Economics of Synchronization

Marginality, Profit, and Decisions

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Topics for this talk

- Marginality: what is it and how does it apply to decision making
- Profit defined
- Stringing effect on lactation curves
- Economics of reproduction for grazing
- Potential solutions

Scenario: you operate a pig farm and sell feeder pigs

- current average costs/pig are $40
- current average price/pig sold is $35
  - **You lose $5 per pig sold**
- During the monthly herd visit, your veterinarian notices a newborn baby pig with a hernia.
- You normally euthanize these pigs at birth, since they do poorly and most die anyway.
- Your veterinarian says she'll fix the pig (guaranteed!) for $10.

- Should you let the vet do the surgery?

Courtesy of Dr. John Fetrow, U Mn

The Tale of Two Pigs

- **EUTHANIZE THE PIG**
- $0 revenue
- $0 expense
- $0 profit

Courtesy of Dr. John Fetrow, U Mn

The Tale of Two Pigs

- DO SURGERY
- $10 for surgery
- $10 for starter feed
- $2 for labor
- $1 for vaccine
- $23 total costs
- $35 revenue
- $12 profit

Courtesy of Dr. John Fetrow, U Mn

The Tale of Two Pigs

- **DO SURGERY**
- $10 for surgery
- $10 for starter feed
- $2 for labor
- $1 for vaccine
- $23 total costs
- $35 revenue
- $12 profit

- **EUTHANIZE THE PIG**
- $0 revenue
- $0 expense
- $0 profit

- **Bad Decision!!**

Courtesy of Dr. John Fetrow, U Mn

WAIT A MINUTE!!?

- The farm loses $5 **on average** on every pig in the operation, and you're saying that by spending $10 **extra** on one extra pig the farm make more profit??
- ***YES!***, because this is not an average pig, it is a **MARGINAL** pig!!!
- It doesn't have to pay the mortgage, utilities, insurance, manure disposal, etc.
  - (its profit actually does help pay those costs)

Courtesy of Dr. John Fetrow, U Mn

This is the message:

- The highest rate of profit is made at the margin, at the last bit of production, the last animal tended to, the final productive input.
- A farm's financial averages are made up of the outcome of a series of marginal decisions.
- The aggregate is the sum of a series of increments.

Previous average profitability is irrelevant to the decision being made.

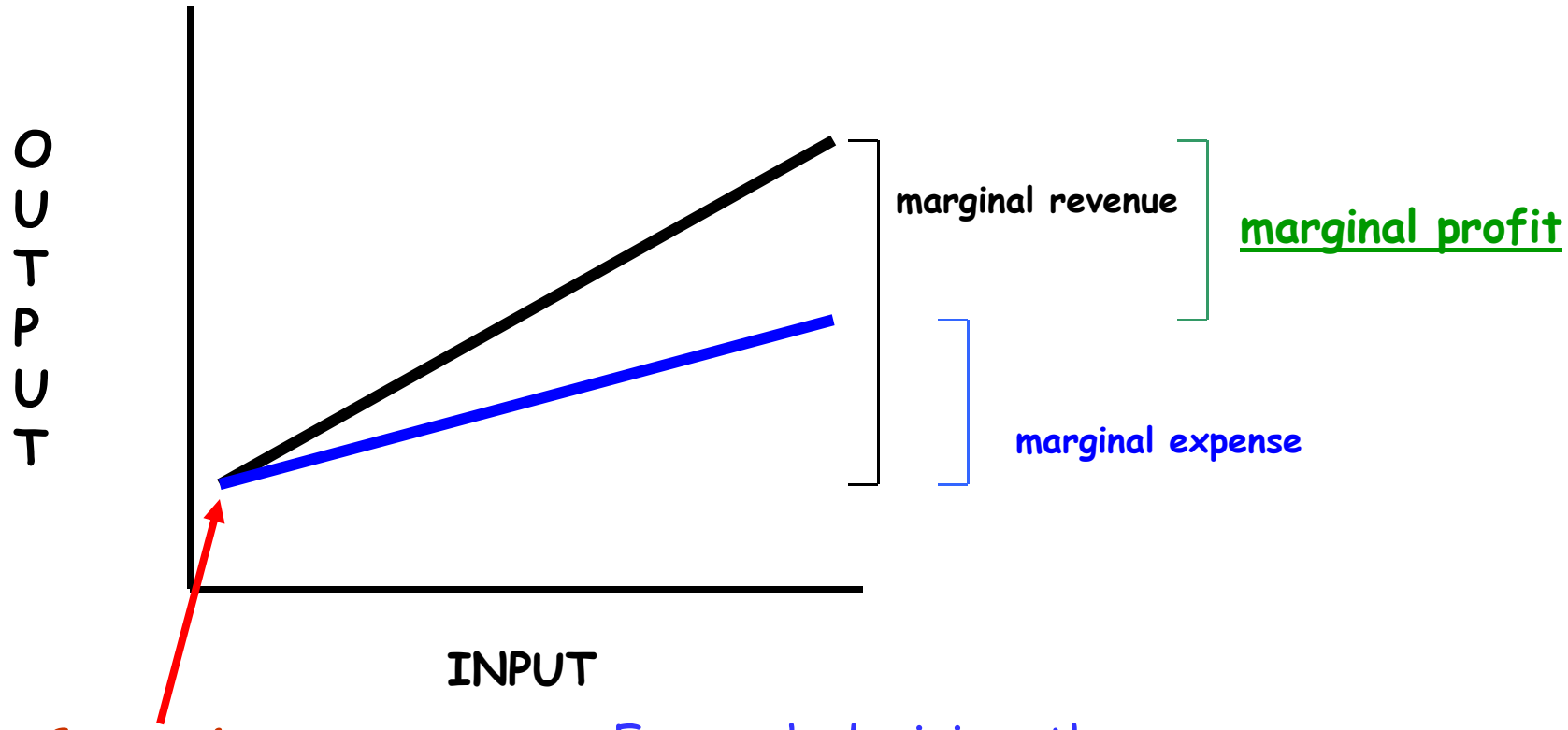
Courtesy of Dr. John Fetrow, U Mn

Marginal Analysis / Partial Budgeting

- project the expense of the next increment of input
- project the revenue that input will generate
- marginal profit =

  marginal revenue - marginal expense

Marginal Analysis:
how real decisions should be made



For each decision, the average performance up to that point is not relevant. What matters is the incremental cost and income that results from the decision.

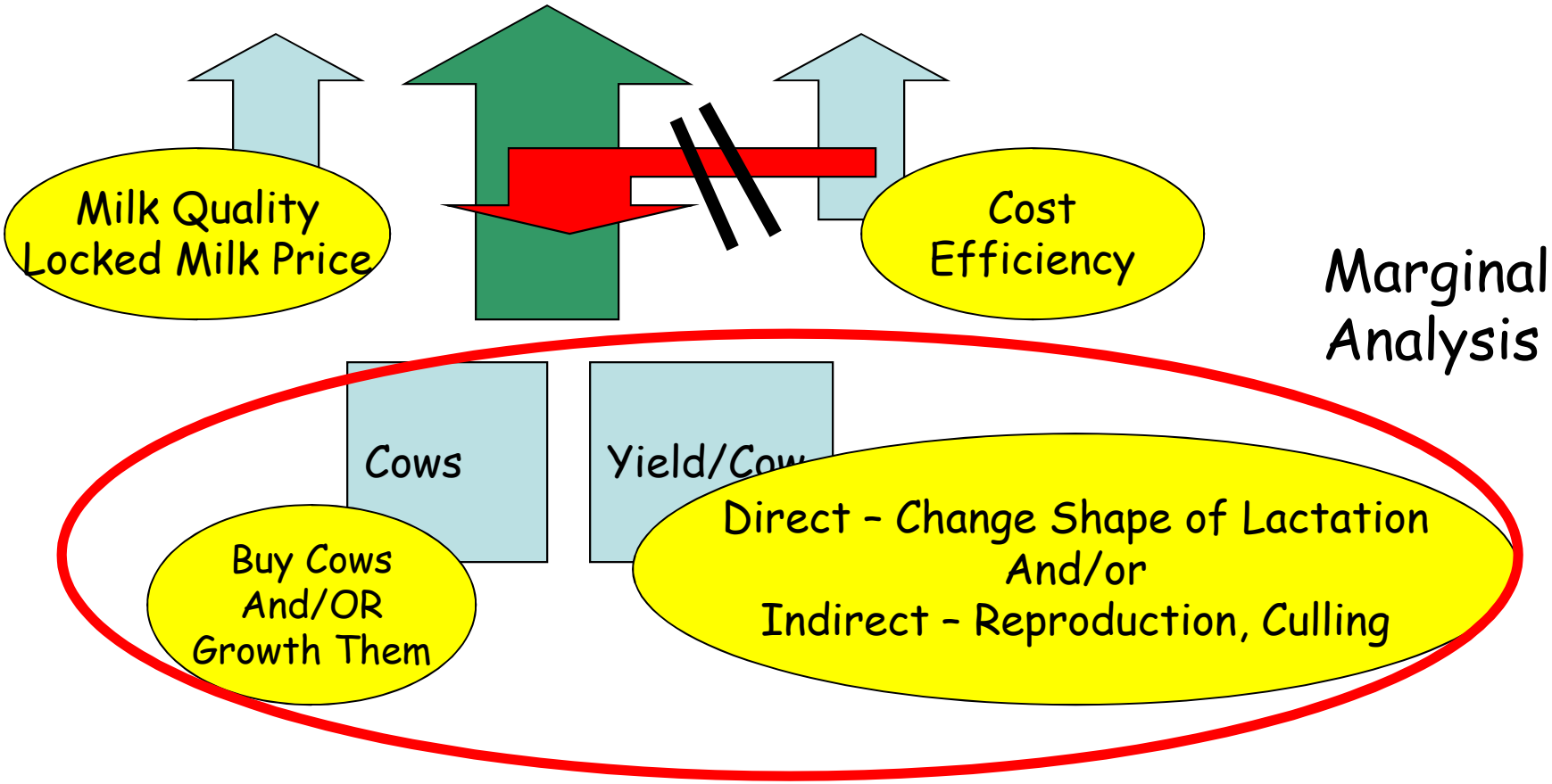
Courtesy of Dr. John Fetrow, U Mn

Marginality and decisions

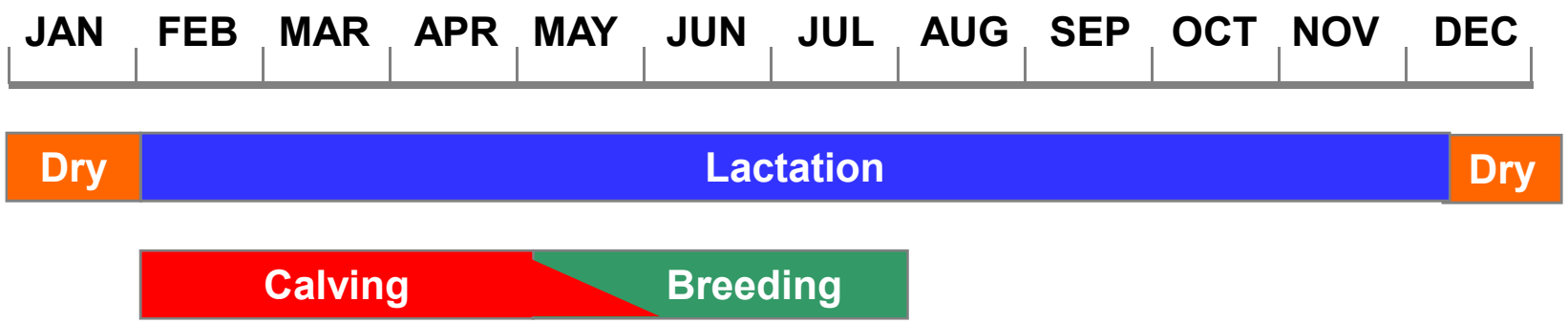
- Decisions are made for lots of reasons
  - perceived need and urgency
  - ease of implementation
  - cash flow
  - personal preference, habit, tradition, anecdote
  - relationships
  - reliability
  - other "intangible" value (e.g. consulting inputs, access to other products, etc.)
  - etc.
- **The purpose of an economic evaluation is to inform the decision maker, not to make the decision.**

How do we grow economically?

