

# Estrous Detection, Timed AI, or a Combination

**V.E. Cabrera**

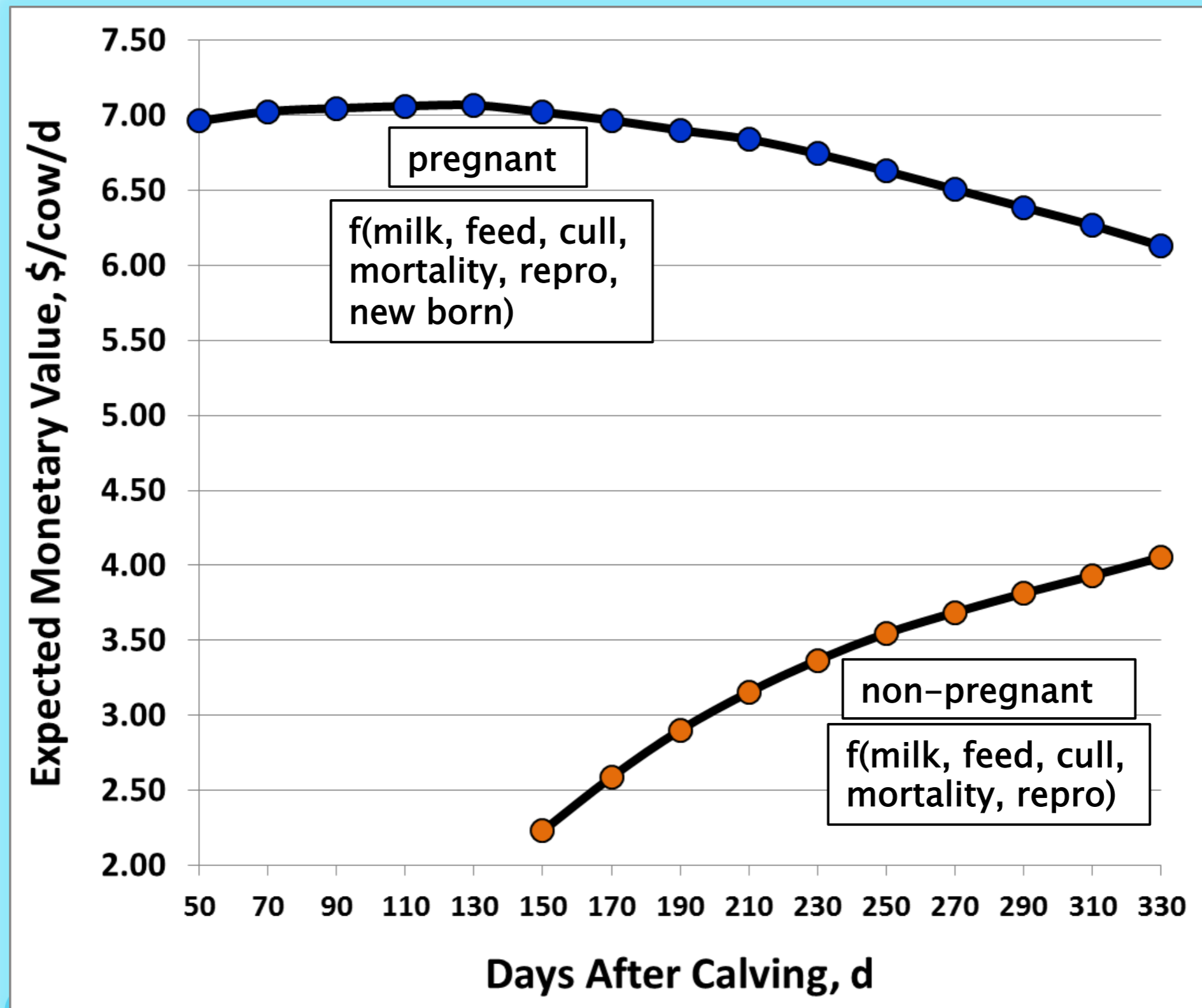
University of Wisconsin-Madison Dairy Science

CEVA - Ruminant Global Technical Meeting, Berlin 14-16 April 2015

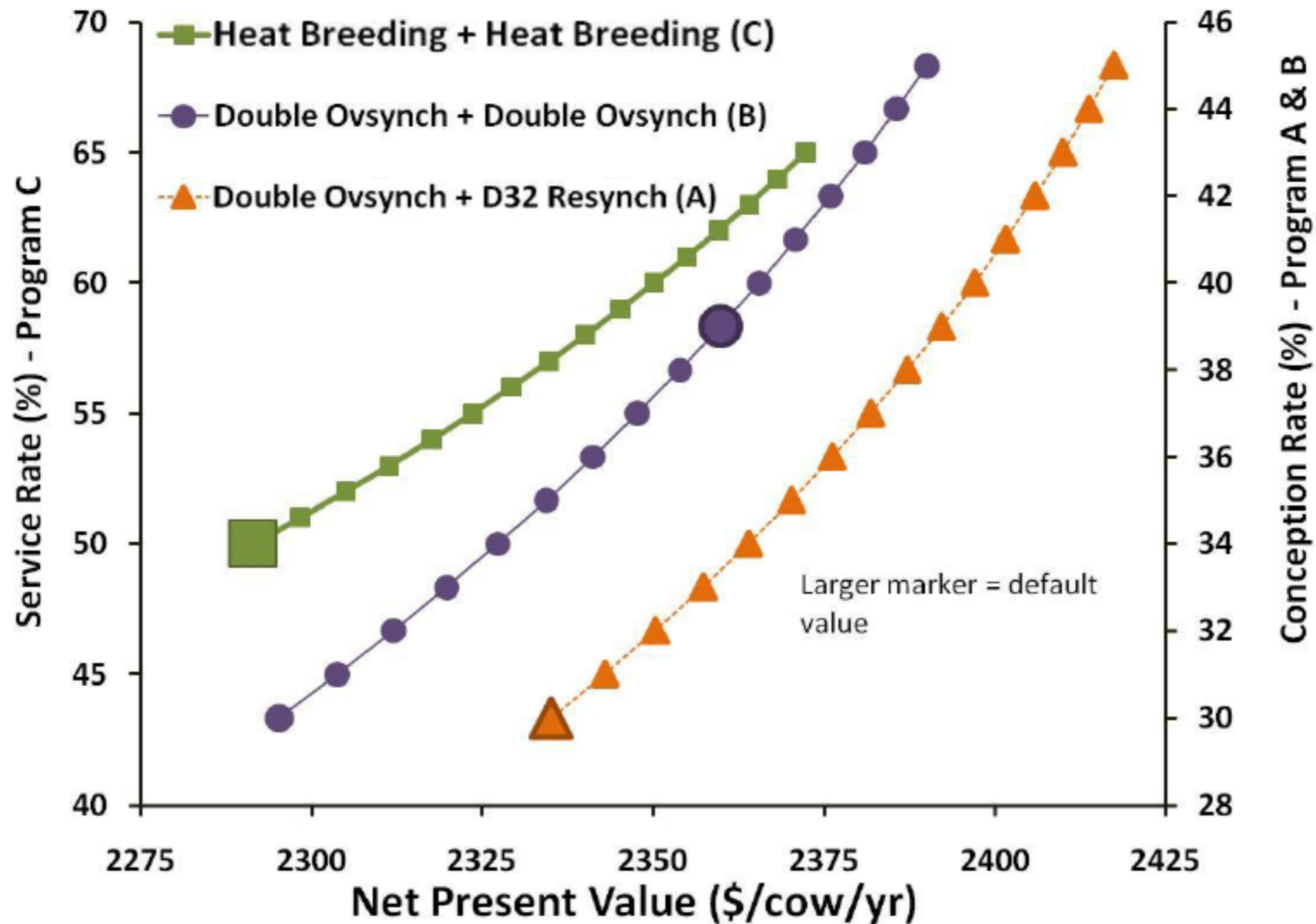
# Economic effects of TAI with ED

	Net return gain TAI vs. TAI + ED, \$/cow.yr				
	TAI CR, %		60% OD CR, %		
<b>Study</b> <i>Repro Program</i>	<b>First Serv.</b>	<b>Later Serv.</b>	<b>25</b>	<b>30</b>	<b>35</b>
<b>Giordano et al., 2011</b>					
<i>Double Ovsynch + D32 Ovsynch</i>	45	30		14	
<i>Double Ovsynch + Double Ovsynch</i>	45	39		-12	
<b>Giordano et al., 2012</b>					
<i>Presynch-Ovsynch + Ovsynch</i>	42	30	-17	2	19

