Economic Impact of Dairy Cow Management

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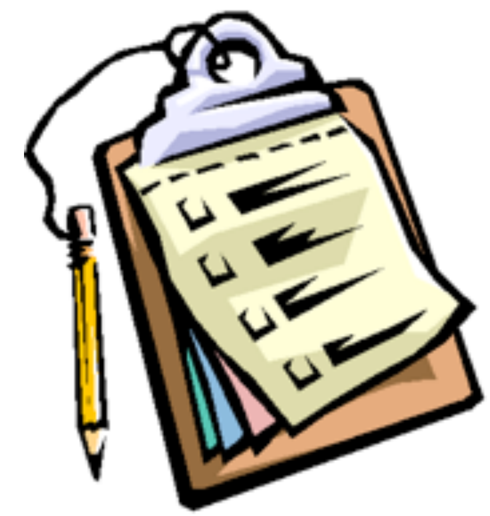
Workshop – Jistebnice, 23 July 2013

DairyMGT.info

UW-Dairy Management Website

Outline

120 minutes



The economic value of a dairy cow

- Rationale
- Decision support tool
- Applications

Livestock gross margin for dairy

- Rationale
- Suite of decision support tools
- Applications

FeedVal2012

- Decision support tool
- Applications

Grouping strategies for lactating cows

- Rationale
- Decision support tool
- Applications

Economic Value of a Dairy Cow

Economic value of a dairy cow

What is it?

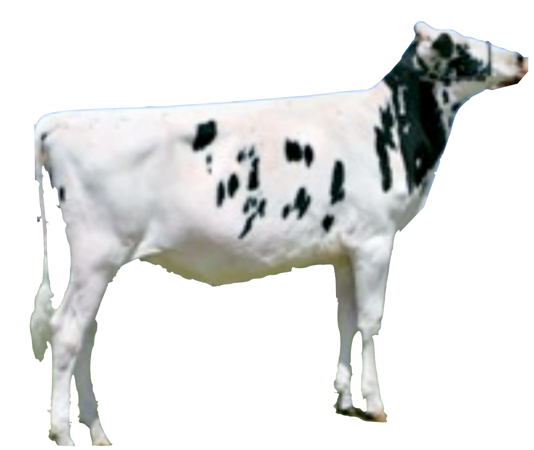
Discounted future net return of a cow

Compared to a replacement

Vs.

Projected net return of a cow - projected net return of replacement

Includes replacement transaction cost



Economic value of a dairy cow

Variables with large impact

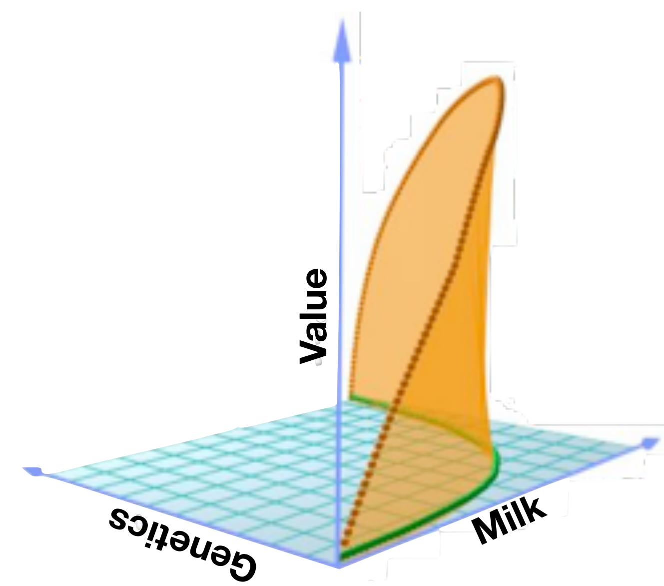
Cow productivity in relation with herd mates

Current lactation

Future lactations

Replacement genetics

Expected genetic improvement with a replacement



Economic value of a dairy cow

Critical economic implications

Optimal replacement management

Keep or replace

Crucial decisions

Breed or not breed

Use of special breeding options

Important information

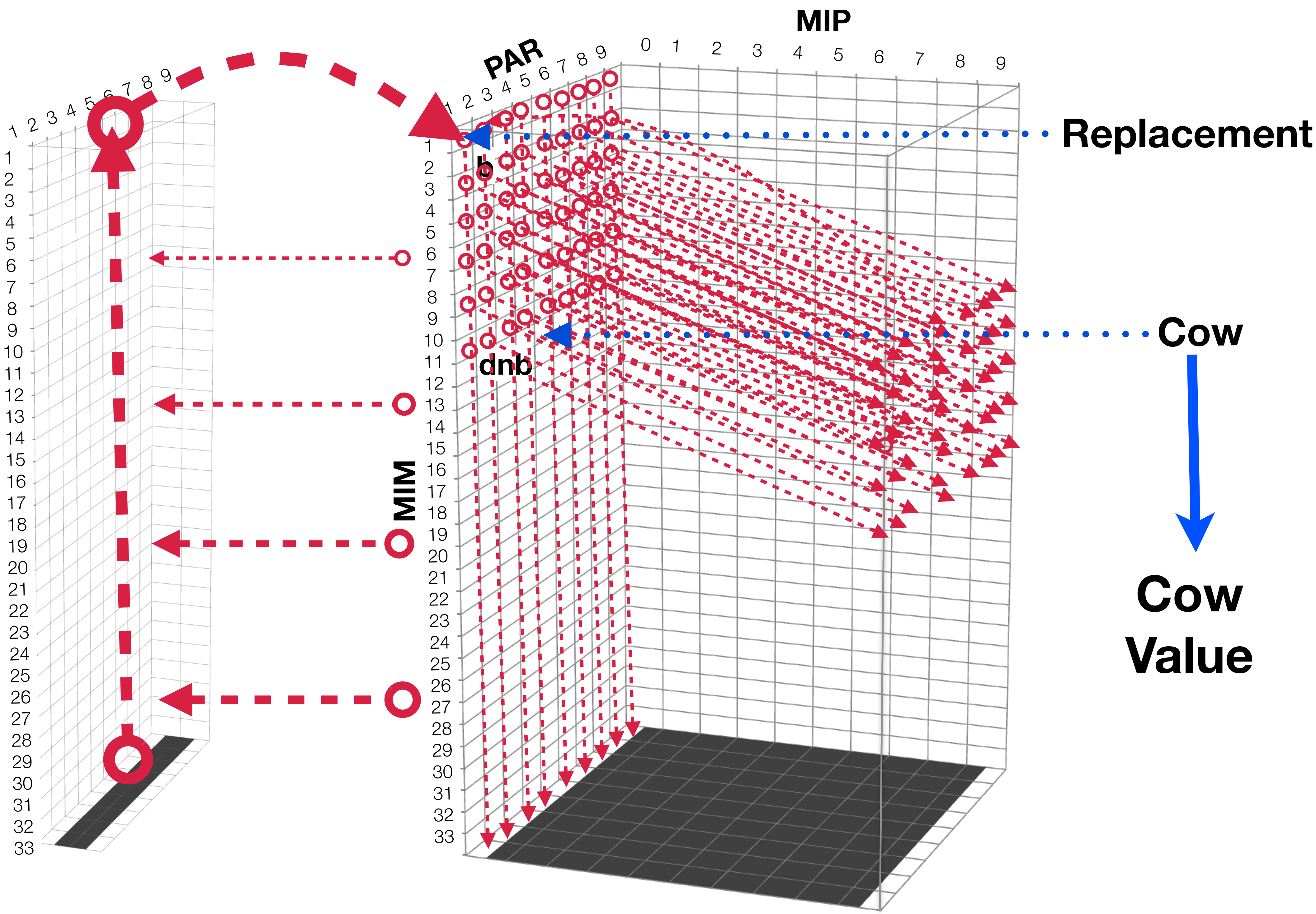
Value of a pregnancy

Cost of a pregnancy loss

Cost of a day open

Basic principle of value of a cow

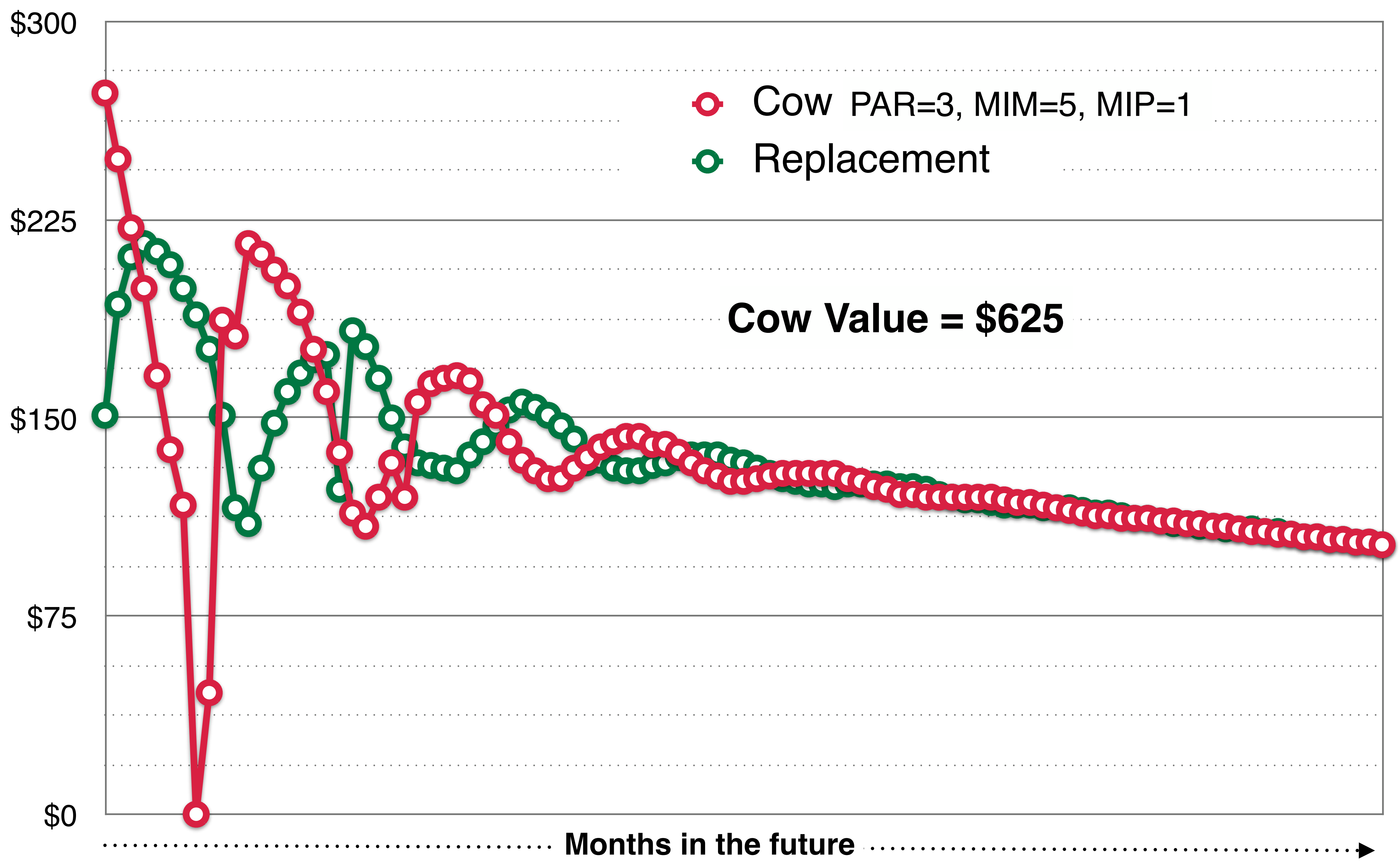
Markov-chains



Cabrera, 2012

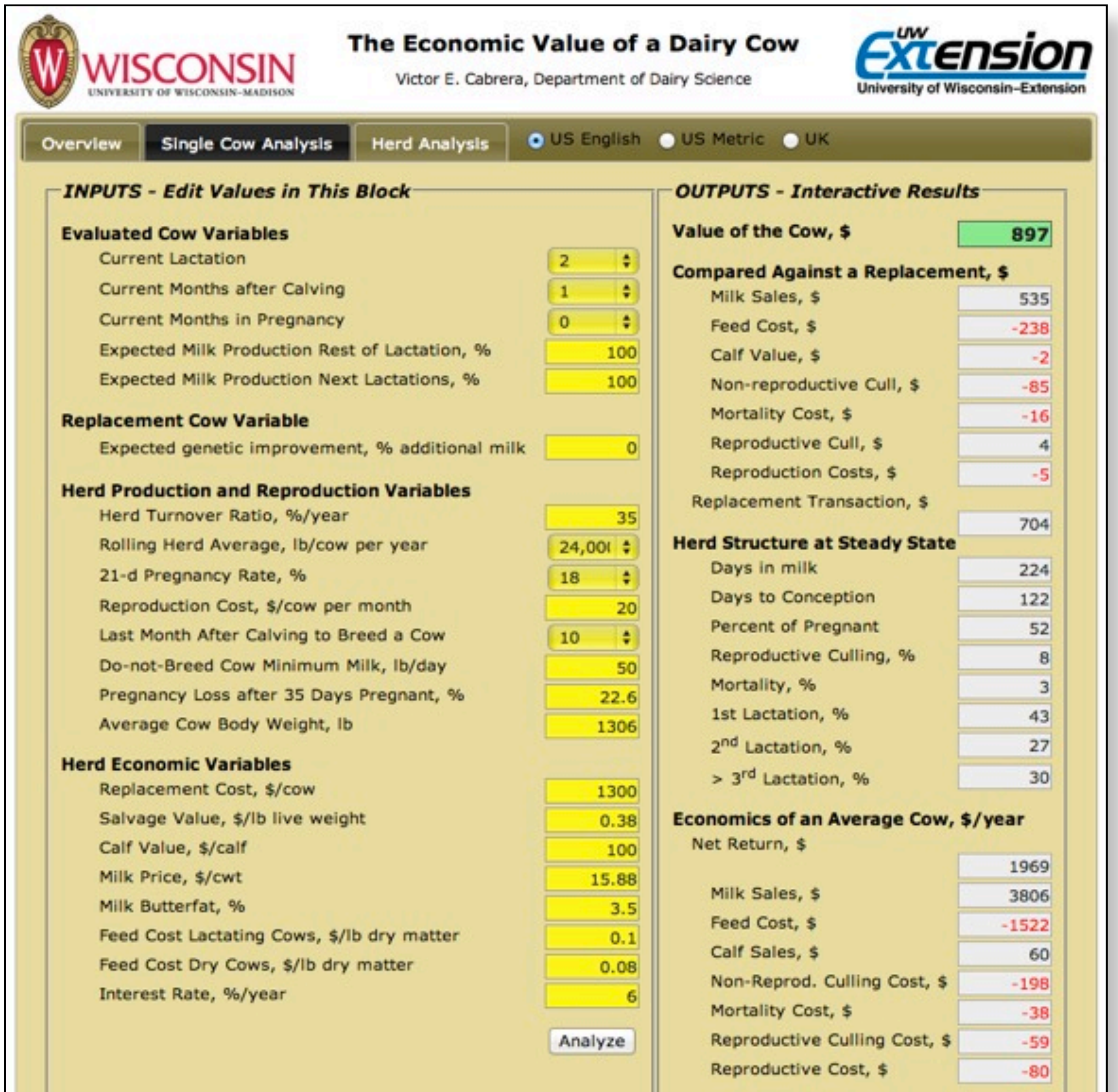
Basic principle of value of a cow

An application



Calculating the value of a cow

Decision support tool



Example:

