



# Decisiones de manejo reproductivo con enfoque económico de la ganadería lechera

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Seminario Internacional Innovación en Reproducción de Rumiantes,  
Universidad Nacional Micaela Bastidas de Apurímac-Perú, 21 octubre 2014

# Valor económico de reproducción

Razones para mejorar reproducción

## Producción

Más leche producida

## Reemplazos

Más terneras

## Reemplazo selectivo

Mejor genética



## Descarte reproductivo

Más vacas preñadas

## Descarte involuntario

Vacas viven más

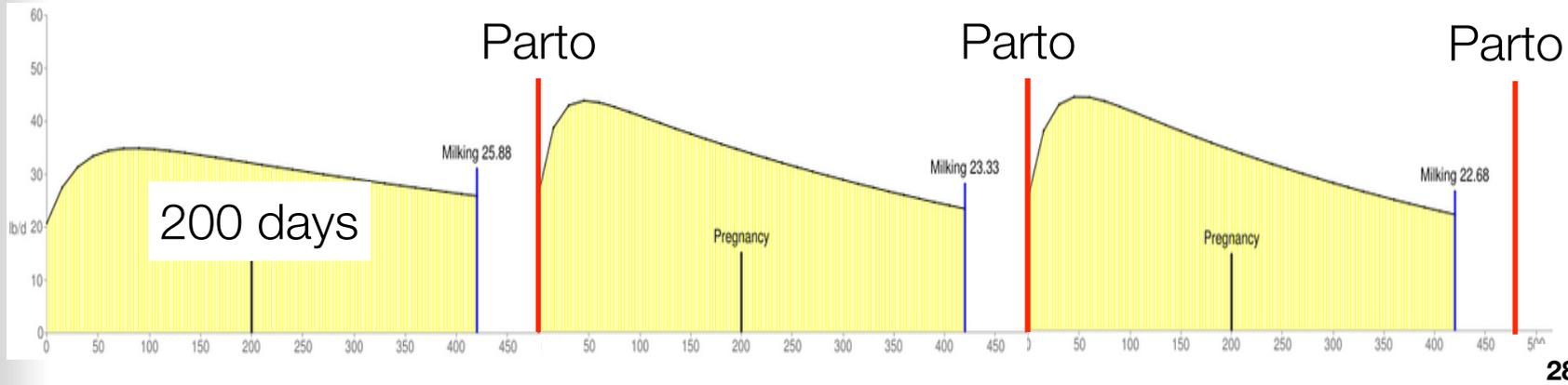
## Costos reproductivos

Relativamente menores

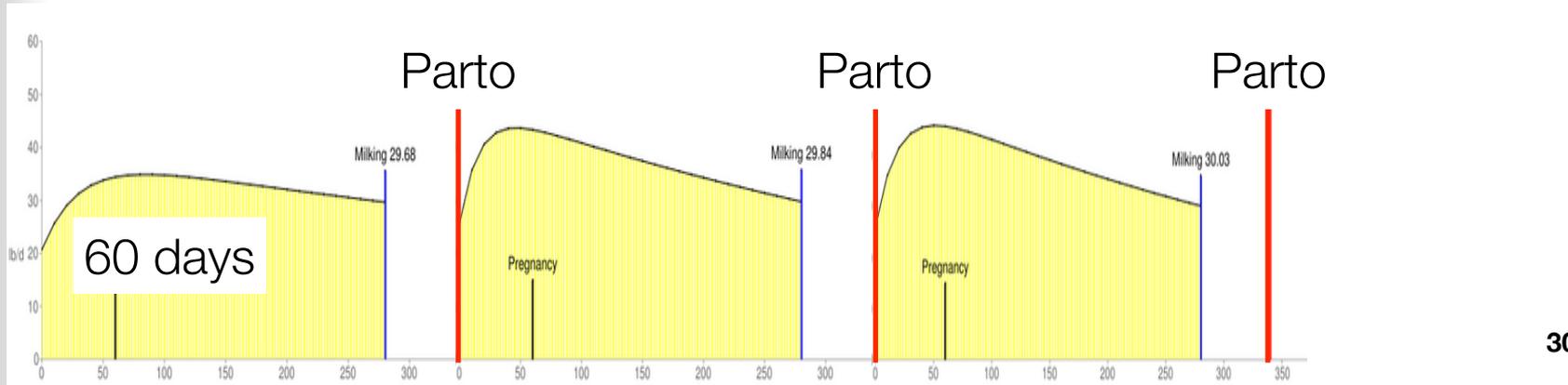
# Producción y productividad

Mayor eficiencia productiva

Leche  
al año



41,485  
10,515



30,224  
10,815

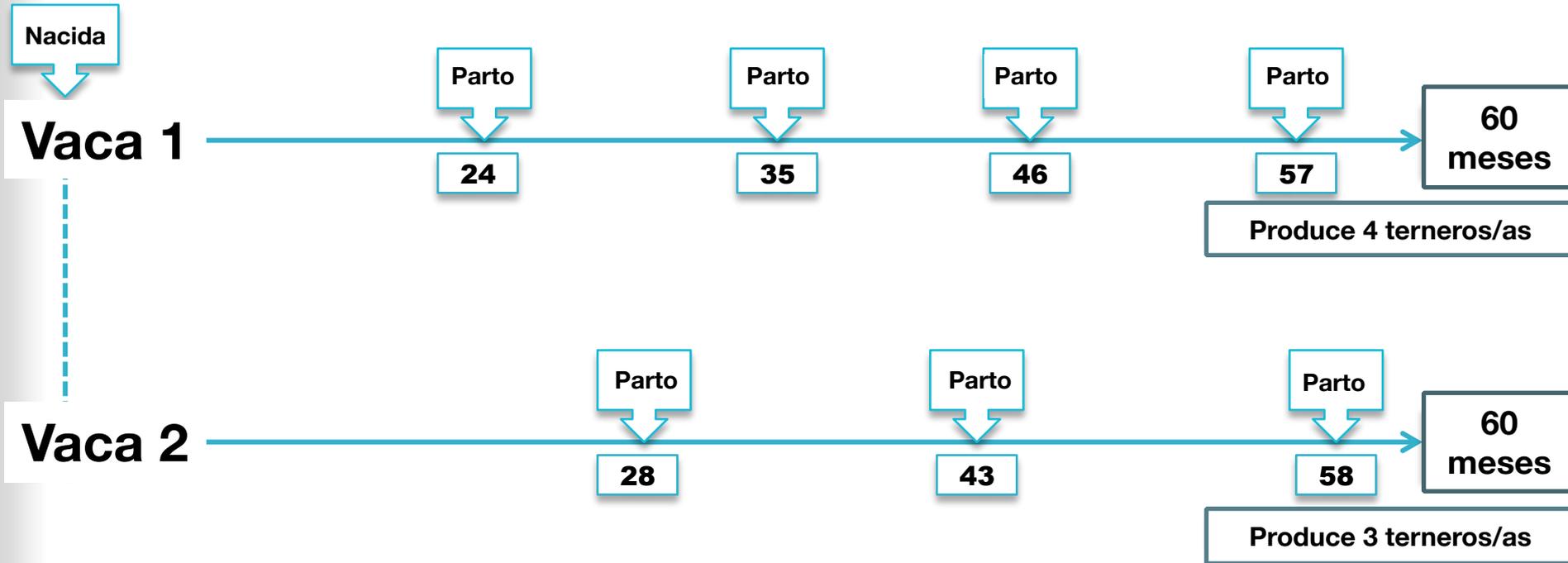
Mas productividad cuando preñada a 60 días: **300 lb/vaca.año**

