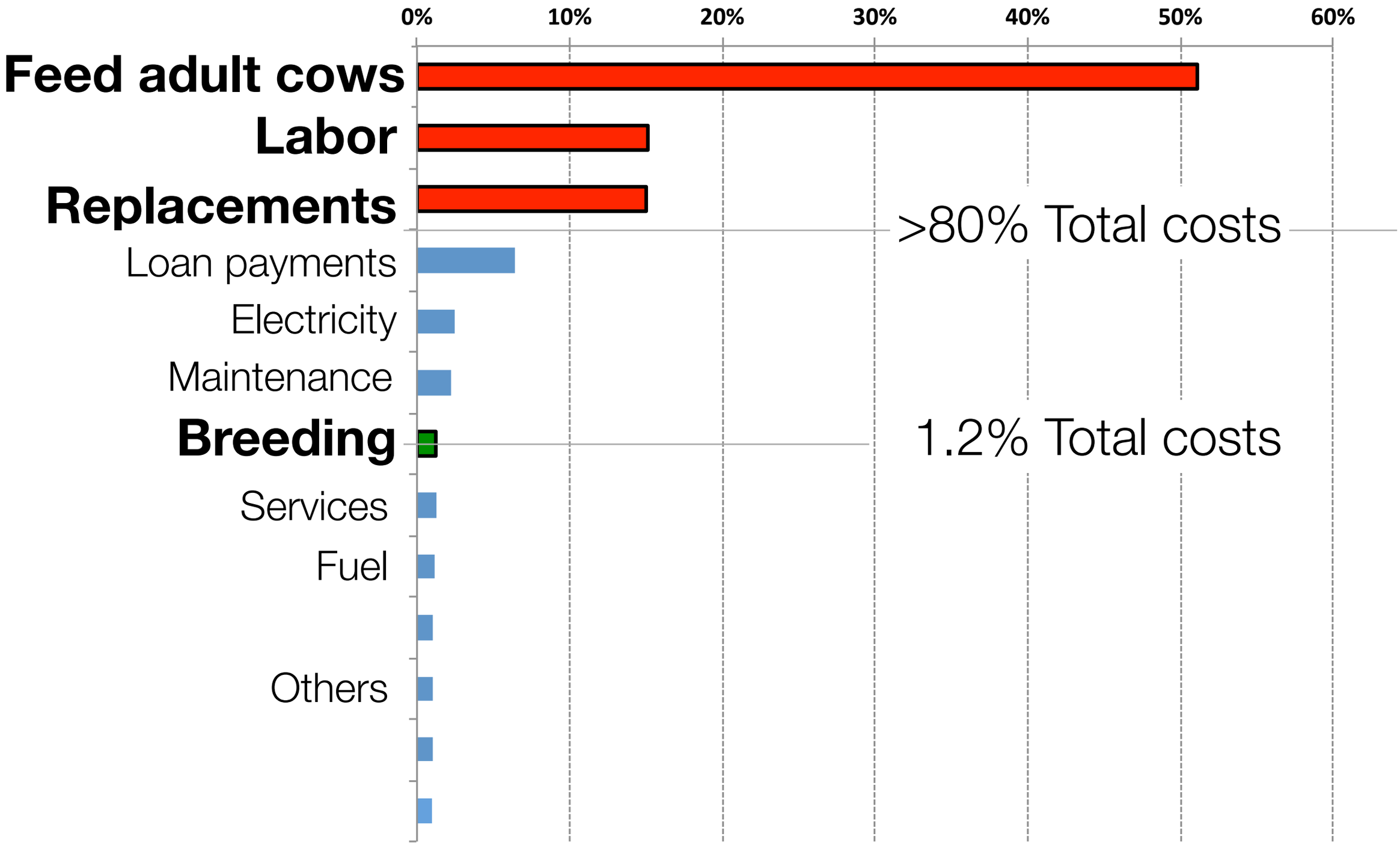
UAB - Barcelona - 11/16/15

Net margin of a dairy enterprise



Structure of costs on a dairy farm



Data from a farm in north Spain

Milk income over feed cost

IOFC

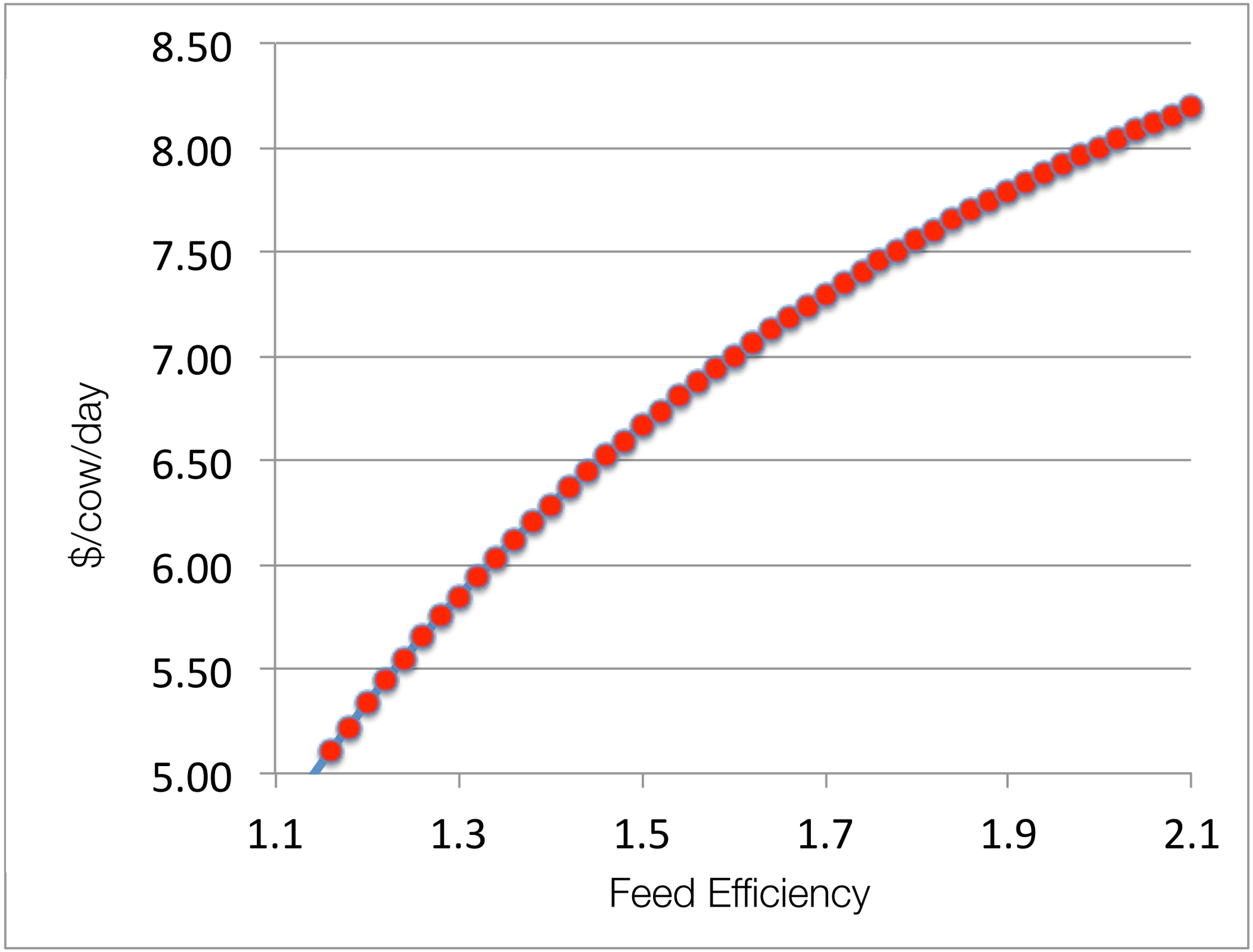
(Milk) x (Price) -

(Feed) x (Cost) = **Margin**

(Milk) x (Price) -

$$\left(\frac{\text{Feed Price}}{\text{Feed Efficiency}} \right)$$

40kg di latte a €0,3/kg e €0,2/kg di alimenti



BIG Costs make the difference

Feed

1. Better purchase of feeds
   - Nutritional grouping
2. Efficiency of use of protein
   - Formulation for maximum IOFC
   - ...

Replacements

- Control pf mortality of calves and heifers
- Fast growth of replacements
