

# Management of dairy goats through the transition between lactations

## Research Results Highlights



**Dr. Gosia Zobel**

Ontario Goat Annual General  
Meeting & Producer  
Education Day  
February 25, 2015



animal welfare  
program



Ontario Veterinary College  
POPULATION MEDICINE







*"Why would you want to study  
goat welfare?"*

*Dairy goats only last a couple  
lactations anyway...."*



# Plan

Reasoning for the studies

Survey of management practices  
results

On-farm study results

- Udder health

- Pregnancy toxemia and ketosis

Ideas to take home

**Why focus on the  
transition between  
lactations (dry off to  
kidding)?**

Cows are routinely  
managed to be “dry”  
for 45-60 days  
before calving

Kidding

Lactation

**Dry Period**

Next Lactation



Cows are routinely managed to be “dry” for 45-60 days before calving

Kidding

Lactation

**Dry Period**

Next Lactation



Antibiotic treatment

Feed restriction





Kidding

Lactation

Dry Period

Next Lactation

**What about goats??**

# Questions needing scientific answers

**What kind of dry period management is happening on goat farms in Ontario?**



# Questions needing scientific answers

What kind of dry period management is happening on goat farms in Ontario?

**Is udder health in the dry period as large of an issue in goats as it is in cows?**



ding



Lactation

