



University of Wisconsin Dairy Management

Cuánto mas dinero podría ganar mejorando la eficiencia reproductiva de vacas en lactancia?

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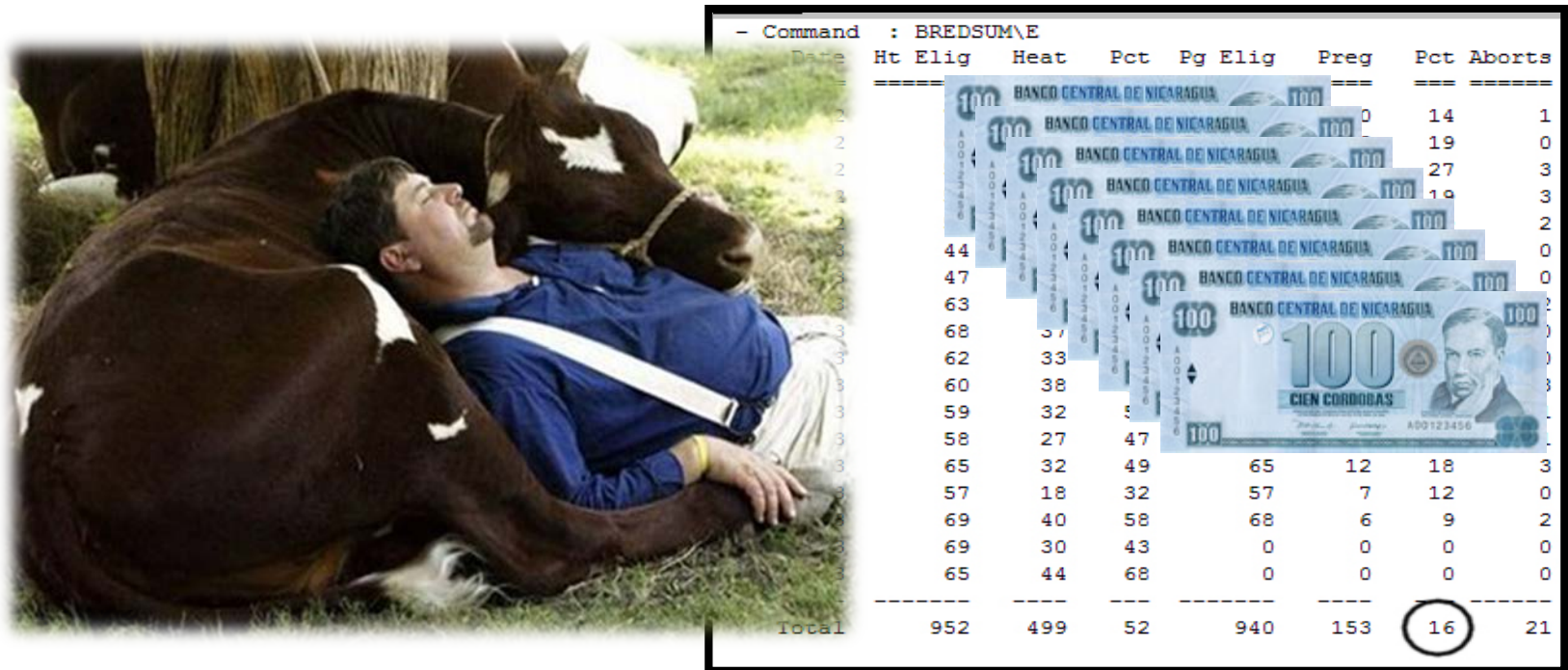
United States
Department of
Agriculture

National Institute
of Food and
Agriculture



Introducción

→ Productores no saben cual es el \$valor de mejorar reproducción!



Introducción

→ Performance reproductiva es asociada con rentabilidad



Louca and Legates, 1968

Britt, 1985

Lima et al., 2010

Introducción

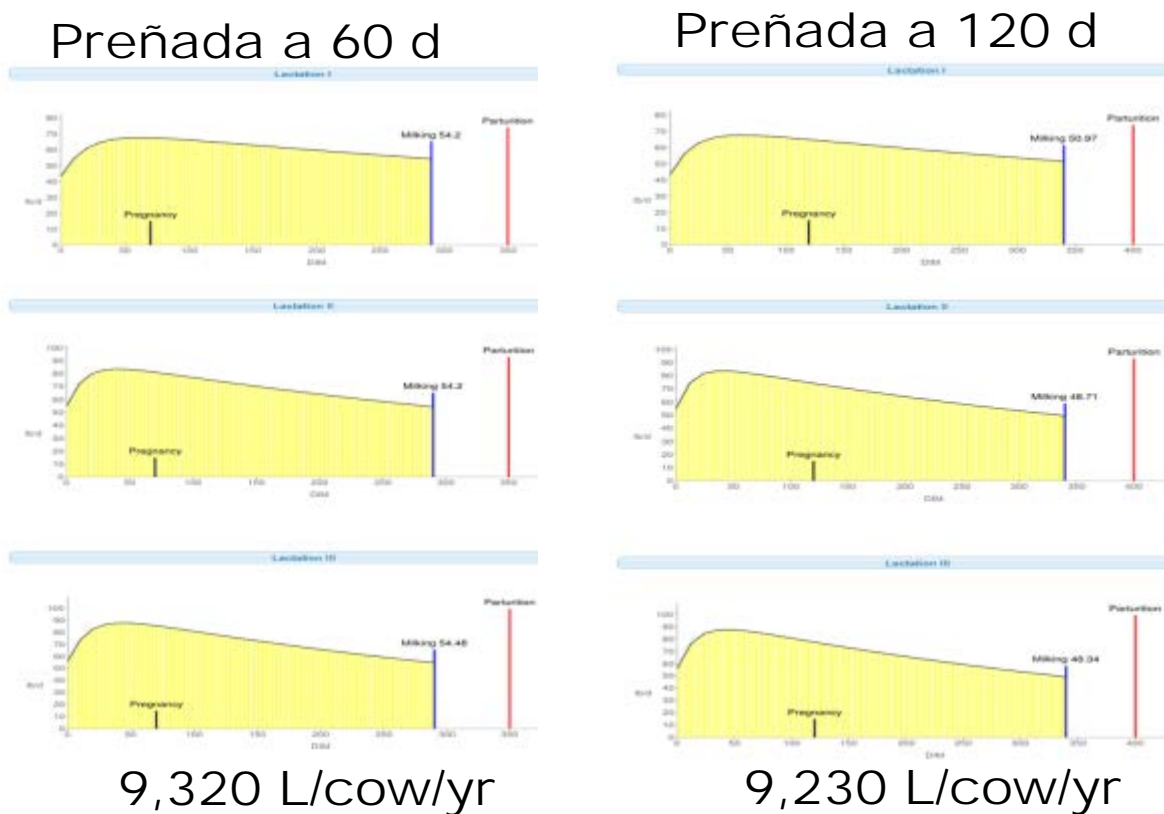
→ Cálculo es complejo!

