Dairy Management

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

DEPARTMENT OF
DAIRY SCIENCE
University of Wisconsin-Madison

UW Extension
University of Wisconsin-Extension

Decision Support Tools

UW-Dairy Management
Decision Support TOOLS

Victor E. Cabrera

UW-Extension Central Wisconsin Series
American Legion Hall, Elroy, WI, 27 February 2014

DairyMGT.info

Largest collection of Decision Support Tools

Lots of info

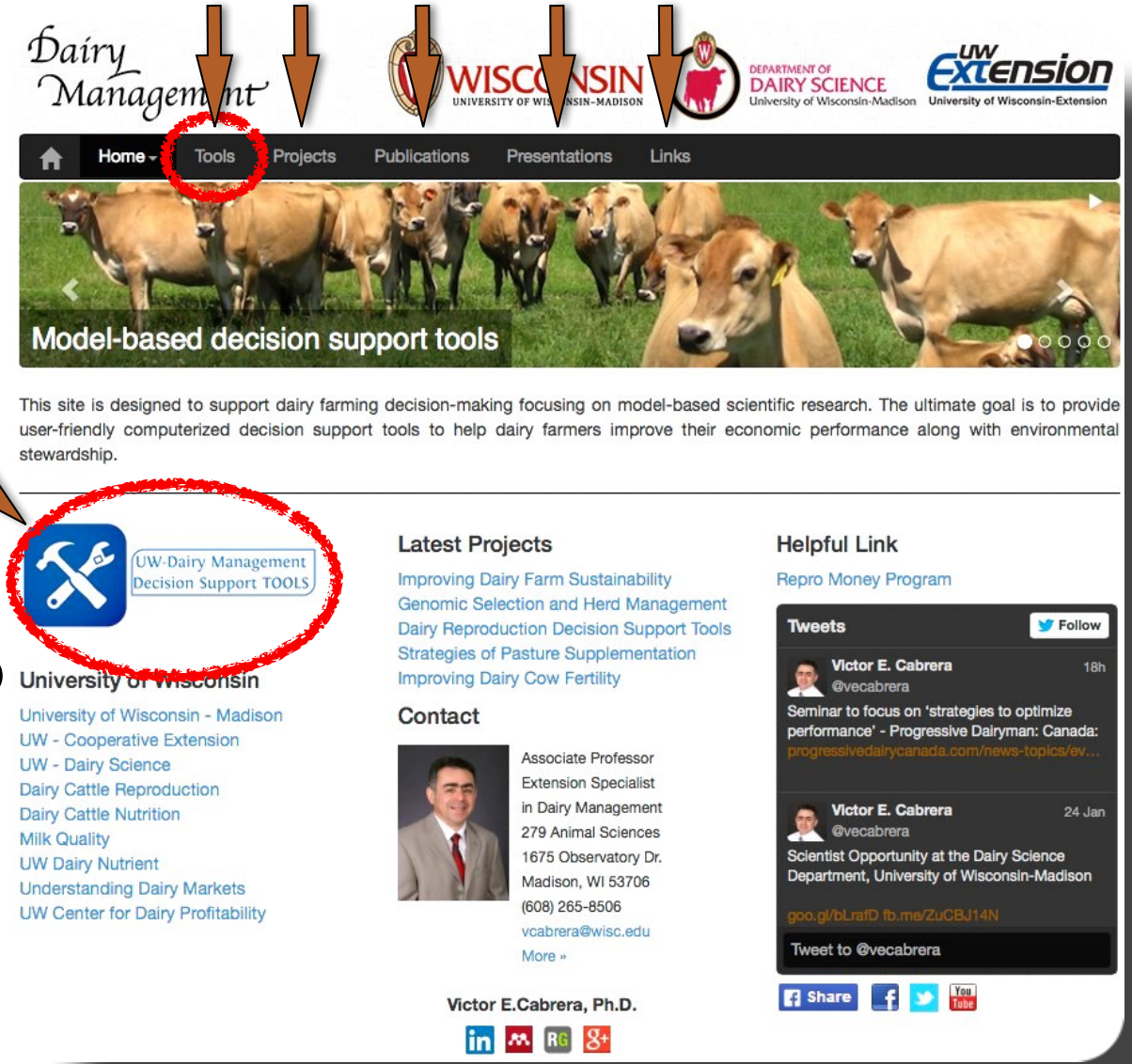
- Projects
- Publications
- Presentations
- Links

Core of DairyMGT.info

Decision

Support

Tools

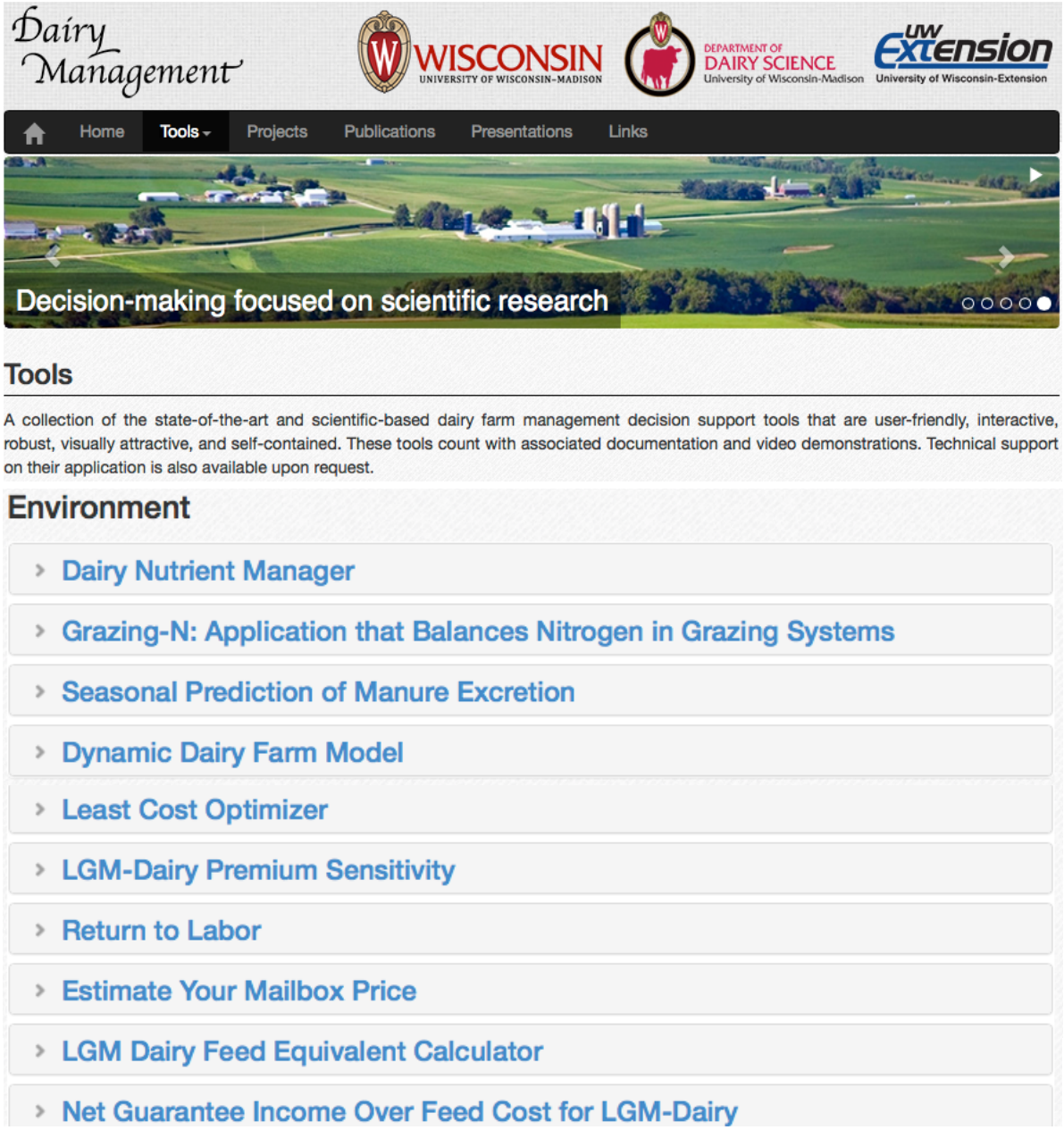


DairyMGT.info: Tools

>40 Decision Support Tools

Many Dairy Farm Management Areas

- Feeding
- Heifers
- Reproduction
- Production
- Replacement
- Environment
- Financial
- Genomics
- Health



