



Economics of Dairy Reproductive Programs

Victor E. Cabrera & Julio Giordano

How do I get her pregnant?

Heat Detection

Ovsynch

G-6-G

PREYSNCH-OVSYNCH



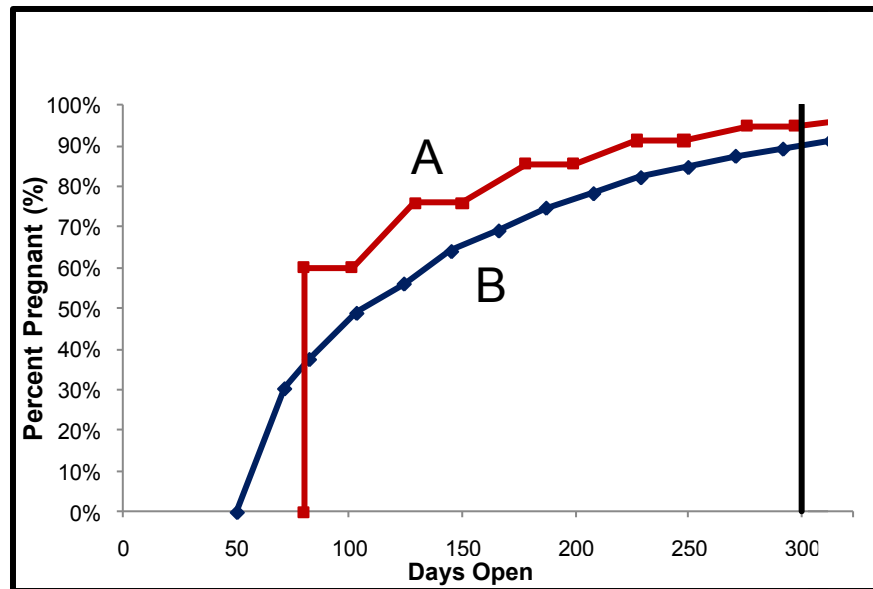
- Command : BREDSUM\E

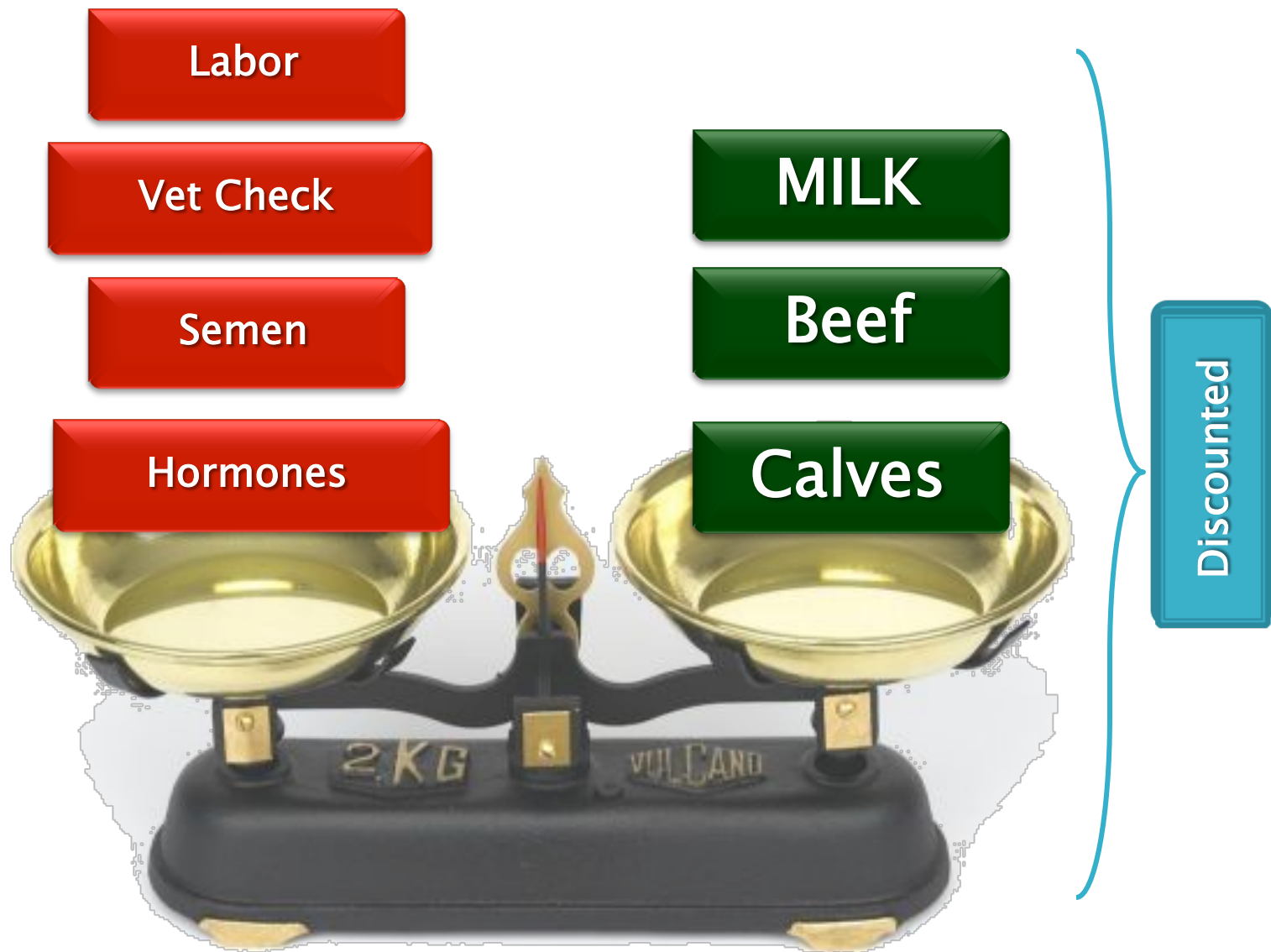
Date	Ht Elig	Heat	Pct	Pg Elig	Preg	Pct	Aborts
9/23/02	74	36	49	74	10	14	1
10/14/02	64	34	53	64	12	19	0
11/04/02	58	40			15	27	3
11/25/02					10	19	3
12/16/02					0	20	2
1/06/03					8	18	0
1/27/03					6	13	0
2/17/03					8	13	2
3/10/03					13	19	0
3/31/03					9	15	0
4/21/03					9	16	3
5/12/03					7	12	1
6/02/03					11	19	1
6/23/03					12	18	3
7/14/03					7	12	0
8/04/03				68	6	9	2
8/25/03	65		43	0	0	0	0
9/15/03	65	44	68	0	0	0	0
Total	952	499	52	940	153	16	21

A stack of US dollar bills, including \$100 and \$10,000 bills, tied with rubber bands. The stack is positioned over the table data.

