

Navigating Low Colostrum Yields in Dairy Herds

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Today's Discussion

- What is the problem? Why do we care?
- What factors play into low colostrum yields?
- Practices to encourage colostrum yield.
- Strategies to manage through low colostrum yields.

What's the Problem?

Some farms report periods of low colostrum yield, particularly during fall and winter.



Why Do We Care?

- Providing early, adequate volumes of high-quality colostrum is the most critical management factor for calf health and survival.
 - Low colostrum yields means less colostrum available.
 - Building and maintain a colostrum bank is more difficult.
- Colostrum replacements costs can quickly add up when needed regularly.
- Its frustrating!



So, what causes low
colostrum yields???





Factors Associated with Colostrum Yield

- Photoperiod
- Temperature and Humidity
- Nutrition
- Additives
- Calf Size
- Calf Sex
- Stillbirth
- Genetics
- Dry Period Length
- Mastitis
- Parity
- Metabolism
- Time to Collection
- Oxytocin Use

Factors Associated with Colostrum Yield

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Environment

Photoperiod and THI

Photoperiod:

Daily length of daylight exposure

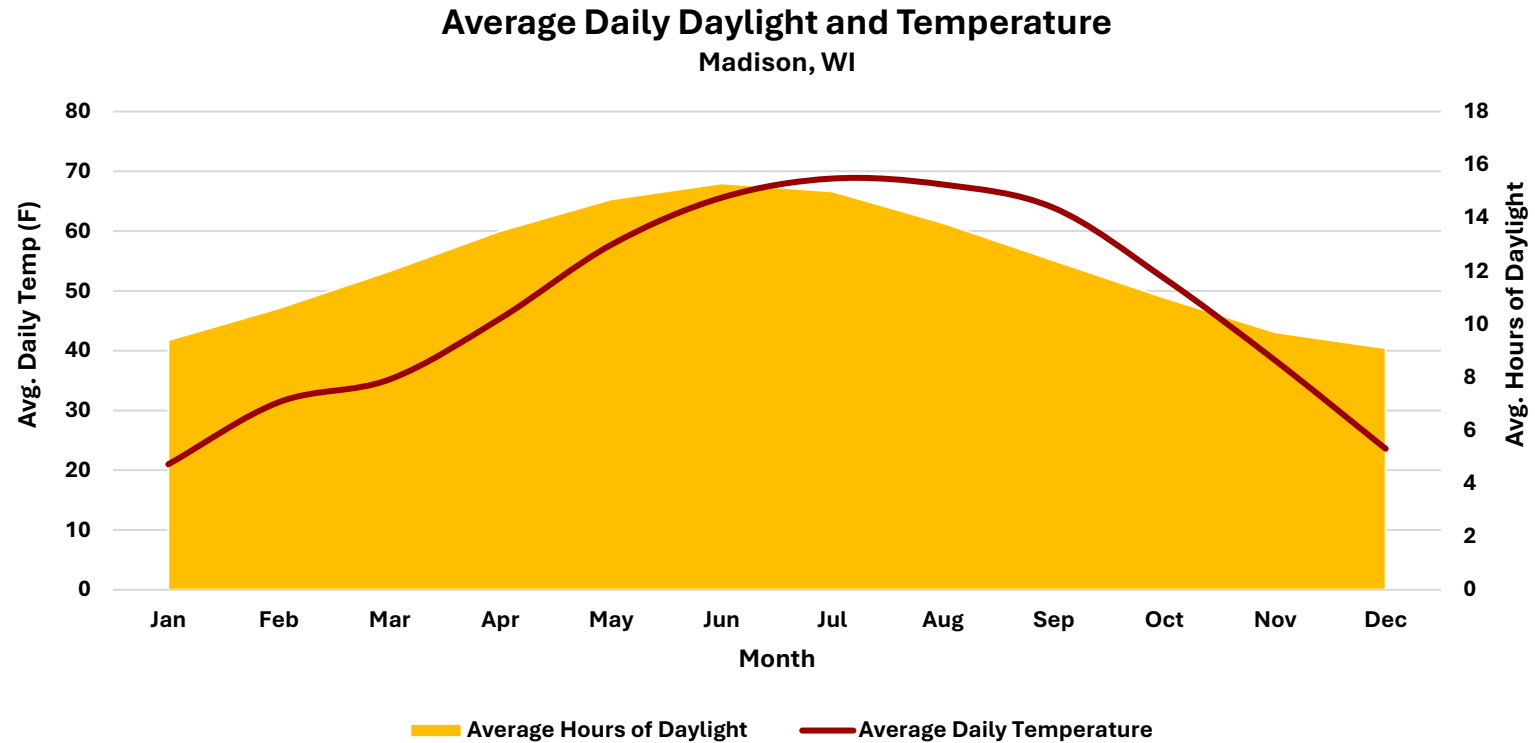
Temperature Humidity Index (THI):