Anatomy of a DairyMGT.info tool

How to explore them

Title

Links to the tool

Short description

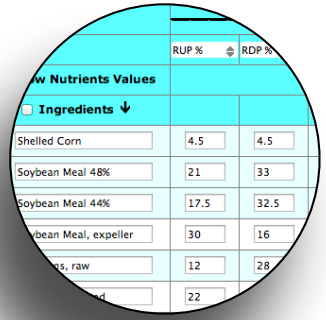
Supporting Docs

Video Demo

Other Languages

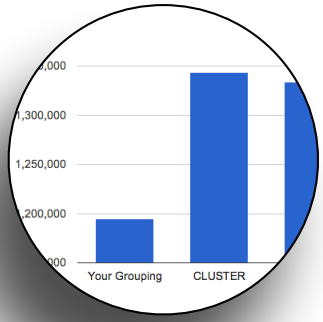
Some Decision Support Tools

Selected Tools for Practical Use



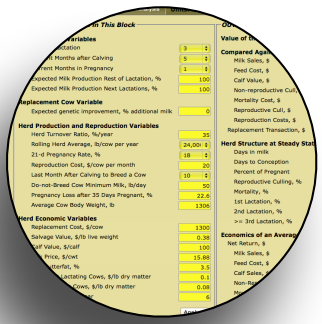
FeedVal 2012

- Estimates the actual value of feed ingredients



Grouping Strategies for Feeding Lactating Cows

- Evaluates the value of more feeding rations



The Economic Value of a Dairy Cow

- Calculates the projected net return of a cow

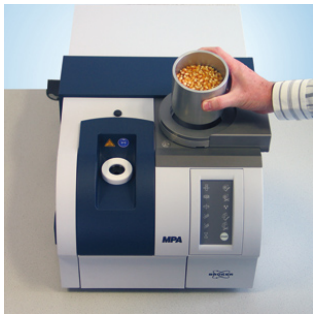
FeedVal 2012

Should I buy this feed?

Market price

- DM basis $/unit price

Nutrient content
Feed composition



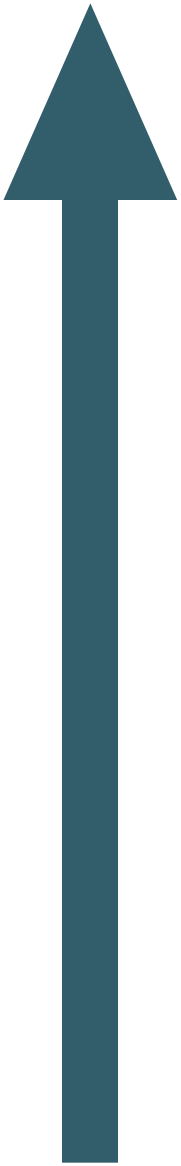
Referee feeds

- Composition
- Market prices

FeedVal 2012

January 2014 dairy feed prices

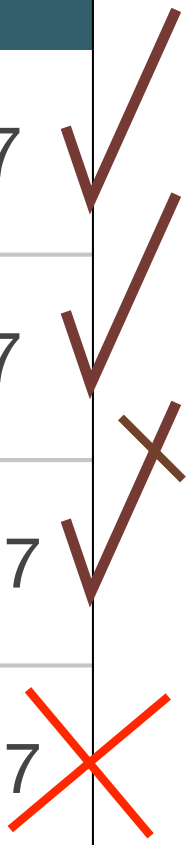
Ingredient	DM %	Unit	Feed Prices ($/Unit) Market	Predicted	Actual Price as % of Predicted	Best-buy Ranking
Wet Distillers	45	ton	76.0	178.4	43	1
Distillers Dried Grains	89	ton	190.0	393.4	48	2
Barley	89	cwt	5.3	9.1	58	3
Corn Gluten Feed	89	ton	160.0	253.3	63	4
Hominy	89	ton	128.0	191.4	67	5
Corn Silage	35	ton	43.2	58.9	73	6
Corn Gluten Meal	89	ton	660.0	887.5	74	7
Shelled Corn	86	bu	4.3	5.5	79	8
Poor Quality Hay	87	ton	140.0	172.8	81	9
Canola Meal, expeller	89	ton	346.8	422.4	82	10
Cottonseed Meal	89	ton	403.0	476.2	85	11
Soybean Meal 48%	89	ton	474.0	532.8	89	12
Wheat Middlings	89	ton	175.0	194.9	90	13
Soy Hulls	89	ton	188.0	200.6	94	14
Wheat	89	bu	5.5	5.7	96	15
Linseed Meal	89	ton	375.0	388.2	97	16
Soybean Meal 44%	89	ton	462.0	468.6	99	17
Good Quality Hay	87	ton	218.3	205.0	107	18
Urea	99	ton	472.0	427.9	110	19
Soybeans, raw	87	bu	12.6	11.1	114	20
Blood Meal	94	ton	1800.0	1540.4	117	21
Sunflower Meal	89	ton	290.0	246.9	117	22
Oats	89	ton	236.9	194.1	122	23
Molasses	89	ton	205.0	144.1	142	24
Whole Cottonseed	89	ton	360.0	247.9	145	25
Beet Pulp	89	ton	270.0	179.6	150	26
Tallow	99	cwt	28.5	15.0	190	27