The Value of a Repro Program

- Net Present Value realized by the herd population dynamics depending on the probabilities of cows getting pregnant in successive reproduction services





Costs

Revenues



Justification and Goal

JUSTIFICATION:

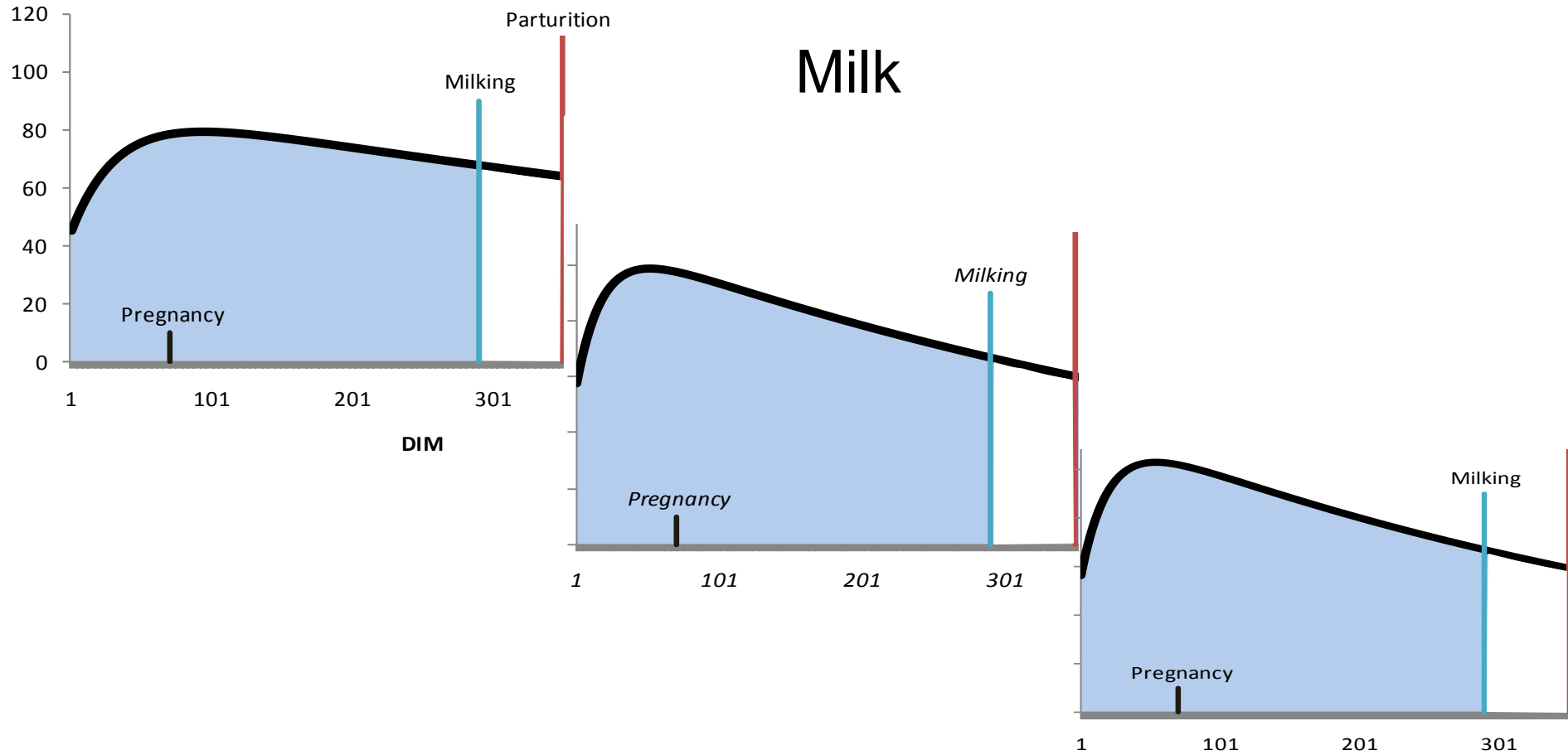
Lack of supporting tools
for selection of repro
programs

GOAL:

Develop a decision support
system to help producers
on the economic selection
of repro programs