Hato de 100 vacas a \$0.20/lb: **\$6,000 ganancia**

Hato de 100 Vaca a \$0.20/lb: **\$30,220 ganancia**

# Reemplazos disponibles

Mas terneras y terneros



Mas terneros/as al año por vaca: **0.2**

Hato de 100 vacas a \$200: **\$4,000 ganancia**

# Remplazo selectivo

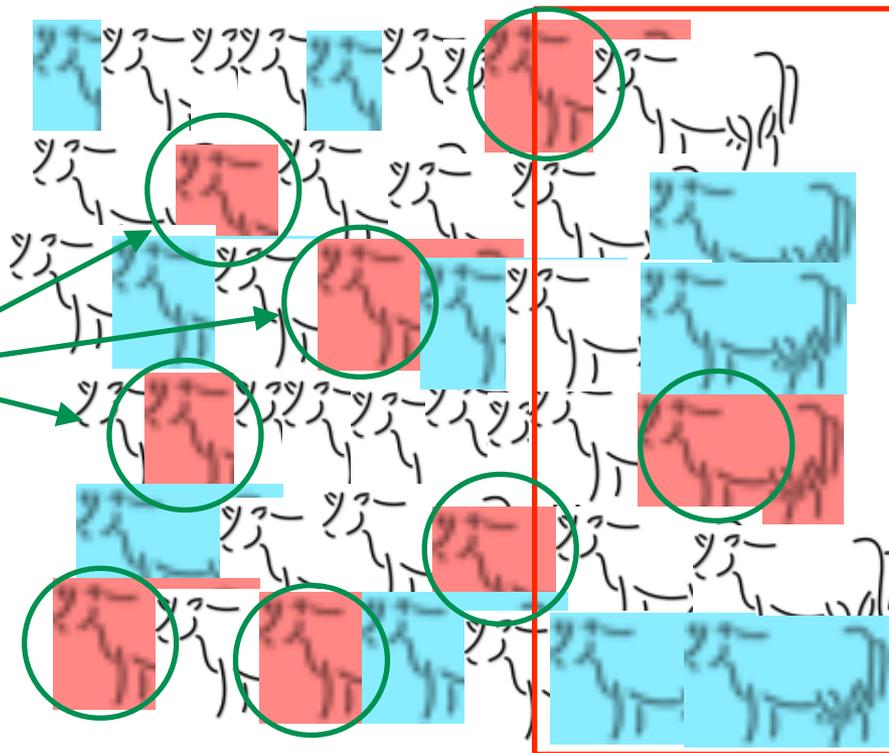
Desechar vacas menos productivas/más problemáticas

