

PRODAIRY

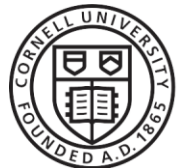
Education & Applied Research



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Calf & Heifer Inventory Management

Margaret Quaassdorff, MS
NWNY Dairy Management Specialist



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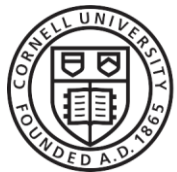


Why is thinking about heifer inventory important?

- Farm Efficiency
- Farm Profitability
- Growth Goals



Photo: Libby Eiholzer



Many farms have too many heifers in their inventory

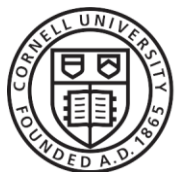
Why?

- Use of sexed semen
- Reproductive efficiency
- Better colostrum practices
- Overall better calf management and health standards

- Benefits of reducing heifer inventory:
 - Decreased stocking density (no need to build new facility)
 - Maximized growth and health
 - Valuable co-products (dairy and beef)
 - Reduced labor and increased profitability



Photo: Libby Eiholzer

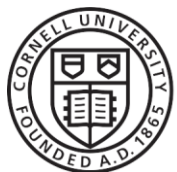


Shift Away from Quantity; Focus on Quality

- Determine the appropriate number of heifers for your operation
 - Based on:
 - Future herd size goals + a 3-5% cushion
 - Cushion is to avoid purchasing heifers in the future if need extra
 - Size of herd
 - Cull rate of mature cows in the herd
 - Age at 1st calving
 - Heifer culling rate (and mortality loss)



Photo: Libby Eiholzer



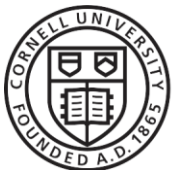
Calculating Inventory Needs

- Determine the appropriate number of heifers for your operation

Mature Cows
1st Calf Heifers
Dry Cows

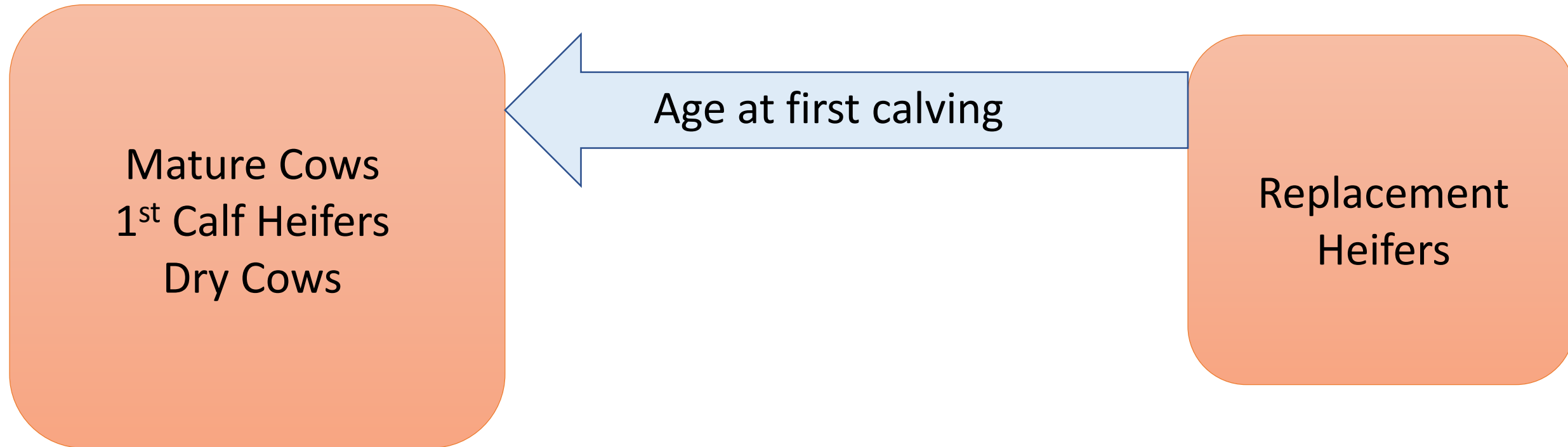
Replacement
Heifers

- How many do I need to maintain herd size?