# Value of a repro program: concept



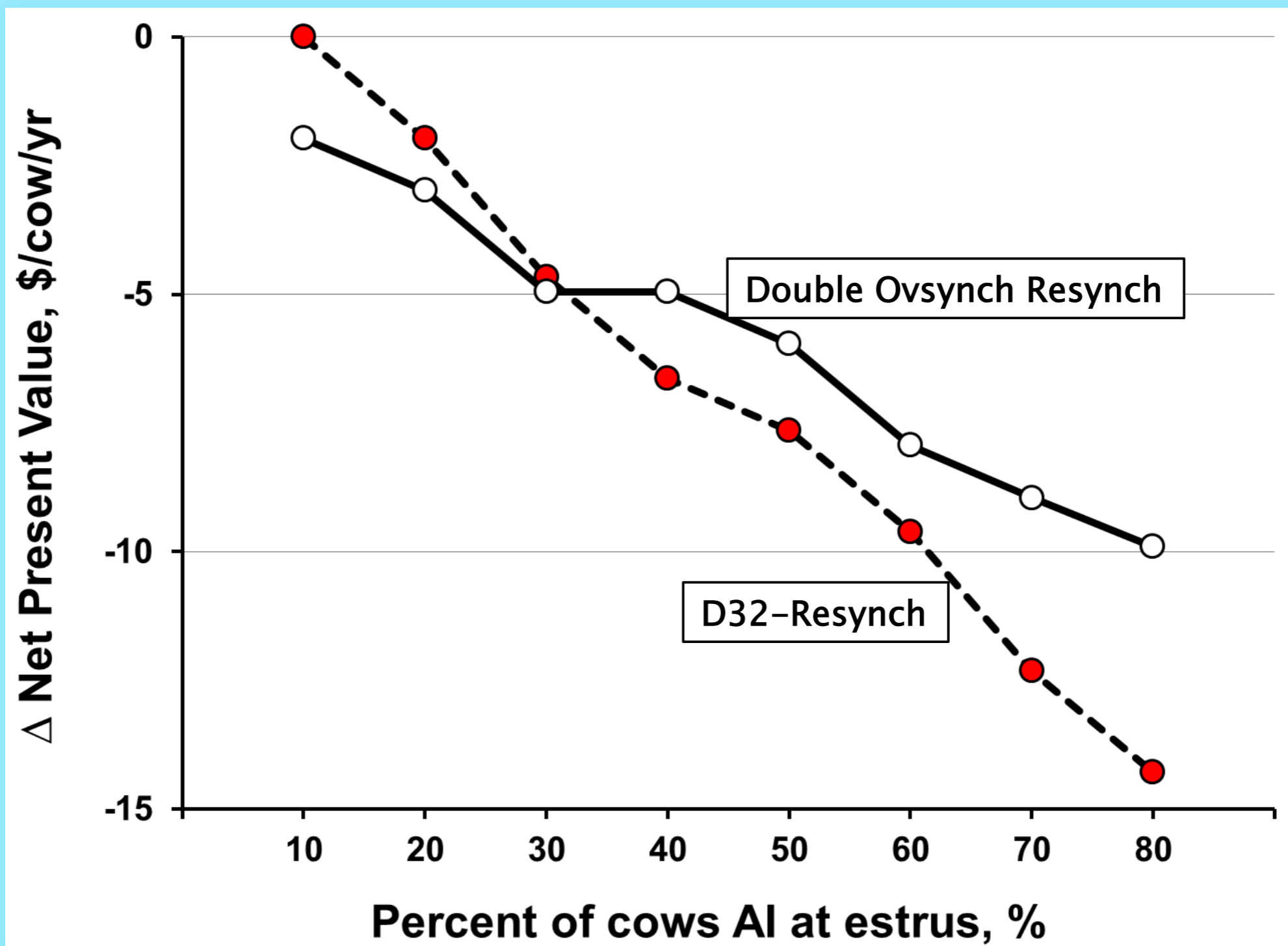
# Overall performance



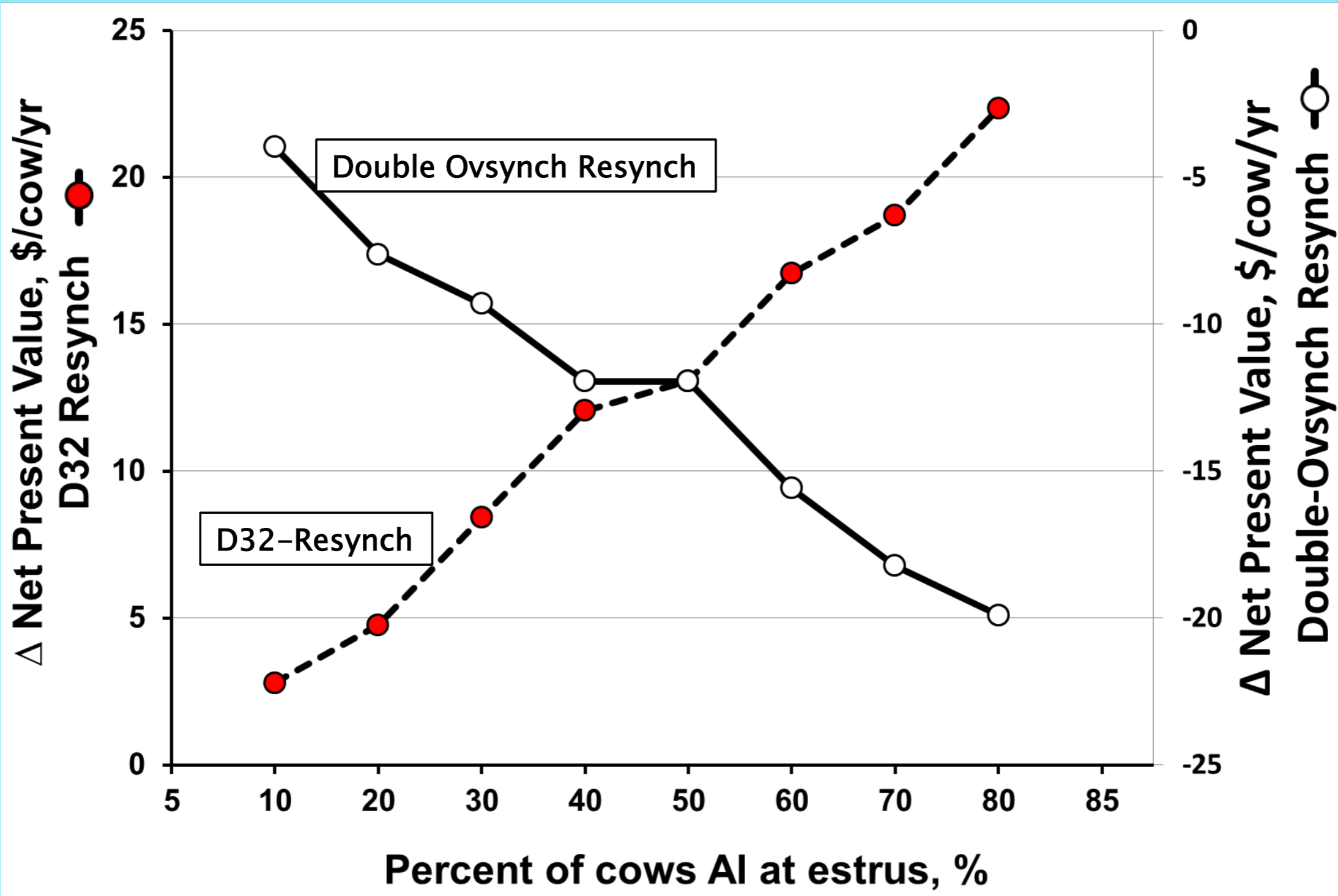
# Repro and \$ performance

1 <sup>st</sup> Service	Reproductive Programs		
	Double-Ovsynch		Estrous Detection
	D32- Resynch	Double- Ovsynch	
2 <sup>nd</sup> Service			Estrous Detection
21-d PR, %	22	25	15
Net Present Value, \$/cow/yr	2,336	2,360	2,291
Value over ED, \$/cow/ yr	45	69	

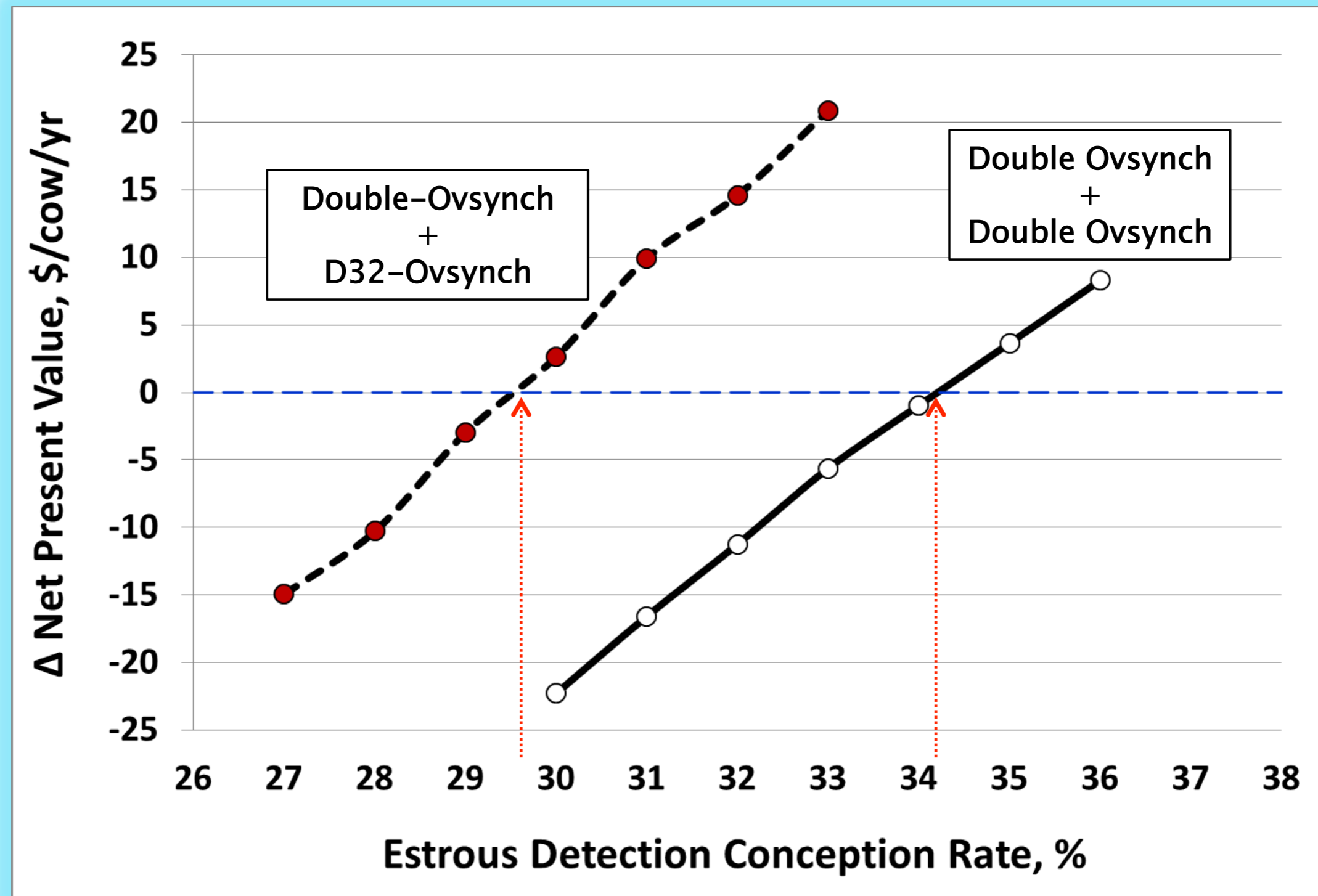
# ED (33% CR) before 1<sup>st</sup> TAI



# ED (30% CR) between TAIs







# 50% ED before and after 1<sup>st</sup> TAI





# Let's calculate it!





**Cornell University**  
Department of Animal Science

**Wisconsin-Cornell Dairy Repro\$  
(UWCUREpro\$)**  
Version 1.3.5.0




**Developed By:**  
**Afshin S. Kalantari, Julio O. Giordano and Victor E. Cabrera**

**Copyright © Protected**

**Acknowledgments**  
This project was supported by Agriculture and Food Research Initiative Competitive Grant no. 2010-85122-20612 from the USDA National Institute of Food and Agriculture.



United States Department of Agriculture  
National Institute of Food and Agriculture



This research was also supported by Hatch project to V.E.C. WIS01577.

# Let's calculate it!

**Herd Parameters**

Herd Size (#)

Average Body Weight (lb)

Involuntary Culling (%/yr)

Mortality Rate (%/yr)

Stillbirth (%)

---

**Economic Parameters**

Milk Price (\$/cwt)

Cost Feed Lactating (\$/lb DM)

Dry Period Fixed Cost (\$/lb DM)

Female Calf value(\$)

Male Calf value (\$)

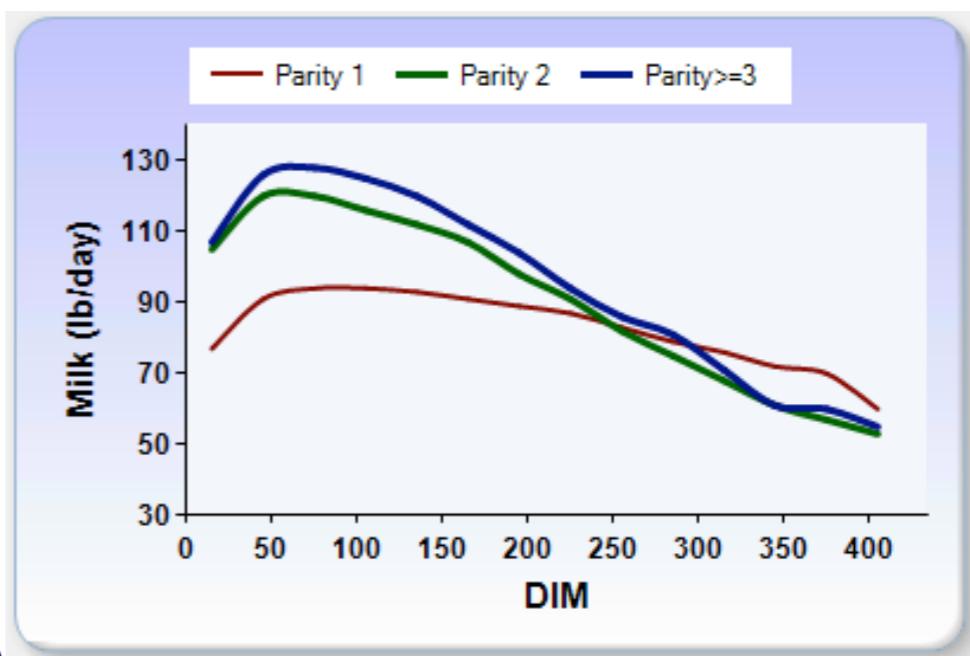
Heifer Replacement Value(\$)

Salvage Value (\$/lb)

Lactation Curves (lb/cow/test)

Own Farm Lactations (Enter/Edit NUMBERS Below)