**Buena  
reproducción**

**Mala  
reproducción**

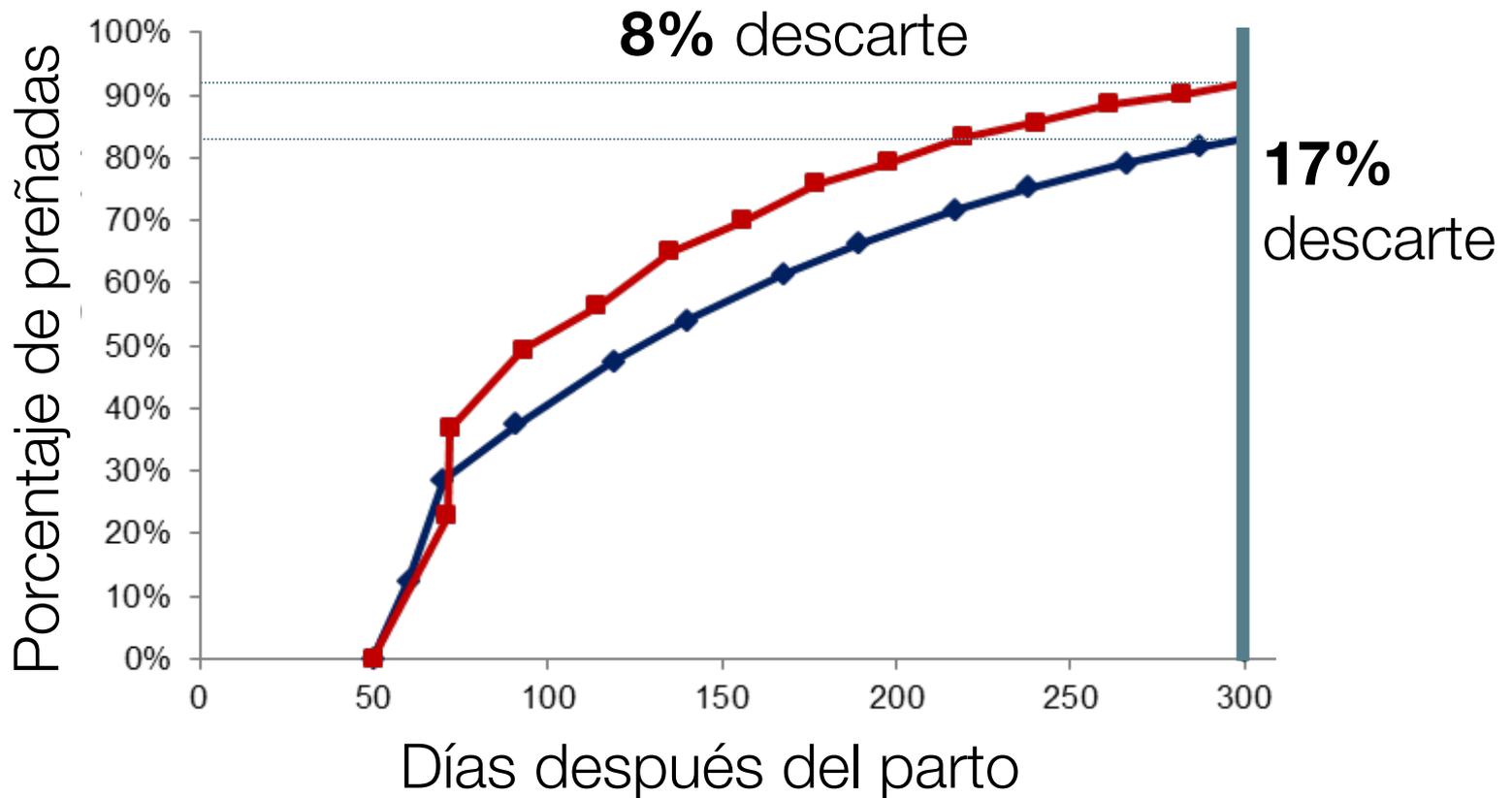
Seleccionadas  
para irse

Se tienen  
que ir



# Descarte reproductivo

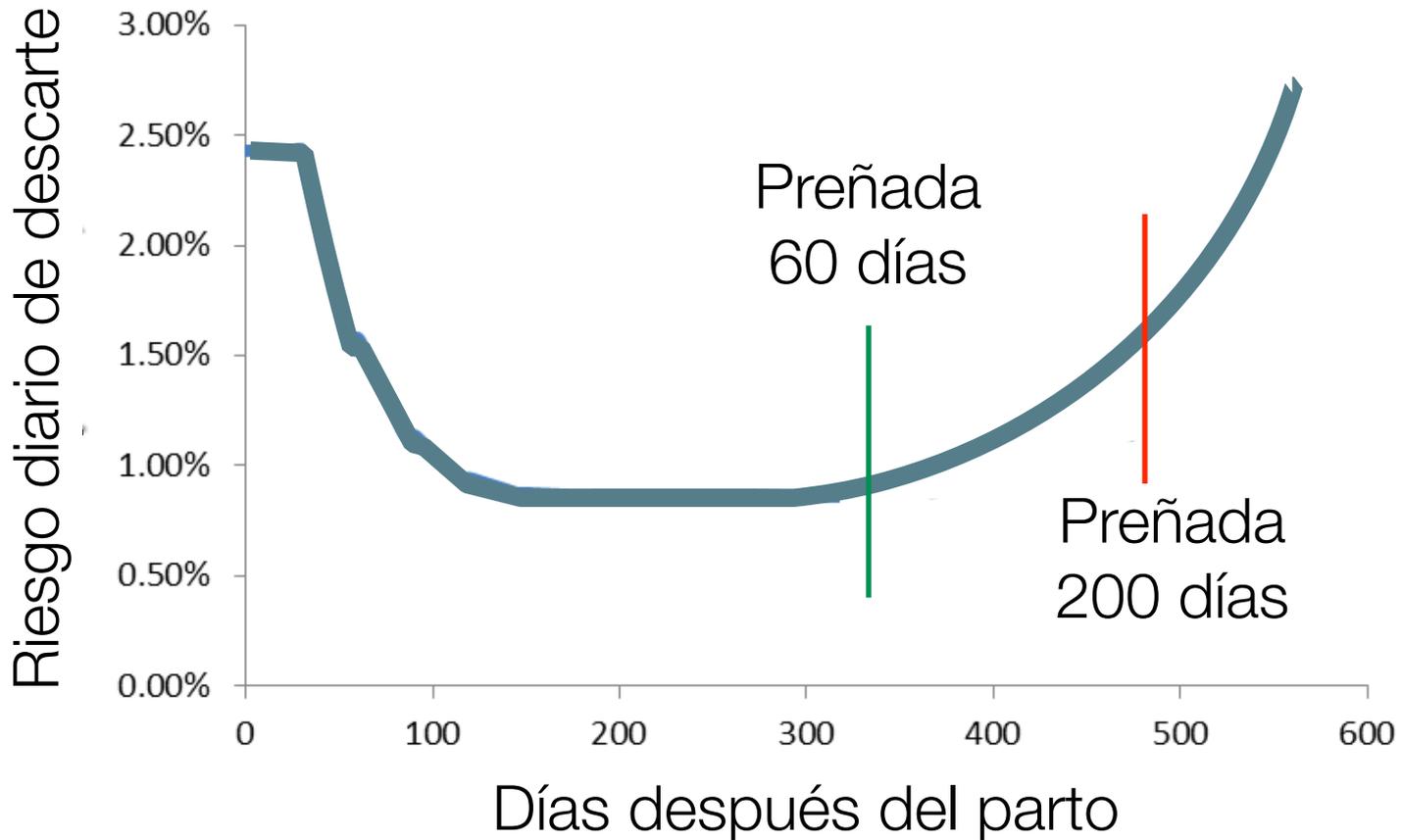
Menos vacas no preñadas desechadas



Hato de 100 vacas a \$800: **\$13,600 ganancia**

# Descarte involuntario

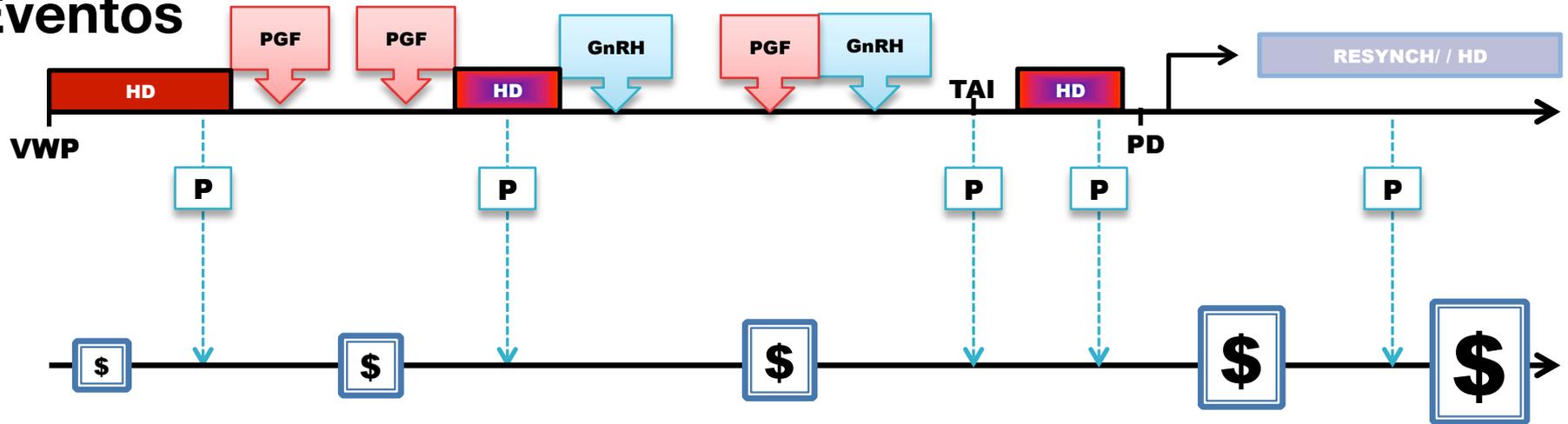
Riesgo incrementa con duración de lactancia