**Dry Period**

Next Lactation



Multiple  
fetuses



ding

Lactation

**Dry Period**

Next Lactation

Metabolic  
demands of milk  
production





Multiple  
fetuses



ding

Lactation

**Negative  
energy  
balance**

Lactation

d

production

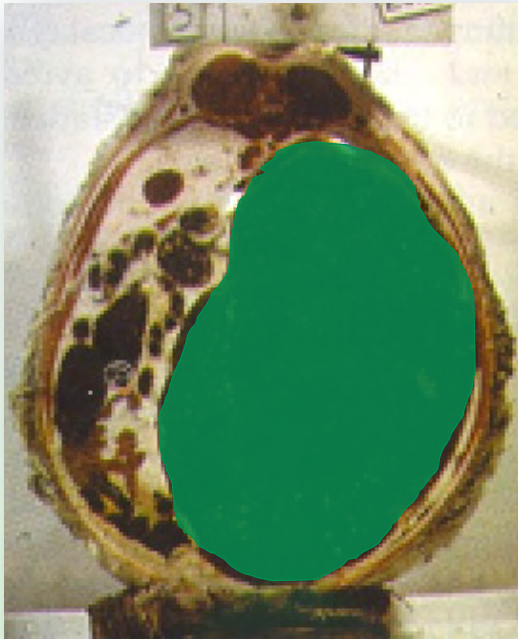


# Negative energy balance



**Not pregnant**

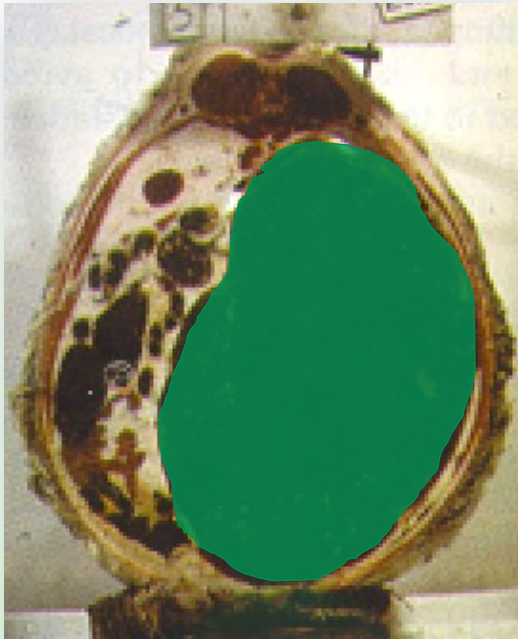
# Negative energy balance



**Not pregnant**



# Negative energy balance



**Not pregnant**

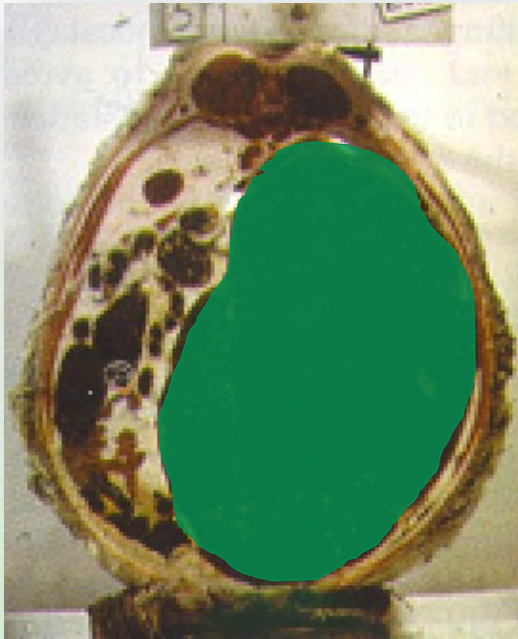


**Single fetus**

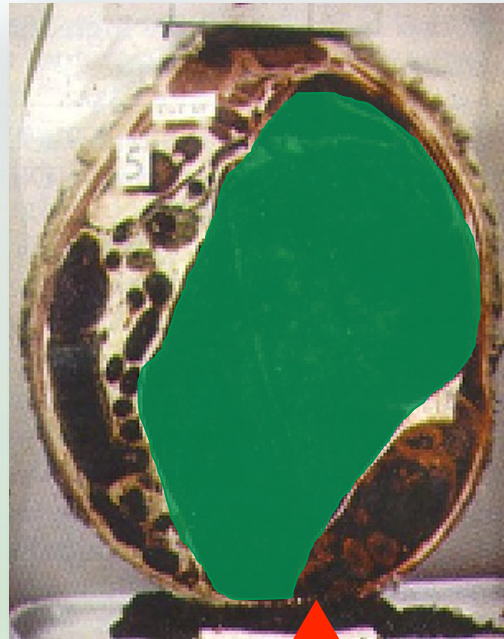


**Twin fetuses**

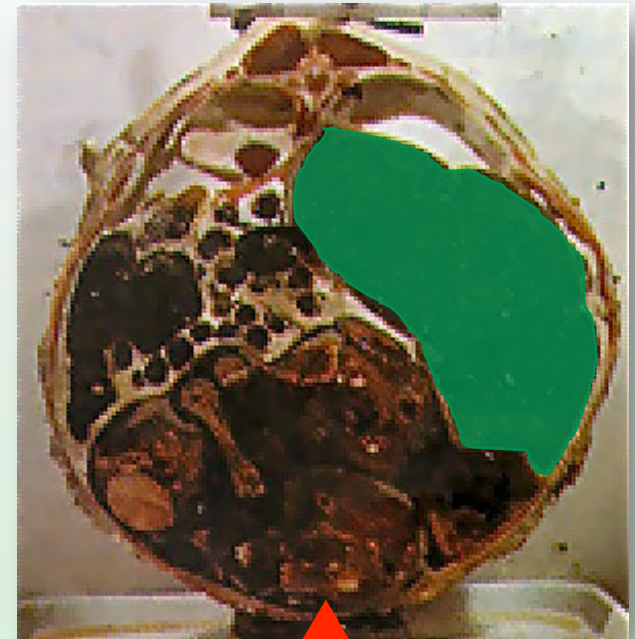
# Negative energy balance



**Not pregnant**



**Single fetus**



**Twin fetuses**



# Negative energy balance



**Not pregnant**



**Single fetus**



**Twin fetuses**

**Pregnancy toxemia and ketosis can result**

# Questions needing scientific answers

What kind of dry period management is happening on goat farms in Ontario?

Is udder health in the dry period as large of an issue in goats as it is in cows?

**How does the dry period affect pregnancy toxemia and ketosis?**



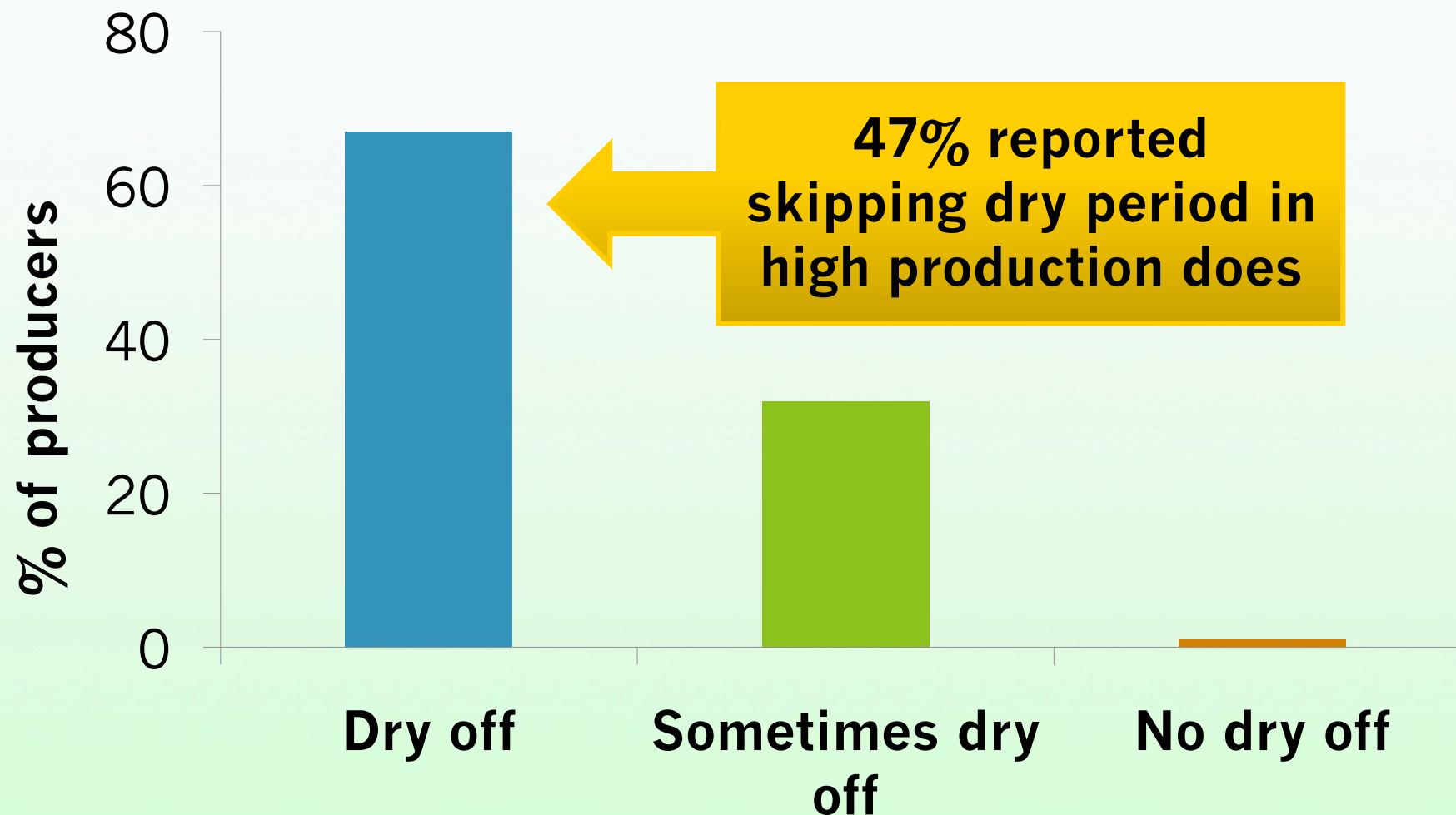
# Studies

1. **Survey:** All of Ontario's 229 producers given opportunity to share their management practices
2. **On-farm:** Monitored does on farms to establish how management practices are impacting goat health and welfare