DIM	Parity 1	Parity 2	Parity ≥3
15	77	105	107
45	91	120	126
75	94	120	128
105	94	116	125
135	93	112	120
165	91	107	112
195	89	98	104
225	87	91	94
255	83	82	86
285	79	75	81
315	76	68	71
345	72	61	61
375	70	57	60
405	60	53	55



## Reproductive Programs

### Current

### Alternative

First AI postpartum	Heat Breeding	Presynch-Ovsynch-14
Second and sub. AI	Heat Breeding	Ovsynch
Resynch before preg check	NO	YES

## Programs Description

VWP (d)	50	50
Estrous Cycle Duration (d)	22	22
Maximum DIM for Breeding	300	300
Do-not-Breed Minimum Milk (lb/d)	50	50
DIM first injection for first AI sync program (d)	36	36
Weekday first injection	Tuesday	Tuesday
Interbreeding interval for TAI services (d)	42	42
Heat bred before first TAI service (%)	60	60
CR heat bred before first TAI service (%)	25	30
CR first TAI service (%)	30	42
Heat bred after first TAI service (%)	60	60
CR heat bred after first TAI service (%)	25	30
CR second and subsequent TAI services (%)	28	38
Pregnancy Loss (%)	24.4	24.4

## Pregnancy Diagnosis

Day in gestation first preg check (d)	39	39
Day in gestation second preg check (d)	67	67
Day in gestation third preg check (d)	221	221

Cows detected in estrus (%)	60	50
CR cows detected in estrus (%)	30	30



## Cost of Reproductive Programs

Do you know total breeding costs(AI, hormones, and labor for injections? If YES Check box

### Insemination Cost

	Current	Alternative
Semen (\$/cow)	5.0	5.0
Labor (\$/cow)	5.0	5.0

### Preg check

	Current	Alternative
Palpation (\$/hr)	105.0	105.0
Ultrasound (\$/hr)	0.0	0.0
Blood Test (\$/cow)	0.0	0.0

### Detection of Estrus

#### Visual Observation

	Current	Alternative
Laborers (#)	0	0
hr/d	0.0	0.0
Labor (\$/h)	0.0	0.0

#### Activity monitors for Heat Detection

	Current	Alternative
System cost (\$)	0	0
Monitors (#)	0	0
Cost per monitor (\$)	0.0	0.0
Maintenance (\$/yr)	0.0	0.0
Life expectancy (yr)	0.0	0.0
Salvage value (%)	0	0

### Synchronization

	Current	Alternative
Labor for injection	15.0	15.0

### Hormones

	Current	Alternative
GnRH (\$/dose)	2.6	2.6
PGF (\$/dose)	2.3	2.3
CIDR (\$/Unit)	10.0	10.0
hCG (\$/dose)	3.5	3.5

### Labor Required for Injections and Pregnancy Diagnosis

Reset default values to zero

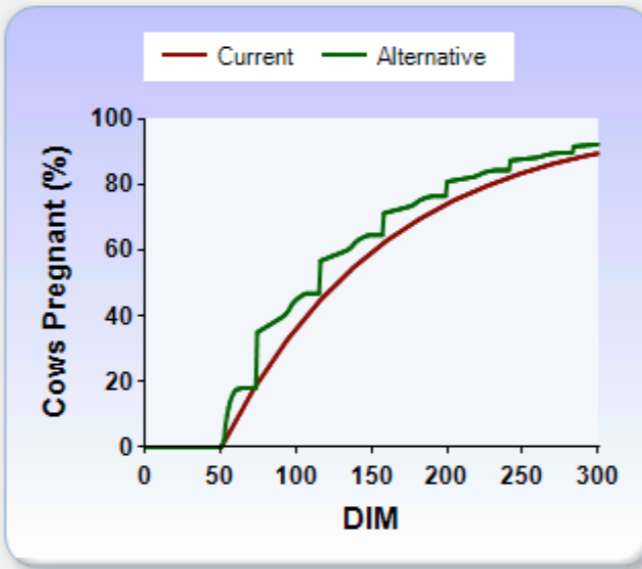
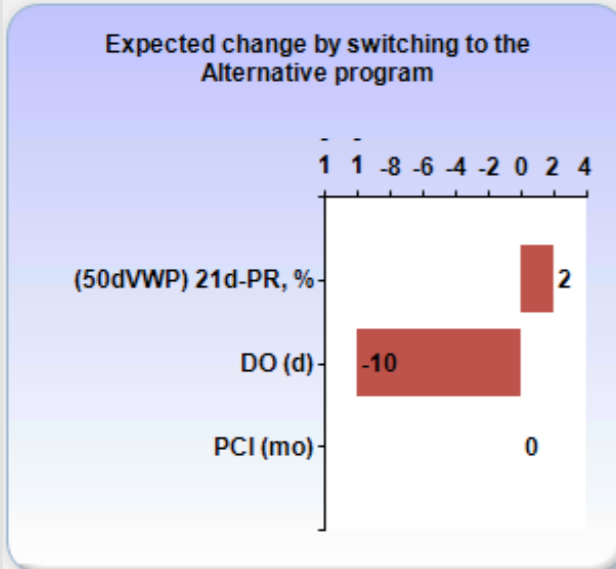
Current	Injections	Desc	Mon	Tue	Wed	Thu	Fri	Sat	Sun
		Laborers	0.0	2.0	0.0	2.0	0.0	0.0	0.0
Pregnancy	Diagnosis	Hours/d	0.0	0.6	0.0	0.9	0.0	0.0	0.0
		# Cows	0.0	36.0	0.0	52.0	0.0	0.0	0.0
		# Cows	0.0	36.0	0.0	52.0	0.0	0.0	0.0

Alternative	Injections	Desc	Mon	Tue	Wed	Thu	Fri	Sat	Sun
		Laborers	0.0	2.0	0.0	2.0	0.0	0.0	0.0
Pregnancy	Diagnosis	Hours/d	0.0	0.6	0.0	0.9	0.0	0.0	0.0
		# Cows	0.0	36.0	0.0	52.0	0.0	0.0	0.0
		# Cows	0.0	36.0	0.0	52.0	0.0	0.0	0.0

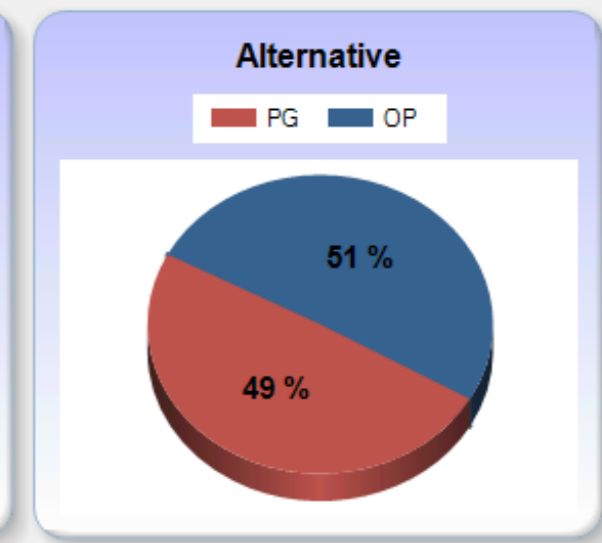
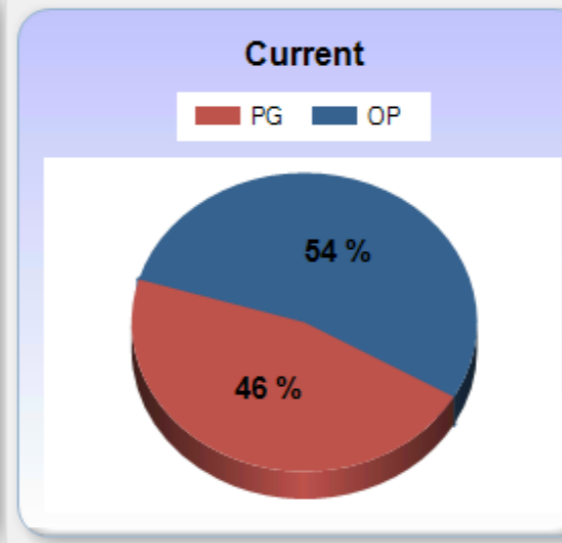


# Results

## Reproductive Performance

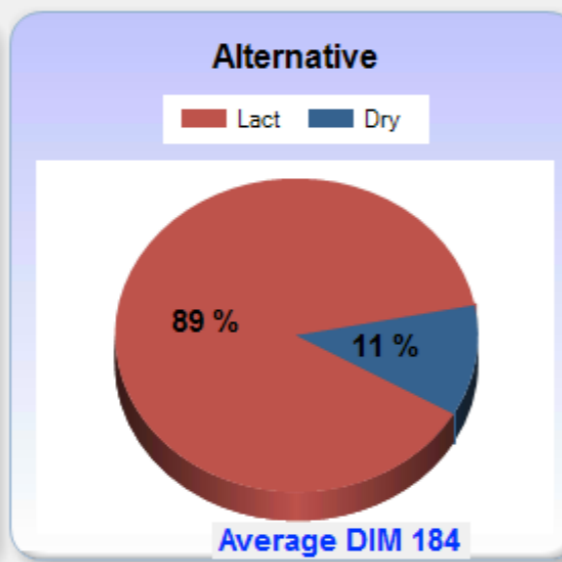
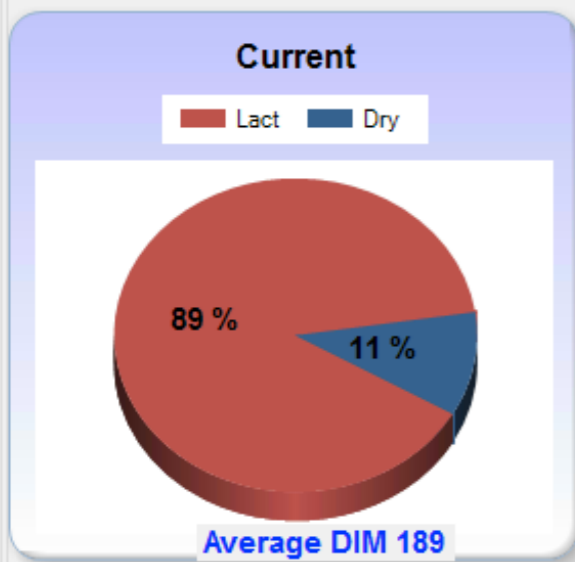


## Distribution of cows based on Pregnancy Status

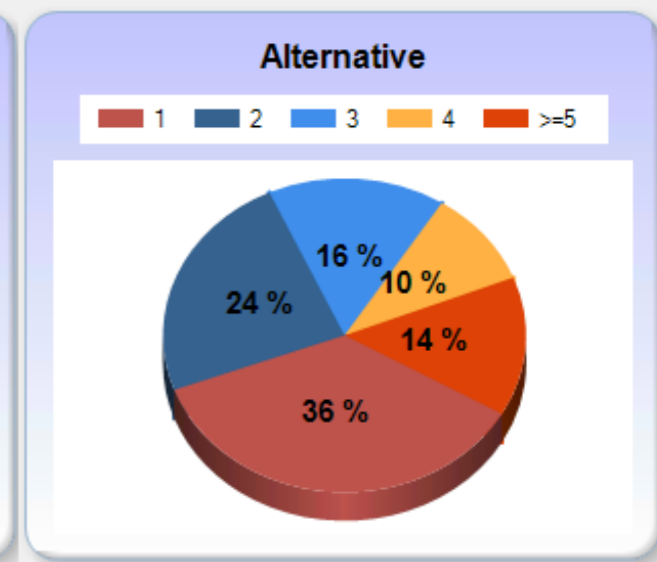
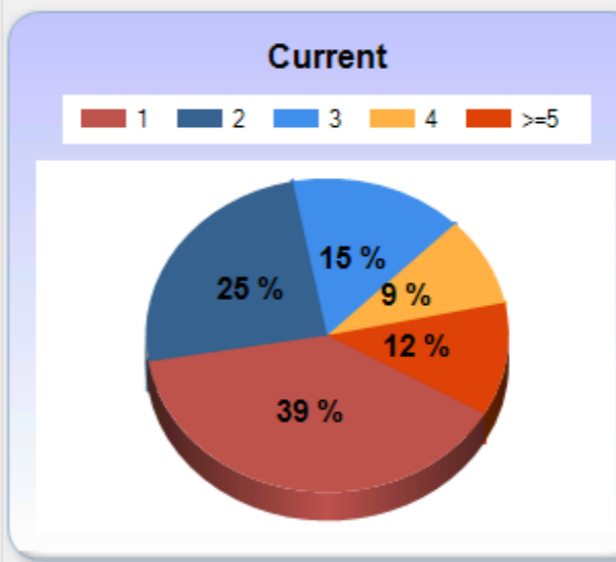