# Costos reproductivos

Relación entre eficiencia reproductiva e inversiones

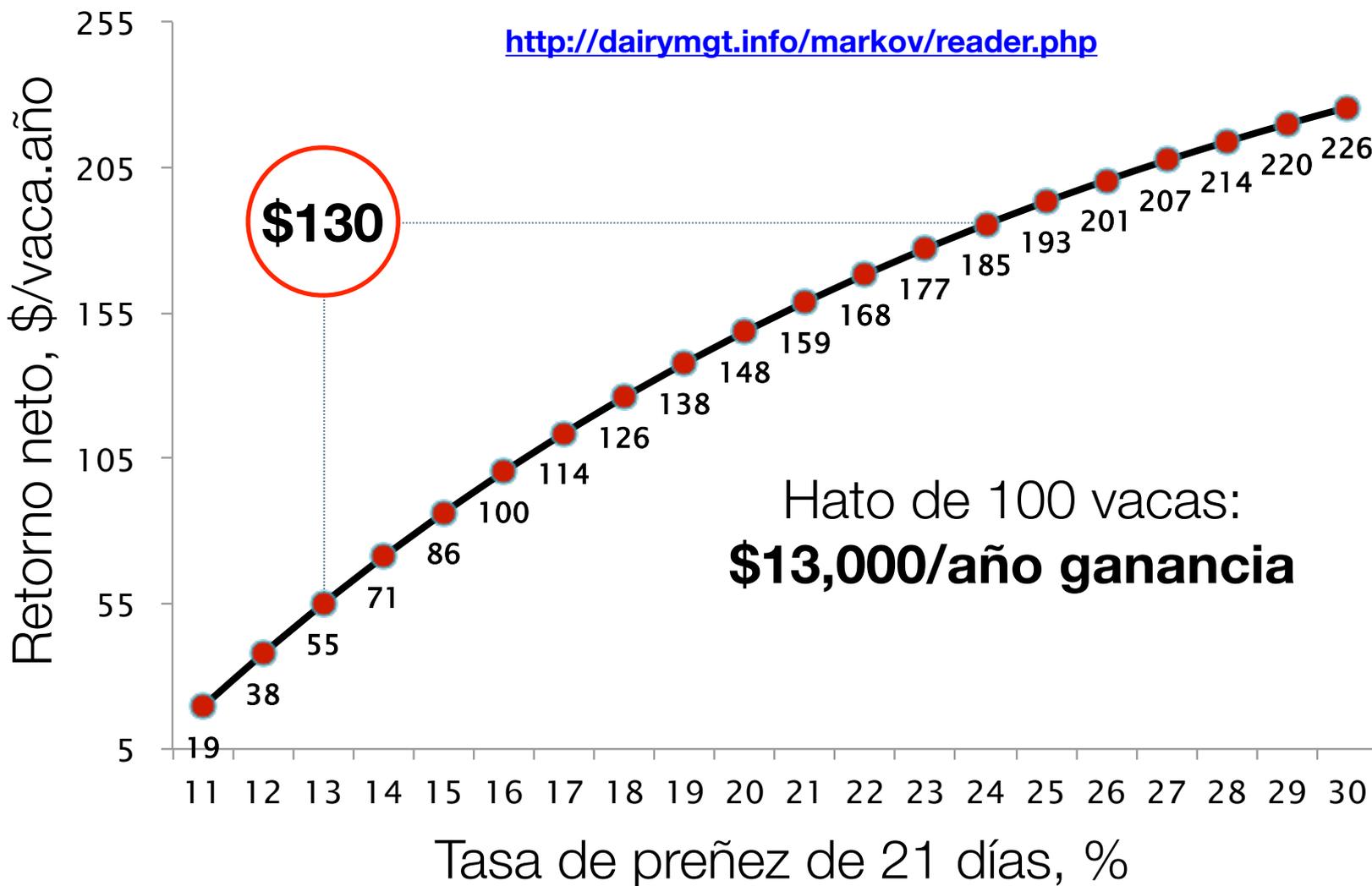
## Eventos



## Costos

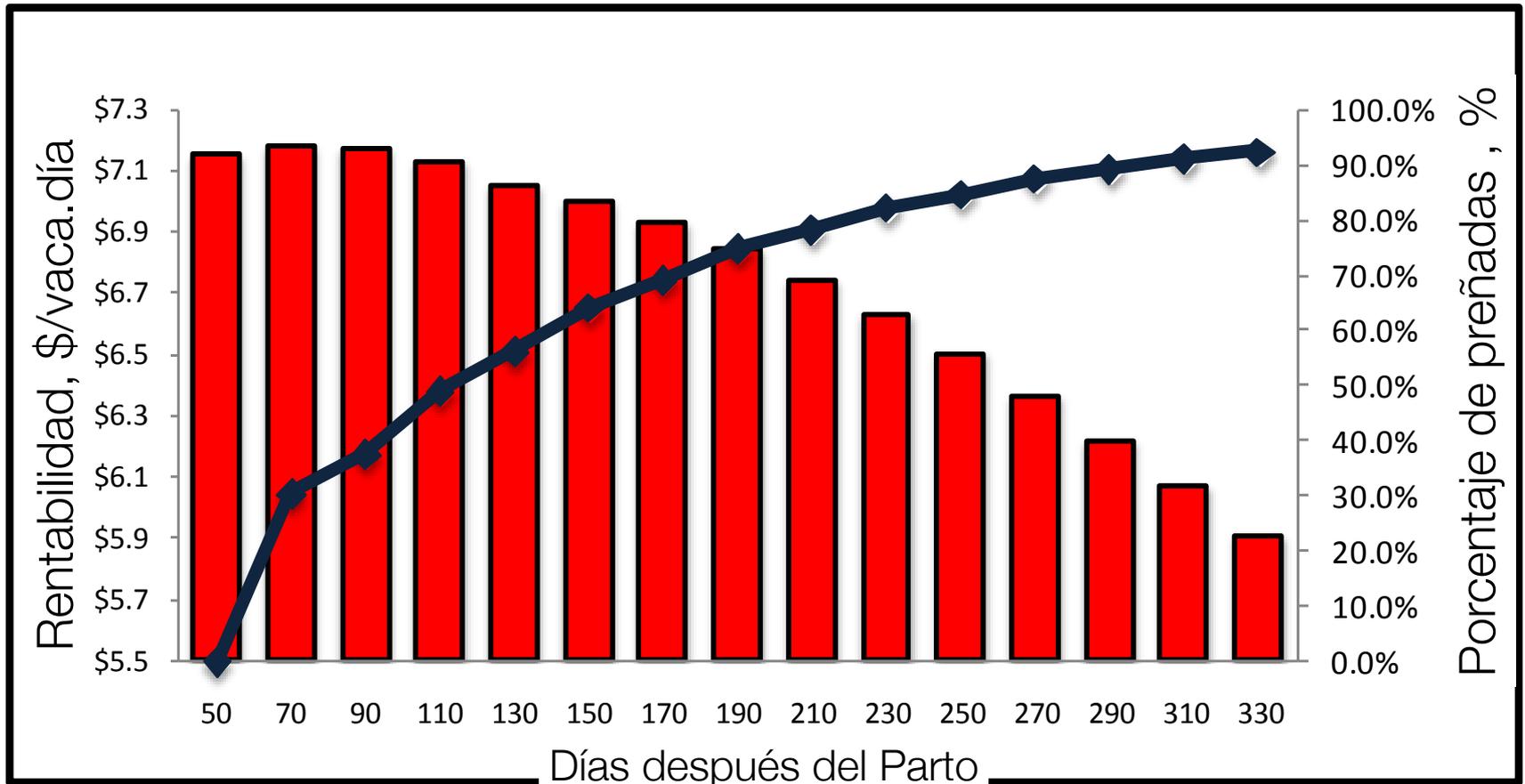
# Un resumen

Valor de mejora de reproducción



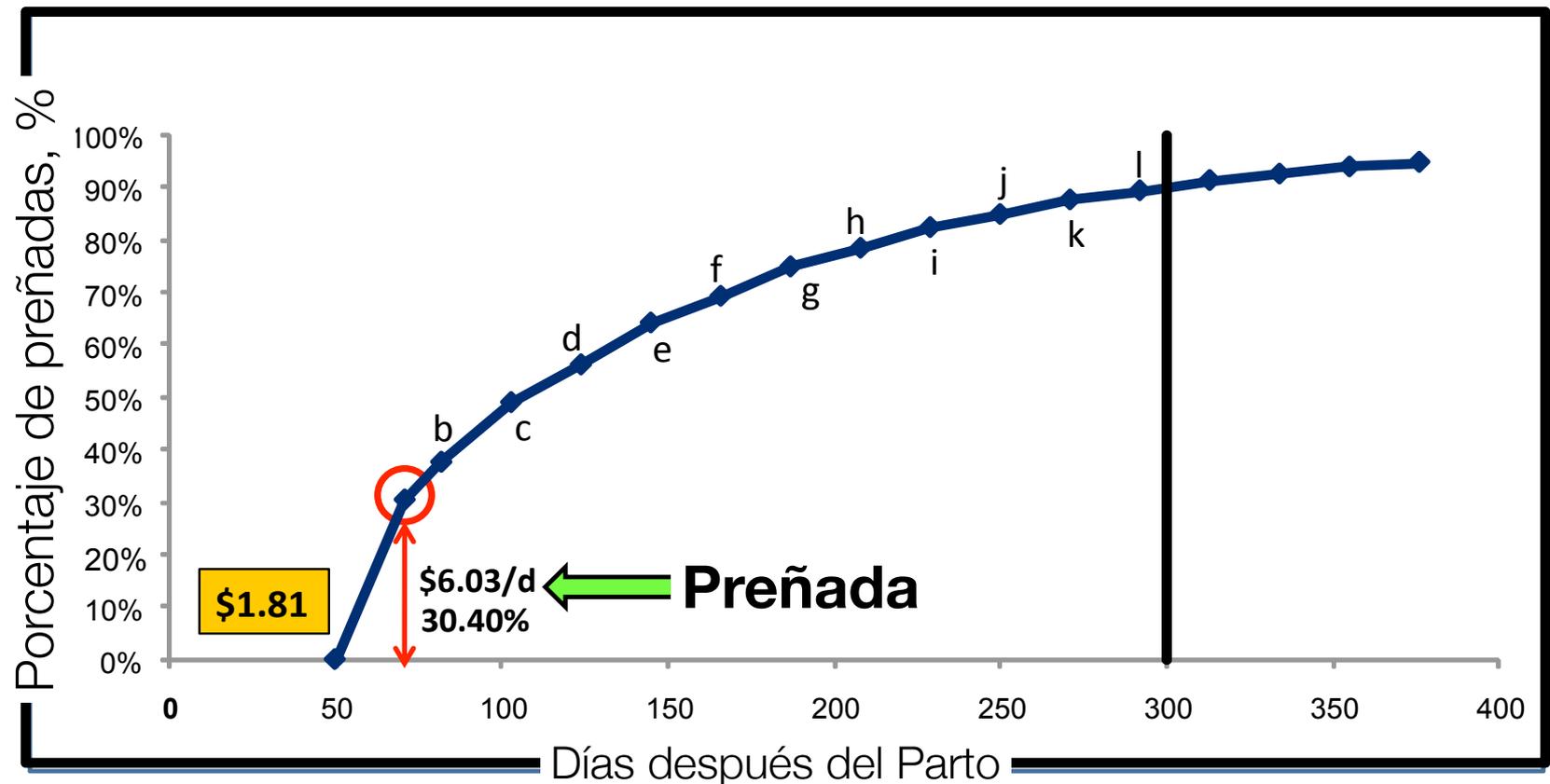
# Rentabilidad total

Como podemos combinar todos los factores



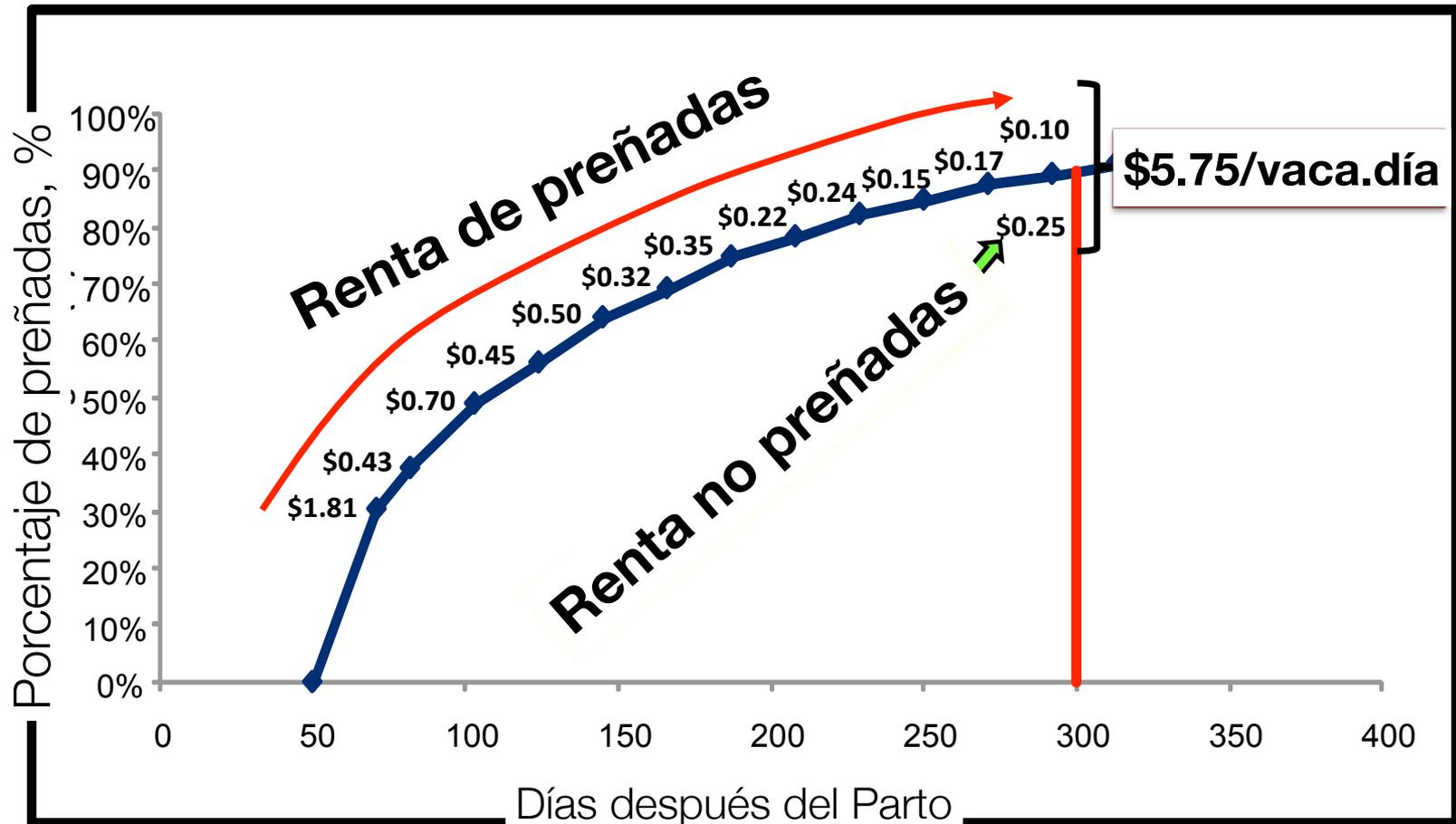
# Rentabilidad de la reproducción

Integrando el valor y el hato



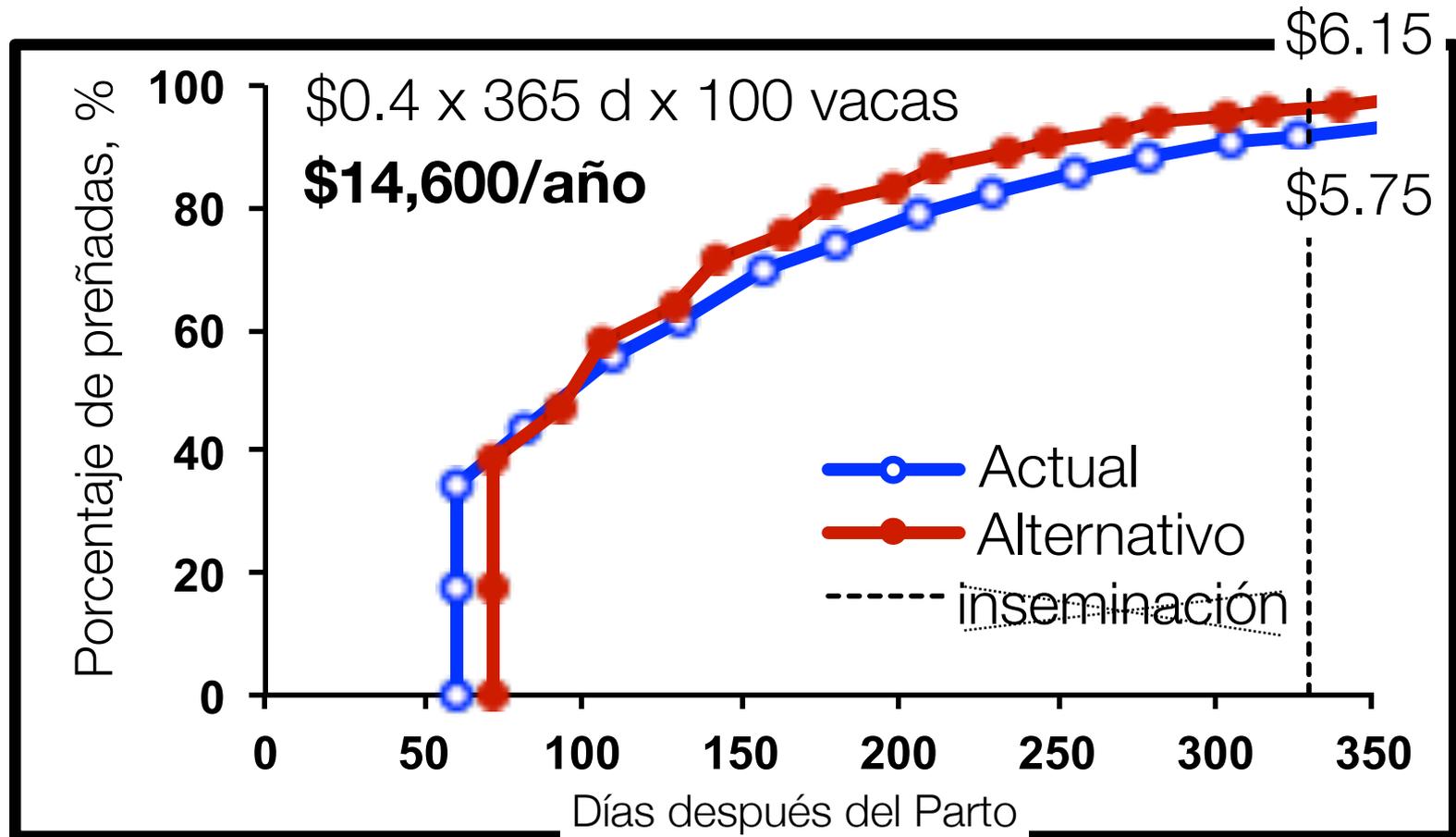
# Rentabilidad de la reproducción

Poniendo todo junto



# Valor económico de programa

Lo más importante es la diferencia



# Entonces como hago el cálculo?

Lo tenemos cubierto

Wisconsin-Cornell DairyRepro\$ (UWCUREpro\$) 1.0

Herd Description | Reproduction | Results | About & Help

**UW Extension**  
University of Wisconsin-Extension

**THE UNIVERSITY of WISCONSIN MADISON**

**Cornell University**  
Department of Animal Science

**Wisconsin-Cornell Dairy Repr0\$ (UWCUREpro\$)**  
Version 1.0.0.1

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

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**Overview**

Reproductive performance greatly impacts dairy farm profitability. Optimal reproductive performance improves milk productivity because cows take better advantage of the most productive part of their lactations, decreases replacement costs due to less reproductive failure, increases the number of offspring, and decreases reproductive costs per pregnancy. Normally, farmers and consultants can keep detailed records and compute meticulous reproductive costs. They can also know herd's reproductive performance. However, it is difficult to assess the actual monetary value of alternative reproductive programs. Therefore, in a multi-state collaboration, we have created the Wisconsin-Cornell Repr0\$ (UW-CUREpro\$) to assist dairy farm decision-makers perform advanced reproductive analyses by studying the economic value of intended reproductive management strategies. The UW-CUREpro\$ is a complex daily Markov chain model inspired on Giordano et al., 2012 (J. Dairy Science 95:5442) that daily simulates every single cow and her economics, and computes the net return associated to reproductive performance parameters. Luckily, this tool has been designed as a user-friendly decision support tool and users only need to define: 1) productive, reproductive, and economic parameters to represent their own farm particular conditions and 2) potential reproductive strategies to be implemented. The decision support tool takes care of the rest!