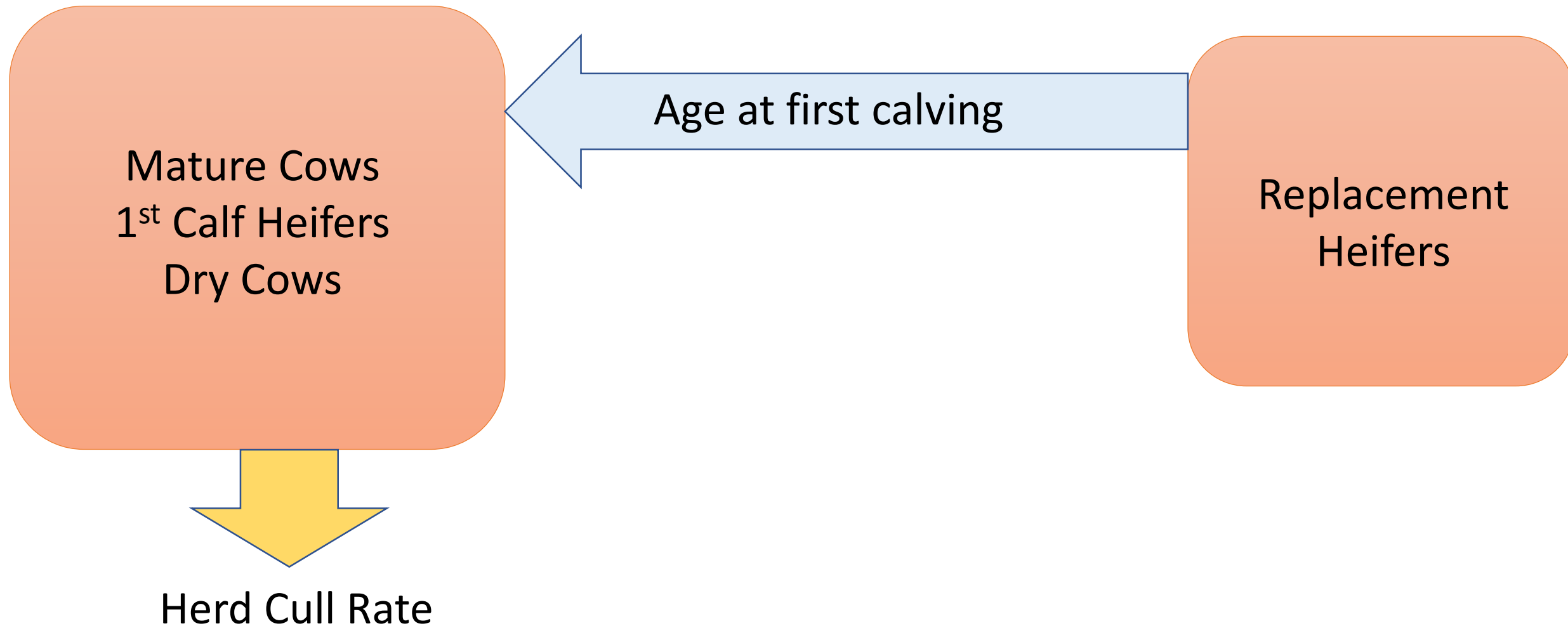
Calculating Inventory Needs

- Determine the appropriate number of heifers for your operation



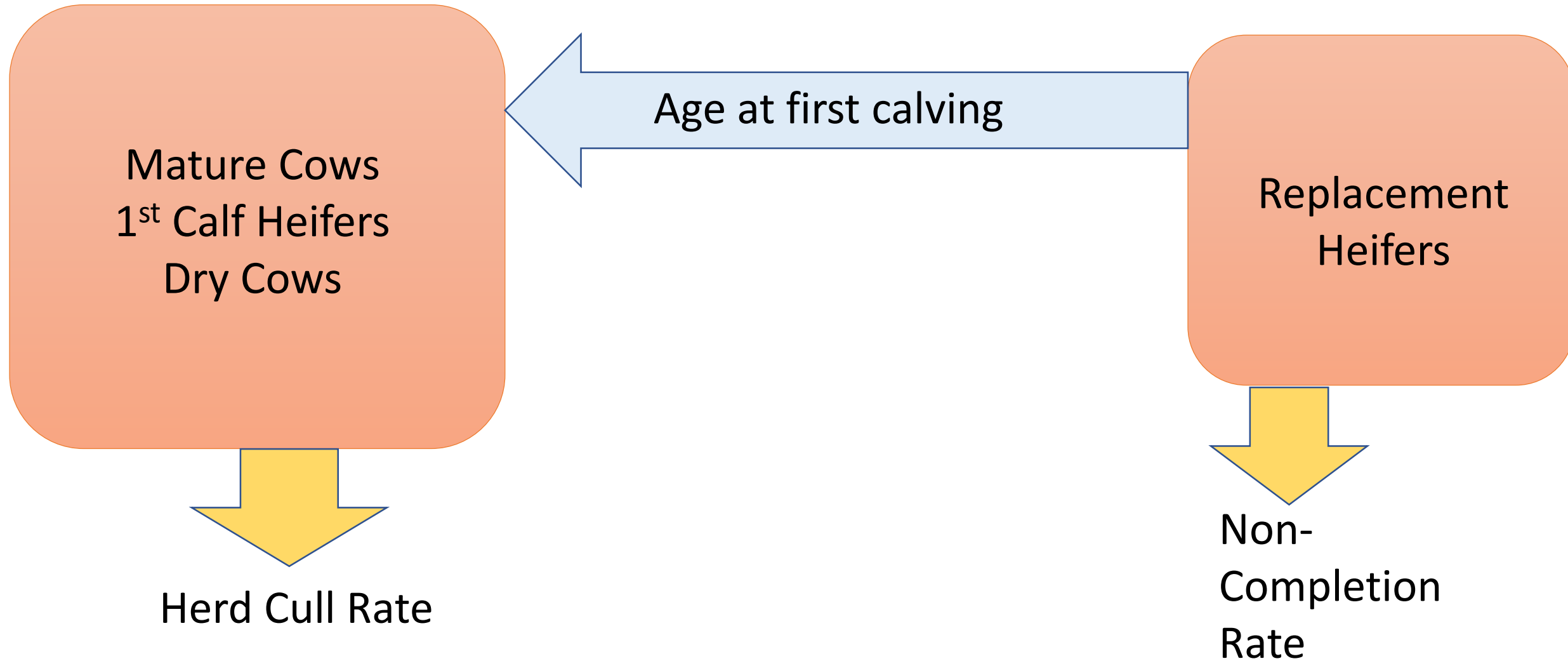
Calculating Inventory Needs

- Determine the appropriate number of heifers for your operation



Calculating Inventory Needs

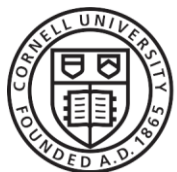
- Determine the appropriate number of heifers for your operation



Determine the appropriate number of heifers for your operation

- How many to maintain herd size?
- Scenario: 100 cow dairy planning to maintain herd size; 22 month age at first calving; a cull rate of 33%, and a non-completion rate of 10%.
- Equation: Herd Size X (Age at First Calving in Months/24) X Cull Rate X (1+ Non-Completion Rate) = Annual number of Heifers Needed
- Calculation: $100 \times (22/24) \times 0.33 \times (1 + 0.10) = \sim 34$ heifers needed to maintain herd size on an annual basis

