Economic Evaluation of Reproductive Programs for Cows

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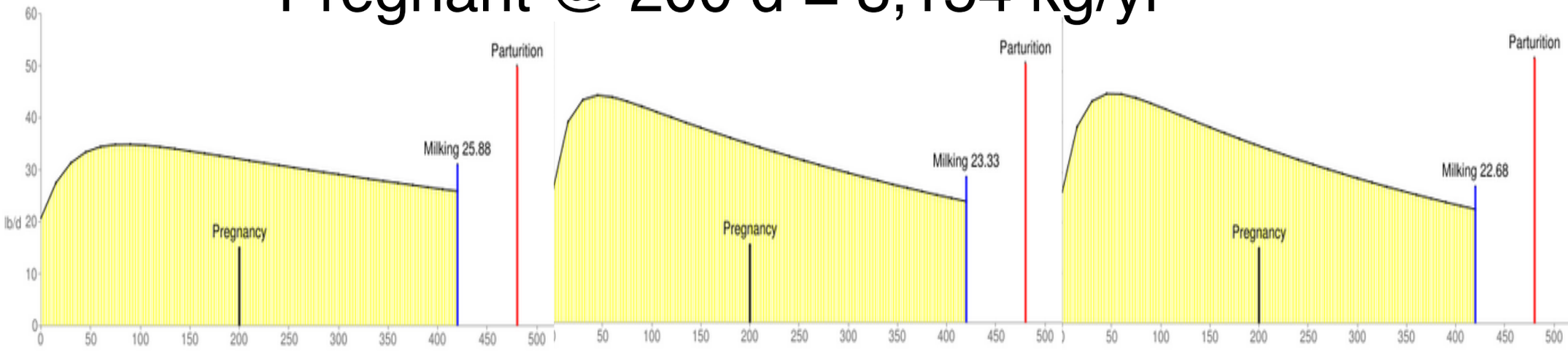
Rationale

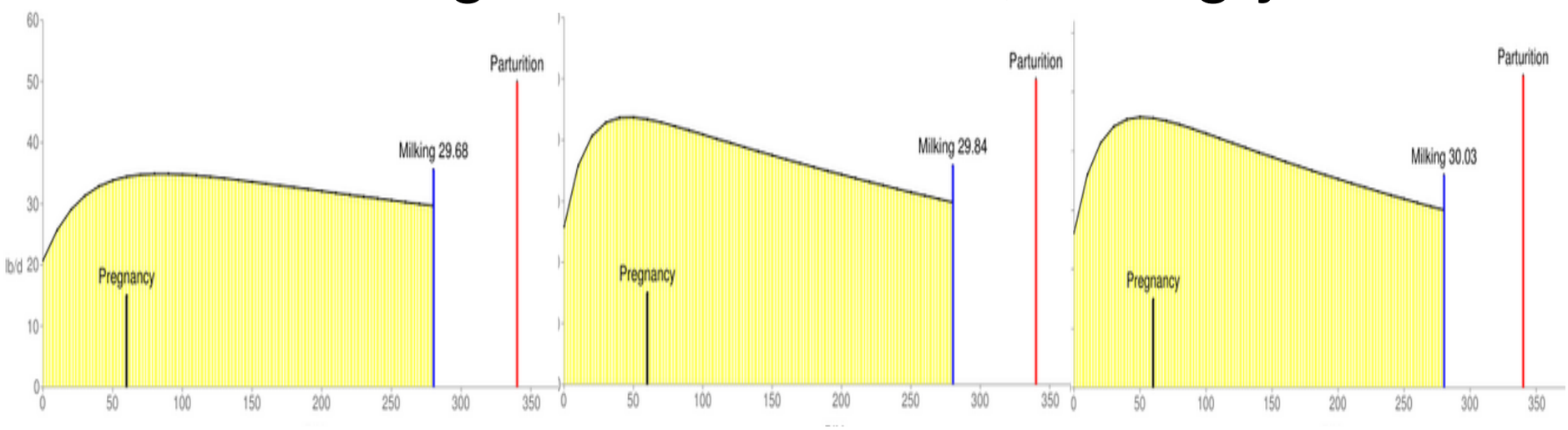
Economics of reproduction

Milk productivity

Pregnant @ 200 d = 8,154 kg/yr



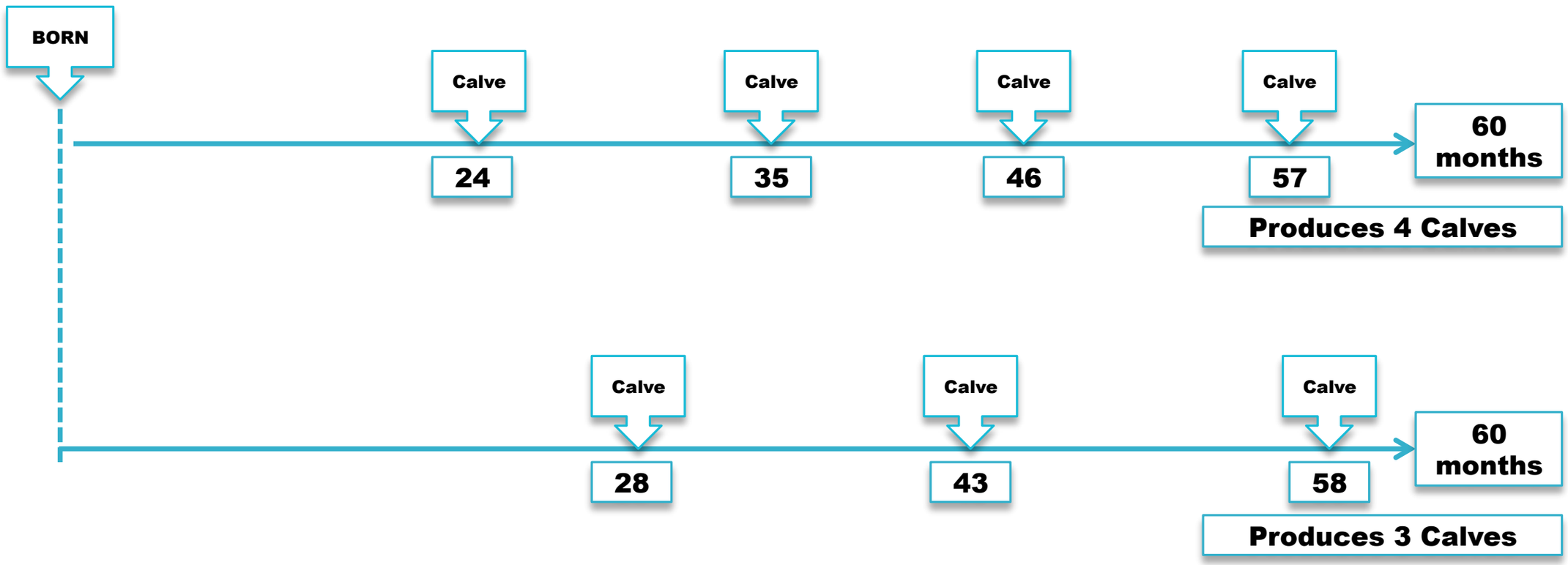
Pregnant @ 60 d = 8,370 kg/yr +216 kg/yr