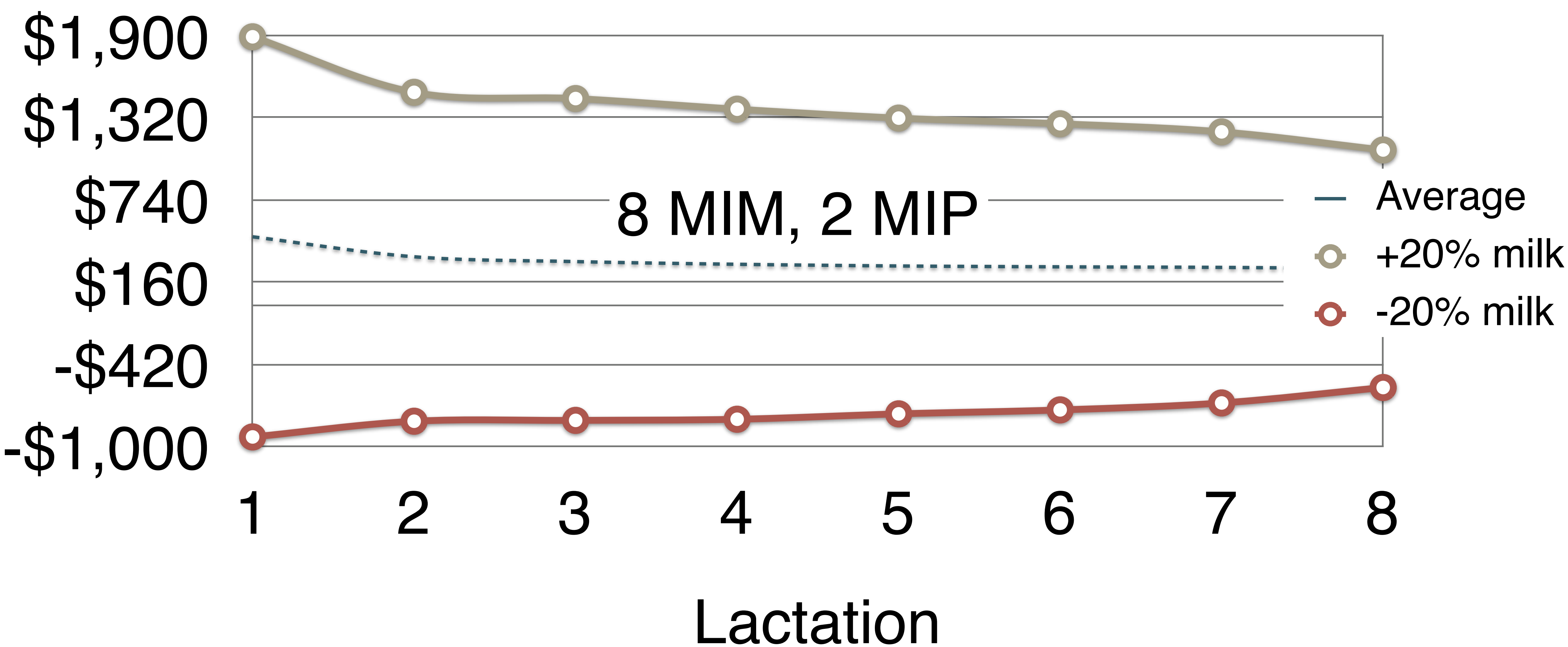
Value of this 2nd lactation, 1 MIM, open cow is **$897**

Economic value of a dairy cow

Practical decision-making

Cull or not cull

Positive cow value indicates cow brings more value than replacement

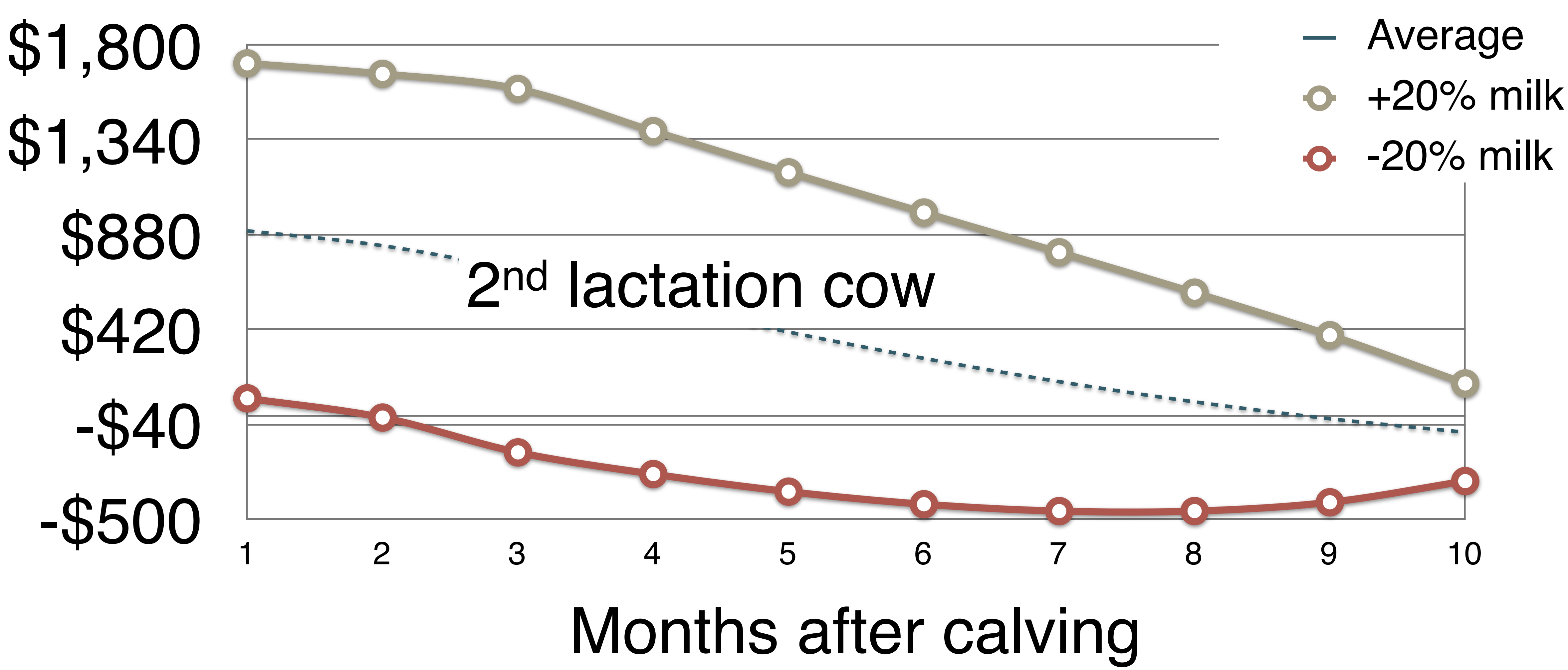


Economic value of a dairy cow

Practical decision-making

Breed or not breed

Better chance for higher value cows

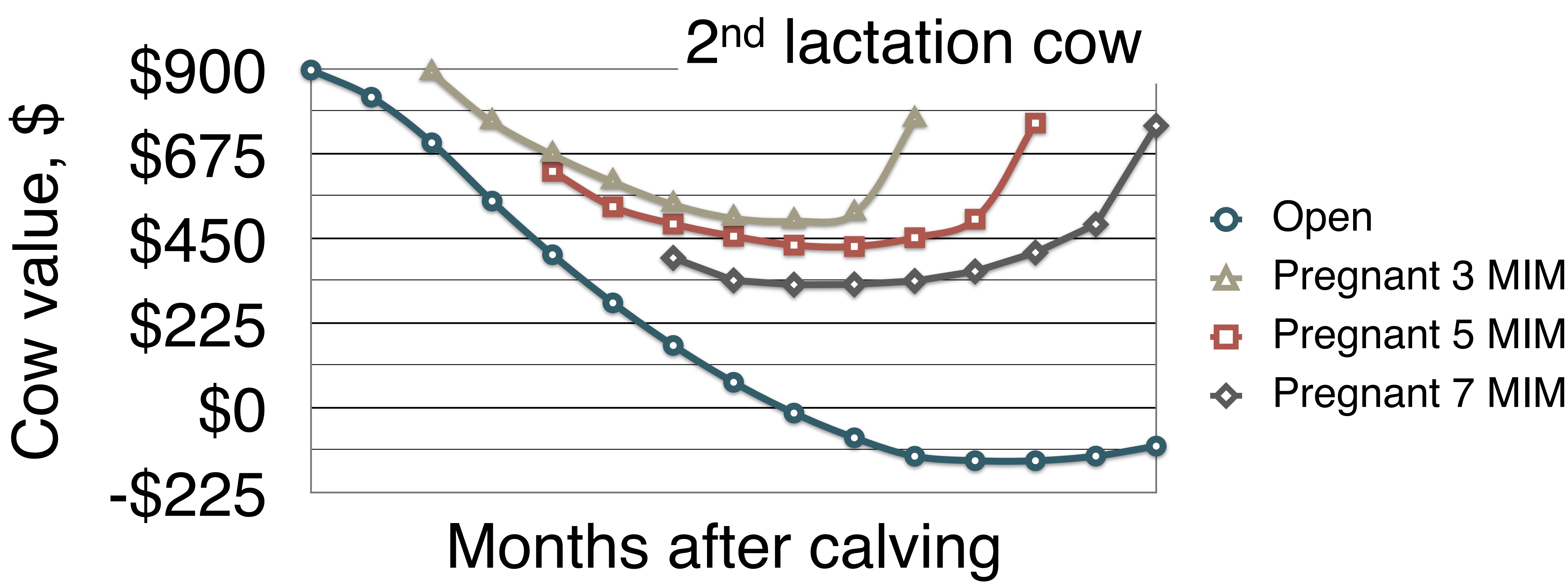


Economic value of a dairy cow

Practical decision-making

Treat or not treat

More investment allowed
in higher value cows

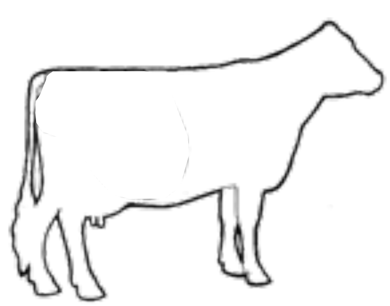


Economic value of a dairy cow

Practical decision-making

Calculate the value of a pregnancy

Difference between pregnant and non-pregnant



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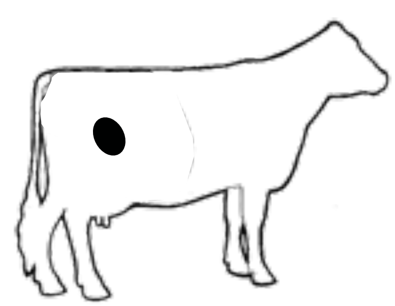
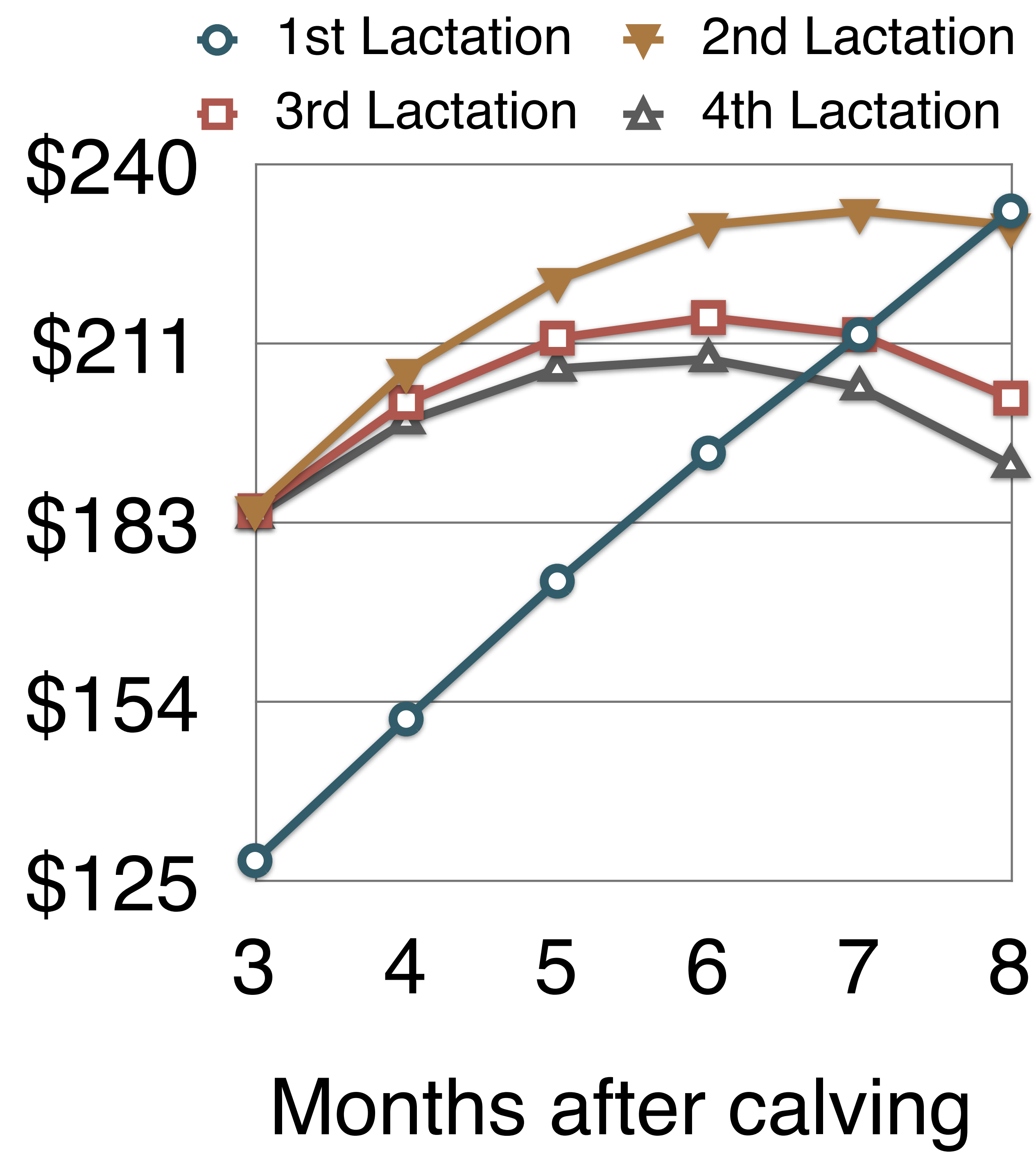