Equation courtesy of UW Extension

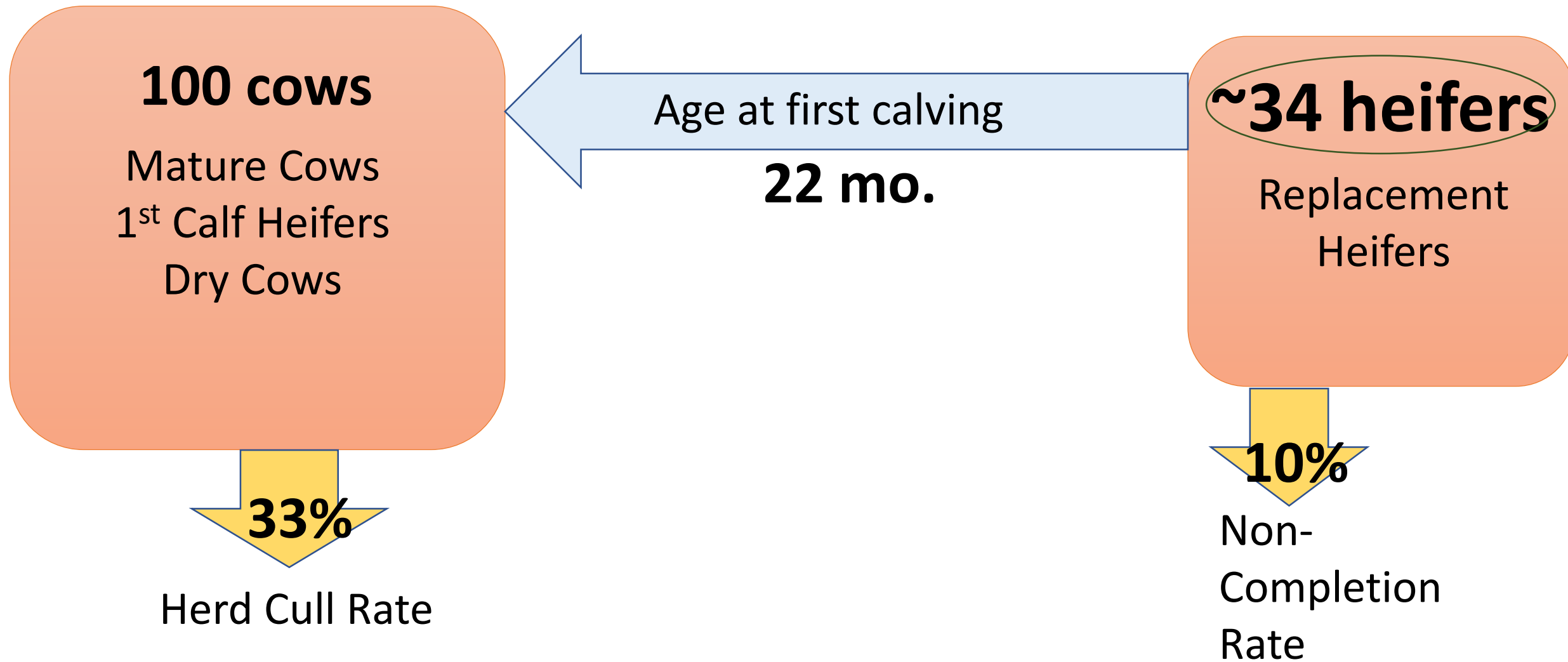


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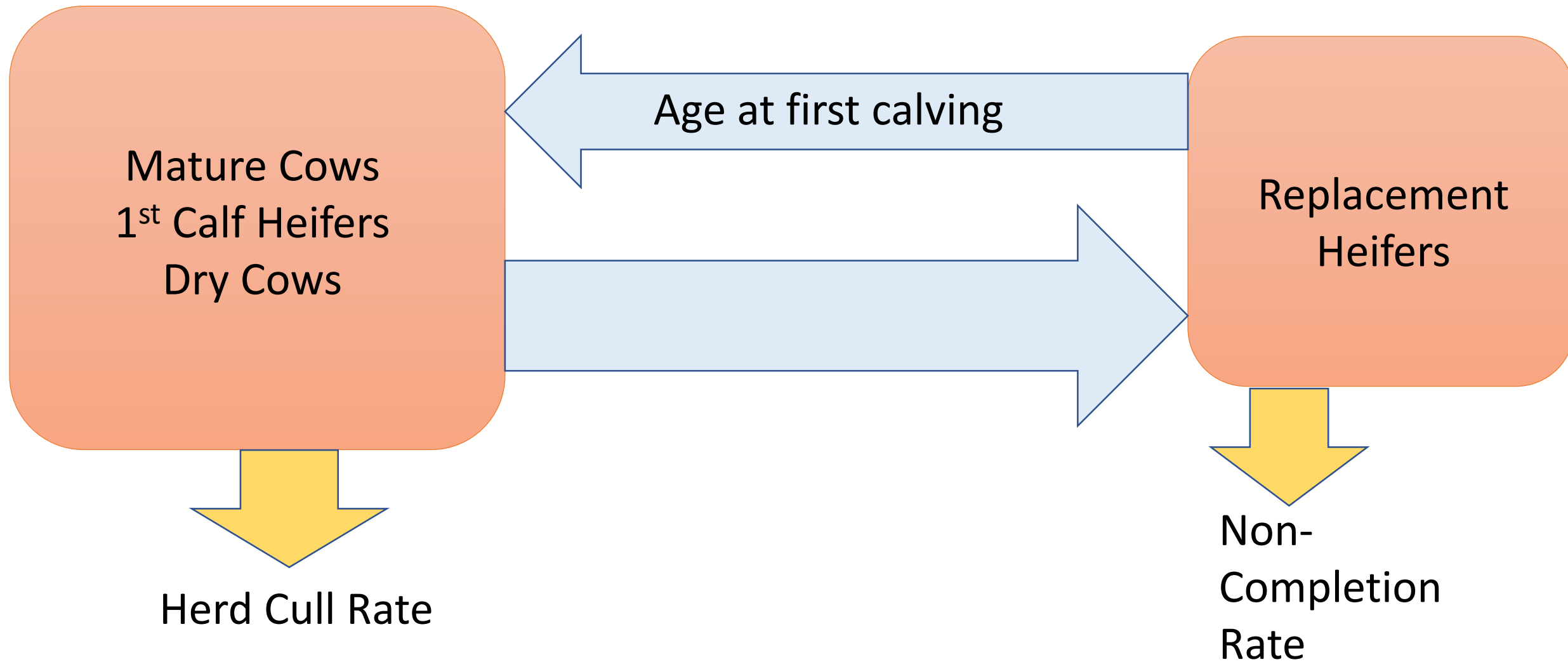
Calculating Inventory Needs

- How many heifers are needed to maintain herd size?