Measure combining air temperature and humidity



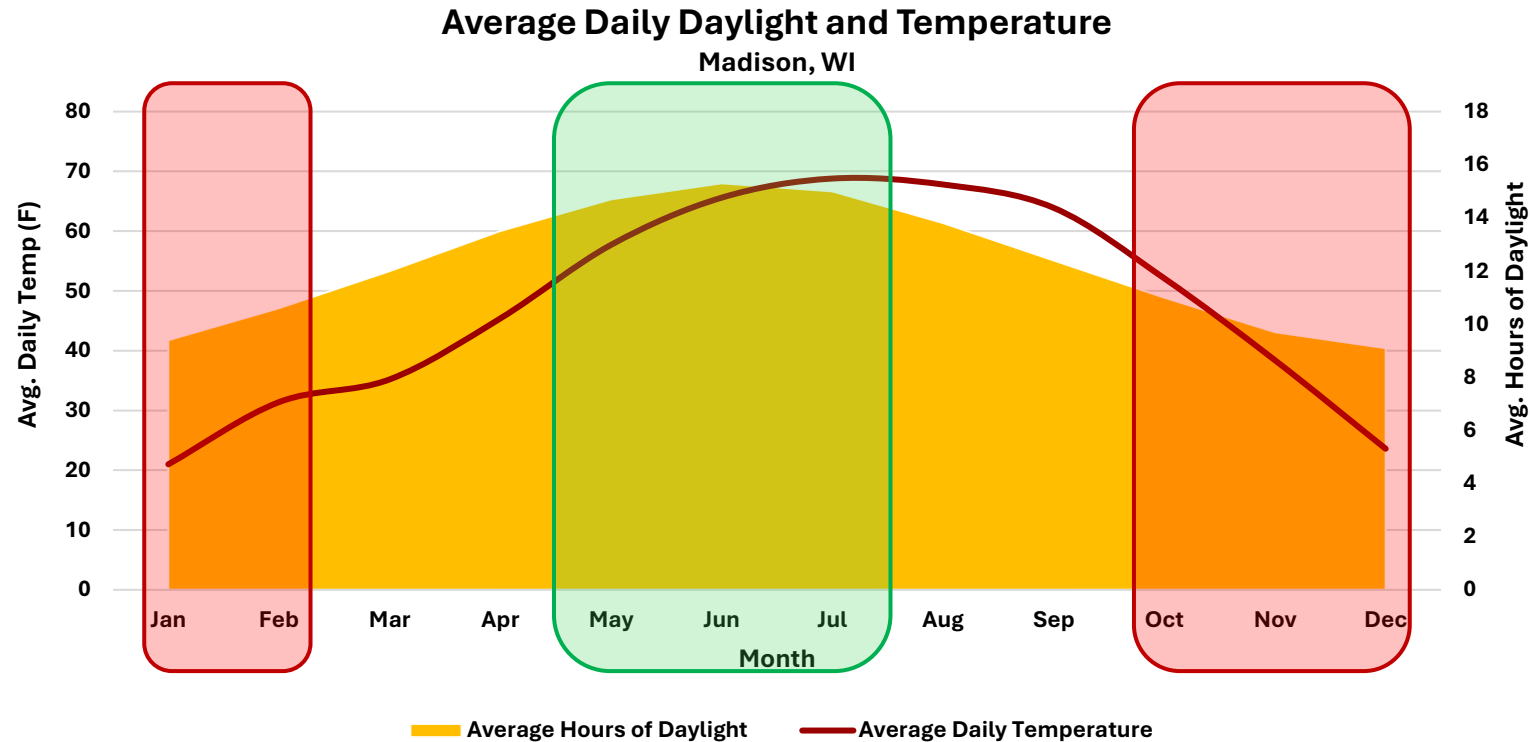
Environment

Photoperiod and THI



Environment

Photoperiod and THI

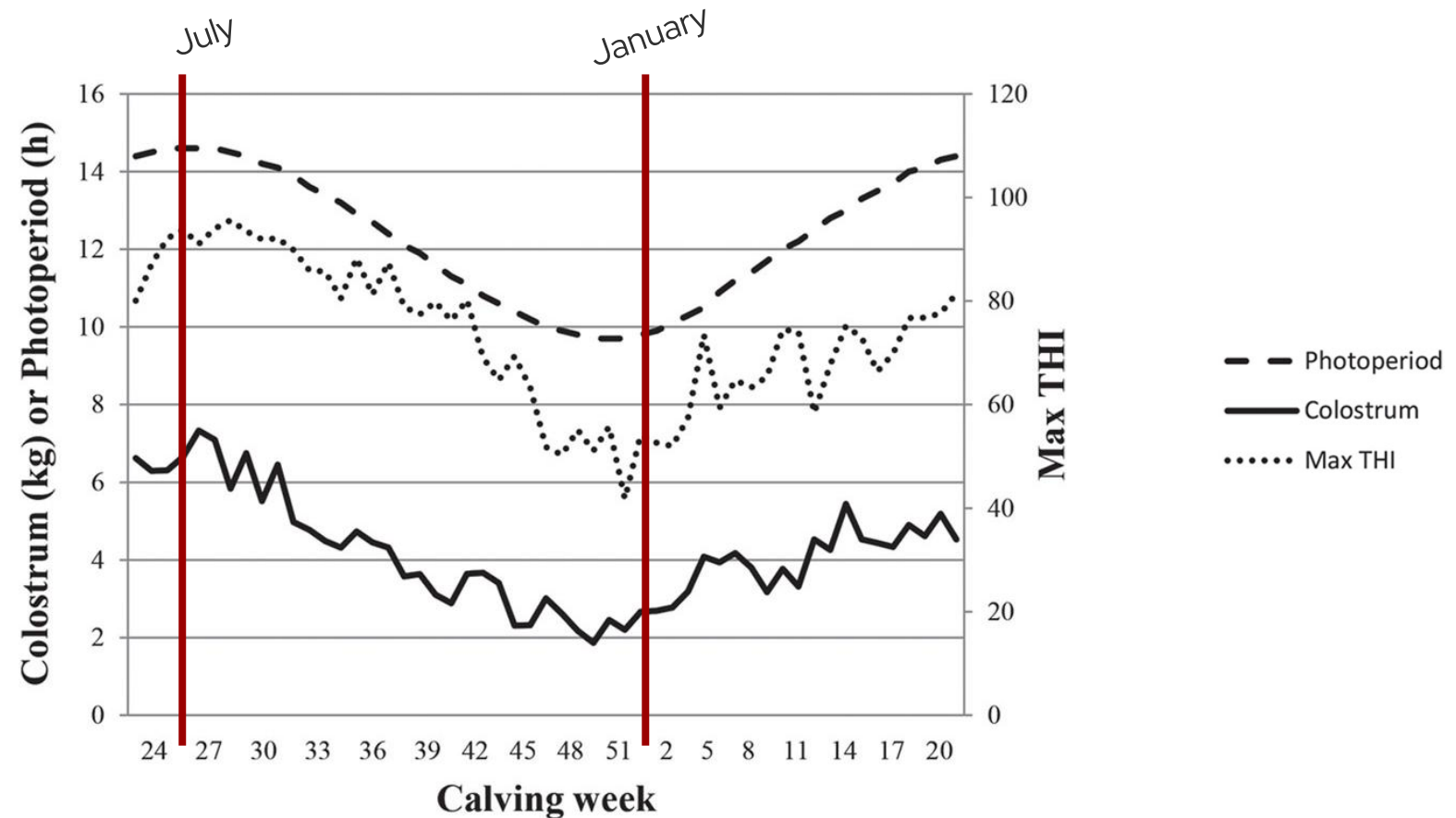


Research has reported **lowest** colostrum yields in **fall/winter**
and **highest** in **early summer**

Environment

Photoperiod and THI

Average Weekly Colostrum Weight by Calving Week
(Gavin et al., 2017)





Environment

Photoperiod and THI

- **Colostrum yield has a seasonal trend.**
 - Why? Potentially due to photoperiod and THI effects.
- **Correlation or Causation? Is the main driver photoperiod, THI, or a combination?**
 - Unclear. THI may be the more important driver.
- **Should I start using long-day lighting for my dry cows?**
 - Not recommended. Long-day lightening research for dry cows did not improve colostrum yield.



Environment

Photoperiod and THI

Key Takeaway:

Don't be surprised by seasonal difference in colostrum yield.

BUT...

Seasonality only explains a portion of colostrum yield differences. Other factors are also at play!

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Nutrition

Key Nutrients

Carbohydrates

Fat

Protein



Nutrition

Key Nutrients

Carbohydrates

Fat

Protein

- Increasing starch higher than ~20% has not significantly improved colostrum yield.
 - Moderate starch (18.6-22.5%) was correlated with a greater colostrum yield than low or high starch diets.
 - High starch diets may decrease IgG concentration.

Nutrition

Key Nutrients

Carbohydrates

Fat

Protein

- **Supplementing fat** in close-up diets has **not** shown colostrum responses





Nutrition

Key Nutrients

Carbohydrates

Fat

Protein

- **Older Cows (3rd + Parity):** Increasing metabolizable protein (MP) levels beyond 6.5% to 8.5% does not affect colostrum yield.
- **Younger Cows (1st and 2nd Parity):** Formulating with MP closer to or beyond 8.5% may boost colostrum yield.