# Study 1: Survey

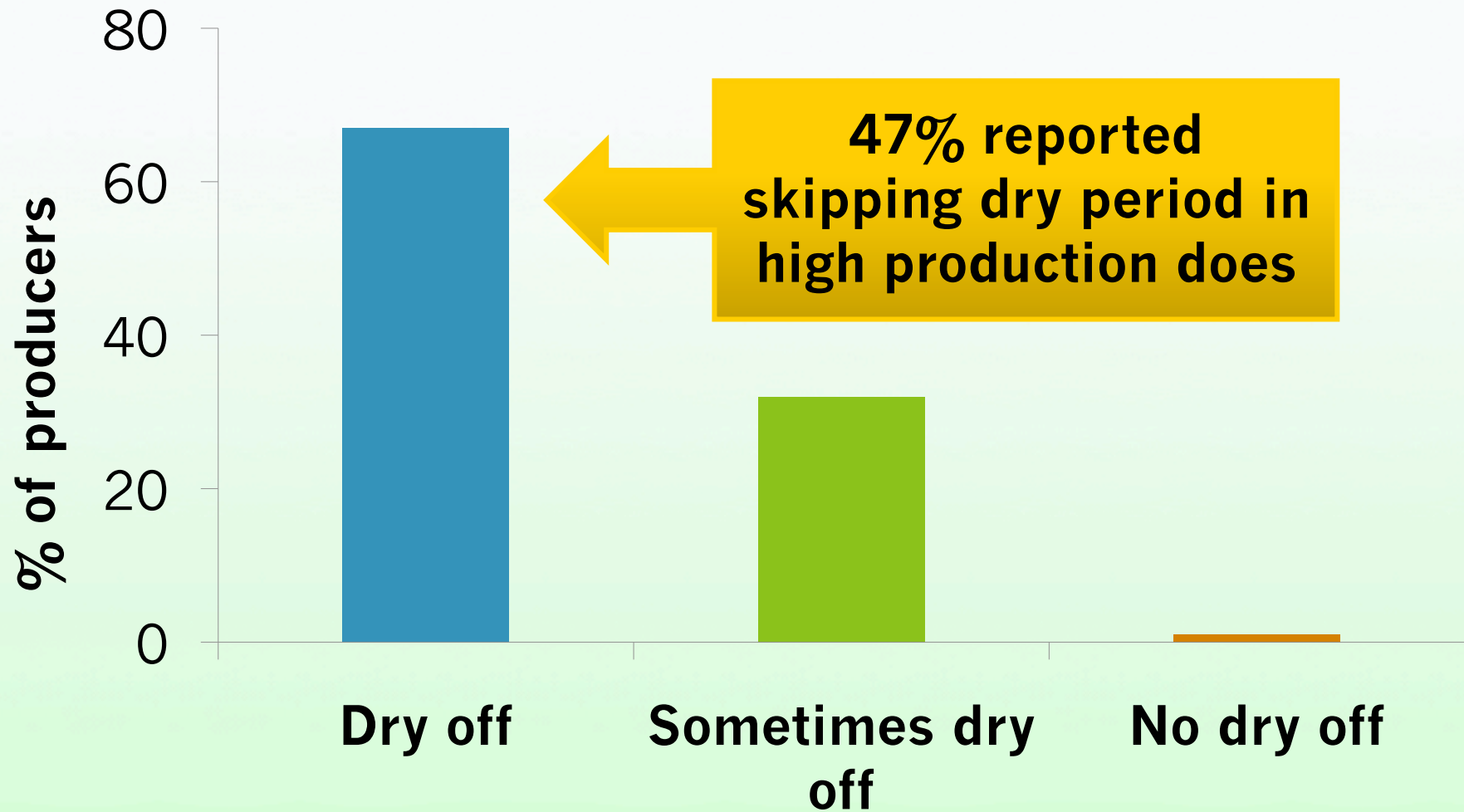
**“Do you dry off your does?”**

# “Do you dry off your does?”





# The majority of producers reported instances of skipping the dry period



## Dry period average

36 – 57 days (*range: 0 – 150 days*)

## Lactation lengths

Doeling: average 313 – 336 days (*range: 150 – 760 days*)

Mature: average 342 – 412 days (*range: 150 – 1500 days*)



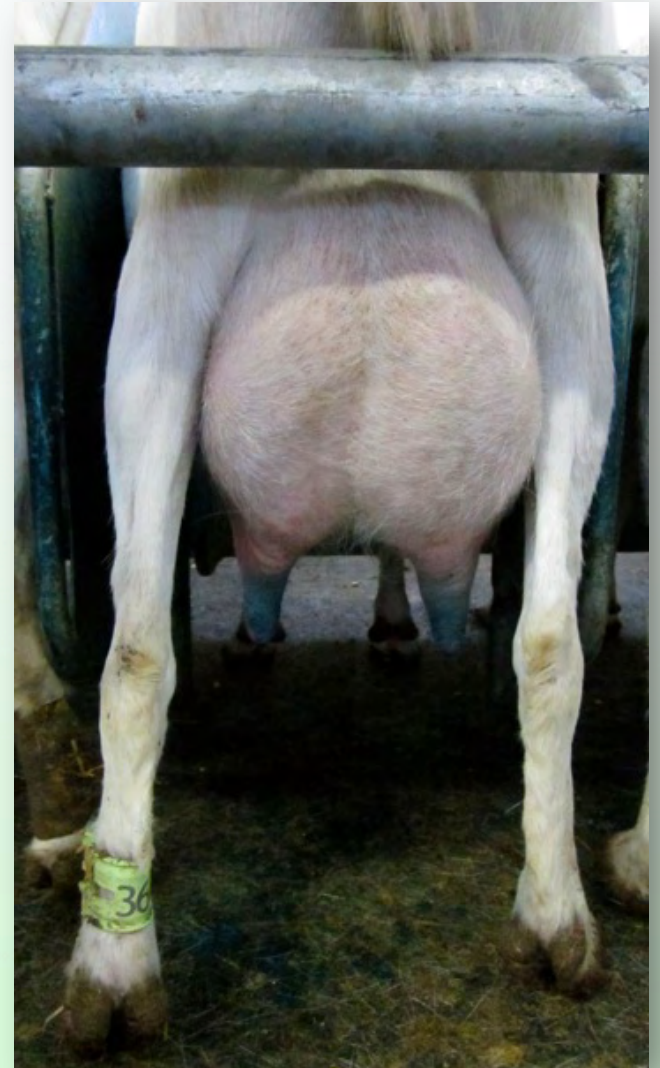
## Dry period average

36 – 57 days (*range: 0 – 150 days*)