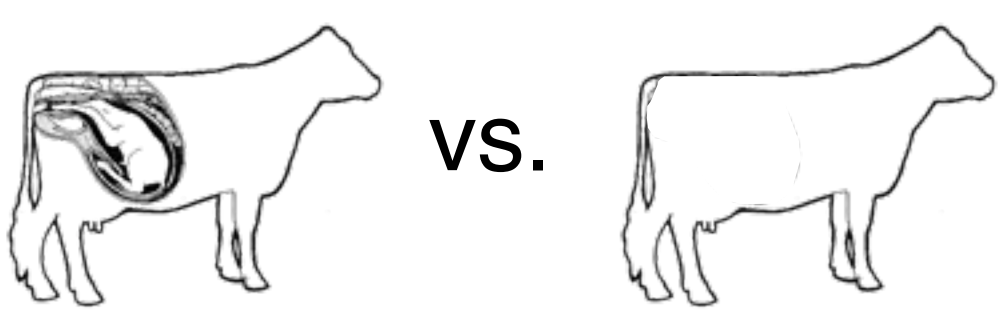


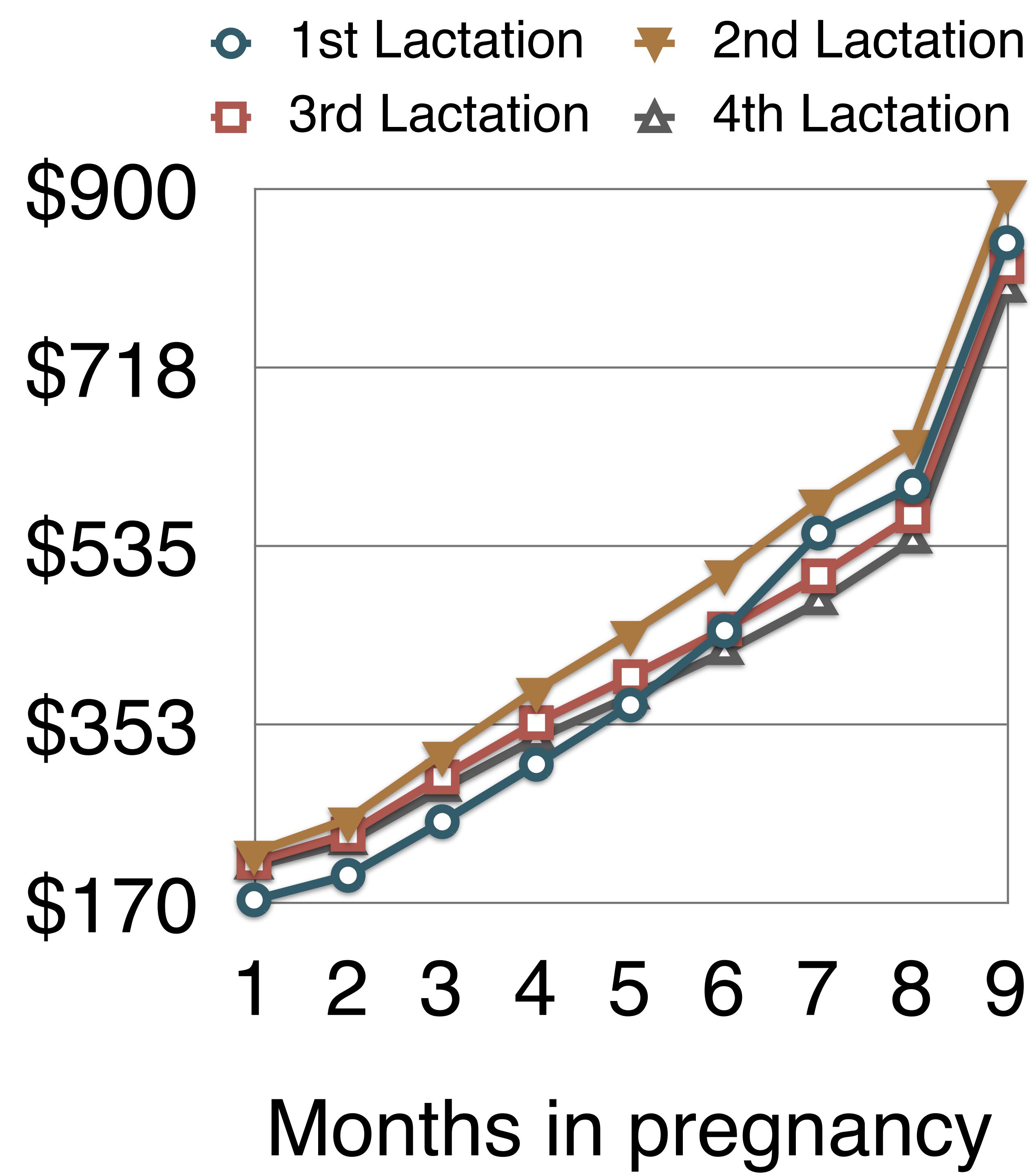
Economic value of a dairy cow

Practical decision-making

Calculate the cost of a pregnancy loss

Difference between non-pregnant and pregnant



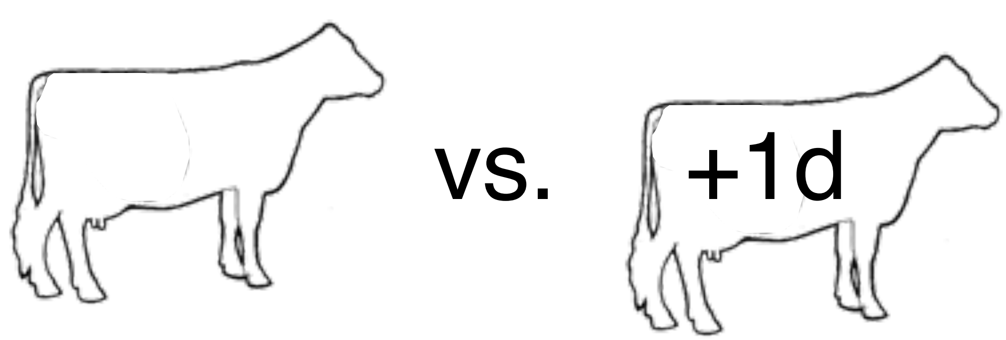


Economic value of a dairy cow

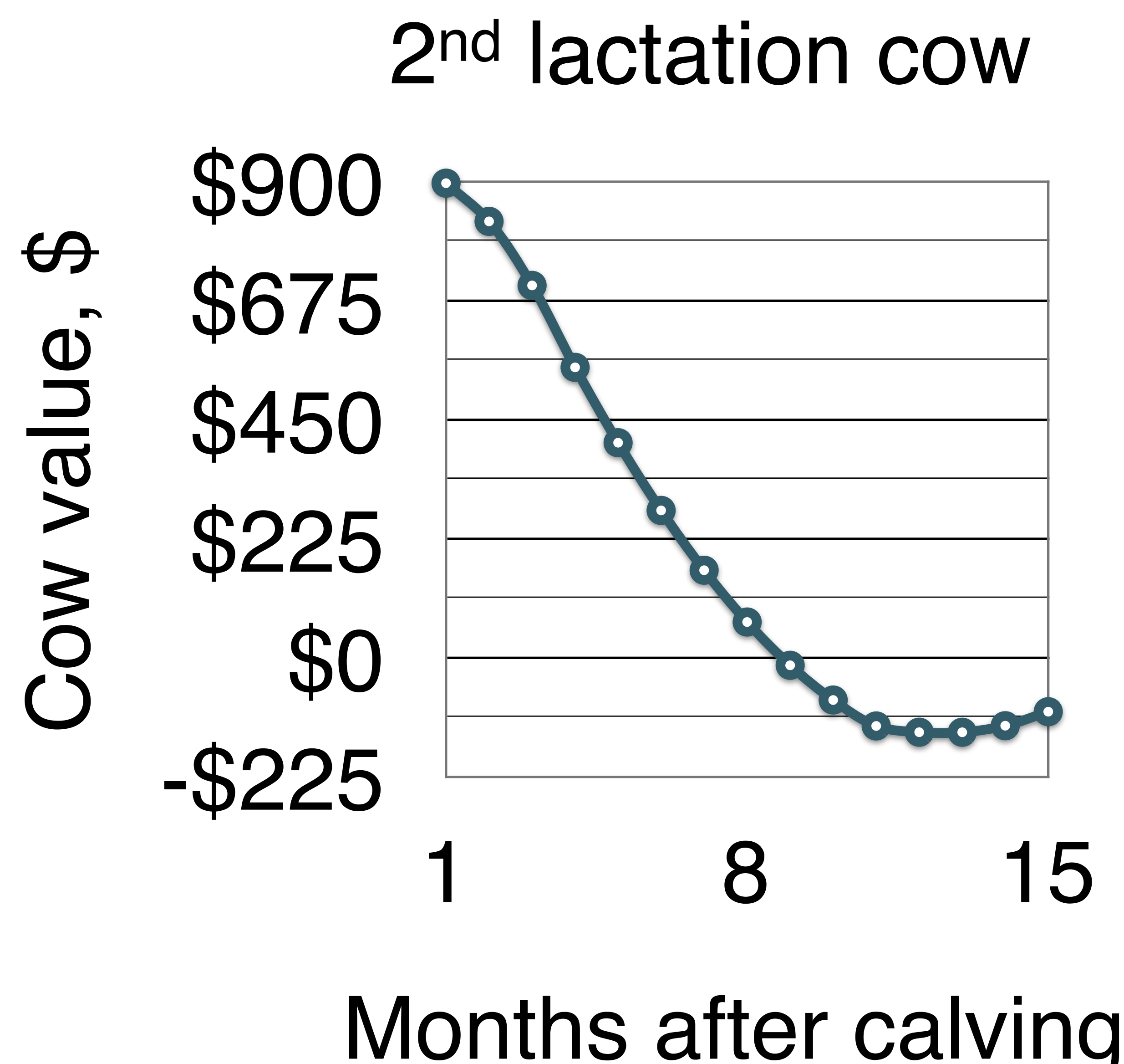
Practical decision-making

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)



Economic value all cows in herd

Ranked values for better decision-making

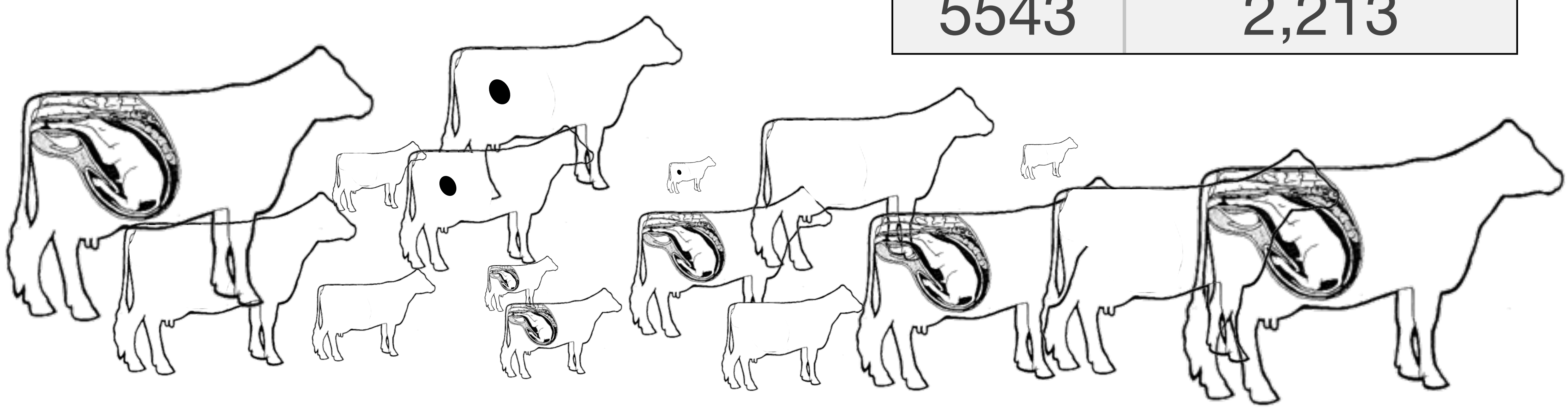
Herd's individual cow values

Candidates for replacement

Best performing animals

Treatment decisions

Cow ID	Cow value, $
5892	-1,123
6344	-243
435	-10
221	269
5543	2,213



Livestock Gross Margin for Dairy

Livestock gross margin for dairy

Price risk management insurance

Protects gross margin
Income over feed cost

Bundled price risk management
Floor milk price + ceiling feed prices

Prices from CME
Class III
Corn
Soybean meal

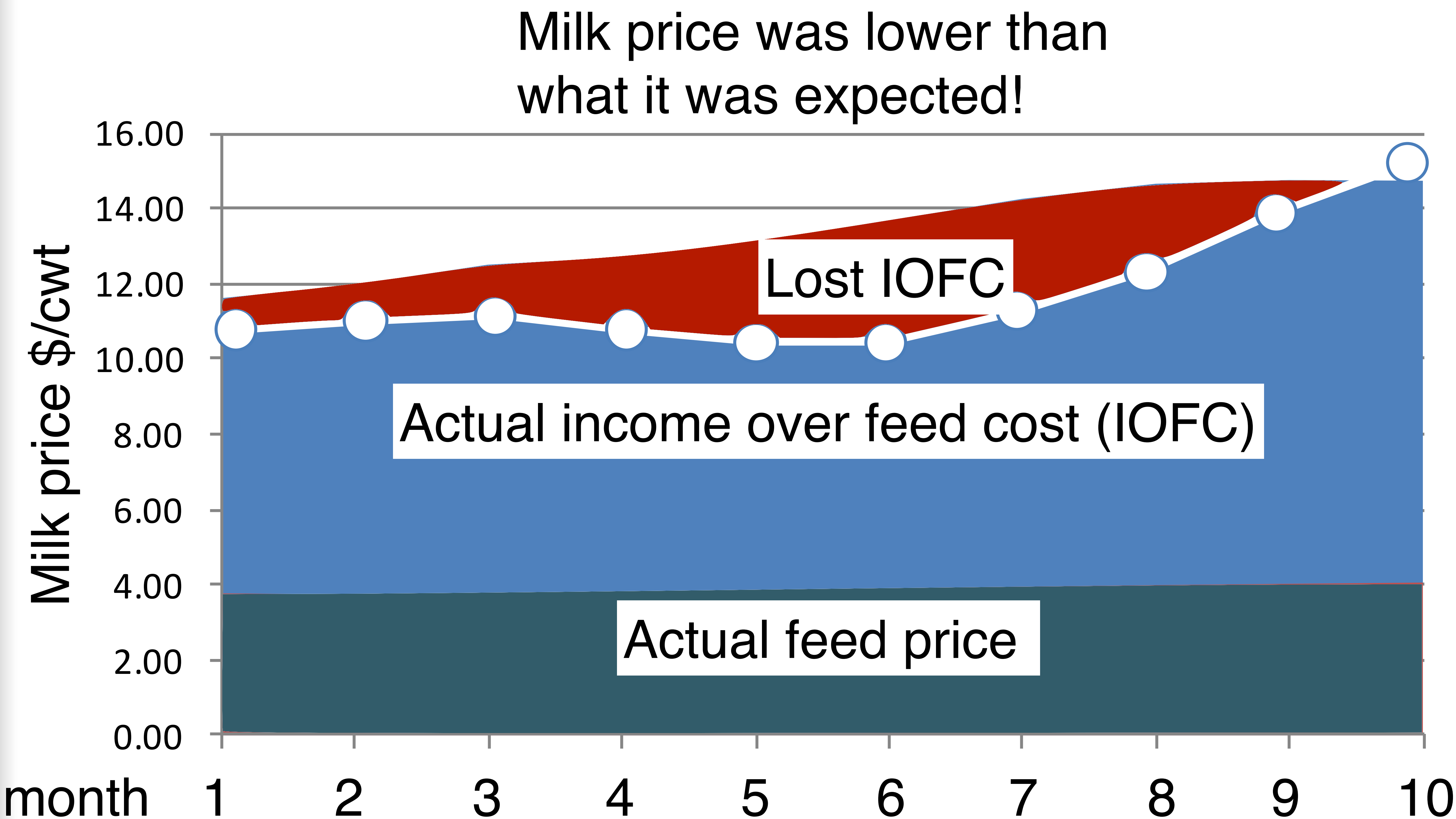
10-month cycles
1 month skipped
Planning 11 months future