Nutrition

Key Nutrients

Carbohydrates

Feed **Moderate**
Starch Levels

High Starch Diets
≠
More Colostrum

Fat

More Fat
≠
More Colostrum

Protein

In **older cows**, stick to
MP recommendations

Younger cows may
benefit from more MP

Nutrition

NASEM Close-Up Diet Requirements

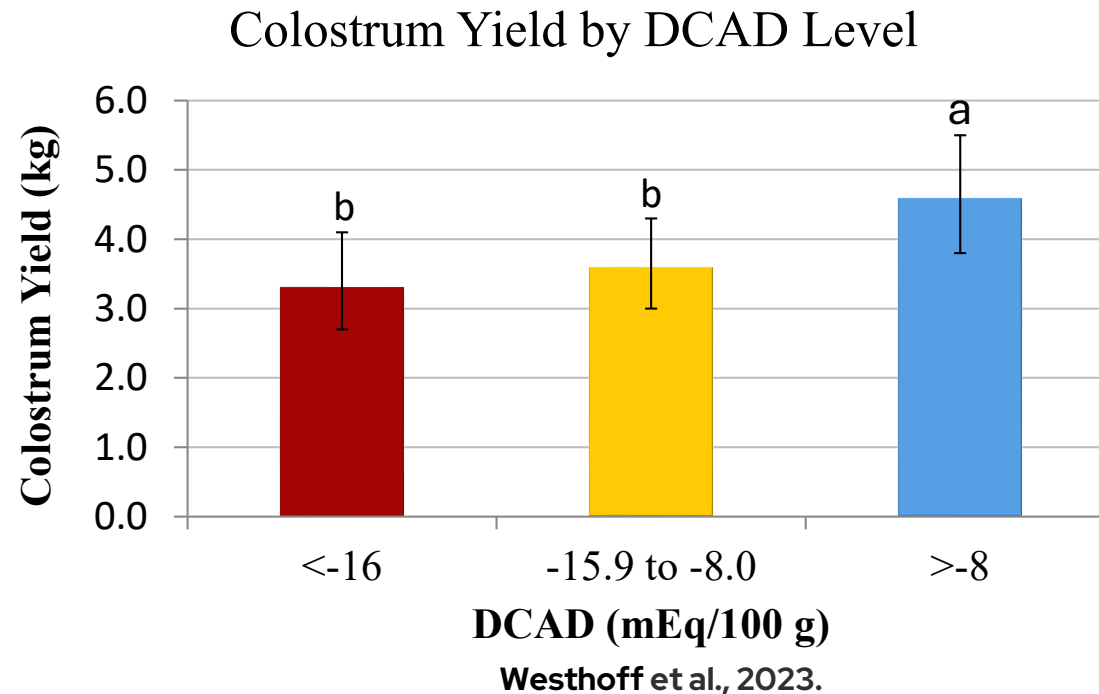
Nutrient	Feeding Level
NE _L	1.28 Mcal/kg
Starch	15-20%
Crude Protein	13.6%
Metabolizable Protein*	6.2%
RDP	10%
RUP	3.6%
NDF (min)	25-33%

*First calf heifers may benefit from higher MP levels

Nutrition

Minerals/Milk Fever Prevention

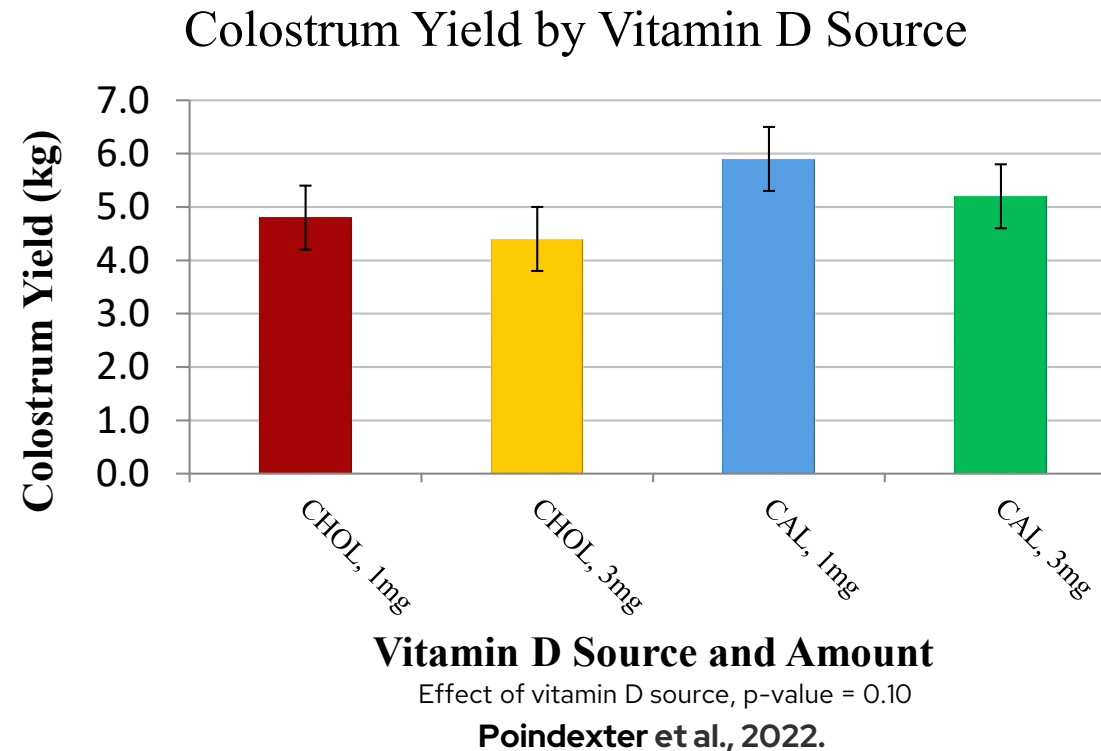
- In general, feeding close-up diets with **negative DCAD or Zeolite A does not** negatively affect colostrum production.
- **BUT**... strong negative DCAD diets (< -8 mEq/100g) may decrease colostrum yield.



Nutrition

Vitamins and Additives

- **Vitamin D:** Source may make a difference.
- Supplementing **calcidiol** may increase colostrum yield compared to **cholecalciferol**.