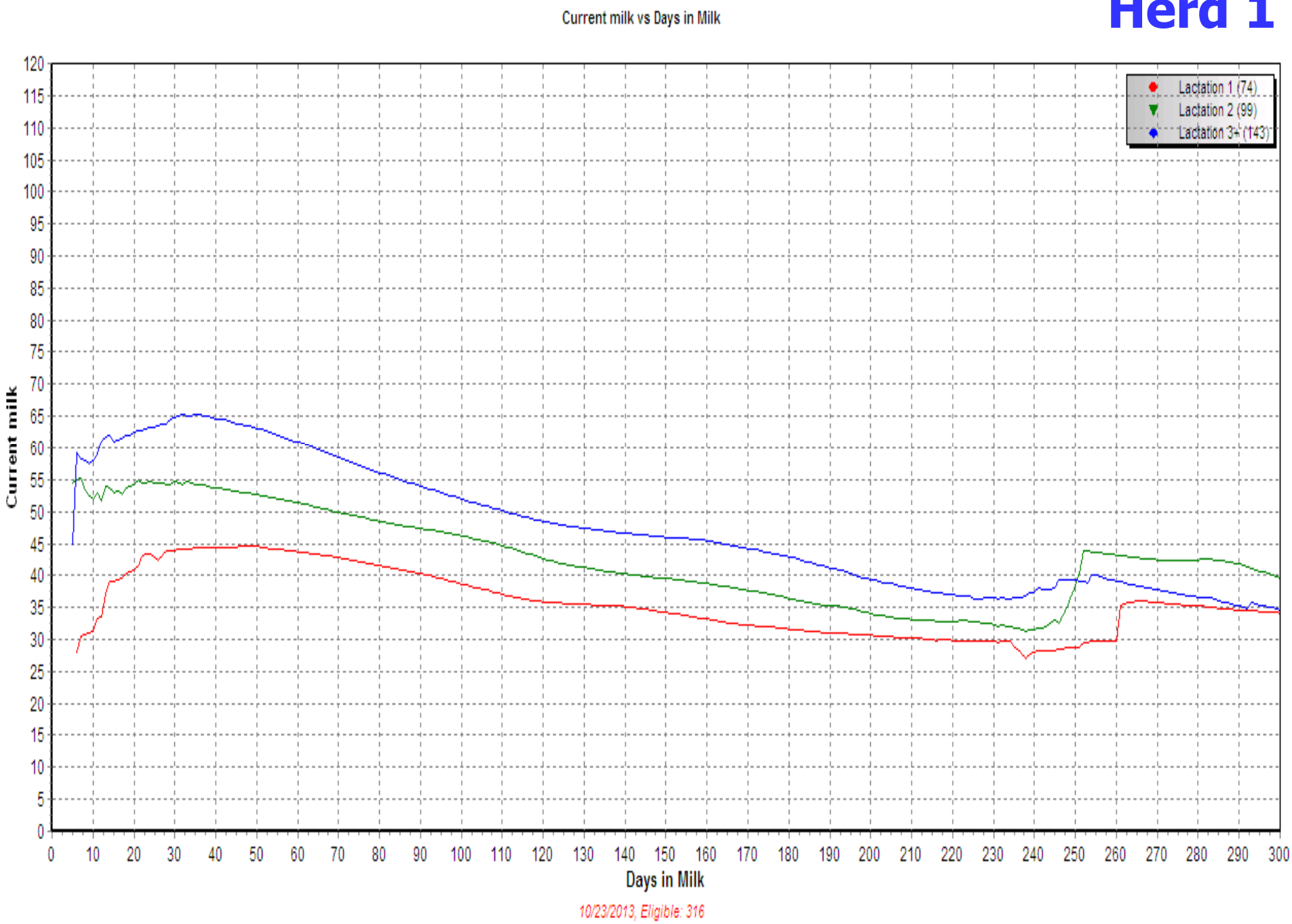
Price X Quantity – Cost = Profits



Reproduction is the key to seasonal calving systems

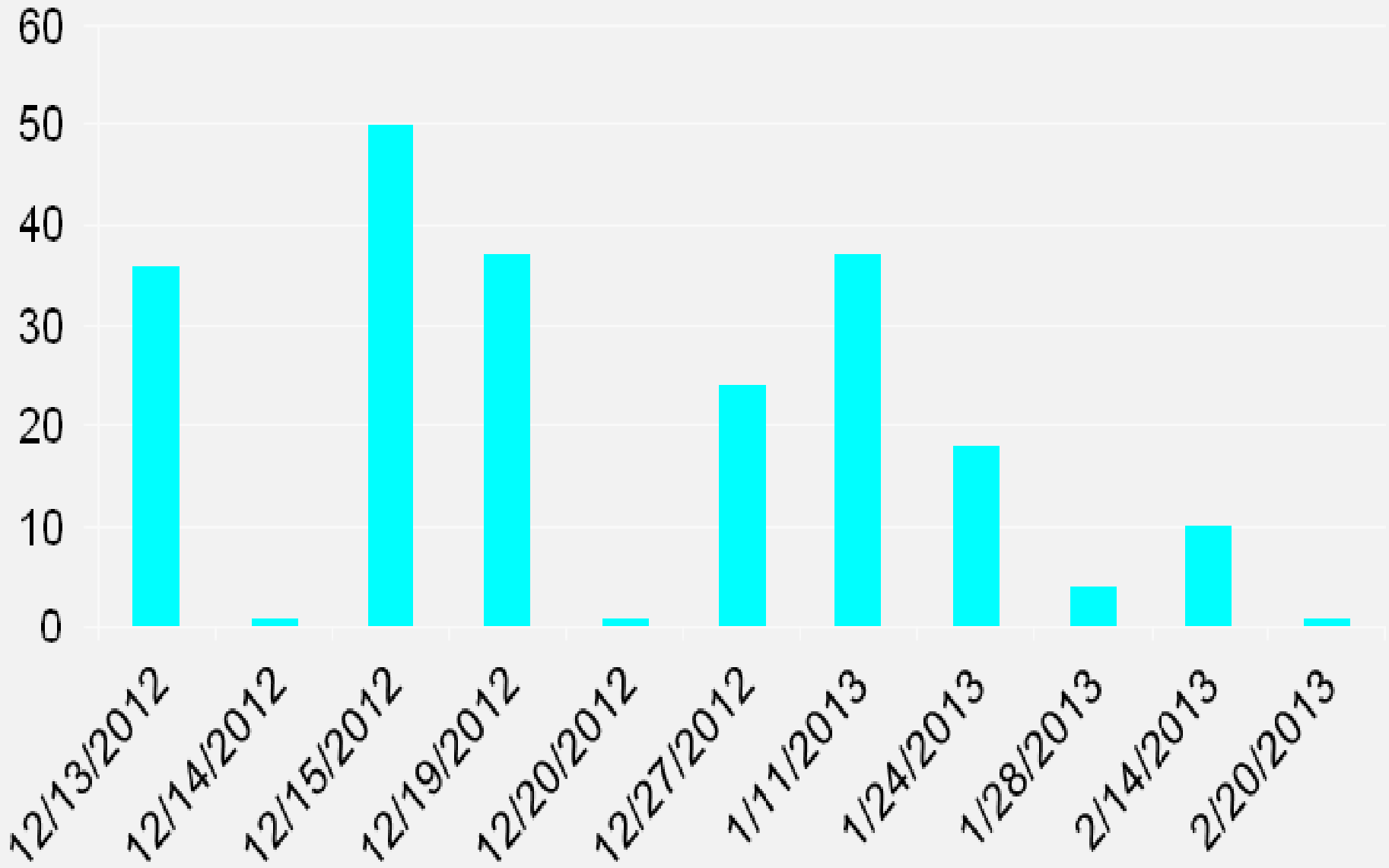


Herd 1


Current milk vs Days in Milk
Lactation 1 (74)
Lactation 2 (99)
Lactation 3+ (143)
Current milk
Days in Milk
10/23/2013, Eligible: 316

Dry Dates

Herd 1



Calving Dates

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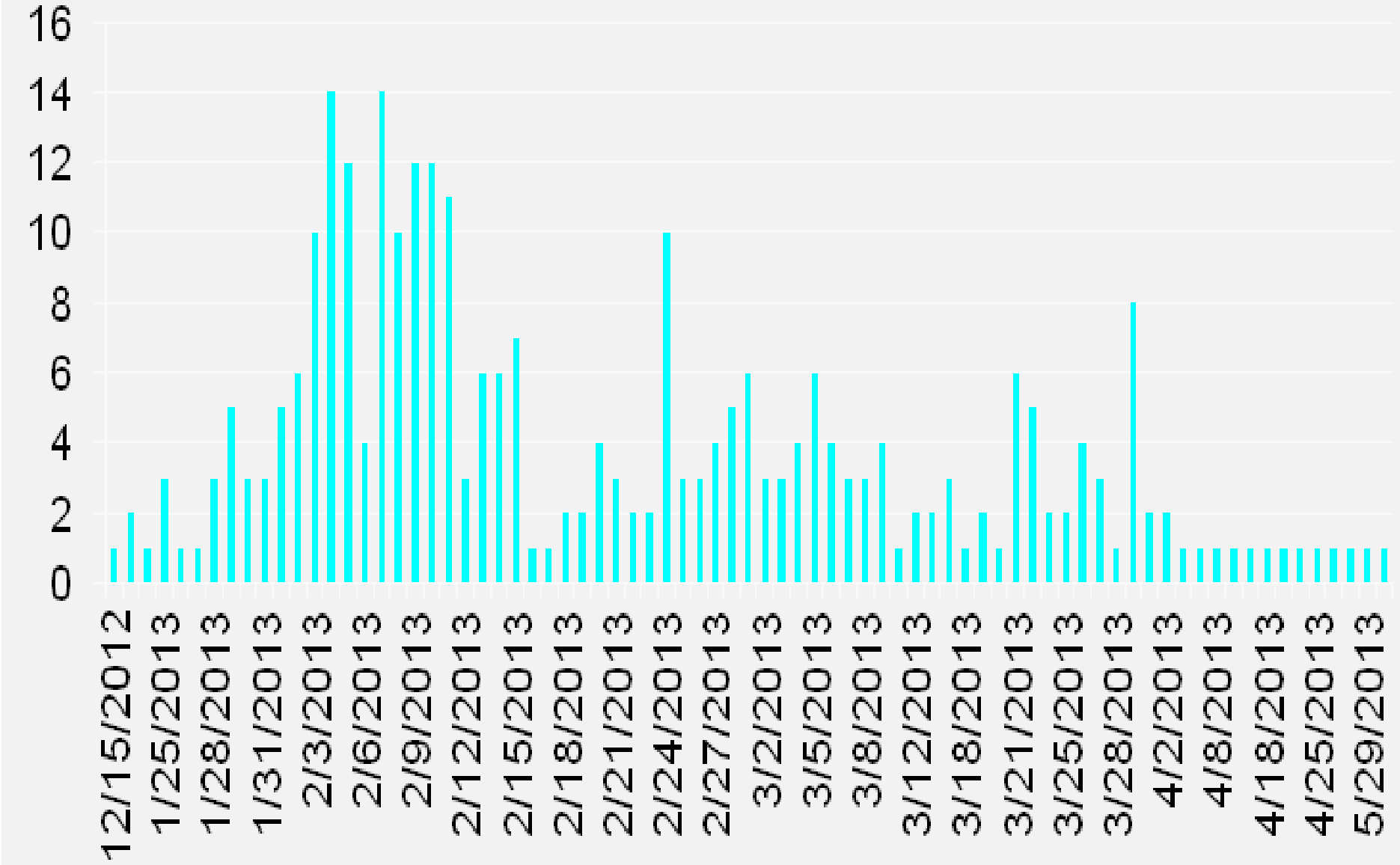