- Weight and height to first breeding
- Genomic selection of best animals
- ...

Other opportunities of improvement

3. Better decisions of replacement

4. Other important considerations

DairyMGT.info

The largest selection of dairy farm decision support tools

Large information

- Projects
- Publications
- Presentations
- Links

Heart of DairyMGT.info

Tools

to Support

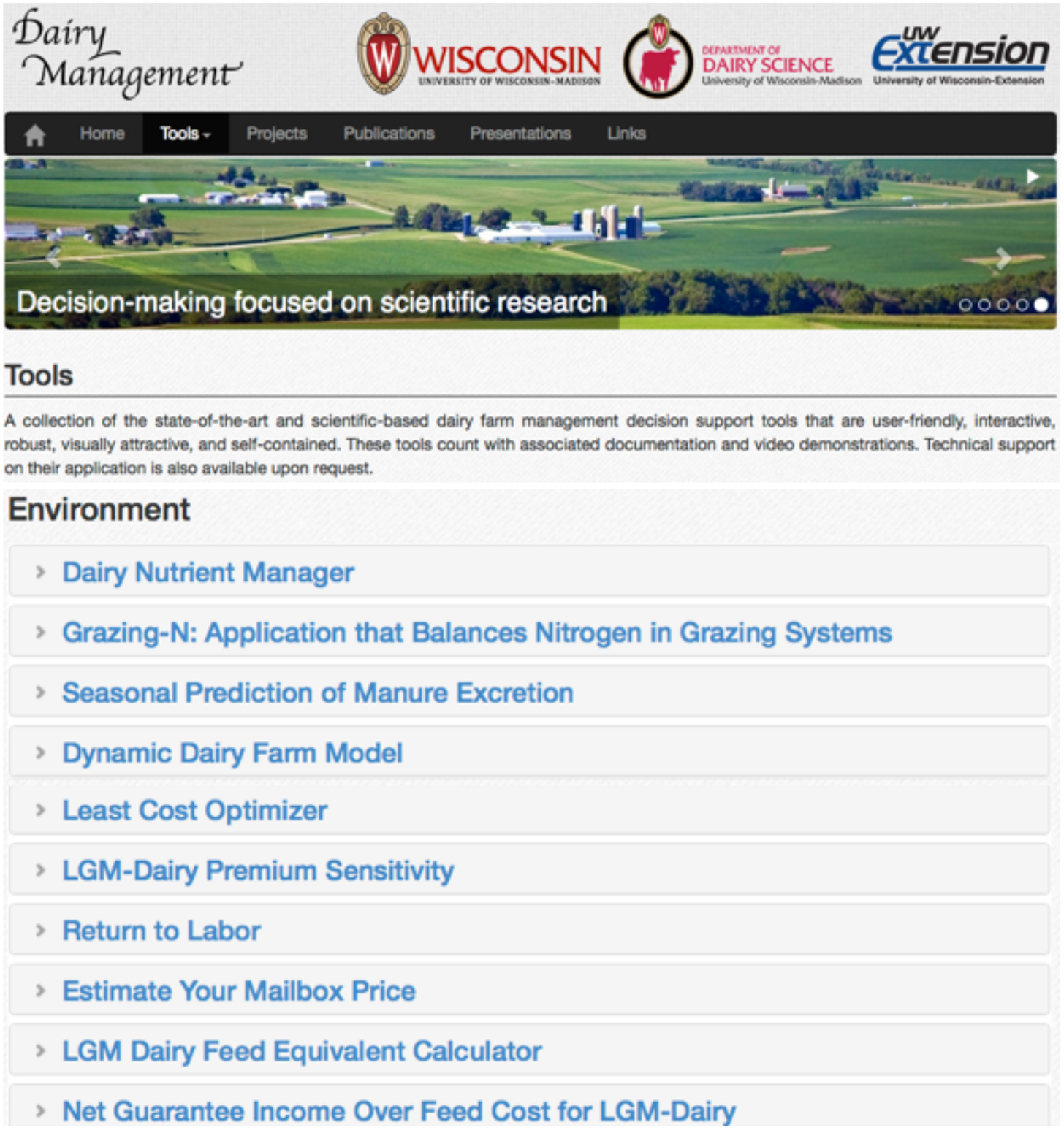
Decision-Making

DairyMGT.info: Tools

>40 Decision Support Tools

Many areas of dairy farm management

- **Feed**
- **Replacements**
- **Reproduction**
- **Production**
- **Replacement**
- **Environment**
- **Finances**
- **Genetics**
- **Health**
- **…**