Nutrition

Vitamins and Additives

- **Vitamin D:** Source may make a difference.
 - Supplementing **calcidiol** may increase colostrum yield compared to **cholecalciferol**.
- **Additives:** Some may improve colostrum production
 - Always ask for the proof. Controlled research is the gold standard!



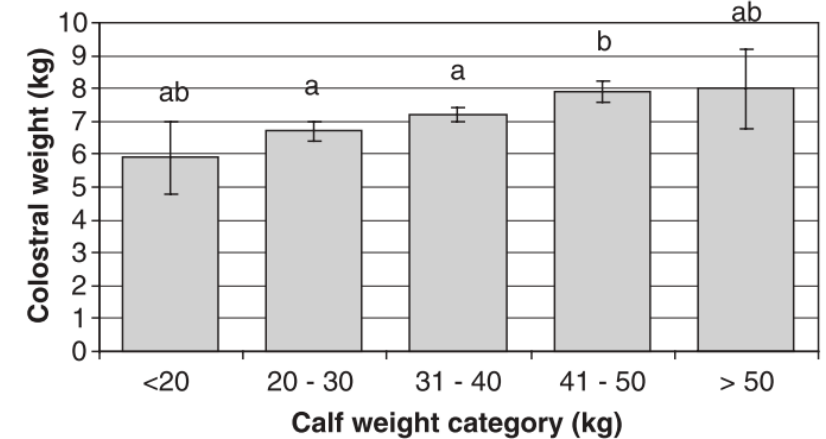
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Calf Factors

- **Calf Sex:** Males and Twins are associated with more colostrum yield.
 - Compared to females, 0.2-0.4kg more for males, 1-1.4kg for twins.
- **Calf Size:** Larger calves correlate with greater colostrum yield.
- **Stillbirth:** Stillbirths are associated with ~0.5kg less colostrum yield.



Conneely et al., 2013

Factors Associated with Colostrum Yield

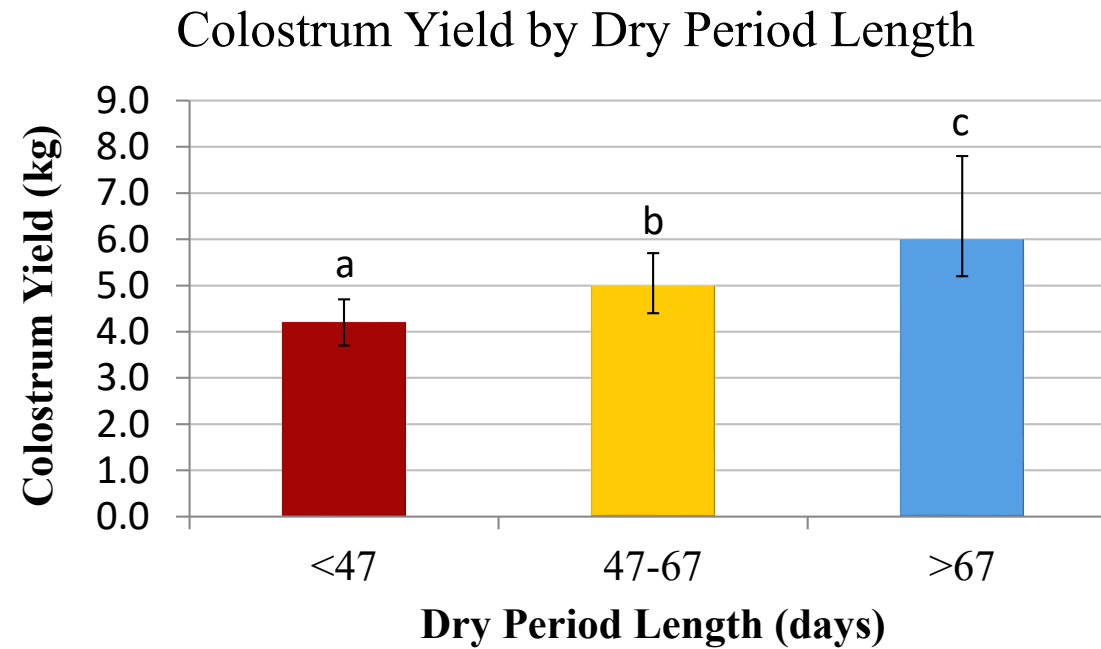
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Cow Factors

Dry Period Length

- **Short dry periods (0–30/40d) result in lower colostrum production.**



Westhoff et al., 2023.