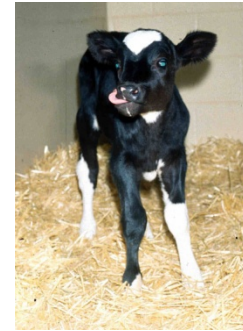


Revenues of PREGNANTS



Revenues of PREGNANTS

➤ Value of a New Born



➤ Value of Salvage for Involuntary Culling



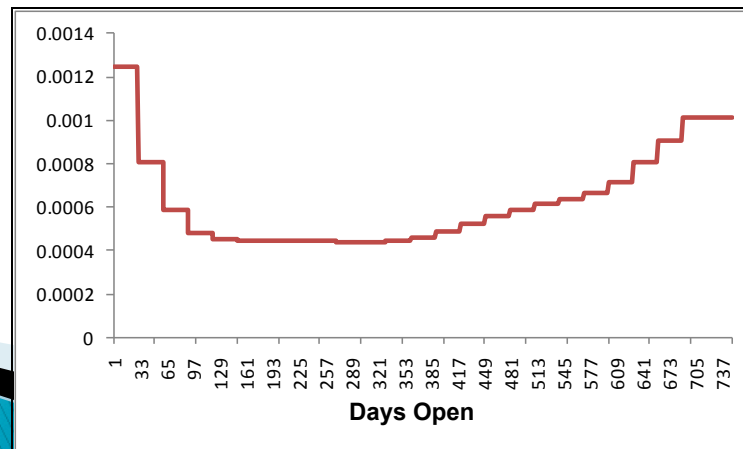
Expenses of PREGNANTS

- Repro Costs
 - Labor
 - Pregnancy Diagnosis
 - Semen Dose
 - Hormones

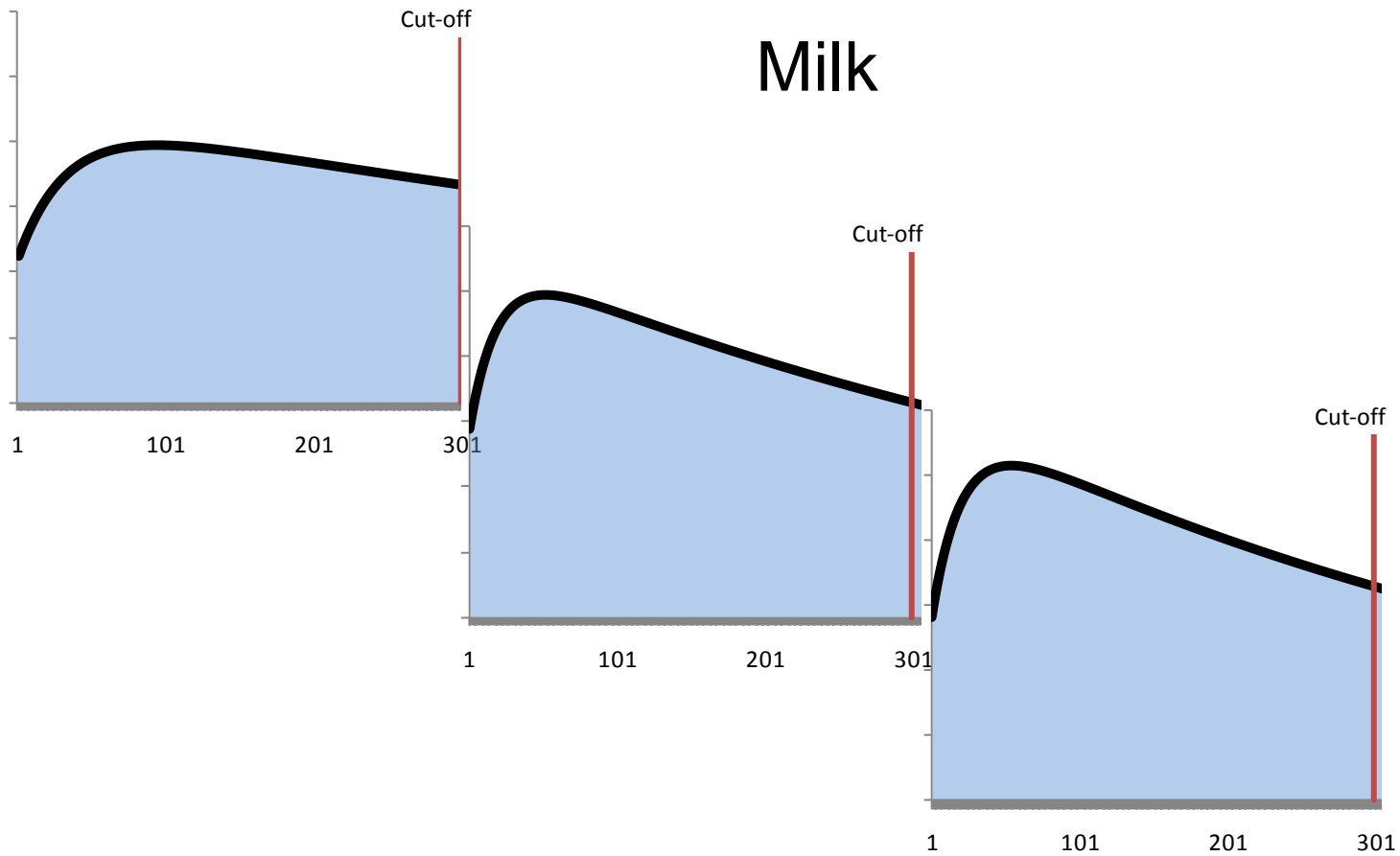


Expenses of PREGNANTS

- Milking Period Feed
 - Follows lactation curve
- Dry Period Feed
 - Fixed daily cost during dry period
- Cost of Involuntary Culling and Death