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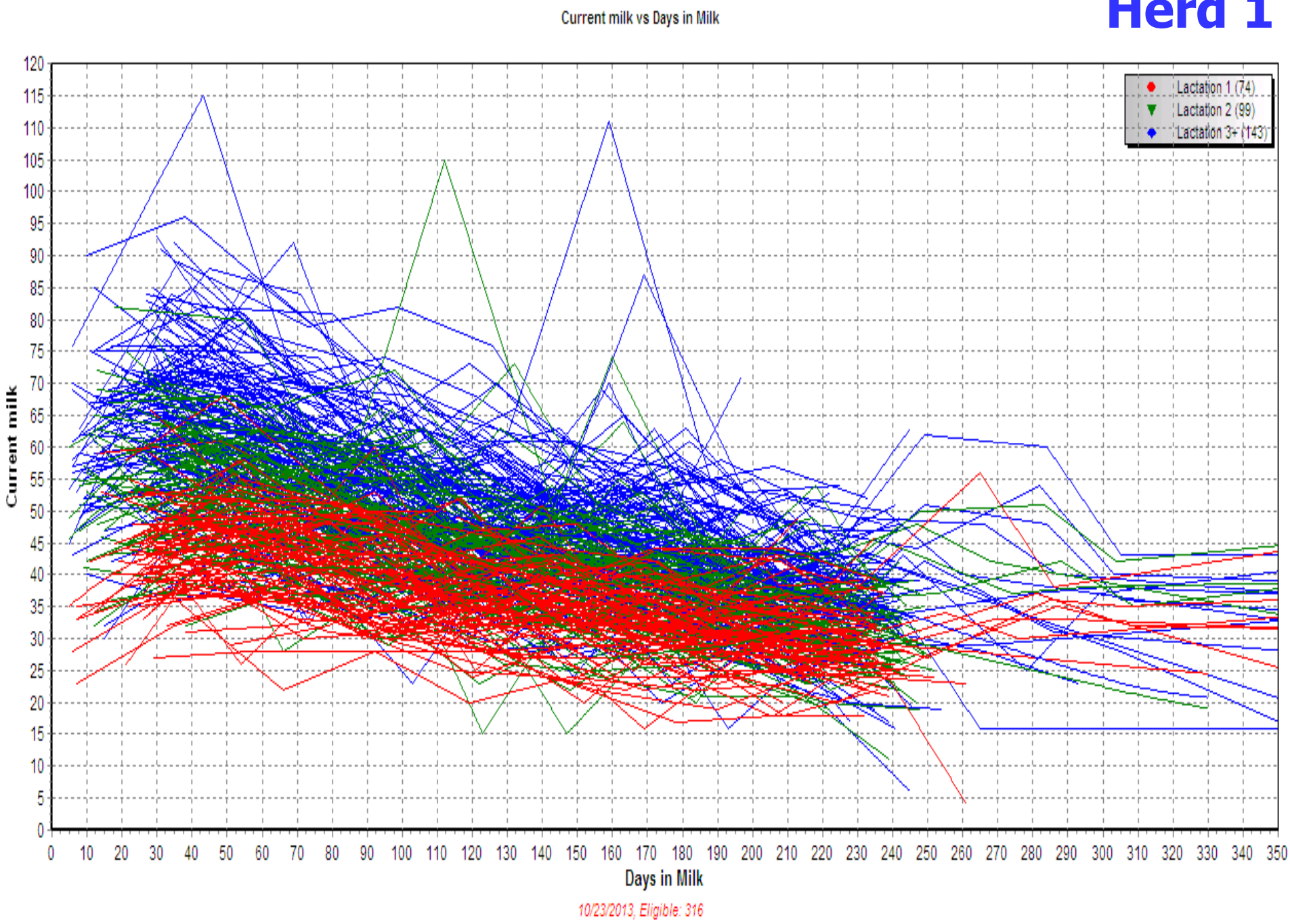
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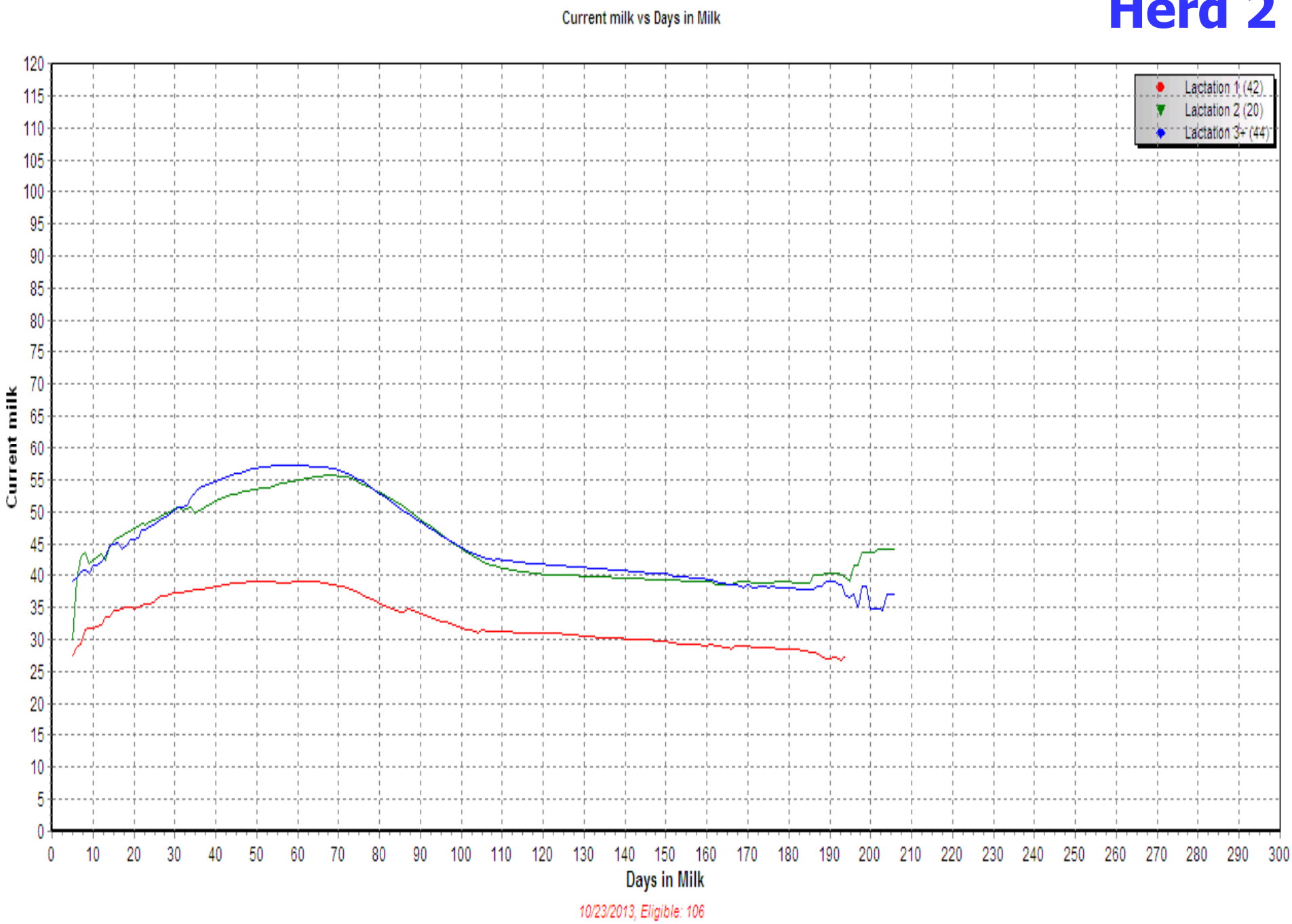
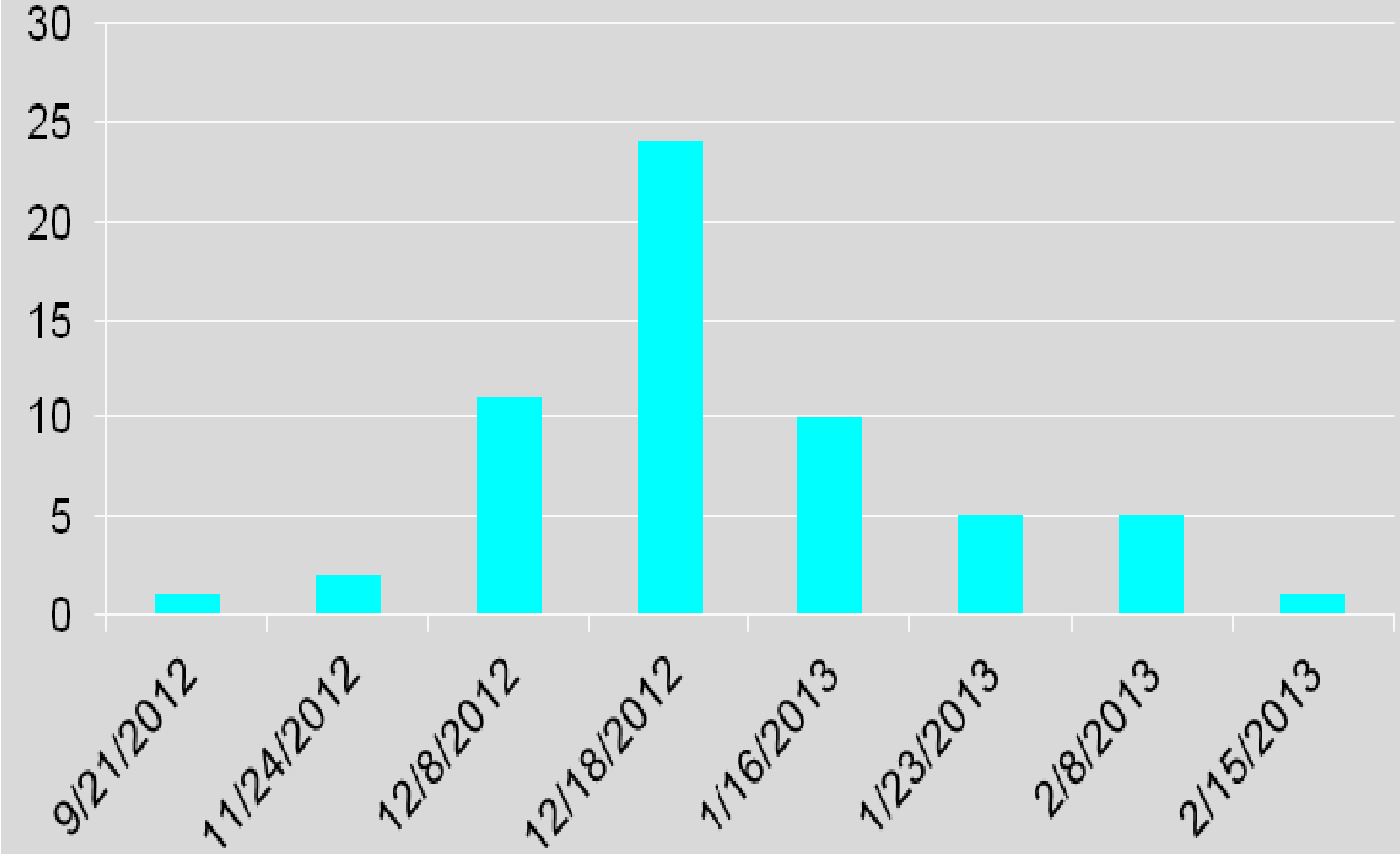
Herd 2


Current milk vs Days in Milk
Lactation 1 (42)
Lactation 2 (20)
Lactation 3+ (44)
Current milk
Days in Milk
10/23/2013, Eligible: 106

Dry Dates

Herd 2



Calving Dates

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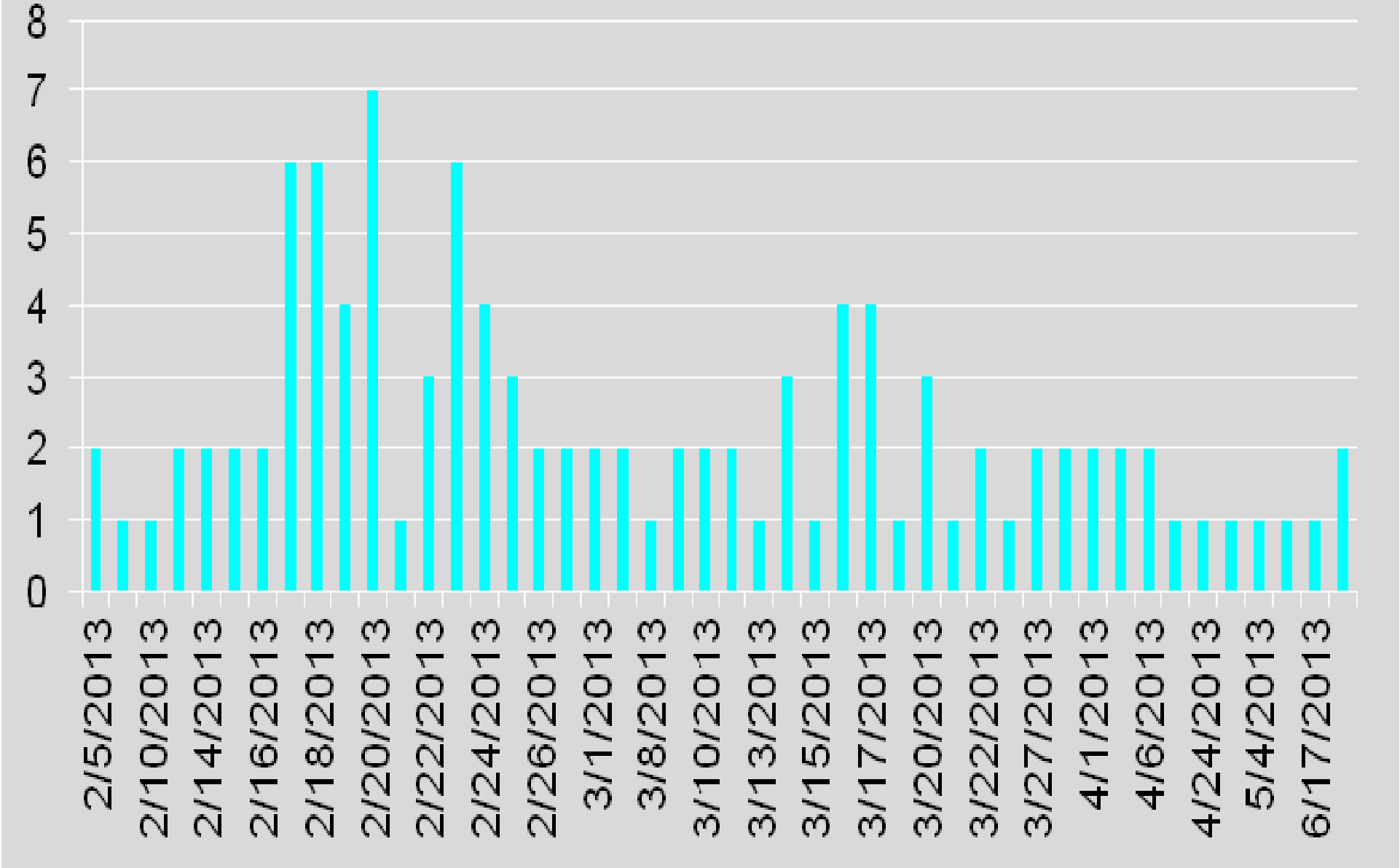