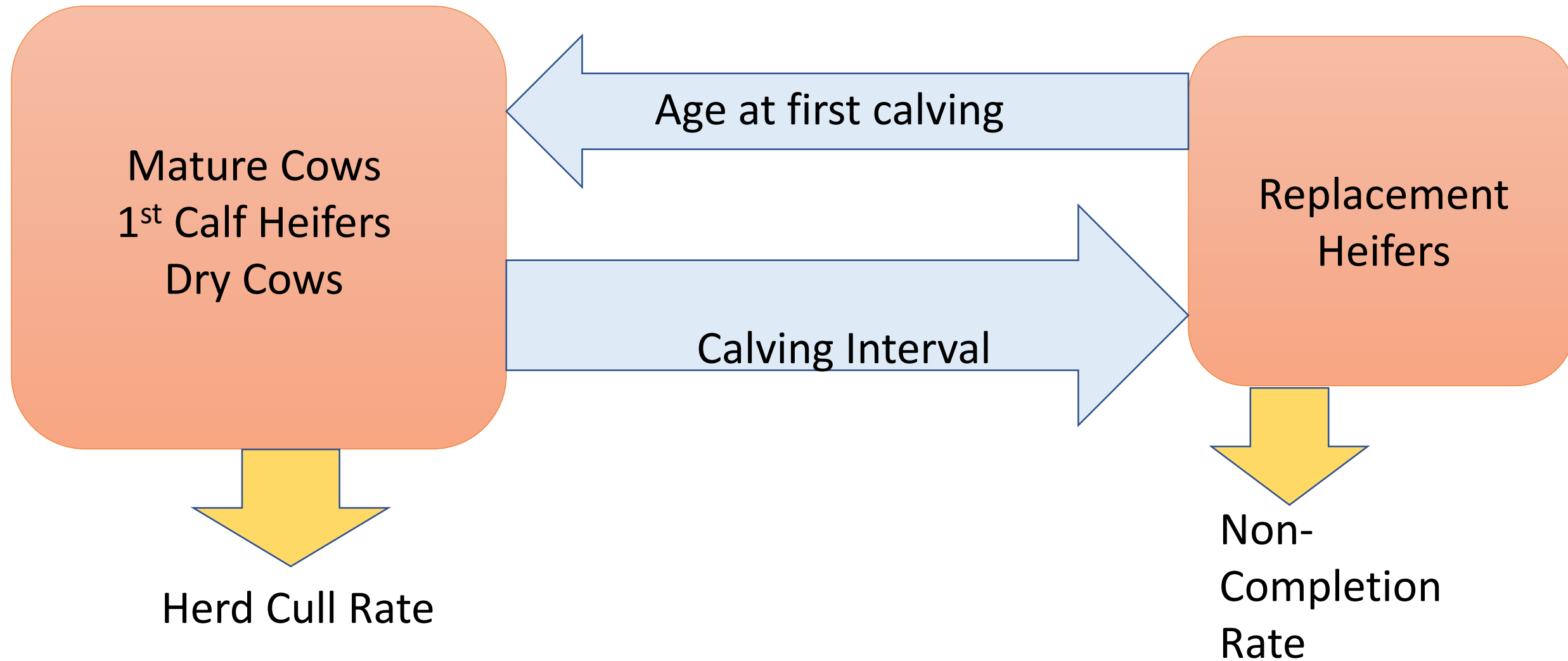
Calculating Incoming Heifer Numbers

- How many heifers do I annually have born on my operation?



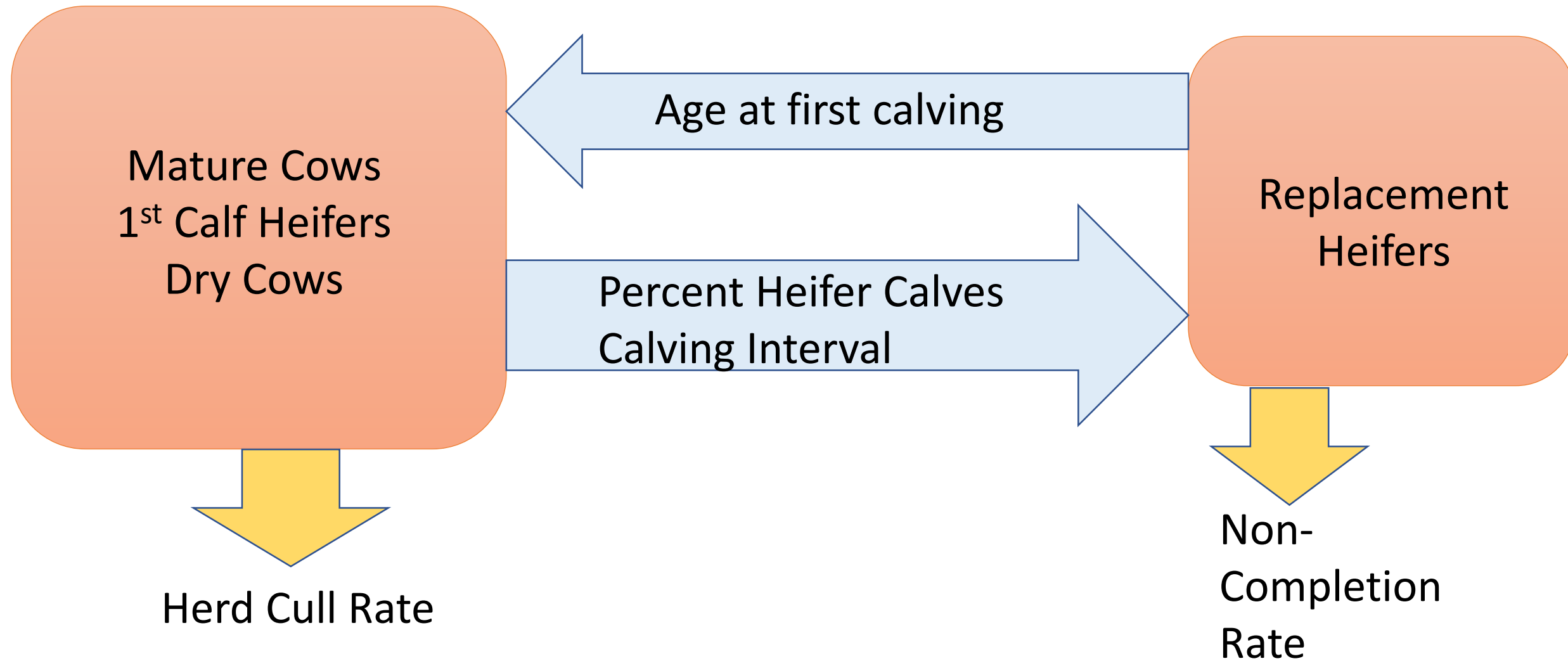
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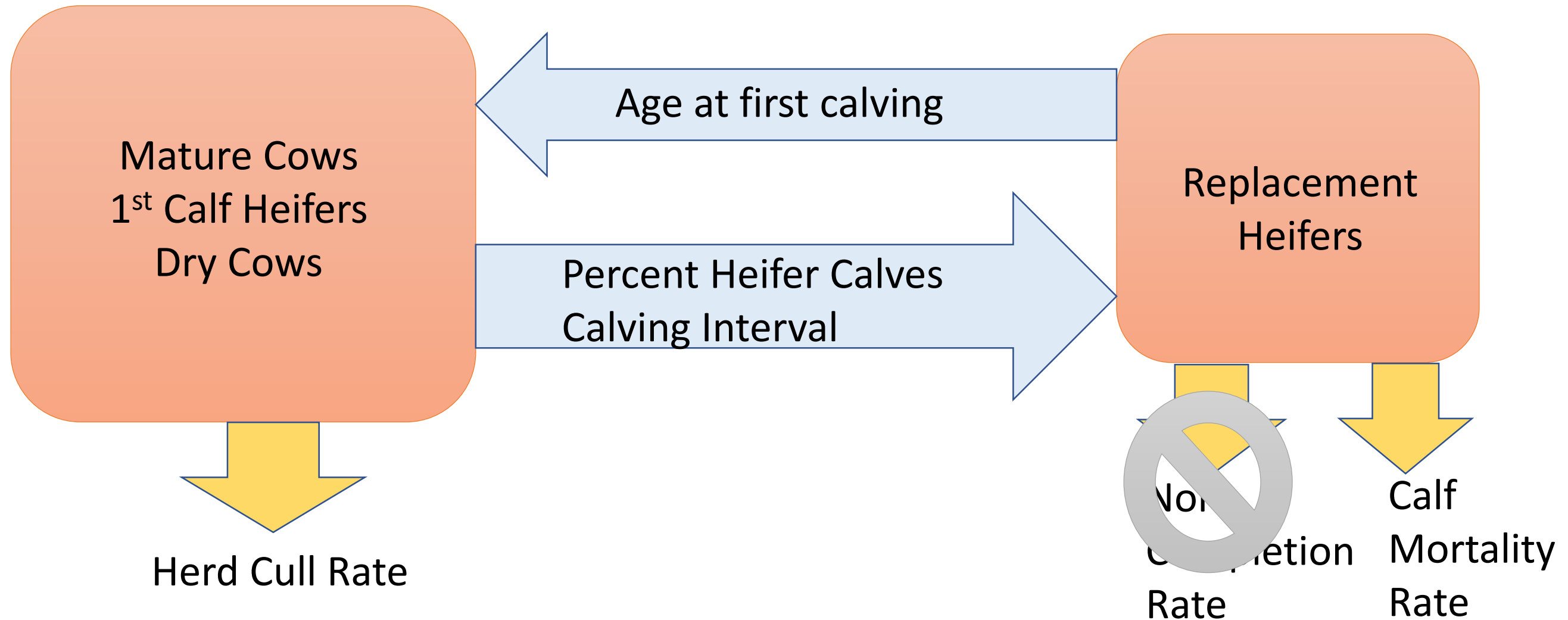
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Calculating Incoming Heifer Numbers