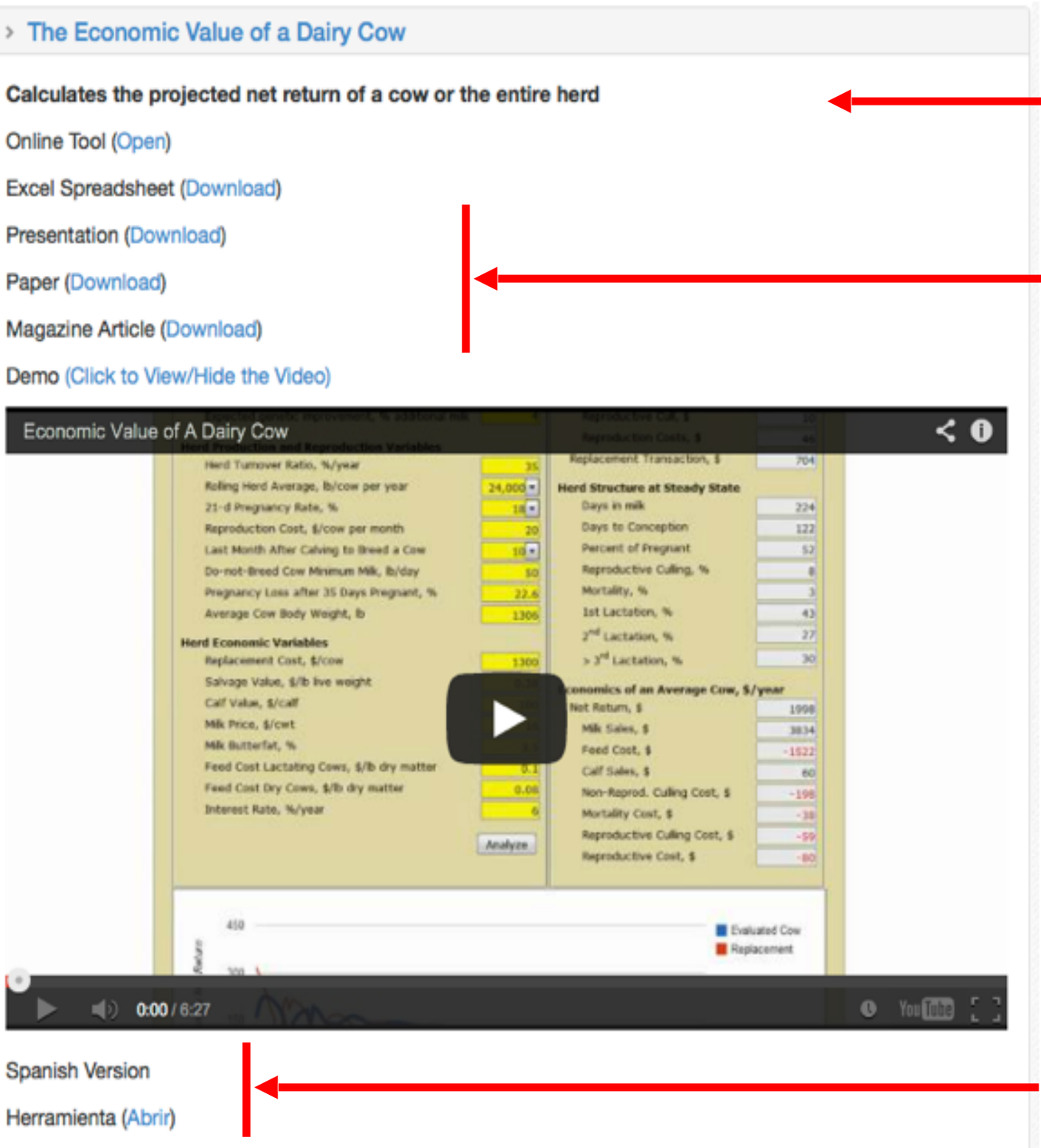
Anatomy of tools

How to explore and use them

Title

Link to the tool

Video Demo



Brief description

Supporting Docs.

Other languages

1 Better purchase of feeds

Better price of feeds

- Ideal to have feeds that provide better price per nutrient
- Cows require nutrients, not feeds

How to know which feeds have better nutrient price?

- Estimate the price per nutrient in different feeds

Feeds provide different amounts of nutrients

- Price per unit of:
- Protein
- Energy
- Ecc.