[UWCU-DairyRepro\\$-Instructions.pdf](#)

Ready

# Describe tu hato

Importante por que el análisis es diferente en cada caso

## Herd Parameters

Herd Size (#)	100
Average Body Weight (lb)	1,400
Involuntary Culling (%/yr)	35.0
Mortality Rate(%/yr)	4.0
Stillbirth(%)	4.9

## Economic Parameters

Milk Price (\$/cwt)	16.00
Cost Feed Lactating (\$/lb DM)	0.08
Dry Period Fixed Cost (\$/lb DM)	0.06
Female Calf value(\$)	136
Male Calf value (\$)	50
Heifer Replacement Value(\$)	1,302
Salvage Value (\$/lb)	0.526

# Describe tu hato

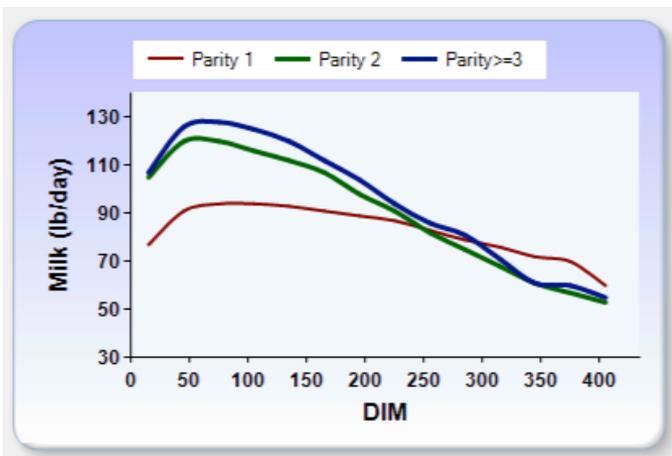
Importante por que el análisis es diferente en cada caso

## Lactation Curves (lb/cow/test)

Own Farm Lactations (Enter/Edit NUMBERS Below)

Own Farm Lactations (Enter/Edit NUMBERS Below)

Lactations of approximately 18,000 lb milk/cow/year  
Lactations of approximately 19,000 lb milk/cow/year  
Lactations of approximately 20,000 lb milk/cow/year  
Lactations of approximately 21,000 lb milk/cow/year  
Lactations of approximately 22,000 lb milk/cow/year  
Lactations of approximately 23,000 lb milk/cow/year  
Lactations of approximately 24,000 lb milk/cow/year  
Lactations of approximately 25,000 lb milk/cow/year  
Lactations of approximately 26,000 lb milk/cow/year  
Lactations of approximately 27,000 lb milk/cow/year  
Lactations of approximately 28,000 lb milk/cow/year  
Lactations of approximately 29,000 lb milk/cow/year  
Lactations of approximately 30,000 lb milk/cow/year



DIM	Parity 1	Parity 2	Parity $\geq 3$
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

# Describe tu programa reproductivo

Y explora cambios que crees mejorarían el desempeño

<u>Reproductive Programs</u>		
	Current	Alternative
First AI postpartum	Presynch-Ovsynch-14	Presynch-Ovsynch-14
Second and sub. AI	Ovsynch	Ovsynch
Resynch before preg check	YES	YES
<u>Programs Description</u>		
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 (%)	0	80
CR heat bred before first TAI service (%)	0	25
CR first TAI service (%)	30	30
Heat bred after first TAI service (%)	0	60
CR heat bred after first TAI service (%)	0	33
CR second and subsequent TAI services (%)	28	28
<u>Pregnancy Diagnosis</u>		
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

# Describe tu programa reproductivo

Usa estándares para el primer servicio

<b>Synchronization Program</b>	<b>VWP (d)</b>	<b>Conception Rate (%)</b>	
		<b>Mean</b>	<b>Range</b>
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)

# Describe tu programa reproductivo

Usa estándares pero servicios adicionales

<b>Synchronization Program</b>	<b>Interbreeding Interval</b>	<b>Conception Rate (%)</b>	
	<b>(d)</b>	<b>Mean</b>	<b>Range</b>
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)

# Describe tu programa reproductivo

Incluye los costos/inversiones realizadas

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

Synchronization

Labor for injection	15.0	15.0
---------------------	------	------

Hormones

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

# Describe tu programa reproductivo

Incluye los costos/inversiones realizadas

## Detection of Estrus

### Visual Observation

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

## Activity monitors for Heat Detection

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

# Describe tu programa reproductivo

Incluye costos de labor

## 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
		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
Current	Pregnancy	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
	Diagnosis	# 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
		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
Alternative	Pregnancy	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
	Diagnosis	# Cows	0.0	36.0	0.0	52.0	0.0	0.0	0.0

# Corre el análisis

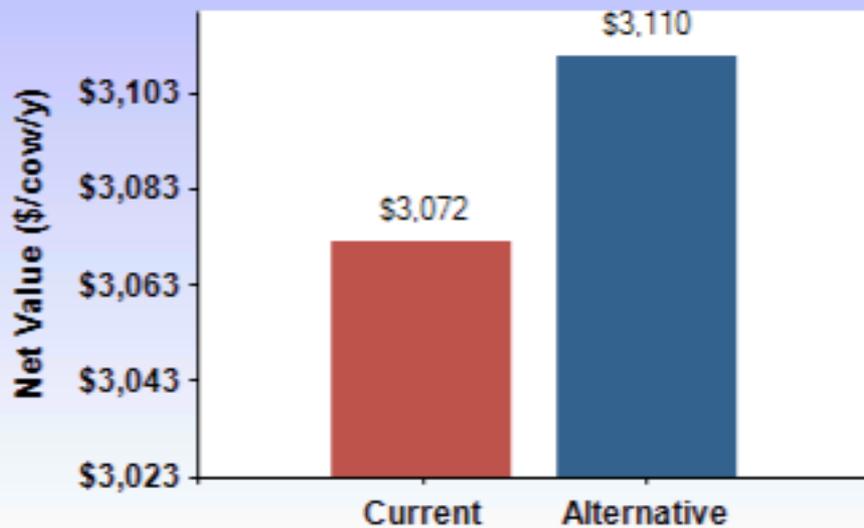
Toma entre 2 y 10 minutos



# Estudia los resultados

Las diferencias son lo mas importante

## Economic Results



## Profit made by switching to the Alternative program

\$/herd/year



**\$3,860**

\$/cow/year



**\$38.6**

# Estudia los resultados

Las diferencias son lo mas importante

## Contribution to Net Value

Item	Current	Alternative	Diff
Total Net Value (\$/cow/y)	3,071.8	3,110.4	38.6
IOFC (\$/cow/y)	3,266.8	3,280.7	13.9
Replacement Cost (\$/cow/y)	-191.0	-183.9	7.1
Reproductive Cost (\$/cow/y)	-41.3	-27.6	13.7
Calf Value (\$/cow/y)	37.3	41.2	3.9

# Estudia los resultados

Las diferencias son lo mas importante

## Cows Leaving the Herd

Item	Current	Alternative	Diff
Total Culling (%)	41.2	39	-2.2
Non-Reproductive Culling (%)	26.3	25.3	-1
Mortality (%)	4.1	3.9	-0.2
Reproductive Culling (%)	10.8	9.8	-1

## Heifer Supply and Demand

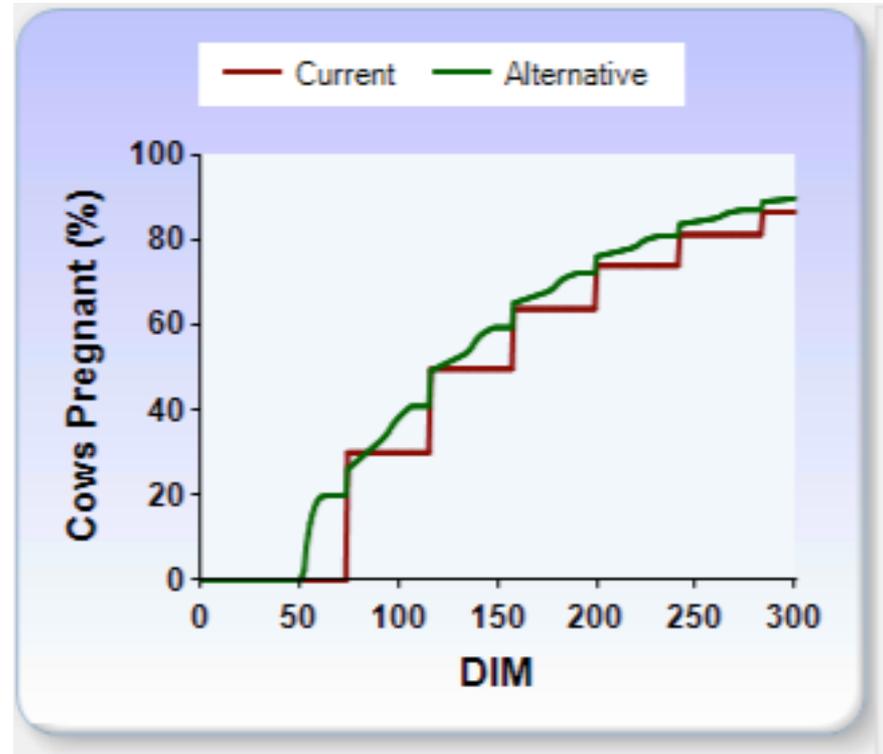
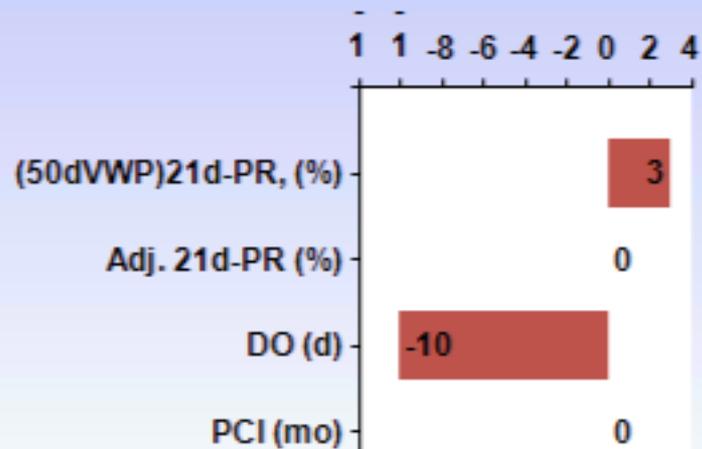
Item	Current	Alternative
Heifer Supply (% of herd/year)	40.9	41.4
Heifer Demand (% of herd/ye...	41.2	39.1
Heifer Balance	-0.3	2.3