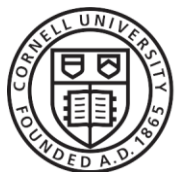
- How many heifers do I annually have born on my operation?



Determine the appropriate number of heifers for your operation

- How many heifers do I currently have born annually on my farm?
- Scenario: 100 cow dairy planning to maintain herd size; 22 month age at first calving; a cull rate of 33%, and a non-completion rate of 10%. Calving interval is 13 months; 55% of calves are born as heifers, and a total heifer calf mortality of 10%.
- Equation: $1 \times \text{Herd Size} \times (12 / \text{Calving Interval}) \times \text{Percentage of heifers} \times (1 - \text{Heifer Mortality}) \times (24 / \text{Age at First Calving in Months}) = \text{Annual number of Heifers Born}$
- Calculation: $1 \times 100 \times (12/13) \times 0.55 \times (1 - 0.10) \times (24/22) = \sim 49 \text{ heifers born annually}$

Equation courtesy of UW Extension

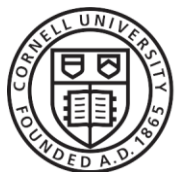
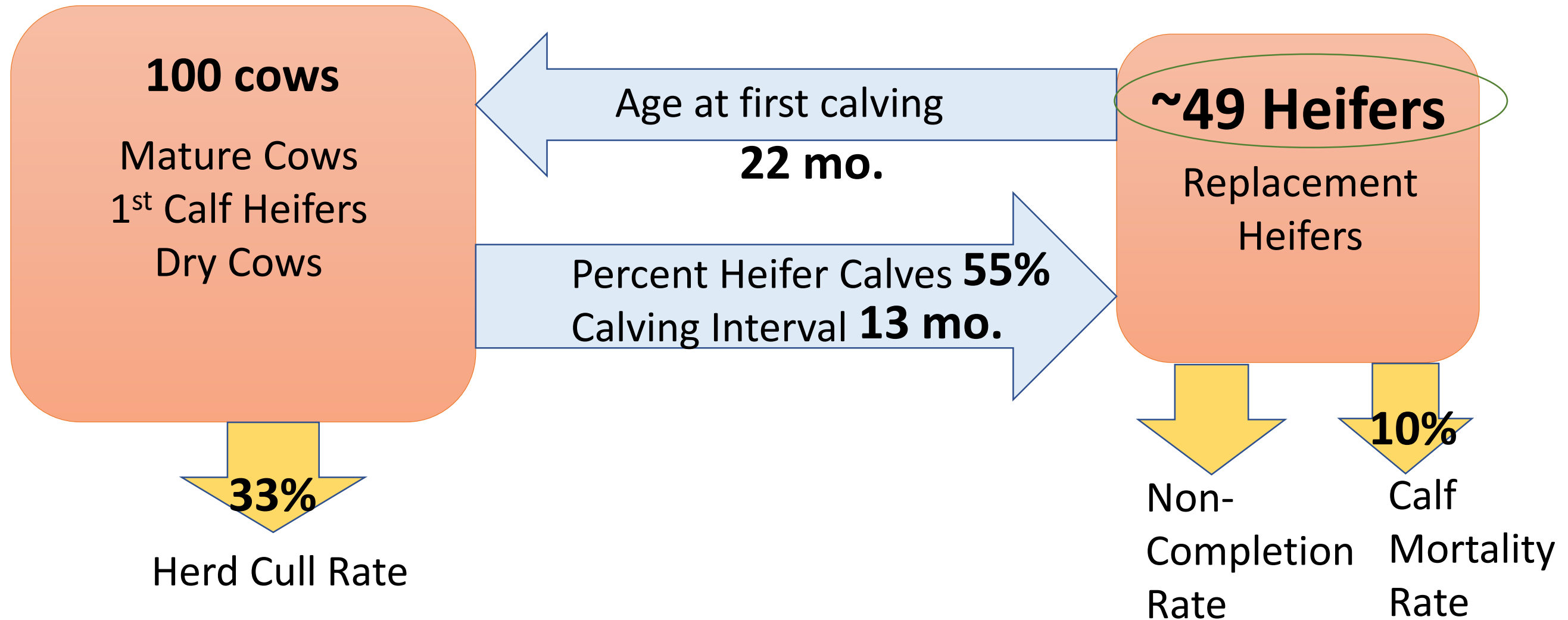


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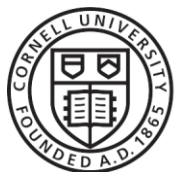
Calculating Incoming Heifer Numbers

- How many heifers do I annually have born on my operation?