Revenues of NON-PREGNANTS



Revenues of NON-PREGNANTS

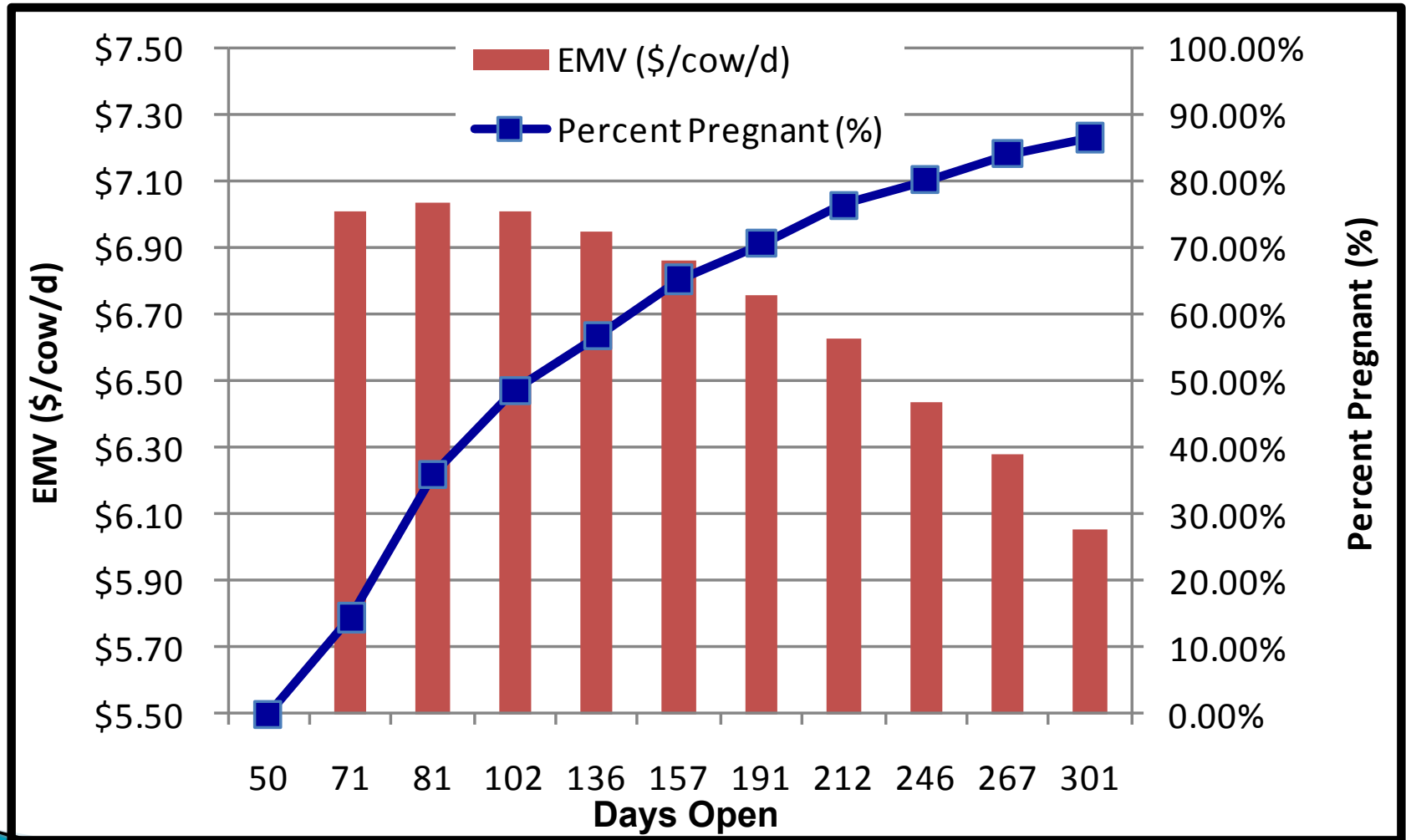
- Salvage Value for Voluntary Culling

Expenses of NON-PREGNANTS

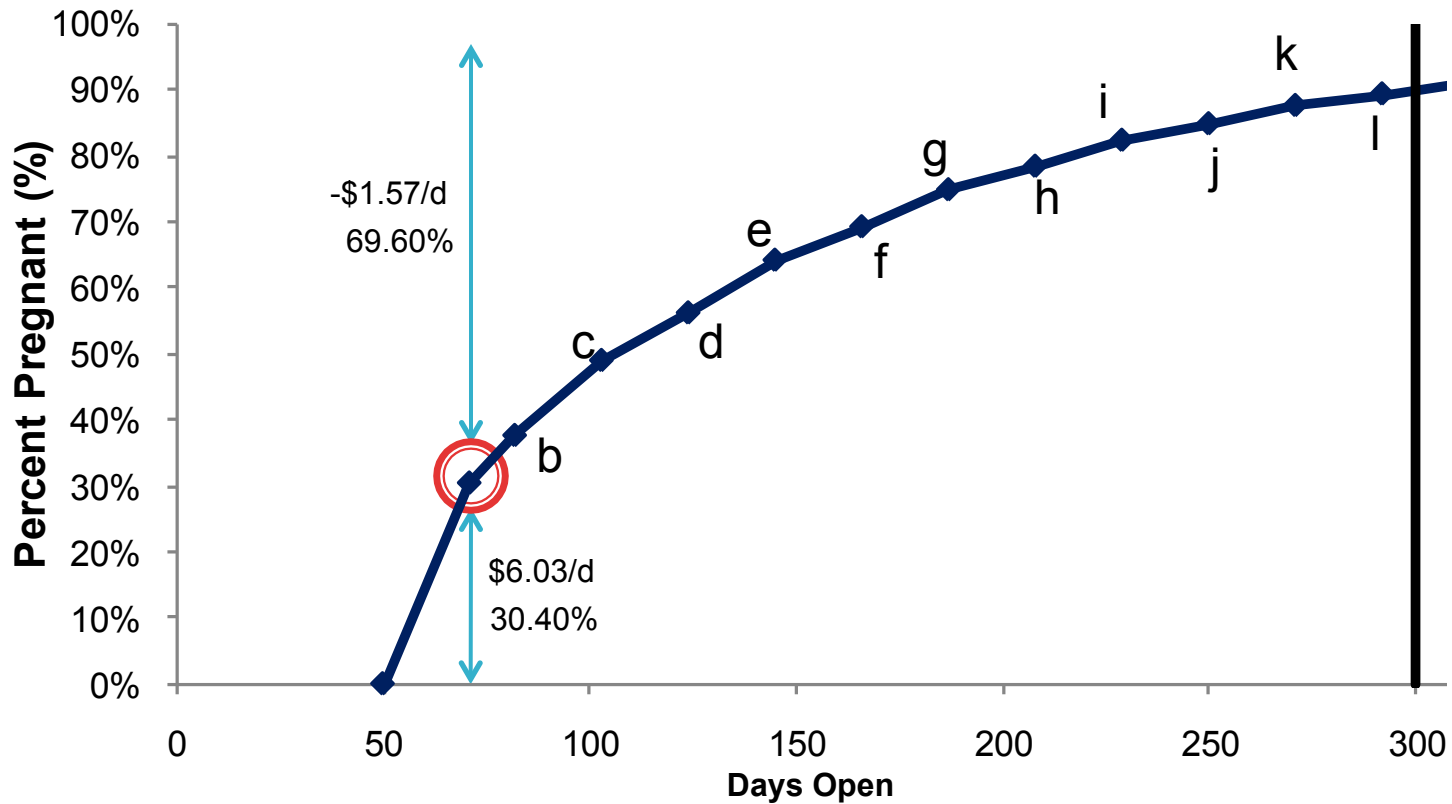
- Cost of Replacement
- Breeding Costs
- Feed
- Cost of Involuntary Culling



The Value of a Repro Program



The Value of a Repro Program



Expected Monetary Value (a + b + c...)