FeedVal 2012

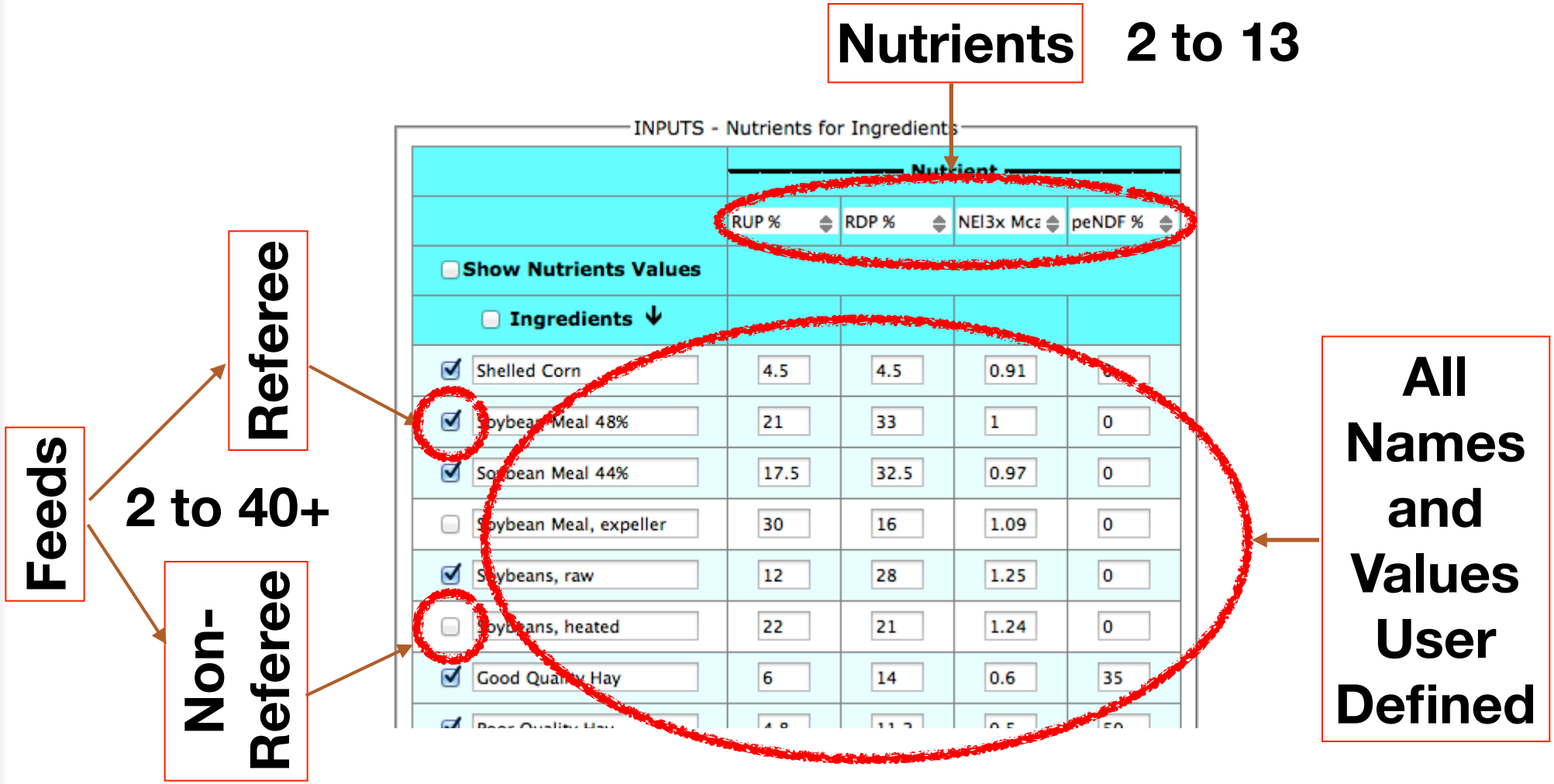
January 2014 dairy feed prices

Feed	Market price	Predicted price	% of Predicted	Rank
Wet Distillers	$76/ton	$176/ton	43%	1 of 27
Corn Grain	$4.3/bu	$5.5/bu	79%	8 of 27
Soybean Meal 44%	$462/ton	$469/ton	99%	17 of 27
Oats Grain	$237/ton	$194/ton	122%	23 of 27



FeedVal 2012

You can and you should do your own analyses



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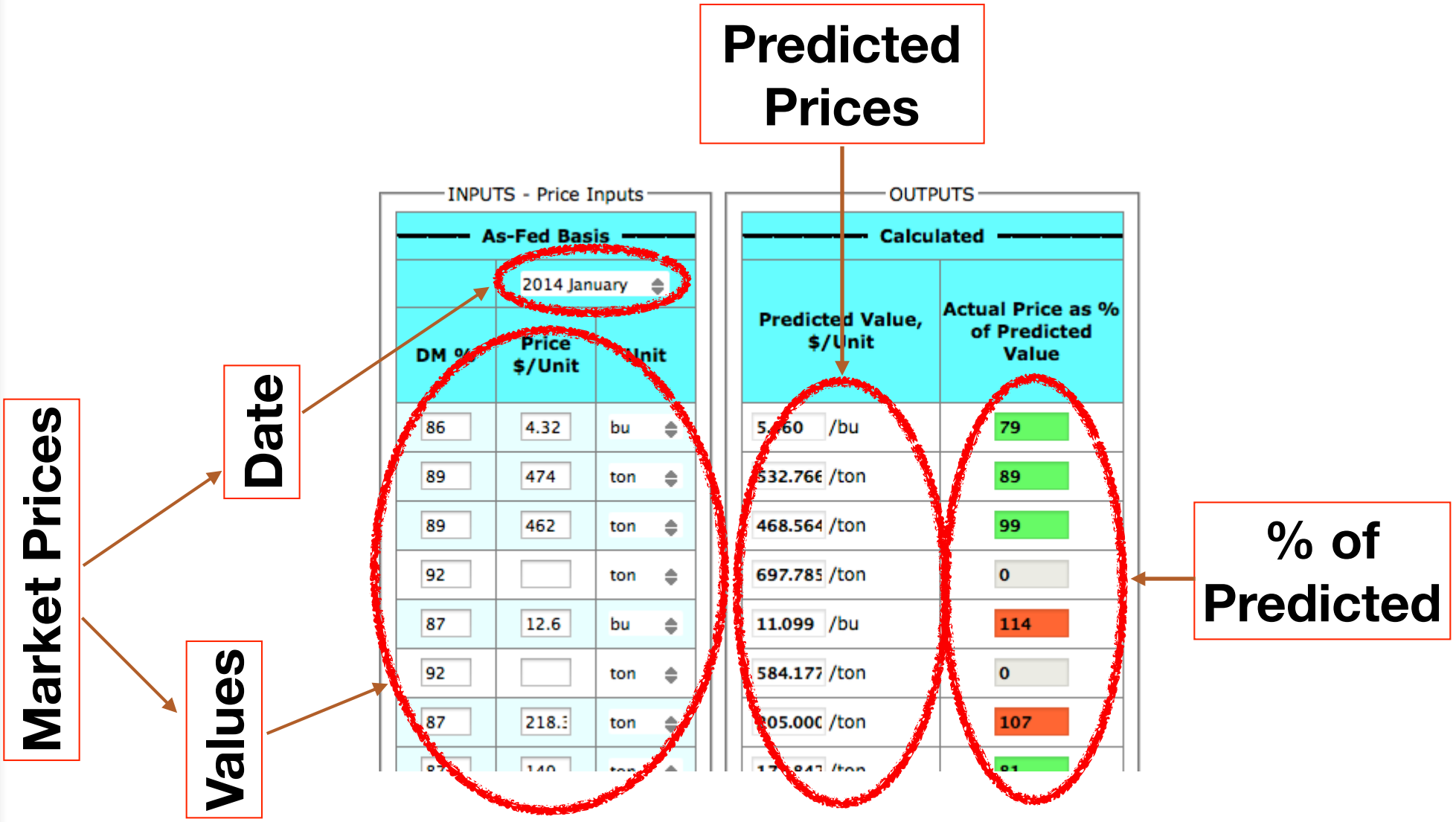


FeedVal 2012

Recap

Calculates real value of a feed based on:

- Nutrient content
- Referee feeds
- Market prices

Help decisions of:

- Feed purchases
- Diet balancing
- Feed utilization

Supports:

- Decreased feed costs
- Increased income over feed costs

Nutritional Grouping Strategies

Rationale

Same ration to all lactating cows

- All lactating cows receive same nutrient density
- Preferred “high” rations
- Low producing cows are overfed

