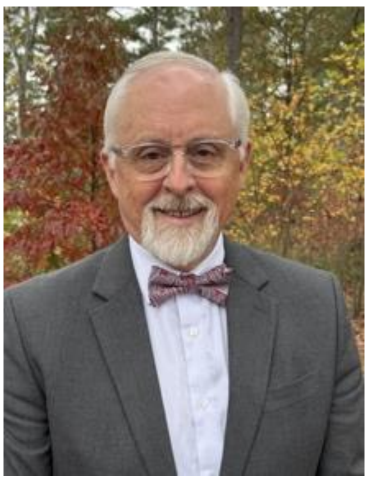
A new perspective on right sizing your heifer inventory

Dr. Michael Overton, DVM, MPVM | Zoetis

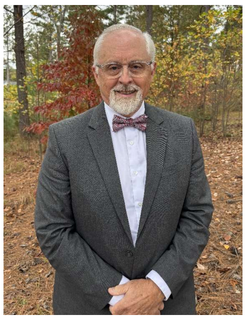
Description of presentation: This presentation explores the economic and biological factors behind right-sizing dairy heifer inventories, challenging the conventional wisdom that lowering replacement rates always improves profitability. It demonstrates how replacement rate is fundamentally driven by available heifer supply, with insufficient replacements forcing herds to keep lower-performing cows longer—ultimately reducing productivity and profits. Practical data-driven strategies are offered to help producers accurately estimate future heifer needs and optimize herd replacement decisions for sustainability and success.



Bio: Dr. Michael Overton is a veterinarian with a diverse background, holding degrees from North Carolina State University and UC Davis. He spent 8 years in private practice and 14 years teaching at UC Davis and the University of Georgia, followed by 13 years in industry with Elanco and Zoetis. Currently, at Zoetis, he leads the development of a global cloud-based analytics platform focused on delivering data-driven solutions to enhance animal health and customer value. His expertise includes reproduction and transition management, record analysis, heifer management, and economic decision-making, with a consistent focus on improving productivity and profitability through advanced analytics.

A New Perspective on Right-Sizing Your Heifer Inventory

Michael Overton
Zoetis, Blairsville, Georgia



Take-home Points

1. **Heifer Availability Drives Replacement Strategies.** Herd-level replacement rates are fundamentally constrained by the number and quality of available replacement heifers.
2. **Prioritize Profitability Over Cost Reduction.** Keeping inferior cows longer to reduce replacement costs may hurt overall profitability.
3. **Data-Driven Planning Reduces Risk.** A clear understanding of actual performance aids in preparing for the future.

2026 High Plains Dairy Conference, March 3-4, 2026

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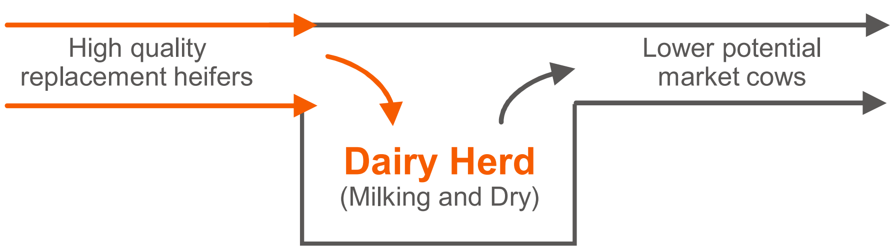
Replacement Rate:

$$\frac{\text{\# Sold + \# Died}_{\text{(Lact>0)}}}{\text{Average \# Milking and Dry}}$$



Lact=0 that Calve = # Sold + # Died (Lact>0)

In a stable herd, these are equal

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I Asked an AI Chatbot to Describe the Prevailing Wisdom Around Dairy Cattle Replacement Rates

Typical Range:

- Most commercial dairy herds have replacement rates between 25% and 40% annually.

Prevailing Target:

- A replacement rate of about 30% is often cited as ideal. Rates above 35-40% are generally viewed as symptomatic of herd problems (e.g., high culling due to disease, injuries, or reproductive failure).

Current Trends:

- In some regions, tightening economics and improvements in herd health have pushed rates lower (closer to 25-30%).
- Others still see high rates due to factors like lameness, mastitis, fertility challenges, or aggressive expansion.

Advice: Remove animals with poor health, low productivity, or genetic problems

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I Asked an AI Chatbot to Describe the Prevailing Wisdom Around Dairy Cattle Replacement Rates

Typical Range:

Do you agree with these statements???

What is the real driver (and limiter) of replacement rate?

Heifer availability

What happens when the availability (and quality) of incoming replacement heifers decreases?

aggressive expansion.