Has to consider the wastage

- Different feeds have different levels of waste

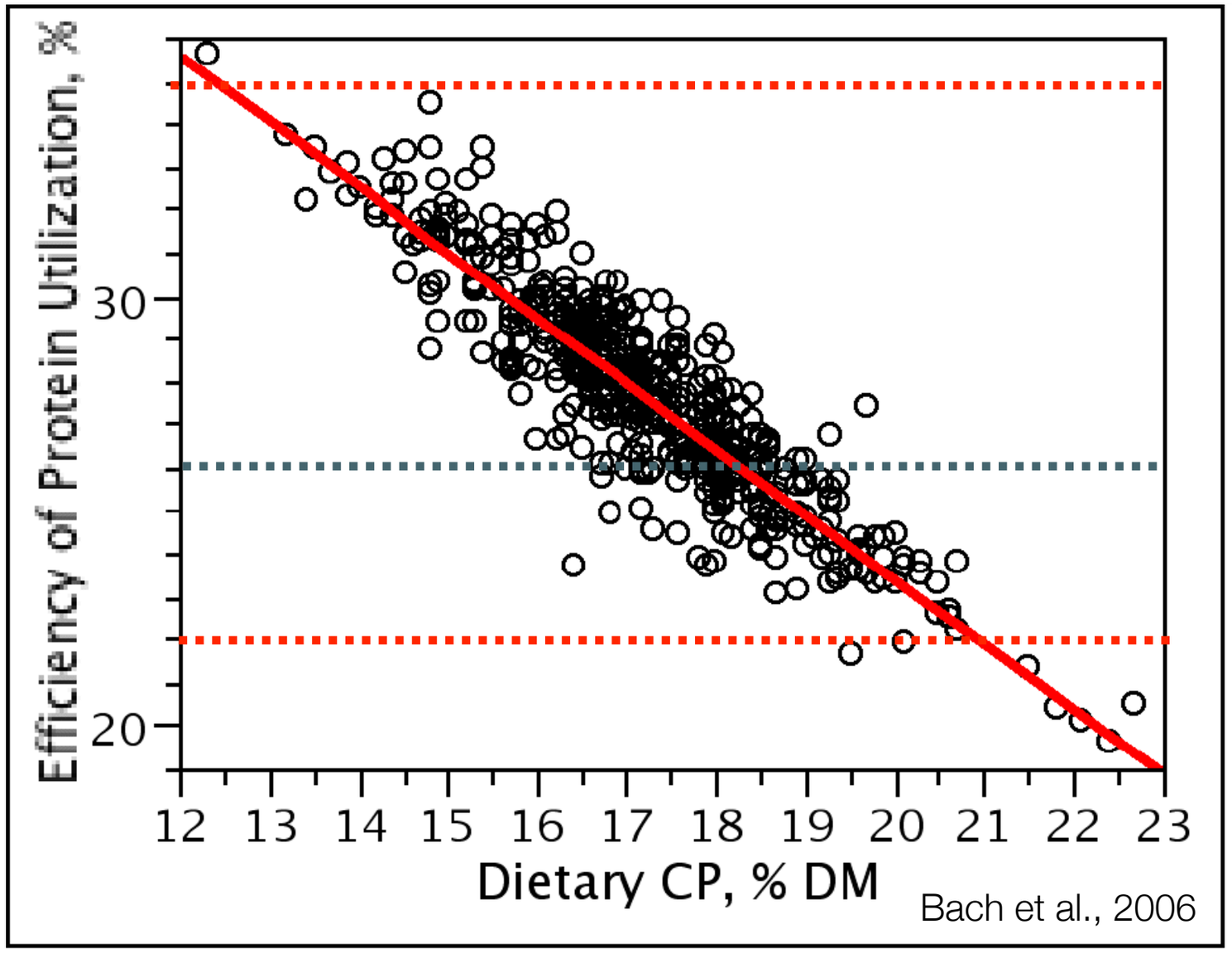
Analyze the value per nutrient

An example of protein

- How much cost the protein from alfalfa with respect to the one of soybean meal (SBM)?

Feed	Protein	DM	€/Tm	€/Tm protein
FEED	%NUT	%DM	COST	**(COST)÷(%NUT) (%DM)**
Alfalfa	18%	87%	220	**1405**
SBM	44%	89%	460	**1175**

Protein from alfalfa is 20% more expensive than the one from SBM!



Feed	Protein	DM	€/Tm	€/Tm protein
SBM	44%	89%	460	**1175**
Efficiency of conversion		**22%**		**5341**
		26%		**4519**
		35%		**3357**

Perform your own analysis with multiple feeds and multiple nutrients

- Use FeedVal v 6.0
- Provides you the ACTUAL value of feeds according to nutrient composition and market prices

		Ingredient	Nutrients				As-Fed Basis			Calculated	
			RUP %	RDP %	NEl3x Mcal/lb	peNDF %	DM %	Unit	Price* $/Unit	Predicted Value $/Unit	Actual Price as % of Predicted Value
1	☑	Shelled Corn	4.5	4.5	0.91	0	86	kg	0.15	0.197/kg	76
2	☑	Soybean Meal 48%	21	33	1	0	89	kg	0.38	0.411/kg	92
3	☑	Soybean Meal 44%	17.5	32.5	0.97	0	89	kg	0.36	0.374/kg	96
4	☐	Soybean Meal, expeller	30	16	1.09	0	92	kg		0.496/kg	
5	☑	Soybeans, raw	12	28	1.25	0	87	kg	0.35	0.358/kg	98
6	☐	Soybeans, heated	22	21	1.24	0	92	kg		0.457/kg	
7	☑	Good Quality Hay	6	14	0.6	35	87	kg	0.19	0.170/kg	112
8	☑	Poor Quality Hay	4.8	11.2	0.5	50	87	kg	0.10	0.137/kg	73
9	☑	Corn Silage	2.8	4.2	0.67	30	35	kg	0.04	0.056/kg	71
10	☐	Earlage/Snaplage	3.6	5.4	0.82	0	60	kg		0.123/kg	
11	☑	Distillers Dried Grains	15	15	0.9	0	89	kg	0.15	0.312/kg	48
			3.6	5.4	0.95	0	70	kg		0.161/kg	
			0	0	2.06	0	99	kg	0.54	0.395/kg	137
			76	19	1.06						
			0	287	0						

+30 years of experience in Wisconsin

Algorithms similar to the ones used in St. Pierre and Glamocic, 2000. JDS 83:1402 1411.

FeedVal v6.0

Acquire the best feeds in September 2015. All in $/Tm with market prices for Midwest (USA).

Feed	Market price	Estimated price	% of the estimated	Rank from 26
Corn	$150	$198	76%	7
SBM	$360	$375	96%	13
Wheat	$200	$191	105%	19
Cotton seed	$340	$236	144%	26

% Estimate: (Market price/Estimated price)*100
Therefore: Less % is better.

FeedVal v6.0

Summary

Estimates the price of feeds based on

- Nutrient content
- Referee feeds
- Market price

Help decisions regarding:

- Purchase feed
- Diet formulation
- Use of feeds

Supports:

- Less costs of feeds
- Greatest IOFC and profitability

2 Nutritional grouping: +TMR

Logic

Use of only one diet for all lactating (e.g., 1 TMR):

- All cows receive same diet
- High diets are preferred
- Cows with lower production or requirements are heavily over-fed

Feed efficiency improves with multiple groups:

- Saving costs of nutrients
- Less cows under or over fed
- Less environmental concerns
- **Greater IOFC**

Strategies for grouping

Depends on the farm and herd

Needed individual requirements:

- Energy (NEL)
- Protein (CP)
- Dry matter intake (DMI)

Number and states of cows

- Total cows in production
- States of the cows

Characteristics of the farm

- Capacity of handle different groups

Criteria to group the cows

Several criteria, some are better

Days in milk (DIM)

- Based on state during lactation: early, medium, late, …

Milk corrected by fat (protein)

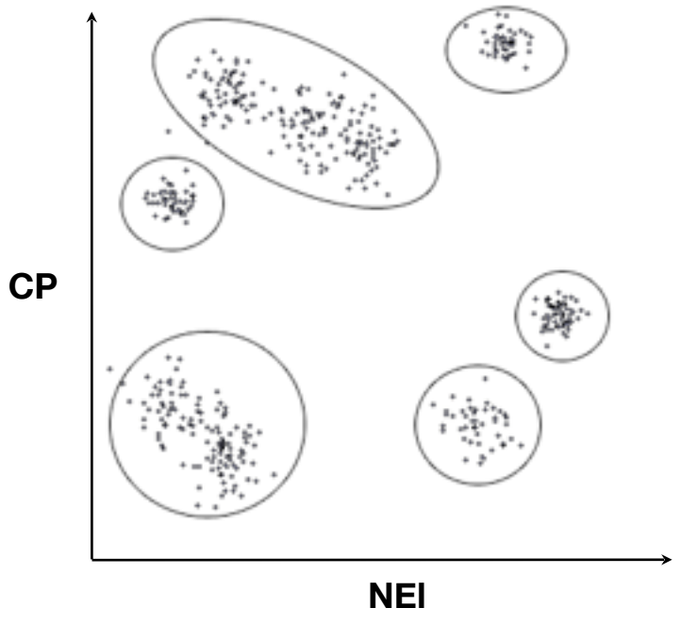
- Based on production level: high, medium, low, …