Improved nutrient efficiency

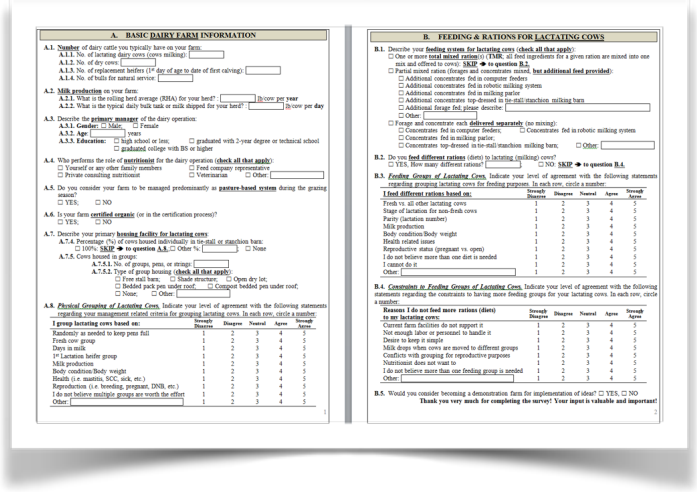
- Diet closer to requirements
- Less over-conditioned cows
- Less environmental concerns
- **Higher milk income over feed costs**

Why Farmers do not Group More?

Exploring main constraints

2-page survey

- 196 farms in WI
- 211 farms in MI



A. BASIC DAIRY FARM INFORMATION

A.1. Number of dairy cattle you typically have on your farm:
A.1.1. No. of lactating dairy cows (cows milking):
A.1.2. No. of dry cows:
A.1.3. No. of replacement heifers (1st day of age to date of first calving):
A.1.4. No. of bulls for natural service:

A.2. Milk production on your farm:
A.2.1. What is the rolling herd average (RHA) for your herd? lb/cow per year
A.2.2. What is the typical daily bulk tank or milk shipped for your herd? lb/cow per day

A.3. Describe the primary manager of the dairy operation:
A.3.1. Gender: ☐ Male, ☐ Female
A.3.2. Age: years
A.3.3. Education: ☐ high school or less; ☐ graduated with 2-year degree or technical school ☐ graduated college with BS or higher

A.4. Who performs the role of nutritionist for the dairy operation (check all that apply):
☐ Yourself or any other family members ☐ Feed company representative
☐ Private consulting nutritionist ☐ Veterinarian ☐ Other:

A.5. Do you consider your farm to be managed predominantly as pasture-based system during the grazing season?
☐ YES; ☐ NO

A.6. Is your farm certified organic (or in the certification process)?
☐ YES; ☐ NO

A.7. Describe your primary housing facility for lactating cows:
A.7.4. Percentage (%) of cows housed individually in tie-stall or stanchion barn:
☐ 100%; SKIP → to question A.8. ☐ Other %: ☐ None
A.7.5. Cows housed in groups:
A.7.5.1. No. of groups, pens, or strings:
A.7.5.2. Type of group housing (check all that apply):
☐ Free stall barn; ☐ Shade structure; ☐ Open dry lot;
☐ Bedded pack pen under roof; ☐ Compost bedded pen under roof;
☐ None; ☐ Other:

A.8. Physical Grouping of Lactating Cows. Indicate your level of agreement with the following statements regarding your management related criteria for grouping lactating cows. In each row, circle a number.

I group lactating cows based on:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Randomly as needed to keep pens full	1	2	3	4	5
Fresh cow group	1	2	3	4	5
Days in milk	1	2	3	4	5
1st Lactation heifer group	1	2	3	4	5
Milk production	1	2	3	4	5
Body condition/Body weight	1	2	3	4	5
Health (i.e. mastitis, SCC, sick, etc.)	1	2	3	4	5
Reproduction (i.e. breeding, pregnant, DNB, etc.)	1	2	3	4	5
I do not believe multiple groups are worth the effort	1	2	3	4	5
Other:	1	2	3	4	5

B. FEEDING & RATIONS FOR LACTATING COWS

B.1. Describe your feeding system for lactating cows (check all that apply):
☐ One or more total mixed rations (=TMR: all feed ingredients for a given ration are mixed into one mix and offered to cows); SKIP → to question B.2.
☐ Partial mixed ration (forages and concentrates mixed, but additional feed provided):
☐ Additional concentrates fed in computer feeders
☐ Additional concentrates fed in robotic milking system
☐ Additional concentrates fed in milking parlor
☐ Additional concentrates top-dressed in tie-stall/stanchion milking barn
☐ Additional forage fed, please describe:
☐ Other:
☐ Forage and concentrate each delivered separately (no mixing):
☐ Concentrates fed in computer feeders; ☐ Concentrates fed in robotic milking system
☐ Concentrates fed in milking parlor;
☐ Concentrates top-dressed in tie-stall/stanchion milking barn; ☐ Other:

B.2. Do you feed different rations (diets) to lactating (milking) cows?
☐ YES, How many different rations? ☐ NO; SKIP → to question B.4.

B.3. Feeding Groups of Lactating Cows. Indicate your level of agreement with the following statements regarding grouping lactating cows for feeding purposes. In each row, circle a number.

I feed different rations based on:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Fresh vs. all other lactating cows	1	2	3	4	5
Stage of lactation for non-fresh cows	1	2	3	4	5
Parity (lactation number)	1	2	3	4	5
Milk production	1	2	3	4	5
Body condition/Body weight	1	2	3	4	5
Health related issues	1	2	3	4	5
Reproductive status (pregnant vs. open)	1	2	3	4	5
I do not believe more than one diet is needed	1	2	3	4	5
I cannot do it	1	2	3	4	5
Other:	1	2	3	4	5

B.4. Constraints to Feeding Groups of Lactating Cows. Indicate your level of agreement with the following statements regarding the constraints to having more feeding groups for your lactating cows. In each row, circle a number.

Reasons I do not feed more rations (diets) to my lactating cows:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Current farm facilities do not support it	1	2	3	4	5
Not enough labor or personnel to handle it	1	2	3	4	5
Desire to keep it simple	1	2	3	4	5
Milk drops when cows are moved to different groups	1	2	3	4	5
Conflicts with grouping for reproductive purposes	1	2	3	4	5
Nutritionist does not want to	1	2	3	4	5
I do not believe more than one feeding group is needed	1	2	3	4	5
Other:	1	2	3	4	5

B.5. Would you consider becoming a demonstration farm for implementation of ideas? ☐ YES, ☐ NO

Thank you very much for completing the survey! Your input is valuable and important!