## Herd Structure

### Distribution of cows by lactational status

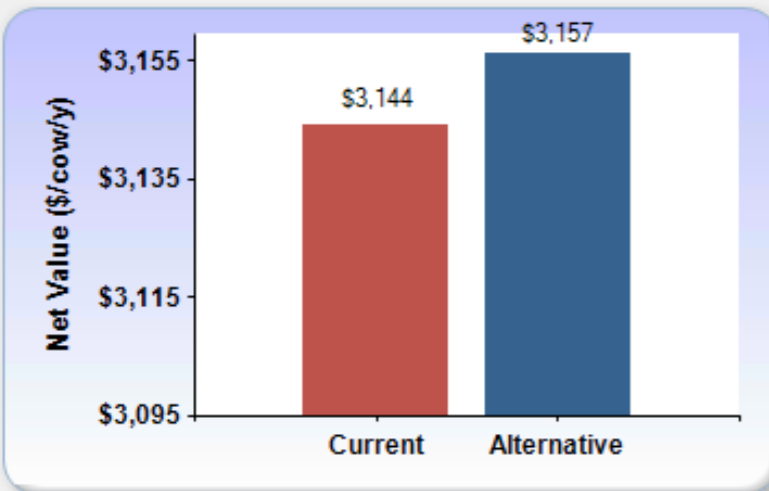


### Distribution of cows by parity



# Results

## Economic Results



### Profit made by switching to the Alternative program



## Contribution to Net Value

Item	Current	Alternative	Diff
Total Net Value (\$/cow/y)	3,144.4	3,156.7	12.3
IOFC (\$/cow/y)	3,276.1	3,291.7	15.6
Replacement Cost (\$/cow/y)	-153.4	-147.6	5.8
Reproductive Cost (\$/cow/y)	-19.3	-32.0	-12.7
Calf Value (\$/cow/y)	41.0	44.6	3.6

Prog.	50d PR	DO(d)	PCI
Curr...	16.5	138	13.99
Alter...	18.62	128	13.68

## Reproductive Programs Summary

Item	Current	Alternative
First AI postpartum	Heat Breeding	Presynch-Ovsynch-14
Second and sub. AI	Heat Breeding	Ovsynch
VWP (d)	50	50
Maximum DIM for Breeding	300	300
Do-not-Breed Minimum Milk (lb/d)	50	50
DIM first injection for first AI sync program (d)	36	36
Interbreeding interval for TAI services (d)	42	42
Heat bred before first TAI service (%)	60	60
CR heat bred before first TAI service (%)	25	30
CR first TAI service (%)	30	42
Heat bred after first TAI service (%)	60	60
CR heat bred after first TAI service (%)	25	30
CR second and subsequent TAI services (%)	28	38

## Cows Leaving the Herd

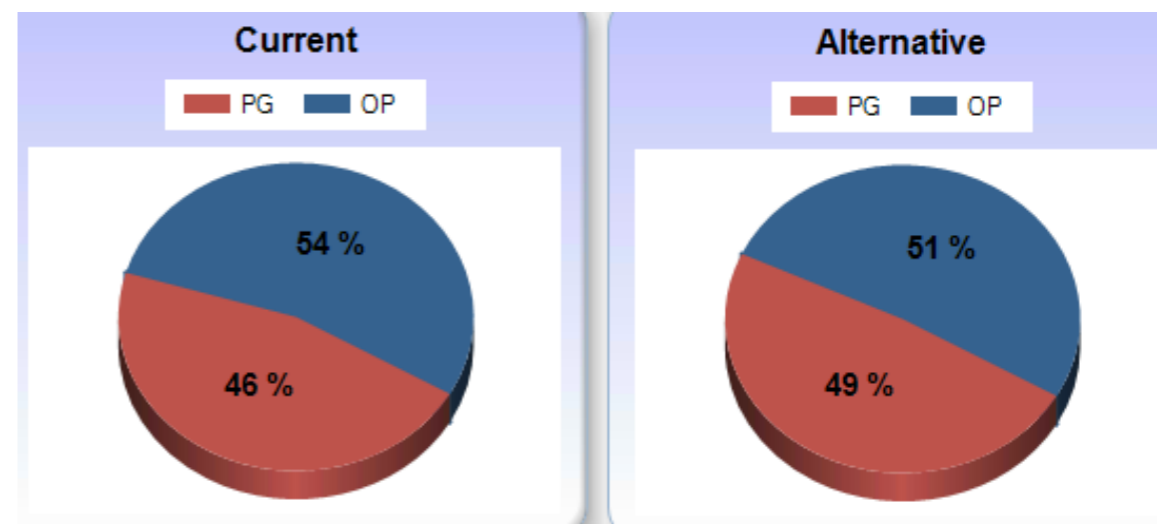
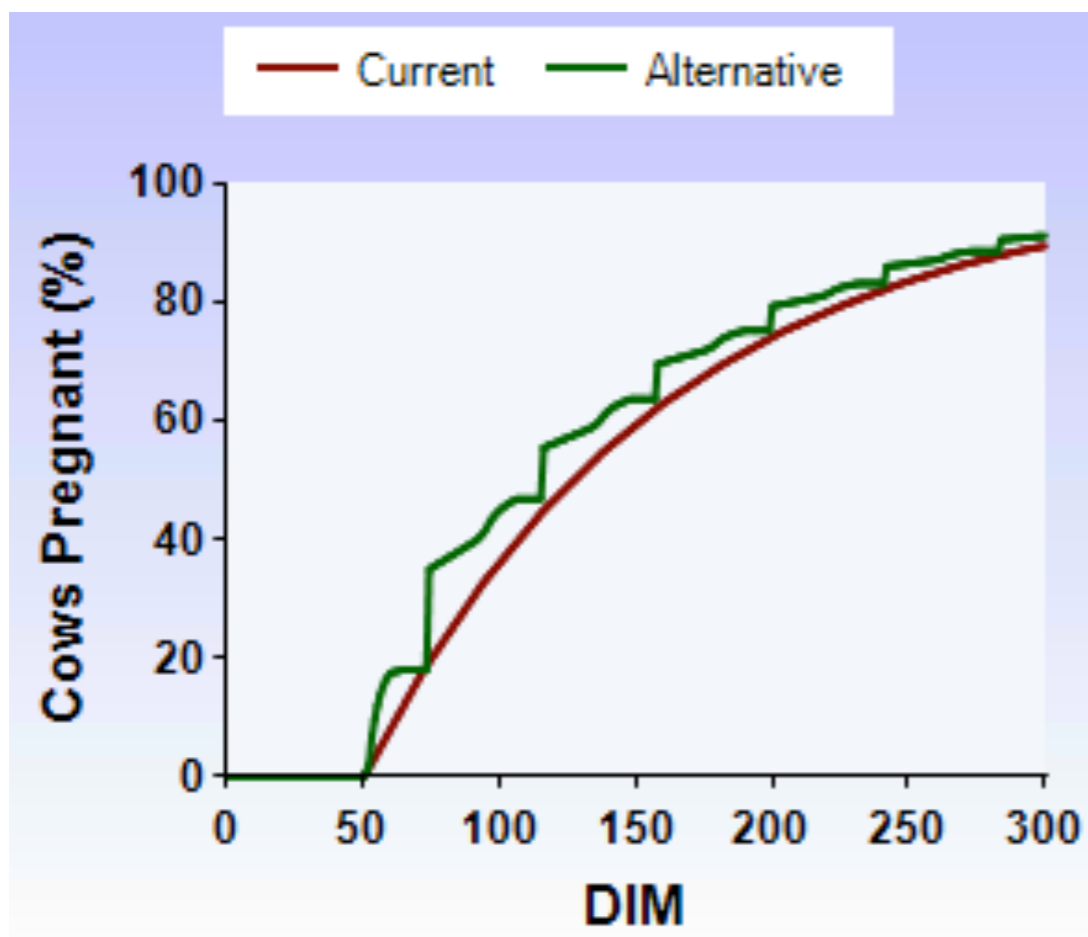
Item	Current	Alternative	Diff
Total Culling (%)	35.9	33.9	-2
Non-Reproductive Culling (%)	21.1	20.3	-0.8
Mortality (%)	3.3	3.1	-0.2
Reproductive Culling (%)	11.5	10.4	-1.1

## Heifer Supply and Demand

Item	Current	Alternative
Heifer Supply (% of herd/year)	39.9	40.6
Heifer Demand (% of herd/ye...)	35.9	33.9
Heifer Balance (% of herd/year)	4	6.7