Milk and BW

- Function of production and weight

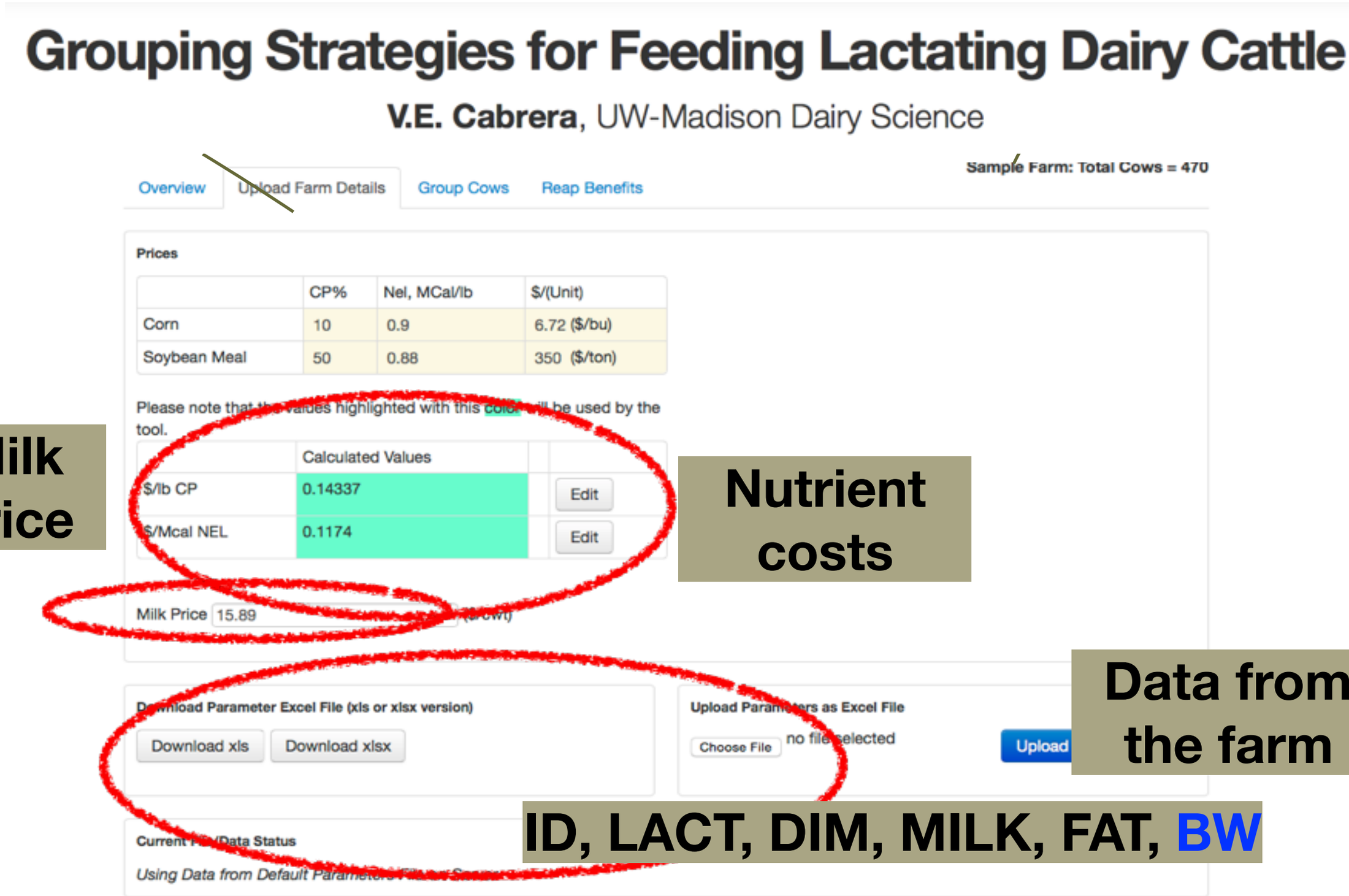
Cluster

- Seems the most EFFICIENT



Strategies of grouping tool

Analyzes the value of GROUPING



Analysis of 30 farms in Wisconsin

Data collected at cow level

Consistent prices for all

- Milk: $0,35/kg
- CP: 0,32/kg
- NEL: 0,1174/Mcal

1 group vs. 3 groups

- Groups of same size

Criteria for grouping

- Cluster

BW estimated based on

- 1° Lactation: 500 kg
- >1° Lactation: 590 kg

Nutritional groups on 30 farms

Cluster grouping in Wisconsin

	Size of farms (n=30)	1 group	3 groups	Improvement
		Income over feed cost (IOFC) $/cow/year		
Min	<200	697	1,059	161
Avg	788	2,311	2,707	396
Max	>1,000	2,967	3,285	580

Improvement ($/cow/year)

- Range 7% to 52%
- Average = $396
- Range = $161 to $580

Cabrera et al., 2012 (Four-State Management and Nutrition Proceedings)

Valuation of grouping published

Reference	T[1]	G[2]	Difference in income over feed cost ($/cow per yr)		
			3-TMR[5] - 1-TMR	3-TMR - 2-TMR	2-TMR - 1-TMR
Smith et al., 1978	F	DIM			+30
Cassel et al., 1984	F	DIM			-117[4]
Williams and Oltenacu, 1992	S	C		+31	
Østergaard et al., 1996	S	DIM/M	3-TMR > 2-TMR > 1-TMR net revenue[3]		
St-Pierre and Thraen, 1999	S	C		+33	+44
Earleywine, 2001	S	DIM	+44		+38
Cabrera et al., 2012	S	NE_L	+396		
Cabrera and Kalantari, 2014	S	NE_L	+46	+25	+21
Kalantari et al., 2015[6]	S	C	+46	+8	+39

Cabrera and Kalantari, 2015 (accepted 13 September 2015, JDS)

Grouping strategies

Summary:

Opportunity to improve efficiency of nutrition
Considering that each group is more homogeneous in requirement

Diets are closer to requirements
Less costs of nutrientes and therefore higher IOFC