Constraints to feeding more ration groups

1. Milk drops when cows are moved
2. Desire to keep management simple
3. Conflicts with grouping for reproduction
4. Farm facilities do not allow it
5. Not enough labor or personnel to handle it

Strategies for Grouping Cows

Depend on farm and herd characteristics

Number of cows

- Lactating cows
- Stages of cows

Individual cow requirements

- Energy (NEL)
- Protein (CP)
- DMI

Farm characteristics

- Capacity to handle feeding groups

Criteria for Nutritional Grouping

Several criteria exist and are used

Days after calving, DIM

- Based on lactation stage: e.g., earlier, medium, late

Fat (protein) corrected milk

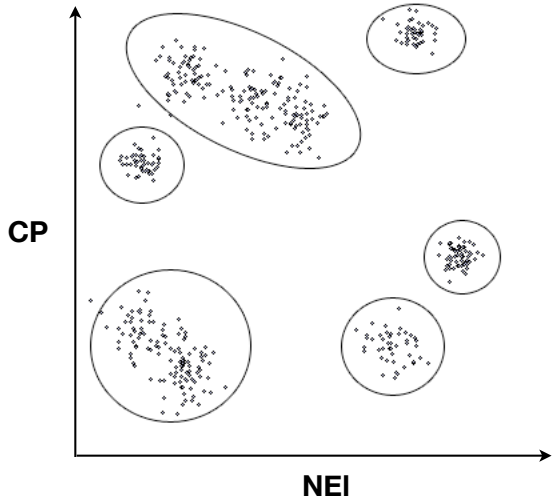
- Based on production level

Dairy merit

- Function of both F(P)CM and BW

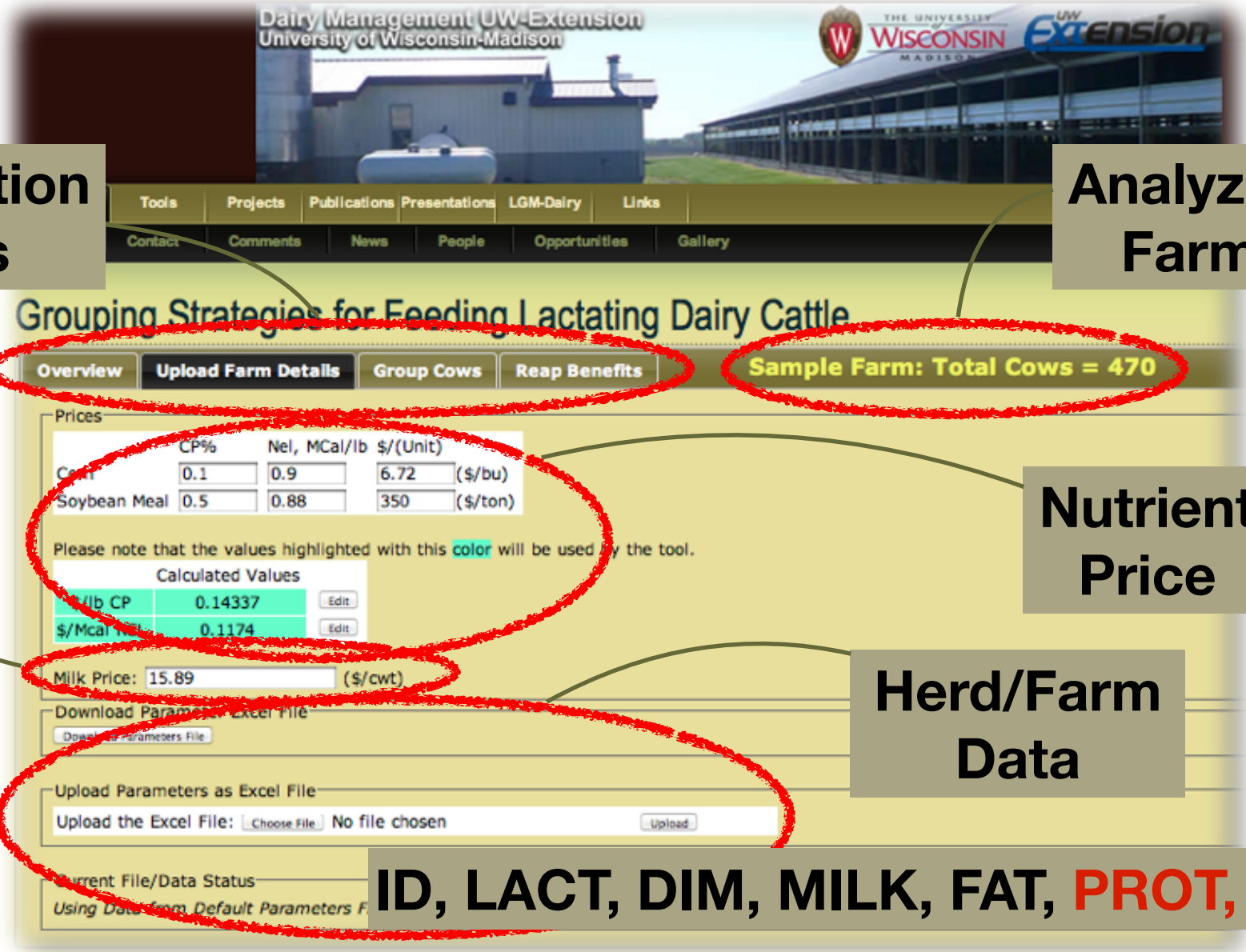
Cluster

- Seems the MOST efficient criterion



Grouping Strategies for Feeding Cows

You can and you should do your own analyses



Navigation Tabs

Analyzed Farm

Milk Price

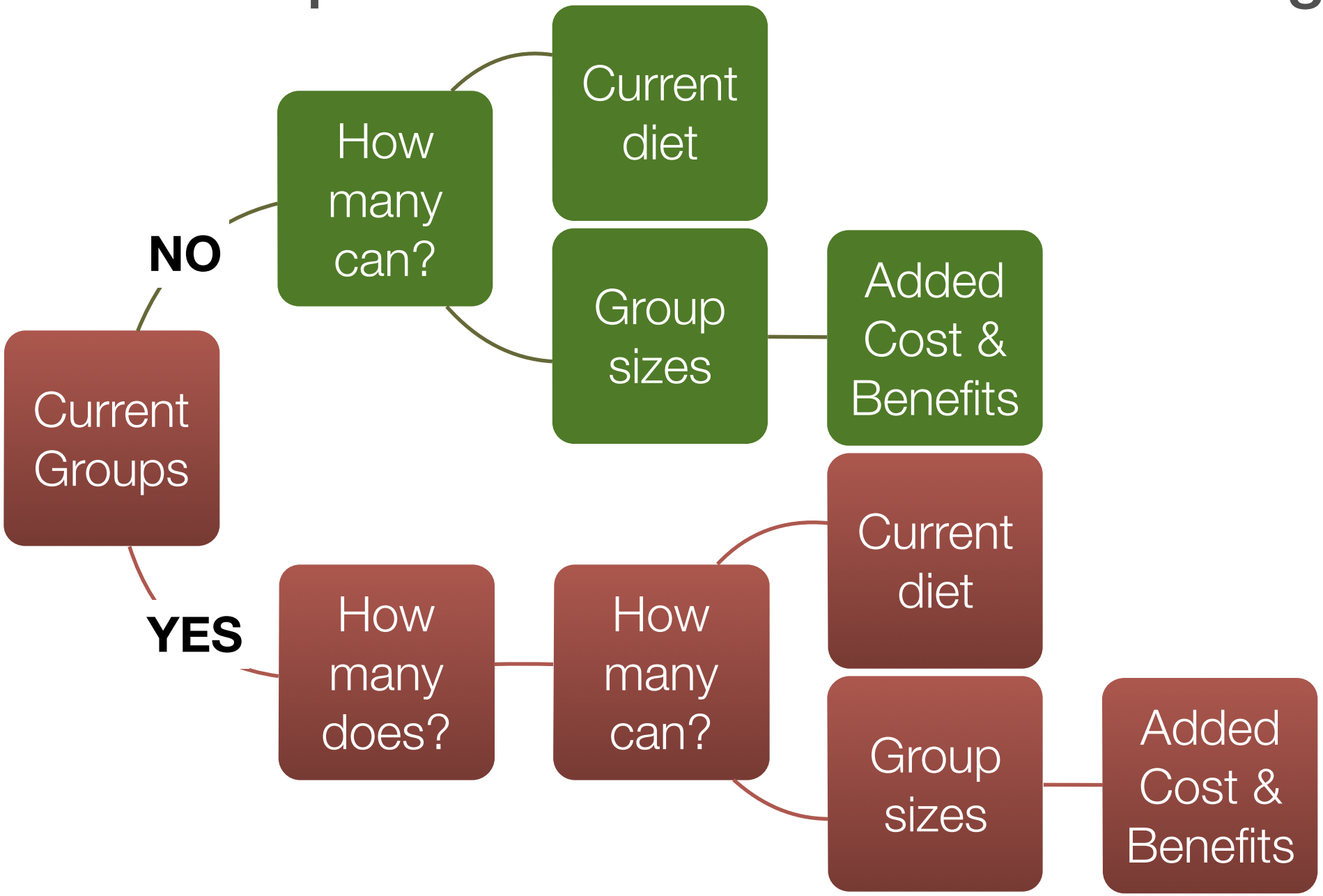
Nutrient Price

Herd/Farm Data

ID, LACT, DIM, MILK, FAT, PROT, BW

Grouping Strategies

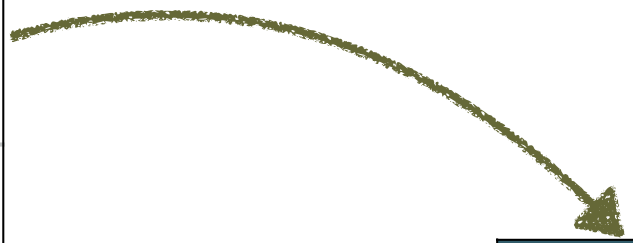
Farm/herd possibilities and decision-making



Grouping Illustration

Economic impact of nutritional grouping

Current Situation	
Lactating Cows	470
Current Groups	None
NEL Mcal/lb	0.80
CP, %	17