Pregnant

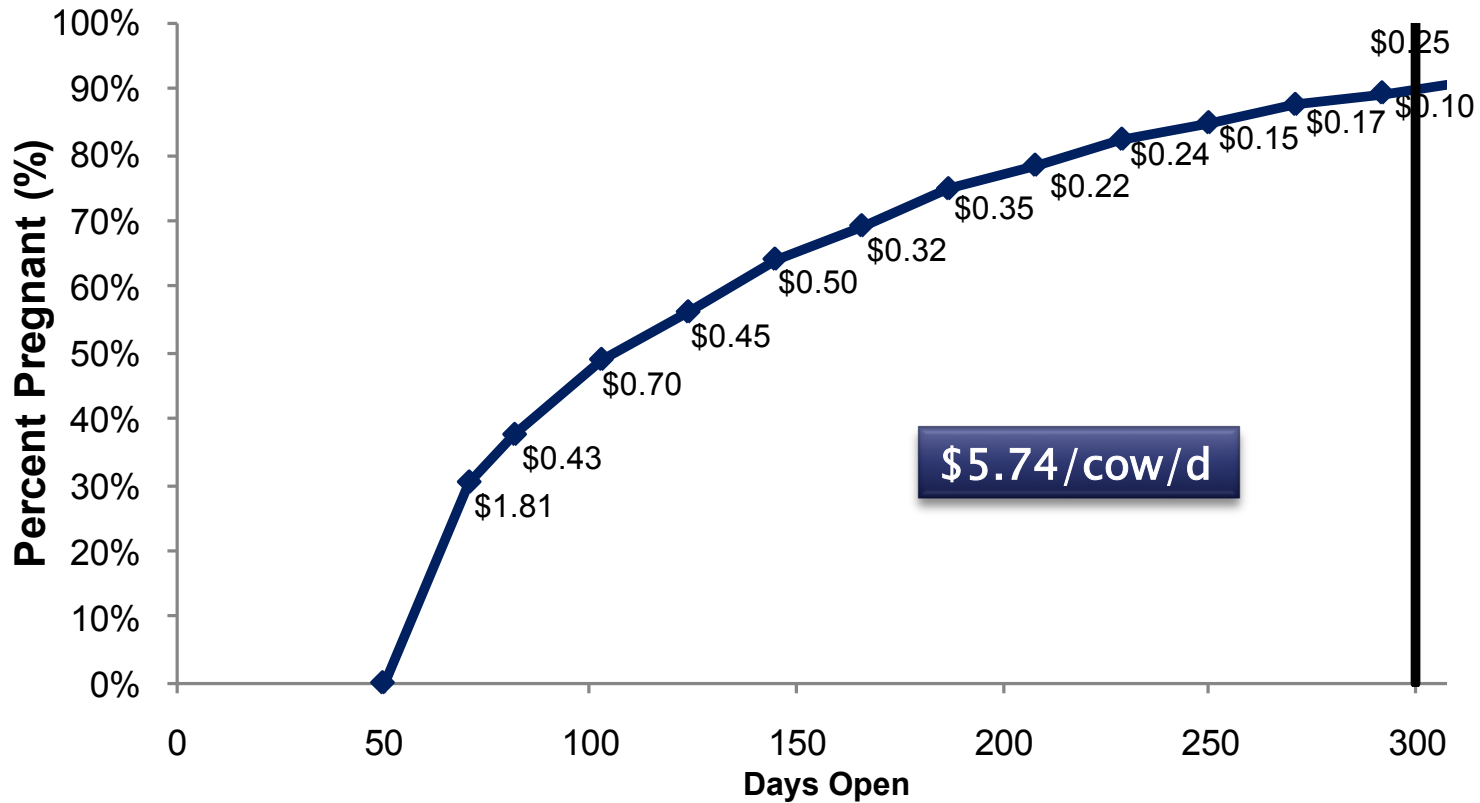
+

Expected Monetary Value (repro culls)