Westhoff et al. 2024. J. Dairy Sci. 107:4109–4128;
Erickson et al. 2024. AAS. 40:791–801;
Westhoff et al. 2023. J. Dairy Sci. 106:4878–4895

Cow Factors

Mastitis

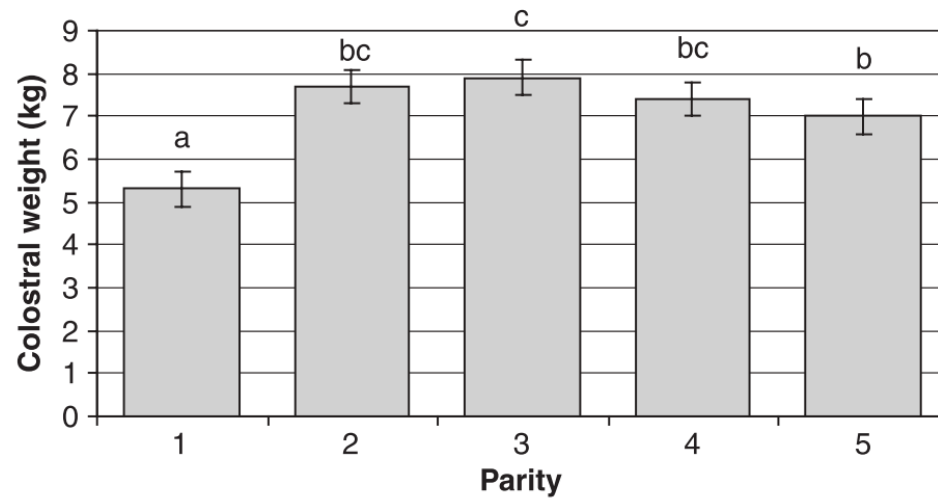
- **Minimizing and managing mastitis is important for animal performance, regardless of colostrum production.**
- Limited research focused on colostrum production.
- One study reported persistently infected quarters produced ~0.10 gallon less than uninfected quarters.



Cow Factors

Genetics, Parity, Production, and Metabolism

- **Genetics:** Loci associated with colostrum yield have been identified
 - Low to moderate heritability, but is it feasible?
- **Parity:** 1st lactation cows produce less than 2nd+ lactation cows.



Conneely et al., 2013



Cow Factors

Genetics, Parity, Production, and Metabolism

- **Previous Production:** Milk yield indicators have mixed relationship with colostrum yields from no relationship to positive relationship.
- **Metabolism:** Relationship with hypocalcemia, BHB, hyperketonemia, etc.
 - Emerging area of research.

Factors Associated with Colostrum Yield

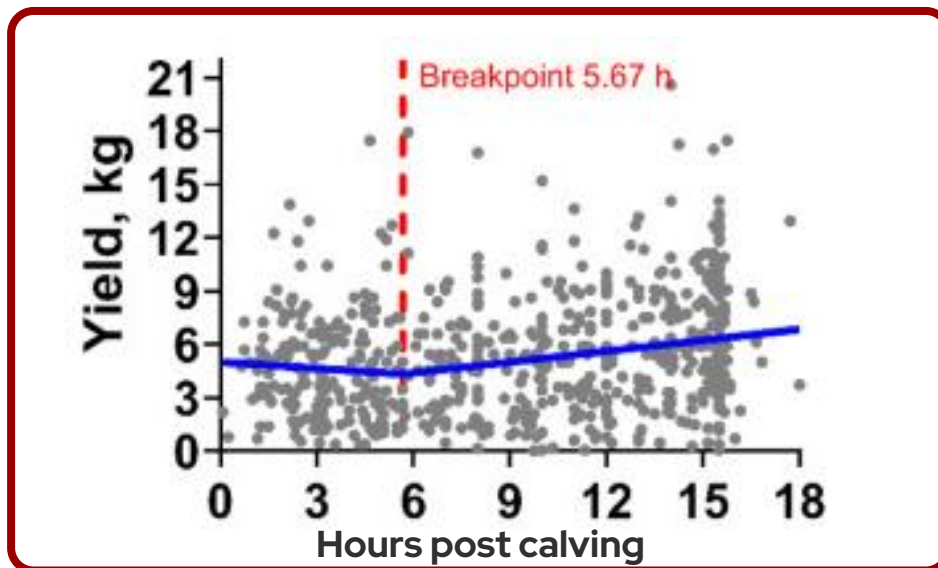
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Management

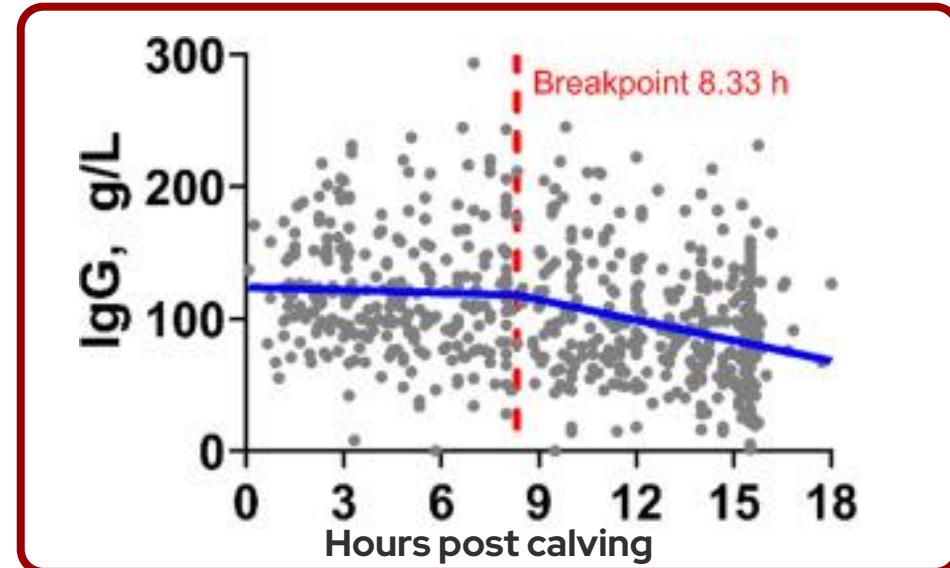
Time to Collection

- As time from calving increases, “colostrum” yield increases.
- **BUT**, IgG concentration decreases.