Possible Situation	
Groups	3
Group Sizes	100, 100, 270
Milk loss	5 lb/d x 4 d
Saved costs	None

Decision Support System Illustration

Cluster grouping criteria

Current Situation				
Group	Cows	NEL	CP	IOFC
	#	Mcal/lb	%	$/cow.d
All	**470**	**0.80**	**17.00**	**6.9**

Possible Situation				
Group	Cows	NEL	CP	IOFC
	#	Mcal/lb	%	$/cow.d
1	100	0.62	13.07	4.7
2	100	0.65	14.18	7.2
3	270	0.71	16.05	9.3
All	**470**	**0.68**	**15.02**	**7.9**

+$147,000/year for 470 cows

Analysis from 30 Dairy Farm Records

30 Wisconsin dairy farms

Prices

- Milk: $15.89/cwt
- CP: 0.1434/lb
- NEL: 0.1174/Mcal

Grouping criteria

- Cluster

No groups vs. 3 groups

- Same size groups

Projected BW

- 1st lactation: 1,100 lb
- >1st lactation: 1,300 lb

Grouping Strategies on 30 Farms

Cluster grouping on Wisconsin farms

	Lactating cows (n=30)	No grouping	3 Groups	Gain
		Income Over Feed Cost $/cow.yr		
Minimum	<200	697	1,059	161
Mean	788	2,311	**2,707**	**396**
Maximum	>1,000	2,967	3,285	580

The Economic Value of a Dairy Cow

CRUCIAL for multiple on-farm decisions

Keep or replace

- Herd is better off with or without the cow
- What are the least valuable animals
- What are the most valuable animals

Breed or do-not-breed

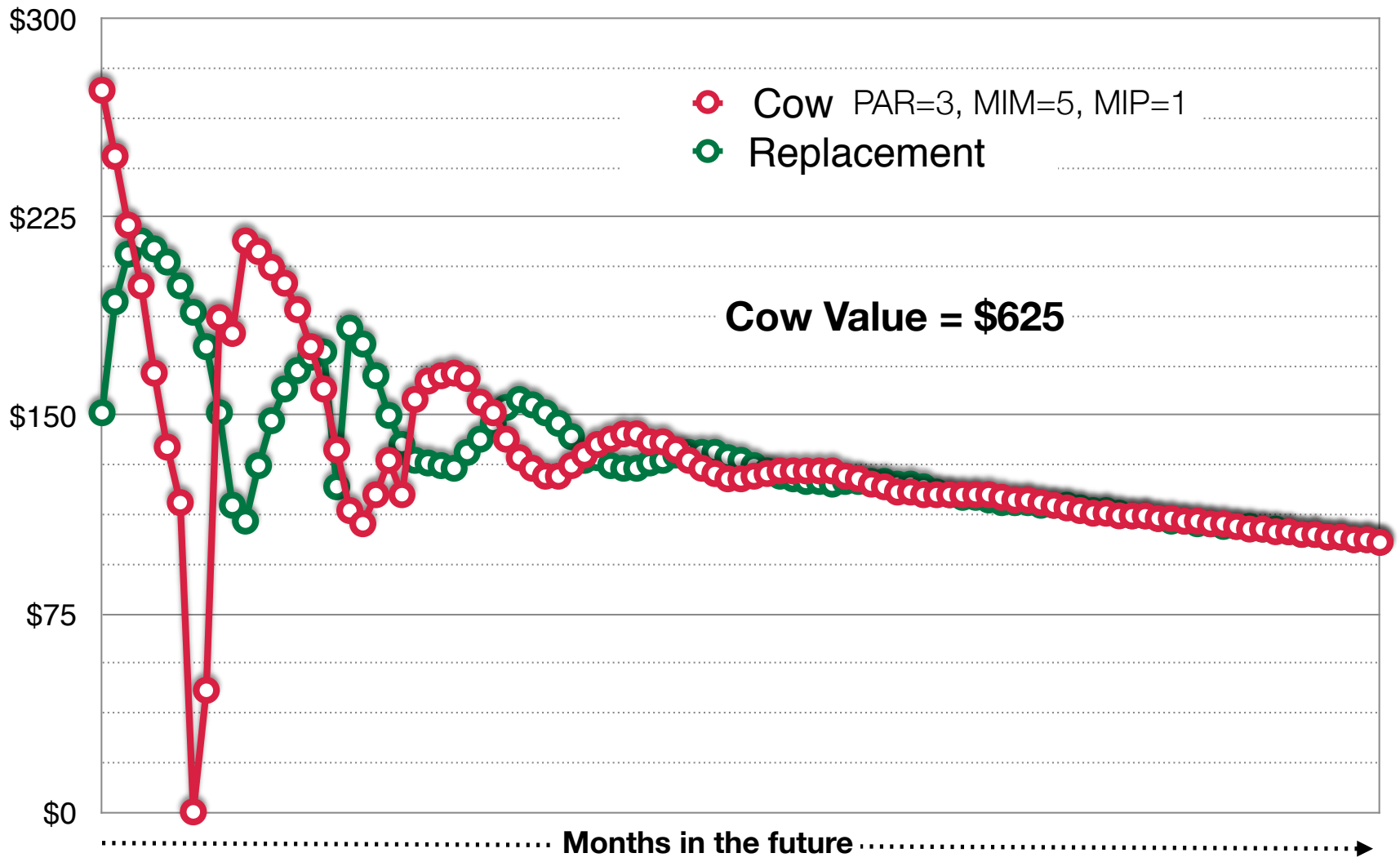
- Value of a pregnancy
- Cost of a pregnancy loss
- Cost of a day open

Treat or do not treat

- How much investment a cow is worth?