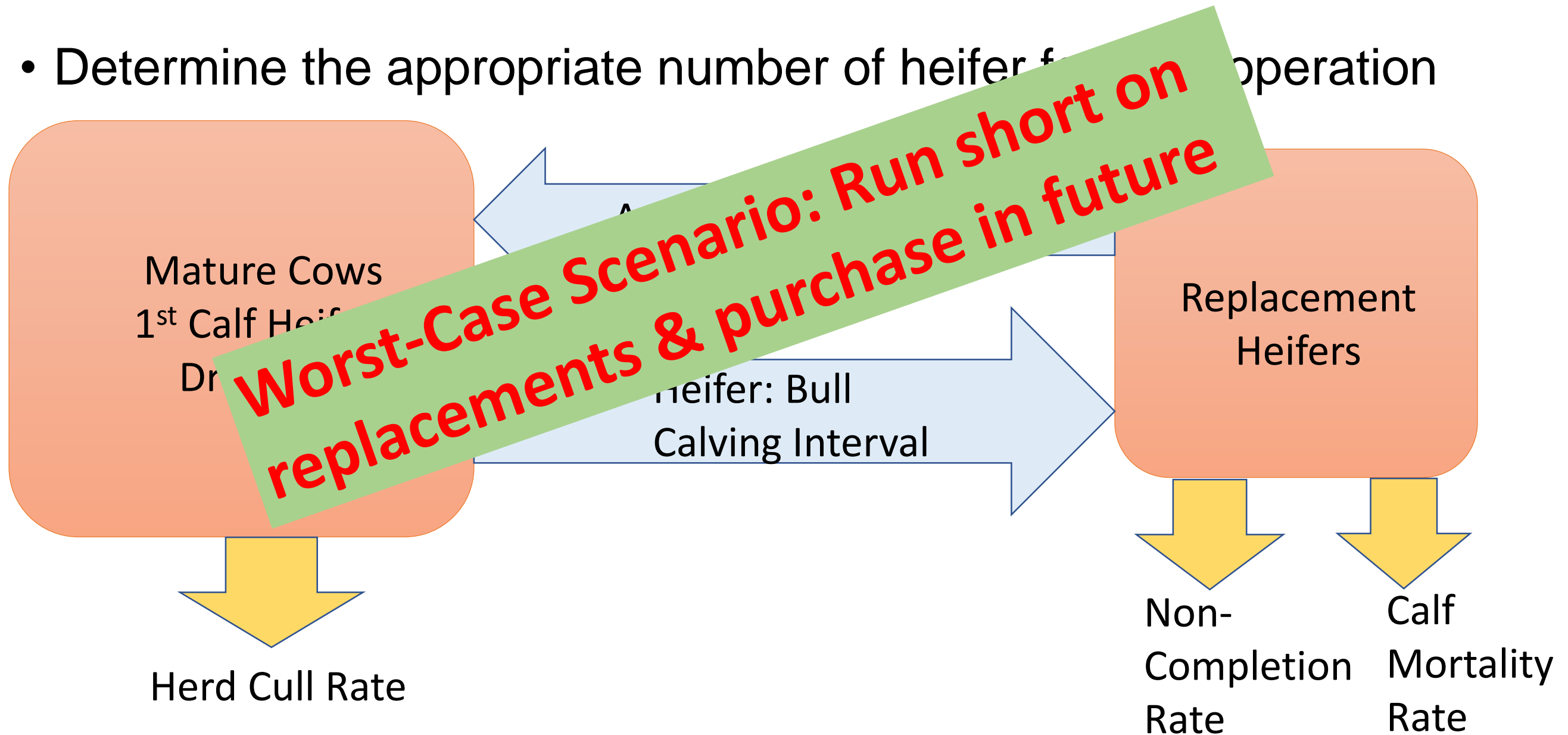
Determine the appropriate number of heifers for your operation

- How many extra heifers do I have on my farm annually?
- Scenario: 100 cow dairy planning to maintain herd size; 22 month age at first calving; a cull rate of 33%, and a non-completion rate of 10%. Calving interval is 13 months; 55% of calves are born as heifers, and a total calf mortality of 10%. I would like a 5% cushion of extra heifers.
- Equation1: (Number of Heifers Needed X 1.05) = Number of total heifers including a cushion of 5%
- Equation2: Number of heifers born annually – number of heifers that I need to maintain herd size including cushion = Total heifers extra annually
- Calculation1: (34 X 1.05) = **~36 heifers needed including a cushion of 5%**
- Calculation2: 49 – 36 = **13 heifers extra annually**



Shift Away from Quantity; Focus on Quality

- Determine the appropriate number of heifer for operation



Don't Be a Heifer Hoarder



Photo: Margaret Quassdorff



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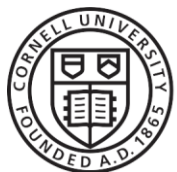


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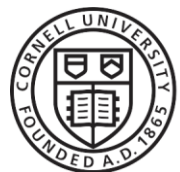
Photo: Margaret Quaassdorff



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Photo: Libby Eiholzer



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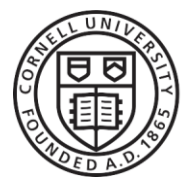


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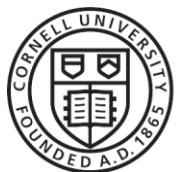
Tools to Choose Who Stays and Who Goes

- Genomics

- Test a portion or all heifers born on the dairy to determine genetic value
- Determine if the cost is feasible
- Benefit: You have a better idea of your genetically highest valued animals, can cull bottom % immediately
 - If you have too many above average animals, they may be sold at a higher value for dairy purposes