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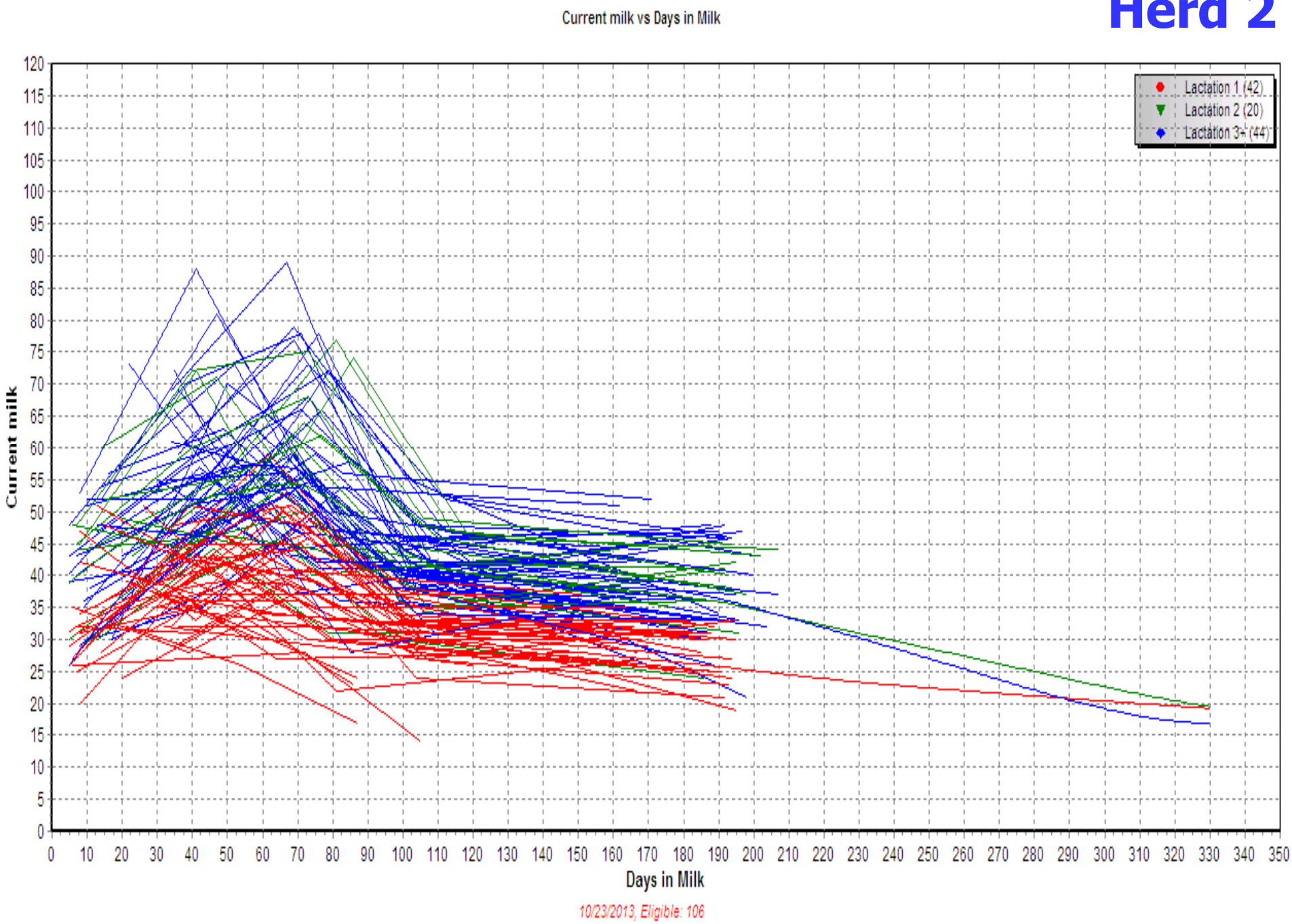
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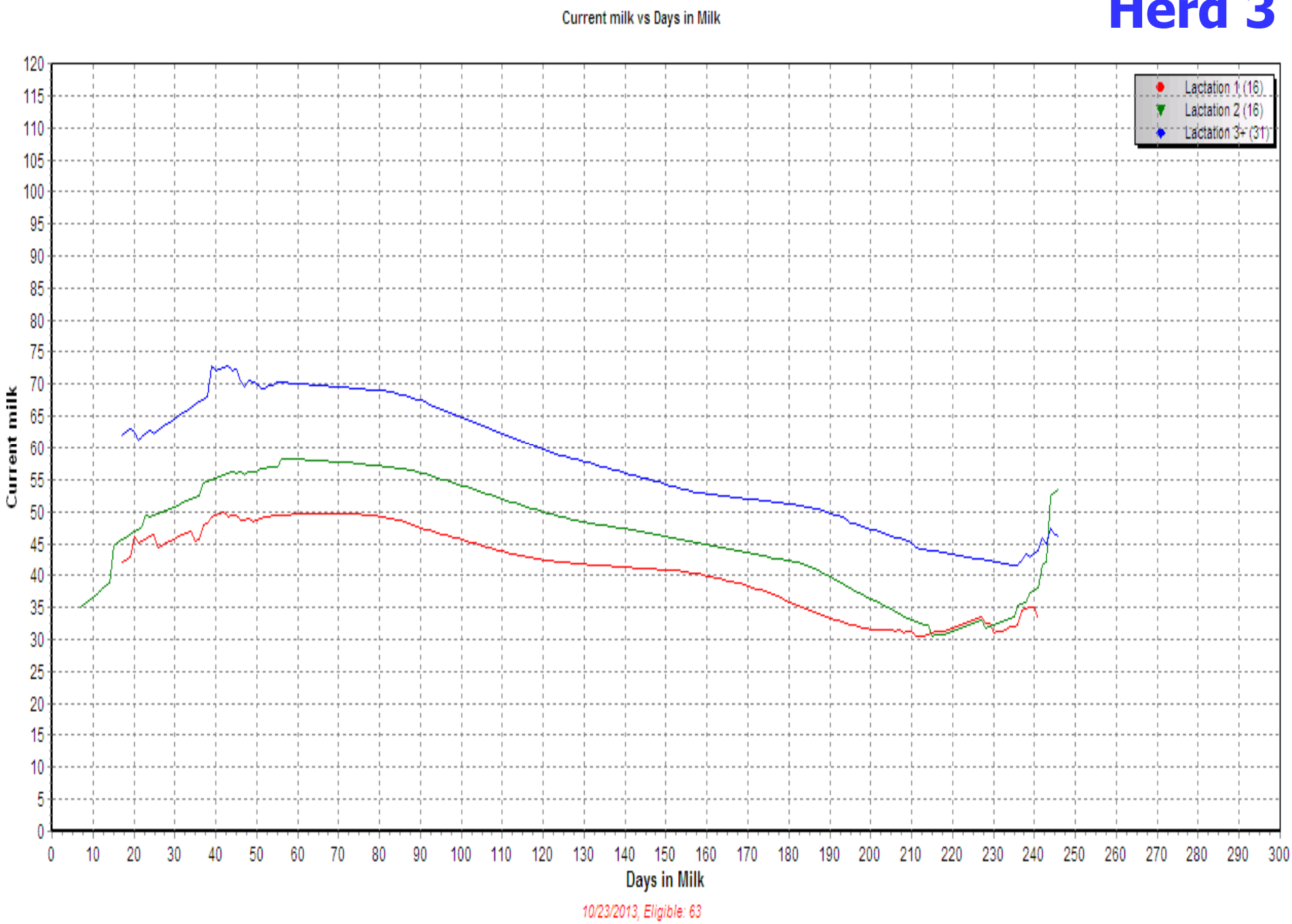
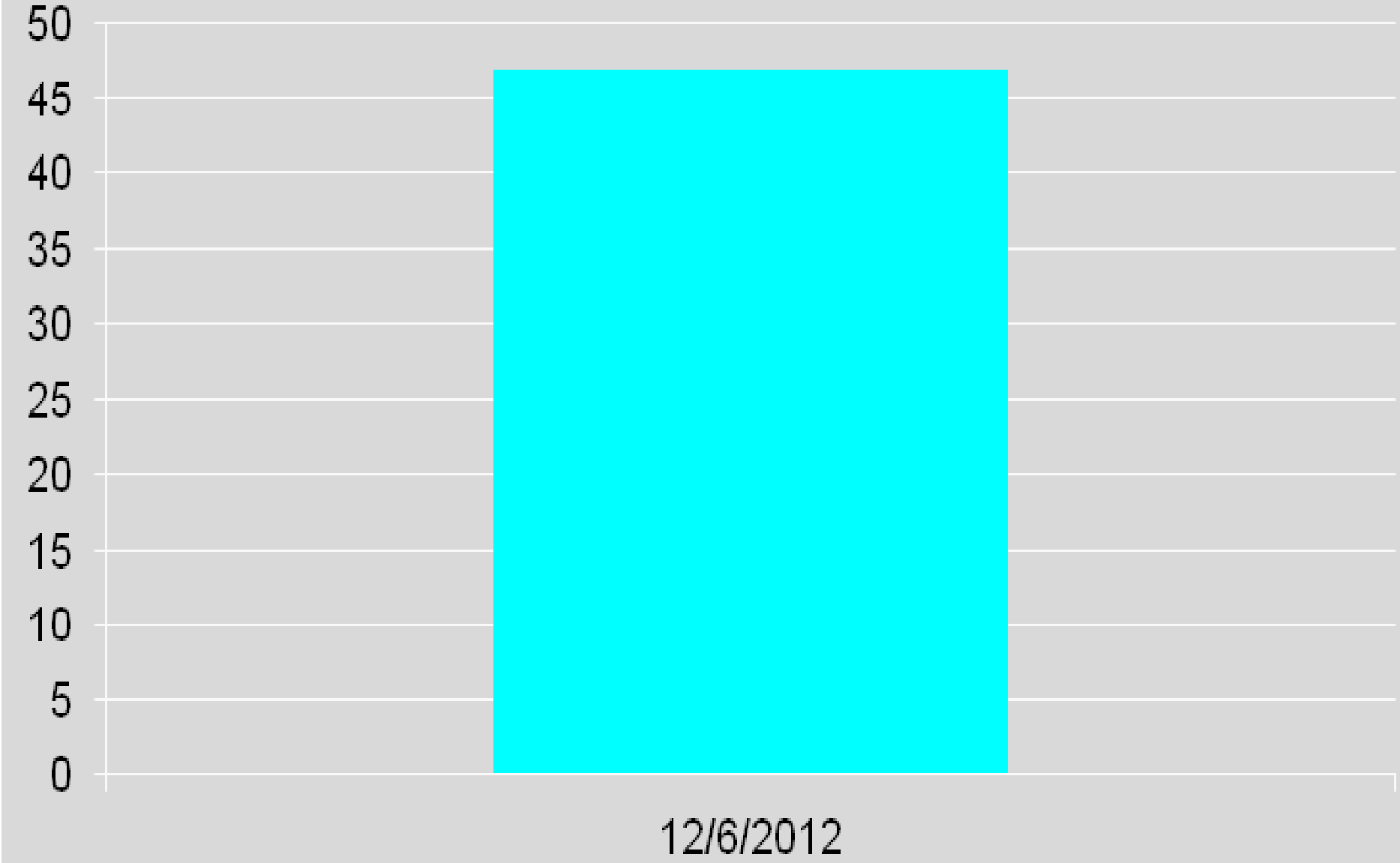

Current milk vs Days in Milk
Lactation 1 (16)
Lactation 2 (16)
Lactation 3+ (31)
Current milk
Days in Milk
10/23/2013, Eligible: 63