Better productivity
It is probably to improve productivity

Additional benefits
- ↓ environmental concerns
- ↑ health conditions

3

Economic value of a cow

Knowing its value is critical for decision-making

- Base for important decisions

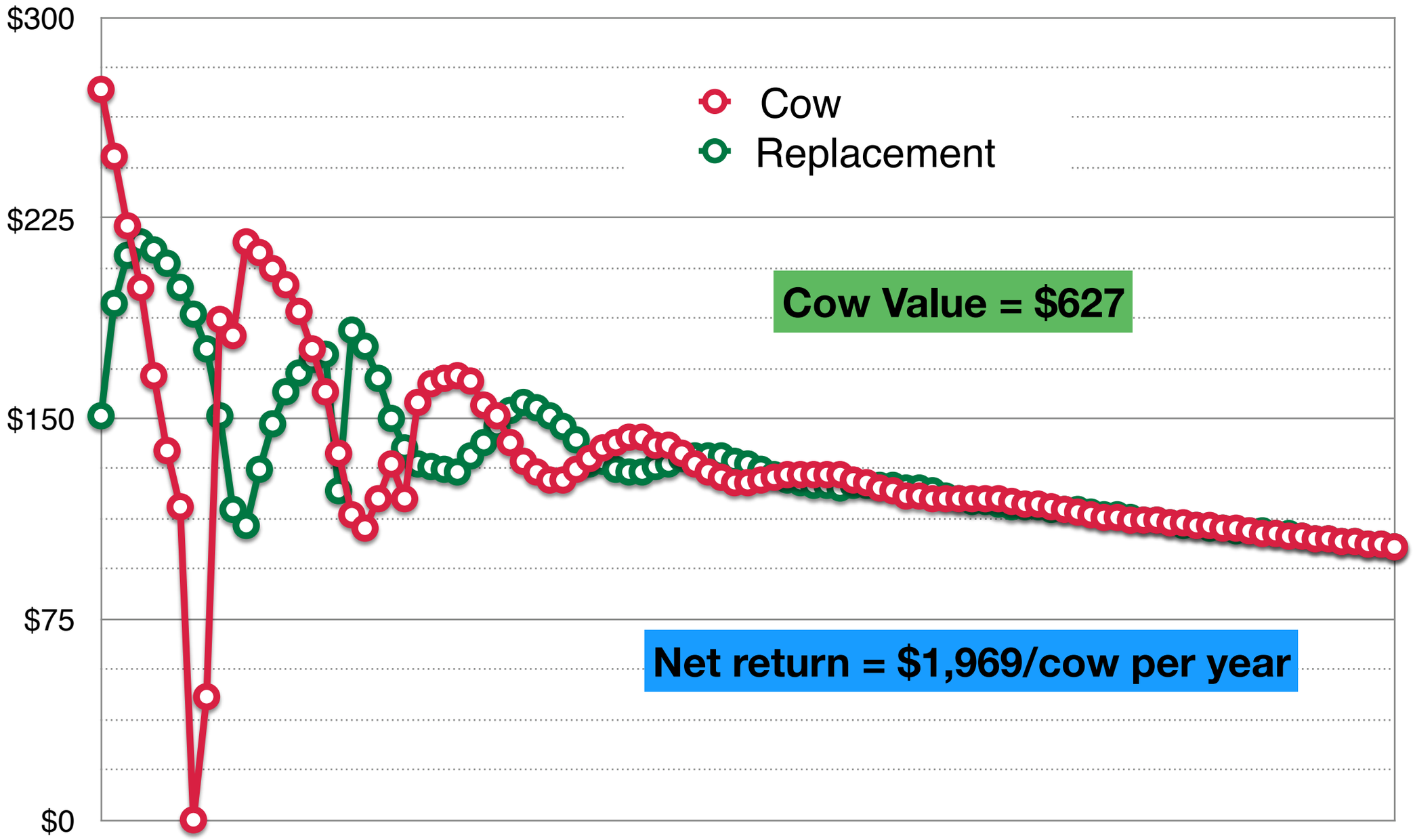
Use a tool like “economic value of a dairy cow”

- Estimates the long-term net return of a cow (with respect to a potential replacement)

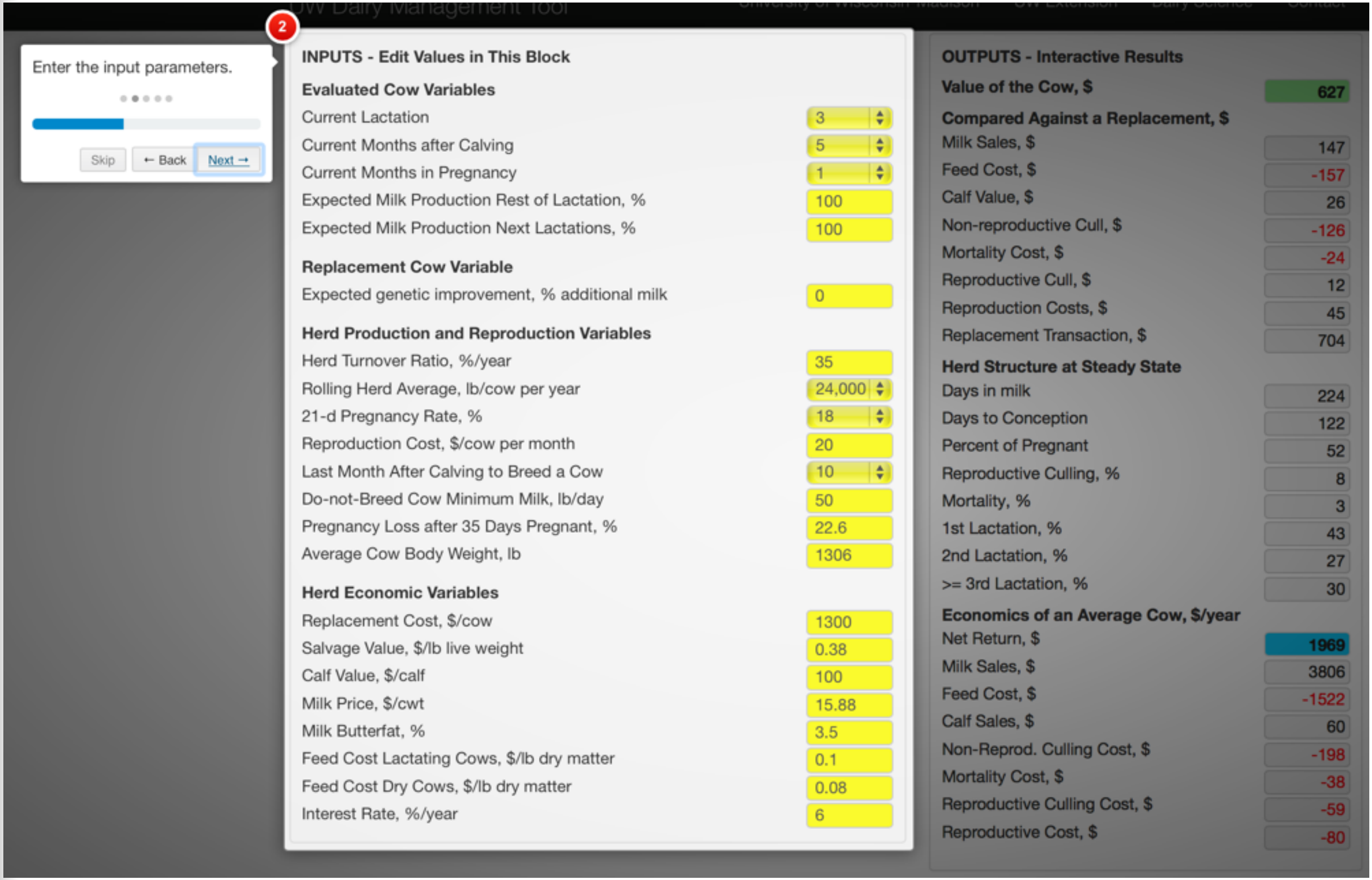
Knowing the value of all cows in the herd is crucial