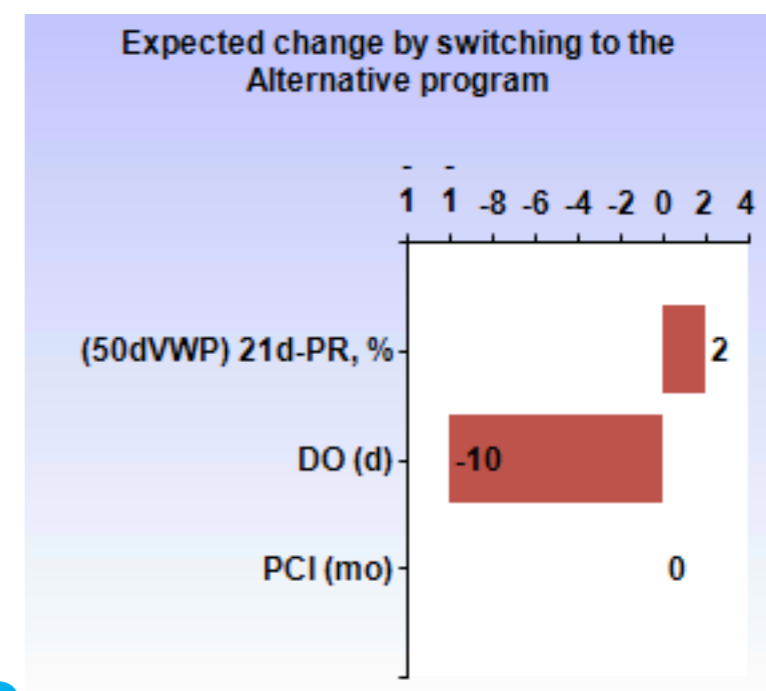
Capture Panel

# ED (current) vs. 42% PsOs-33%Os

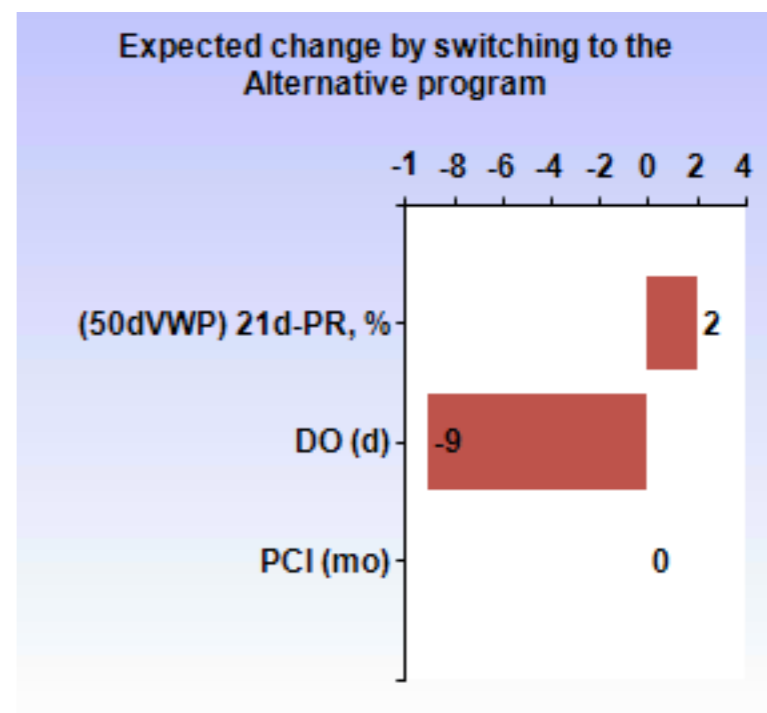
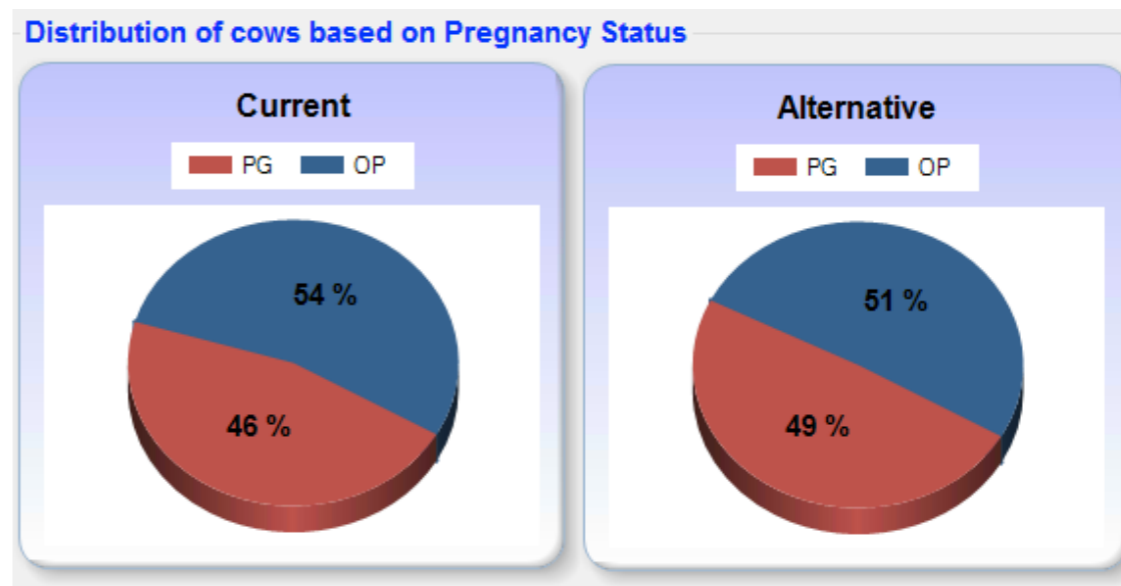
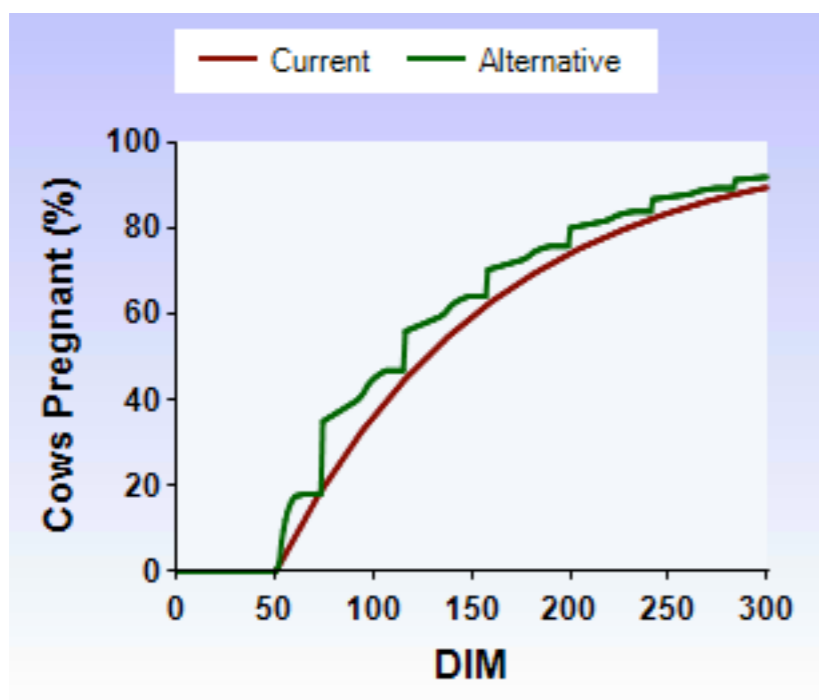


## Contribution to Net Value

Item	Current	Alternative	Diff
Total Net Value (\$/cow/y)	3,144.4	3,152.1	7.7
IOFC (\$/cow/y)	3,276.1	3,290.3	14.2
Replacement Cost (\$/cow/y)	-153.4	-149.7	3.7
Reproductive Cost (\$/cow/y)	-19.3	-32.2	-12.9
Calf Value (\$/cow/y)	41.0	43.7	2.7



# ED (current) vs. 42% PsOs-35%Os

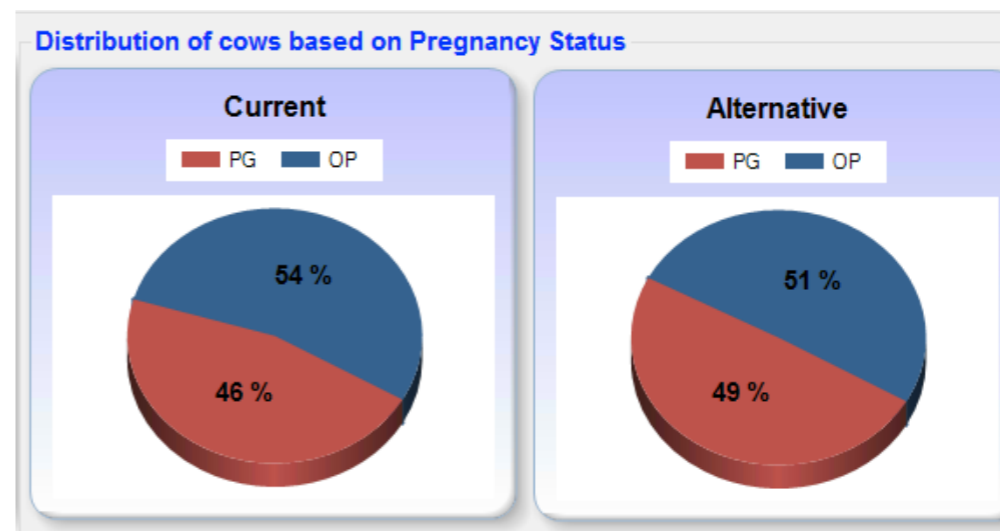
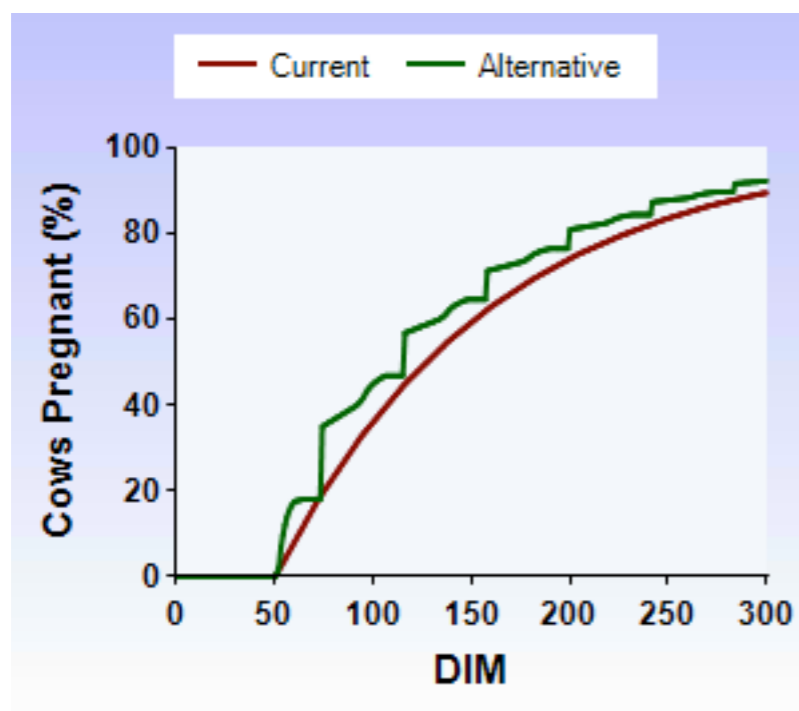


## Contribution to Net Value

Item	Current	Alternative	Diff
Total Net Value (\$/cow/y)	3,144.4	3,154.7	10.3
IOFC (\$/cow/y)	3,276.1	3,290.6	14.5
Replacement Cost (\$/cow/y)	-153.4	-148.2	5.2
Reproductive Cost (\$/cow/y)	-19.3	-32.1	-12.8
Calf Value (\$/cow/y)	41.0	44.4	3.4