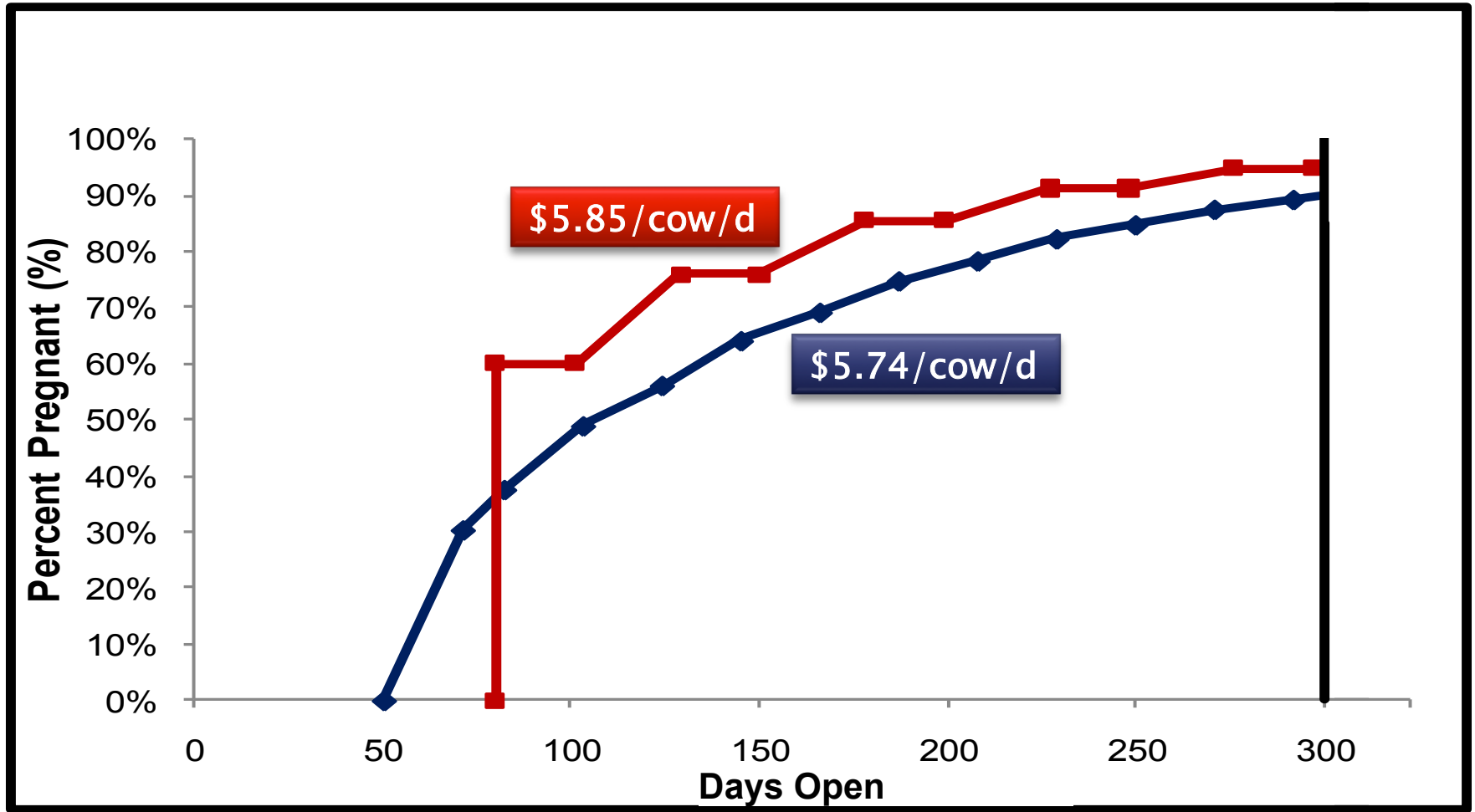
Non-Pregnant



The Value of a Repro Program



The Value of a Repro Program



\$40.2/cow/yr



Reproductive Economic Analysis



Reproductive Economic Analysis

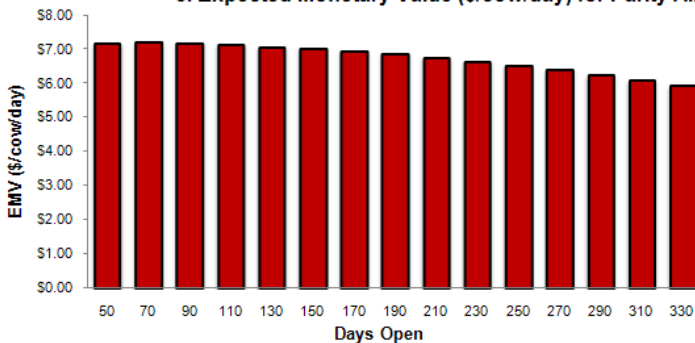
1. Productive and Economic Parameters Summary

Lactating Cows in Parity All	(#)	1000
Rolling Herd Average	(lb/cow/y)	25000
Milk Price	(\$/cwt)	15.00
Average Value New Born	(\$)	175
Heifer Replacement Value	(\$)	1,600
Salvage Value	(\$)	450

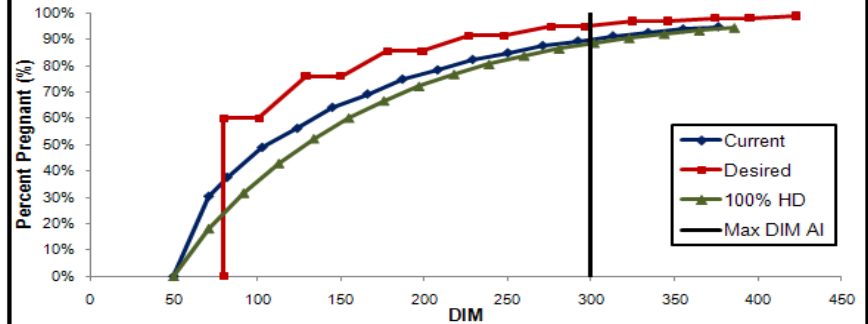
2. Reproductive Programs Summary

	Current	Desired	Baseline
1 st Service Postpartum	G-6-G	G-6-G	Heat Breeding
2 nd and Following Services	G-6-G	G-6-G	Heat Breeding
Voluntary Waiting Period	50d	80d	50d
Maximum DIM for Breeding		300d	
DIM 1st TAI	82d	80d	
Interbreeding Interval	42d	49d	21d
Heat Bred Before 1 st TAI	80%	0%	55%
CR Heat Bred Before 1 st TAI	55%	0%	33%
Heat Bred After 1 st TAI	65%	0%	55%
CR Heat Bred After 1 st TAI	28%	0%	30%
CR 1 st Service TAI	36%	60%	
CR 2 nd + Services TAI	33%	40%	
Cost 1st Service Breeding	\$39.60	\$37.09	
Cost Resynch Breedings	\$39.60	\$37.09	
Cost Heat Breedings	\$27.80	\$23.89	\$27.80
Pregnancy Diagnosis Method	Palpation	Palpation	Palpation
Pregnancy Diagnosis Cost	\$12.80	\$8.89	\$12.80

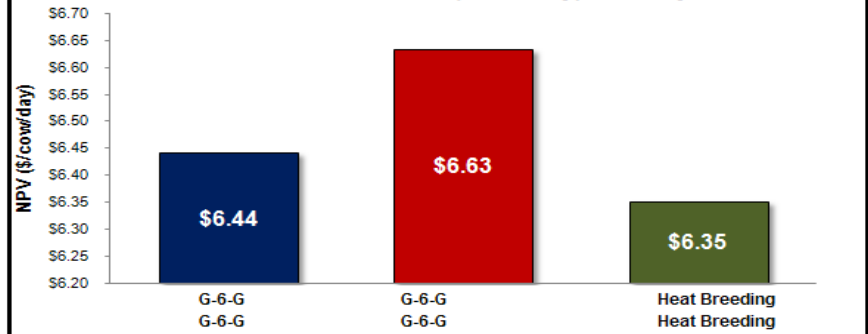
3. Expected Monetary Value (\$/cow/day) for Parity All



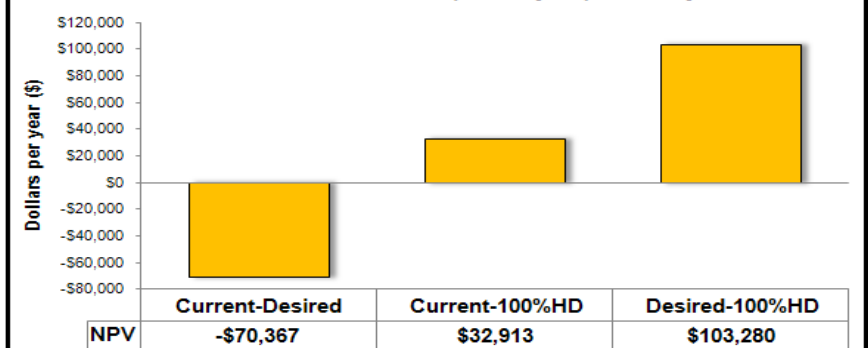
4. Survival Curves for Pregnancy for Parity All



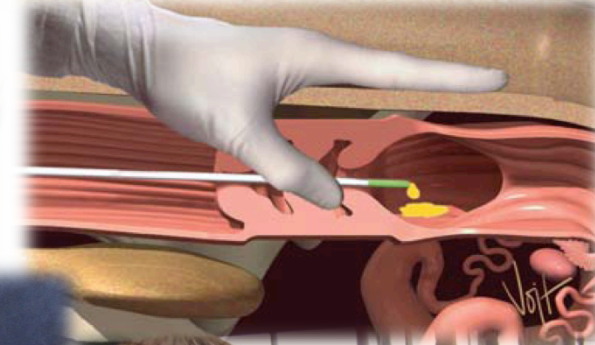
5. Net Present Value (\$/cow/day) for Parity All