Advice: Remove animals with poor health, low productivity, or genetic problems

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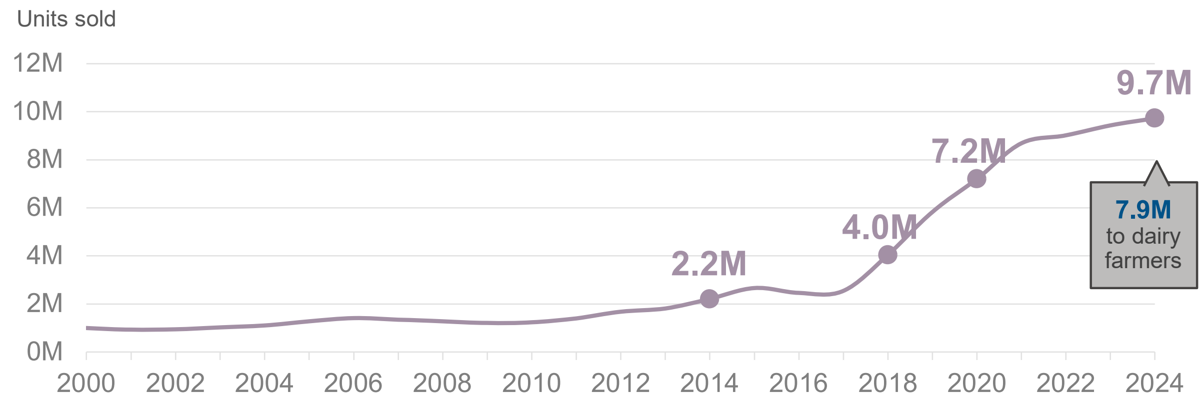
Beef-on-dairy Continues to Transform the Industry

Domestic beef semen sales climbed substantially[1]



5 [1]Corey Geiger, CoBank, Georgia Dairy Conference, January 20, 2026

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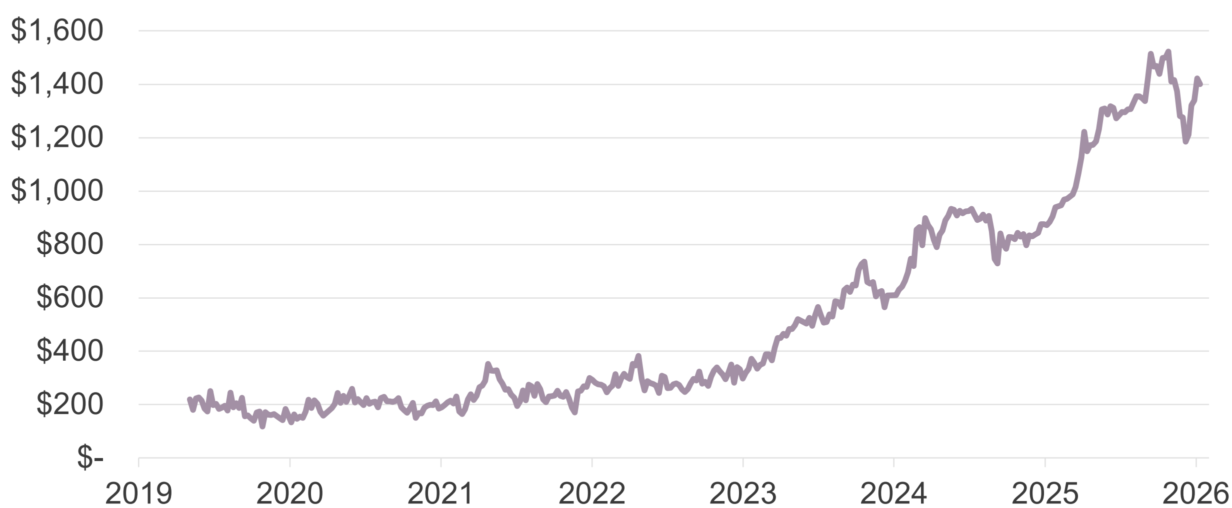
Pennsylvania Beef-on-dairy Calf Pricing ($ Per Calf)



6 [1]Corey Geiger, CoBank, Georgia Dairy Conference, January 20, 2026

Where are These Values Heading???

Who knows for sure. The following comments/thoughts are just my personal reflections and are not meant to represent official projections or predictions:

Market conditions remain favorable. Record prices may pull back a little, but fundamentals are still supportive

Futures do not suggest an impending crash

Based on current consumer demand for beef and low cow-calf inventories, will probably continue to see above-average calf values

Watchouts:

- Some event(s) that cause consumer demand to weaken
- Beef herd rebuild that is faster than expected
- Political action to change market for imported beef