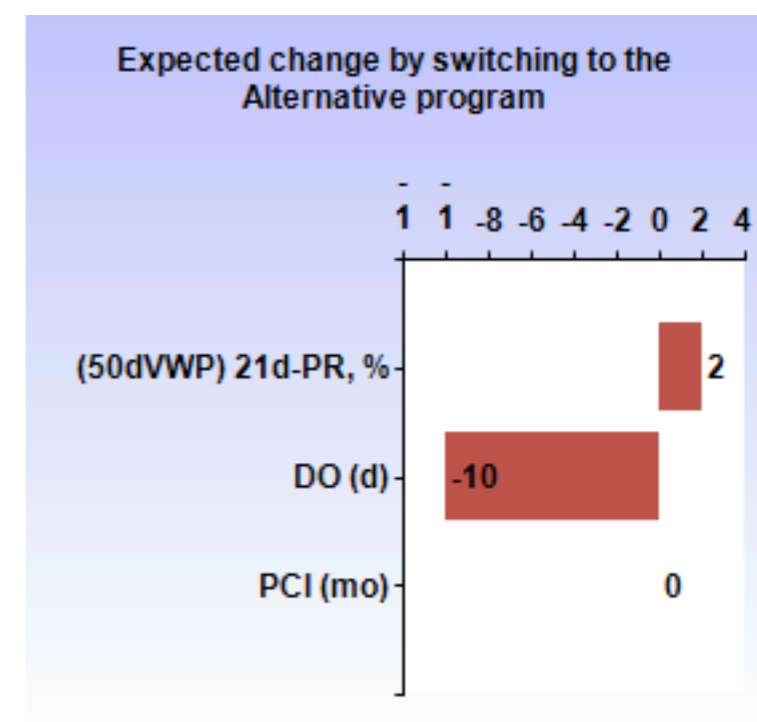


# ED (current) vs. 42% PsOs-38%Os

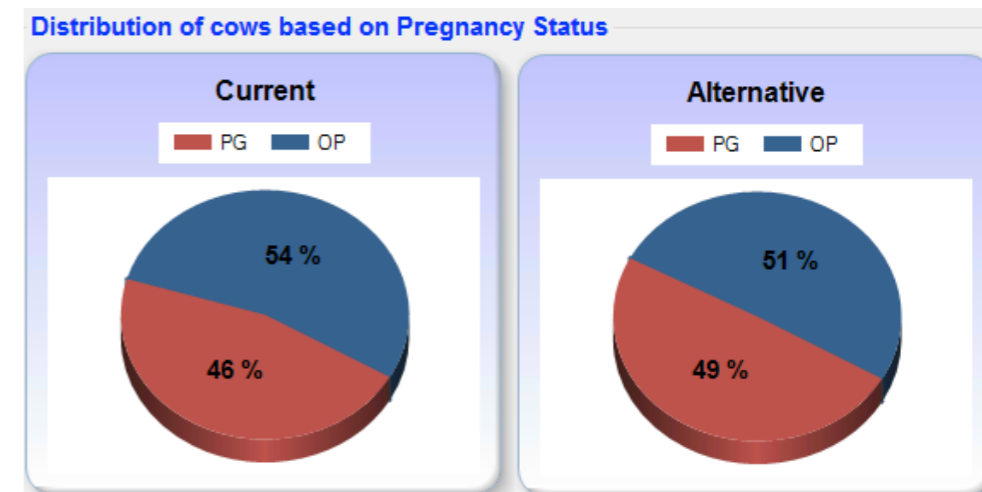
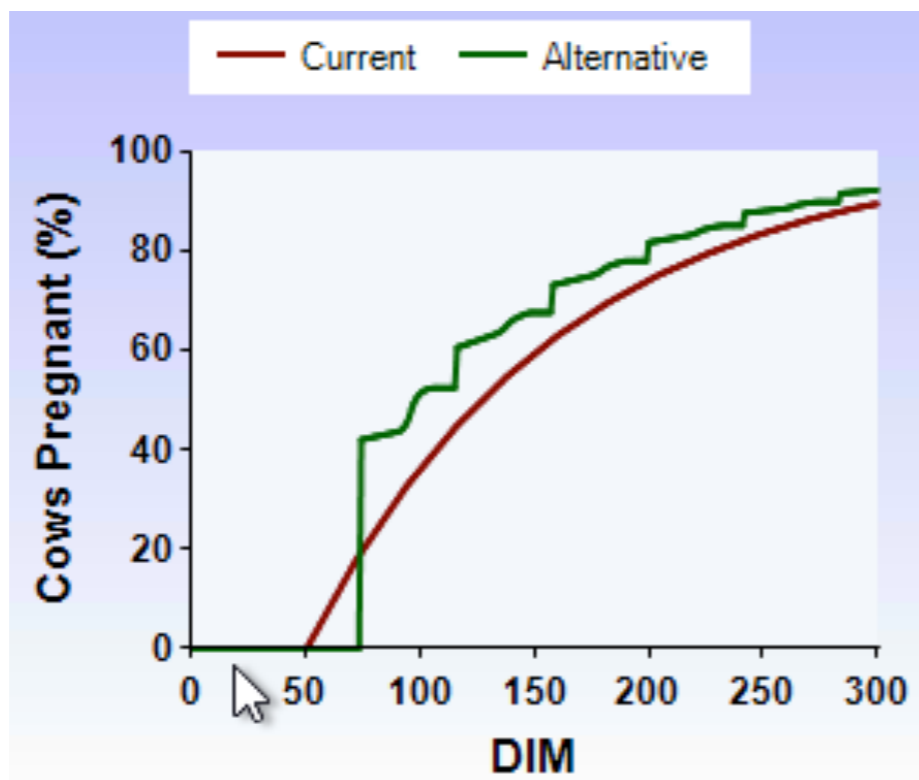


## Contribution to Net Value

Item	Current	Alternative	Diff
Total Net Value (\$/cow/ly)	3,144.4	3,156.7	12.3
IOFC (\$/cow/ly)	3,276.1	3,291.7	15.6
Replacement Cost (\$/cow/ly)	-153.4	-147.6	5.8
Reproductive Cost (\$/cow/ly)	-19.3	-32.0	-12.7
Calf Value (\$/cow/ly)	41.0	44.6	3.6

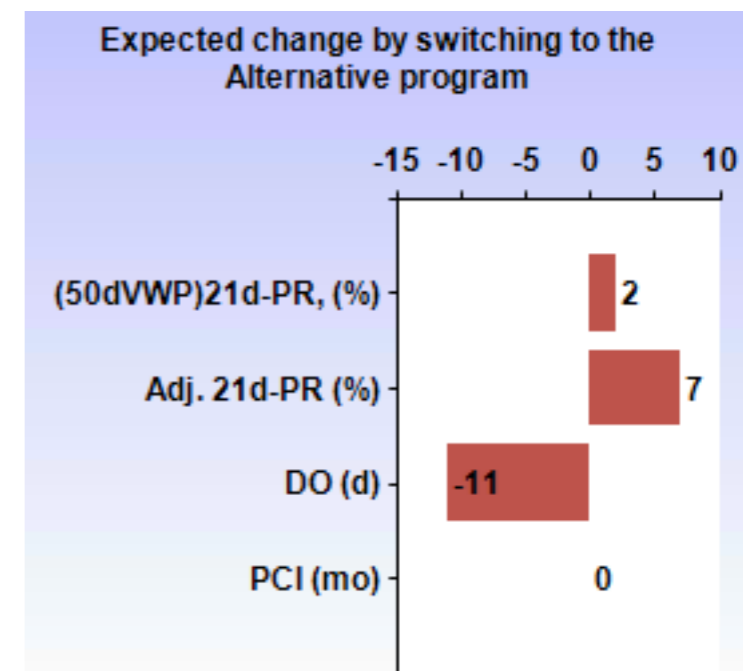


# ED (current) vs. 42% PsOs-38%Os

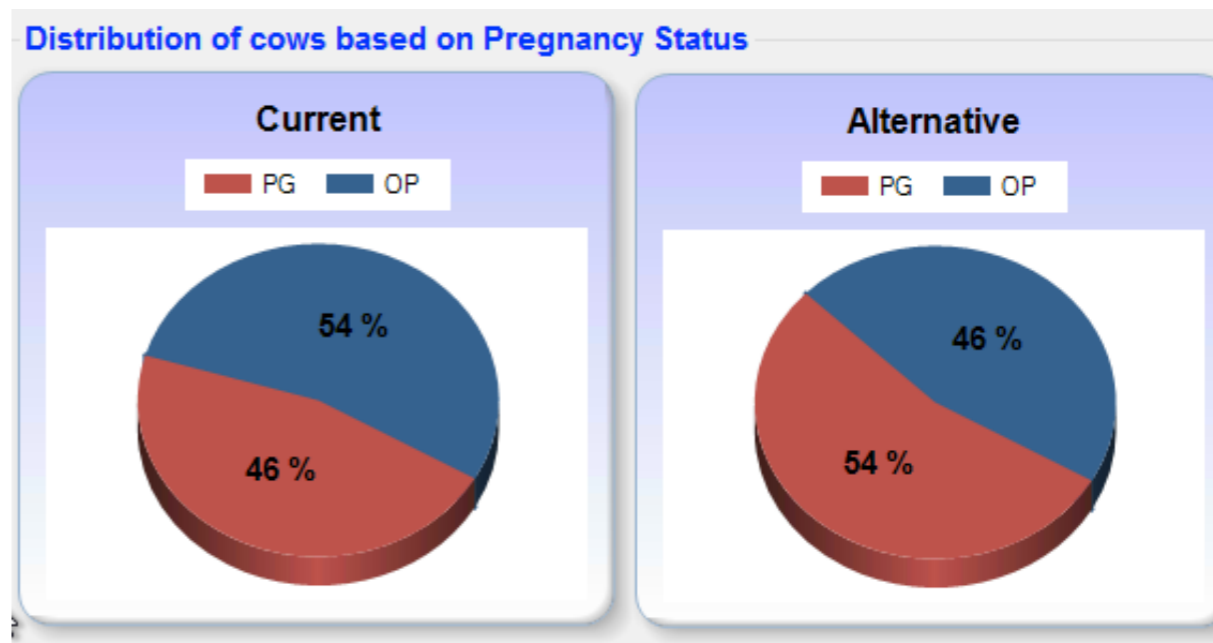
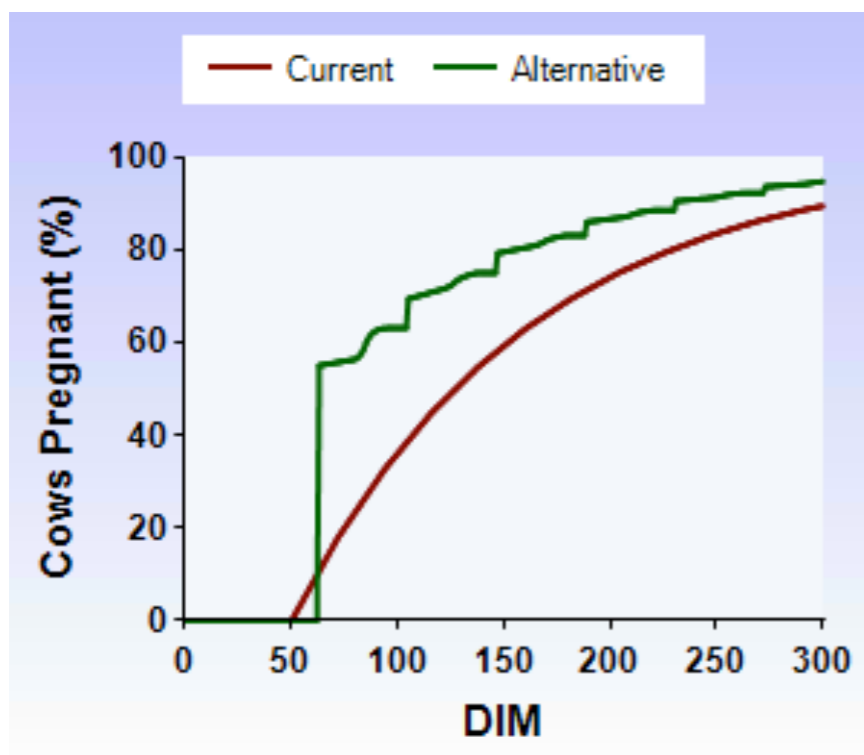


## Contribution to Net Value

Item	Current	Alternative	Diff
Total Net Value (\$/cow/y)	3,144.4	3,161.4	17.0
IOFC (\$/cow/y)	3,276.1	3,301.6	25.5
Replacement Cost (\$/cow/y)	-153.4	-147.6	5.8
Reproductive Cost (\$/cow/y)	-19.3	-37.2	-17.9
Calf Value (\$/cow/y)	41.0	44.6	3.6