Re-insured
USDA Risk Management Agency

Monthly selling
Premium subsidy available

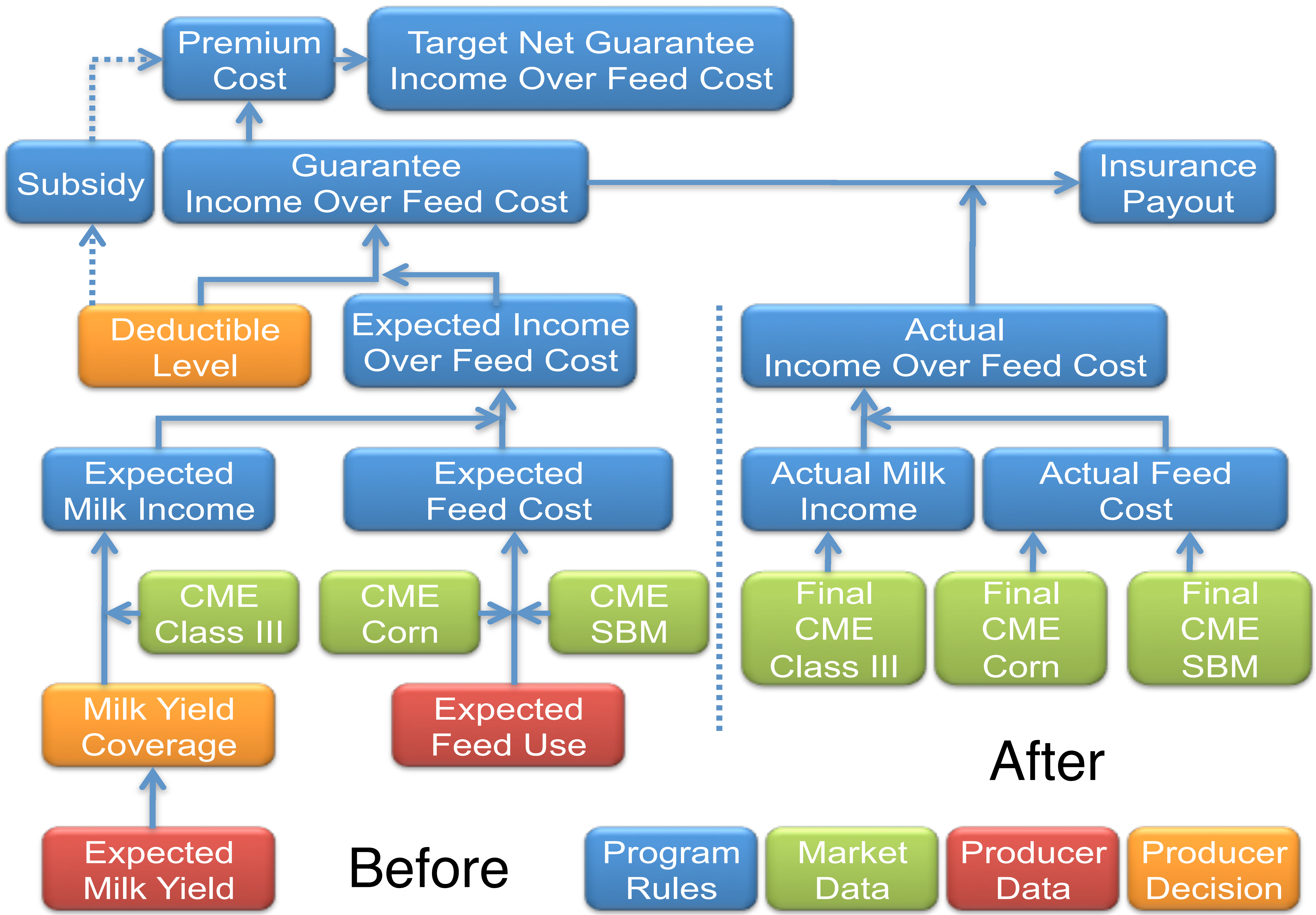
Livestock gross margin for dairy

Price risk management insurance



Livestock gross margin for dairy

How it works?



Livestock gross margin for dairy

Premium estimator

The prices we use for the Gross Margin Calculation correspond to future and option prices retrieved on the trade dates: **2013-07-03, 2013-07-05, 2013-07-08**

☑ Coverage Month	Production (cwt)		Corn Equiv (tons)		Soybean Meal Equiv (tons)		% covered	Monthly Gross Margin		
Month Year	Milk Qty.	Covered Milk × Expected Price = Milk Revenue	Corn Qty.	Covered Corn × Expected Price = Corn Cost	SBM Qty.	Covered SBM × Expected Price = SBM Cost		Milk Revenue - Corn Cost - SBM Cost - (Deductible × Milk Qty.)	$/cwt of Farm Milk	$/cwt of Covered Milk
☑ Sep 2013	4113	1,934 cwt × $18.52/cwt = $35,824	95.8	45.1 tons × $5.30/bu = $8,528	21.1	9.9 tons × $393.39/ton = $3,904	47.03	21,458	5.22	11.09
☑ Oct 2013	4340	2,041 cwt × $18.48/cwt = $37,719	101.1	47.5 tons × $5.19/bu = $8,819	22.3	10.5 tons × $366.99/ton = $3,849	47.03	23,010	5.30	11.27
☑ Nov 2013	4188	1,970 cwt × $18.18/cwt = $35,807	97.6	45.9 tons × $5.09/bu = $8,338	21.5	10.1 tons × $365.90/ton = $3,700	47.03	21,799	5.21	11.07
☑ Dec 2013	4240	1,994 cwt × $17.82/cwt = $35,534	98.8	46.5 tons × $4.98/bu = $8,264	21.8	10.3 tons × $364.82/ton = $3,740	47.03	21,535	5.08	10.80
☑ Jan 2014	4188	1,970 cwt × $17.33/cwt = $34,133	97.6	45.9 tons × $5.02/bu = $8,229	21.5	10.1 tons × $366.12/ton = $3,702	47.03	20,232	4.83	10.27
☑ Feb 2014	4023	1,892 cwt × $17.15/cwt = $32,447	93.7	44.1 tons × $5.06/bu = $7,963	20.7	9.7 tons × $366.83/ton = $3,571	47.03	19,021	4.73	10.05
☑ Mar 2014	4075	1,916 cwt × $17.09/cwt = $32,752	94.9	44.6 tons × $5.10/bu = $8,129	20.9	9.8 tons × $367.55/ton = $3,613	47.03	19,094	4.69	9.96
☑ Apr 2014	4038	1,899 cwt × $17.12/cwt = $32,511	94.1	44.3 tons × $5.14/bu = $8,123	20.8	9.8 tons × $367.30/ton = $3,593	47.03	18,896	4.68	9.95
☑ May 2014	4063	1,911 cwt × $17.20/cwt = $32,865	94.7	44.5 tons × $5.18/bu = $8,239	20.9	9.8 tons × $367.05/ton = $3,608	47.03	19,108	4.70	10.00
☑ Jun 2014	4149	1,951 cwt × $17.19/cwt = $33,541	96.7	45.5 tons × $5.21/bu = $8,470	21.3	10.0 tons × $368.03/ton = $3,687	47.03	19,434	4.68	9.96
Total Farm	41,417 cwt		965 tons		213 tons		47.03%	GMG 203,588	4.92	10.45
Total Covered	19,478 cwt		454 tons		100 tons					
Total Weighted Avg Price	17.62 $/cwt		5.13 $/bu		369.37 $/tons					

Livestock gross margin for dairy

Premium estimator

Deductible Level ($/cwt)	Total Premium ($)	Subsidized Premium ($)	GMG ($)	Net GMG ($)	Prob. of Payout (%)	Net Premium as % of GMG (%)	% Net Prem. change	% GMG Change
0.0	13,616	11,165	223,066	211,901	50	5.01	-	-
0.1	12,627	10,228	221,118	210,890	48	4.63	-8.39	-0.87
0.2	11,688	9,234	219,170	209,936	45	4.21	-17.30	-1.75
0.3	10,799	8,316	217,222	208,907	43	3.83	-25.52	-2.62
0.4	9,956	7,467	215,275	207,808	41	3.47	-33.12	-3.49
0.5	9,157	6,593	213,327	206,734	38	3.09	-40.95	-4.37
0.6	8,402	5,797	211,379	205,582	36	2.74	-48.08	-5.24
0.7	7,687	5,073	209,431	204,358	34	2.42	-54.56	-6.11
0.8	7,012	4,348	207,483	203,136	32	2.10	-61.06	-6.99
0.9	6,377	3,826	205,535	201,709	30	1.86	-65.73	-7.86
1.0	**5,778**	**3,004**	**203,588**	**200,583**	**29**	**1.48**	**-73.09**	**-8.73**
1.1	5,217	2,609	201,640	199,031	26	1.29	-76.64	-9.61
1.2	4,699	2,349	199,692	197,343	24	1.18	-78.96	-10.48
1.3	4,219	2,110	197,744	195,634	23	1.07	-81.11	-11.35
1.4	3,776	1,888	195,796	193,908	21	0.96	-83.09	-12.22
1.5	3,376	1,688	193,848	192,160	18	0.87	-84.88	-13.10
1.6	3,012	1,506	191,900	190,394	17	0.78	-86.51	-13.97
1.7	2,678	1,339	189,953	188,614	15	0.70	-88.01	-14.84
1.8	2,374	1,187	188,005	186,818	14	0.63	-89.37	-15.72
1.9	2,096	1,048	186,057	185,009	13	0.56	-90.61	-16.59
2.0	1,846	923	184,109	183,186	11	0.50	-91.73	-17.46

Unit	Premium	GMG	Net GMG
Total ($)	3,004	203,588	200,583
Per cwt of Farm Milk ($/cwt)	0.07	4.92	4.84
Per cwt of Covered Milk ($/cwt)	0.15	10.45	10.30

Livestock gross margin for dairy

Optimize the level of coverage

Target NIOFC: $ 5.0 /cwt

The prices we use for the Gross Margin Calculation correspond to future and option prices retrieved on the trade dates: **2013-07-03, 2013-07-05, 2013-07-08**

☑ Coverage Month	Production (cwt)		Corn Equiv (tons)		Soybean Meal Equiv (tons)		% covered	Monthly Gross Margin		
Month Year	Milk Qty.	Covered Milk × Expected Price = Milk Revenue	Corn Qty.	Covered Corn × Expected Price = Corn Cost	SBM Qty.	Covered SBM × Expected Price = SBM Cost		Milk Revenue - Corn Cost - SBM Cost - (Deductible × Milk Qty.)	$/cwt of Farm Milk	$/cwt of Covered Milk
☑ Sep 2013	4113	4,113 cwt × $18.52/cwt = $76,172	95.8	95.8 tons × $5.30/bu = $18,133	21.1	21.1 tons × $393.39/ton = $8,301	100	45,625	11.09	11.09
☑ Oct 2013	4340	4,340 cwt × $18.48/cwt = $80,202	101.1	101.1 tons × $5.19/bu = $18,751	22.3	22.3 tons × $366.99/ton = $8,184	100	48,927	11.27	11.27
☑ Nov 2013	4188	4,188 cwt × $18.18/cwt = $76,137	97.6	97.6 tons × $5.09/bu = $17,730	21.5	21.5 tons × $365.90/ton = $7,867	100	46,352	11.07	11.07
☑ Dec 2013	4240	0 cwt × $17.82/cwt = $0	98.8	0.0 tons × $4.98/bu = $0	21.8	0.0 tons × $364.82/ton = $0	0	0	NA	NA
☑ Jan 2014	4188	1,378 cwt × $17.33/cwt = $23,878	97.6	32.1 tons × $5.02/bu = $5,757	21.5	7.1 tons × $366.12/ton = $2,590	32.9	14,154	3.38	10.27
☑ Feb 2014	4023	1,569 cwt × $17.15/cwt = $26,907	93.7	36.5 tons × $5.06/bu = $6,603	20.7	8.1 tons × $366.83/ton = $2,961	39	15,773	3.92	10.05
☑ Mar 2014	4075	0 cwt × $17.09/cwt = $0	94.9	0.0 tons × $5.10/bu = $0	20.9	0.0 tons × $367.55/ton = $0	0	0	NA	NA
☑ Apr 2014	4038	662 cwt × $17.12/cwt = $11,337	94.1	15.4 tons × $5.14/bu = $2,833	20.8	3.4 tons × $367.30/ton = $1,253	16.4	6,589	1.63	9.95
☑ May 2014	4063	61 cwt × $17.20/cwt = $1,048	94.7	1.4 tons × $5.18/bu = $263	20.9	0.3 tons × $367.05/ton = $115	1.5	609	0.15	10.00
☑ Jun 2014	4149	3,166 cwt × $17.19/cwt = $54,417	96.7	73.8 tons × $5.21/bu = $13,741	21.3	16.3 tons × $368.03/ton = $5,981	76.3	31,529	7.60	9.96
Total Farm	41,417 cwt		965 tons		213 tons		47.03%	GMG 209,559	5.06	10.76
Covered	19,477 cwt		454 tons		100 tons					
Weighted Avg Price	17.98 $/cwt		5.17 $/bu		372.43 $/tons					

Livestock gross margin for dairy

Optimize the level of coverage

Optimized

Unit	Premium	GMG	Net GMG
Total ($)	2,450	209,535	207,085
Per cwt of Farm Milk ($/cwt)	0.06	5.06	5.00
Per cwt of Covered Milk ($/cwt)	0.13	10.76	10.63

vs.

Naïve
47% coverage

Unit	Premium	GMG	Net GMG
Total ($)	3,004	203,588	200,583
Per cwt of Farm Milk ($/cwt)	0.07	4.92	4.84
Per cwt of Covered Milk ($/cwt)	0.15	10.45	10.30

	Optimized	Naïve	Gain
Total premium, $	2,450	3,004	554
Premium, $/cwt	0.06	0.07	0.01
Net guaranteed IOFC, $	207,085	200,583	6,502

Valvekar et al., 2010

FeedVal2012

FeedVal2012 concept

What is FeedVal?