REPOSICION DE COSTOS
DESCARTE
LECHE TERNEROS



Introducción

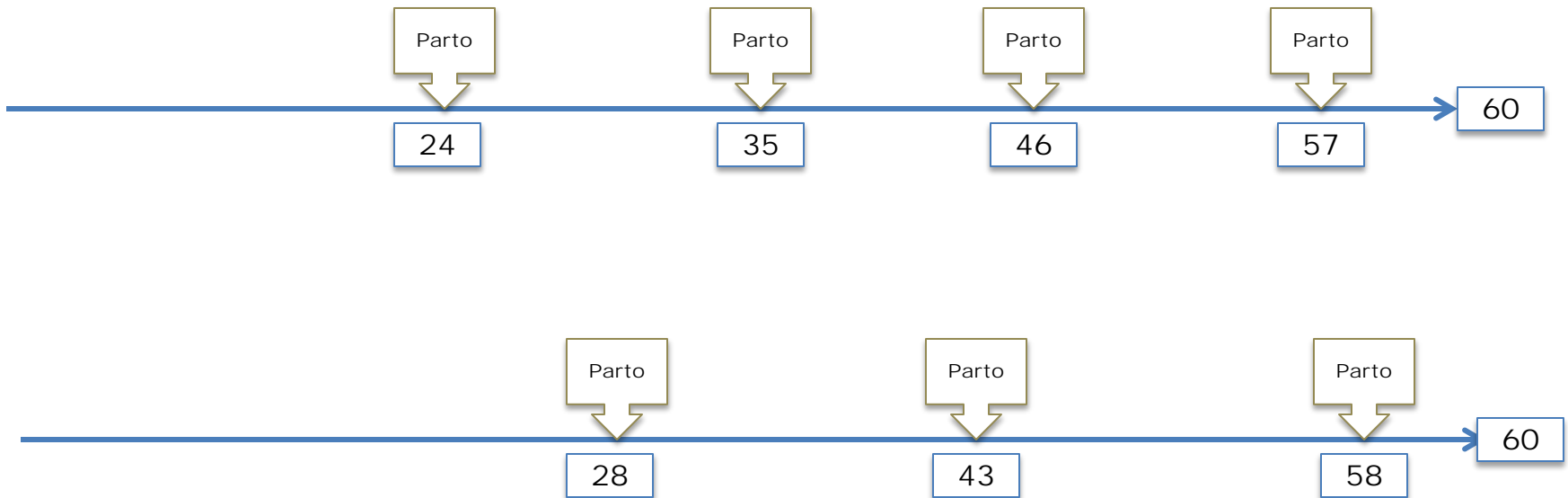
→ Producción/productividad



60 d menos =
↑ **90 L/cow/yr**

Introducción

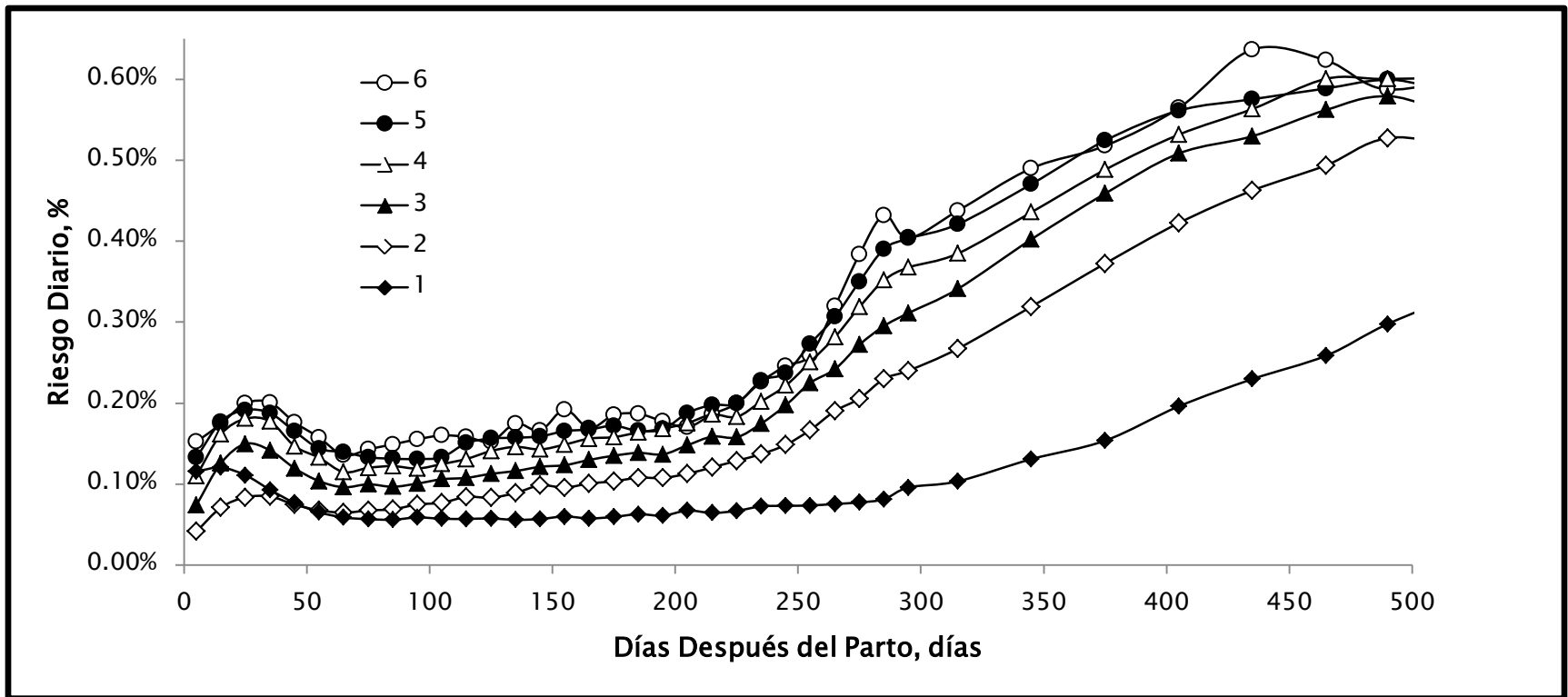
→ Número de nacimientos



Por Ejemplo: 1 cría mas por vaca en 60 meses de vida adulta

Introducción

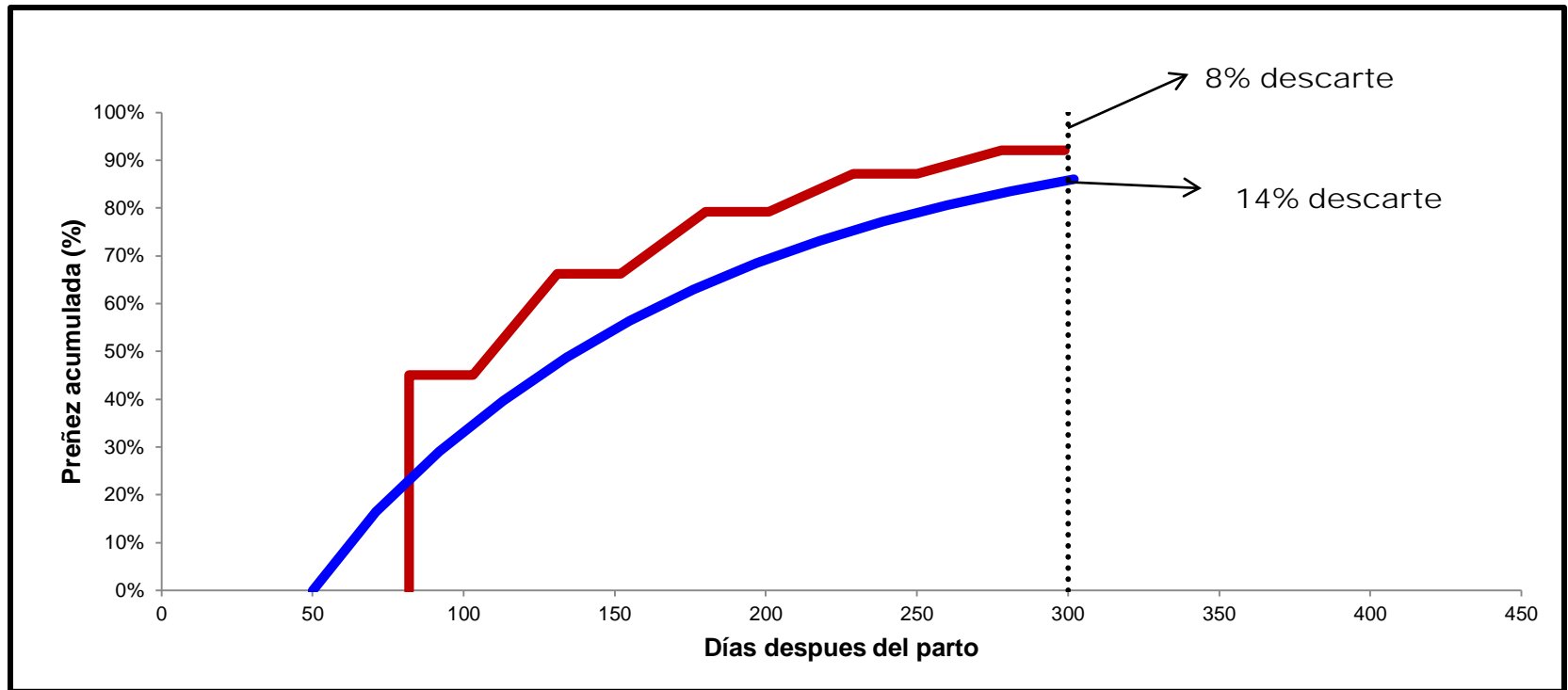
→ Descarte involuntario



Por ejemplo: ↑ descarte tarde en la lactancia

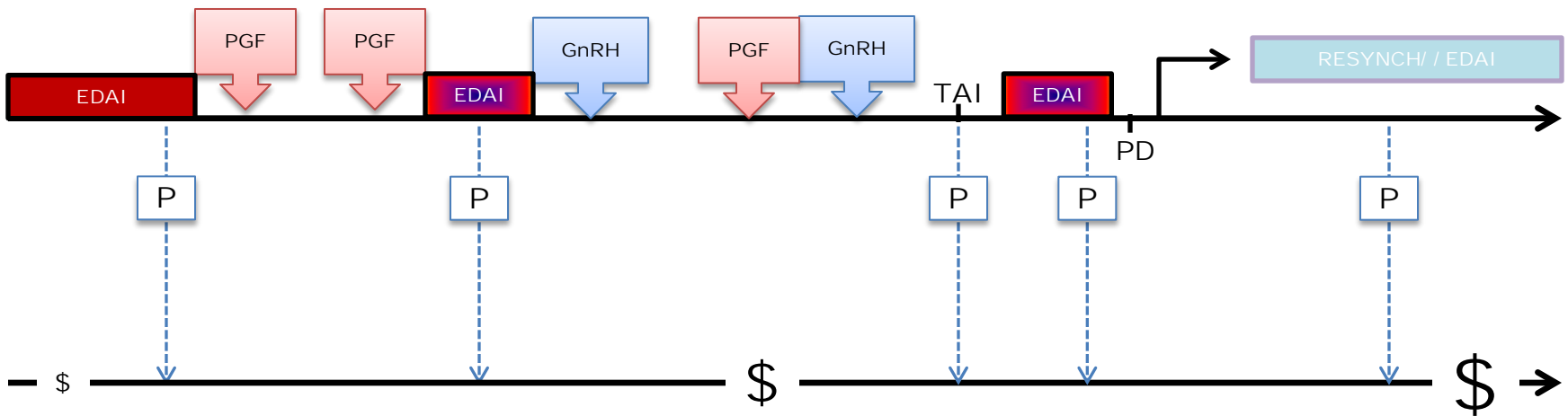