Colostrum Yield over Time



IgG Concentration over Time



Management

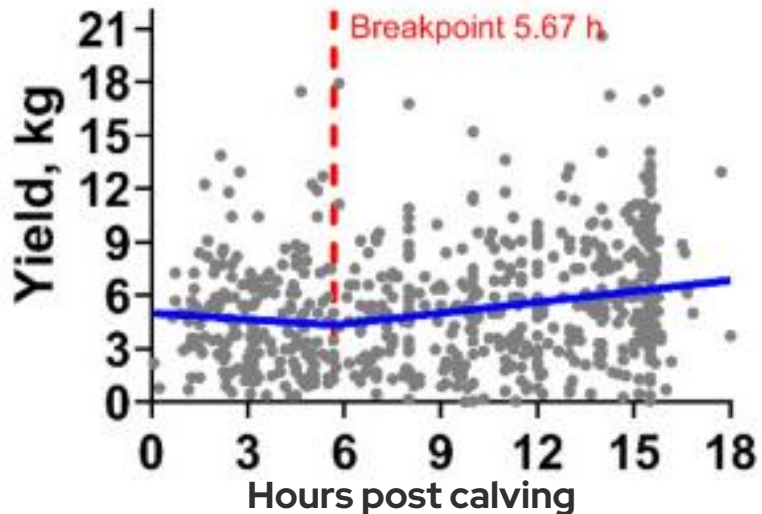
Time to Collection

Recommendation:

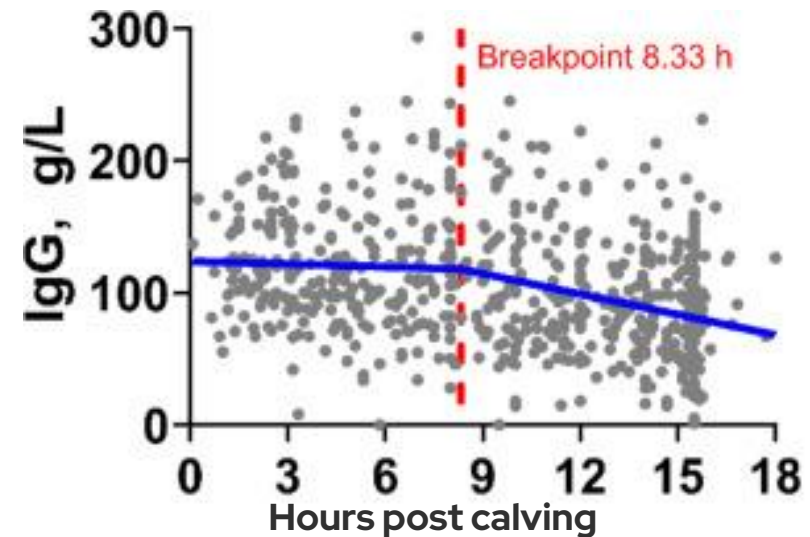
Harvest **<8 hr** after calving

If feeding dam's colostrum to own calf, aim for <2 hr after calving.