Decision support tool

Assess the true value of feed ingredients

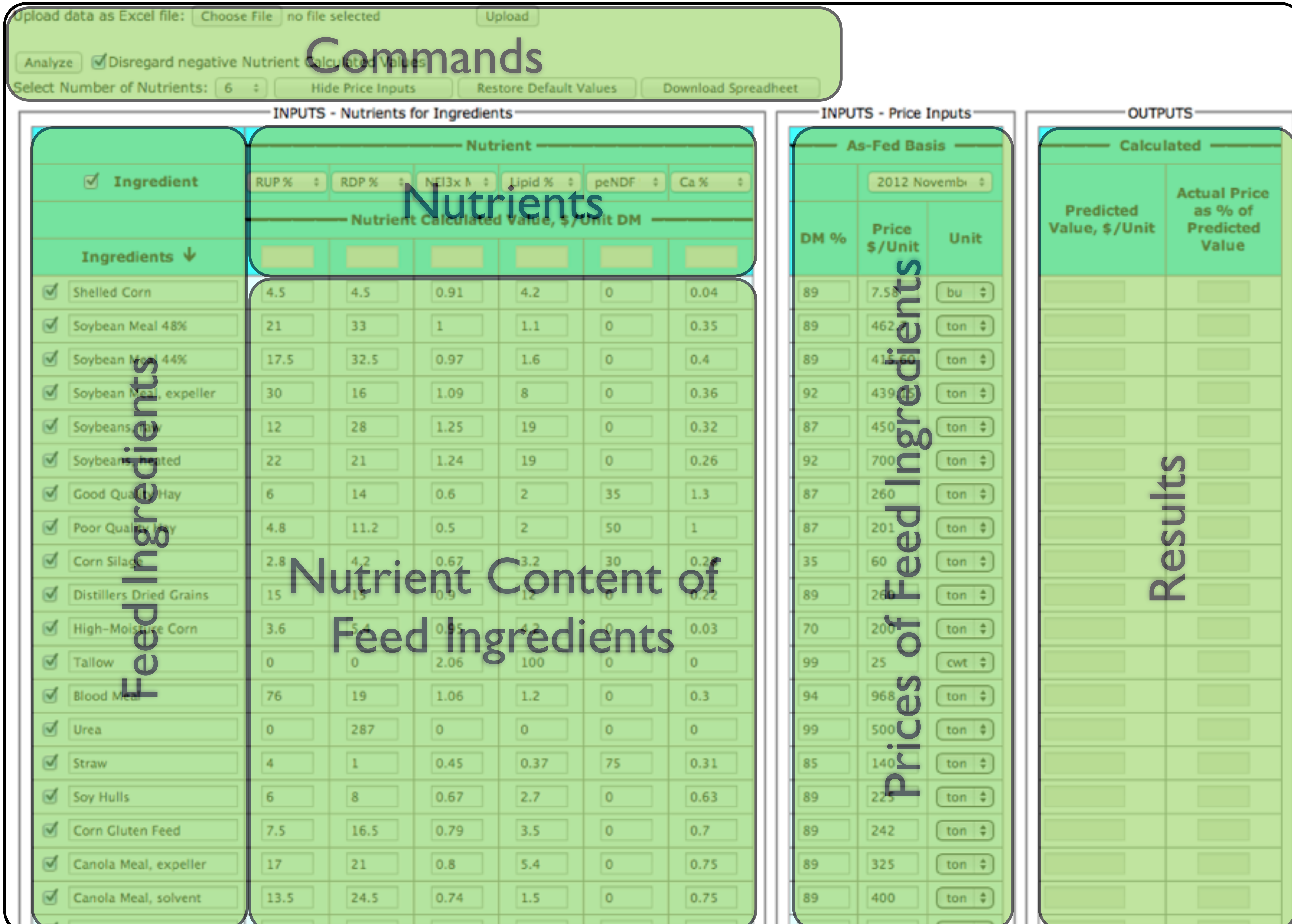
Assists in the management of

- Purchasing feeds
- Use available feeds
- Formulate diets

Helps economical decision-making

- Producers
- Nutritionists
- Lenders

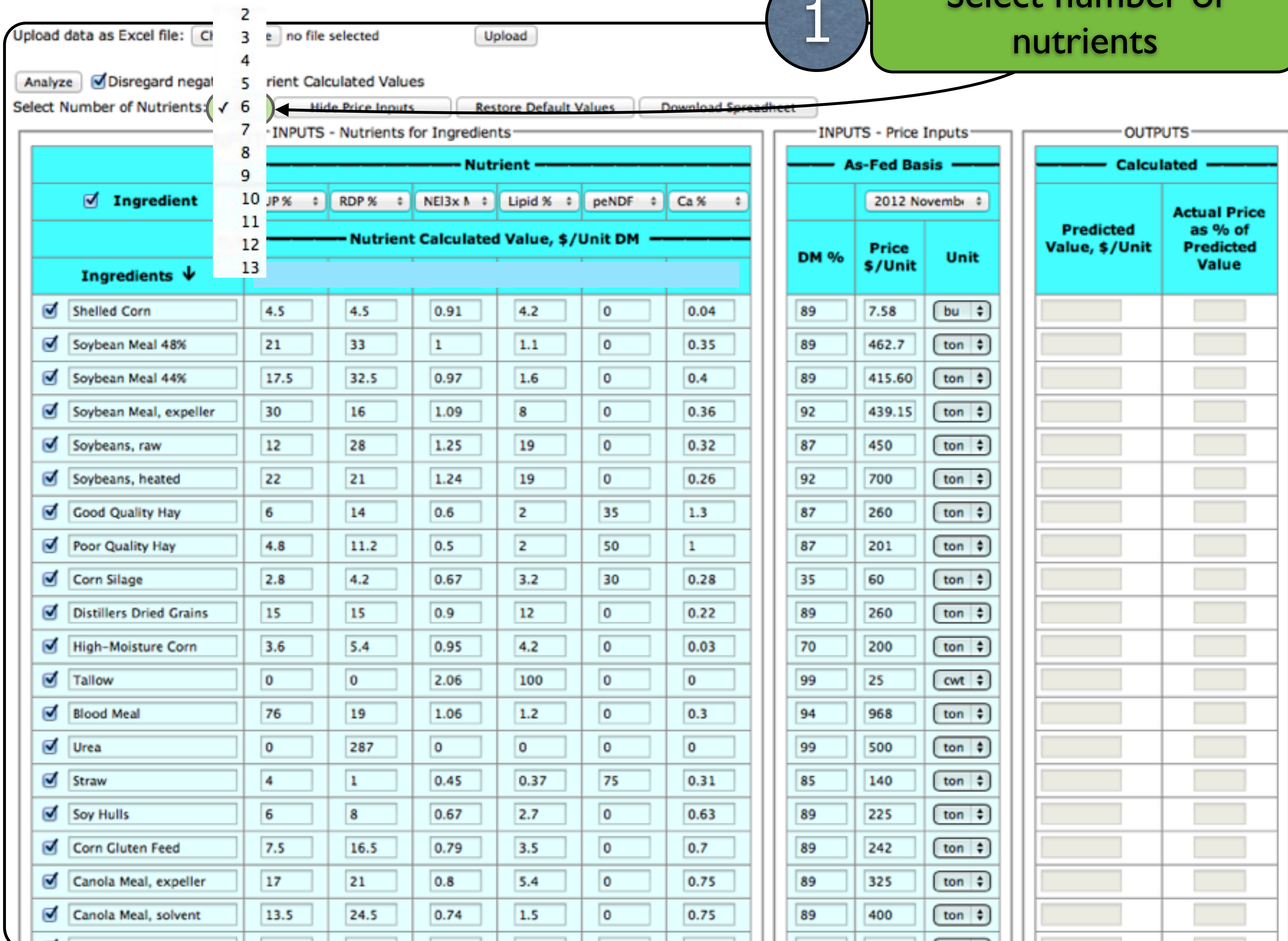
FeedVal2012



FeedVal2012

1

Select number of nutrients

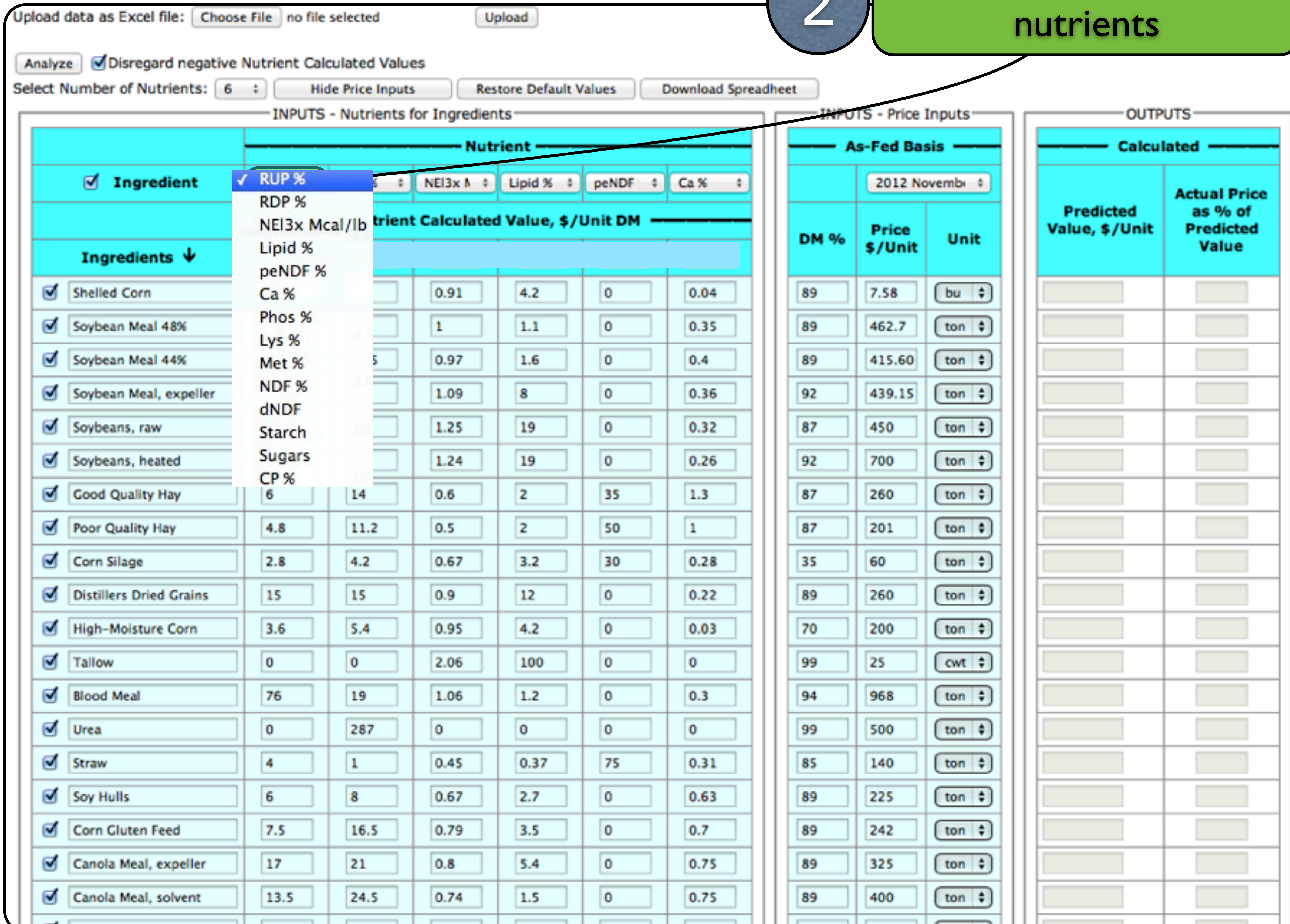


Ingredient	UP %	RDP %	NEl3x M	Lipid %	peNDF	Ca %	DM %	Price $/Unit	Unit	Predicted Value, $/Unit	Actual Price as % of Predicted Value
Shelled Corn	4.5	4.5	0.91	4.2	0	0.04	89	7.58	bu		
Soybean Meal 48%	21	33	1	1.1	0	0.35	89	462.7	ton		
Soybean Meal 44%	17.5	32.5	0.97	1.6	0	0.4	89	415.60	ton		
Soybean Meal, expeller	30	16	1.09	8	0	0.36	92	439.15	ton		
Soybeans, raw	12	28	1.25	19	0	0.32	87	450	ton		
Soybeans, heated	22	21	1.24	19	0	0.26	92	700	ton		
Good Quality Hay	6	14	0.6	2	35	1.3	87	260	ton		
Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton		
Corn Silage	2.8	4.2	0.67	3.2	30	0.28	35	60	ton		
Distillers Dried Grains	15	15	0.9	12	0	0.22	89	260	ton		
High-Moisture Corn	3.6	5.4	0.95	4.2	0	0.03	70	200	ton		
Tallow	0	0	2.06	100	0	0	99	25	cwt		
Blood Meal	76	19	1.06	1.2	0	0.3	94	968	ton		
Urea	0	287	0	0	0	0	99	500	ton		
Straw	4	1	0.45	0.37	75	0.31	85	140	ton		
Soy Hulls	6	8	0.67	2.7	0	0.63	89	225	ton		
Corn Gluten Feed	7.5	16.5	0.79	3.5	0	0.7	89	242	ton		
Canola Meal, expeller	17	21	0.8	5.4	0	0.75	89	325	ton		
Canola Meal, solvent	13.5	24.5	0.74	1.5	0	0.75	89	400	ton		
Cottonseed Meal	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		

FeedVal2012

2

Select combination of nutrients



Ingredients	RUP %		NEl3x M	Lipid %	peNDF	Ca %	DM %	Price $/Unit	Unit	Predicted Value, $/Unit	Actual Price as % of Predicted Value
Shelled Corn	[illegible]	[illegible]	0.91	4.2	0	0.04	89	7.58	bu		
Soybean Meal 48%	[illegible]	[illegible]	1	1.1	0	0.35	89	462.7	ton		
Soybean Meal 44%	[illegible]	[illegible]	0.97	1.6	0	0.4	89	415.60	ton		
Soybean Meal, expeller	[illegible]	[illegible]	1.09	8	0	0.36	92	439.15	ton		
Soybeans, raw	[illegible]	[illegible]	1.25	19	0	0.32	87	450	ton		
Soybeans, heated	[illegible]	[illegible]	1.24	19	0	0.26	92	700	ton		
Good Quality Hay	6	14	0.6	2	35	1.3	87	260	ton		
Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton		
Corn Silage	2.8	4.2	0.67	3.2	30	0.28	35	60	ton		
Distillers Dried Grains	15	15	0.9	12	0	0.22	89	260	ton		
High-Moisture Corn	3.6	5.4	0.95	4.2	0	0.03	70	200	ton		
Tallow	0	0	2.06	100	0	0	99	25	cwt		
Blood Meal	76	19	1.06	1.2	0	0.3	94	968	ton		
Urea	0	287	0	0	0	0	99	500	ton		
Straw	4	1	0.45	0.37	75	0.31	85	140	ton		
Soy Hulls	6	8	0.67	2.7	0	0.63	89	225	ton		
Corn Gluten Feed	7.5	16.5	0.79	3.5	0	0.7	89	242	ton		
Canola Meal, expeller	17	21	0.8	5.4	0	0.75	89	325	ton		
Canola Meal, solvent	13.5	24.5	0.74	1.5	0	0.75	89	400	ton		
Cottonseed Meal	30	25	0.78	1.9	0	0.2	89	350	ton		

FeedVal2012

3

Select ingredients

Upload data as Excel file: Choose File no file selected Upload

Analyze ☑ Disregard negative Nutrient Calculated Values

Select Number of Nutrients: 6 | Hide Price Inputs | Restore Default Values | Download Spreadheet