- Decisions of replacement
- Optimize individual management according to value

OUTPUTS - Interactive Results	
Value of the cow, $	**764**
Compared Against a Replacement, $	
Milk Sales, $	287
Feed Cost, $	-175
Calf Value, $	33
Non-reprodutive Cull, $	-117
Mortality Cost, $	-22
Reproductive Cull, $	19
Reproduction Costs, $	36
Replacement Transaction, $	704
Herd Structure at Steady State	
Days in milk	222
Days to Conception	119
Percent of Pregnant	55



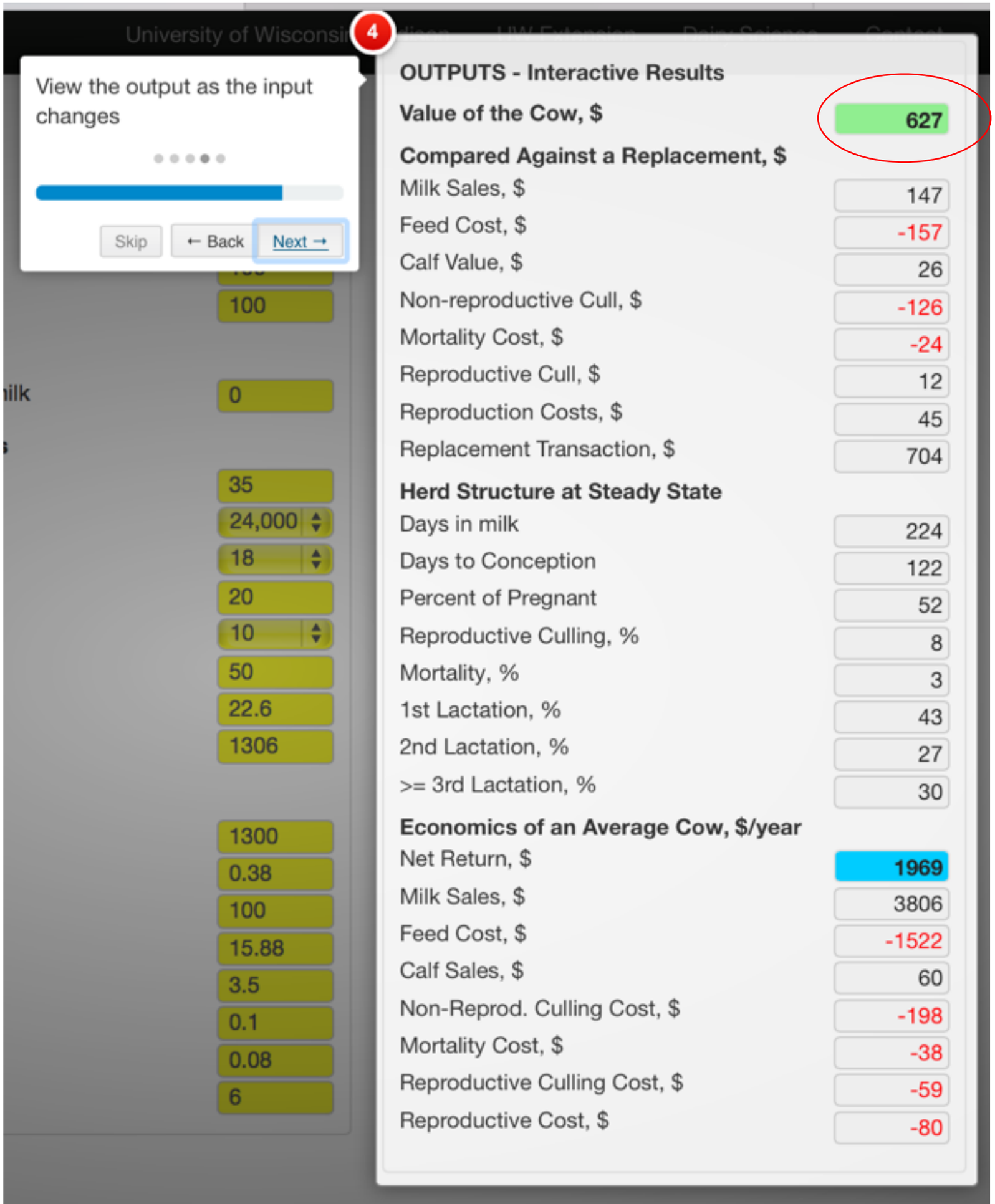
Graph of the net return of a cow (blue), with respect to a replacement (red). Difference of the long term of the cow and the replacement values becomes the economic value of a dairy cow.



Parameters can be defined directly in the yellow cells

Results are immediate!

For example, $627 (green cell) is the value of the cow and $1,969/year is the average net return of cow in the herd



Tool economic value of a cow

Summary

Better profitability
Knowing the value of each cow allows to do more individual decisions: E.g., which animal to breed first and with what semen or if to treat an animal

Fundamental optimal decisions
keep or replace animals

Better efficiency of the herd
Over time, best animals will be selected in the herd

Additional usage

- Average net return of a cow responds to management parameters

4 Other FUNDAMENTAL considerations for profitability

Maximize the IOFC

- Not the production

Efficiency of the use of nutrients

- Specifically the use of protein in diet

Management of the information

- Up-to-date, rigorous record keeping, …

Use of "benchmarking"