Introducción

→ Descarte voluntario



Introducción

→ Costos de reproducción



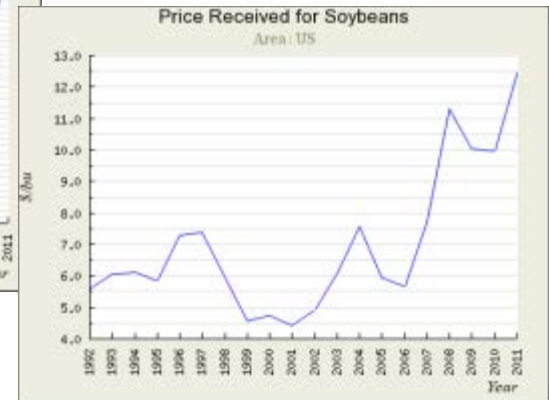
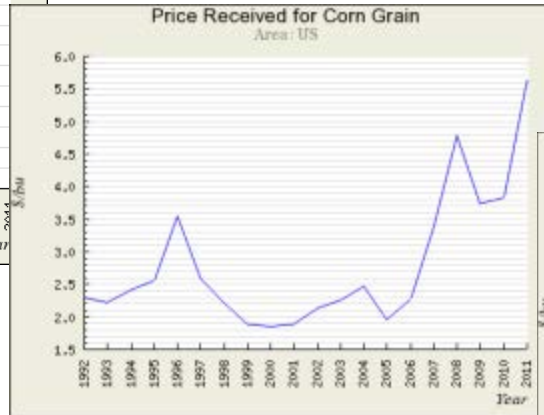
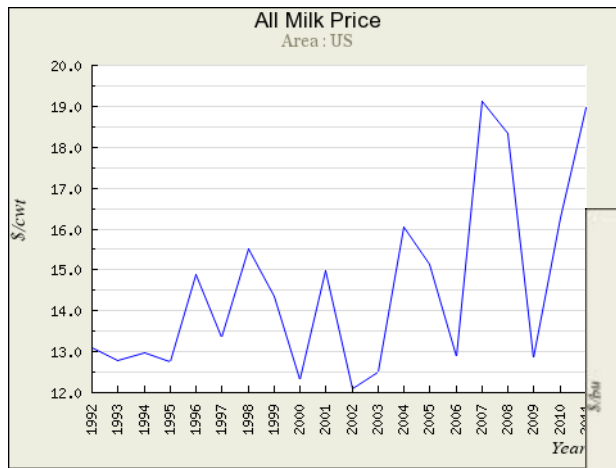
Introducción

→ Específico para una lechería



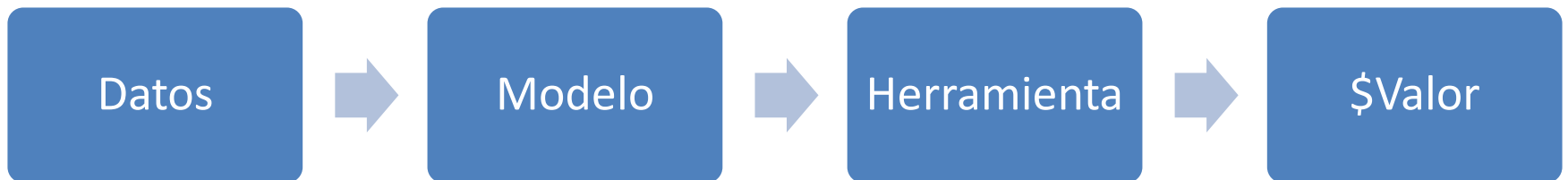
Introducción

→ Depende del mercado!



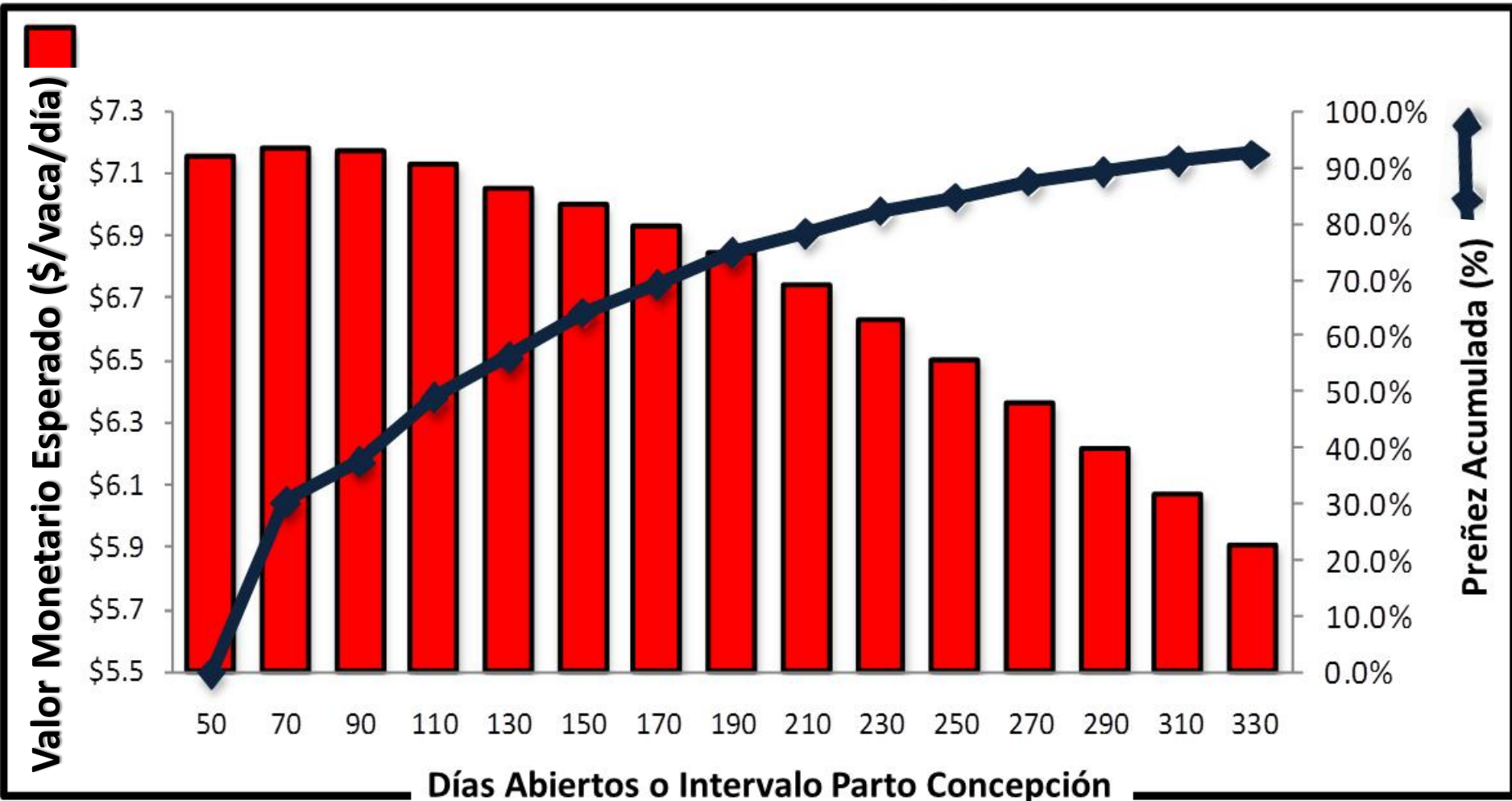
Objetivo

→ Crear «herramienta(s)» que calcule(n) el \$valor de programas reproductivos en lecherías