INPUTS - Nutrients for Ingredients | INPUTS - Price Inputs | OUTPUTS

Nutrient | As-Fed Basis (2012 Novemb) | Calculated

☑ Ingredient

Nutrient Calculated Value, $/Unit DM

Ingredients ↓	RUP %	RDP %	NEl3x M	Lipid %	peNDF	Ca %	DM %	Price $/Unit	Unit	Predicted Value, $/Unit	Actual Price as % of Predicted Value
☑ Shelled Corn	4.5	4.5	0.91	4.2	0	0.04	89	7.58	bu		
☑ Soybean Meal 48%	21	33	1	1.1	0	0.35	89	462.7	ton		
☑ Soybean Meal 44%	17.5	32.5	0.97	1.6	0	0.4	89	415.60	ton		
☑ Soybean Meal, expeller	30	16	1.09	8	0	0.36	92	439.15	ton		
☑ Soybeans, raw	12	28	1.25	19	0	0.32	87	450	ton		
☑ Soybeans, heated	22	21	1.24	19	0	0.26	92	700	ton		
☑ Good Quality Hay	6	14	0.6	2	35	1.3	87	260	ton		
☑ Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton		
☑ Corn Silage	2.8	4.2	0.67	3.2	30	0.28	35	60	ton		
☑ Distillers Dried Grains	15	15	0.9	12	0	0.22	89	260	ton		
☑ High-Moisture Corn	3.6	5.4	0.95	4.2	0	0.03	70	200	ton		
☑ Tallow	0	0	2.06	100	0	0	99	25	cwt		
☑ Blood Meal	76	19	1.06	1.2	0	0.3	94	968	ton		
☑ Urea	0	287	0	0	0	0	99	500	ton		
☑ Straw	4	1	0.45	0.37	75	0.31	85	140	ton		
☑ Soy Hulls	6	8	0.67	2.7	0	0.63	89	225	ton		
☑ Corn Gluten Feed	7.5	16.5	0.79	3.5	0	0.7	89	242	ton		
☑ Canola Meal, expeller	17	21	0.8	5.4	0	0.75	89	325	ton		
☑ Canola Meal, solvent	13.5	24.5	0.74	1.5	0	0.75	89	400	ton		

FeedVal2012

4

Edit ingredients & their nutrient composition

Upload data as Excel file: Choose File no file selected Upload

Analyze ☑ Disregard negative Nutrient Calculated Values

Select Number of Nutrients: 6 | Hide Price Inputs | Restore Default Values | Download Spreadheet

INPUTS - Nutrients for Ingredients | INPUTS - Price Inputs | OUTPUTS

Ingredient	Nutrient: RUP %	RDP %	NEl3x M	Lipid %	peNDF	Ca %	As-Fed Basis (2012 November): DM %	Price $/Unit	Unit	Calculated: Predicted Value, $/Unit	Actual Price as % of Predicted Value
Ingredients ↓	Nutrient Calculated Value, $/Unit DM										
Shelled Corn	4.5	4.5	0.91	4.2	0	0.04	89	7.58	bu		
Soybean Meal 48%	21	33	1	1.1	0	0.35	89	462.7	ton		
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Soybeans, raw	12	28	1.25	19	0	0.32	87	450	ton		
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Good Quality Hay	6	14	0.6	2	35	1.3	87	260	ton		
Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton		
Corn Silage	2.8	4.2	0.67	3.2	30	0.28	35	60	ton		
Distillers Dried Grains	15	15	0.9	12	0	0.22	89	260	ton		
High-Moisture Corn	3.6	5.4	0.95	4.2	0	0.03	70	200	ton		
Tallow	0	0	2.06	100	0	0	99	25	cwt		
Blood Meal	76	19	1.06	1.2	0	0.3	94	968	ton		
Urea	0	287	0	0	0	0	99	500	ton		
Straw	4	1	0.45	0.37	75	0.31	85	140	ton		
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FeedVal2012

5

Edit ingredients units, DM & prices

Upload data as Excel file: Choose File no file selected Upload

Analyze ☑Disregard negative Nutrient Calculated Values

Select Number of Nutrients: 6 | Hide Price Inputs | Restore Default Values | Download Spreadheet

INPUTS - Nutrients for Ingredients | INPUTS - Price Inputs | OUTPUTS

☑ Ingredient	Nutrient: RUP %	RDP %	NEl3x M	Lipid %	peNDF	Ca %	As-Fed Basis (2012 November): DM %	Price $/Unit	Unit	Calculated: Predicted Value, $/Unit	Actual Price as % of Predicted Value
Ingredients ↓	Nutrient Calculated Value, $/Unit DM										
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Soybeans, heated	22	21	1.24	19	0	0.26	92	700	ton		
Good Quality Hay	6	14	0.6	2	35	1.3	87	260	ton		
Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton		
Corn Silage	2.8	4.2	0.67	3.2	30	0.28	35	60	ton		
Distillers Dried Grains	15	15	0.9	12	0	0.22	89	260	ton		
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Tallow	0	0	2.06	100	0	0	99	25	cwt		
Blood Meal	76	19	1.06	1.2	0	0.3	94	968	ton		
Urea	0	287	0	0	0	0	99	500	ton		
Straw	4	1	0.45	0.37	75	0.31	85	140	ton		
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Canola Meal, solvent	13.5	24.5	0.74	1.5	0	0.75	89	400	ton		
Cottonseed Meal	20	25	0.78	1.9	0	0.2	89	350	ton		

FeedVal2012

6

Perform a calculation!

Upload data as Excel file: Choose File no file selected Upload

Analyze Disregard negative Nutrient Calculated Values

Select Number of Nutrients: 6 Hide Price Inputs Restore Default Values Download Spreadheet

INPUTS - Nutrients for Ingredients | INPUTS - Price Inputs | OUTPUTS

Ingredient	Nutrient: RUP %	RDP %	NEl3x M	Lipid %	peNDF	Ca %	As-Fed Basis (2012 November): DM %	Price $/Unit	Unit	Calculated: Predicted Value, $/Unit	Actual Price as % of Predicted Value
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Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton		
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Distillers Dried Grains	15	15	0.9	12	0	0.22	89	260	ton		
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FeedVal2012

6

Perform a calculation!

Upload data as Excel file: Choose File no file selected Upload

Analyze Disregard negative Nutrient Calculated Values

Select Number of Nutrients: 6 | Hide Price Inputs | Restore Default Values | Download Spreadheet

INPUTS - Nutrients for Ingredients | INPUTS - Price Inputs | OUTPUTS

Ingredient	RUP %	RDP %	NEl3x M	Lipid %	peNDF	Ca %	DM %	Price $/Unit (As-Fed Basis, 2012 November)	Unit	Predicted Value, $/Unit	Actual Price as % of Predicted Value
Shelled Corn	4.5	4.5	0.91	4.2	0	0.04	89	7.58	bu	7.175 /bu	106
Soybean Meal 48%	21	33	1	1.1	0	0.35	89	462.7	ton	457.830 /ton	101
Soybean Meal 44%	17.5	32.5	0.97	1.6	0	0.4	89	415.60	ton	421.416 /ton	99
Soybean Meal, expeller	30	16	1.09	8	0	0.36	92	439.15	ton	540.529 /ton	81
Soybeans, raw	12	28	1.25	19	0	0.32	87	450	ton	419.164 /ton	107
Soybeans, heated	22	21	1.24	19	0	0.26	92	700	ton	513.416 /ton	136
Good Quality Hay	6	14	0.6	2	35	1.3	87	260	ton	208.104 /ton	125
Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton	170.824 /ton	118
Corn Silage	2.8	4.2	0.67	3.2	30	0.28	35	60	ton	73.193 /ton	82
Distillers Dried Grains	15	15	0.9	12	0	0.22	89	260	ton	352.972 /ton	74
High-Moisture Corn	3.6	5.4	0.95	4.2	0	0.03	70	200	ton	204.297 /ton	98
Tallow	0	0	2.06	100	0	0	99	25	cwt	24.841 /cwt	101
Blood Meal	76	19	1.06	1.2	0	0.3	94	968	ton	947.340 /ton	102
Urea	0	287	0	0	0	0	99	500	ton	500.270 /ton	100
Straw	4	1	0.45	0.37	75	0.31	85	140	ton	133.790 /ton	105
Soy Hulls	6	8	0.67	2.7	0	0.63	89	225	ton	218.846 /ton	103
Corn Gluten Feed	7.5	16.5	0.79	3.5	0	0.7	89	242	ton	272.393 /ton	89
Canola Meal, expeller	17	21	0.8	5.4	0	0.75	89	325	ton	358.360 /ton	91
Canola Meal, solvent	13.5	24.5	0.74	1.5	0	0.75	89	400	ton	322.765 /ton	124
Cottonseed Meal	20	25	0.78	1.9	0	0.2	89	350	ton	384.871 /ton	91

FeedVal2012

7

Analyze results

Upload data as Excel file: Choose File no file selected Upload

Analyze ☐ Disregard negative Nutrient Calculated Values

Select Number of Nutrients: 6 | Hide Price Inputs | Restore Default Values | Download Spreadheet

INPUTS - Nutrients for Ingredients | INPUTS - Price Inputs | OUTPUTS

Ingredient	RUP %	RDP %	NEl3x M	Lipid %	peNDF	Ca %	DM %	Price $/Unit (2012 November)	Unit	Predicted Value, $/Unit		Actual Price as % of Predicted Value
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Soybeans, raw	12	28	1.25	19	0	0.32	87	450	ton	419.164	/ton	107
Soybeans, heated	22	21	1.24	19	0	0.26	[illegible]	[illegible]	[illegible]	513.416	/ton	136
Good Quality Hay	6	14	0.6	2	35	1.3	87	260	ton	208.104	/ton	125
Poor Quality Hay	4.8	11.2	0.5	2	50	1	87	201	ton	170.824	/ton	118
Corn Silage	2.8	4.2	0.67	3.2	30	0.28	35	60	ton	73.193	/ton	82
Distillers Dried Grains	15	15	0.9	12	0	0.22	[illegible]	[illegible]	[illegible]	352.972	/ton	74
High-Moisture Corn	3.6	5.4	0.95	4.2	0	0.03	70	200	ton	204.297	/ton	98
Tallow	0	0	2.06	100	0	0	99	25	cwt	24.841	/cwt	101
Blood Meal	76	19	1.06	1.2	0	0.3	94	968	ton	947.340	/ton	102
Urea	0	287	0	0	0	0	99	500	ton	500.270	/ton	100
Straw	4	1	0.45	0.37	75	0.31	85	140	ton	133.790	/ton	105
Soy Hulls	6	8	0.67	2.7	0	0.63	89	225	ton	218.846	/ton	103
Corn Gluten Feed	7.5	16.5	0.79	3.5	0	0.7	89	242	ton	272.393	/ton	89
Canola Meal, expeller	17	21	0.8	5.4	0	0.75	89	325	ton	358.360	/ton	91
Canola Meal, solvent	13.5	24.5	0.74	1.5	0	0.75	89	400	ton	322.765	/ton	124
Cottonseed Meal	20	25	0.78	1.9	0	0.2	89	350	ton	384.871	/ton	91

Overpriced

Bargain!

FeedVal applications

Monthly market watch

Best feed ingredient prices ranked

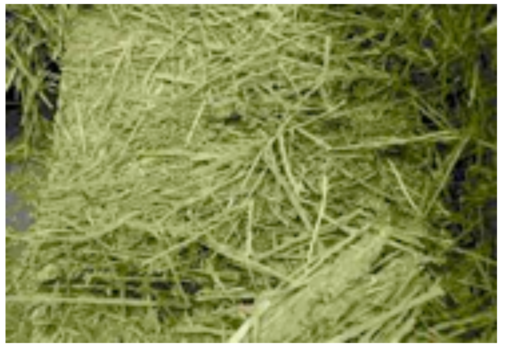
Pricing drought stressed corn silage

Assessment according to nutrient content

Pricing treated alfalfa hay

Fair price

Justify treating?



June 2013 market watch

FeedVal 2012 predicted dairy feed prices and rankings for June 2013[1]

V.E. Cabrera, P. Hoffman, and R. Shaver

Bargain

Overpriced

Best

OK

Worst

Ingredient	DM %	Unit	Feed Prices ($/Unit) Market	Feed Prices ($/Unit) Predicted	Actual Price as % of Predicted Value	Best-buy Ranking
Wet Distillers	45	ton	76.0	183.7	41	1
Distillers Dried Grains	89	ton	225.0	373.7	60	2
Corn Gluten Feed	89	ton	163.0	270.5	60	3
Wheat Middlings	89	ton	190.0	236.0	81	4
Corn Gluten Meal	89	ton	570.0	637.3	89	5
Soy Hulls	89	ton	195.0	216.3	90	6
Hominy	89	ton	225.0	243.9	92	7
Corn Silage	35	ton	66.9	72.4	92	8
Wheat	89	bu	6.6	7.2	93	9
Shelled Corn	89	bu	6.7	7.1	94	10
Cottonseed Meal	89	ton	370.0	385.3	96	11
Urea	99	ton	505.0	503.8	100	12
Canola Meal, expeller	89	ton	365.0	364.9	100	13
Sunflower Meal	89	ton	245.0	242.5	101	14
Barley	89	cwt	11.9	11.7	102	15
Tallow	99	cwt	37.5	36.4	103	16
Soybean Meal 48%	89	ton	472.0	453.1	104	17
Blood Meal	94	ton	1025.0	966.0	106	18
Poor Quality Hay	87	ton	184.5	168.5	109	19
Molasses	89	ton	220.0	199.2	110	20
Linseed Meal	89	ton	365.0	323.4	113	21
Soybean Meal 44%	89	ton	475.0	416.8	114	22
Whole Cottonseed	89	ton	358.0	311.9	115	23
Soybeans, raw	87	bu	15.4	12.6	123	24
Good Quality Hay	87	ton	263.6	204.3	129	25
Beet Pulp	89	ton	270.0	199.8	135	26
Oats	89	ton	383.0	239.9	160	27
Soybean Meal, expeller	92	ton		555.1		
Soybeans, heated	92	ton		549.7		
Earlage/Snaplage	60	ton		153.5		
High-Moisture Corn	70	ton		201.5		
Straw	85	ton		129.1		
Canola Meal, solvent	89	ton		319.4		
Hi-Pro Distillers	89	ton		428.3		
Brewers Dried Grains	89	ton		333.5		
Wet Brewers	25	ton		87.8		
Malt Sprouts	89	ton		263.9		
Wheat Bran	89	ton		220.8		
Corn Stover	80	ton		106.4		
Whey	20	ton		47.3		

Predicted Prices

[1]Analysis performed using UW-Madison FeedVal 2012: http://dairymgt.info/tools/feedval_12/index.php including 27 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 2012 decision support tool and local input prices.

Nutritional Grouping Strategies

Feeding lactating cows differently

Some cows might be overfed

Same ration to all cows

All lactating cows receive same density diet

Preferred "high" rations

Low producing animals receive more nutrients than required

Possible solution

Consider additional feeding groups

Improved nutrient use efficiency

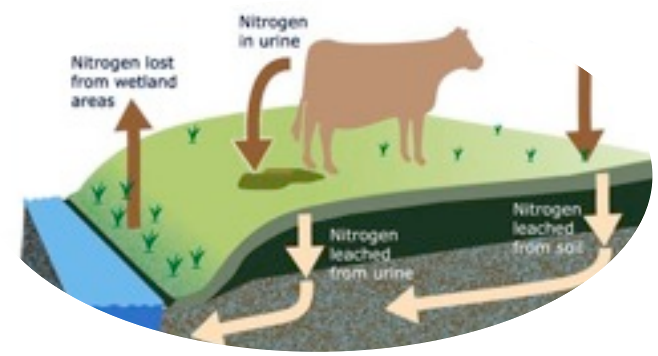
Diet closer to cow requirements

Less overfed animals

Decreased overweighted cows

Less nutrient excretion

Decreased environmental concerns



Lower feeding costs

Higher milk income over feed cost

Why do not group more?