## Lactation lengths

Doeling: average 313 – 336 days (*range: 150 – 760 days*)

Mature: average 342 – 412 days (*range: 150 – 1500 days*)



*People varied in their opinion on  
importance and purpose of dry off*



**TOP DRY OFF  
PRIORITY**



**Days until  
kidding**

# TOP DRY OFF PRIORITY

```
graph TD; A[\"TOP DRY OFF PRIORITY\"] --> B[\"Days until kidding\"]; A --> C[\"Milk production\"]
```

Days until  
kidding

Milk  
production

# TOP DRY OFF PRIORITY

Days until  
kidding

*Reduce milk production  
before dry off*

Milk  
production



# TOP DRY OFF PRIORITY

Days until  
kidding

Milk  
production



**Successful** milk  
production reduction

Milking ceased  
**SHORT DRY PERIOD**



# TOP DRY OFF PRIORITY

Days until  
kidding

Milk  
production



**Successful** milk  
production reduction

**Unsuccessful** milk  
production reduction

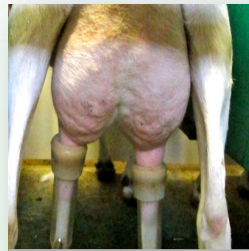
Milking ceased  
**SHORT DRY PERIOD**

Milking continued  
**NO DRY PERIOD**

# TOP DRY OFF PRIORITY

Days until  
kidding

Milk  
production



**Successful** milk  
production reduction

**Unsuccessful** milk  
production reduction

Milking ceased  
**SET DRY PERIOD**

Milking ceased  
**SHORT DRY PERIOD**

Milking continued  
**NO DRY PERIOD**



*In my opinion, these two questions [regarding using water and feed restriction to reduce milk production] are some of the worst things you can do to the doe if you expect healthy and full grown kids. The last few weeks are most important to get healthy kids and best milk production. **If a doe's milk production stays up, then I keep milking her**".*





# Recap: Survey

Over 2/3 of producers aim to dry off  
– but not always successful

Continued milk production is causing  
shorter or skipped dry periods

Many producers see benefits of  
managing their does using variable  
dry period lengths



# Study 2: On-Farm

10 Ontario farms within 3 hours of  
University of Guelph

On each farm,  
enrolled 20 – 80  
does (and their  
kids)

Monitored from dry  
off to kidding



Farms received  
customized  
reports showing  
their results  
compared to the  
other farms

## Survey of Dairy Goat Management Practices

Confidential Report

Prepared For:



This confidential report summarizes the data collected by researchers that visited your farm in 2013. Your farm was one of 10 farms participating in the study. For your information, your farm's performance is compared to these other farms. We have provided suggestions for how you can make improvements.

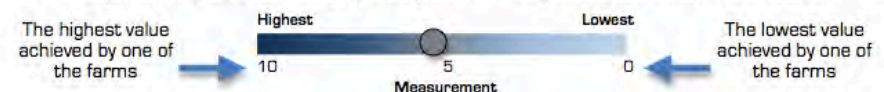
### Overview of Measurements

1. Dry off practices
2. Subclinical mastitis
3. Hoof care & lameness
4. Body condition scores
5. Pregnancy toxemia & ketosis
6. Activity levels
7. Kid immunity status & early growth rate

*Most measures were made on the **21 study does** (or their kids) that we followed for the project. Lameness and body condition score are shown for a random subsample of **48 other does** on your farm.*

### Interpreting the Results

You are provided your farm's average (all your does averaged), as well as the average found on the other farms for each of the measurements taken. The range of values from each farm (highest, average, lowest) is presented graphically as well, and your value is shown with a circle.



*Depending on the measurement, it may be good to get a high number (e.g., milk production), might be a spot for improvement (e.g., high ketosis level), or is simply for information purposes (e.g., lying time).*

Dr. Ken Leslie, Dr. Marina von Keyserlingk and PhD candidate Gosia Zobel

Questions? [gzobel@uoguelph.ca](mailto:gzobel@uoguelph.ca)



a place of mind  
THE UNIVERSITY OF BRITISH COLUMBIA



# Reports summarized:



Milk production

Dry period length

Udder health (mastitis)  
prevalence



Hoof health

Lameness



# Reports summarized:



Body condition score  
Pregnancy toxemia and  
ketosis



Kid immunity  
Kid early growth rate



## 2. SUBCLINICAL MASTITIS



Bacteriological analysis was done on samples taken before dry off and after kidding.

Pathogens varied between farms, but the most common were Coagulase Negative *Staphylococci* (CNS) and *Staphylococcus aureus*.

### Infections at dry off

Your farm 55%

Average of  
all farms 41 %



### Infections at kidding

Your farm 47%

Average of  
all farms 51%



### Suggestions

**You were the only farm on which infection prevalence decreased across the dry**

## 2. SUBCLINICAL MASTITIS



Bacteriological analysis was done on samples taken before dry off and after kidding.

Pathogens varied between farms, but the most common were Coagulase Negative *Staphylococci* (CNS) and *Staphylococcus aureus*.

### Infections at dry off

Your farm 55%

Average of all farms 41 %

### Infections at kidding

Your farm 47%

Average of all farms 51%



### Suggestions

**You were the only farm on which infection prevalence decreased across the dry**

## 2. SUBCLINICAL MASTITIS

Bacteriological analysis was done on samples taken before dry off and after kidding.