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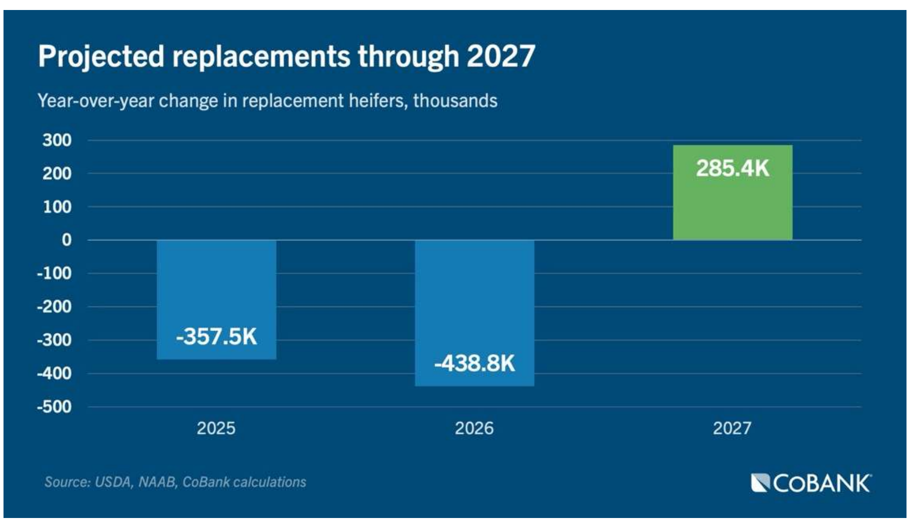
Dairy Replacements Will Shrink Further Until 2027[1]

Dairy replacements available to enter the milking string on U.S. dairy farm (year over year)



8 [1]Model and calculations by Corey Geiger, CoBank, Georgia Dairy Conference, January 20, 2026

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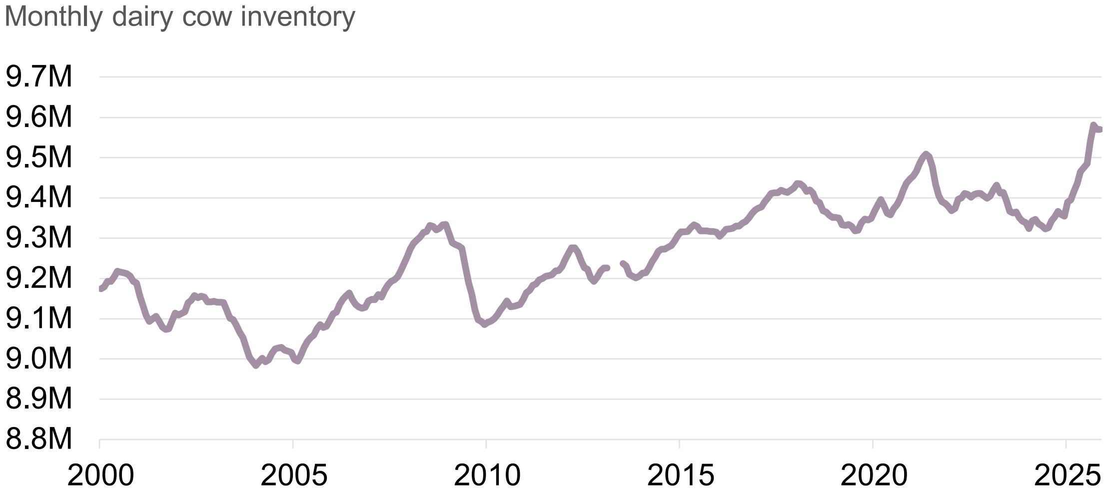
Yet, We Have the Largest Dairy Cow Herd In 30 Years[1]



~90,000 fewer cows culled in 2025 than in 2024; culling pullback extends back to 2023[1]

9 [1]Corey Geiger, CoBank, Georgia Dairy Conference, January 20, 2026

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Recent Comments from Veterinarians

- "I can't really put my finger on why, but milk/cow is down and we can't seem to get it back up. Forages are good, cow comfort is good… but the cows just aren't responding" (veterinarian in mid-Atlantic region)
- "Dry-off milk is down… cows aren't producing as well as they have been…" (California veterinarian)
- Why???
- Herds are milking more "stale" cows (that should have been replaced sooner)

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Replacement Rate:

$$\text{Replacement Rate} = \frac{\#\ \text{Sold} + \#\ \text{Died}_{(\text{Lact}>0)}}{\text{Average}\ \#\ \text{Milking and Dry}}$$

\# Lact=0 that Calve = # Sold + # Died (Lact>0)

In a stable herd, these are equal

e.g. In a stable 1,000-cow herd over a 12-month period, *by definition*, if 350 first-calf heifers enter the herd, 350 existing cows found a new home

Availability (and quality) of incoming heifers drives replacement rate

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Herd-level Replacement Rate is Driven by Heifer Availability (and Quality)

Herds that grow their own replacements "plan" for a "maximum" level of turnover based on how many heifers are raised*

Type of Cows for Replacement

Dead cows
Incurable or chronic disease issues
Cows that fail to become pregnant
Health-related poor producers
Poor producers but otherwise healthy
Genetics (heifers)

Failure to produce enough heifers results in constrained replacement opportunities

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Focus on Replacing the Right Cows at the Right Time and NOT Just on Lowering Replacement Cost

*Focus management efforts to reduce the risk of cows losing sufficient value to **warrant** replacement!*

- Reduce disease risk, improve repro, reduce lameness, etc.
- Genetics, nutritional management, improve cow comfort, etc. are all important

But continue focusing on making good economic decisions to improve profitability

Remember, the question that we need to continuously ask ourselves…

> "Is the immediate and long-term value of *THIS* **slot** improved by keeping the current cow or by replacing her with a fresh heifer?"