Rationale

Economics of reproduction

Newborn value

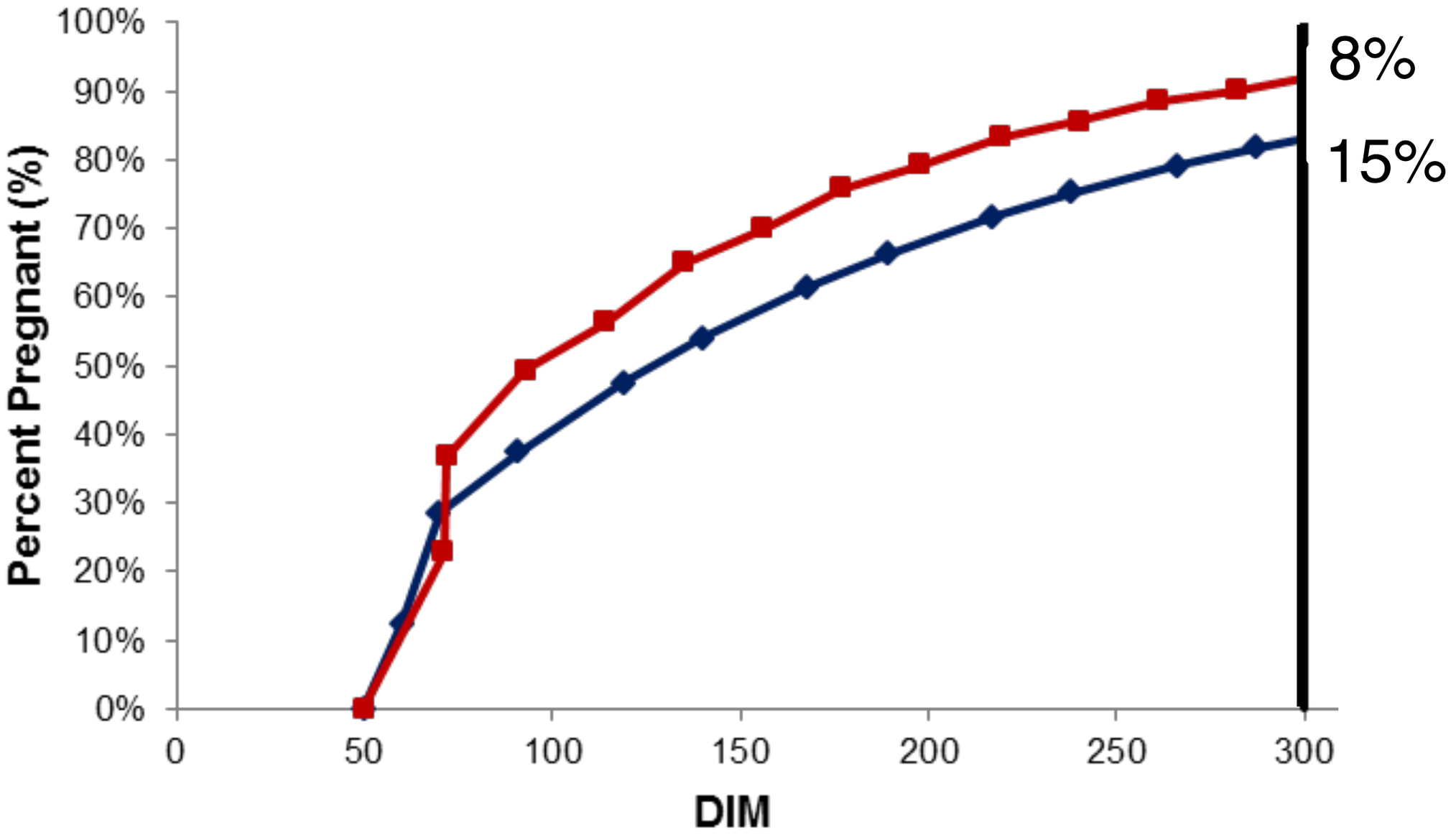


One more calf in 60 months life expectancy

Rationale

Economics of reproduction

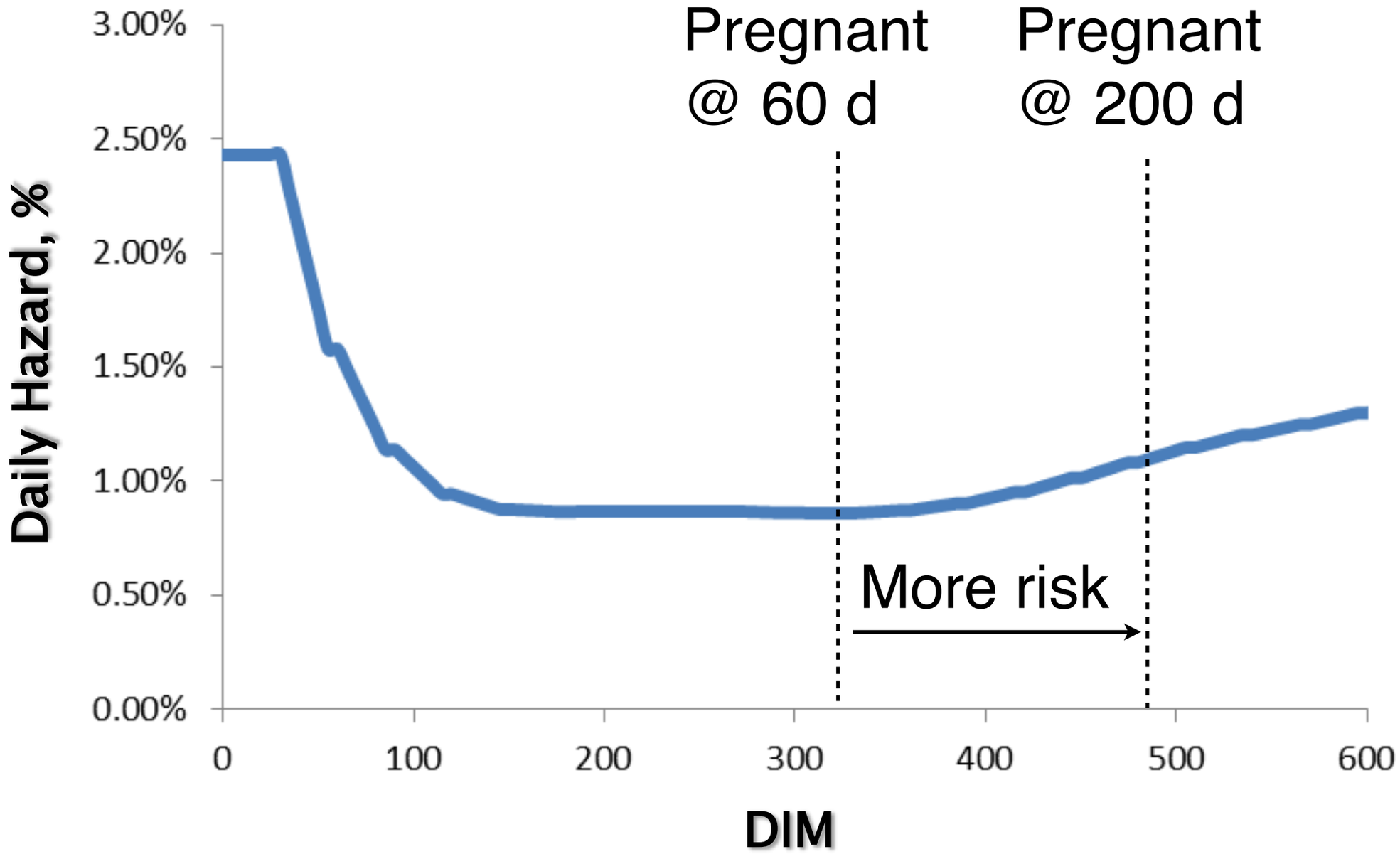
Reproductive culling



Rationale

Economics of reproduction

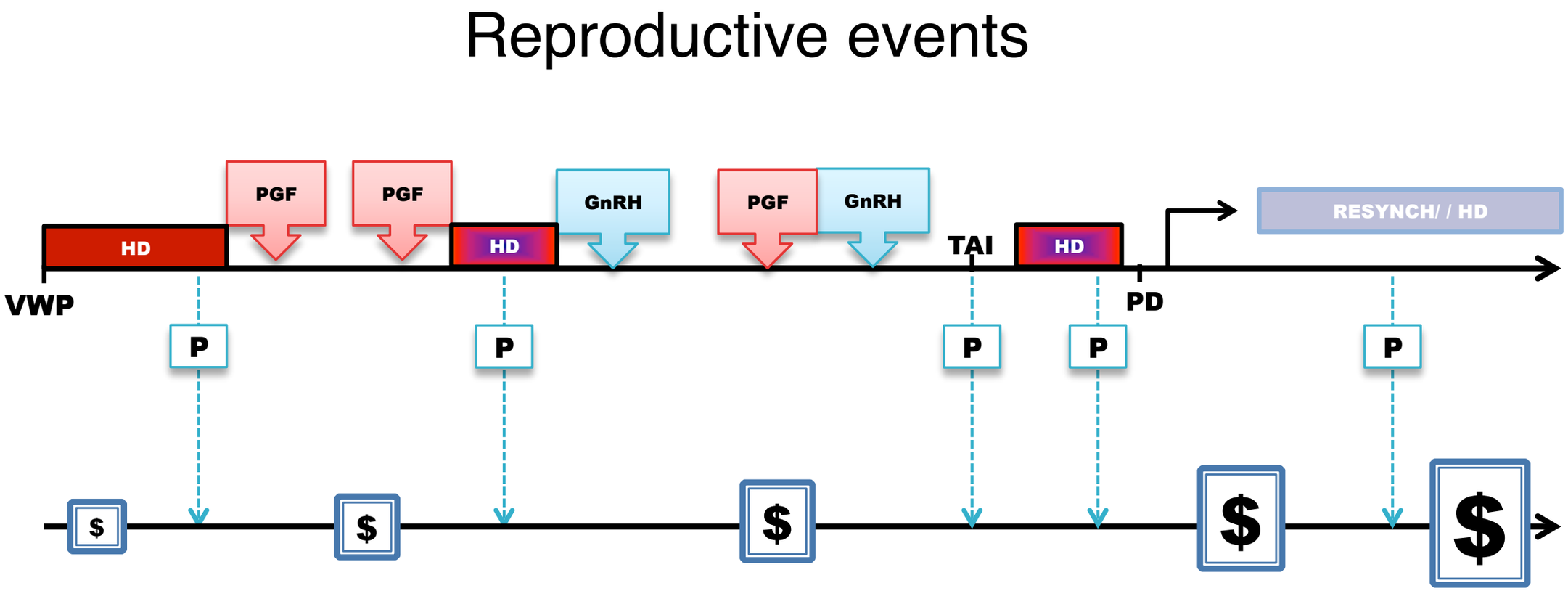
Involuntary culling



Rationale

Economics of reproduction

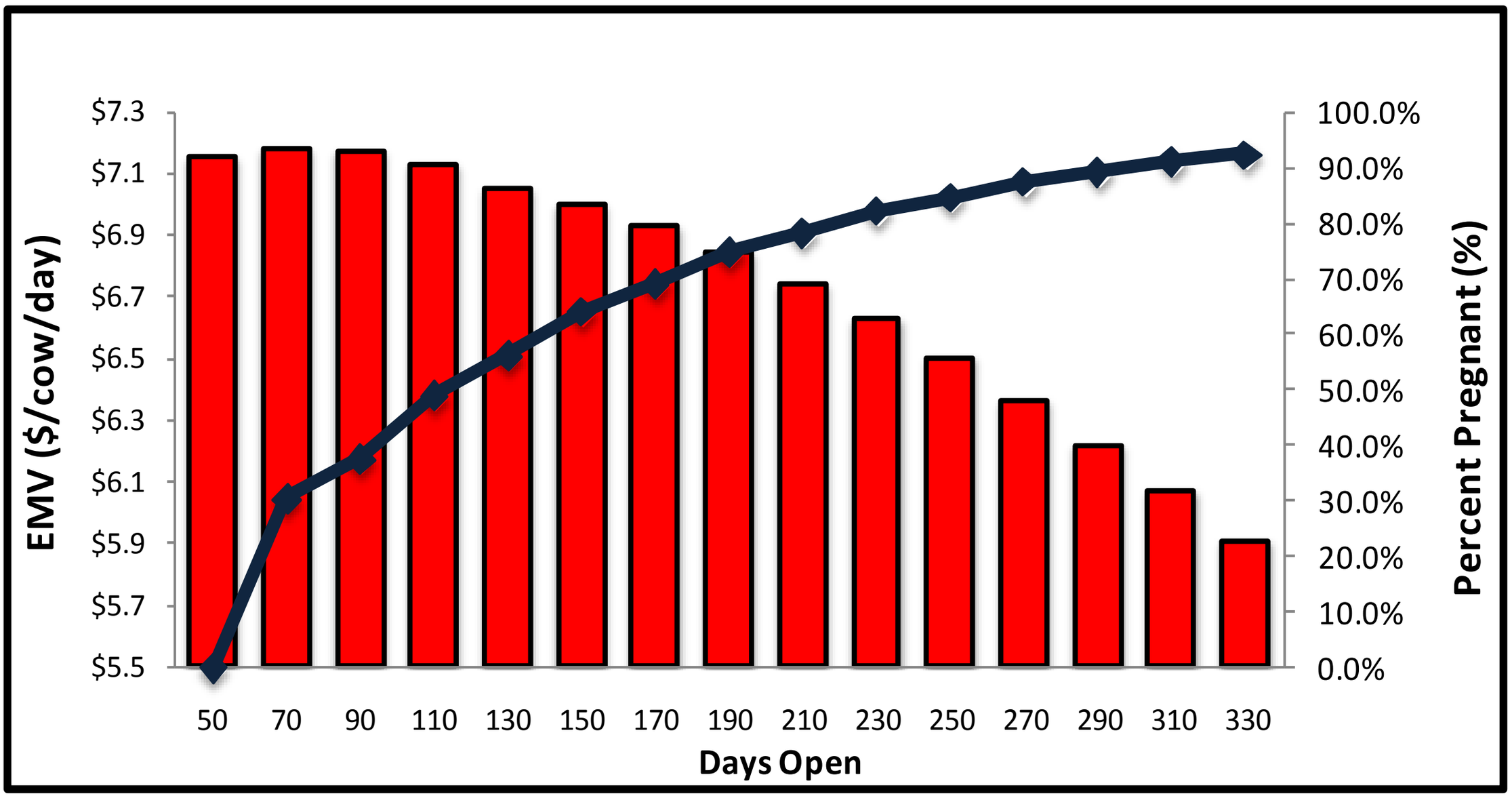
Reproductive costs



Reproductive costs

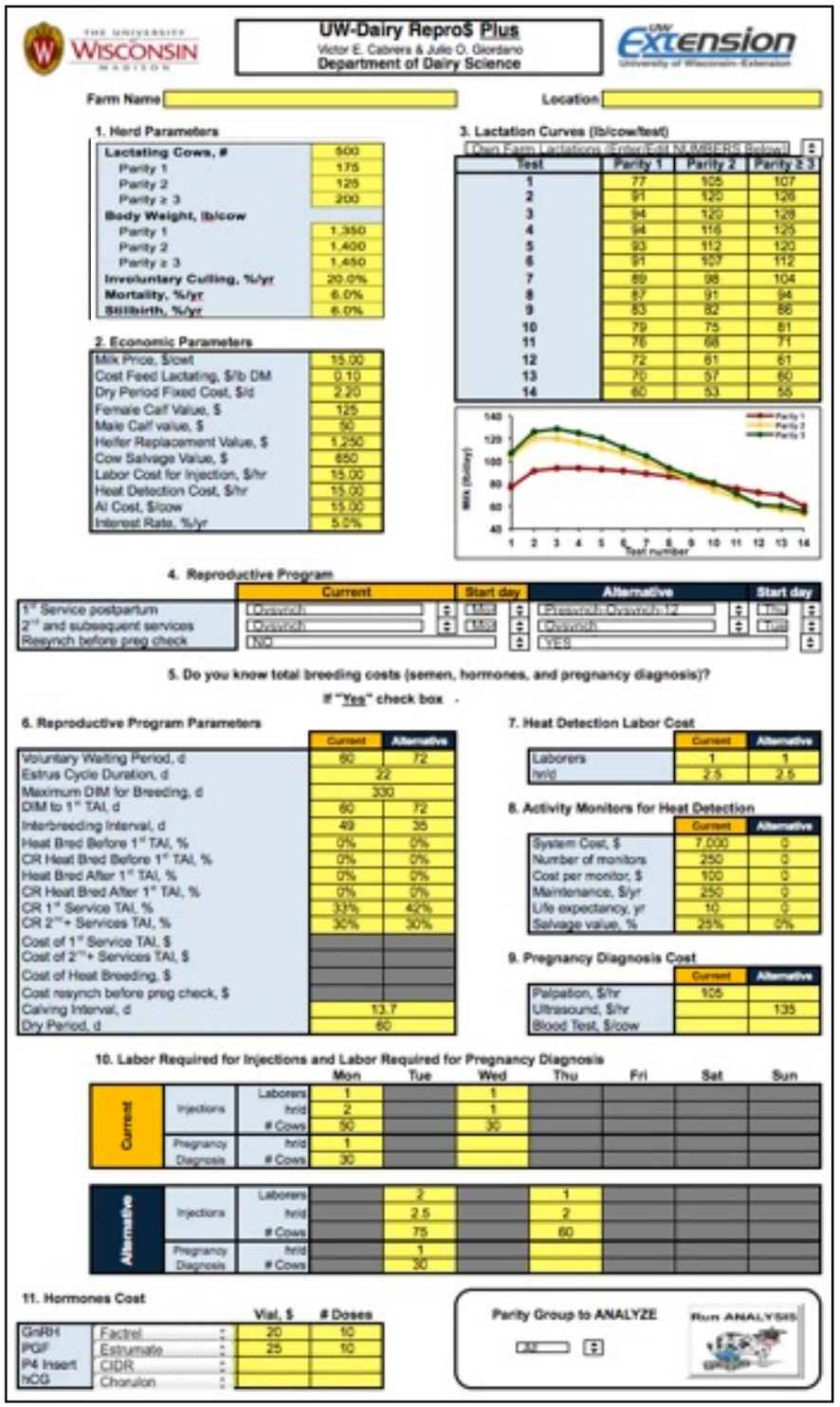