# Estudia los resultados

Las diferencias son lo mas importante

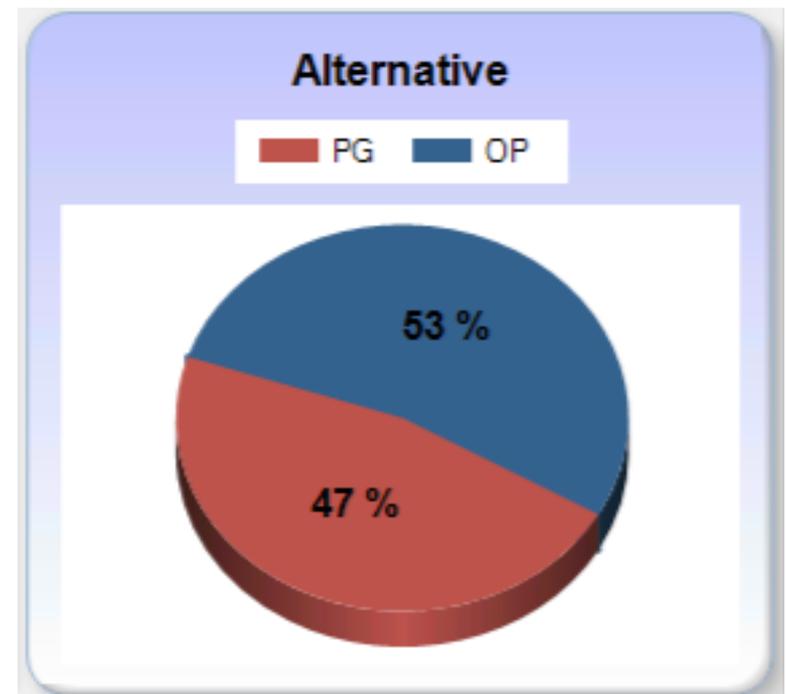
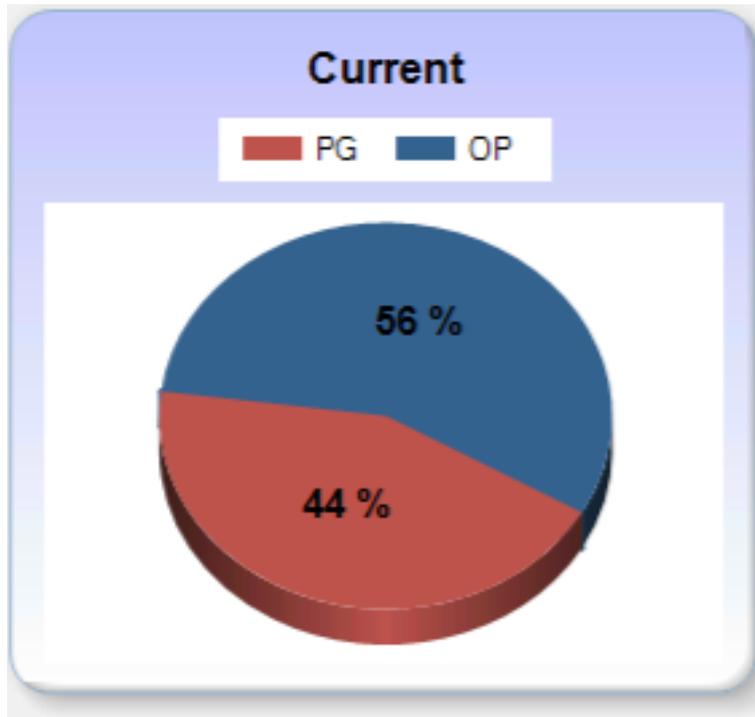
## Reproductive Performance

Expected change by switching to the Alternative program



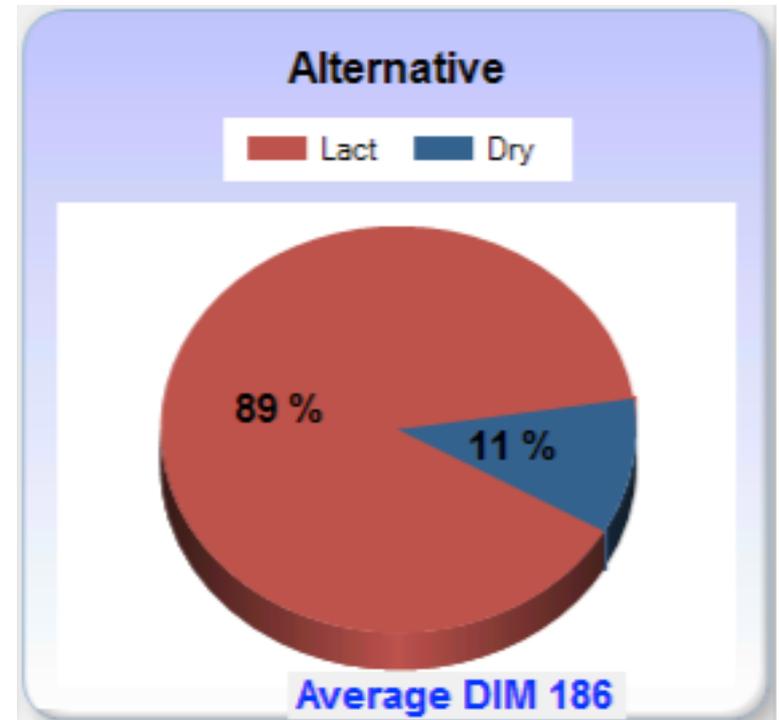
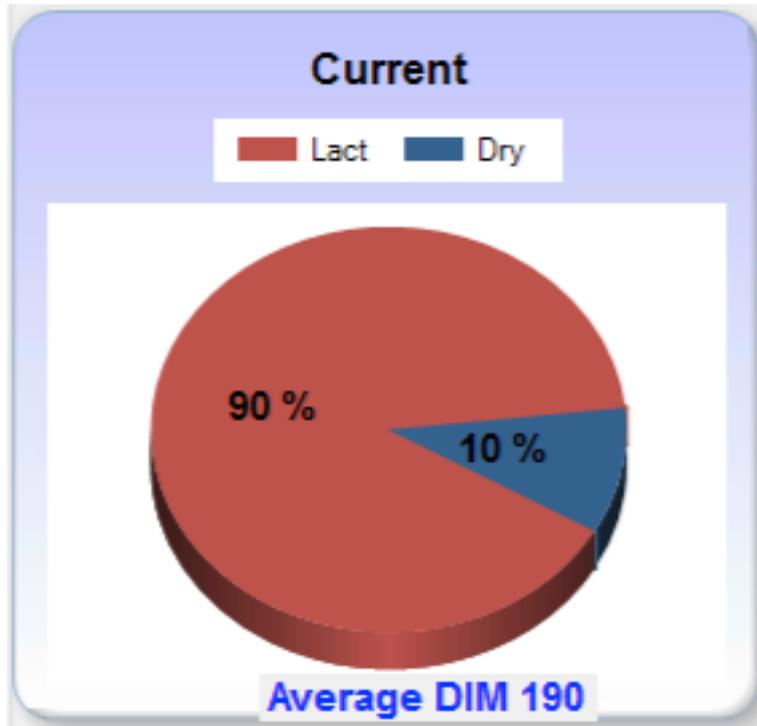
# Estudia los resultados