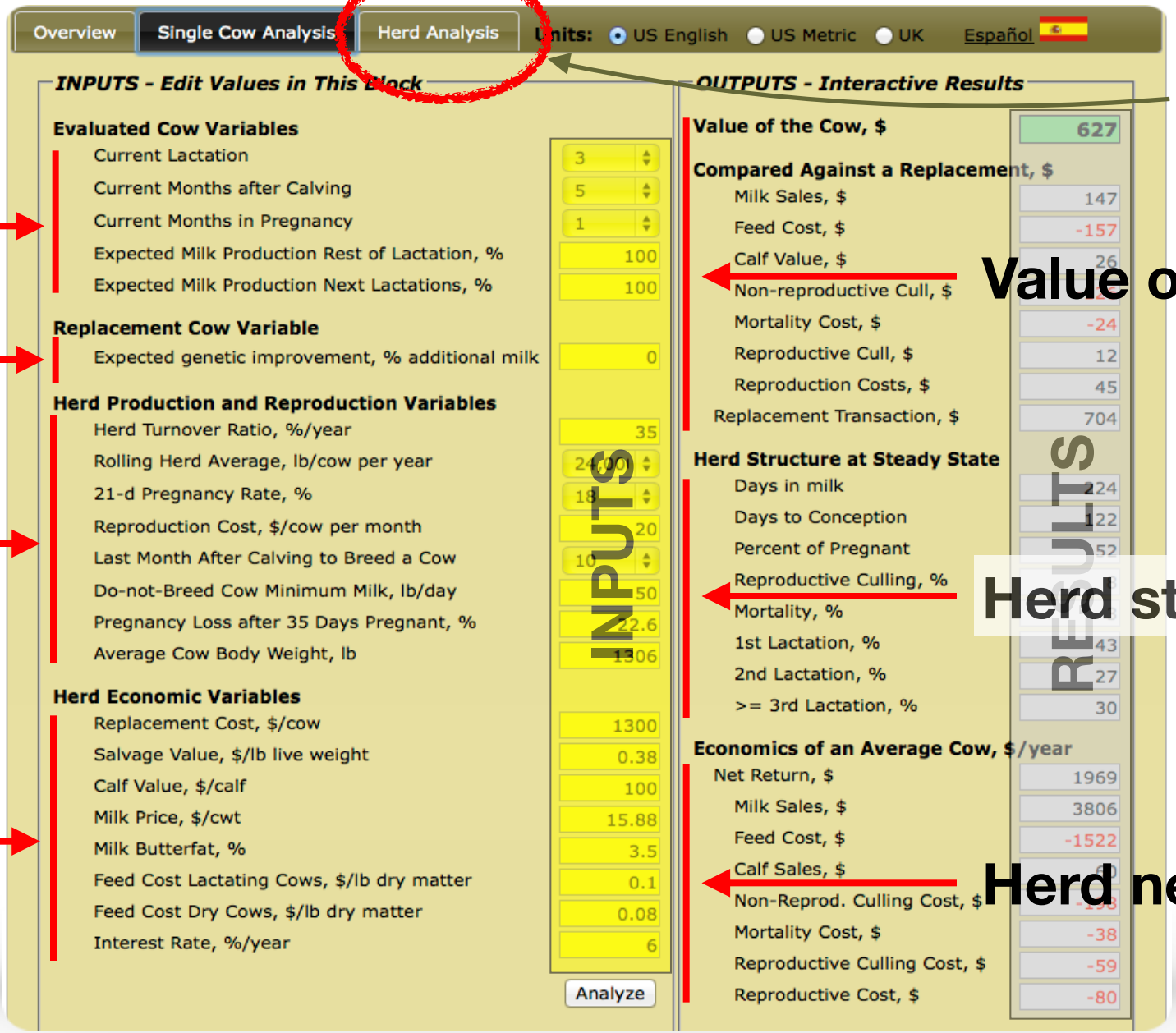
Projected Economic Net Return

Expected future profitability



Economic Value of a Dairy Cow

You can and you should do your own analyses



Cow

Repla-cement

Herd

Market

Herd analysis

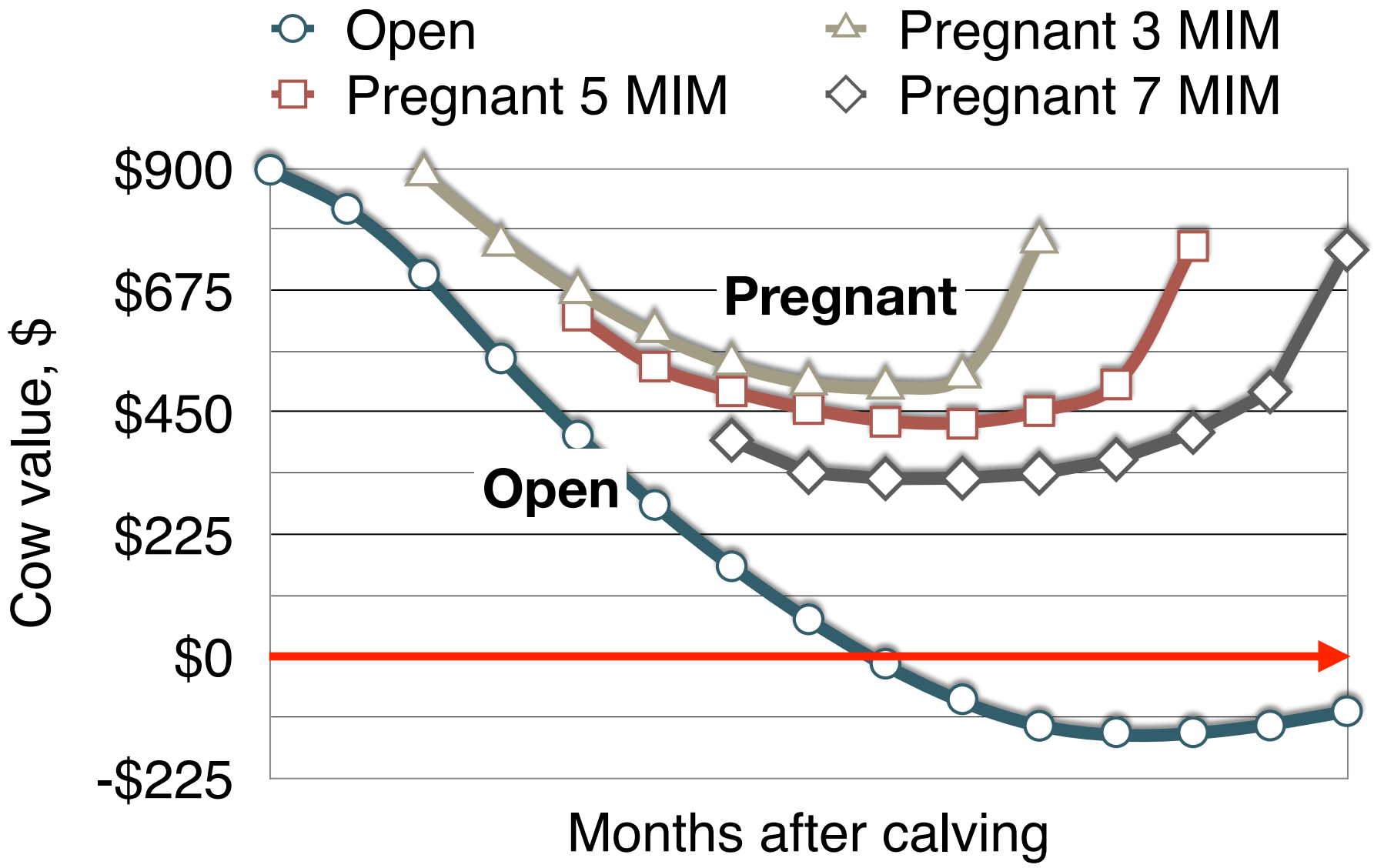
Value of a Cow

Herd structure

Herd net return

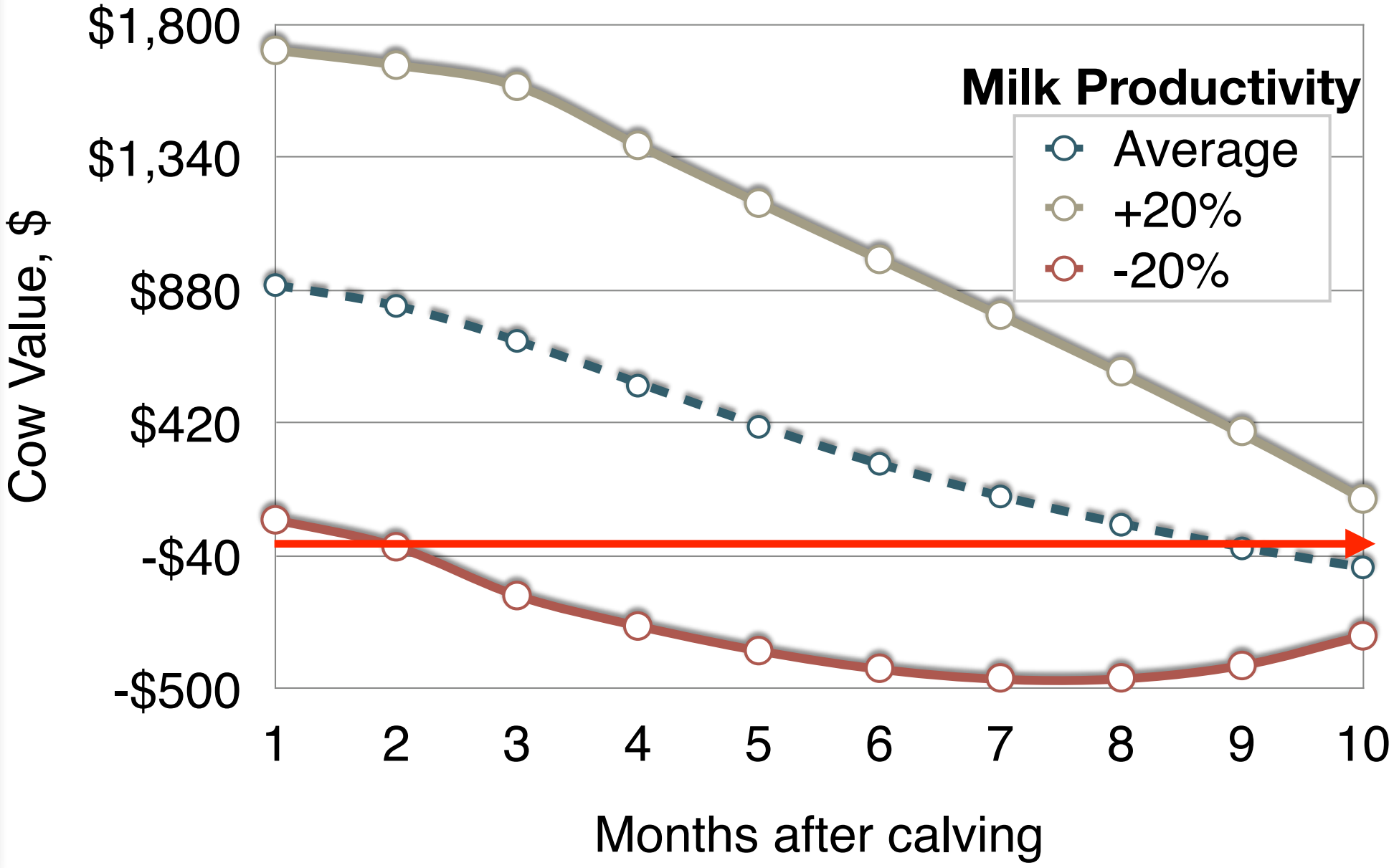
The Value of an Average Cow

Open vs. pregnant in second lactation



Milk Productivity and Value of a Cow

Impact of projected productivity



AgSource Herd Selection Guide

Individual cow value for all herd

Service Requested

Calculate Individual Cow Productivity

Lifetime ME

Genetic Merit

The Economic Value of a Dairy Cow

	Identification and Status				Reproduction					Current Lactation			Lifetime Average			Genetics		Test Day		
Ctrl Num	Barn Name	Lact	Calv date	DIM	Last Bred	Serv Sire	No. Serv	Days Open	Repro Status /DCC	ME Milk	LS SCC	TCI	ME Milk	LS SCC	TCI	NM$	Gen Ind.	Milk	LS SCC	Exp. Rel. $
3241	1522	1	9/25/11	DRY	3/29/12	7HO08946	2	186	P/233	46513	1.1		46513	1.1		99				$4,576
3304	1585	1	1/21/12	301	5/16/12	7HO09420	2	116	P/185	43440	0.8		43440			142		78	0.9	$3,684
3377	1658	1	8/6/12	103	10/21/12	7HO09893	1	76		42577	1.9		42577			146		131	1.3	$3,571
3327	1608	1	3/14/12	248	6/11/12	7HO09229	2	89	P/159	42690	1.4		42690			567		109	0.9	$3,468
3326	1607	1	4/15/12	216	7/20/12	7HO10176	2	96	P/120	41259	1.6		41259			340		112	1.5	$3,156