Expected monetary value

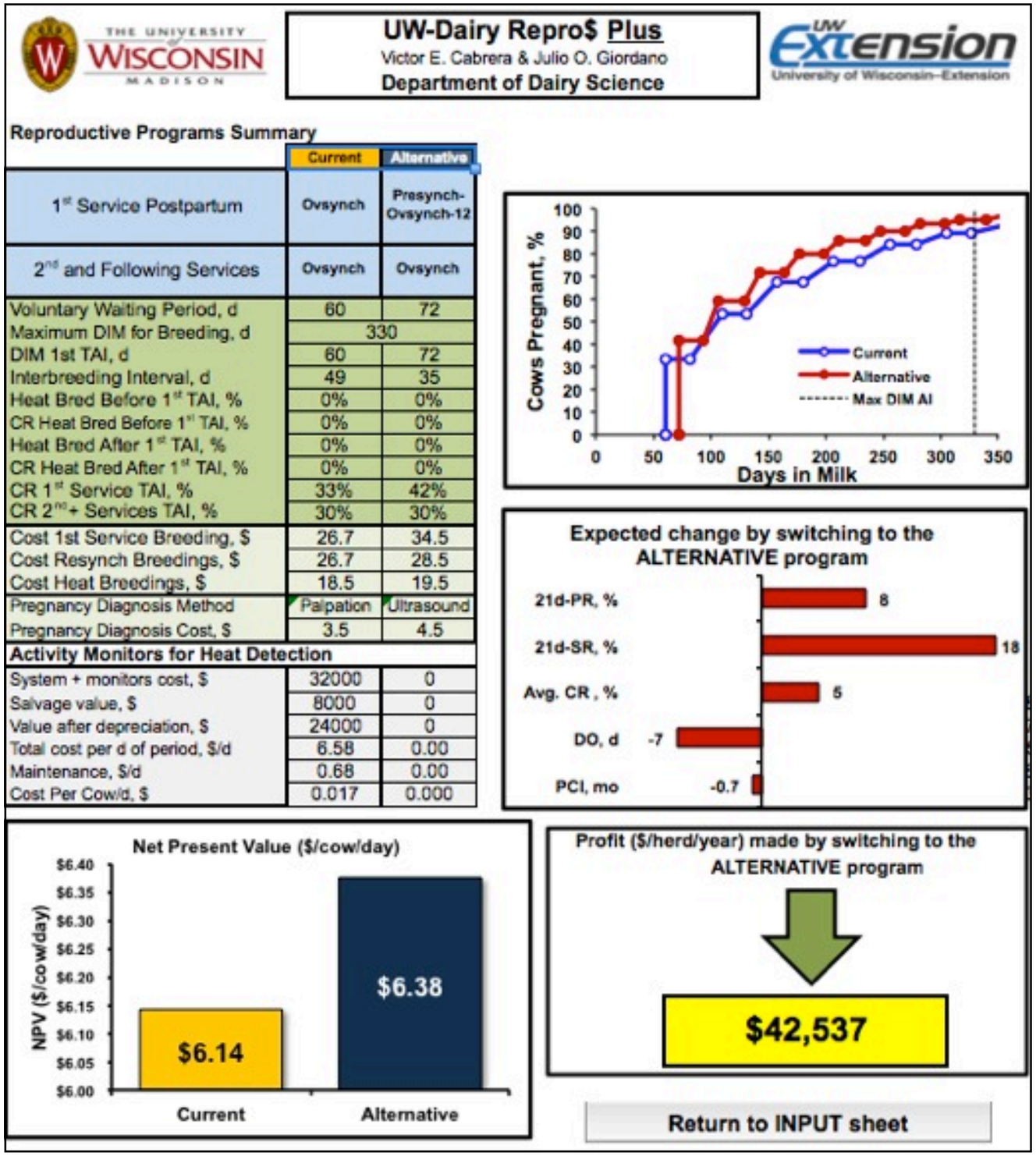
Economics of reproductive programs



UW-DairyRepro$Plus

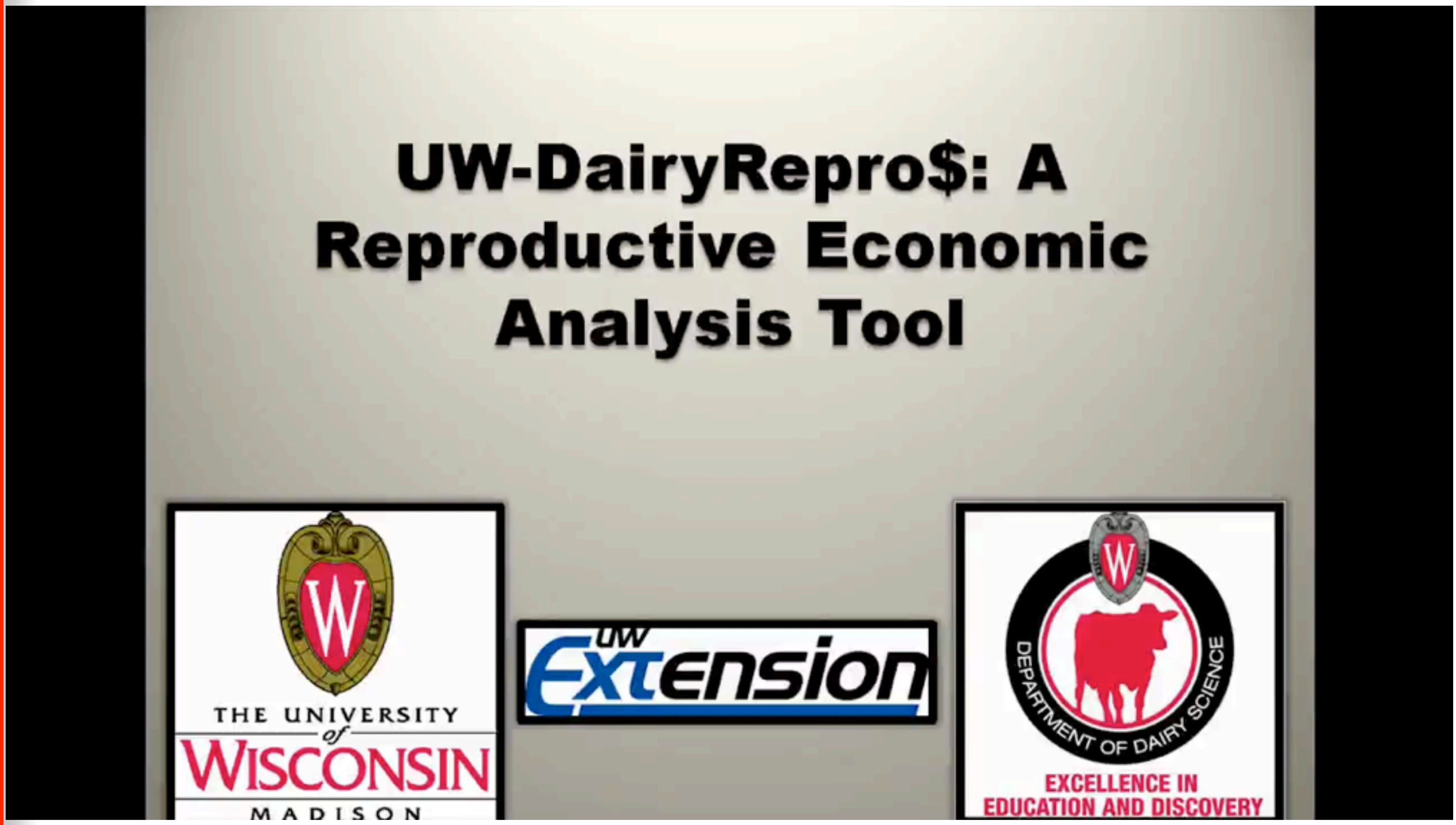
Spreadsheet decision support tool





Video demonstration

Available at DairyMGT.info



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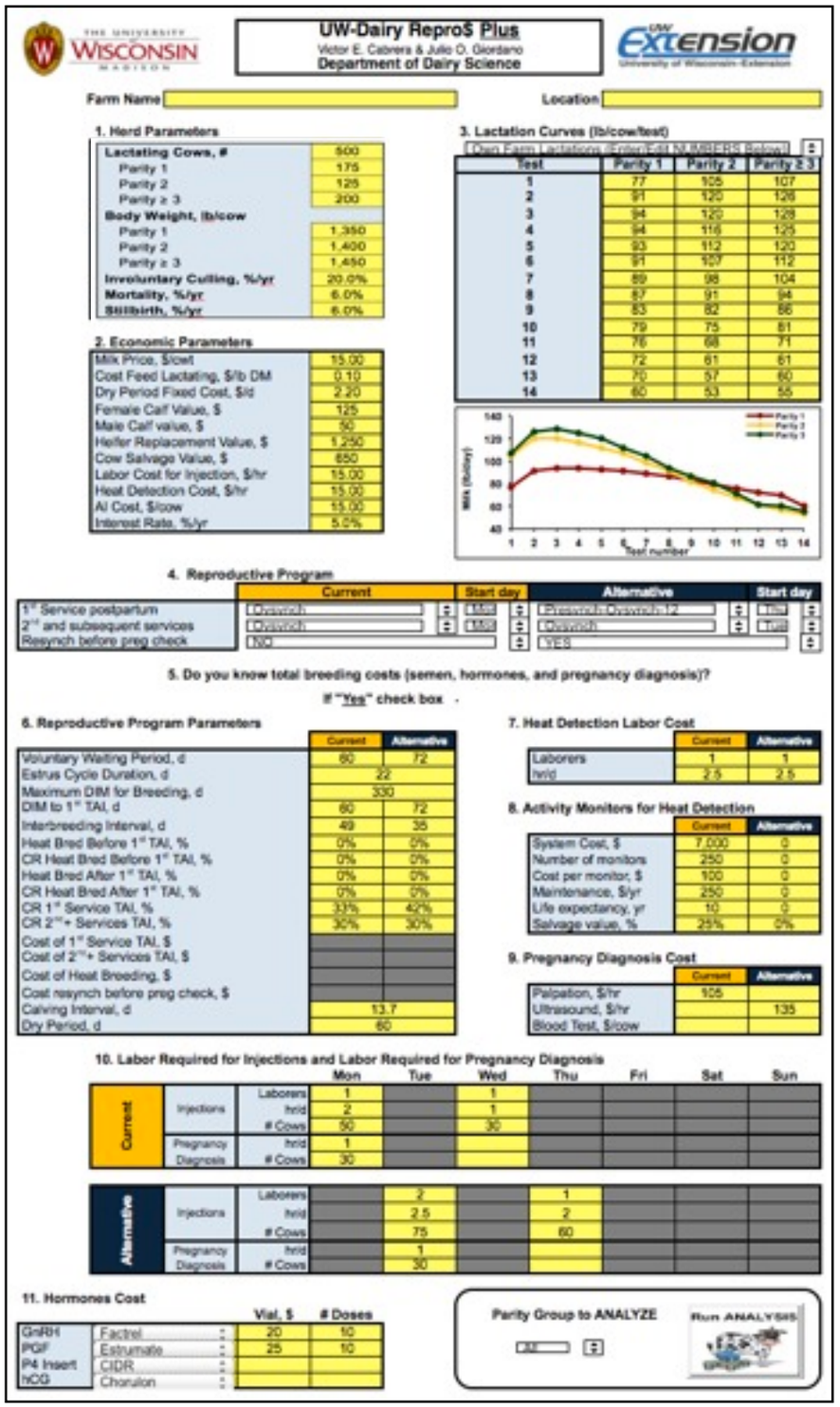

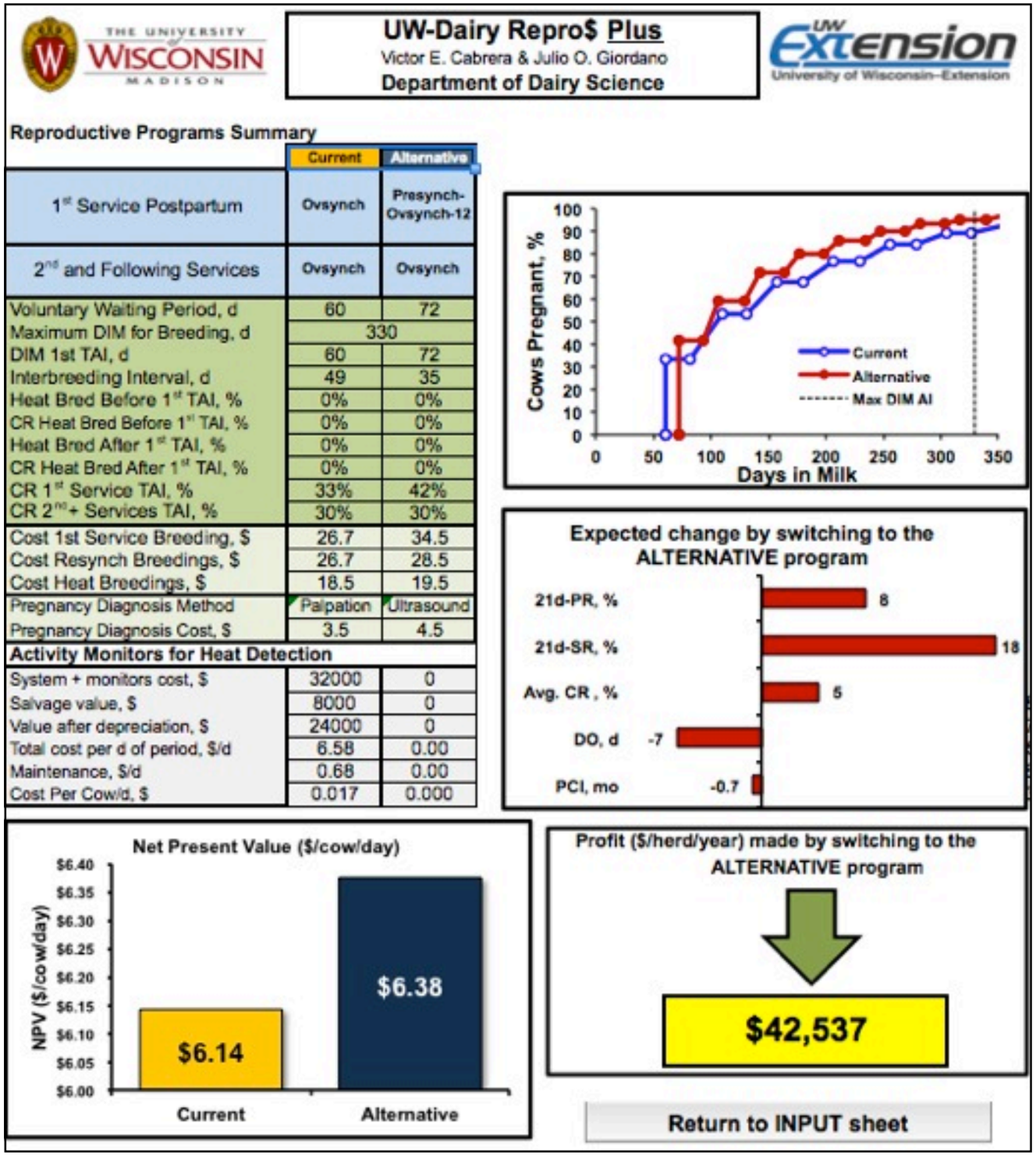

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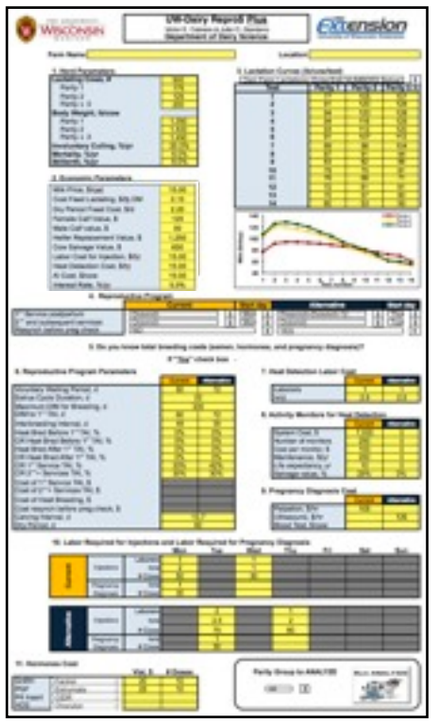
Input data