Relación de vacas preñadas y abiertas



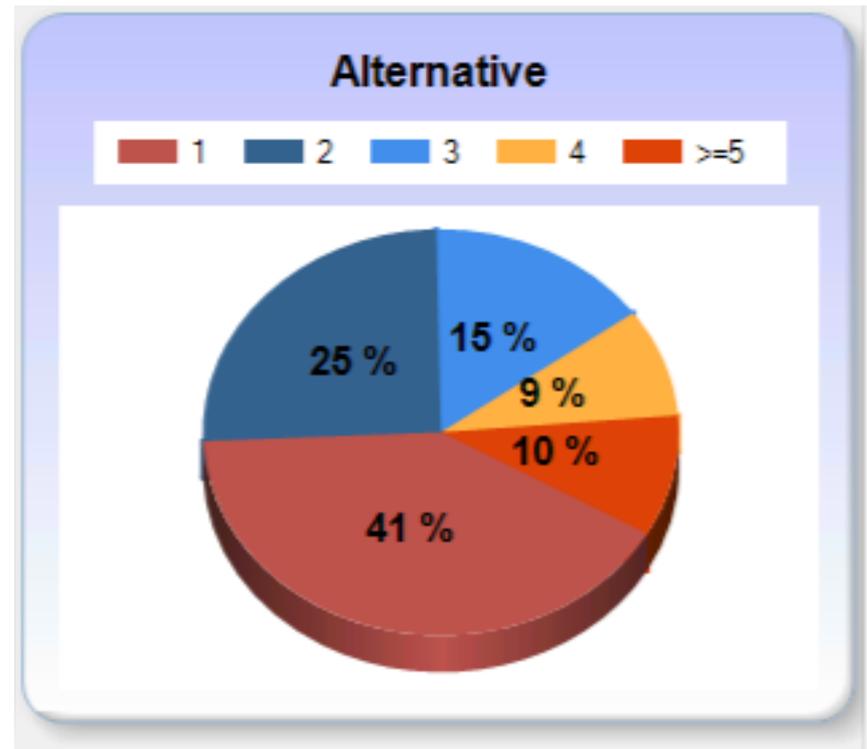
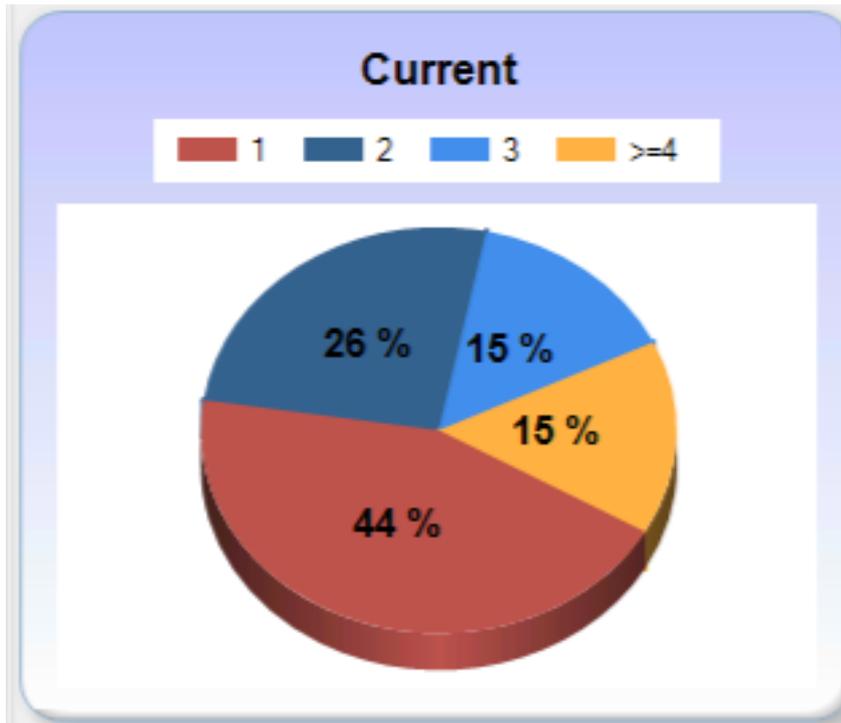
# Estudia los resultados

Relación de vacas productivas y secas

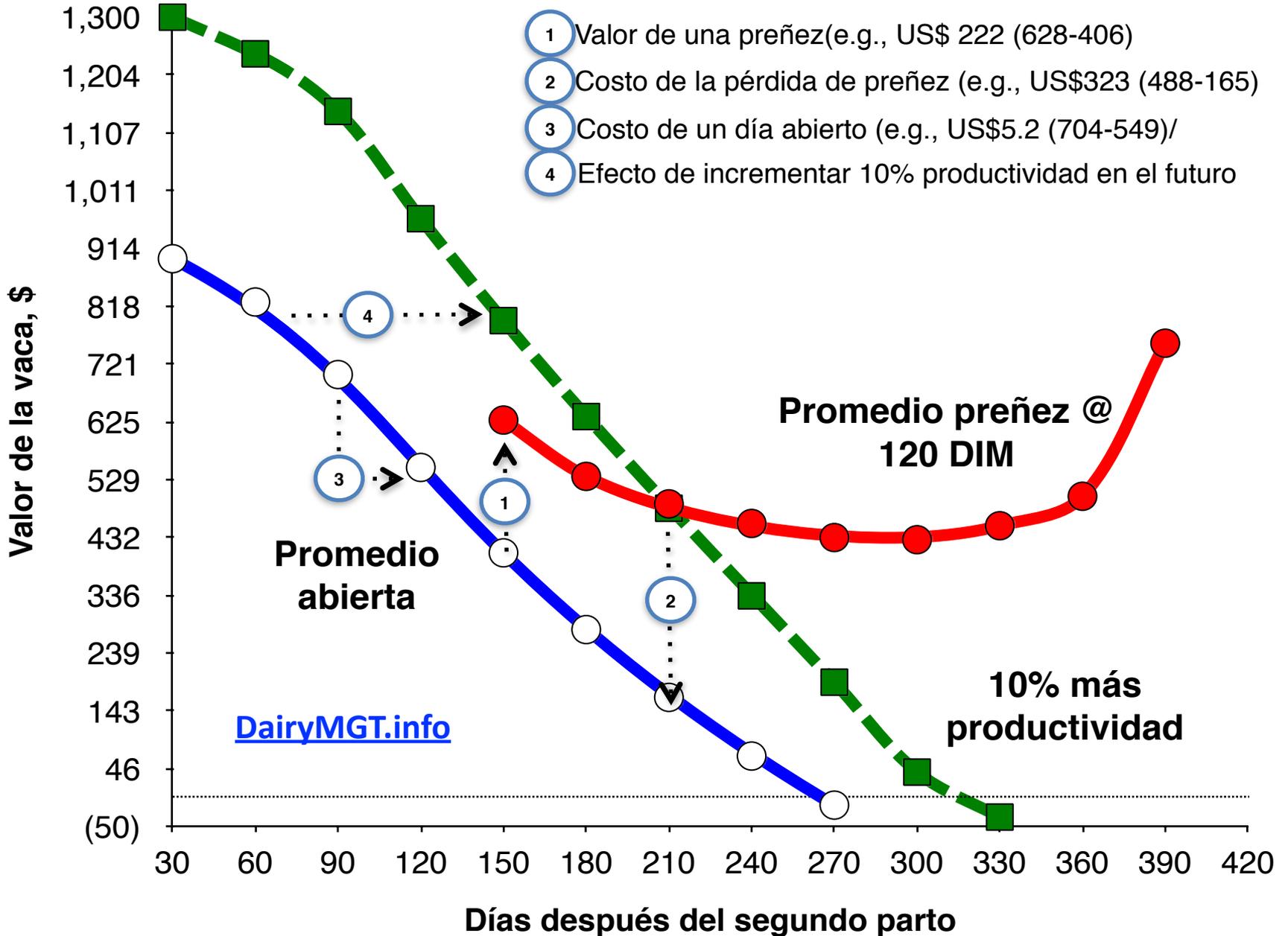


# Estudia los resultados

Distribución de animales por lactancia



# El Valor de Una Vaca



# Agradecimientos

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Food and Agriculture**



United States Department of Agriculture  
National Institute of Food and Agriculture



GRACIAS!!!

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