Increasing **replacement rate can improve profitability if done carefully…**

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Overview of an Economic Model[1] Used in This Presentation

- Spreadsheet-based model that mimics the flows of cows from first calving through each successive lactation up to a maximum of 10
- Each lactation has its own unique production curve, removal risk (sold, condemned, died), lactation length, dry period length, dry period cost, transition management cost, and transition disease cost
- Each future lactation is adjusted back to the day of first calving using a net present value approach with an interest rate of 8%

Key economic assumptions:

Milk $/lb ECM =		$0.22
Replacement =		$3,200
Calf values:	HO Heifer:	$750
	HO Bull:	$800
	BeefXCalf:	$1,200
Market cow (liveweight):		$1.5/lb
Feed (lactating)/lb:		$0.13
Dry cow cost/d:		$3.25

Economic result = **Income over Cost (IOC)**

(Milk + Calf Value + Market Cow Revenue) – (Feed + Dry Cow + Transition + Replacement Cost)

14 [1]Overton, M. and S. Eicker. 2022. Use of an NPV model to estimate the value of additional selective replacement of dairy cattle during first lactation. J. Dairy Sci. Vol. 105, Suppl. 1:140.

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Examining the Relationship Between Replacement Rate and Milk Production on IOC*

Herd Replacement Rate

Relative Milk Production	32%	34%	36%	38%	40%
Average Cow			Ref		

*IOC = (Milk + Calf + Market Cow Revenue) – (Lactating Feed + Dry Cow Feed + Transition Management + Transition Disease + Replacement Costs)

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Examining the Relationship Between Replacement Rate and Milk Production on IOC*

Herd Replacement Rate

Relative Milk Production	32%	34%	36%	38%	40%
Average Cow	$58	$31	Ref	($36)	($75)

Many assume that if they constrain (lower) replacement rate, it will save money.
If, average production per cow did not change due to keeping potential market cows longer, this would be true. However…

*IOC = (Milk + Calf + Market Cow Revenue) – (Lactating Feed + Dry Cow Feed + Transition Management + Transition Disease + Replacement Costs)

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Examining the Relationship Between Replacement Rate and Milk Production on IOC*

Herd Replacement Rate

Relative Milk Production	32%	34%	36%	38%	40%
Average Cow	$58	$31	Ref	($36)	($75)
2% Decrease in Milk	($26)	($53)	($84)	($120)	($159)

Restricting replacement production actually results in a diagonal move in this grid and a reduction in profitability since cows *that should be replaced* are retained longer due to insufficient replacement heifers being available

*IOC = (Milk + Calf + Market Cow Revenue) – (Lactating Feed + Dry Cow Feed + Transition Management + Transition Disease + Replacement Costs)

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Examining the Relationship Between Replacement Rate and Milk Production on IOC*

Herd Replacement Rate

Relative Milk Production	32%	34%	36%	38%	40%
2% Increase in Milk	$141	$115	$84	$49	$10
Average Cow	$58	$31	Ref	($36)	($75)
2% Decrease in Milk	($26)	($53)	($84)	($120)	($159)

Careful and appropriate *selective* replacement can increase profitability if it results in an increase in production

A higher replacement rate is costly IF production does not change but it can be more profitable if replacement yields a higher level of production

*IOC = (Milk + Calf + Market Cow Revenue) – (Lactating Feed + Dry Cow Feed + Transition Management + Transition Disease + Replacement Costs)

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So, What Happens if Replacement Heifer Production is Inadequate?

Some replacements can be purchased (unlikely for many herds due to cost and quality issues).

Therefore:

- Cows that should be replaced will be retained longer
- Fewer replacement heifers reduces or eliminates the option for selective replacement based on productivity

If a herd lowers their replacement rate from 38% to 34% (without significant management improvements), the worst cows in the herd are required to be retained about 113 days longer!

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An Actual Dairy Example

For the past year, the average milk for cows that left the herd as "SOLD" after 120 DIM = 68 lb

What if these cows were retained an extra 113 days as a consequence of delayed replacement?

- With a 0.18 lb drop/day → 20 lb less milk at time of replacement (48 lb)
- That is nearly 1200 lb of cumulative milk production opportunity lost
- At $0.13/lb TMR and $0.22/lb milk → $0.16 loss/lb of milk (marginal milk value)
- Approaching $200 net loss/delayed replacement
- At the new 34% replacement rate → about $62/cow slot/year

OK – but what about the savings from fewer replacements needed?

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Consequences of Delayed Replacement

(Decreasing Replacement Rate from 38% to 34% by Constraining Heifer Supply)

Key Assumptions Used:

- Market value = $1.50/lb
- Whole herd annual mortality risk = 6%
- Condemnation risk at market = 7%
- Interest rate = 9%

Average Replacement Cost/d at Varying Replacement Rates[1]

Heifer Cost	34%	36%	38%
$2,800	$1.13	$1.17	$1.21
$3,100	**$1.41**	$1.46	**$1.53**
$3,400	$1.68	$1.76	$1.84

$1.53 - $1.41 = $0.12; $0.12 * 365 = $43

	-$62	Loss in marginal milk/yr (cow slot)
Replacement cost savings	$43	Replacement cost savings/ year (cow slot)
Difference	**-$19**	**Net loss/cow slot (herd)**
	-$55	**Net loss/cow replaced/year**

[1]Based upon a whole herd replacement and depreciation model as presented in Overton, M. and S. Eicker. 2022. J. Dairy Sci. Vol. 105, Suppl. 1:140

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Is There Evidence Across the Industry that an Insufficient Heifer Supply Has Hurt Dairy Performance?