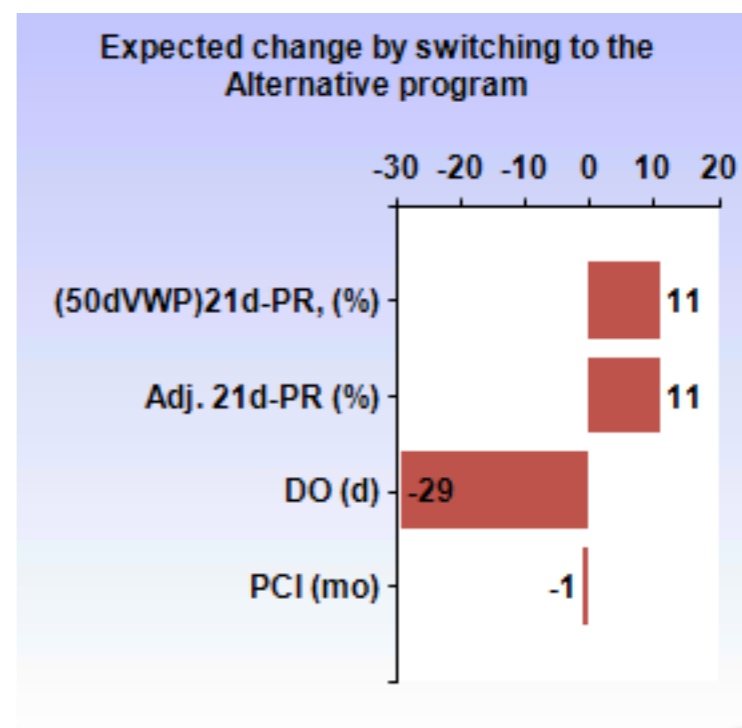


# ED (current) vs. 55% DOs-35%Os

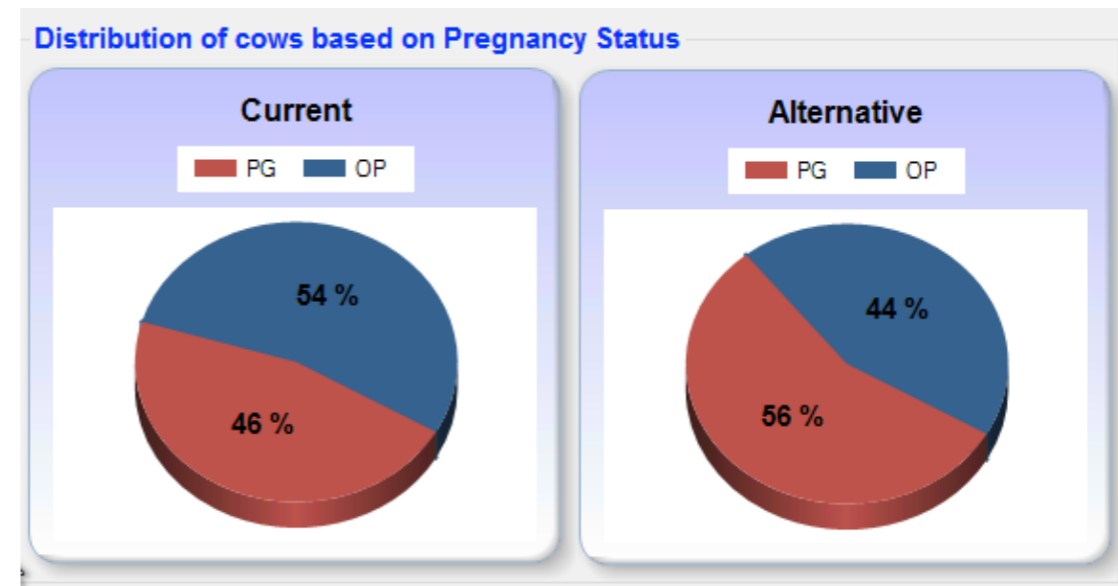
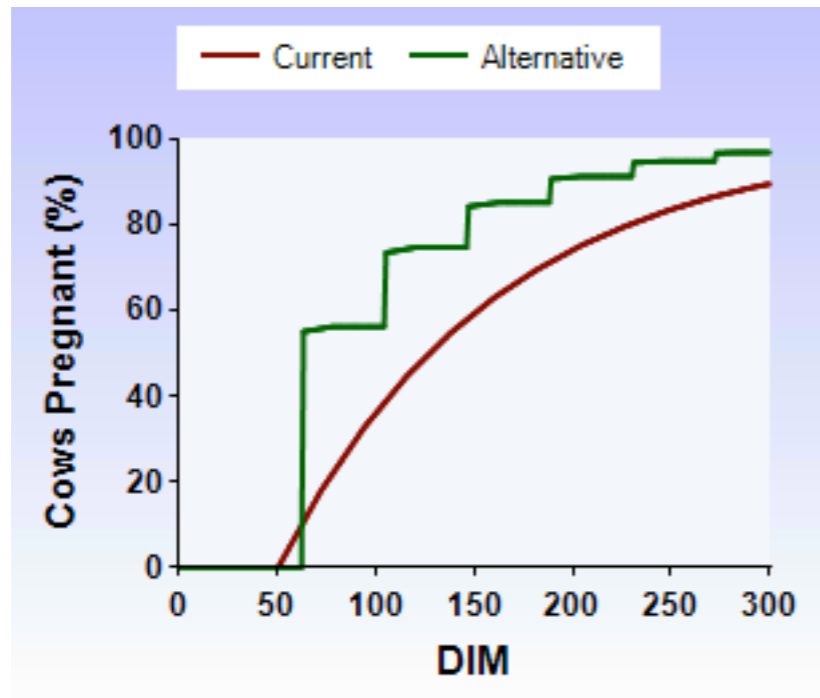


## Contribution to Net Value

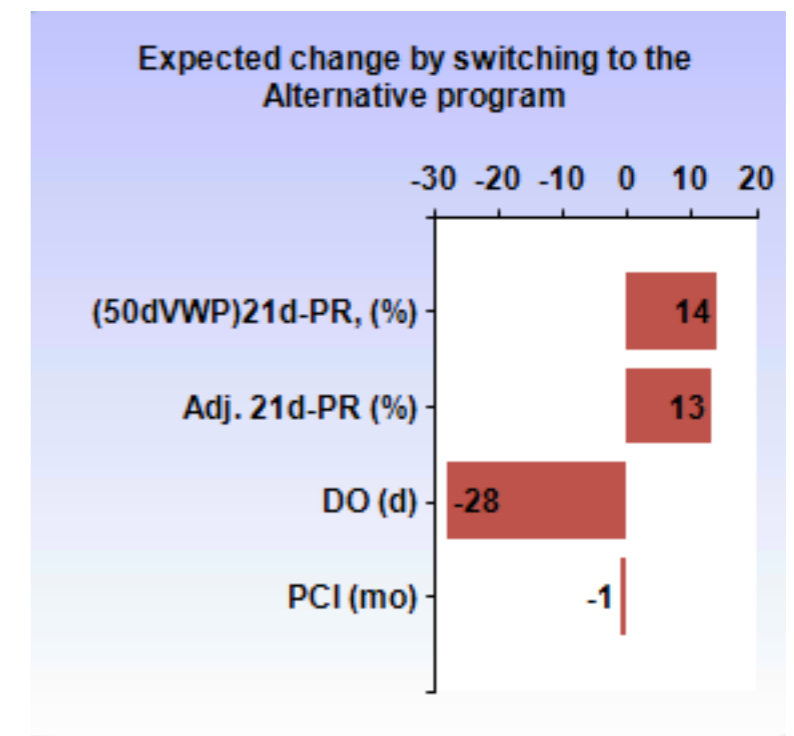
Item	Current	Alternative	Diff
Total Net Value (\$/cow/y)	3,144.4	3,205.5	61.1
IOFC (\$/cow/y)	3,276.1	3,333.1	57.0
Replacement Cost (\$/cow/y)	-153.4	-140.7	12.7
Reproductive Cost (\$/cow/y)	-19.3	-37.1	-17.8
Calf Value (\$/cow/y)	41.0	50.2	9.2



# ED (current) vs. 55% DOs-42%DOs



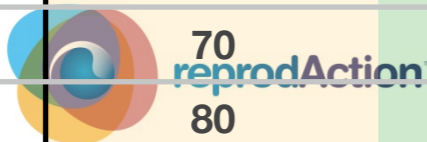
Item	Current	Alternative	Diff
Total Net Value (\$/cow/y)	3,144.4	3,216.1	71.7
IOFC (\$/cow/y)	3,276.1	3,339.8	63.7
Replacement Cost (\$/cow/y)	-153.4	-135.1	18.3
Reproductive Cost (\$/cow/y)	-19.3	-41.2	-21.9
Calf Value (\$/cow/y)	41.0	52.6	11.6





# Defining other repro programs

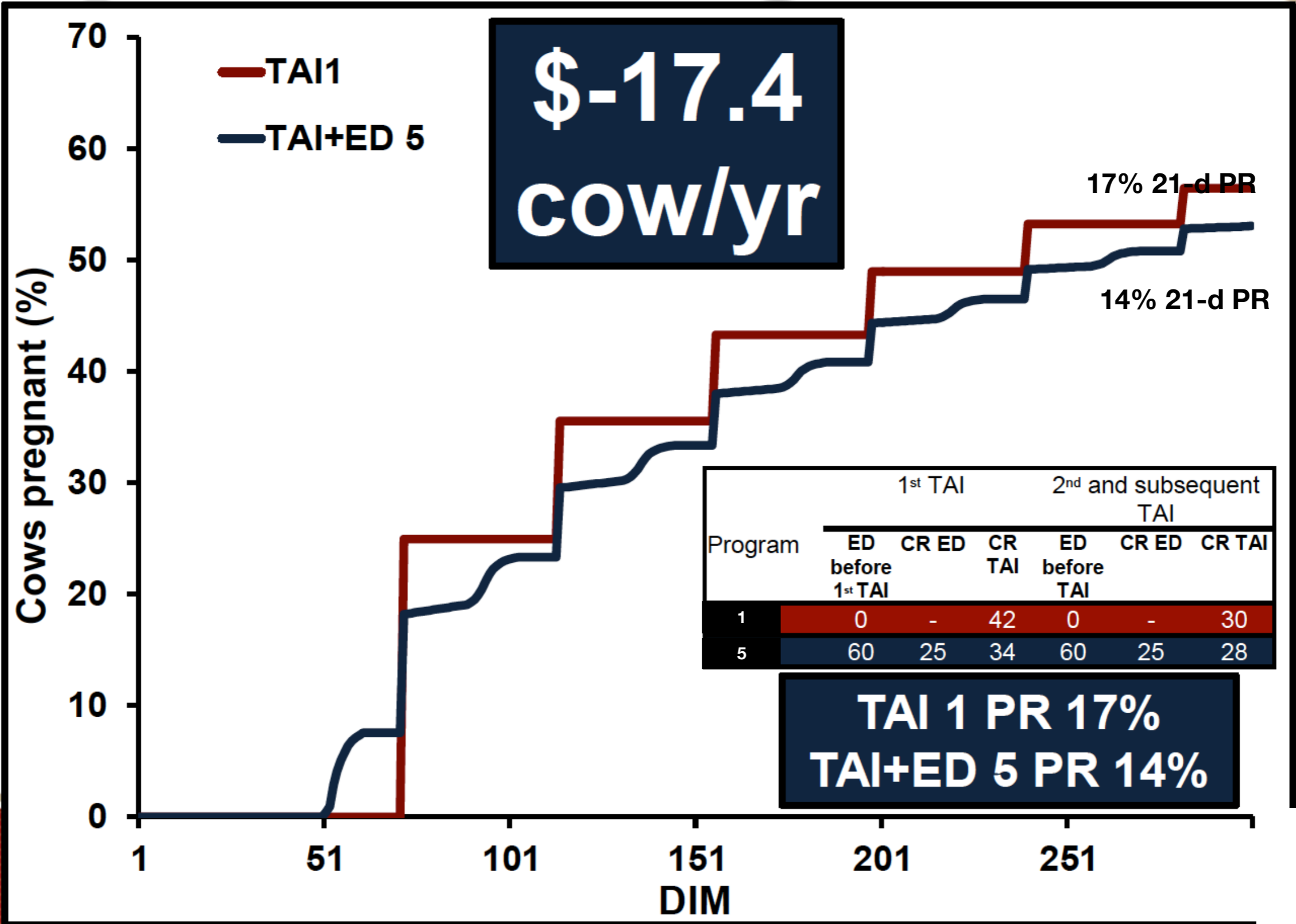
Program	1 <sup>st</sup> TAI			2 <sup>nd+</sup> TAI		
	ED before 1 <sup>st</sup> TAI	CR ED	CR 1 <sup>st</sup> TAI	ED after TAI	CR ED	CR 2 <sup>nd+</sup> TAI
1	0	-	42	0	-	30
2	30	25	40	30	25	30
3	40	25	38	40	25	30
4	50	25	36	50	25	30
5	60	25	34	60	25	28
6	70	25	32	70	25	28
7	80	25	30	80	25	28
8	30	30	40	30	30	30
9	40	30	38	40	30	30
10	50	30	36	50	30	30
11	60	30	34	60	30	28
12	70	30	32	70	30	28
13	80	30	30	80	30	28
14	30	35	40	30	35	30
15	40	35	38	40	35	30
16	50	35	36	50	35	30
17	60	35	34	60	35	28
18	70	35	32	70	35	28
19	80	35	30	80	35	28