Un Enfoque

Valor Monetario Esperado



Valor Neto

→ Diferencia entre ingresos y egresos de una curva reproductiva



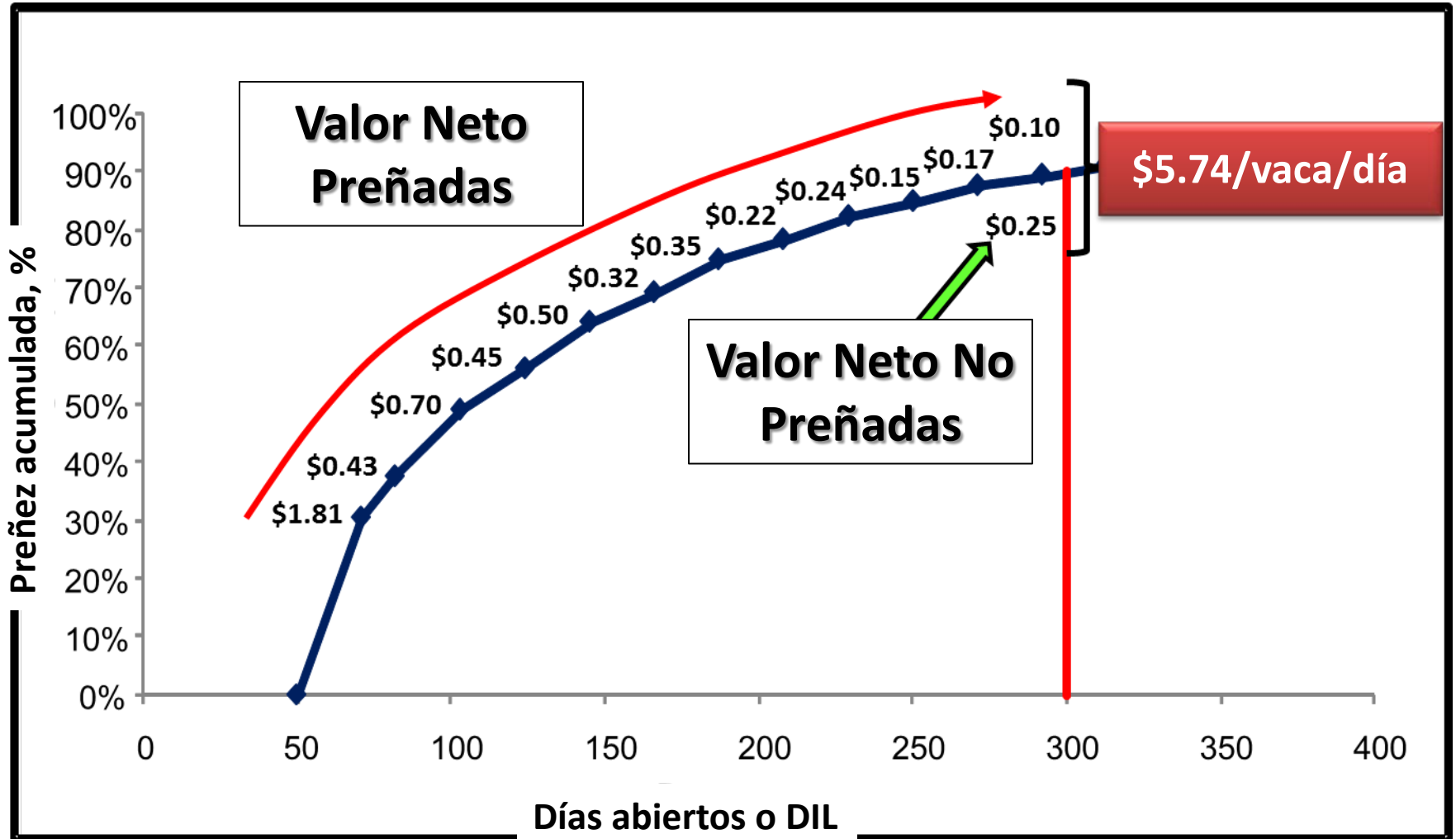
Valor Neto

→ Performance reproductiva

| | Días Abiertos | Disponibles | Tasa IA | Preñez/Periodo | Abierta/Periodo | Preñadas | No Preñadas |
|-------------------|---------------|-------------|---------|----------------|-----------------|----------|-------------|
| | días | | | | % | | |
| Espera Voluntaria | 50 | 100.00 | 0.00 | | | 0.00 | 100.00 |
| Detección Celos | 71 | 100.00 | 80.00 | 30.40 | 49.60 | 30.40 | 69.60 |
| 1er IATF | 82 | 20.00 | 20.00 | 7.20 | 12.80 | 37.60 | 62.40 |
| Detección Celos | 103 | 62.40 | 40.56 | 11.36 | 29.20 | 48.96 | 51.04 |
| 2nd IATF | 124 | 21.84 | 21.84 | 7.21 | 14.63 | 56.16 | 43.84 |

Valor Neto

→ Performance económica (\$Valor)



UW-DairyRepro\$



UW-Dairy Repro\$
Victor E. Cabrera & Julio O. Giordano
Department of Dairy Science



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Farm Name **Farm A** Location **Wisconsin**

| 1. Productive Parameters | | |
|---------------------------------------|-------|-------|
| Lactating Cows (#) | | 1,688 |
| Rolling Herd Average (RHA) (lb/cow/y) | 30000 | |
| Involuntary Culling Rate (%) | | 29.4% |
| Mortality Rate (%) | | 6.9% |
| Stillbirth Rate (%) | | 9.0% |

| 2. Lactation Curves | | | Lact. 1 | Lact. 2 | Lact. > 2 |
|----------------------|-----|-------------------------------|---------|---------|-----------|
| Cow Number | | | 778 | 469 | 441 |
| Body Weight (lb/cow) | | | 1,350 | 1,400 | 1,450 |
| Test | DIM | Define Lactation Curves Below | | | |
| 1 | 15 | 61 | 86 | 89 | |
| 2 | 45 | 81 | 107 | 111 | |
| 3 | 75 | 90 | 110 | 114 | |
| 4 | 105 | 94 | 107 | 108 | |
| 5 | 135 | 93 | 100 | 102 | |
| 6 | 165 | 90 | 92 | 97 | |
| 7 | 195 | 91 | 84 | 91 | |
| 8 | 225 | 87 | 77 | 84 | |
| 9 | 255 | 85 | 74 | 79 | |
| 10 | 285 | 83 | 65 | 78 | |
| 11 | 315 | 78 | 62 | 81 | |
| 12 | 345 | 72 | 53 | 75 | |
| 13 | 375 | 68 | 52 | 67 | |
| 14 | 405 | 63 | 59 | 66 | |
| 15 | 435 | 51 | 51 | 49 | |
| 16 | 465 | 51 | 43 | 52 | |
| 17 | 495 | 51 | 35 | 47 | |
| 18 | 525 | 47 | 30 | 43 | |
| 19 | 555 | 44 | 25 | 38 | |

| 3. Economic Parameters | | | <input type="checkbox"/> Check if total breeding costs are known |
|---------------------------------------|--|-------|--|
| Milk Price (\$/cwt) | | 16.97 | |
| Cost Feed Lactating (DM) (\$/lb) | | 0.10 | |
| Dry Period Fixed Cost (\$/d) | | 2.20 | |
| Female Calf Value (\$/calf) | | 108 | |
| Male Calf Value (\$/calf) | | 40 | |
| Heifer Replacement Value (\$/heifer) | | 1,288 | |
| Salvage Value (\$/cow) | | 624 | |
| Labor Cost for Injection (\$/hr) | | 15.00 | |
| Heat Detection Cost (\$/hr) | | 15.00 | |
| Artificial Insemination Cost (\$/cow) | | 10.00 | |
| Interest Rate (%) | | 6.5% | |

| 4. Pregnancy Diagnosis Cost | | | Current | Alternative | 100% HD |
|-----------------------------|--|-----|---------|-------------|---------|
| Palpation (\$/hr) | | 105 | | | 105 |
| Ultrasound (\$/hr) | | | | 135 | |
| Blood Test (\$/cow) | | | | | |

| 5.a. Reproductive Program | | | Start day | Alternative | Start day |
|---|----------------|-----|----------------|-------------|-----------|
| | Current | day | | day | |
| 1 st Service Postpartum | Double-Ovsynch | Fri | Double-Ovsynch | Fri | |
| 2 nd and Subsequent Services | Ovsynch | Mon | Double-Ovsynch | Fri | |
| Resynch before preg check | YES | | YES | | |

| 5.b. Reproductive Program Parameters | | | Current | Alternative | 100% HD |
|---|--|-----|---------|-------------|---------|
| Voluntary Waiting Period (d) | | 82 | 82 | 50 | |
| Estrus Cycle Duration (d) | | | 21 | | |
| Maximum DIM for Breeding | | | 300 | | |
| DIM to 1 st TAI (d) | | 82 | 82 | | |
| Interbreeding Interval (d) | | 42 | 49 | | |
| Heat Bred Before 1 st TAI (%) | | 0% | 0% | 50% | |
| CR Heat Bred Before 1 st TAI (%) | | 0% | 0% | 33% | |
| Heat Bred After 1 st TAI (%) | | 0% | 0% | 50% | |
| CR Heat Bred After 1 st TAI (%) | | 0% | 0% | 30% | |
| CR 1 st Service TAI (%) | | 45% | 45% | | |
| CR 2 nd + Services TAI (%) | | 30% | 39% | | |
| Calving Interval (mo) | | | 14.1 | | |
| Dry Period (d) | | | 70 | | |

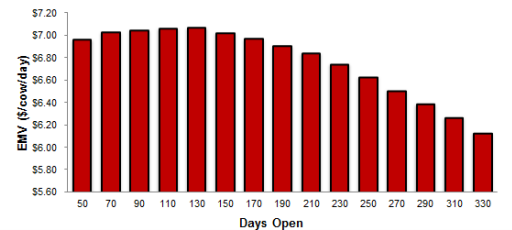
1. Productive and Economic Parameters Summary

| | | |
|---------------------------------------|------|-------|
| Cows in Parity All | (#) | 1688 |
| Rolling Herd Average (RHA) (lb/cow/y) | | 30000 |
| Milk Price (\$/cwt) | | 16.97 |
| Average Value New Born | (\$) | 74 |
| Heifer Replacement Value | (\$) | 1,288 |
| Salvage Value | (\$) | 624 |