Dry Dates

Herd 3



Calving Dates

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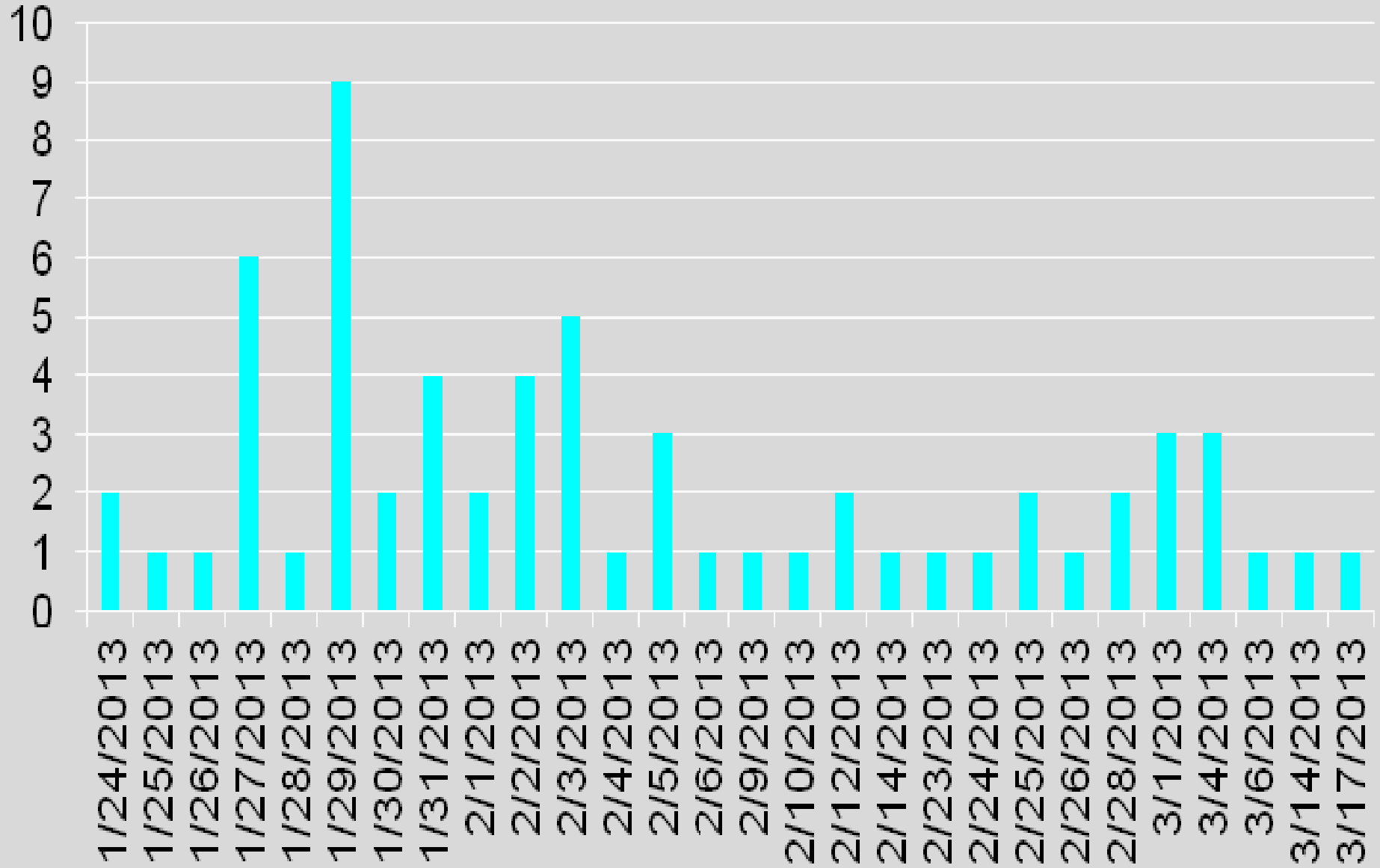