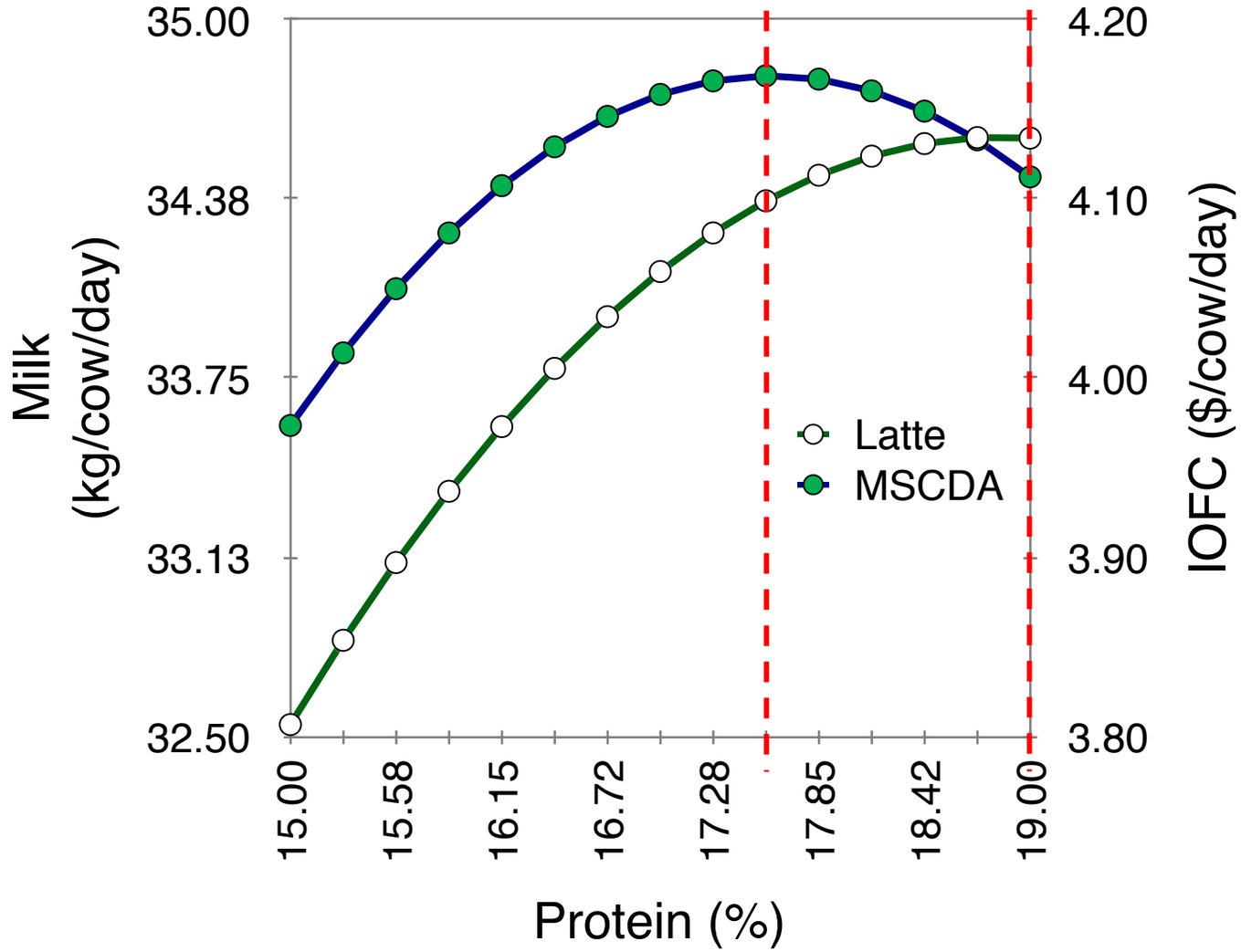
- Compare against the past and other similar farms

Investment in training

- **Managers using the best technology**

Maximum production is not always the most profitable

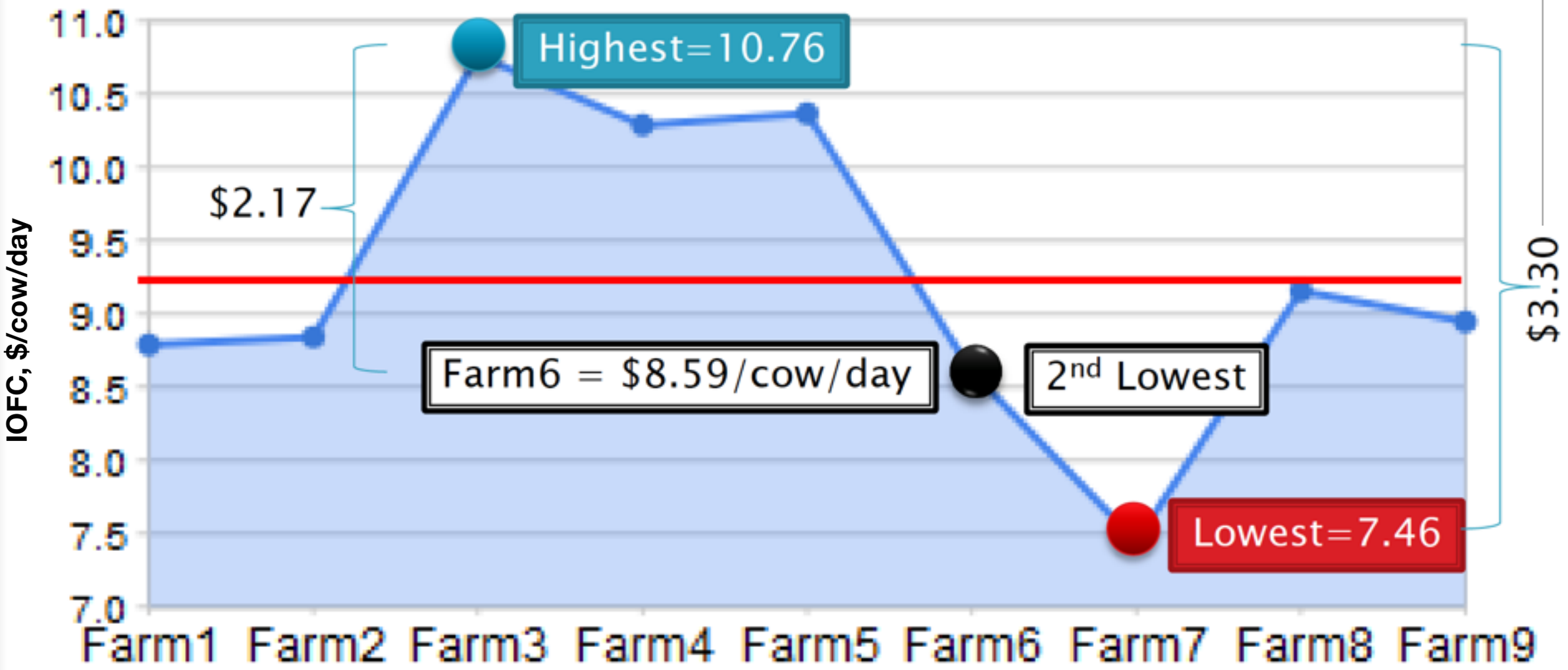
+0.22 kg milk
+1.42% Protein
-0.06 IOFC



Estimates with tool income over feed supplement cost (DairyMGT.info), that uses functions from NRC (2001) Milk = f(RUP, RDP).

Systematic comparisons “benchmarking”

Why the big differences



Estimated with the Dairy Extension IOFC tool (DairyMGT.info)

Cabrera et al., 2010. (Four-State Management and Nutrition Proceedings

Thanks

DairyMGT.info

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