Herd

Lactating Cows, #	500
Parity 1	175
Parity 2	125
Parity ≥ 3	200
Body Weight, lb/cow	
Parity 1	1,350
Parity 2	1,400
Parity ≥ 3	1,450
Involuntary Culling, %/yr	20.0%
Mortality, %/yr	6.0%
Stillbirth, %/yr	6.0%

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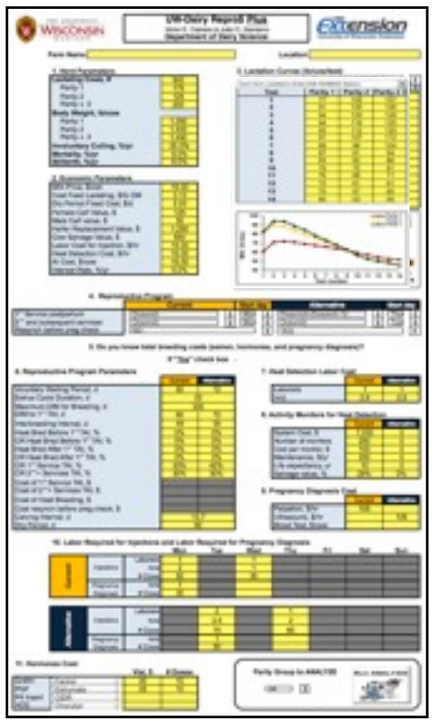
Input data



Economics

Milk Price, $/cwt	15.00
Cost Feed Lactating, $/lb DM	0.10
Dry Period Fixed Cost, $/d	2.20
Female Calf Value, $	125
Male Calf value, $	50
Heifer Replacement Value, $	1,250
Cow Salvage Value, $	650
Labor Cost for Injection, $/hr	15.00
Heat Detection Cost, $/hr	15.00
AI Cost, $/cow	15.00
Interest Rate, %/yr	5.0%

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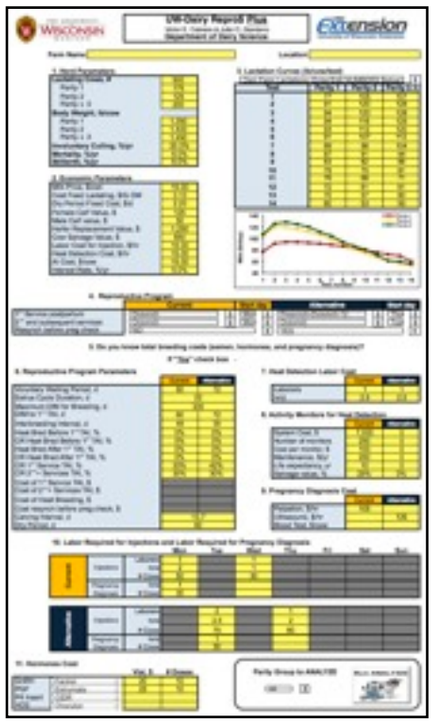
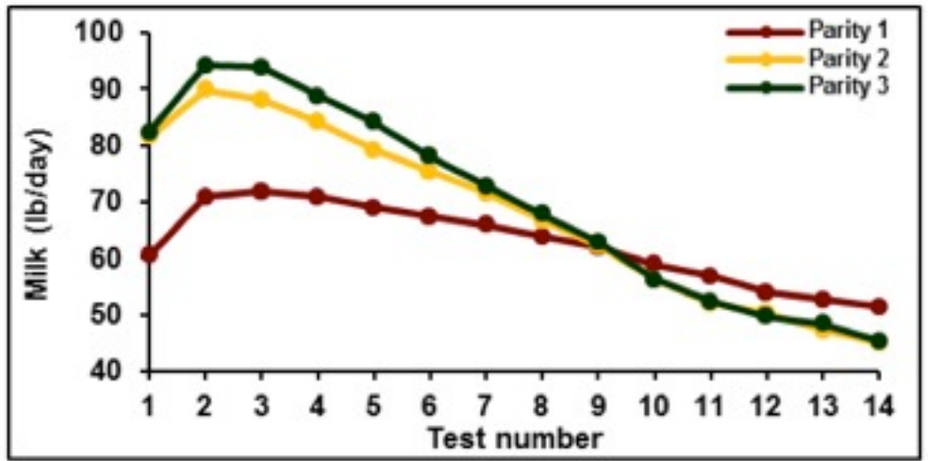
Input data



Lactation curves

Own Farm Lactations (Enter/Edit NUMBERS Below)

Test	Parity 1	Parity 2	Parity ≥ 3
1	77	105	107
2	91	120	126
3	94	120	128
4	94	116	125
5	93	112	120
6	91	107	112
7	89	98	104
8	87	91	94
9	83	82	86
10	79	75	81
11	76	68	71
12	72	61	61
13	70	57	60
14	60	53	55



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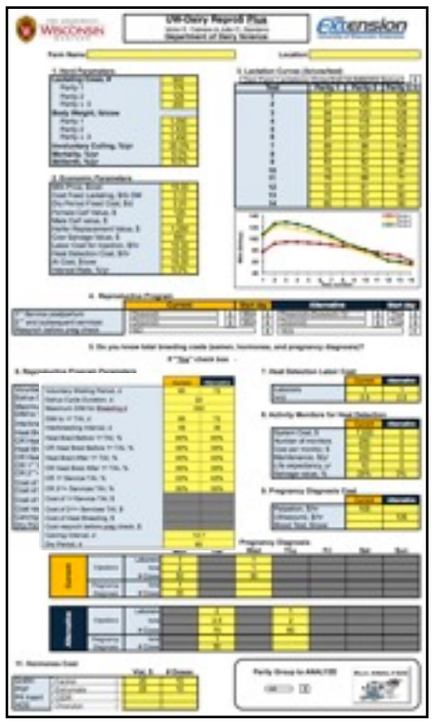
Detailed definition of reproduction



Reproductive programs

	Current	Start day
1st Service postpartum	Ovsynch	Tue
2nd and subsequent services	Ovsynch	Tue
Resynch before preg check	YES	

	Alternative	Start day
1st Service postpartum	Presynch-Ovsynch-12	Thu
2nd and subsequent services	Ovsynch	Tue
Resynch before preg check	YES	

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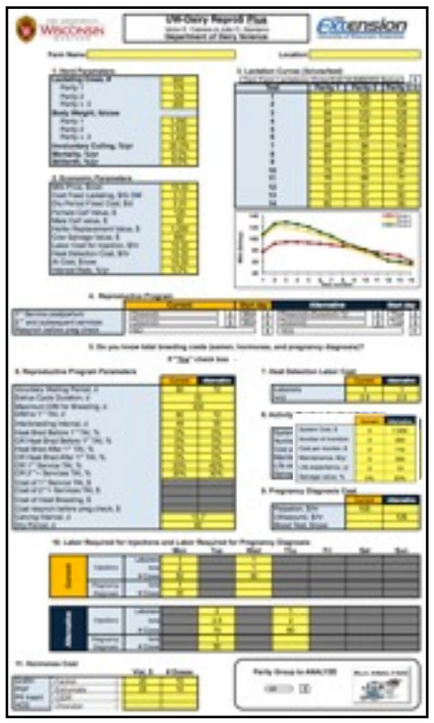
Define reproduction performance



Reproductive programs

	Current	Alternative
Voluntary Waiting Period, d	60	72
Estrus Cycle Duration, d	22	
Maximum DIM for Breeding,d	330	
DIM to 1st TAI, d	60	72
Interbreeding Interval, d	49	35
Heat Bred Before 1st TAI, %	50%	50%
CR Heat Bred Before 1st TAI, %	35%	35%
Heat Bred After 1st TAI, %	40%	40%
CR Heat Bred After 1st TAI, %	35%	35%
CR 1st Service TAI, %	33%	42%
CR 2nd+ Services TAI, %	30%	30%
Cost of 1st Service TAI, $		
Cost of 2nd+ Services TAI, $		
Cost of Heat Breeding, $		
Cost resynch before preg check, $		
Calving Interval, d	13.7	
Dry Period, d	60	

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Expected performance 1st service

Synchronization Program	VWP (d)	Conception Rate (%)	
		Mean	Range
Presynch-Ovsynch-14	70-85	37	(32-42)
Presynch-Ovsynch-12	70-85	42	(37-47)
Presynch-Ovsynch-11	70-85	43	(37-47)
Presynch-Ovsynch-10	70-85	44	(37-47)
Double-Ovsynch	70-85	47	(40-50)
G-6-G	70-85	45	(37-47)
Ovsynch	60-75	33	(30-37)
Cosynch-72	60-75	26	(25-33)
Presynch-Ovsynch-12 w/CIDR	70-85	45	(40-50)
Double-Ovsynch w/ CIDR	70-85	50	(43-53)
Ovsynch w/ CIDR	60-75	36	(40-50)
Cosynch-72 w/ CIDR	60-75	32	(33-40)

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Expected performance 2nd+ services

Synchronization Program	Interbreeding Interval (d)	Conception Rate (%) Mean	Range
Ovsynch-Day 25	35	27	(24-30)
Ovsynch-Day 32	42	30	(25-35)
Ovsynch-Day 39	49	28	(25-32)
Double-Ovsynch	49	38	(33-42)
Short-Double-Ovsynch	42	34	(30-38)
HGPG (hCG-7d-Ovsynch)	35	37	(33-41)
GGPG (GnRH-7d-Ovsynch)	35	34	(27-37)
G-6-G	49	35	(32-38)
Cosynch-72-Day 25	35	23	(20-25)
Cosynch-72-Day 32	42	28	(24-32)
Cosynch-72-Day 39	49	25	(23-28)
Ovsynch-Day 32 w/ CIDR	42	33	(28-38)
Double-Ovsynch w/ CIDR	49	41	(36-45)
Short-Double-Ovsynch w/CIDR	42	37	(33-41)
HGPG (hCG-7d-Ovsynch) w/CIDR	35	40	(36-41)
GGPG (GnRH-7d-Ovsynch) w/ CIDR	35	35	(30-40)
G-6-G w/CIDR	49	38	(33-41)
Cosynch-72-Day 32 w/CIDR	42	31	(27-35)

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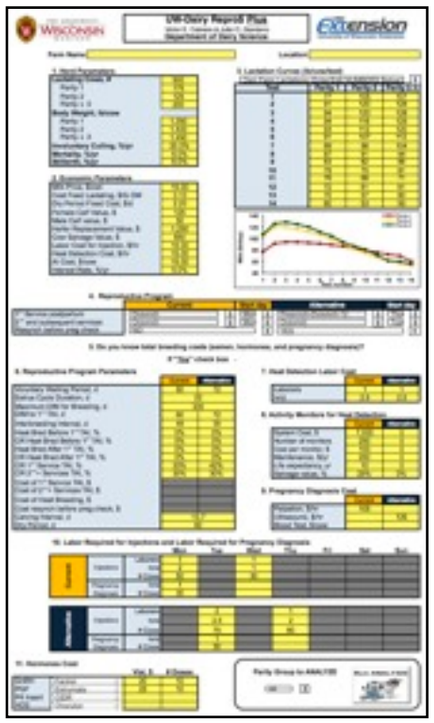
Use of heat detection devices



Activity monitors for heat detection

New!