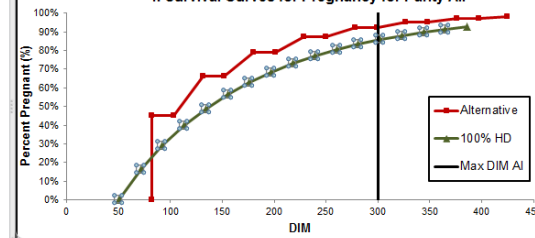
2. Reproductive Programs Summary

| | Current | | Alternative | Baseline |
|---|----------------|------------|----------------|---------------|
| | Double-Ovsynch | Ovsynch | Double-Ovsynch | Heat Breeding |
| 1 st Service Postpartum | 82d | 82d | 82d | 50d |
| 2 nd and Following Services | | | | |
| Voluntary Waiting Period | | | 300d | |
| Maximum DIM for Breeding | 82d | 82d | | |
| DIM 1st TAI | 42d | 49d | | 21d |
| Interbreeding Interval | 0% | 0% | 50% | |
| Heat Bred Before 1 st TAI | 0% | 0% | 33% | |
| CR Heat Bred Before 1 st TAI | 0% | 0% | 50% | |
| Heat Bred After 1 st TAI | 0% | 0% | 30% | |
| CR Heat Bred After 1 st TAI | 45% | 45% | | |
| CR 1 st Service TAI | 30% | 39% | | |
| CR 2 nd + Services TAI | 22% | 25% | 15% | |
| 21d-Pregnancy Rate | 61% | 61% | 50% | |
| 21d-Service Rate | 38% | 42% | 32% | |
| Average CR all breedings | 131 | 130 | 142 | |
| Days Open (d) | 14.0 | 14.0 | 14.7 | |
| Projected Calving Interval (mo) | \$29.17 | \$29.23 | | |
| Cost 1st Service Breeding | \$21.00 | \$29.23 | | |
| Cost Resynch Breedings | \$13.04 | \$13.55 | \$13.06 | |
| Cost Heat Breedings | Palpation | Ultrasound | Palpation | |
| Pregnancy Diagnosis Method | 3.00 | 3.55 | 3.06 | |
| Pregnancy Diagnosis Cost | | | | |

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



4. Survival Curves for Pregnancy for Parity All



Parámetros Productivos

1. Parámetros Productivos

| | | |
|-------------------------------------|---------|-------|
| Vacas Totales $\geq 1^{\circ}$ Lact | (N°) | 400 |
| Tasa de Descarte Involuntario | (%/Año) | 14.3% |
| Tasa de Mortandad (Adultos) | (%/Año) | 6.5% |
| Tasa de Nati-muertos | (%) | 8.0% |

| 2. Curvas de Lactancias | | 1° Lact | 2° Lact | > 2° Lact |
|-------------------------|-----|---------|---------|-----------|
| Numero de Vacas | | 120 | 90 | 190 |
| Peso (Kg/Vaca) | | 575 | 667 | 667 |
| Control | DEL | | | |
| 1 | 15 | 22 | 30 | 31 |
| 2 | 45 | 28 | 33 | 34 |
| 3 | 75 | 30 | 34 | 36 |
| 4 | 105 | 30 | 35 | 37 |
| 5 | 135 | 32 | 31 | 38 |
| 6 | 165 | 30 | 30 | 35 |
| 7 | 195 | 24 | 22 | 30 |
| 8 | 225 | 24 | 21 | 26 |
| 9 | 255 | 21 | 21 | 17 |
| 10 | 285 | 20 | 18 | 16 |
| 11 | 315 | 19 | 17 | 14 |
| 12 | 345 | 20 | 15 | 13 |
| 13 | 375 | 19 | 12 | 12 |
| 14 | 405 | 15 | 6 | 8 |
| 15 | 435 | 14 | 6 | 2 |
| 16 | 465 | 12 | 3 | 0 |
| 17 | 495 | 10 | 0 | 0 |
| 18 | 525 | 9 | 0 | 0 |
| 19 | 555 | 7 | 0 | 0 |

Parámetros Económicos

3. Parámetros Económicos

Marque si conoce los costos de Reproducción*

| | | |
|--------------------------------|--------------|-------|
| Precio Leche | (\$/Lt) | 1.40 |
| Alimentación Vacas Ordeño | (\$/KgMS) | 0.65 |
| Alimentación Vacas Secas | (\$/día) | 4.50 |
| Ternera recién nacida | (\$/ternera) | 750 |
| Ternero recién nacido | (\$/ternero) | 200 |
| Vaquillona de Reemplazo | (\$/Vaq) | 7000 |
| Vaca de Descarte | (\$/Vaca) | 3000 |
| Colocación de Hormonas (labor) | (\$/hr) | 17.00 |
| Detección de Celos (labor) | (\$/hr) | 17.00 |
| Inseminación (semén + labor) | (\$/Vaca) | 25.00 |
| Tasa de Interés | (%/Año) | 12.0% |

* Ver instrucciones.

4. Costo del Diagnóstico de Preñez

| | | Actual | Alternativo | 100% DC |
|----------------|-----------|--------|-------------|---------|
| Palpación | (\$/hr) | 100 | | 100 |
| Ultrasonido | (\$/hr) | | 120 | |
| Test Sanguíneo | (\$/vaca) | | | |

Parámetros Reproductivos

5.b. Parámetros de los Programas Reproductivos

| | | Actual | Alternativo | 100% DC |
|---|---------|--------|-------------|---------|
| Período de Espera Voluntario (PEV) | (días) | 50 | 50 | 50 |
| Duración del Ciclo Estral | (días) | 21 | | |
| Maximo DEL para Preñarse | (días) | 300 | | |
| DEL al 1º IATF | (días) | 70 | 72 | |
| Intervalo entre servicios | (días) | 49 | 42 | |
| Det. de Celos <u>antes</u> de 1º IATF | (%) | 50% | 60% | 53% |
| TC c/Det. Celos <u>antes</u> de 1º IATF | (%) | 33% | 35% | 33% |
| Det. de Celos <u>después</u> de 1º IATF | (%) | 50% | 60% | 53% |
| TC c/Det. Celos <u>después</u> de 1º IATF | (%) | 30% | 30% | 30% |
| TC 1º Servicio c/IATF | (%) | 32% | 35% | |
| TC 2º/posteriores Servicios c/IATF | (%) | 28% | 28% | |
| Intervalo entre Partos | (meses) | 14.1 | | |
| Período Seco | (días) | 62 | | |

5.c. Costos de Hormonas

| Hormona | \$/Frasco | Dosis Frasco |
|-----------------------------|-----------|--------------|
| GnRH | 0 | 0 |
| PGF2 α (\pm eCG) | 50 | 10 |
| Dispositivo Intravaginal P4 | 200 | 10 |
| Estradiol | 80 | 100 |

Parámetros Reproductivos

5.d. Labores de Inyecciones y Diagnóstico de Preñez: Programa Actual

| | | Lun | Mar | Mie | Jue | Vie | Sab | Dom |
|-----------------------|--------------|-----|-----|-----|-----|-----|-----|-----|
| Inyecciones | Trabajadores | | 2 | | | | | |
| | hr/día | | 2 | | | | | |
| | Nº Vacas | | 30 | | | | | |
| Diagnóstico de Preñez | Nº Vacas | | 30 | | | | | |
| | hr/día | | 2 | | | | | |

5.e. Labores de Inyecciones y Diagnóstico de Preñez: Programa Alternativo

| | | Lun | Mar | Mie | Jue | Vie | Sab | Dom |
|-----------------------|--------------|-----|-----|-----|-----|-----|-----|-----|
| Inyecciones | Trabajadores | | 2 | 2 | | | | |
| | hr/d | | 2 | 2 | | | | |
| | Nº Vacas | | 30 | 30 | | | | |
| Diagnóstico de Preñez | Nº Vacas | | 30 | | | | | |
| | hr/día | | 2 | | | | | |

5.f. Labores de Detección de Celos

| | | Lun | Mar | Mie | Jue | Vie | Sab | Dom |
|-----------------------|----------|-----|-----|-----|-----|-----|-----|-----|
| Detección de Celos | Personas | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | hr/día | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Diagnóstico de Preñez | Nº Vacas | 30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | hr/día | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