### DRY OFF



### KIDDING



Suggestions

You were the only farm on which infection prevalence decreased across the dry



# Udder health (mastitis)

Milk samples taken  
from each udder half  
at 2 periods



Lactation

**Dry Period**

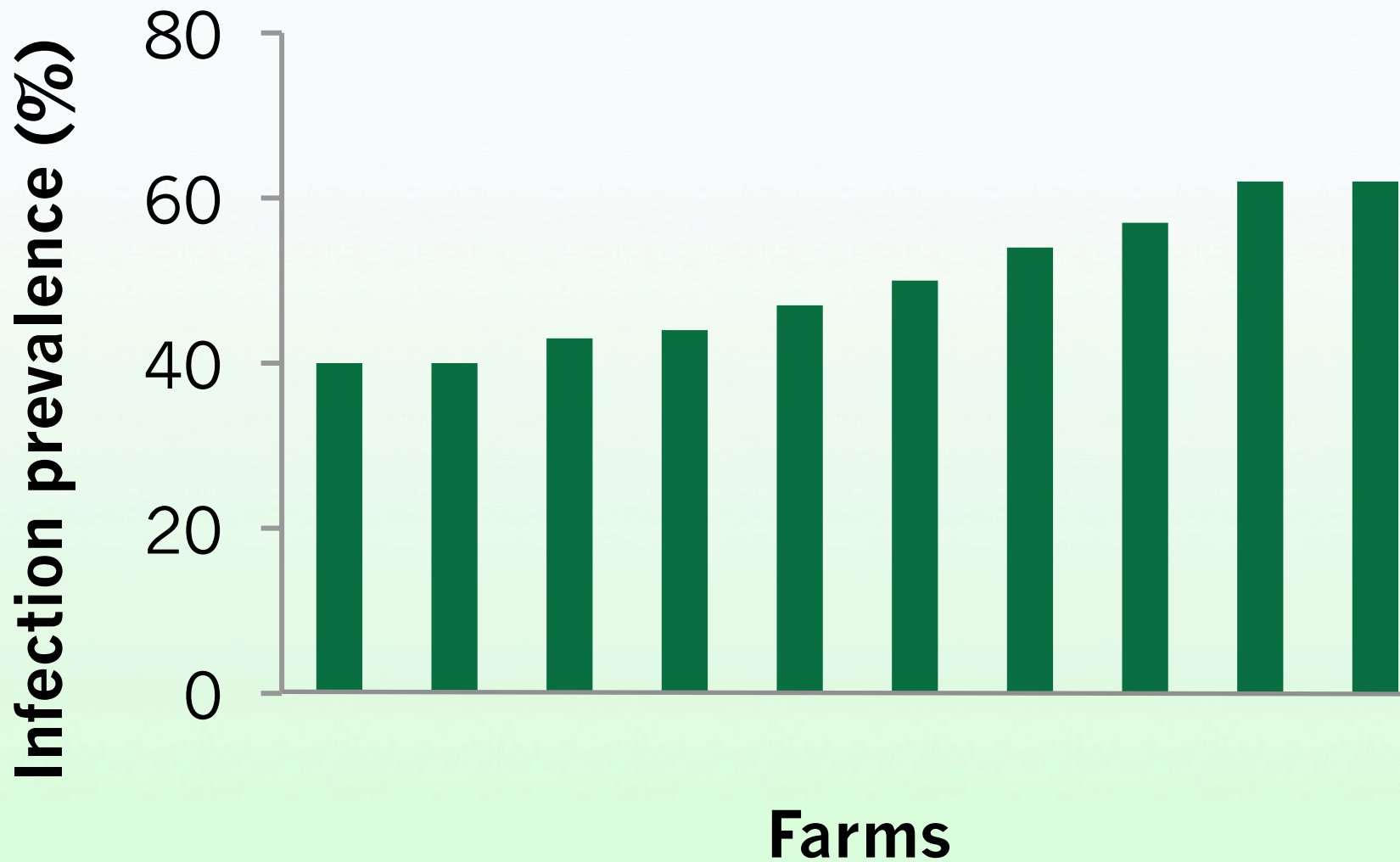