	Current	Alternative
System Cost, $	0	7,000
Number of monitors	0	350
Cost per monitor, $	0	110
Maintenance, $/yr	0	350
Life expectancy, yr	0	10
Salvage value, %	0%	25%

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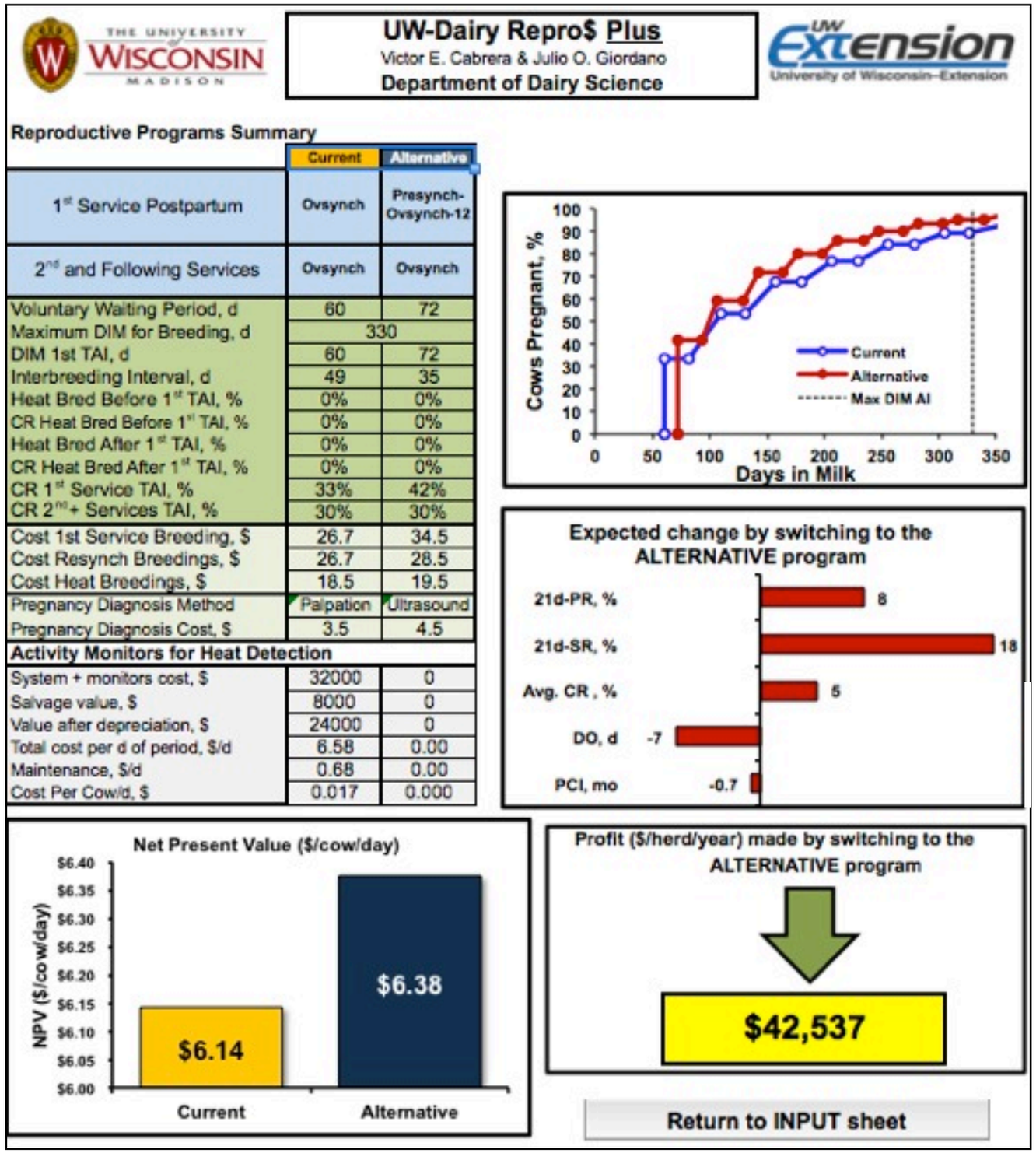
Examine results



UW-DairyRepro$Plus

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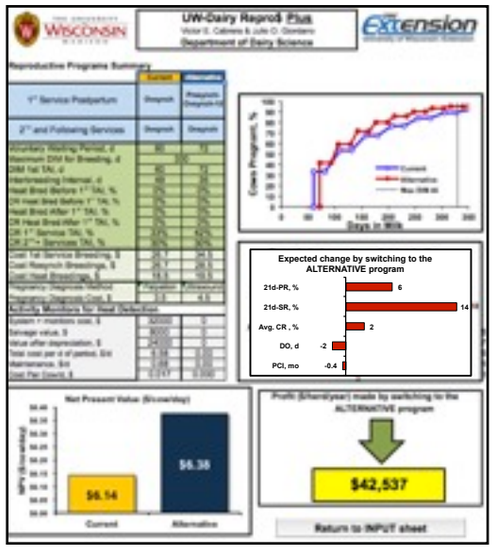
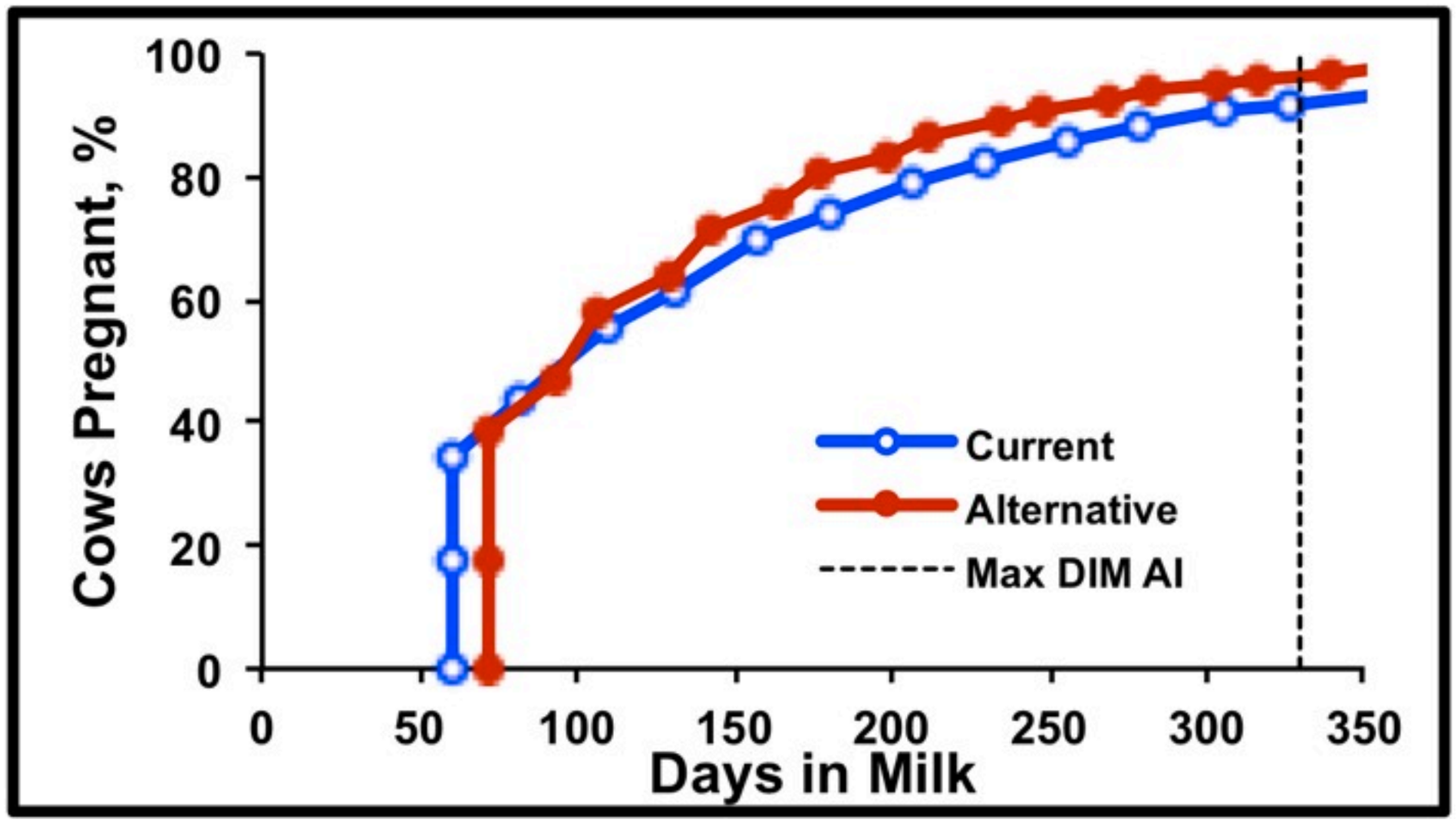
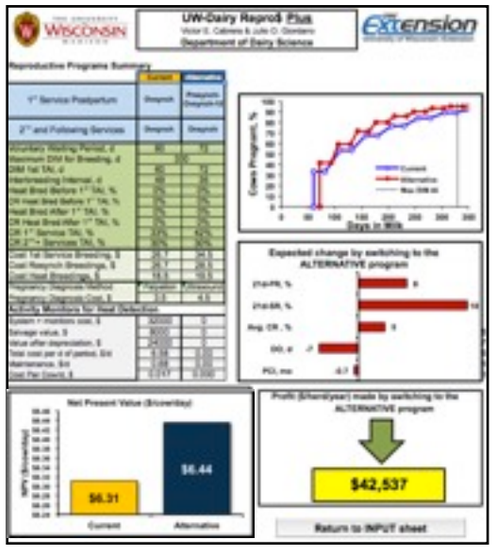