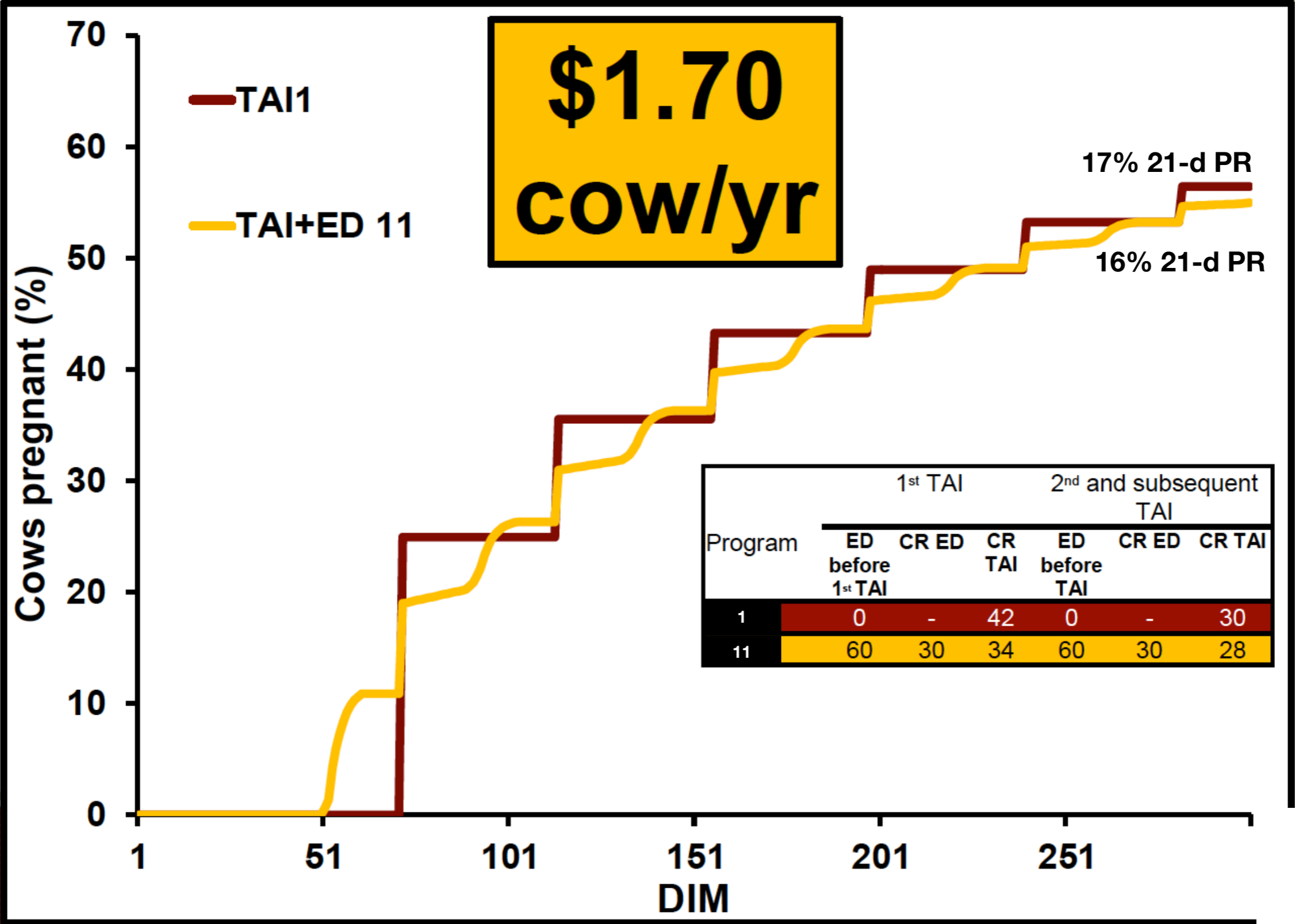
THE COW CLASS



# Repro and economic performance

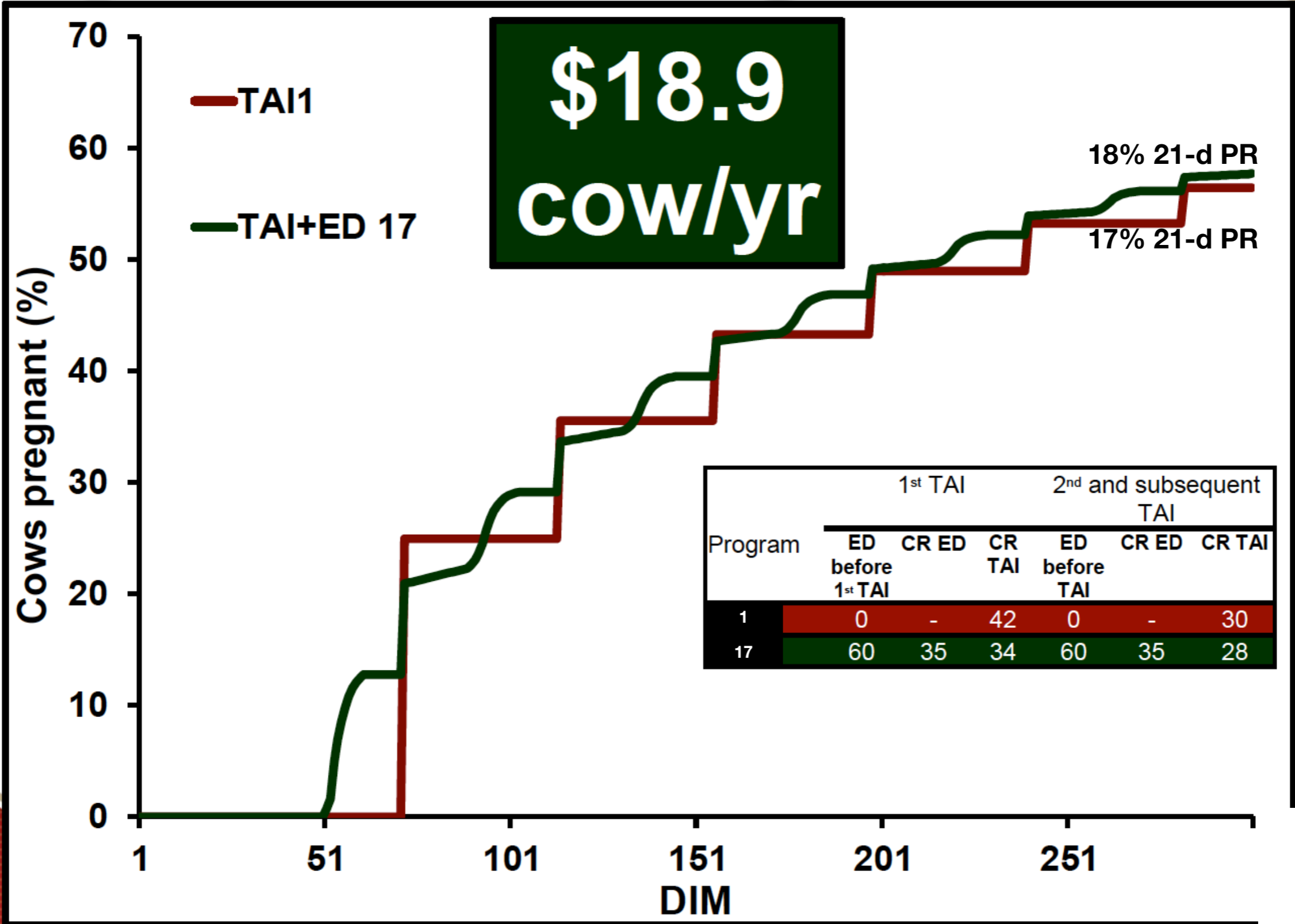


# Repro and economic performance

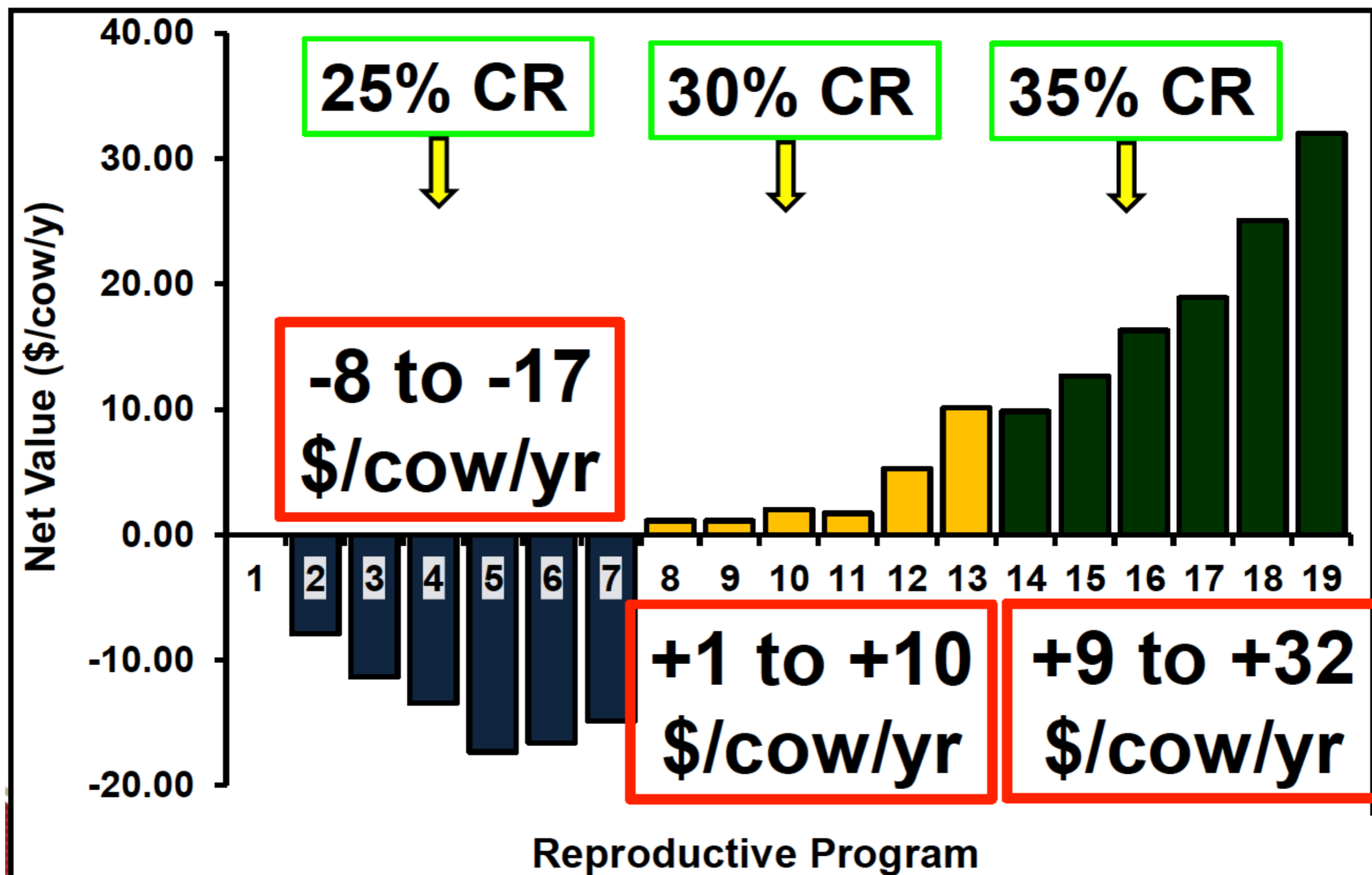




# Repro and economic performance



# Overall economic performance



# Improve pure ED program

Program	1st Service		2nd+ Service	
	ED	CR	ED	CR
<b>100% ED</b>	<b>60</b>	<b>30</b>	<b>60</b>	<b>30</b>
PreSynchOvSynch + OvSynch	Y	42	Y	33
PreSynchOvSynch + OvSynch	Y	42	Y	35
PreSynchOvSynch + OvSynch	Y	42	Y	38
PreSynchOvSynch + OvSynch	N	42	Y	35
DoubleOvSynch + OvSynch	N	55	Y	35
DoubleOvSynch + DoubleOvSynch	N	55	Y	42