Retrospective data analysis, presented Jan 30, 2025 at National Mastitis Council annual meeting

"Short" herds

Replacement risk for 2023-2024 was at least 2% points ***lower*** than 2020-2022
(herd-level average = -6%)

AND

Heifers calving in 2023-2024 was at least 2% points ***lower*** than 2020-2022
(herd-level average = -12%)

N=12 herds; 207,963 lactations

"Surplus" herds

Replacement risk for 2023-2024 was at least 2% points ***higher*** than 2020-2022
(herd-level average = 3%)

AND

Heifers calving in 2023-2024 was at least 2% points ***higher*** than 2020-2022
(herd-level average = 10%)

N=7 herds; 83,149 lactations

22 Overton and Eicker, NMC January 30, 2025

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A Few Summarized Results

Changes by End of Lact Year Group: 2020-2022 → 2023-2024

	"Short" Herds	"Surplus" Herds	
Sold	-13%	+11%	
Died	+7%	-1%	
Dry	+6%	-4%	
	"Short" Herds	**"Surplus" Herds**	**Difference (Short – Surplus)**
Sold	-2.6 lb	0.9 lb	-3.5 lb
DIM at Sold	10 d	-15 d	25 d
Dry	-2.8 lb	4.2 lb	-7.0 lb
DIM at Dry	1 d	-8 d	9 d
Change in % with 2+ Cases of Mastitis	+12%	- 1%	

All results shown significant with p<0.05

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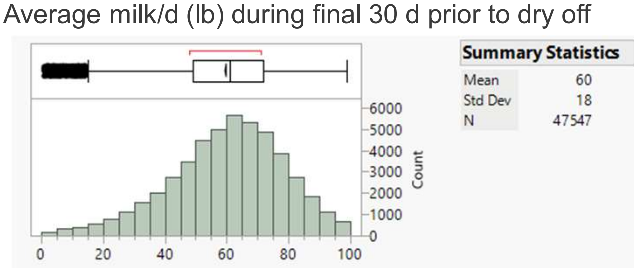
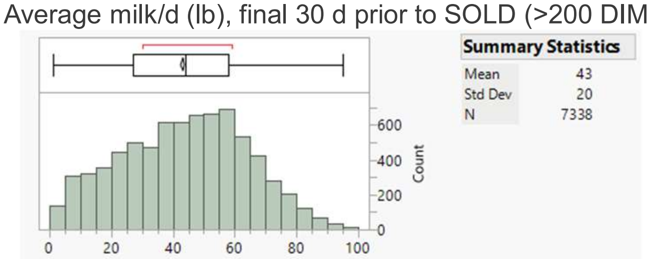
One More Example: 18 California Herds Following HPAI[1]

Average milk/d (lb) during final 30 d prior to dry off



Average milk/d (lb), final 30 d prior to SOLD (>200 DIM)



Cows already pregnant during HPAI: dry-off milk ~normal (60 lb)

Average milk prior to being sold after 200 DIM: down significantly (43 lb vs. 53 for cows sold prior to HPAI)

Predicted optimal cut point for these herds (if a replacement is available) was ~65 lb

Cows were retained longer than optimal

24 [1]Overton and Eicker, "A Look Back at California Dairies: Economic and Management Considerations Following HPAI", California ARPAS Conference, Oct 29, 2025

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Keeping Inferior Cows In the Herd Longer Lowers Cost But Also Lowers Profitability

Do not get caught "cutting costs" (or chasing sunk costs) and end up hurting profitability

Strive to make replacement decisions *before* the cow becomes a liability vs. "waiting to see what happens"

Earlier replacement decisions tend to be associated with higher salvage values, thus lowering net replacement cost/transaction

These concepts apply equally to first lactation cows…

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But, But, But… She Hasn't Paid for Herself…

Average Cow	Calving to Dry (d)	Total Milk (lb)	Avg/day	Milk + Calf Income	Feed	Dry Cow &Transition	Housing & Other Costs	Running Net
Lact 1	332	25862	78	$6,242	($2,390)	($395)	($2,490)	$966
Lact 2	324	29865	92	$7,083	($2,582)	($423)	($2,430)	$2,614
Lact 3	79	8697	110	$2,636	($706)	($451)	($593)	$3,500
Total	**735**	**64,424**		**$15,960**	**($5,678)**	**($1,270)**	**($5,513)**	**$3,500**
Average/day			88	$21.71	($7.73)		($7.50)	$4.76/d