Mostrar Resultados Según Lactancias

Todas las Lactancias ▼

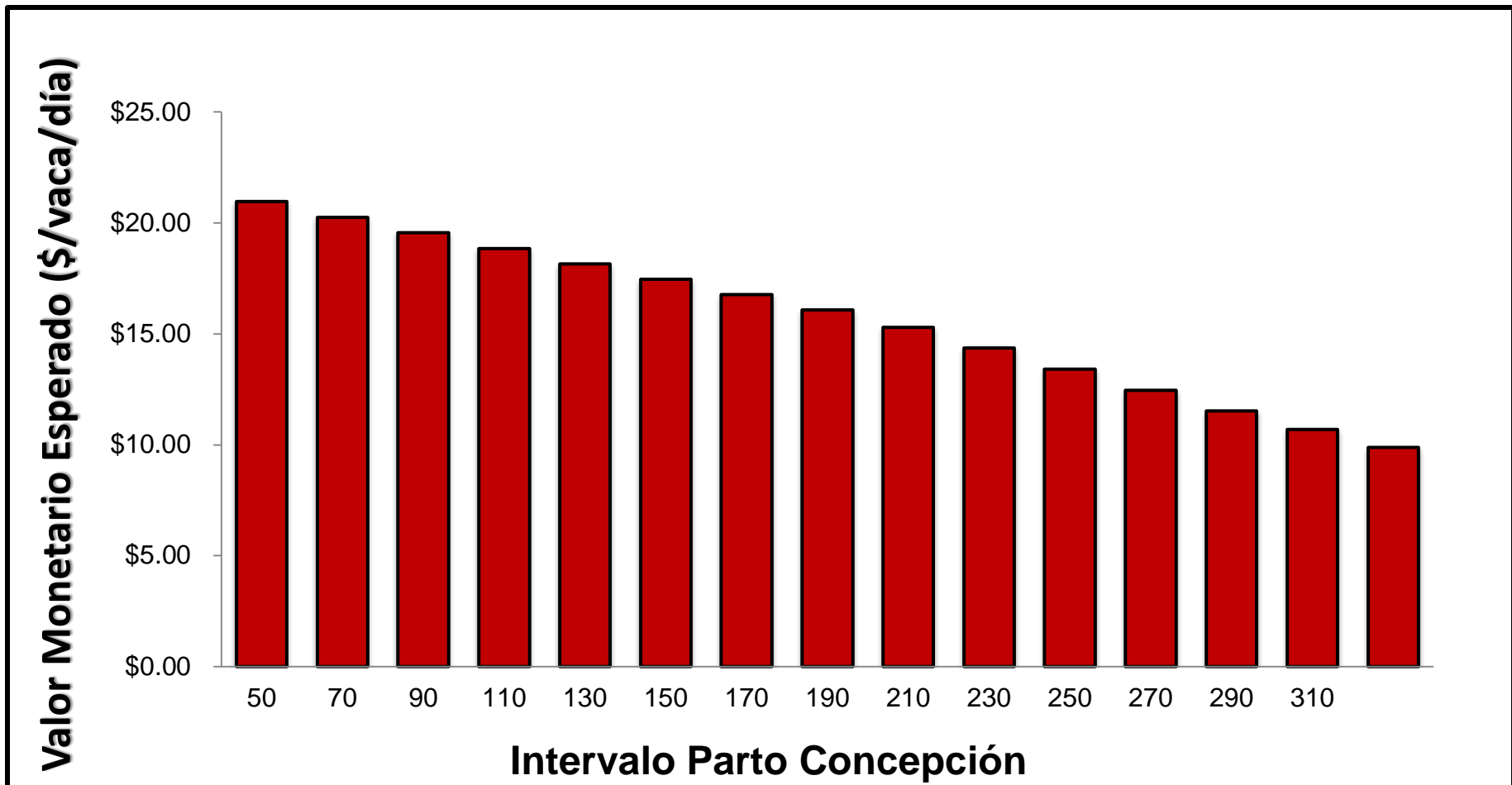
Ejecutar ANALISIS

Resultados: Preñez y Costos

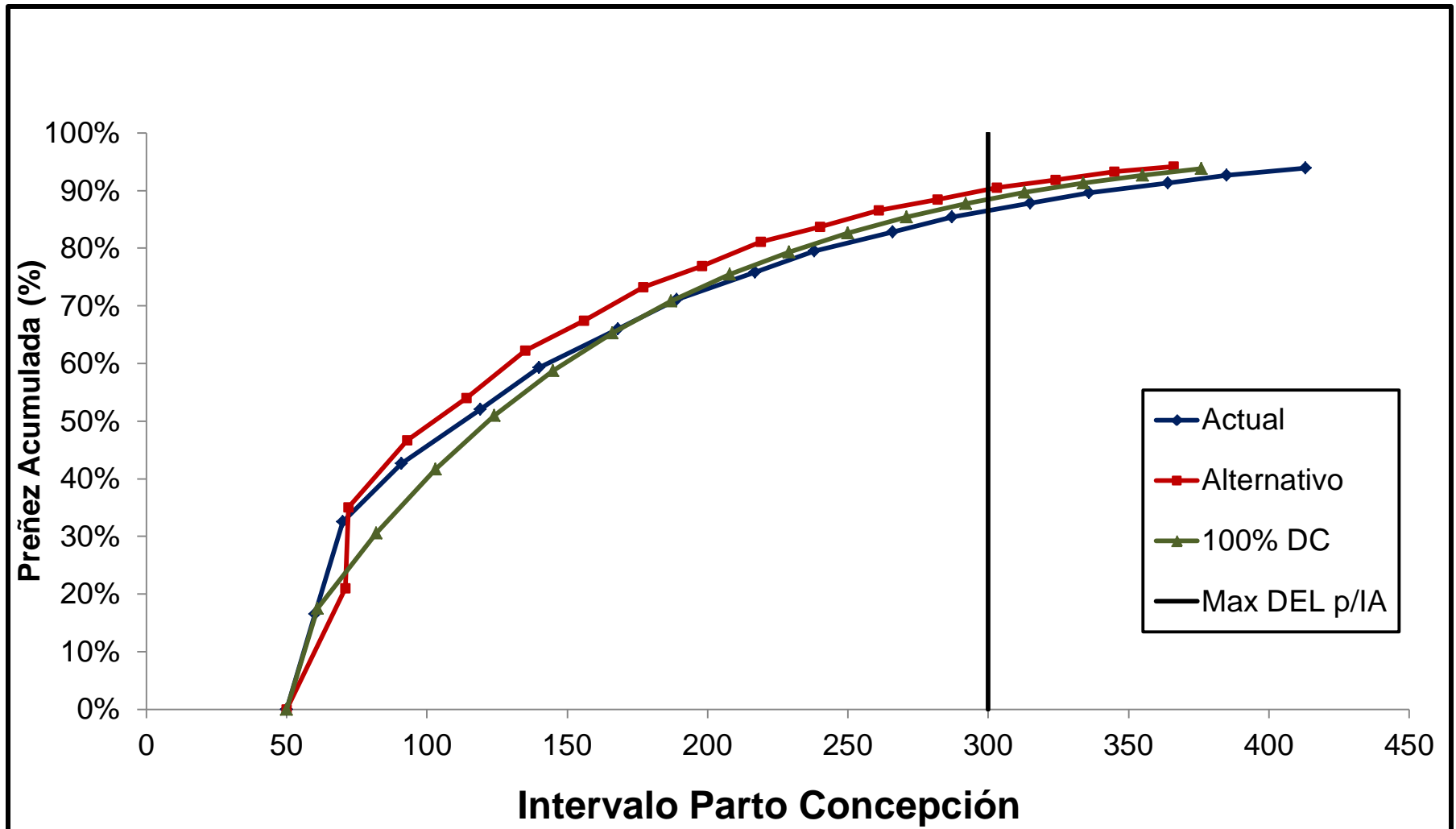
2. Resumen de Parámetros Reproductivos

| | Actual | Alternativo | 100% DC |
|---------------------------------------|--------------------|----------------|--------------------|
| 1º Servicio Posparto | BE-DIV-PGF-ECP | BE-DIV-PGF-BE | Detección de Celos |
| 2º y Sigüientes Servicios | Detección de Celos | BE-DIV-PGF-ECP | Detección de Celos |
| Período de Espera Voluntario | 50d | 50d | 50d |
| Máximo DEL para Preñarse | 300d | | |
| DEL al 1º IATF | 70d | 72d | |
| Intervalo entre Servicios | 49d | 42d | 21d |
| Det. de Celos antes de 1º IATF | 50% | 60% | 53% |
| TC c/Det. Celos antes de 1º IATF | 33% | 35% | 33% |
| Det. de Celos después de 1º IATF | 50% | 60% | 53% |
| TC c/Det. Celos después de 1º IATF | 30% | 30% | 30% |
| TC 1º Servicio c/IATF | 32% | 35% | |
| TC 2º/posteriores Servicios c/IATF | 28% | 28% | |
| % Vacas Descartadas Vacías | 15% | 12% | 12% |
| Tasa de Preñez c/21 días | 18% | 22% | 16% |
| Tasa de Inseminación c/21 días | 61% | 71% | 53% |
| Tasa de Concepción Promedio | 32% | 32% | 32% |
| Intervalo Parto-Concepción | 126 | 123 | 134 |
| Intervalo entre Partos Proyectado | 14.2 | 13.9 | 14.3 |
| Costo del 1º Servicio Sincronizado | \$62.80 | \$66.40 | |
| Costo de Sig. Servicios Sincronizados | \$31.67 | \$64.13 | |
| Costo de Servicios c/ Detección Celos | \$31.77 | \$33.00 | \$31.67 |
| Método de Diagnóstico de Preñez | Palpation | Palpation | Palpation |
| Costo del Diagnóstico de Preñez | 6.67 | 8.00 | 6.67 |