Reproductive performance

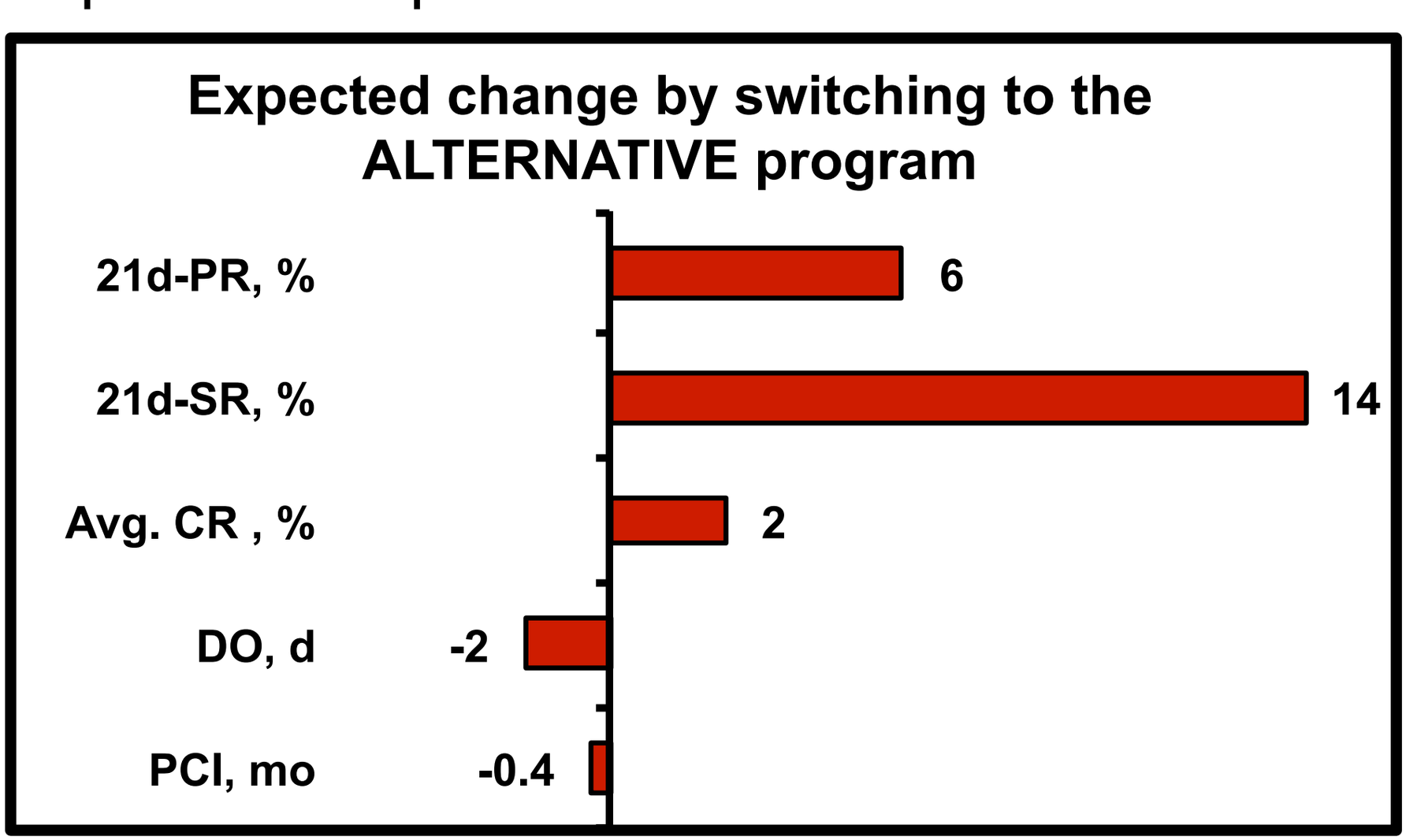


UW-DairyRepro$Plus

Examine results

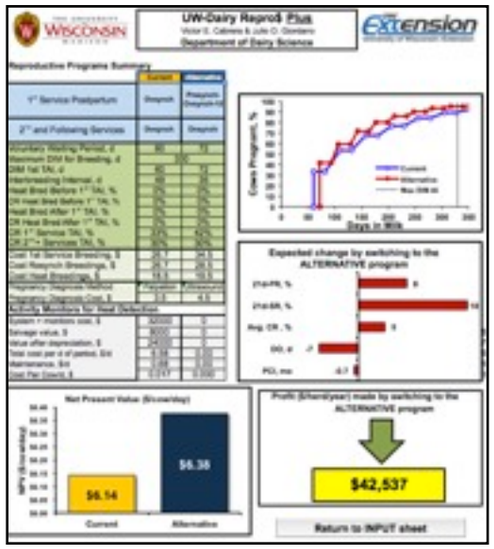


Reproductive performance

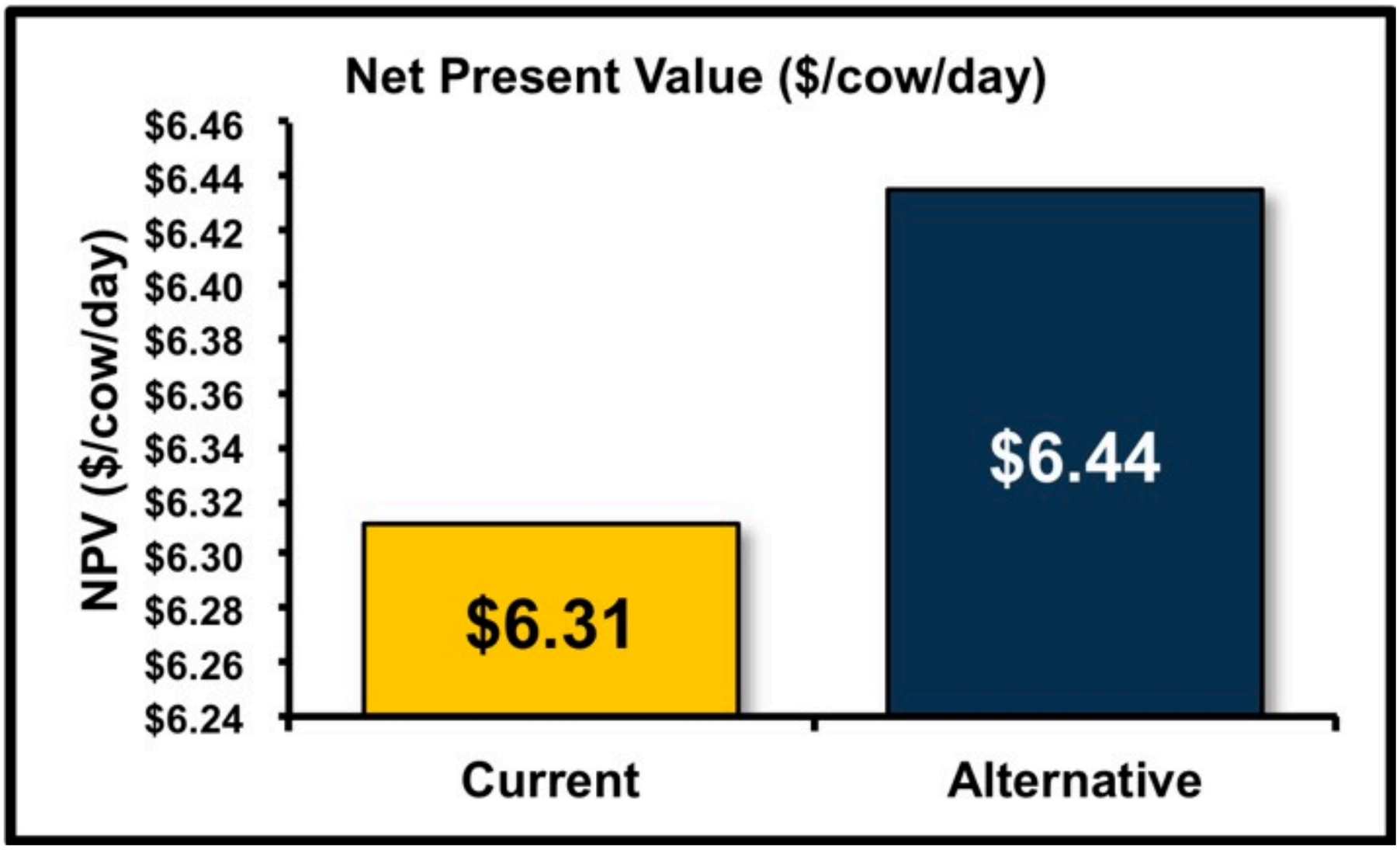


UW-DairyRepro$Plus

Examine results



Economic difference of programs



$0.13 = $47/cow per year net gain

Repro$ Plus application 1

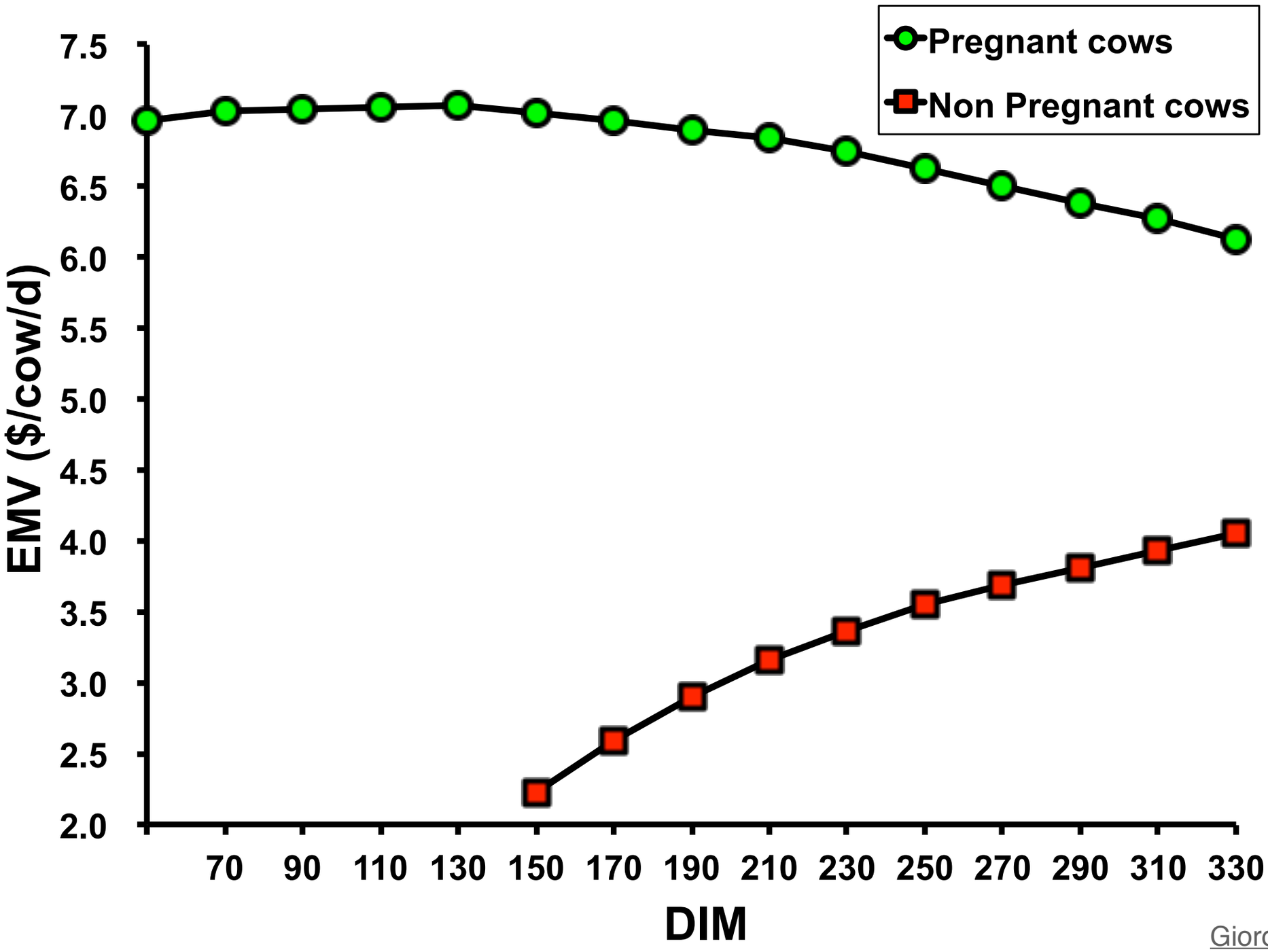
TAI and heat detection interaction

	A	B	C
1st Service	Double-OvSynch		Heat detection
2nd+ Services	ReSynch-D32	Double-OvSynch	Heat detection
Voluntary waiting period, d	82	82	50
Interbreeding interval, d	42	49	21
CR at 1st service, %	45	45	33
CR at 2nd+ services, %	30	39	30

Giordano et al. (2011)

Repro$ Plus application 1

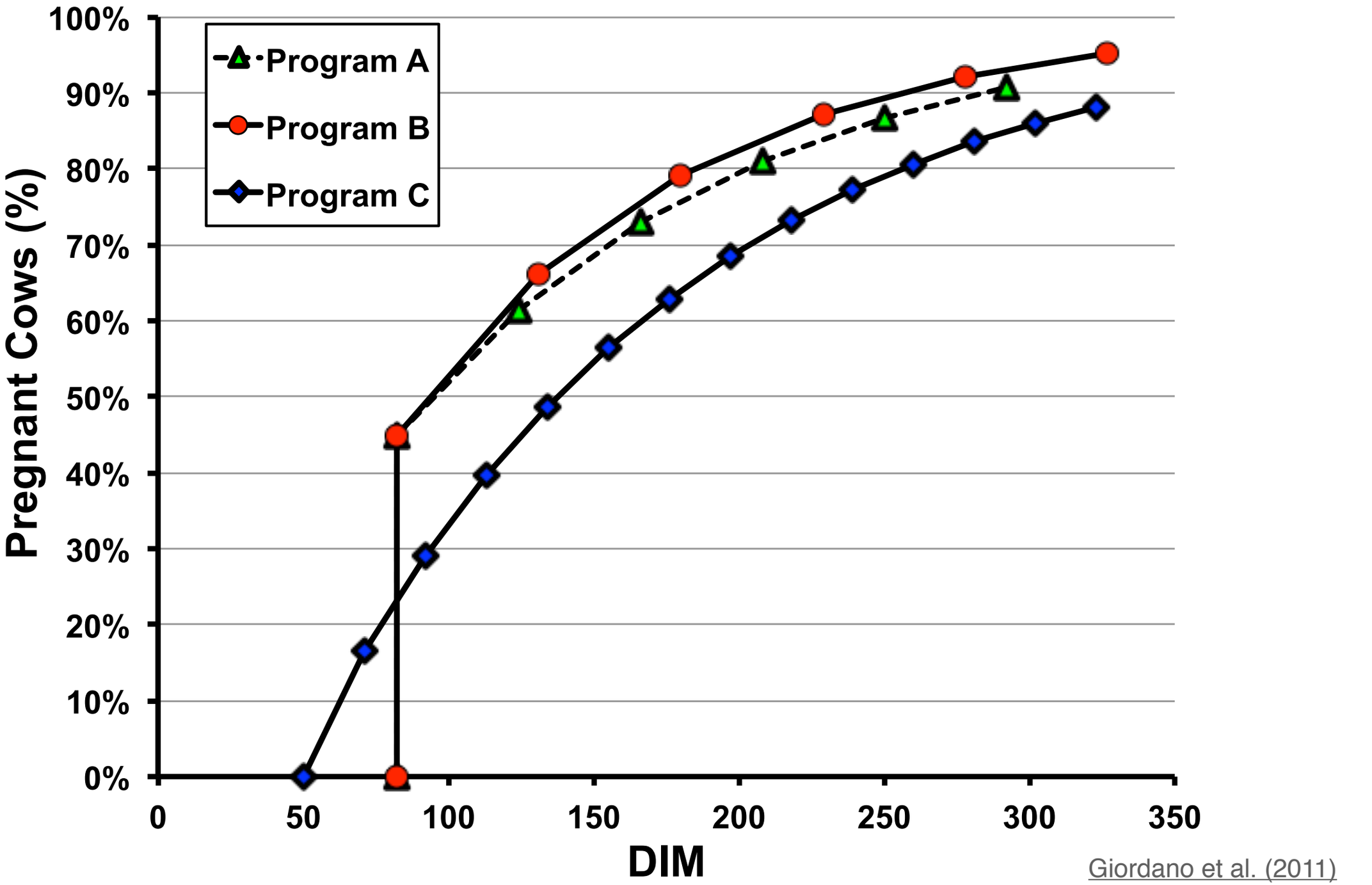
Expected monetary value (EMV)



Giordano et al. (2011)

Repro$ Plus application 1

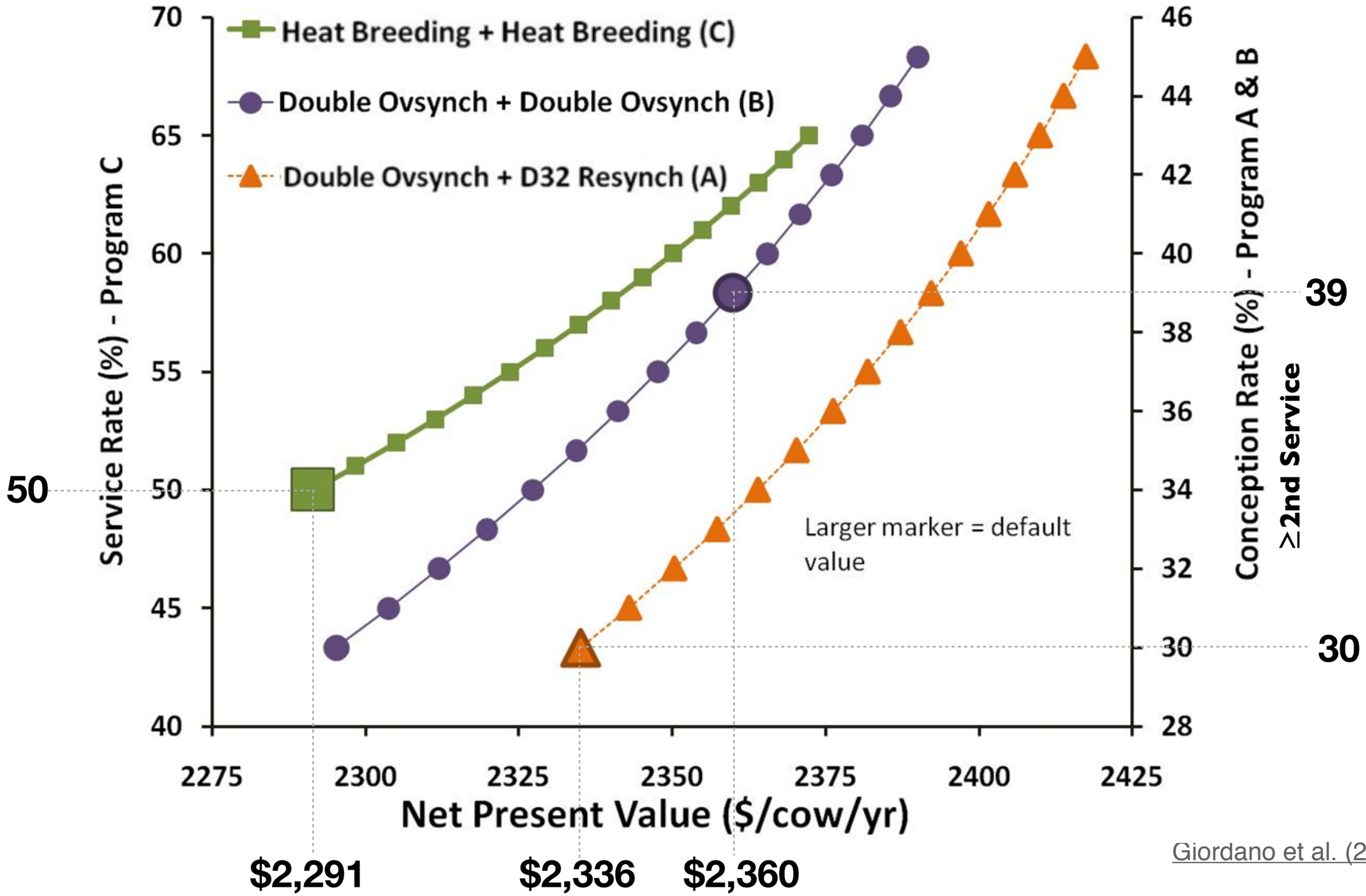
Reproductive performance



Giordano et al. (2011)