15th Percentile Cow	Calving to Dry (d)	Total Milk (lb)	Avg/day	Milk + Calf Income	Feed	Dry Cow &Transition	Housing & Other Costs	Running Net
Lact 1	332	19138	58	$4,829	($2,027)	($395)	($2,490)	($83)
Lact 2	324	22100	68	$5,451	($2,163)	($423)	($2,430)	$353
Lact 3	338	24399	72	$5,934	($2,329)	($451)	($2,535)	$972
Lact 4	334	24756	74	$6,009	($2,336)	($487)	($2,505)	$1,654
Lact 5	330	25185	76	$6,099	($2,347)	($470)	($2,475)	$2,460
Lact 6	336	25077	75	$6,077	($2,359)	($495)	($2,520)	$3,163
Lact 7	33	2573	78	$1,349	($238)	($525)	($248)	$3,502
Total	**2027**	**143,227**		**$35,750**	**($13,799)**	**($3,247)**	**($15,203)**	**$3,502**
Average/day			71	$16.63	($6.81)		($7.50)	$1.73/d

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But, But, But… She Hasn't Paid for Herself…

Average Cow	Calving to Dry (d)	Total Milk (lb)	Avg/day	Milk + Calf Income	Feed	Dry Cow &Transition	Housing & Other Costs	Running Net
Lact 1								$966
Lact 2								$2,614
Lact 3								$3,500
Total								**$3,500**
Average/								$4.76/d

The decision to replace a cow should never consider when she has paid for herself, but rather what is most profitable for that slot

The lower producing cow takes more than 2.5 X longer to reach the same economic endpoint *(Chasing Sunk Costs!!!)*

When you have low producing cows, do you *REALLY* want to keep them long enough for them to pay for themselves???

(Remember, the lower the producer, the longer it will take)

15th Perce Cow								nning Net
Lact 1								($83)
Lact 2								$353
Lact 3								$972
Lact 4								$1,654
Lact 5								$2,460
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Average/day			71	$16.63	($6.81)		($7.50)	$1.73/d

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Estimating Replacements Needs Involves Speculation

Projecting Future Heifer Needs Starts with an Evaluation of Historical Data

- Historical cow replacement rate – % of milking and dry cows that are replaced each year
- Historical heifer completion rate – % of heifers actually enter the lactating herd

NEITHER of these will likely be **exactly** the same in the future but we must start with a reasonable approximation and then add some buffer

Many Things Can and Do Change That Will Alter Heifer Needs

- Cow health challenges
- Heifer quality
- Milk price
- Genetic potential
- Heifer cost
- Market cow value

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Heifer Completion Rate

Very much misunderstood metric

TERRIBLE metric for monitoring

- Tremendous lag ➔ Instead, we should monitor performance within each management stage
- Can be difficult to interpret
- A higher completion rate is not necessarily better – perhaps herds are holding on to poor quality heifers (chronic health issues, poor genetics)
- A lower completion rate is not necessarily worse
  - What if the herd was selling excess heifers to a neighbor?
  - What if the herd is aggressively limiting breeding opportunities?

BUT! It is important to understand for future planning purposes

A big issue that I have noticed ➔ tendency to overestimate how many heifers make it to calving

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My Approach for Heifer Completion Rate

Heifer Completion (Liveborn to Calving): Key Stages and Measures

- % of heifers that conceive that actually calve
- % of heifers reaching 365 days of age that conceive
- % of heifers sold from 91 to 365 days of age
- % of heifers died from 91 to 365 days of age
- % of liveborn heifers sold by 90 days of age
- % of liveborn heifers died by 90 days of age

(Work Backwards from Calving when I calculate completion rate)

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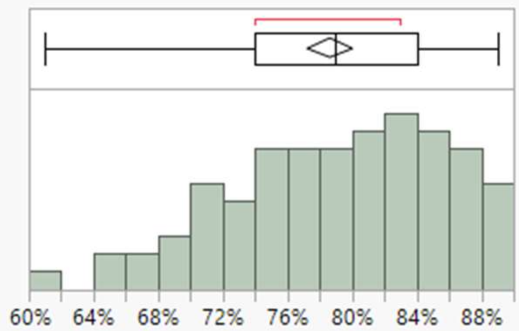
Heifer Completion Rate: Born Alive to Calving (85 U.S. Herds*)

Born alive to Calving



Quantiles

100.0%	maximum	89%
99.5%		89%
97.5%		89%
90.0%		87%
75.0%	quartile	84%
50.0%	median	79%
25.0%	quartile	74%
10.0%		70%
2.5%		64%
0.5%		61%
0.0%	minimum	61%

Summary Statistics

Mean	79%
Std Dev	7%

Note: This dataset excluded herds producing heifers for another herd

31 *Zoetis internal data on file

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Stage-specific Risks That Contribute to Heifer Completion Rate

	Median	Interquartile Range
% of Heifers That Conceive That Fail to Calve	3%	2%–5%
% That Fail to Conceive (≥365 Days of Age)	6%	4%–8%
Sold from 91 to 365 Days	2%	1%–4%
Died from 91 to 365 Days	3%	2%–6%
Sold by 90 Days	0%	0%–1%
Died by 90 Days	4%	3%–6%
Heifer Completion – Liveborn to Calving	**79%**	**74%–84%**

Data based on 85 Commercial US dairy herds (Zoetis internal data on file)

Note: These are NOT benchmarks or goals. Higher is not necessarily better and lower is not necessarily worse.