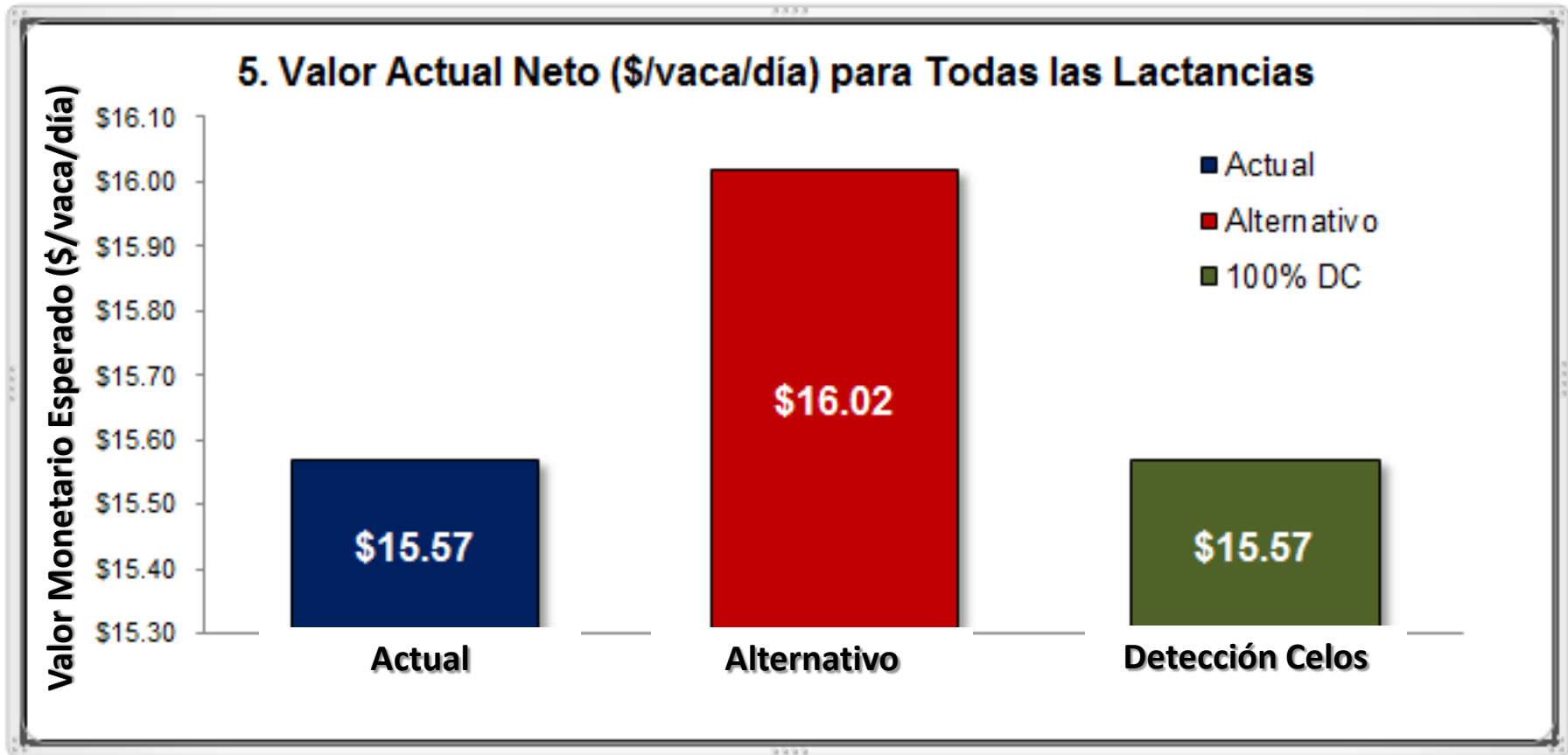
Resultados: Valor Monetario Esperado



Resultados: Preñez



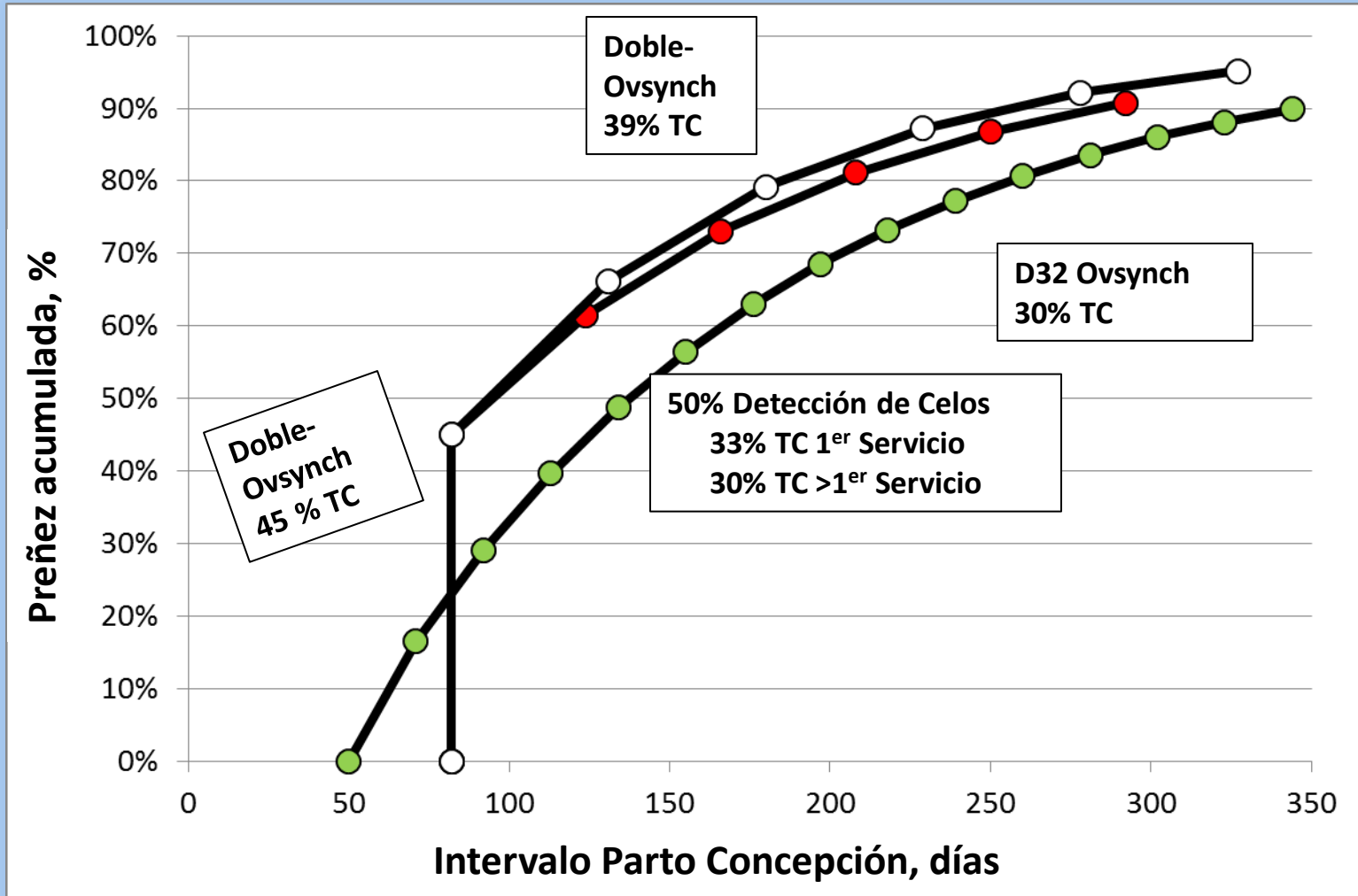
Resultados: Valor Neto



Estudio de Caso

| | | Programa A | Programa B | Programa C |
|--------------------------------------|---|----------------|------------------|---------------|
| 1er Servicio | | Doble OvSynch | | Det. Celo |
| 2do Servicio | | D32 Resynch | Doble OvSynch | Det. Celo |
| Período de Espera Voluntario | d | 82 | 82 | 50 |
| Intervalo entre Servicios | d | 42 | 49 | 21 |
| Tasa de Concepción 1er Servicio | % | 45 | 45 | 33 |
| Tasa de Concepción 2do+ Servicios | % | 30 | 38 | 30 |

Estudio de Caso



Estudio de Caso

| | | Programa A | Programa B | Programa C |
|-----------------------------------|-----|----------------|------------------|---------------|
| 1er Servicio | | Doble OvSynch | | Det. Celo |
| 2do Servicio | | D32 Resynch | Doble OvSynch | Det. Celo |
| 21-d Tasa Preñez | % | 22 | 25 | 15 |
| 21-d Tasa de Servicio | % | 62 | 60 | 50 |
| Promedio Tasa Concepción | % | 38 | 42 | 32 |
| Intervalo de Partos Proyectada | Mes | 14.1 | 14.0 | 14.9 |