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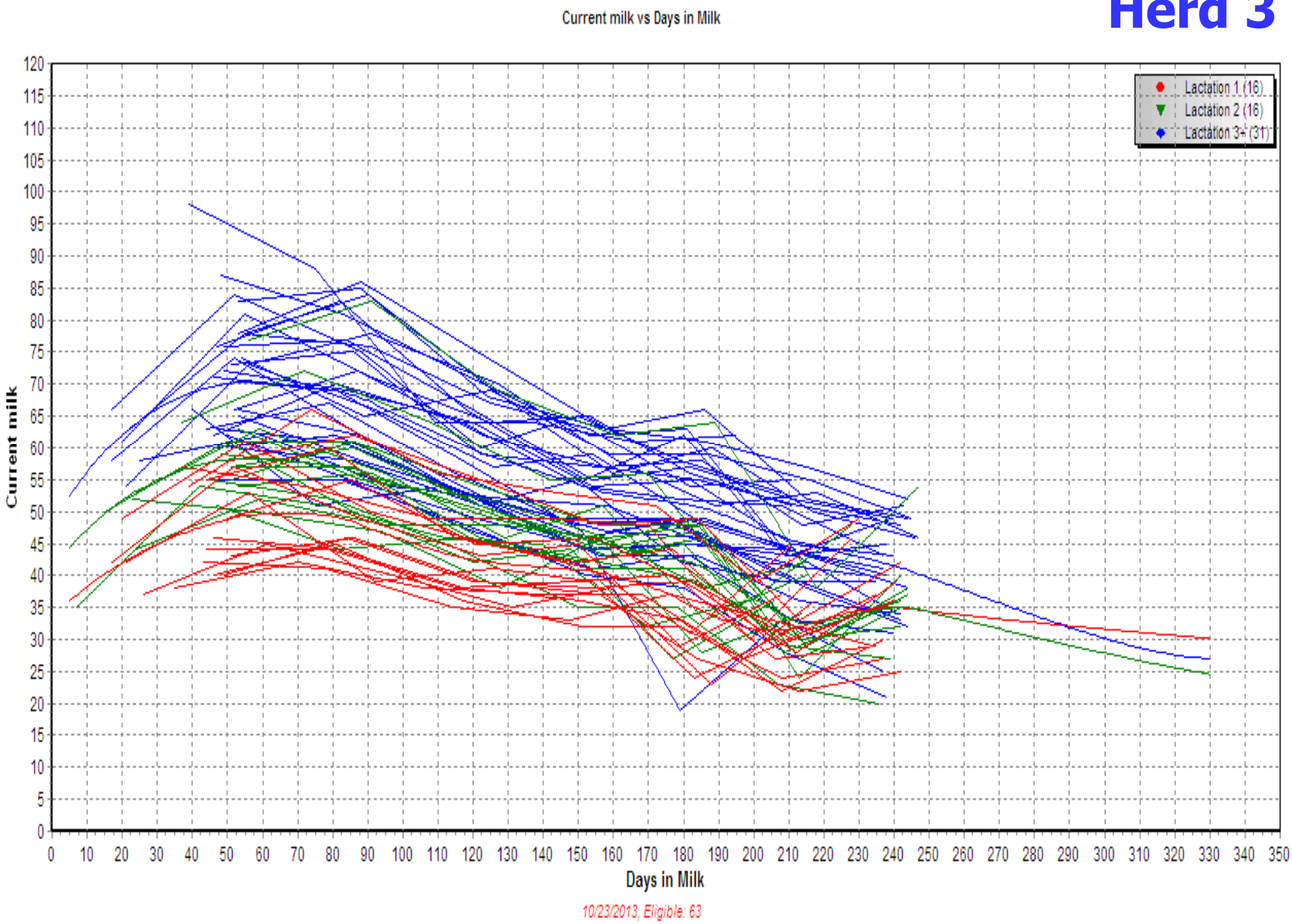
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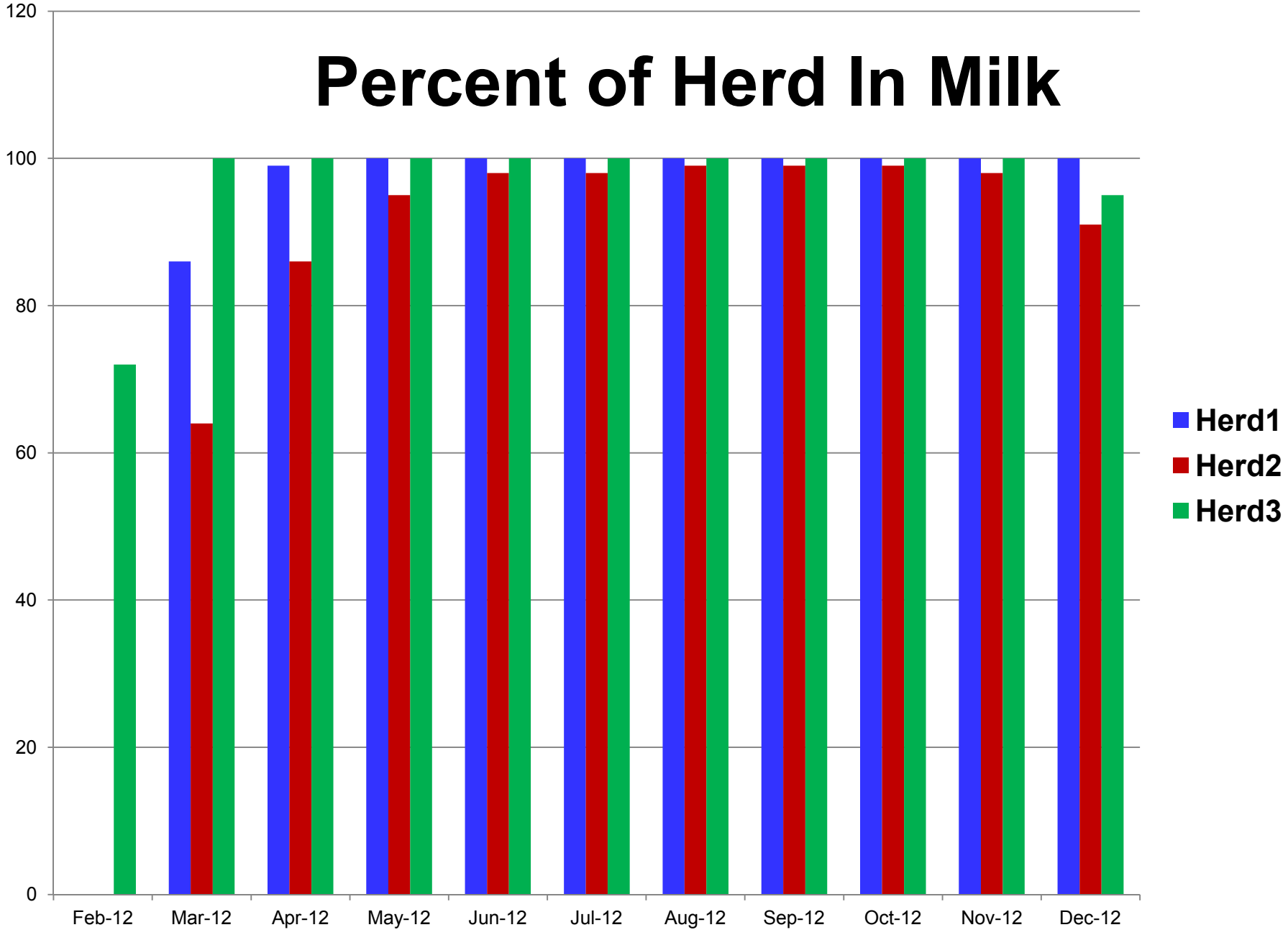
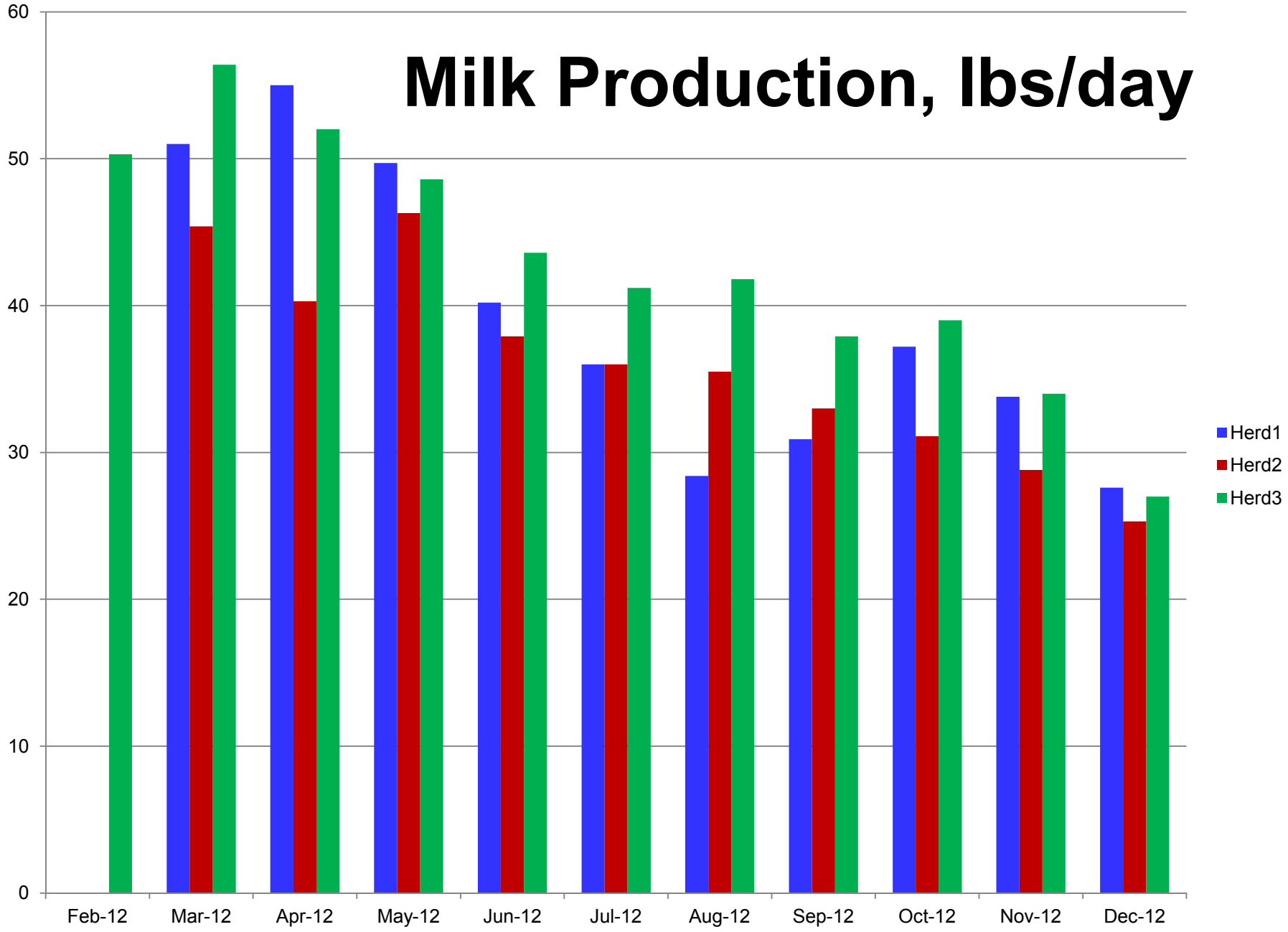
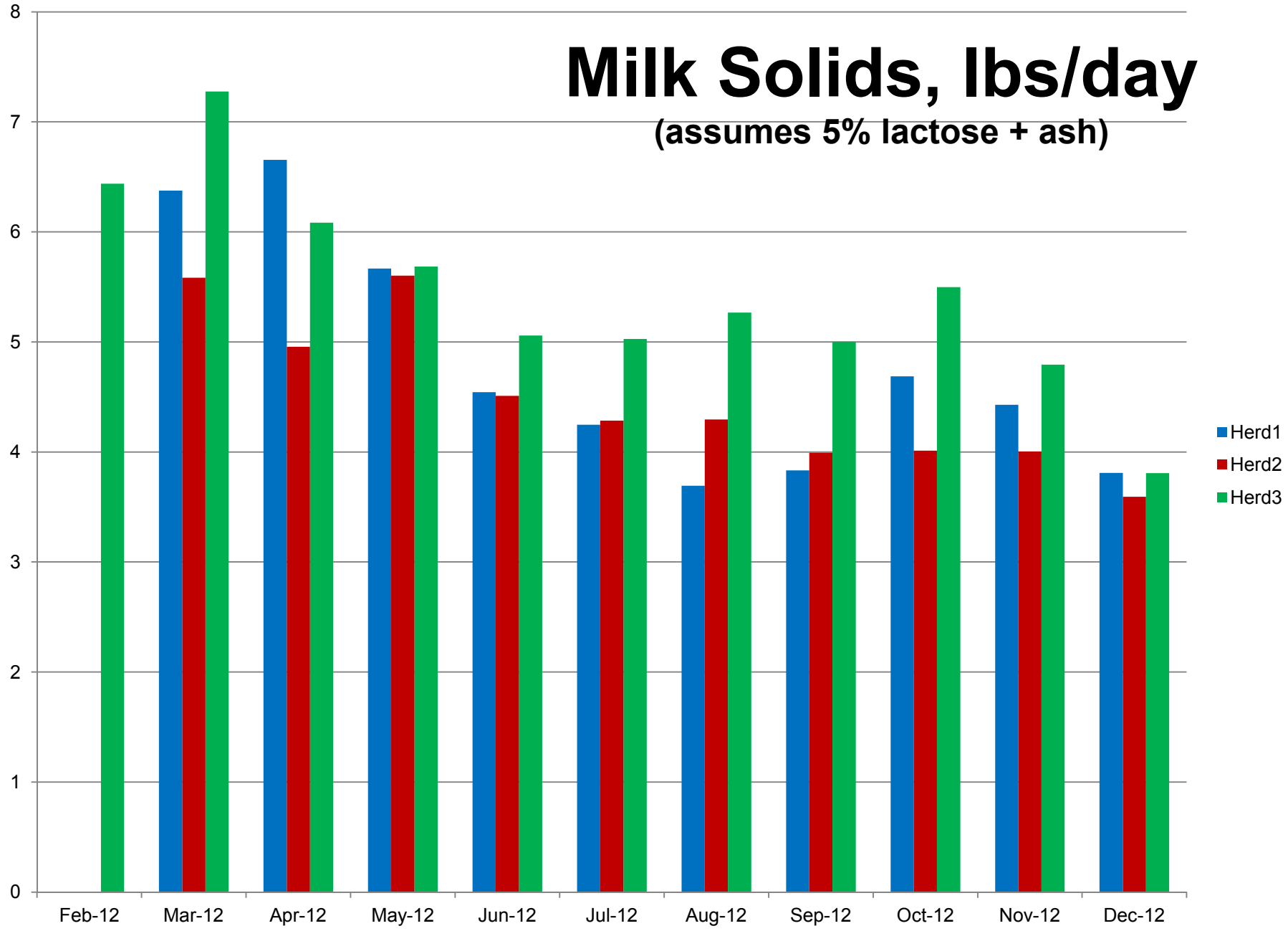
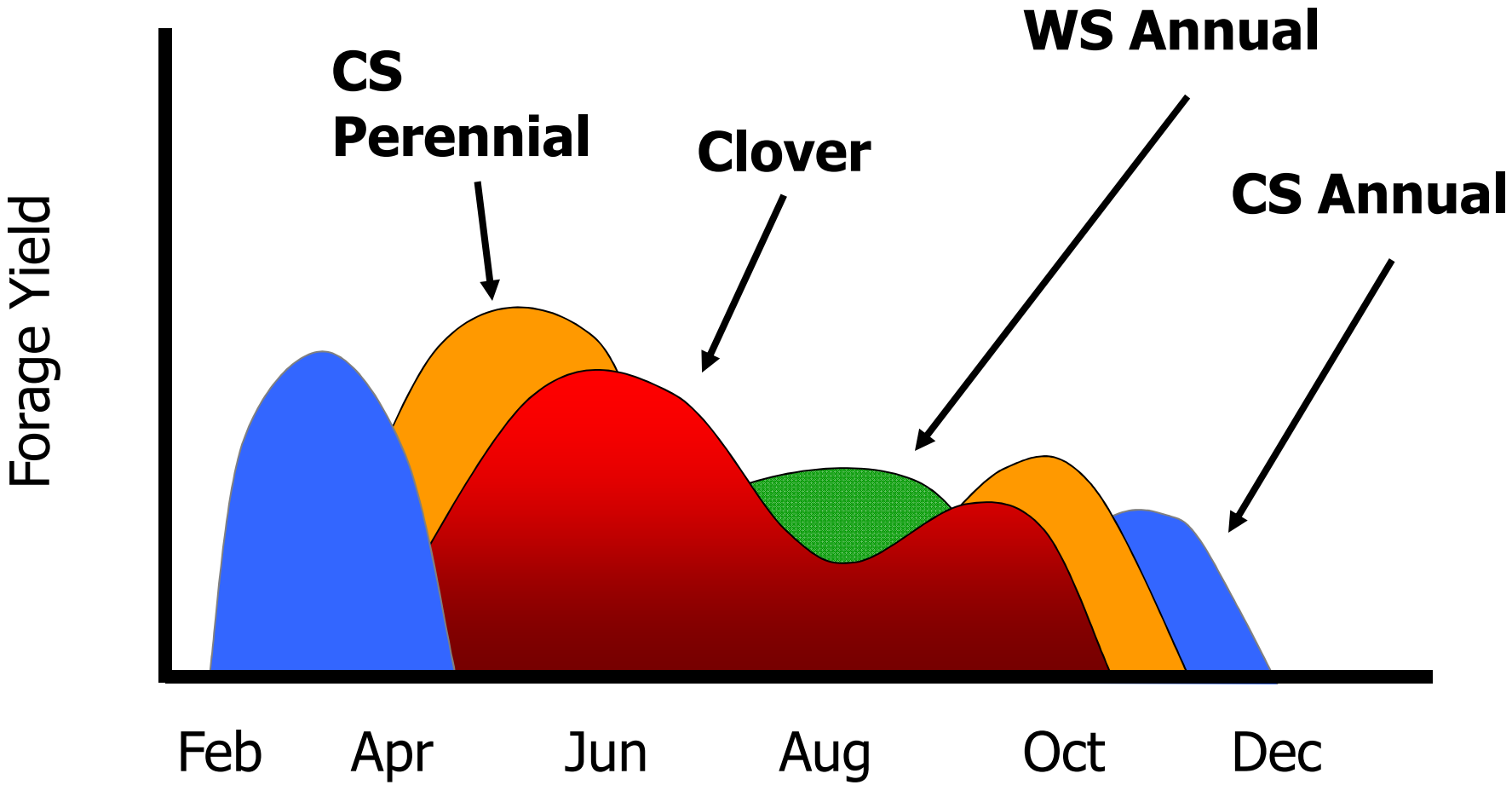

Percent of Herd In Milk
120
100
80
60
40
20
0
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
Dec-12
Herd1
Herd2
Herd3


Milk Production, lbs/day
60
50
40
30
20
10
0
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
Dec-12
Herd1
Herd2
Herd3


Milk Solids, lbs/day
(assumes 5% lactose + ash)
8
7
6
5
4
3
2
1
0
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
Dec-12
Herd1
Herd2
Herd3