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How Many Heifers Should a Dairy Produce per Year?

One approach for consideration

	All	L=1	L=2	L>2
Avg # Milking and Dry	1000	313	256	431
# Sold	311	75	59	178
# Died	59	12	9	37
Herd Turnover	37%	28%	27%	50%
Total Replacements Needed – Status quo	**370**			

Year	# Replaced	Avg # M & D	Replacement Rate
2015	395	990	40%
2016	339	1010	34%
2017	361	995	36%
2018	388	1000	39%
2019	365	1005	36%
2020	380	1005	38%
2021	371	1000	37%
2022	361	1005	36%
2023	386	980	39%
2024	350	1010	35%
Average	**370**	**1000**	**37%**

Standard Deviation = 2%

2% of 1000 = 20

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One Approach to Estimate Replacement Needs

	All	L=1	L=2	L>2
Avg # Milking and Dry	1000	313	256	431
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# Died	59	12	9	37
Herd Turnover	37%	28%	27%	50%
Total Replacements Needed – Status quo	**370**			

Year-to-Year Variation (1 std dev of 10-yr RR = 2% of herd)		20 →	**390**
Cushion for unanticipated needs (% of the herd)	**3%**	30 →	**420**

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(Note: This is NOT an inventory calculation; thus, age at first calving is not needed)

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One Approach to Estimate Replacement Needs

	All	L=1	L=2	L>2
Avg # Milking and Dry	1000	313	256	431
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Total Replacements Needed – Status quo	**370**			

Year-to-Year Variation (1 std dev of 10-yr RR = 2% of herd)		20 →	**390**
Cushion for unanticipated needs (% of the herd)	**3%**	30 →	**420**
Net # Heifer Needed to Enter Lactation =		**420**	

Our final target for this herd, based on the assumptions above, is 420 heifers that calve

(Note: This is NOT an inventory calculation; thus, age at first calving is not needed)

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# Heifers Needed to Calve		420
% of Preg. Heifers removed before Calving	4%	
		438 # Heifers that Get Pregnant
% of Breeding Heifers that Fail to Conceive	6%	
		465 # Heifers Enter Breeding Pen
% Sold: 91 to 365 days	2%	
% Dead: 91 to 365 days	3%	
% Prebreeding Selective Removals	2%	
		500 # Heifers reaching 90 days
% Sold: Liveborn to 90 days	1%	
% Died: Liveborn to 90 days	4%	
% Postweaning Selective Removals	3%	
Heifer completion (born alive to calving)	**77%**	**544** # Heifers Born Alive

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Other Factors that Impact the Number of Heifers that Enter the Herd

	Median	Interquartile Range
Stillborn Risk:	2.9%	2.2% - 3.7%

% of Animals (pregnancies) that make it to calving

Lactation #	0	1	2	3+	ALL
Median	96%	89%	85%	78%	89%
Interquartile Range	92% - 98%	87% - 91%	82% - 88%	74% - 81%	88% - 91%

Warning! These values are NOT meant to be goals or guidelines. Actual results should be the consequence of appropriate management decisions based upon health, heifer supply, and economic conditions.

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# Heifers Needed to Calve		**420**
% of Preg. Heifers removed before Calving	4%	
		438 # Heifers that Get Pregnant
% of Breeding Heifers that Fail to Conceive	6%	
		465 # Heifers Enter Breeding Pen
% Sold: 91 to 365 days	2%	
% Dead: 91 to 365 days	3%	
% Prebreeding Selective Removals	2%	
		500 # Heifers reaching 90 days
% Sold: Liveborn to 90 days	1%	
% Died: Liveborn to 90 days	4%	
% Postweaning Selective Removals	3%	
Heifer completion (born alive to calving)	**77%**	**544** # Heifers Born Alive
% Stillborn	3%	
	75%	**561** # Dairy Females births
Removals from d-40 preg to calving	12%	
% of Female Pregnancies to Enter Herd	**66%**	**638** # of d-40 Female Pregnancies Needed

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Final Question for Consideration: Regarding Ongoing Breeding Decisions…

Assuming that just enough heifers will be produced with the breeding plan thus far, what type of sire should be used to produce the *LAST 100* pregnancies in a 2500-cow herd?

100 pregnancies represents 4% of total herd size

Breeding options:

- Sexed dairy semen
- Beef semen

Assumptions Used for Subsequent Scenarios

Herd size (milking and dry)	2,500	
Replacement rate (last year)	34%	
Heifers needed/year	850	
Stillborn risk	3%	
Heifer completion rate	80%	
Interest rate	8%	
Springer heifer future value	$3,200	
	Option 1	**Option 2**
Semen options	Sexed, Holstein	Beef
100 pregnancies --> liveborn calves	85 F; 12 M	97 BeefX
Calf values	$750; $1000	$1,300
"Extra" replacement springers	68	buy as needed
Potential replacement rate	37%	?