3359	1640	1	6/4/12	166	10/24/12	7HO10091	2	142		42777	2.4		42777			20		125	2.2	$3,130
3077	1358	2	1/25/12	297	11/10/12	7HO09471	6	290		39417	5.4	2404	39616	0.5	2404	318		128	3.9	$278
3085	1367	2	7/15/12	125					N	33255	0.9	428	35944	1.6	428	71		131	1.2	$276
2871	1154	3	1/14/12	DRY	3/25/12	7HO09052	1	71	P/237	33183	1	-913	34185	1.7	76	344				$273
3253	1534	2	10/28/12	20						31578	1.4	3517	34188	3.8	3517	285		119	1.4	$273
3269	1550	1	1/22/12	DRY	3/31/12	7HO09420	1	69	P/231	34011	3.8		34011	3.8						$270
3281	1562	1	2/4/12	287	4/15/12	7HO09165	1	71	P/216	33609	1.6		33609			185		59	1.9	$269
2945	1228	3	9/25/12	53						27406	0.8	612	36670	1.9	226	194		115	1	$265
3371	1652	1	8/19/12	90						33556	0.9		33556			124		100	0.8	$256
3217	1499	2	10/8/12	40						17783	1.2	-6148	26926	3.3	-6148			47	1.1	($3,473)
3429	1710	1	10/29/12	19						23564	2.1		23564					53	2.1	($3,654)
3421	1702	1	10/30/12	18						19546	1.7		19546					34	1.7	($5,128)
3428	1709	1	10/11/12	37						19173	1.6		19173					41	0.8	($5,151)
3400	1681	1	10/18/12	30						18936	1.6		18936					41	1.6	($5,384)
3389	1670	1	10/18/12	30						17321	1.3		17321					34	1.3	($5,958)

Thanks

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Dairy Management

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DEPARTMENT OF DAIRY SCIENCE
University of Wisconsin-Madison

UW Extension
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