Next Lactation

↑  
**SAMPLE 1**

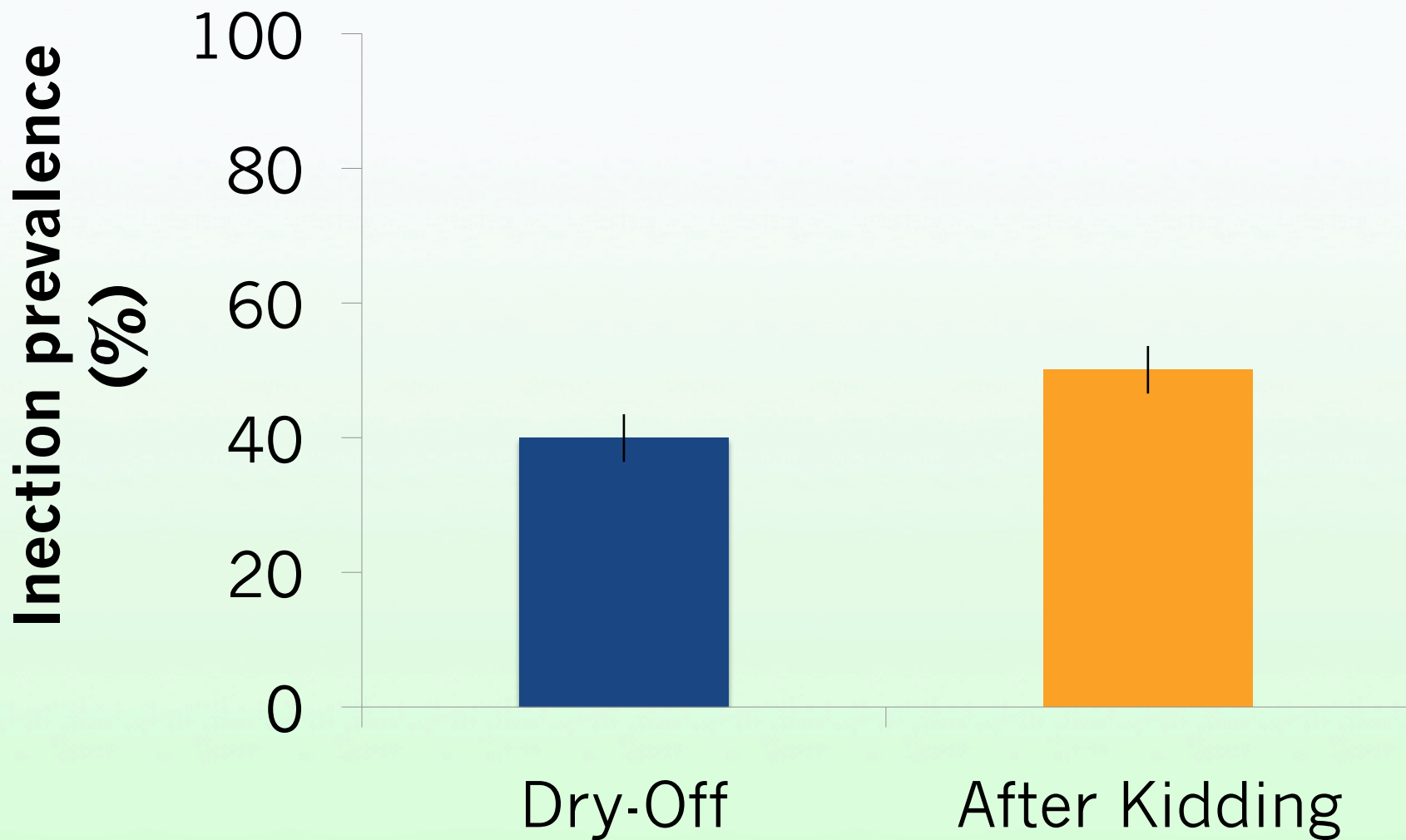
↑  
**SAMPLE 2**



# High infection prevalence on all farms



# Infections increased after kidding

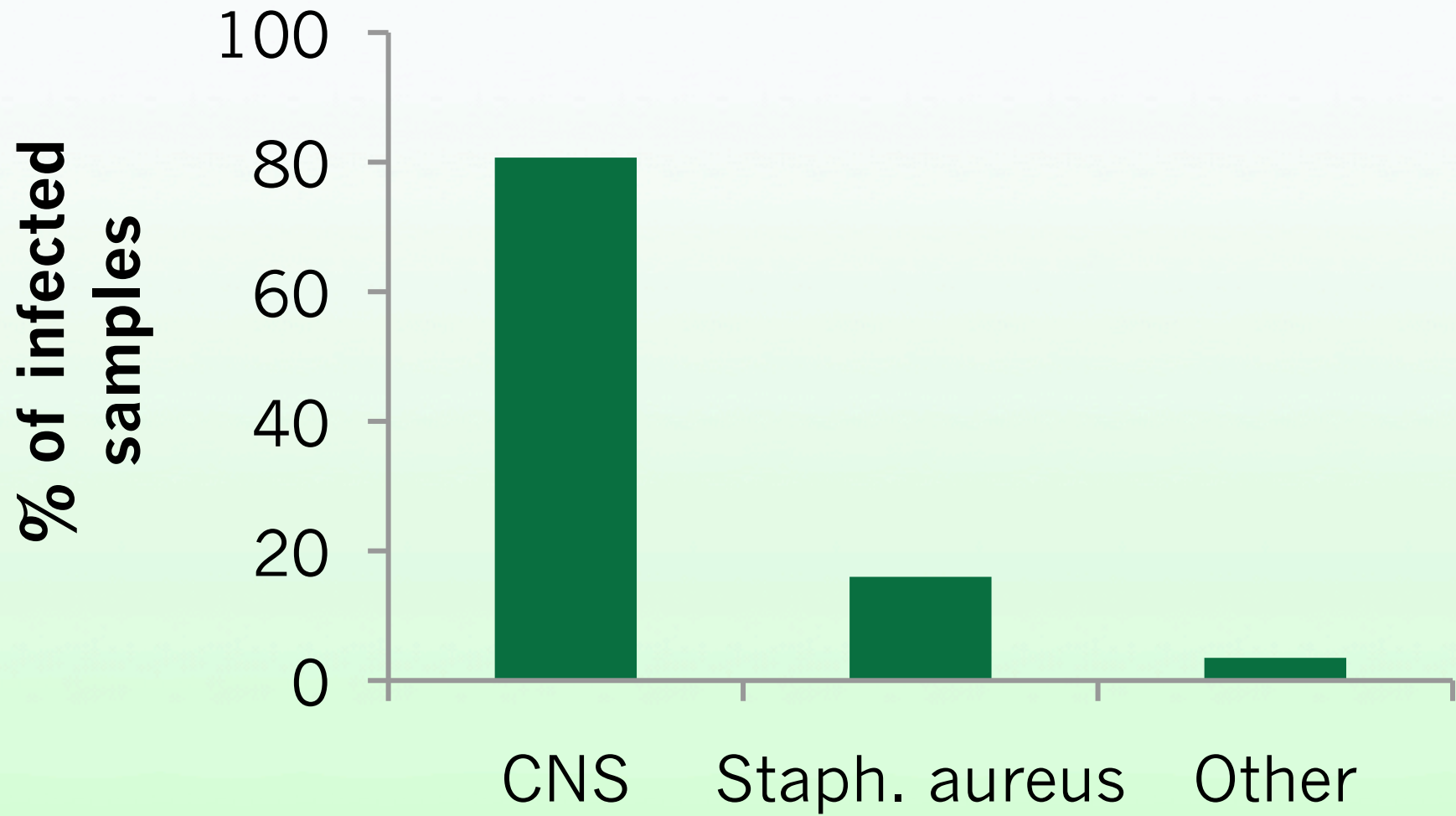


( $P = 0.04$ )