[1]https://premierlivestockandauctions.com/market-reports/, last accessed 12/2/25
[2]https://www.ams.usda.gov/mnreports/lsmdairycomp.pdf, last accessed 12/2/25

Let's Take a Look at Calf Values…

	Option 1 - Breed Extra with Sexed Semen		Option 2 - Breed Extra with Beef Semen
	Female Holstein	Male Holstein	Holstein X Beef
# Born	88	12	100
# Born alive	85	12	97
Value/calf at birth	$750	$1000	$1,300
Total value at birth	$64,020	$11,640	$126,100
Total calf value produced	**$75,660**		**$126,100**

If we compare the value of the liveborn calves (and assume 3% stillbirth risk for all calves), we see what appears to be an easy decision!

~$50,000 advantage for Option 2 → bring on the beef semen!

But not so fast… we need to evaluate the longer-term perspective as well!

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Let's Take a Longer-Term View of a Hypothetical Scenario with 2 Options:

Scenario:

The herd is convinced that the extra heifers will be valuable

There is extra capacity for raising them

Options: breed for a few more heifers or breed for more beef cross calves

Extra heifers raised in Option 1 represent "marginal heifers" and raising costs are marginal

Marginal raising cost = -$1,700 (not including initial calf value)

In Option 2 when beef semen is used, the herd plans to buy extra heifers "as needed"

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Scenario…

Extra heifers are desired/needed AND there is extra capacity for raising them (marginal heifers)

	Option 1 - Breed with Sexed Semen		Option 2 - Breed with Beef Semen	
	Female Holstein	Male Holstein	Beef Sire	Purchased Springers
# Born alive	85	12	97	73
Value/calf at birth	$750	$1000	$1,300	
Total value at birth	$64,020	$11,640	$126,100	
Total young calf value produced	**$75,660**		**$126,100**	
Marginal raising cost (not incl. initial value)	($1,700)			
Total raising costs (dead heifers, incl. calf value)	($5,595)			
Total raising cost/value (sold heifers, incl. calf value)	$1,862			
Net cost/springer calving (incl/ calf value)	**($2,505)**			
Total Raising Costs	**($171,039)**			
Springer heifer present value	$3,200			($3,200)
Total Springers Realized	**68**			**68**
Total investment (or cost) for springers (NPV)	**$218,522**			**($218,522)**
Final Net by Option	**$123,143**		**($92,422)**	
Final Net (Option A - Option B)		**$216,263**		

Under these assumptions of equal final springer numbers, using sexed dairy semen is more valuable due to the profit made of raising vs. purchasing heifers

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Sensitivity Analysis for our Scenario
(Marginal Raising Cost)

(Net Benefit of Option 1 (sexed dairy semen) vs. Option 2 (beef semen)

\# Springers Purchased Later for Option B

Springer Value	0	1	25	40	68	Breakeven #
$2,900	-$25,539	-$22,639	$46,961	$90,461	$172,497	9
$3,200	**-$2,957**	**$243**	**$77,043**	**$125,043**	**$215,565**	**1**
$3,500	$19,625	$23,125	$107,125	$159,625	$258,633	N/A
$3,800	$42,206	$46,006	$137,206	$194,206	$301,701	N/A

Springer values/costs and cull heifer values decide the breakeven # for purchase.

Assumes $2500 marginal heifer raising cost, including calf value

(Note: I have attempted to link the springer and cull heifer values based on market conditions but calf values are NOT linked)

Based on current economic conditions, there is money to be made in producing some extra heifers even if no additional heifers are purchased.

This advantage ***does not*** consider the potential genetic and production differences between home-grown vs. purchased springers

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Overall Summary

Beef cross values have been a two-edged sword for the dairy industry – don't lose sight of a dairy's opportunities for raising heifers or its ultimate goal of enhancing milk production

The potential replacement of a cow with a fresh heifer is all about improving the herd

- Replacing cows is expensive but failing to replace cows at the right time is also expensive
- Remember, salvage value matters!

Producing a few extra replacement heifers creates several profitable options → don't get caught short!

a) More cows can be selectively replaced on the basis of milk production
b) Dairies can raise and sell excess springers or even fresh cows (after collecting the calf)
c) Dairies can genomically test their heifers and use this information to make better breeding decisions and selectively remove some of the inferior future replacements

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Take Home Action Points

Make sure you are using enough sexed semen to produce a bit of a surplus of heifers

- 3-5% as a start but a bit more if they are willing

Look at a 2 or 3-year window for establishing historical heifer needs

Use the correct herd-specific completion rate

- Based on my 85-herd data set, average heifer completion rate ~ 79%

Given sufficient heifers, strive to make earlier replacement decisions in order to reduce lost opportunity, improve herd productivity, and improve salvage value (and welfare)

There are lots of options for how extra heifers may be allocated!

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Thank You for Your Attention!

Any Questions?

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