Probably many reasons

Farm facilities or equipment limitations

Physical constraints

Not enough expertise or knowledge available

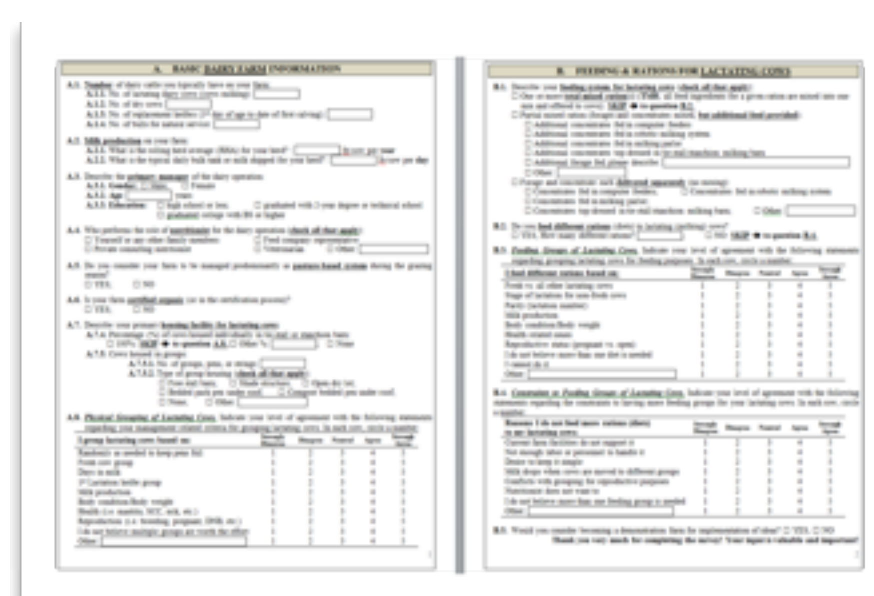
Management constraints

Not enough labor or personnel

Labor constraints

Other reasons

Trying to find them



Strategies for grouping cows

Depend on farm and herd characteristics

Individual cow nutrient requirements

- Energy
- Protein

Number of lactating cows on the herd

Farm characteristics

Capacity to handle lactating feeding groups

Adapted from McGilliard et al., 1983; St-Pierre and Thraen, 1999

Cow nutrient requirement

Energy

Total net energy (NE_{total})

Energy required for maintenance + energy required for milk production

$$NE_{total}\ (Mcal) = NE_{maintenance} + NE_{milk}$$

$NE_{maintenance}$

Function of animal body weight

$$NE_{maintenance} = 0.079 \times BW^{0.75}$$

NE_{milk}

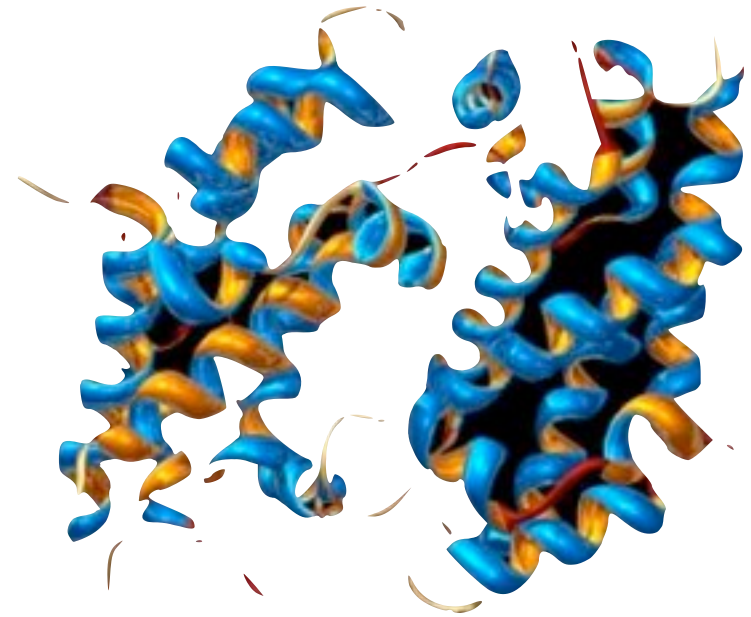
Function of milk and fat production

$$NE_{milk} = Milk \times (0.36 + 0.0969 \times Fat\%)$$

NRC, 2001

Cow nutrient requirement

Protein



Total crude protein (CP_{total})

Protein required for maintenance + protein required for milk production

$$CP_{total}\,(g) = CP_{maintenance} + CP_{milk}$$

$CP_{maintenance}$

Function of animal body weight

$$CP_{maintenance} = 104.78 + 0.73 \times BW - 0.00015432 \times BW^2$$

CP_{milk}

Function of milk and fat production

$$CP_{milk} = Milk \times (4586 + 1036 \times Fat\%)$$

McGilliard et al., 1983

Cow feed requirement

Dry matter intake

Total dry matter intake (DMI)

Function of DIM, BW, and 4% fat corrected milk (4% FCM)

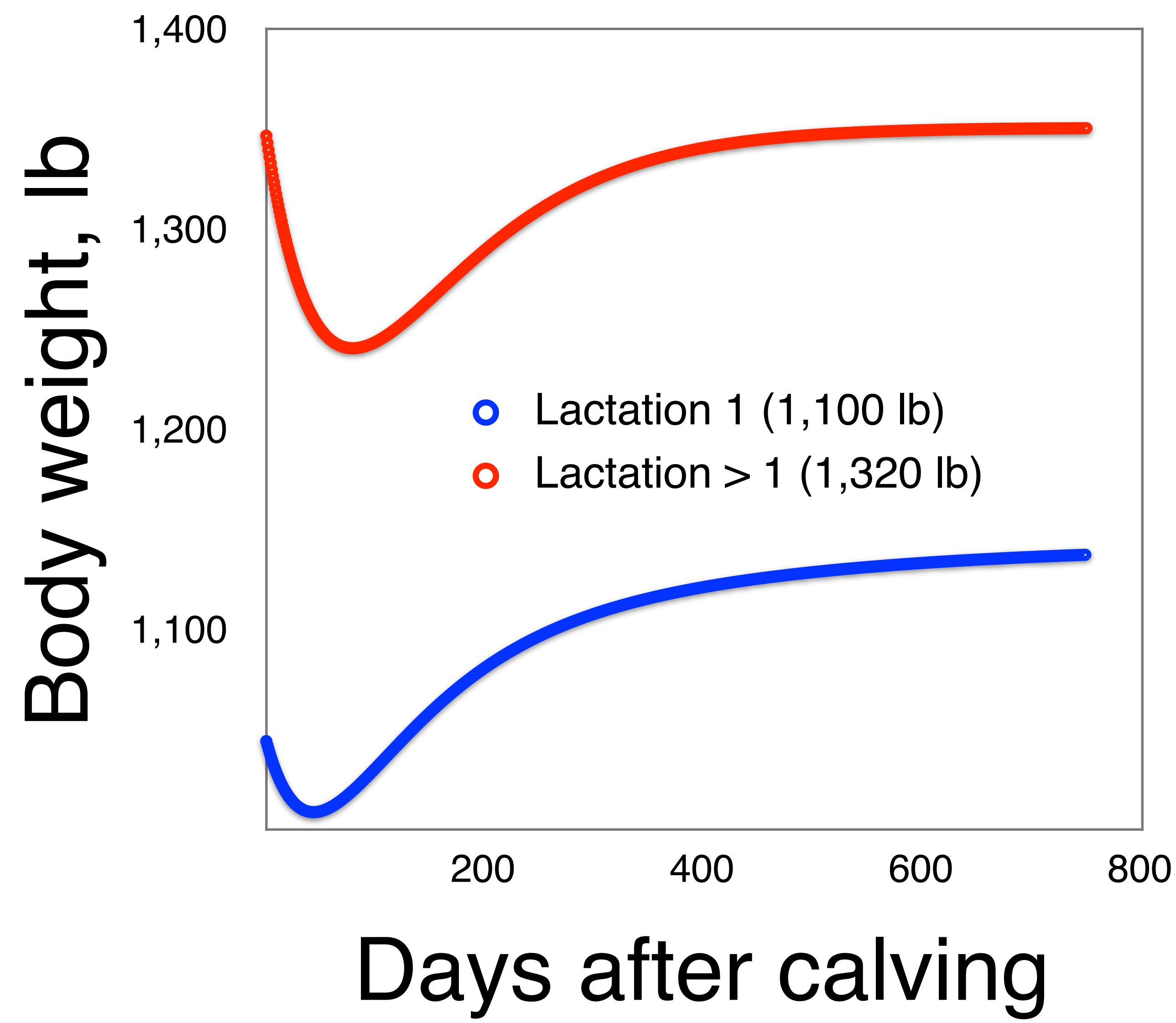
$$DMI\ (kg) = (0.372 \times 4\%\ FCM + 0.0968 \times BW^{0.75}) \times (1 - e^{(-0.192 \times ((DIM/7) + 3.67))})$$

$$4\%\ FCM = 0.4 \times Milk + 15 \times (Fat\%/100) \times Milk$$

NRC, 2001

Cow body weight

Measurements are not always available



Korver et al., 1985 function
fitted to NRC, 2001

Estimation based on

- Lactation
- DIM
- Cohorts' average BW

Nutrient requirement for a group

Energy and protein

Lead factor

Multiplicative factor to adjust nutrient requirements of a group

$$NE_{group}\ (Mcal) = 83^{rd}\ Percentile$$

$$CP_{group}\ (\%) = 83^{rd}\ Percentile$$

Stallings and McGilliard, 1984

Criteria for grouping

Several criteria exist

Days after calving (DIM)

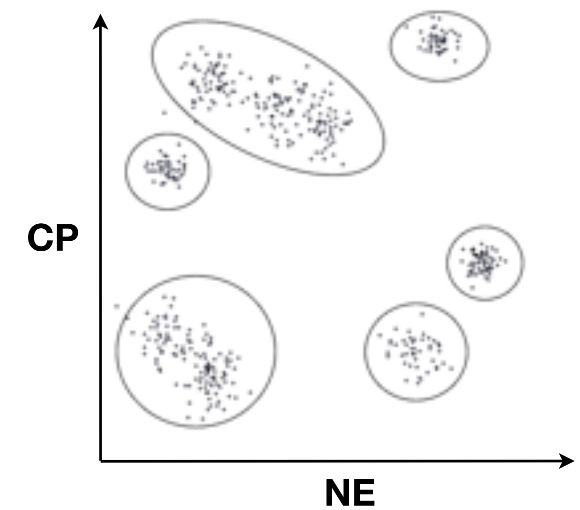
Based on stage of lactation

Fat corrected milk

Based on level of production measured as FCM

Dairy merit

Function of both FCM and BW



Cluster

Function of NE and CP. Seems to be most efficient criterion.

McGilliard et al., 1983; St-Pierre and Thraen, 1999

Calculate the value of NE and CP

Determine diets' cost

Value of NE and CP could be deducted

Using referee feeds

Price NE and CP

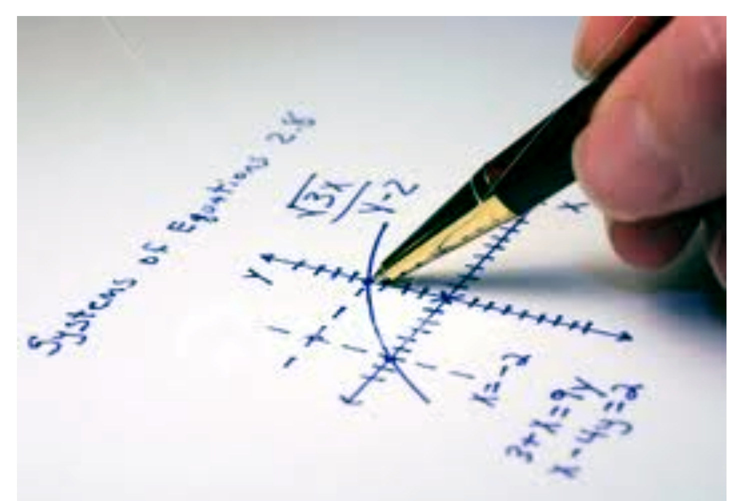
Nutrient values NE ($/Mcal) and CP ($/kg)