Repro$ Plus application 1

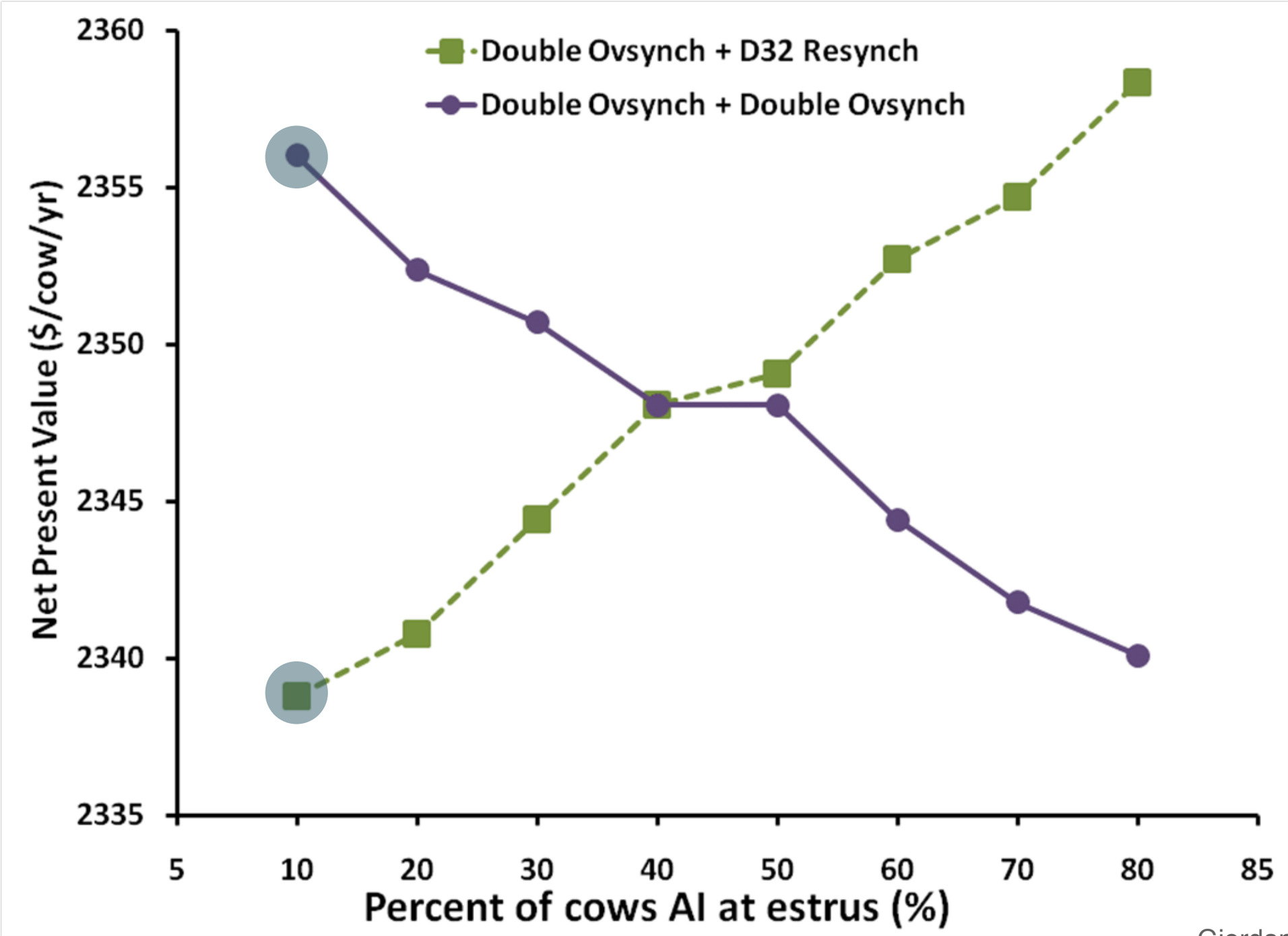
Sensitivity to service and conception rates



Giordano et al. (2011)

Repro$ Plus application 1

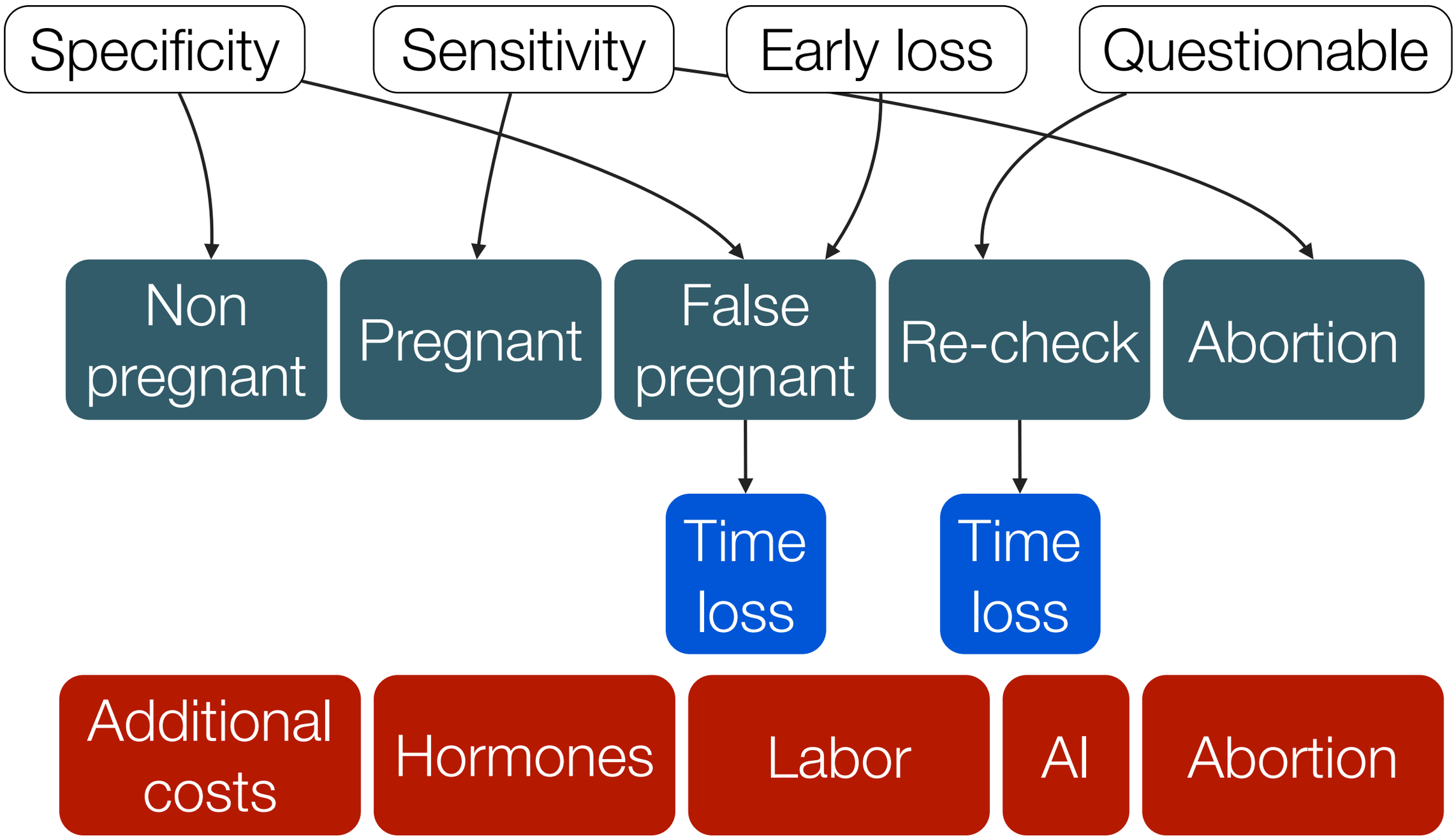
Impact of heat AI services for ≥ 2 services



Giordano et al. (2011)

Repro$ Plus application 2

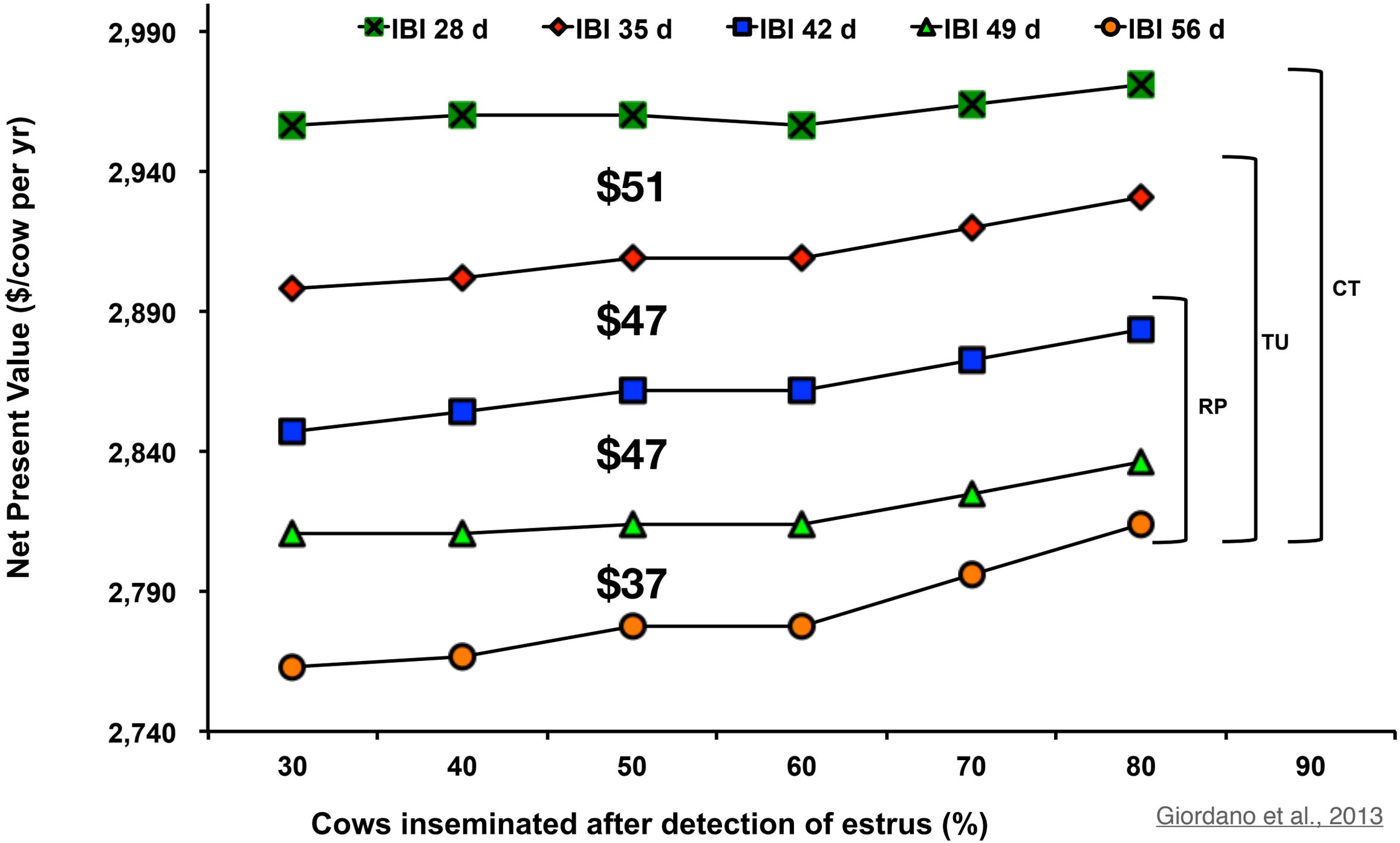
Chemical test for early pregnancy detection