6. Difference in NPV (\$/herd/year) for Parity All



Data Inputs



Productive and Economic Data

Productive Parameters

- Lactating cow #
- RHA
- Lactation curves
- Involuntary Culling Rate
- Mortality Rate
- Stillbirth Rate

Economic Parameters

- Milk Price
- Cost Feed Lactating
- Dry Period Fixed Cost
- Value New Born
- Replacement Heifer
- Salvage Value
- Interest Rate

Reproduction Related Costs

- Heat Detection
- Artificial Insemination
- Pregnancy Diagnosis
- Hormones
- Labor for injections



Reproductive Program

	Current	Start day	Desired	Start day
1 st Service Postpartum	Presynch-Ovsynch14	Tue	Ovsynch	Mon
2 nd + Services	Ovsynch	Tue	Ovsynch	Mon

1st Service

- Presynch-Ovsynch
- G-6-G
- Double-Ovsynch
- Heat Breeding

2nd Plus Services

- Ovsynch
- Heat Breeding
- G-6-G
- Select Synch



General Reproductive Data

	Current	Desired	100% HD
Estrous Cycle Duration		21 d	
Calving Interval		13.4 mo	
Dry Period Length		65 d	
Maximum DIM for Breeding		300 d	



Specific Repro Program Data

	Current	Desired	100% HD
Voluntary Waiting Period	50 d	80 d	50 d
DIM to 1 st TAI	80 d	80 d	
Interbreeding interval	42 d	35 d	
Heat Bred before 1 st TAI	60%	0%	55%
CR Heat Bred before 1 st TAI	33%	0%	33%
Heat Bred after 1 st TAI	40%	0%	55%
CR Heat Bred after 1 st TAI	28%	0%	30%
CR 1 st service TAI	38%	42%	
CR 2 nd + Services TAI	30%	33%	