Colostrum Yield over Time



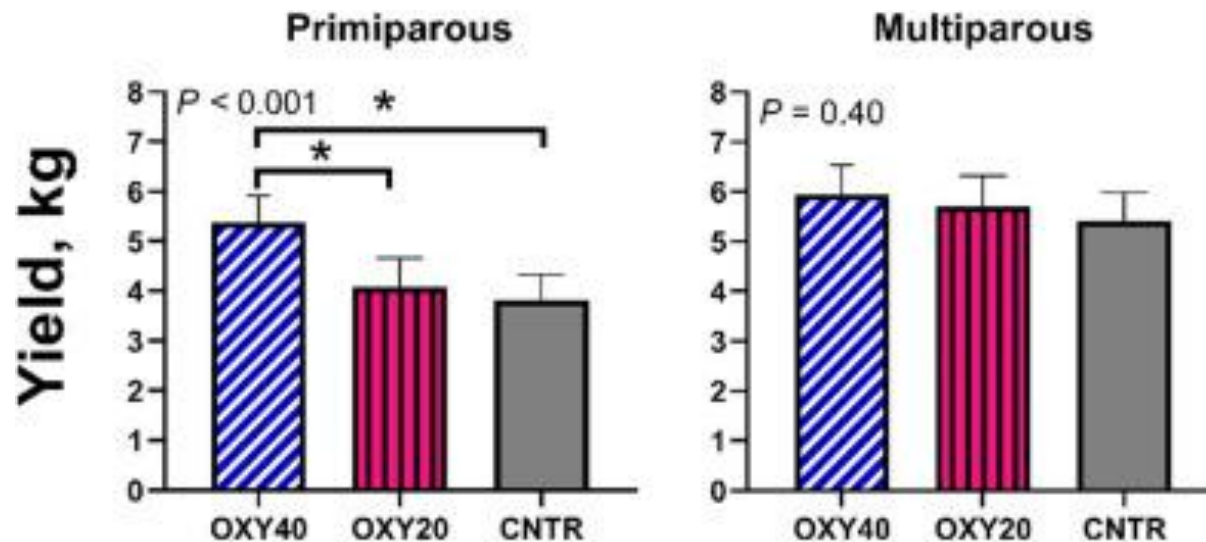
IgG Concentration over Time



Management

Oxytocin Use

- Initial research suggests oxytocin use can boost colostrum yields in primiparous cows.
- More research is needed.
- Discuss with your vet if this is a route you want to pursue.
- Consider who is administering oxytocin and when/where.

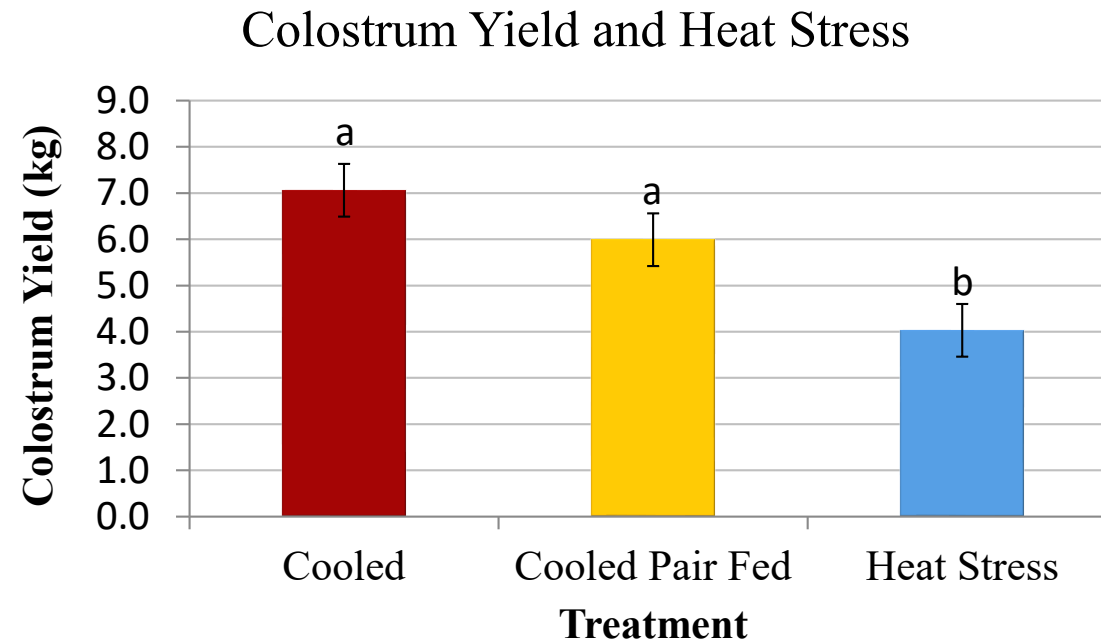


OXY40: 40 IU of Oxytocin
OXY20: 20 IU of Oxytocin
CNTR: No Oxytocin.

Management

Heat Abatement

Heat stress negatively affects colostrum yields.



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Management

- Time to Collection
- Oxytocin Use

**That's a lot of factors to
keep track of!**

**What can I practically do
with this info?**





Practices to Support Colostrum Yield

- **Dry Period Length** – 45-60 days.
- **Mastitis Management** – Minimize, treat, and address mastitis issues during the dry period.
- **Minimize Environmental Stressors** – Heat abatement, consistent and adequate access to feed and water, avoid overcrowding.

Practices to Support Colostrum Yield

- **Encourage Colostrum Let Down** – Calm, low-stress milking environment. Proper prep and complete milk out before unit removal.
- **Consider Oxytocin** – First-lactation cows. Consider who, where, and when this would be administered.
- **Diet Formulation** – Evaluate that diets meet needs. Younger animals may benefit from higher levels of metabolizable protein.
- **Assess Feed Additives** – Look for research backed products.

How can I manage
through low
colostrum supplies?



Managing Through Low Colostrum Periods

1. Build a Bank

- Test colostrum quality. Label and store accordingly.

2. Follow Proper Storage Practices

- Refrigerate for no more than 1 day. Freeze for up to 1 year.
- Restaurant rules: First in, first out. Clean environment. Proper labeling. Monitor temperature.

3. Have Colostrum Replacer Available

- Select a colostrum replacer, not a colostrum supplement.
- Colostrum replacer should provide 300 grams of IgG.



Take-Home Messages

- **There are many factors that influence colostrum yield.**
 - Seasonal swings are real, but not the sole cause of low yields.
- **Management practices can help promote colostrum yields.**
- **During periods of low colostrum supply, fine-tune colostrum management.**

Take-Home Messages

- **There are many factors that influence colostrum yield.**

- Seasonal swings are real, but not the sole cause

- **Managers**

- **During periods of low supply, fine-tune colostrum management**

Stay Tuned!
More research is focusing on this issue.

Questions?



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