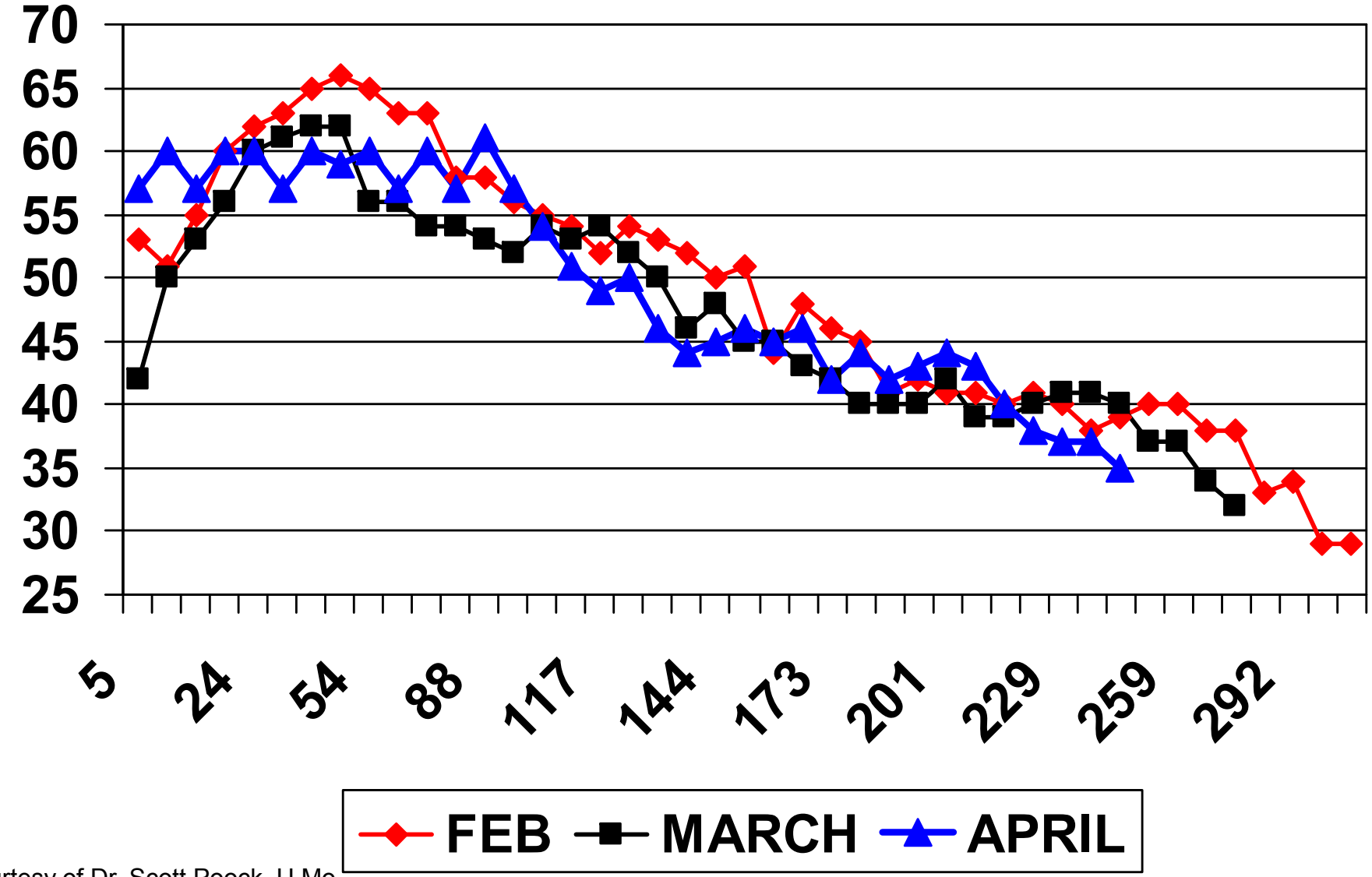
A Simple System



Courtesy of Dr. Scott Poock, U Mo

Lactation Curve by DIM

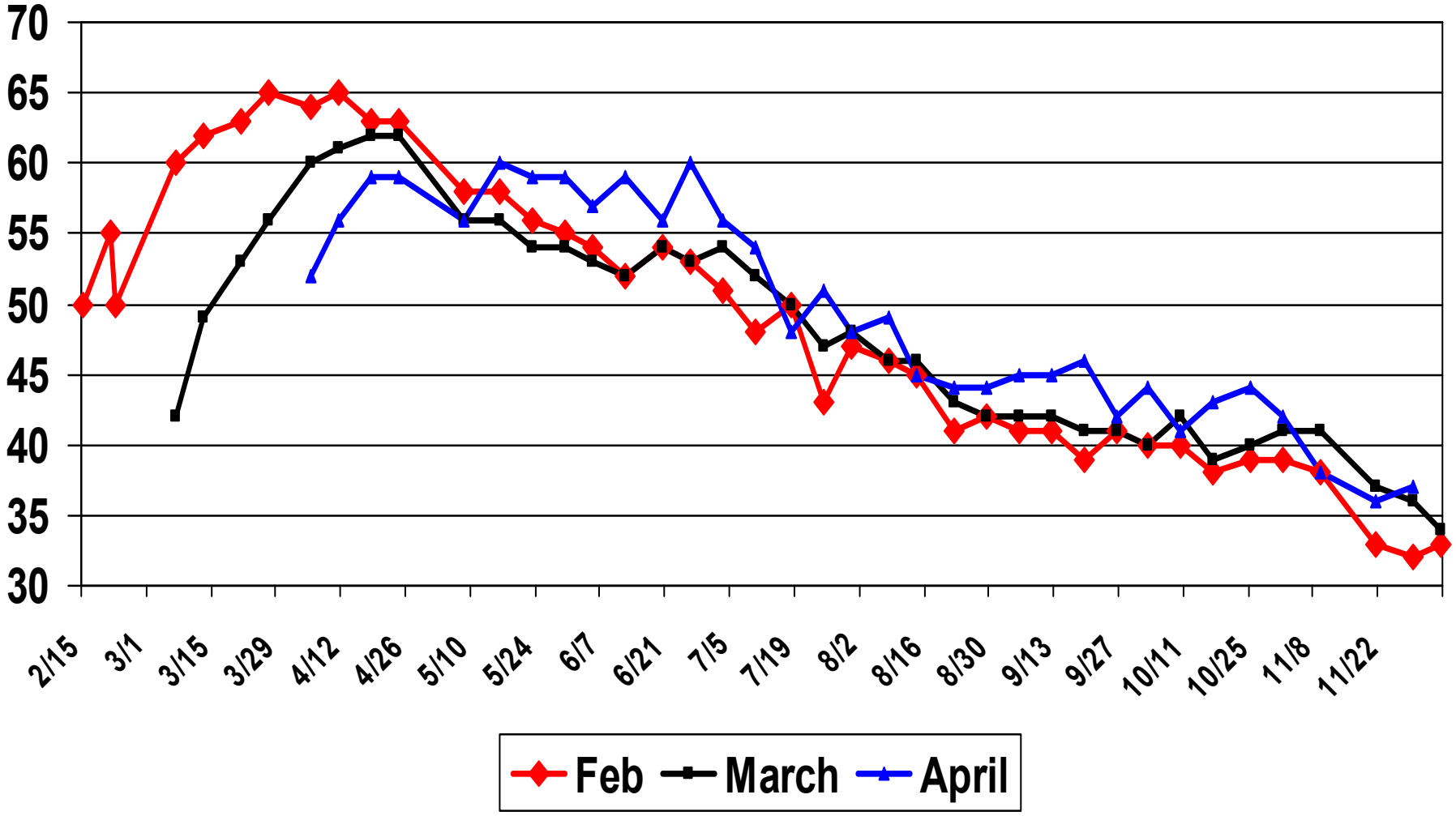
cows calving in Feb, March and April



Courtesy of Dr. Scott Poock, U Mo

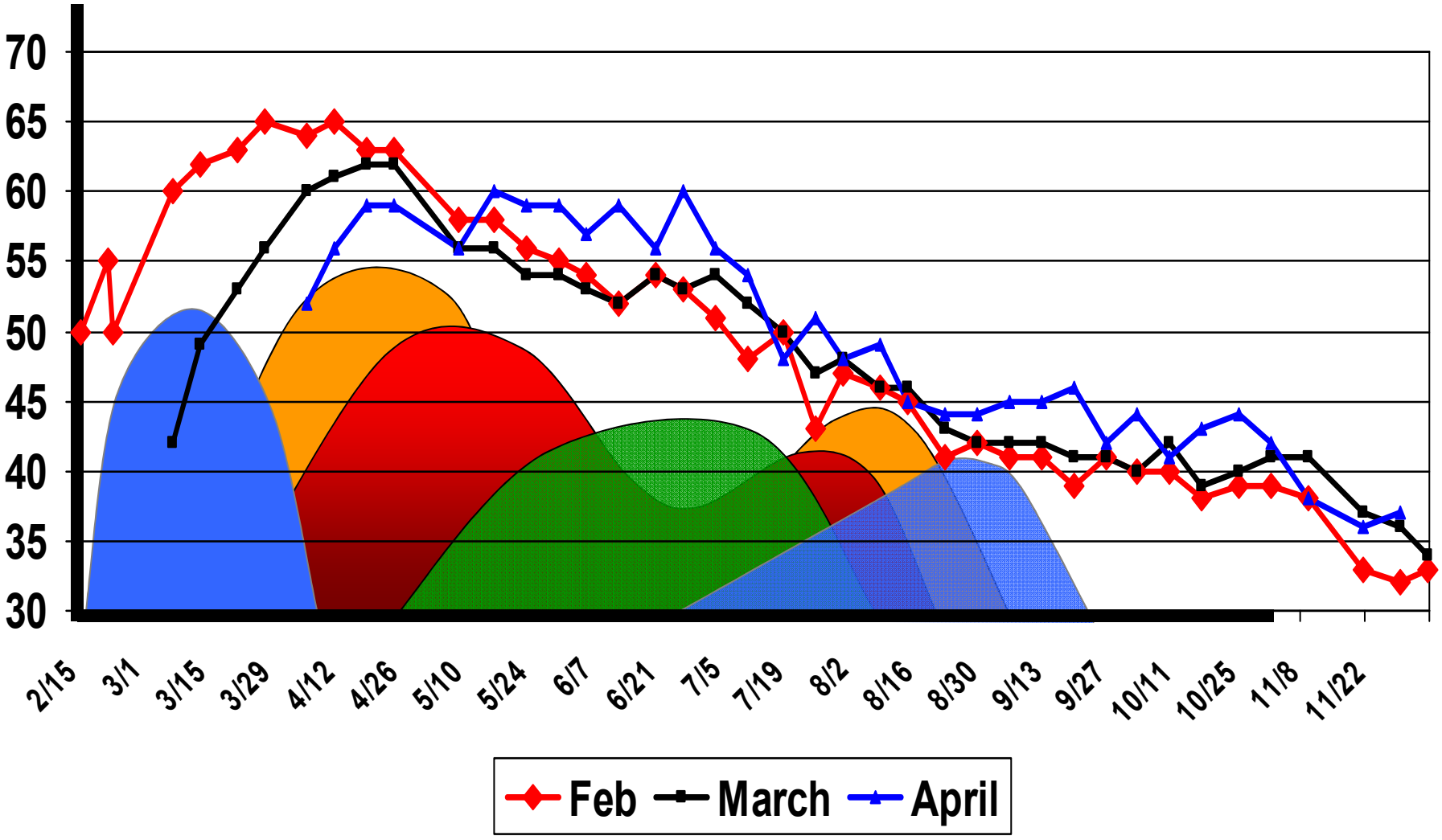
Lactation Curve by month

cows calving in Feb, March and April



Courtesy of Dr. Scott Poock, U Mo

Overlay Lactation and Pasture



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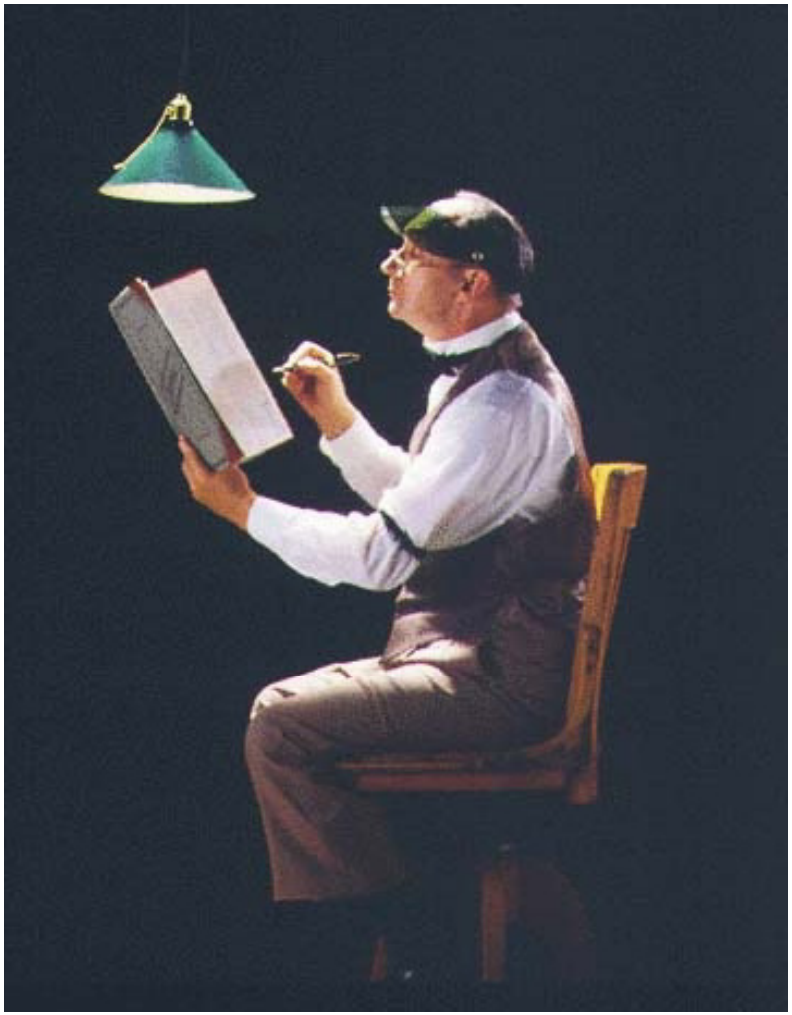
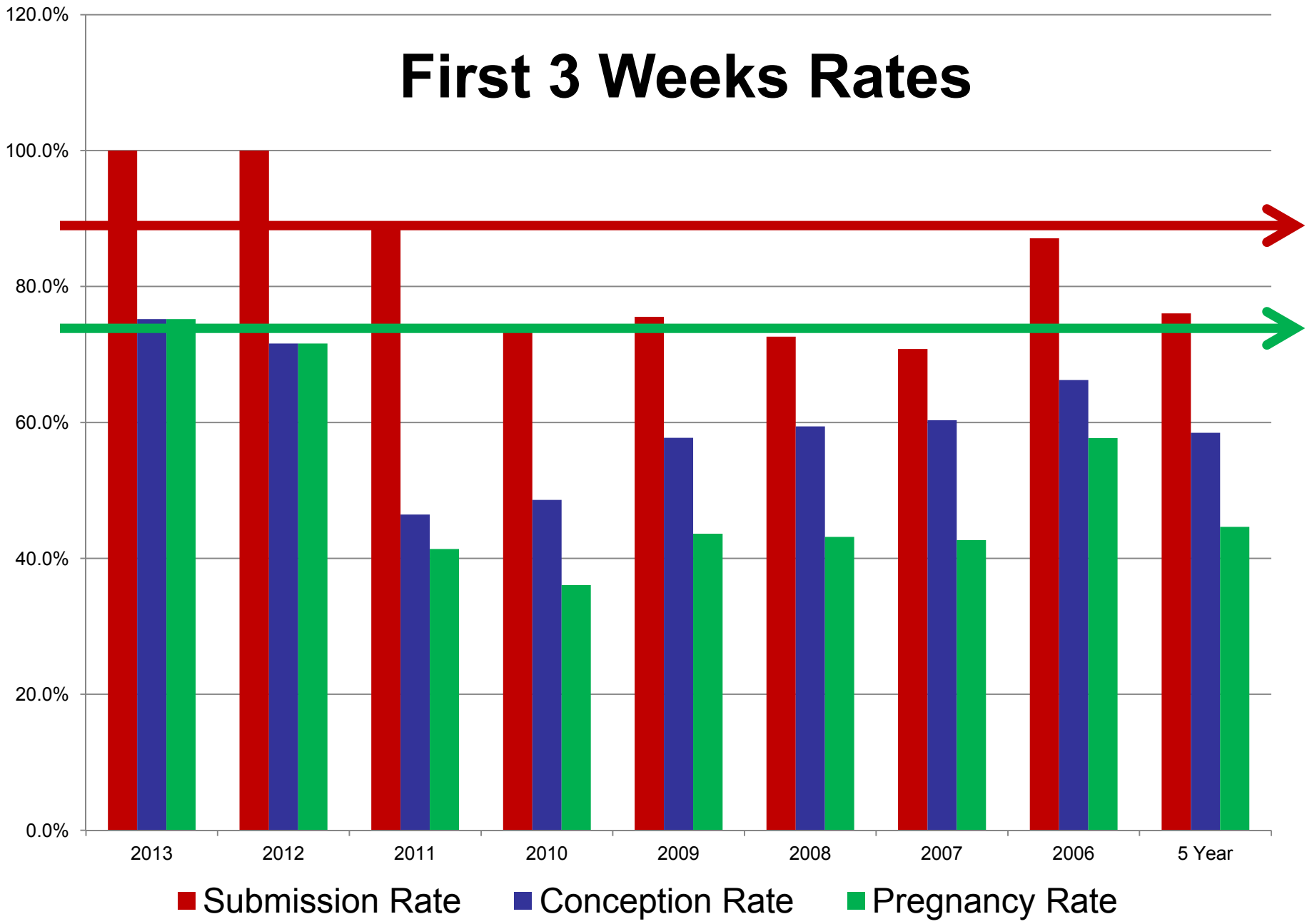
Is reproduction worth improving?