Corn %CP + Corn Mcal NE = $/kg Corn Price

SBM %CP + SBM Mcal NE = $/kg SBM Price

Value of NE and CP could be available on a farm

Based on farm experience

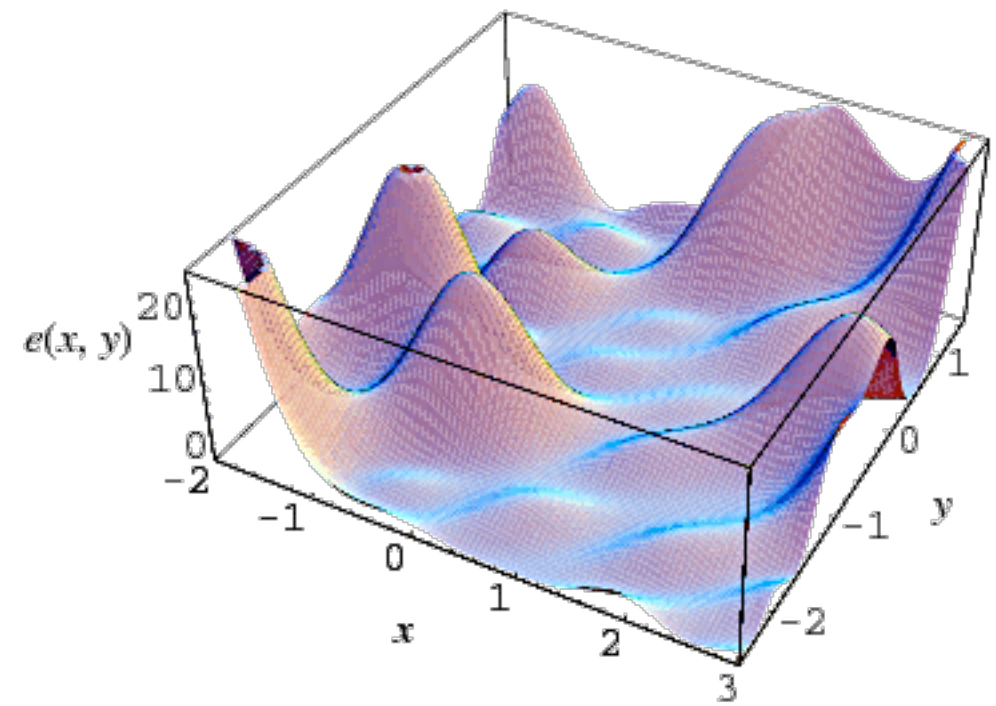


Optimize cows to a feeding group

Maximize the income over feed cost

Non-linear optimization

- Iterative process
- Search for global maxima IOFC



$$Max(IOFC) = SUM(IOFC_{group})$$

$$IOFC_{group} = Milk\ Value - Feed\ Cost$$

Additional costs and benefits

Impacts grouping feeding strategies

Management cost

- Additional labor
- Extra management

Avoid costs

- Additives savings

Milk depression

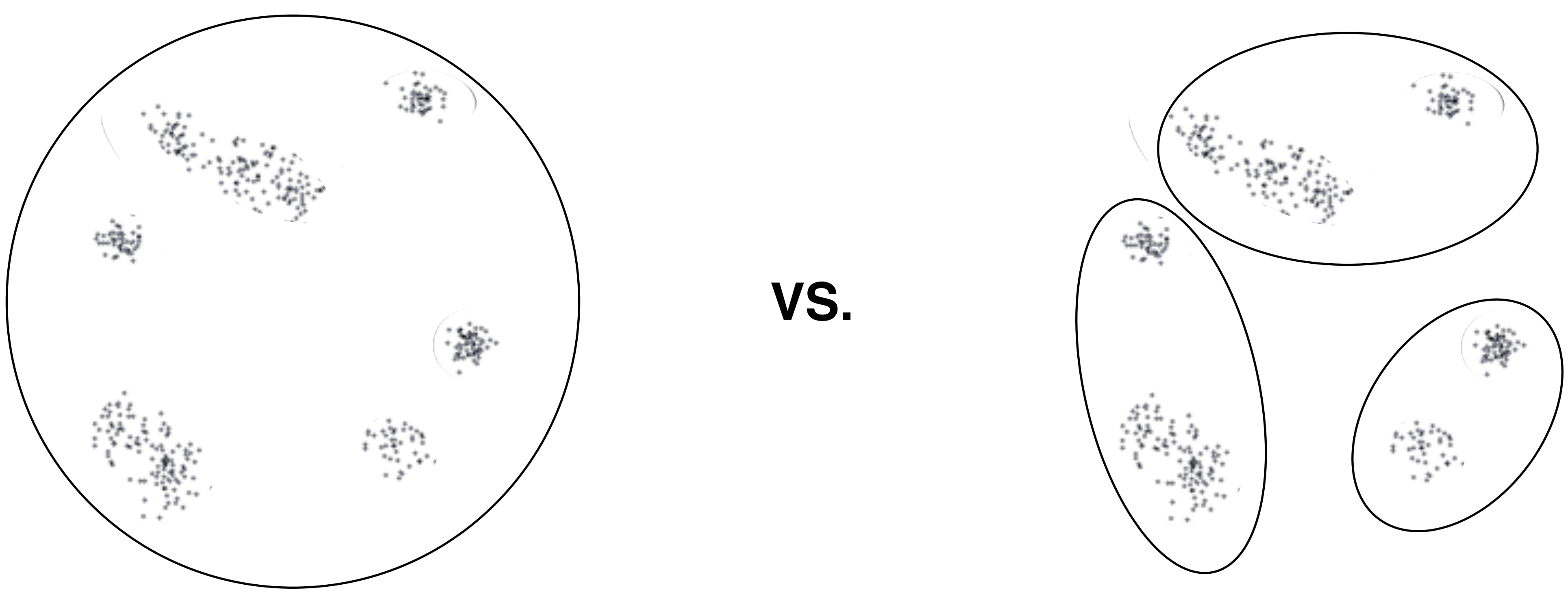
- Cow social interactions
- Diet changes

Overall net return

Bottom line grouping strategies

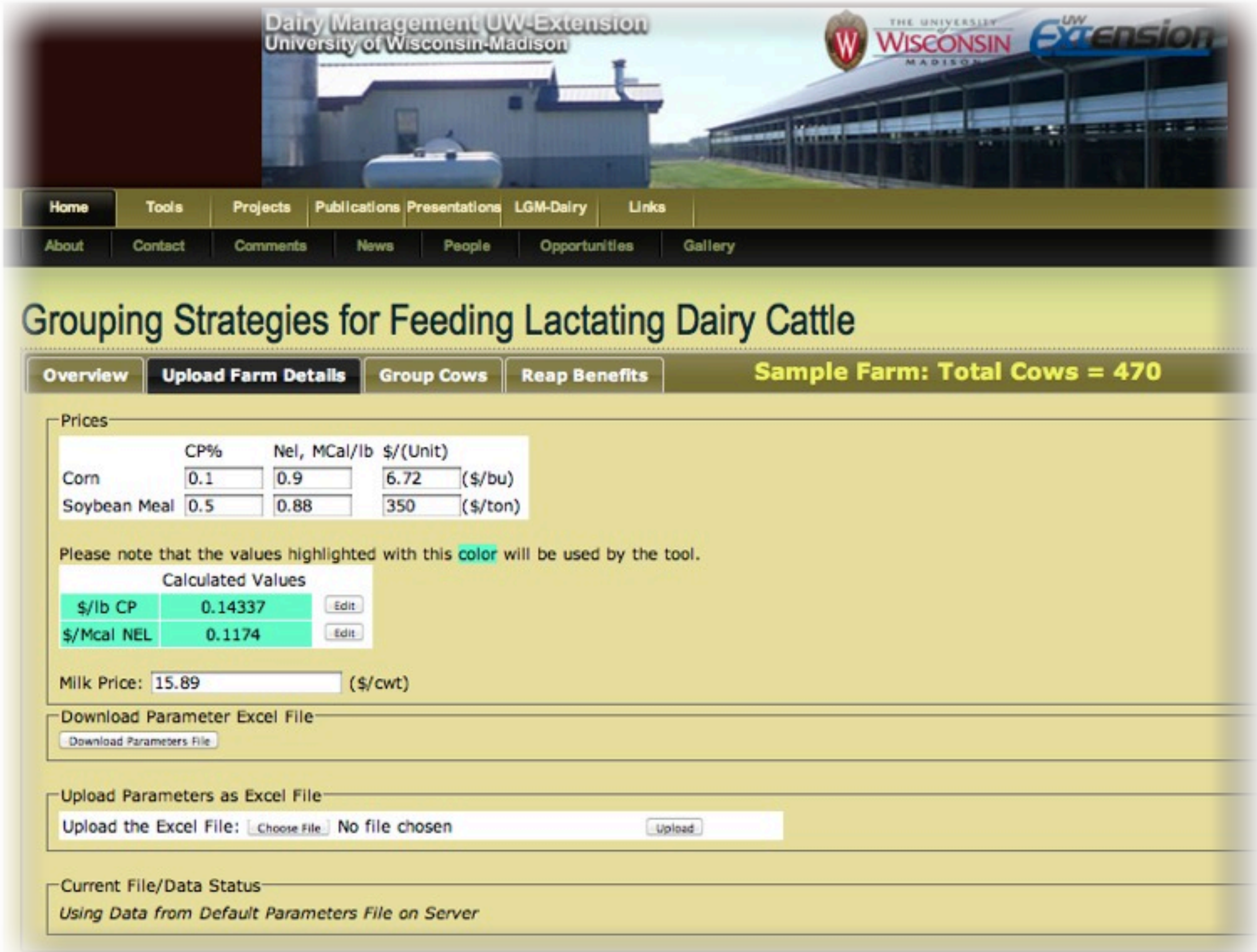
Net return

+ Max (IOFC)
- Extra management
- Milk depression
+ Savings



Grouping strategies

For feeding lactating dairy cattle



Get the farm data

Farm time specific dataset

NE and CP value

- Farm known value
- Calculated from corn and soybean meal

Milk price

- Farm known value

Grouping strategies

- Farm current situation
- Possible situations

Cow information

Table of specific data

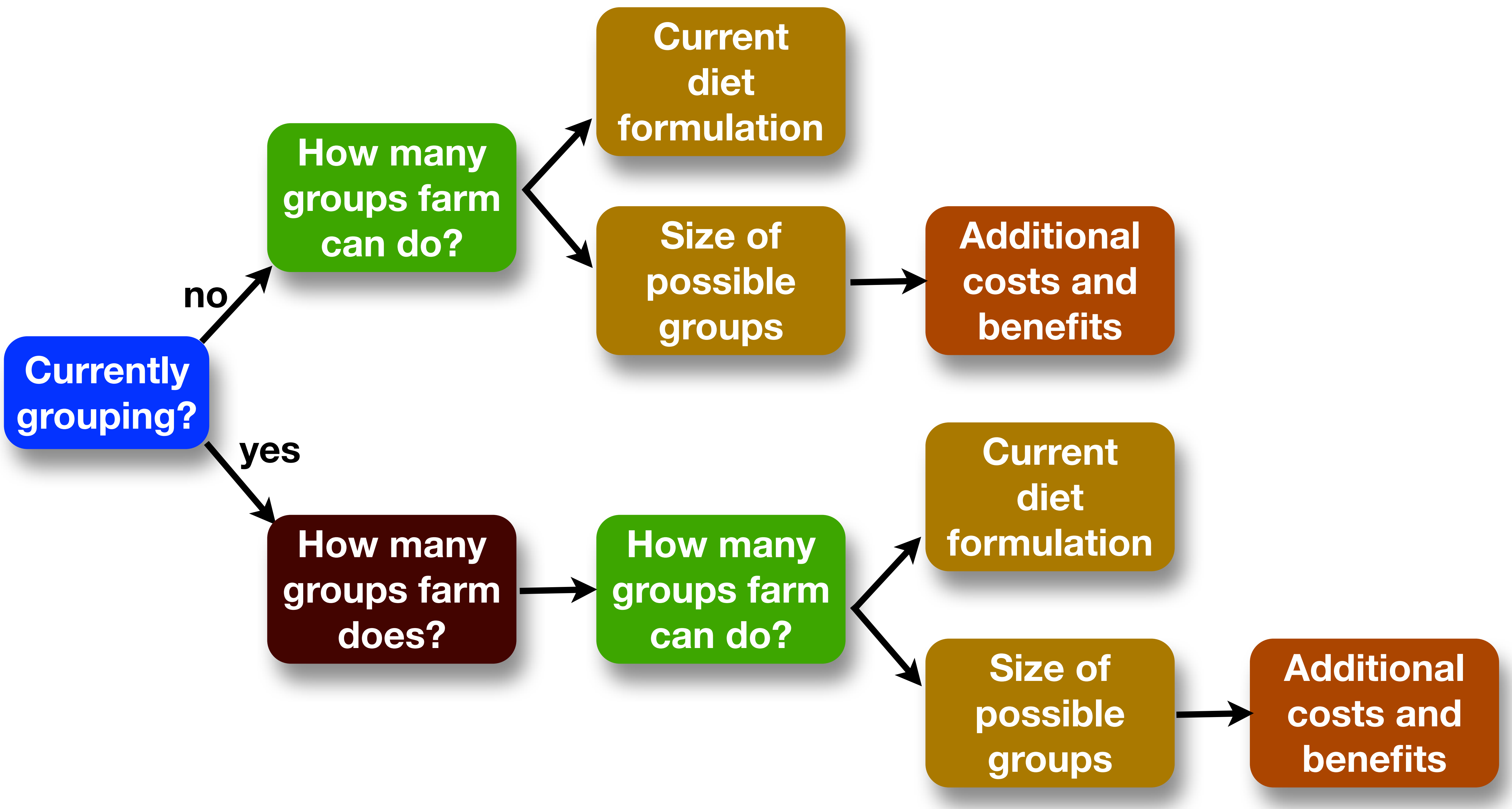
Cow ID	Parity	DIM	Milk, lb/d	Milk fat, %
6234	1	84	62	4.1
132	7	118	73	3.8
6196	1	198	85	3.4
6149	4	199	114	3.6
5045	2	280	81	4.3

Additional information

- Cow's BW, or
- Parity's average BW

Grouping strategies

Farm possibilities



Tool illustration

Economic impact of grouping

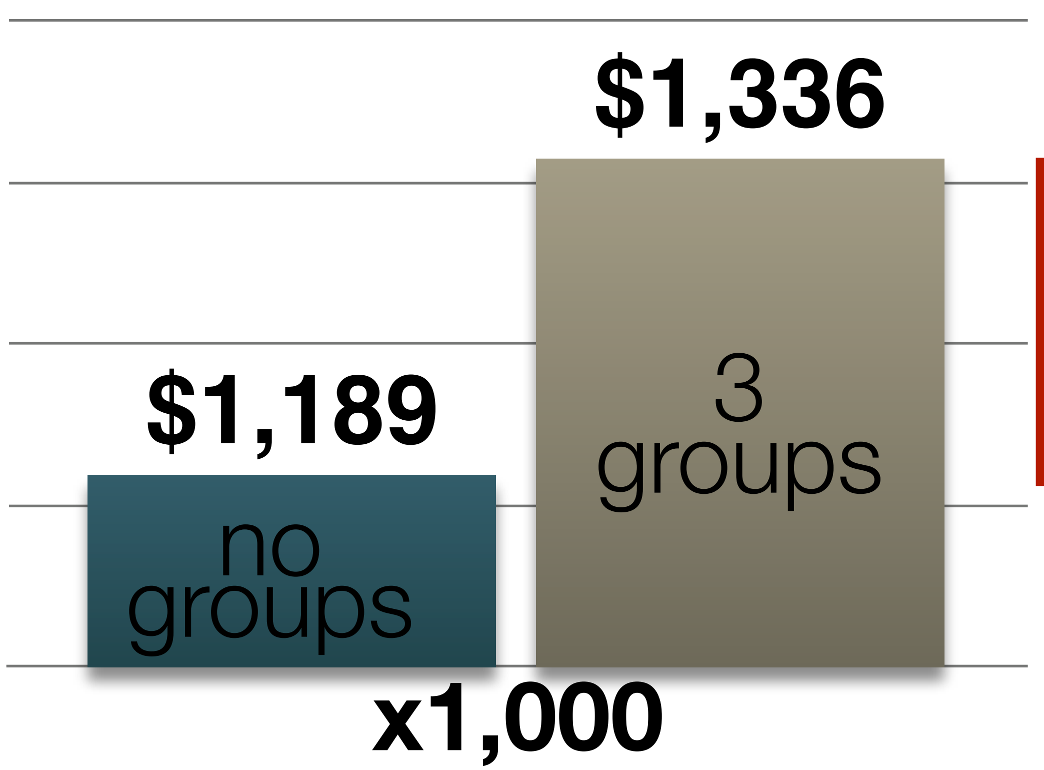
Current situation	
Lactating cows	470
Number groups	None
NE, Mcal/lb	0.80
CP, %	17%

Possible situation	
Number groups	3
Group sizes	100, 100, 270
Added cost, $	$1,000/month
Milk loss	5 lb/cow
Milk loss time	4 days
Saved cost, $	$0

Decision support system illustration

Cluster grouping criteria

	Possible situation			
	Cow numbers	NE, Mcal/lb	CP, %	IOFC, $/cow/day
Group 1	270	0.71	16.05	9.3
Group 2	100	0.65	14.18	7.2
Group 3	100	0.62	13.07	4.7



Annual value of grouping
$147,000/470 cows

Cabrera et al., 2012

Analysis from dairy farm records

30 Wisconsin dairy farms

No grouping vs. 3 groups

- Same size groups

Cluster grouping

- 83rd percentile CP and NEl

Same prices for all

- $15.89/cwt milk
- $0.14337/lb CP
- $0.1174/Mcal NEl

Projected body weight

- 1,100 lb primiparous
- 1,300 lb multiparous

Analysis from dairy farm records

30 Wisconsin dairy farms

	Number of lactating cows (n=30)	Income over Feed Cost (no grouping)	Income over Feed Cost (3 groups)
		$/cow per year	
Mean	788	$2,311	**$2,707**
Minimum	< 200	$697	**$1,059**
Maximum	> 1,000	$2,967	**$3,285**

Increase of IOFC ($/cow per year)

- Between 7 and 52%
- Mean = $396
- Range = $161 to $580

After reasonable extra costs

- Still increased net margin of between 5 and 47%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Thanks