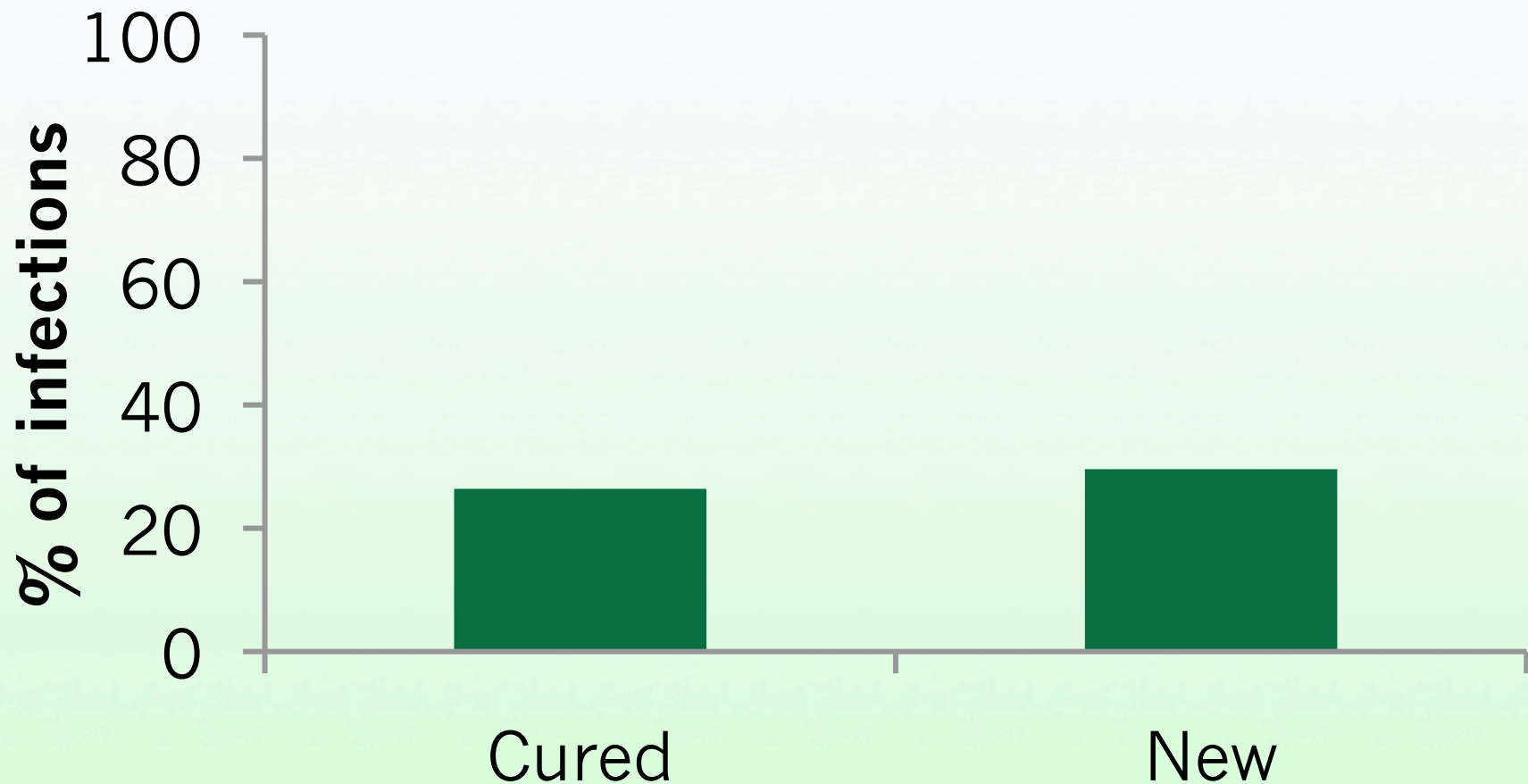
Zobel et al. (*in prep*)

# Majority of infections:

Coagulase-negative *staphylococci* (CNS)



# Spontaneous cures similar to new infections



( $P = \text{NS}$ )

Zobel et al. (*in prep*)

# Recap: Udder health

High level of infection – largely CNS, which often does not elevate somatic cell count (SCC), but can still be problematic

Infection was high even before the dry period



# Recap: Udder health

High level of infection – largely CNS, which often does not elevate somatic cell count (SCC), but can still be problematic