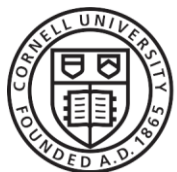
- Pedigrees and PTA's

- Look at the pedigree of the heifers you have to get a better idea of potential
- Benefit: Can make an assumption that animals from good lines will also be good animals...not always the case!
- Remember that both pedigrees and genomics are only part of the story...ENVIRONMENT MATTERS



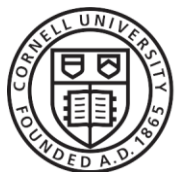
Tools to Choose Who Stays and Who Goes

- Health Records: Maintain accurate health records for all heifers
 - Difficult calving: dystocia; calves usually don't do as well as peers
 - Injury: Physical impairment, poor confirmation, etc.
 - Disease: health and treatment history
 - Antibiotic treatment along with diarrhea had a significant effect on TDM residual milk and calves that were treated with antibiotics **produced 1,086 lb less milk in the first lactation than calves with no record of being treated.** Soberon et al., 2012
 - Easy to implement a strategy when you have these records
 - 3-strike policy: Treated 3 times for moderate to severe illness and you're out.
 - *Severe pneumonia is an "automatic out" in my book



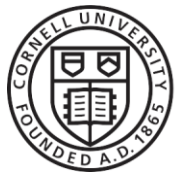
Heifer Inventory Management from the Cow Side

- Strategies from the Cow Side:
 - Use of Beef Semen
 - Why? Crossbred DairyxBeef has a higher beef market value than a purebred dairy calf
 - Which cows do I breed to beef?
 - Lower genomic value
 - Reproduction status (# of times bred to dairy)
 - Poor production record
 - Which beef bulls do I use?
 - Not all beef bulls are created equal- Work with AI companies
 - Important for the dairy industry to produce a high quality beef animal as a co-product to build a good reputation



Heifer Inventory Management from the Cow Side

- Example: Farm 1
 - Problem: Half the herd is 1st calf heifers and no space for calves
 - Too many calves per autfeeder- increased sickness risk, limited growth potential
 - Forced to wean early creates small calves and stress
 - Not capitalizing on higher milk production of mature cows
 - Solution: Determine needs and Sell excess heifer calves and 1st lact. animals
 - Reduce percent of 1st lactation animals to 42%, sell based on dam and sire production criteria
 - Top 40% of milking herd bred back to HO, bottom 60% to Angus
 - Crossbred calves are sold within a week



Heifer Inventory Management from the Cow Side

- Example: Farm 2
 - Problem: Excessive Expense and Want Better Calf Performance
 - Trying to raise all animals at the highest quality
 - Solution: Determine Inventory Goal
 - Top 25% of milking herd determined by a weighting of 75% genomics and 25% milk production
 - Bred back to Holstein
 - Rest of herd bred to Limousin
 - 90% of heifers bred to sexed semen, bottom 10% bred to Angus
 - High quality angus bulls with highly heritable traits



Photo: Margaret Quaassdorff

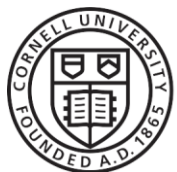
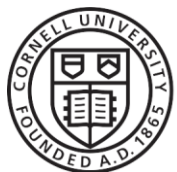




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Goal: Raise Profitable High Quality Heifers



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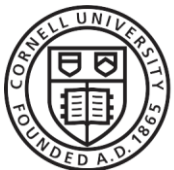




Goal:

Raise Profitable High Quality Heifers

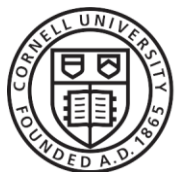
How do we know we are on the right track?



Growth Goals and Tracking Growth

Goal: Double birth weight by weaning date

- Start by measuring birth weight
- Measure again at weaning or before moving to a weaned pen
 - Keep weaning age consistent for comparison



Growth Goals and Tracking Growth

Weigh Tape Usage

- Calf should stand on level floor with head upright
- Tape should be snug, but not too tight around heart girth
 - Just behind the front legs and shoulder blades



Height Measurement

- Level surface, head upright
- Measure at highest point of withers with a measuring stick

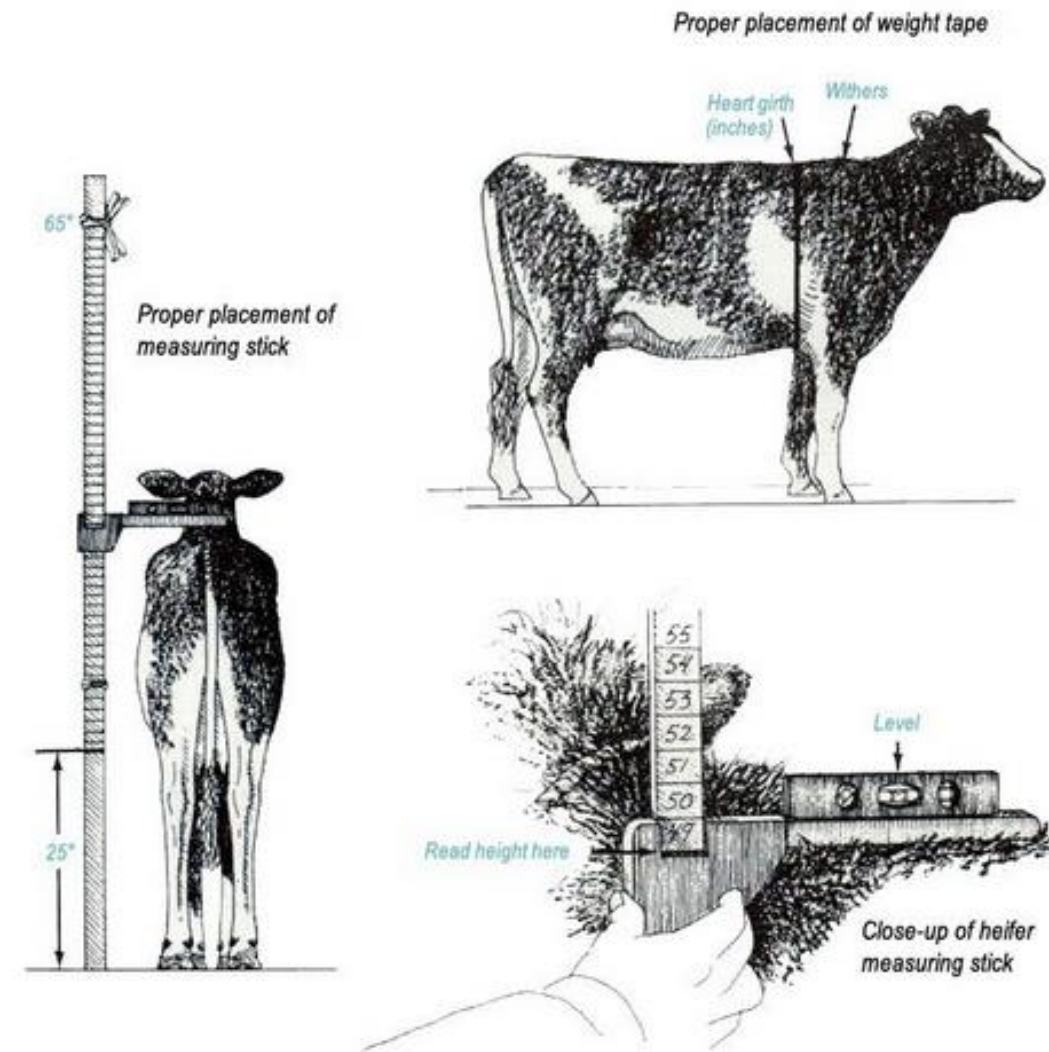
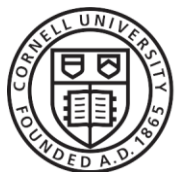