Results

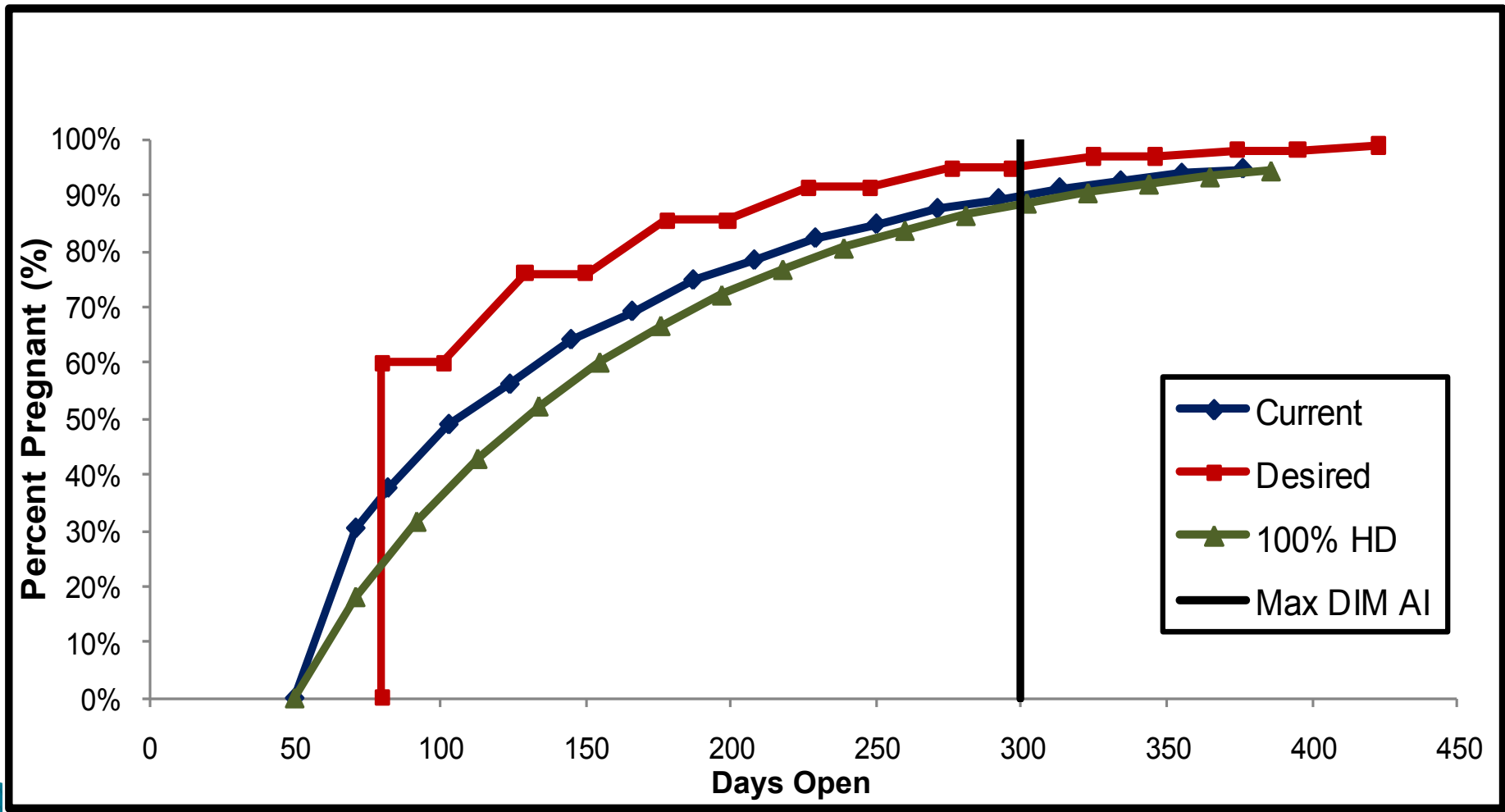


Breeding Costs

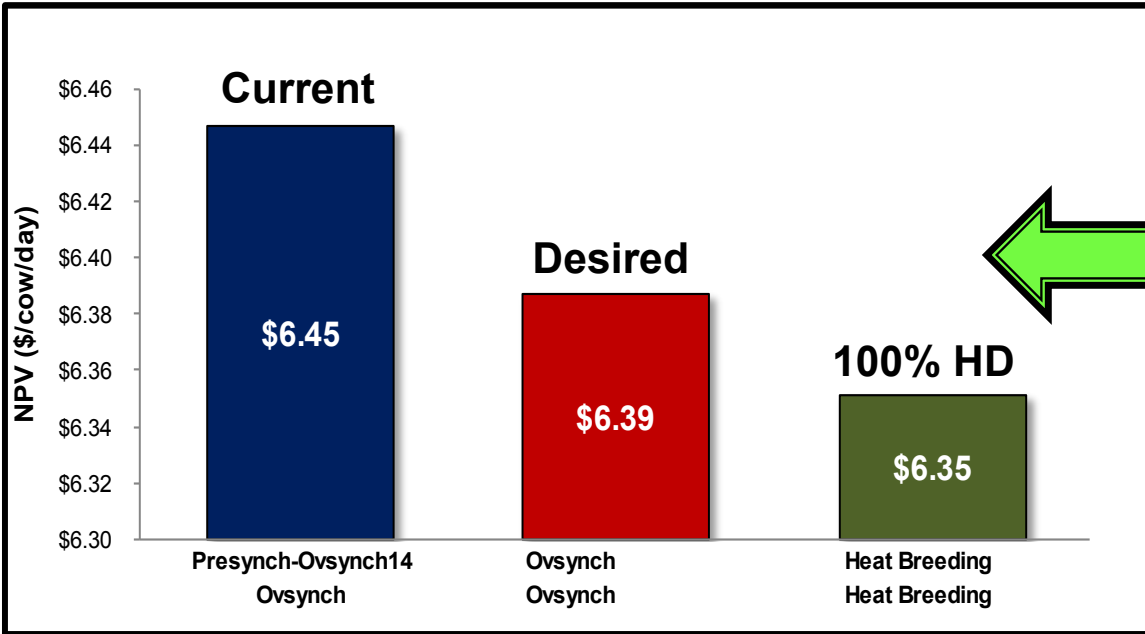
	Current	Desired	100% HD
1st Service Postpartum	Presynch–Ovs	Ovsynch	Heat Breeding
2nd + Services	Ovsynch	Ovsynch	Heat Breeding
Cost 1st Service Breeding	\$41.0	\$32.3	
Cost Resynch Breeding	\$35.6	\$32.3	
Cost Heat Breeding	\$27.8	\$23.9	\$27.8
Preg. Diagnosis Method	Palpation	Ultrasound	Palpation
Pregnancy Diagnosis Cost	\$6.5	\$8.9	\$6.0



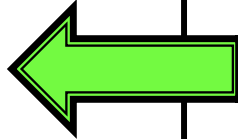
Reproductive Performance



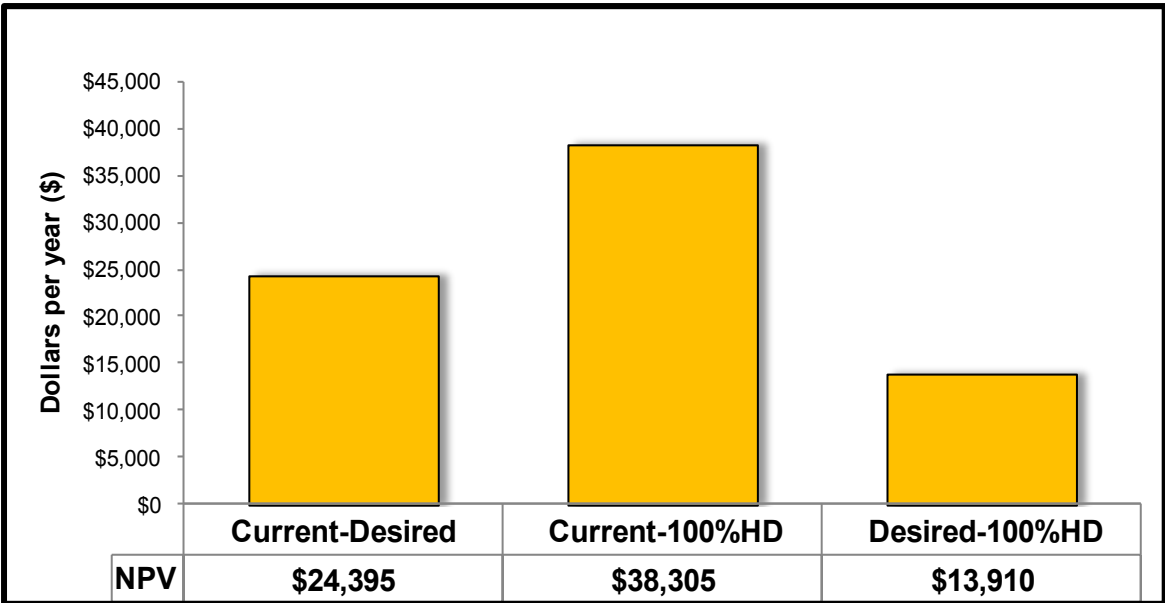
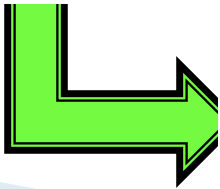
Economic Outcomes



Profit differences (NPV)
“per cow per day”



Profit differences (NPV)
“per herd per year”



Conclusions

- Breeding costs may become insignificant with respect to the EMV and/or NPV (gained or lost) with a pregnancy
- The “cost for pregnancy” could then be a misleading indicator of repro program value
- Reproduction performance has a strong and positive relationship with the value of a repro program



Limitations of the Model

- Analyses performed only for one lactation
- Pregnancy losses not accounted



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Dairy Management

Dairy Management 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 systems to help dairy farms improve their economic performance. Dr. Victor Cabrera focuses on model-based decision support in dairy cattle and in dairy farm production systems. Dr. Cabrera's primary interest is to improve cost-efficiency and profitability along with environmental stewardship in dairy farms by using simulation techniques, artificial intelligence, and expert systems. Dr. Cabrera's research and Extension programs involve interdisciplinary and participatory approaches towards the creation of user-friendly decision support systems. As an Extension Specialist, Dr. Cabrera works in close relationships with county-based Extension faculty, dairy producers, consultants, and related industry.

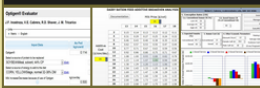
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- Cost-Benefit of Accelerated Liquid Feeding Program for Dairy Calves
- Economic Value of Sexed Semen Programs for Dairy Heifers
- Heifer Replacement
- Heifer Break-Even

Reproduction

- Economic Value of Sexed Semen Programs for Dairy Heifers

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- Decision Support System Program for Dairy Production and Expansion
- Economic Analysis of Switching from 2X to 3X Milking
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