How do you get from the biological program to economics?



What is the value of a pregnancy, the cost of missing grazing days, or the payback from an improved pregnancy rate?



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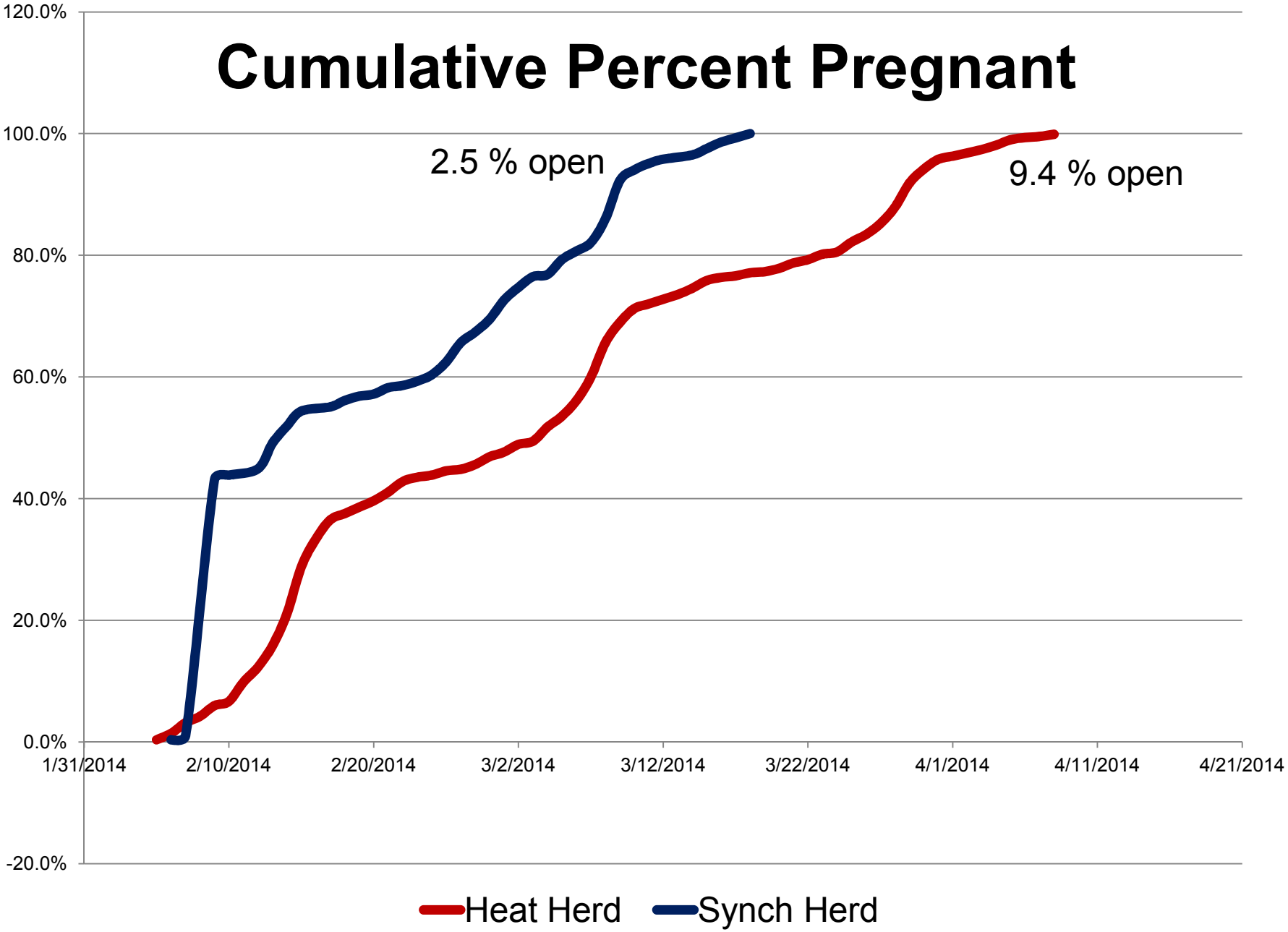
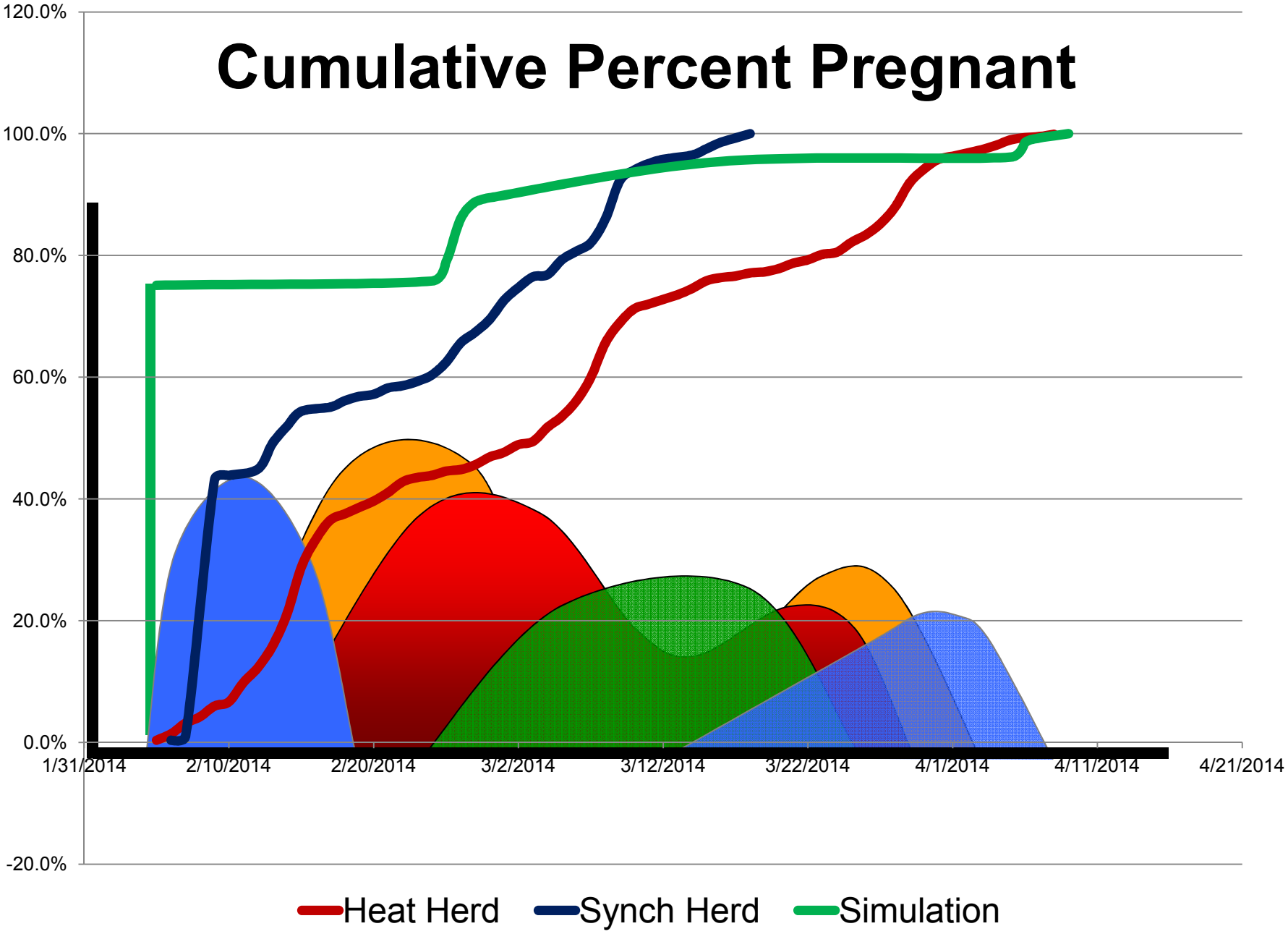

Cumulative Percent Pregnant
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
-20.0%
1/31/2014
2/10/2014
2/20/2014
3/2/2014
3/12/2014
3/22/2014
4/1/2014
4/11/2014
4/21/2014
2.5 % open
9.4 % open
Heat Herd
Synch Herd

Synchronization Program

- Late April, set up 100% of the cows with a program that provides highest conception (eg. Show-Me Synch)
- Tail paint and breed on standing heat for next 28-30 days (thru late May)
- Pregnancy check cows at 28-30 days
- Resynchronize open cows with a high conception protocol (eg. CIDR Synch)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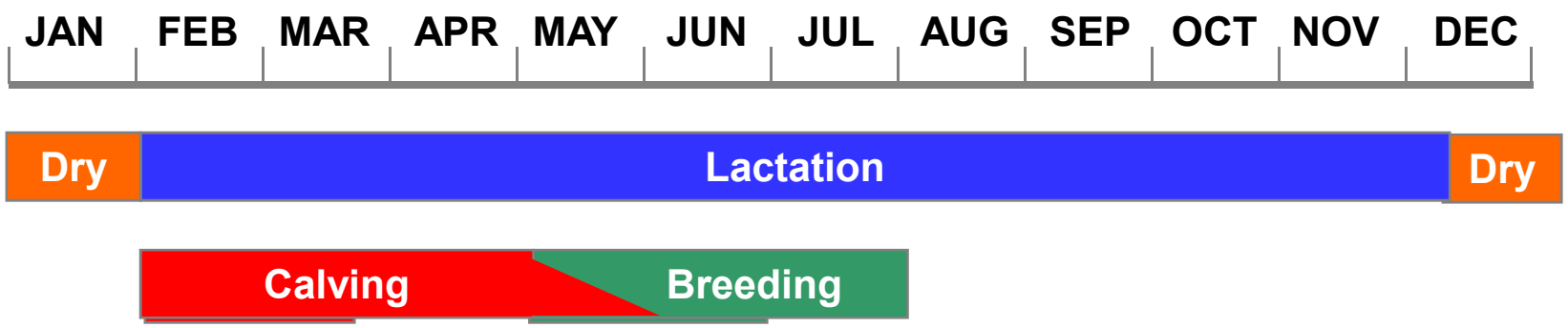
-20.0%
1/31/2014
2/10/2014
2/20/2014
3/2/2014
3/12/2014
3/22/2014
4/1/2014
4/11/2014
4/21/2014
Heat Herd
Synch Herd
Simulation

Reproduction is the key to seasonal calving systems



Consider the Art of the Possible