Giordano et al., 2013

Repro$ Plus application 2

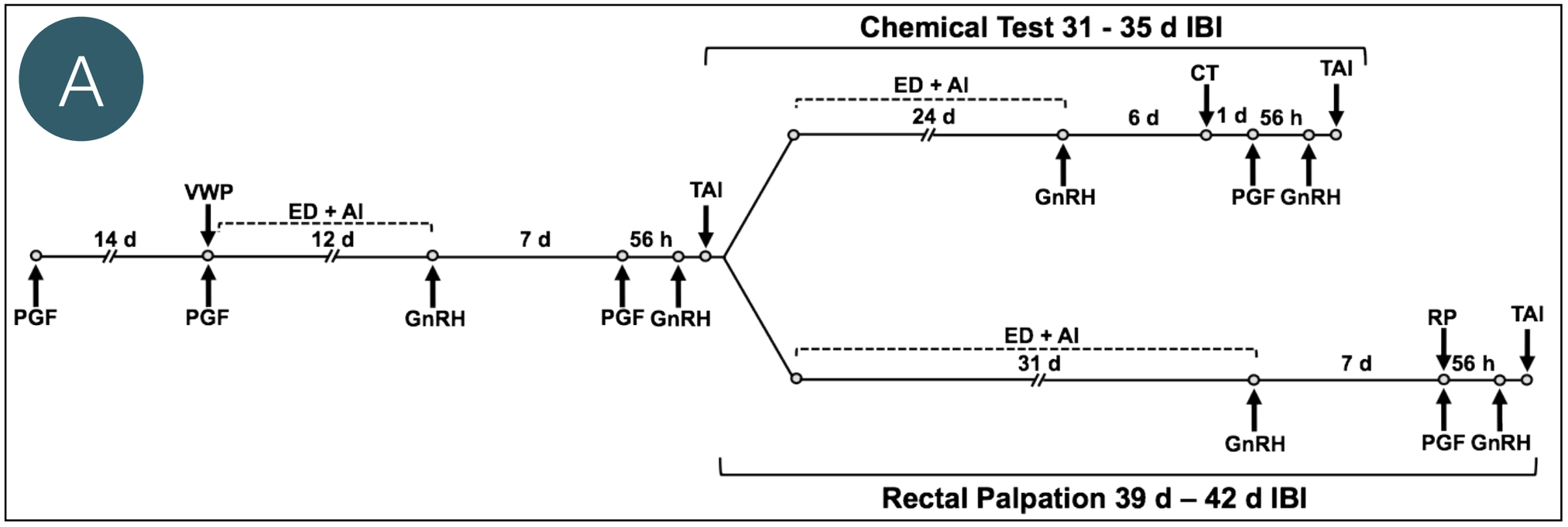
The value of shorter interbreeding (IBI)

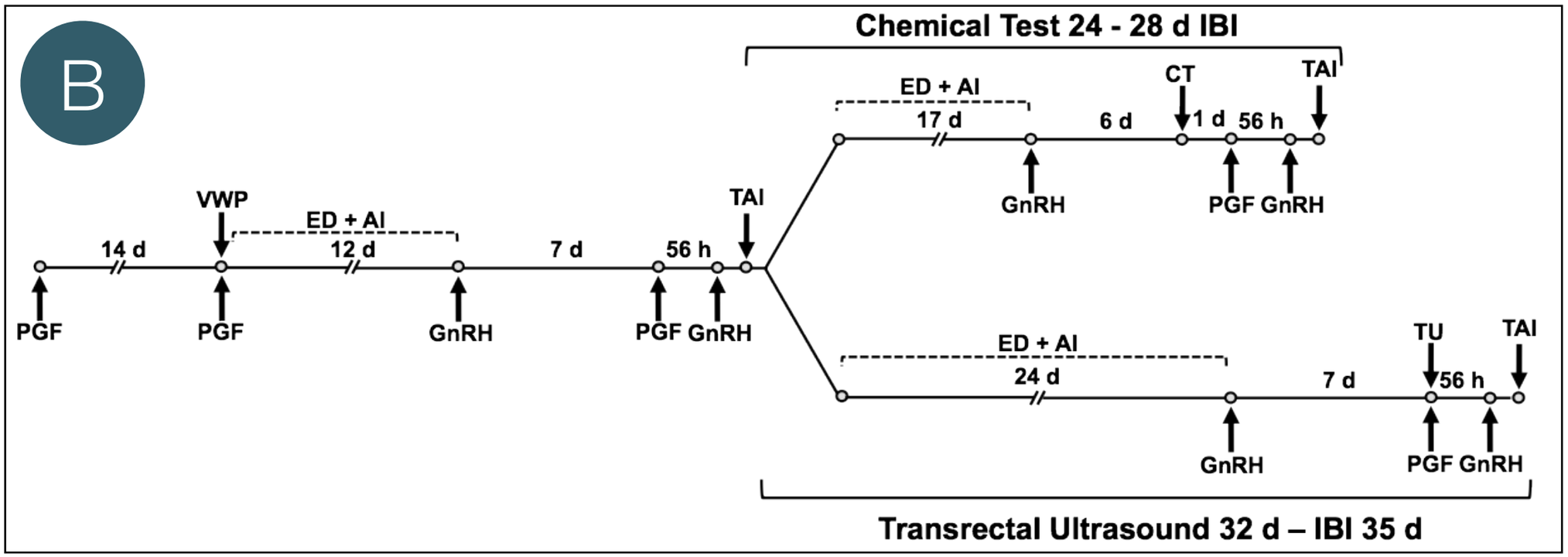


Giordano et al., 2013

Repro$ Plus application 2

Test of shorter IBI programs

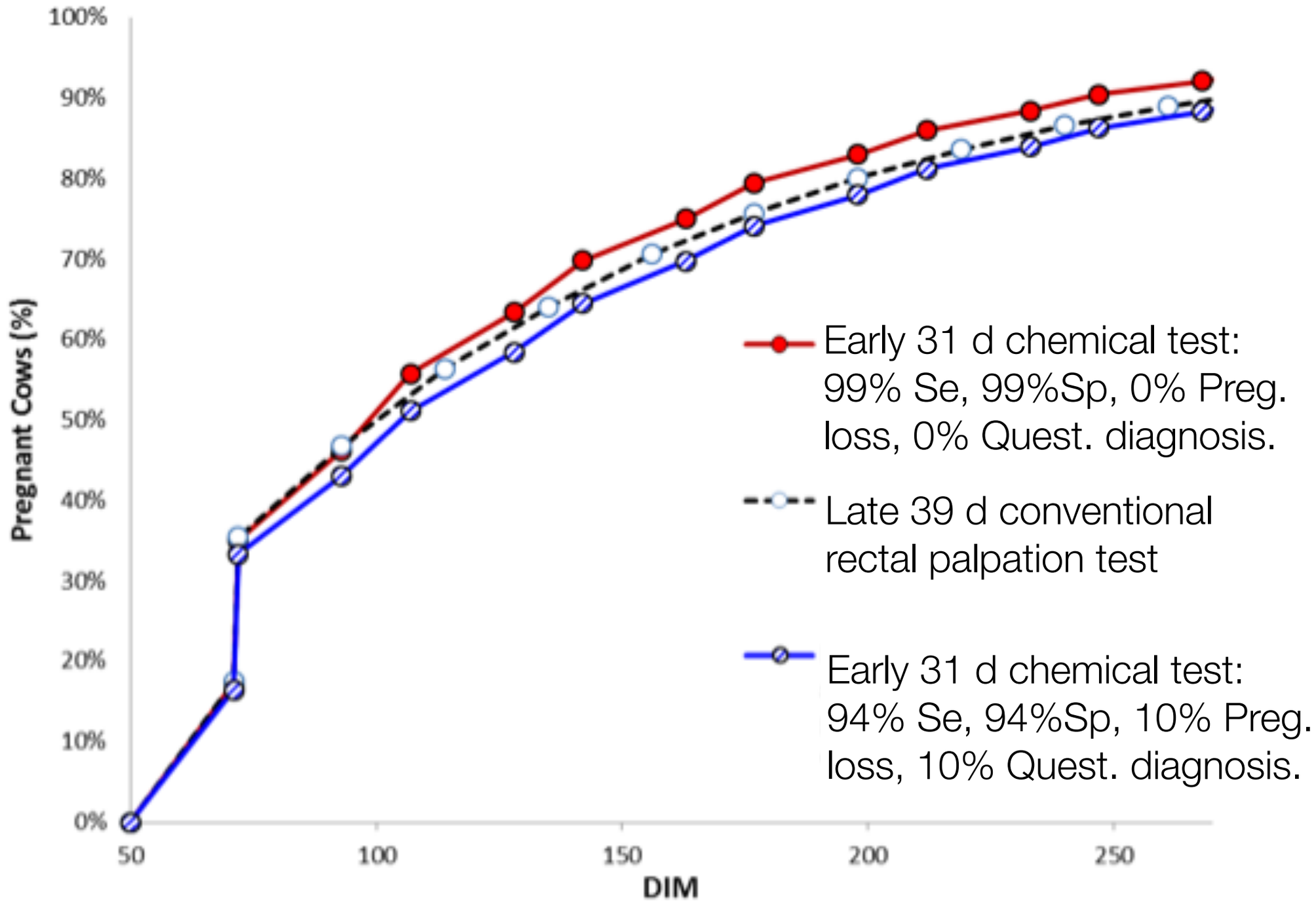




Giordano et al., 2013

Repro$ Plus application 2

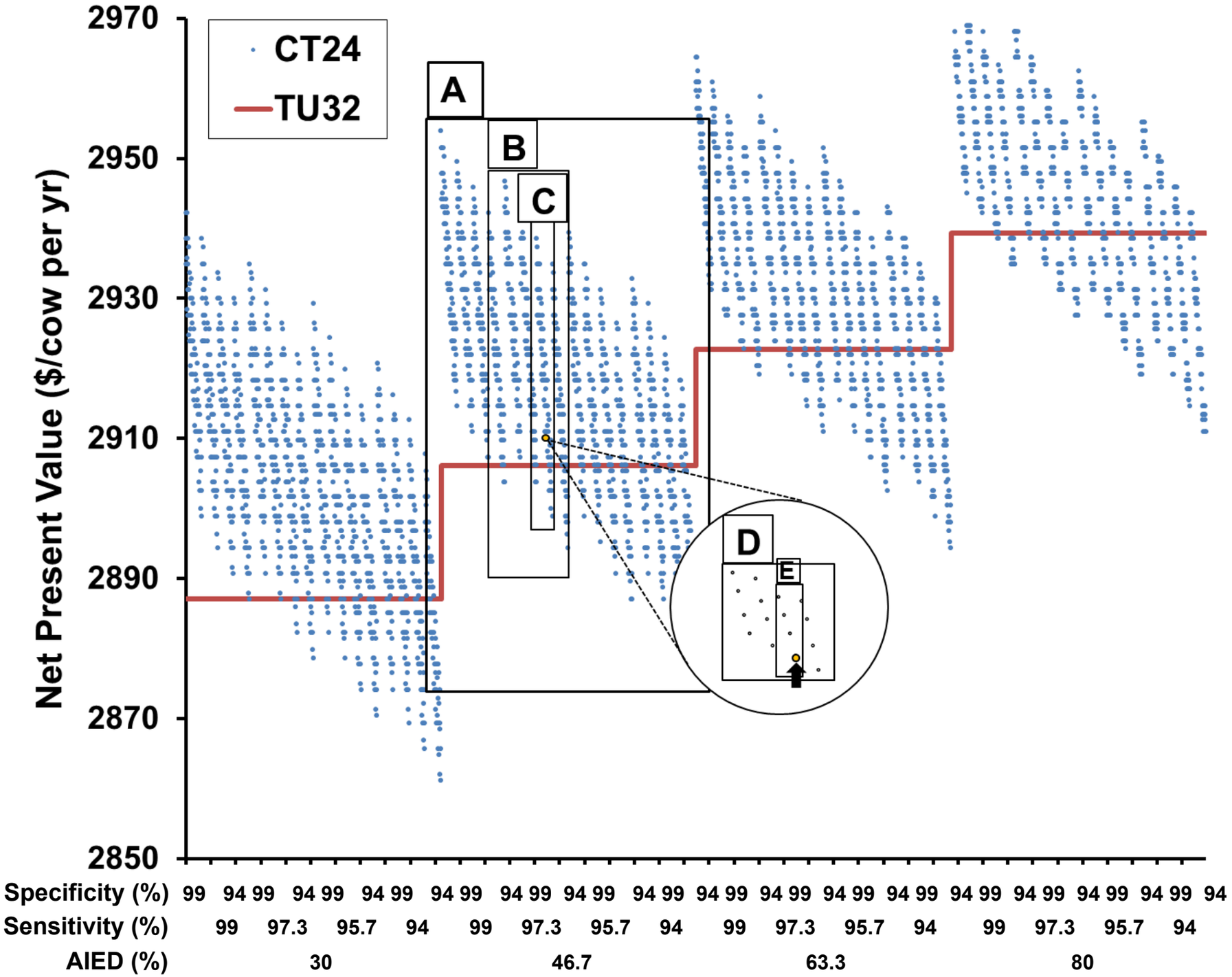
Reproductive performance



Giordano et al., 2013

Repro$ Plus application 2

Economic performance



Giordano et al., 2013

Repro$ Plus application 2

Economic performance

			$ per 1% or $0.1	
	Base	**Range**	**CT31 vs RP39**	**CT24 vs TU32**
% Sensitivity	98/97	94-99	**+5.3**	**+4.5**
% Specificity	98/97	94-99	**+3.1**	**+2.5**
% Pregnancy loss	6/6.6	0-10	**-3.1**	**-2.5**
% Questionable	3.3/8.5	0-10	**-0.4**	**-0.3**
% Estrous detection	50	30-80	**0.097**	**-0.220**
$ CT cost	2.4	0.5-5	**-0.0175**	**-0.0192**

Giordano et al., 2013

Repro$ Plus application 2

Economic performance

	Break even	
	CT31 vs RP39	**CT24 vs TU32**
% Sensitivity	**96.4**	**94.9**
% Specificity	**95.1**	**93.2**
% Pregnancy loss	**8.9**	**10.5**

Early chemical pregnancy test

Profitable when Sensitivity >95%, Specificity >93%, Early pregnancy loss <11%

Giordano et al., 2013

Thanks