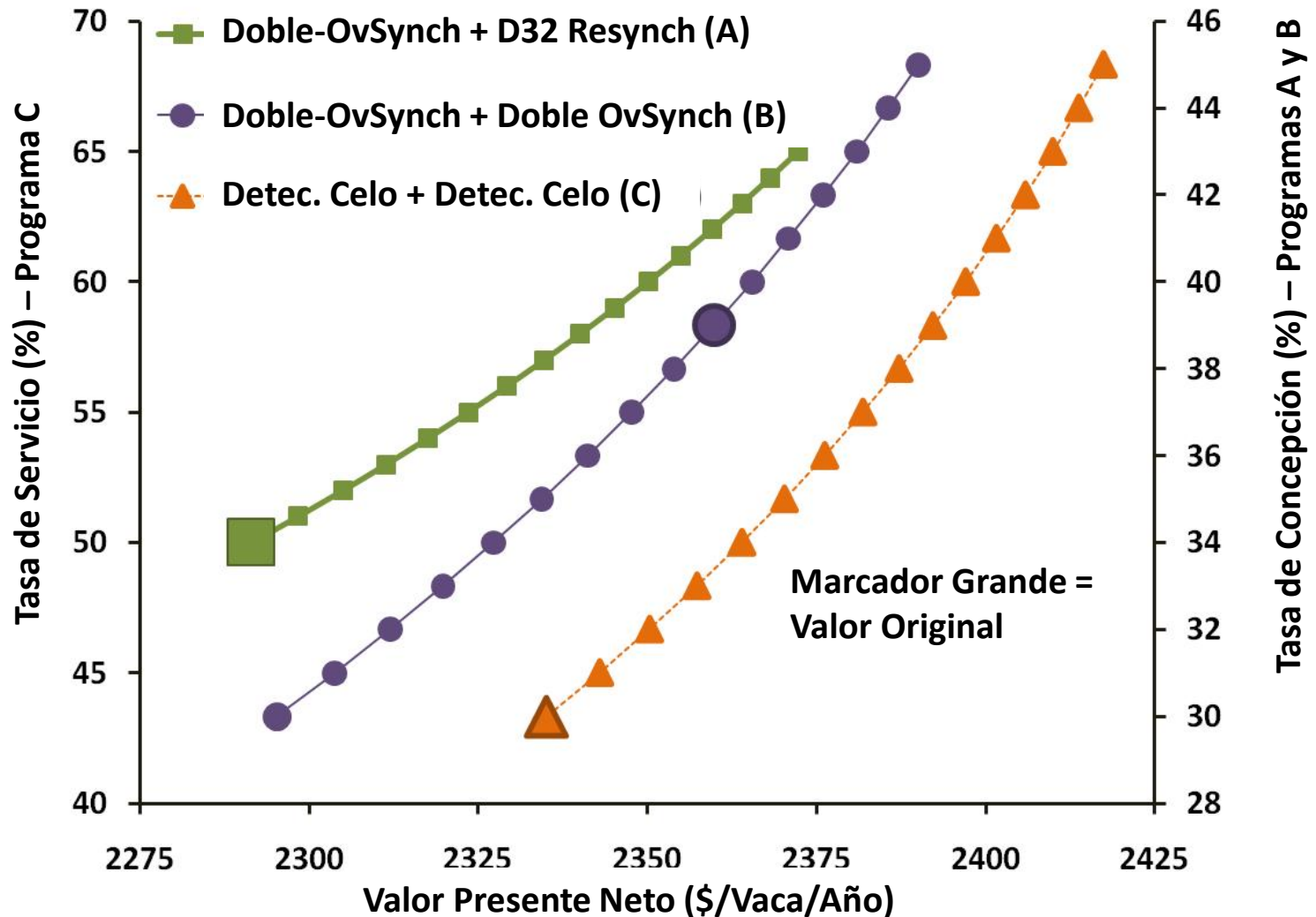
Estudio de Caso

| | | Programa A | Programa B | Programa C |
|---------------------|-------------|---------------|---------------|------------|
| 1er Servicio | | Doble OvSynch | | Det. Celo |
| 2do Servicio | | D32 Resynch | Doble OvSynch | Det. Celo |
| Valor Presente Neto | \$/Vaca/año | \$2,335 | \$2,357 | \$2,291 |
| Valor sobre 100% DC | \$/Vaca/año | \$44 | \$65 | -- |

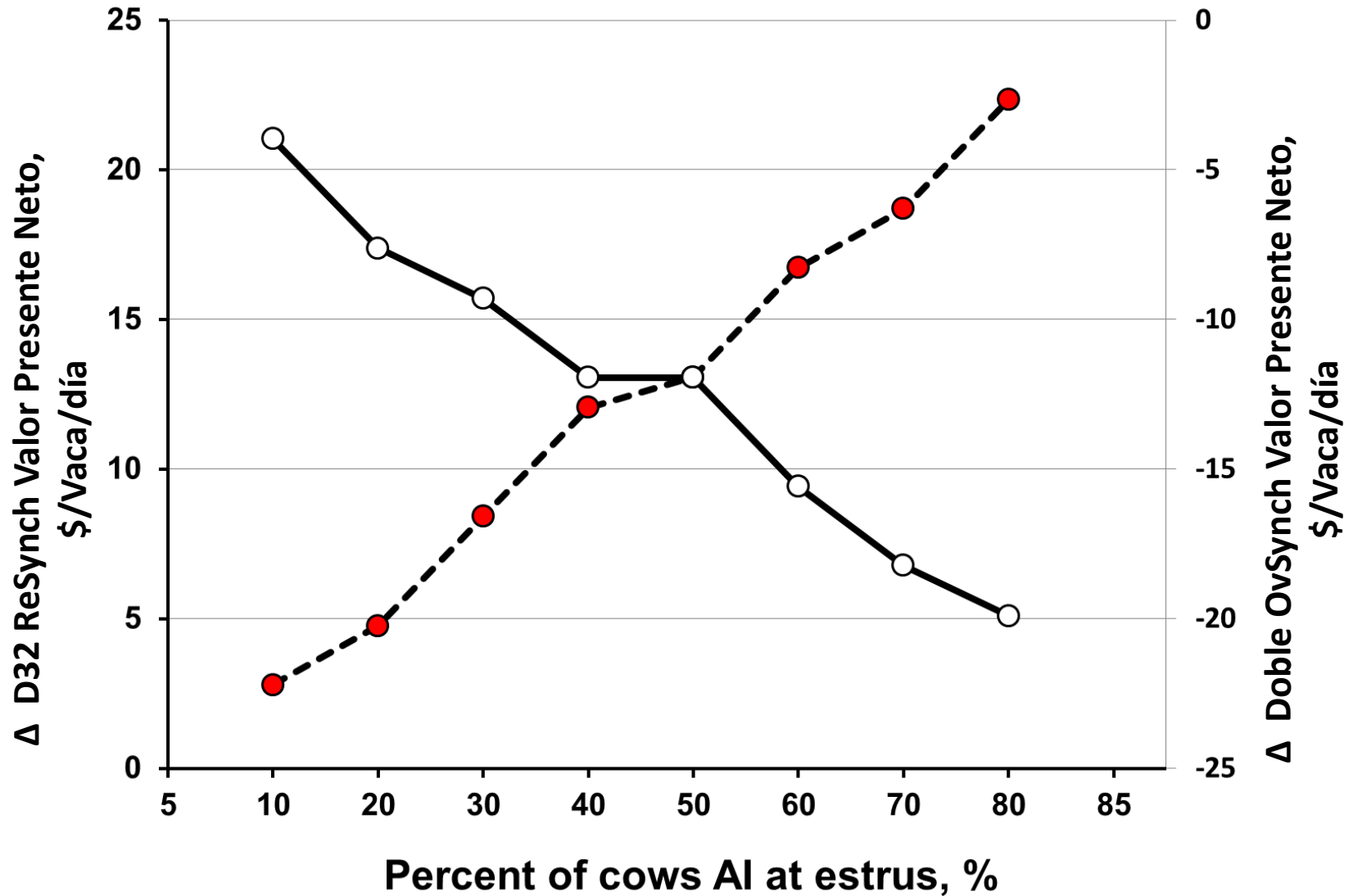
Estudio de Caso

| | | Programa A | Programa B | Programa C |
|---|-------------|----------------|------------------|---------------|
| 1er Servicio | | Doble OvSynch | | Det. Celo |
| 2do Servicio | | D32 Resynch | Doble OvSynch | Det. Celo |
| Ingreso de leche sobre los costos de alimentación | \$/Vaca/año | \$2,623 | \$2,633 | \$2,561 |
| Desecho y Mortandad | \$/Vaca/año | -\$288 | -\$274 | -\$284 |
| Costo Reproductivo | \$/Vaca/año | -\$54 | -\$58 | -\$37 |
| Valor Terneros | \$/Vaca/año | \$55 | \$56 | \$51 |

Estudio de Caso



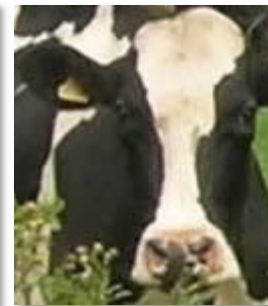
Estudio de Caso





United States
Department of
Agriculture

National Institute
of Food and
Agriculture



University of Wisconsin Dairy Management