Figure 1. Diagrams showing proper placement of the weight tape and height measuring stick used to measure heifer growth.

Courtesy of Penn State Extension



Growth Goals and Tracking Growth

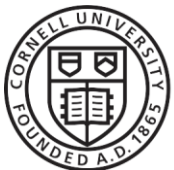
Goal: Calve @ 22-24 months of age

Start by weighing a sample of mature cows in your herd.

- **Body Weight Targets**
 - 55% of mature BW at 1st conception (12-15 months of age)
 - 85% of mature BW at 1st calving
- **Height Targets**
 - 55% of mature height at birth
 - 85% of mature height at 1st conception
 - 96% of mature height at 1st calving

If you are not hitting these goals, consider:

- Nutrition
- Feeding and Lying Space
- Health factors
- Overall environment



Growth Goals and Tracking Growth



Customized Dairy Heifer Growth Chart

Extension Team:	Dairy	Tool Version:	
Author:	Coleen Jones, Jud Heinrichs	Last Updated:	8/31/2016
Contact Email:	cmj11@psu.edu		
Website:	http://extension.psu.edu/animals/dairy		

Description:

This spreadsheet is a tool designed to allow you to develop a growth curve for your heifers that is based on your goals for age at first calving. Calculations are based off of the mature size of animals in your herd and use the target growth system described in the 2001 Nutrient Requirements of Dairy Cattle.

- Generates a growth chart from mature size and age at first calving.
- Compares heifer performance to growth required to meet herd goals, not to a breed standard.

<https://extension.psu.edu/customized-dairy-heifer-growth-chart>



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Growth Goals and Tracking Growth

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Remember, these are based on averages. Small herds with diverse genetics may produce calves outside the average and skew your overall results.

Think: A big flashy show calf might be taller or larger at these different benchmarks; twins may be smaller.



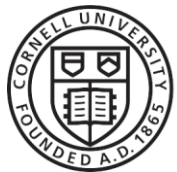
Growth Goals and Tracking Growth

Photo: Sarah Morrison



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Growth Goals and Tracking Growth

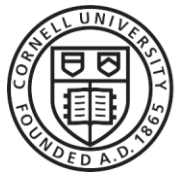
Photo: Sarah Morrison



Photo: Margaret Quaassdorff

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Grouping Strategies

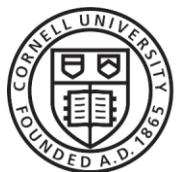
- Group 1 (Day 0 to 2 months of age)
 - Usually a single pen/hutch, or in autofeeder situations, groups that can be easily monitored for health and feeding
 - Well-ventilated and draft free
 - Clean, dry, comfortable
- Group 2 (2 to 4 months of age)
 - Small group of 3 to 8 calves (learning social aspects and eating feed to develop rumen)
 - Monitor for health and increasing intakes post-weaning
 - Keep this group low-stress, try not to do vaccinations here
- Group 3 (4 to 6 months of age)
 - Animals of this size are still small, and would do best not to compete with animals in Groups 4 and older
 - Try to keep this group smaller as well



Photo: Margaret Quaassdorff



Photo: Libby Eiholzer

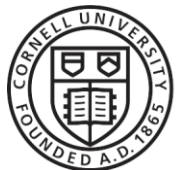


Grouping Strategies

- Group 4 (6 to 9 months of age; 400-600lbs)
 - Flexible style housing
- Group 5 (9 to 12 months of age; 601-800lbs)
 - Watch for heats to determine if she is beginning to cycle
 - Headlocks in this group as well in case you get backed up in Group 6
- Group 6 (12 to 18 months of age; 801-1000lbs)
 - Breeding age; headlocks necessary
- Group 7 (18 months to calving; 1001-1200lbs)
 - Have headlocks necessary for vaccination and health checks
 - Moving animals to a comfortable, quiet and well-monitored area is highly recommended for calving



Photo: Libby Eiholzer



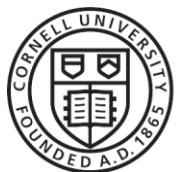
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***Number of groups can depend on facilities available, and number of animals.
Groups 4 through 7 can do well combined**



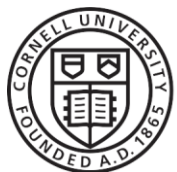
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Shift Away from Quantity; Focus on Quality

Summary

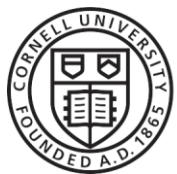
- ✓ Achieve best management practices to have the ability to raise the best quality heifers
- ✓ Calculate appropriate heifer inventory needs depending on your operation's management system
- ✓ Employ strategies of choosing the most valuable animals to raise through your system
- ✓ Save input costs by removing less desirable animals from your system
- ✓ Increase income by selling above-average dairy heifers for dairy, and incorporate high quality beef genetics into your breeding program to create a value-added co-product
- ✓ Measure and monitor growth rates to maximize efficiency, and learn where improvements can be made in your system
- ✓ Consider grouping strategies that maximize the health, growth, and labor efficiency on your operation



Thank You



Photo: Margaret Quaassdorff



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