**Infection was high even before the dry period**

# Things to consider



# Things to consider



# **Pregnancy toxemia and ketosis**



# Pregnancy toxemia & ketosis



## On-farm test

Elevated blood  $\beta$  -  
Hydroxybutyrate  
levels before and  
after kidding



# Lying time monitored with data loggers



# Milk production





**Average milk  
production:**  
3.0 kd/d





## **Average milk production:**

3.0 kd/d

## **Negative impacts:**

Sickness

Feed type

Dry period length



## **Average milk production:**

3.0 kd/d

## **Negative impacts:**

Sickness

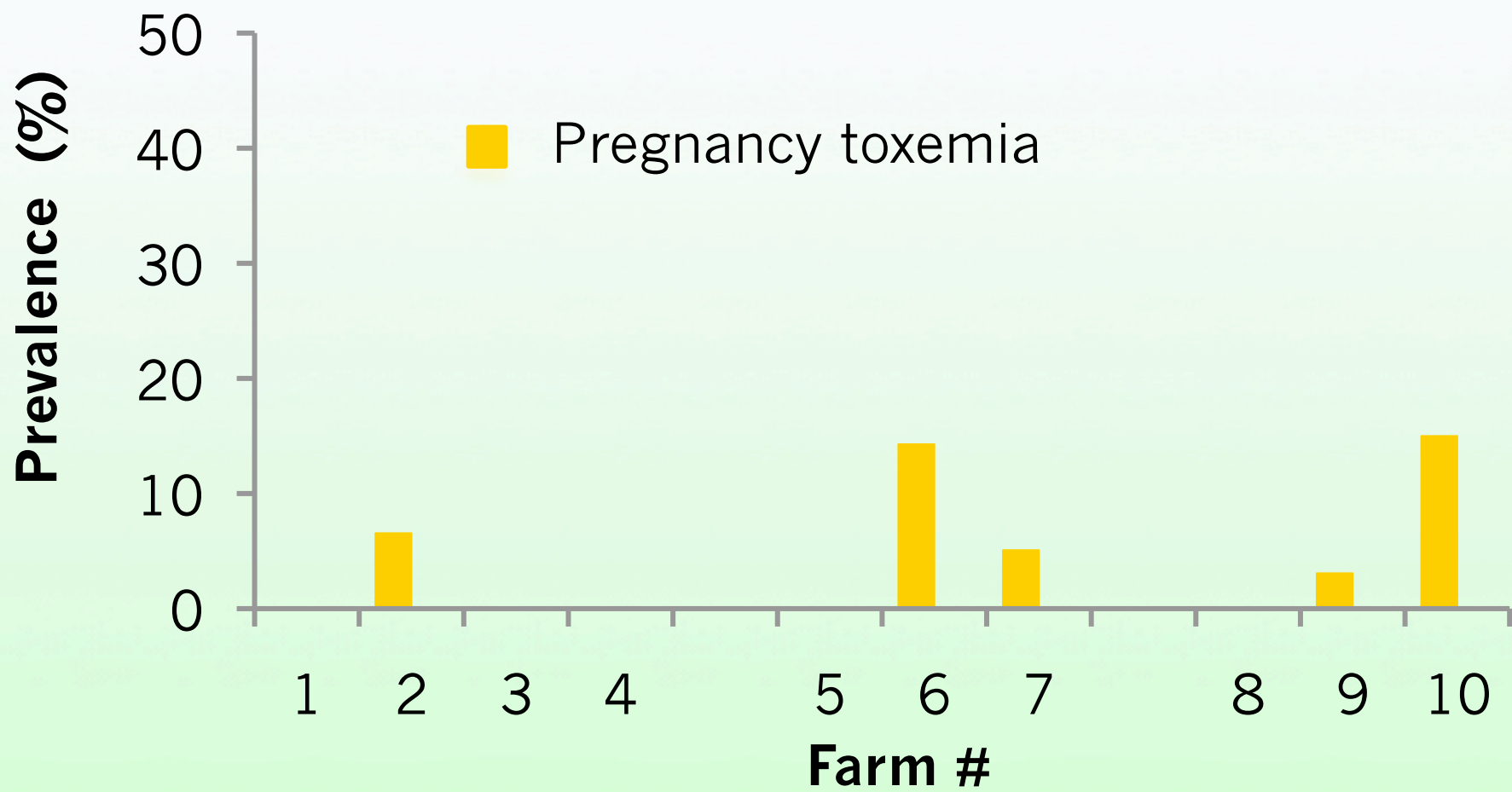
Feed type

Dry period length

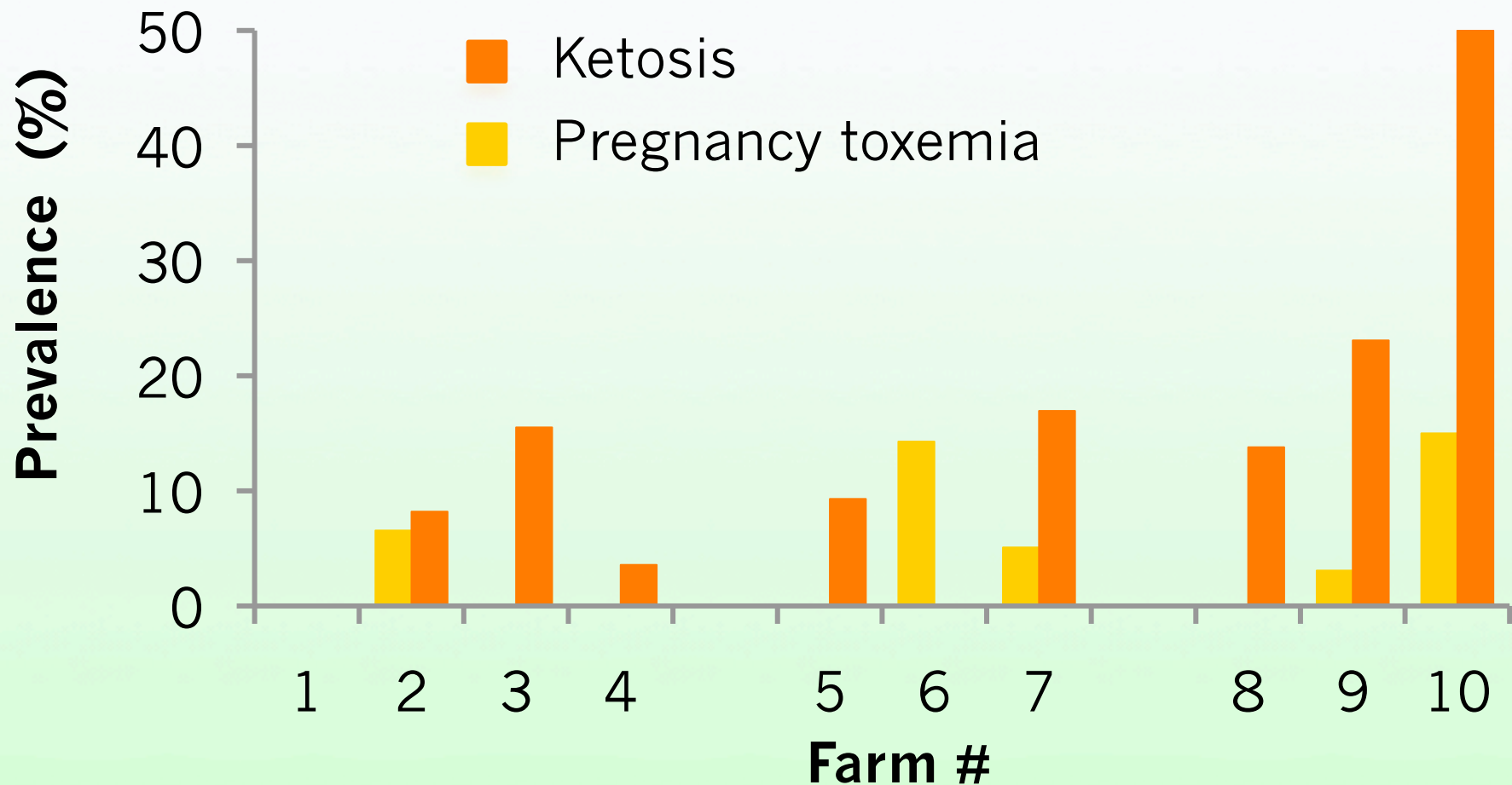
## **Highest milk production:**

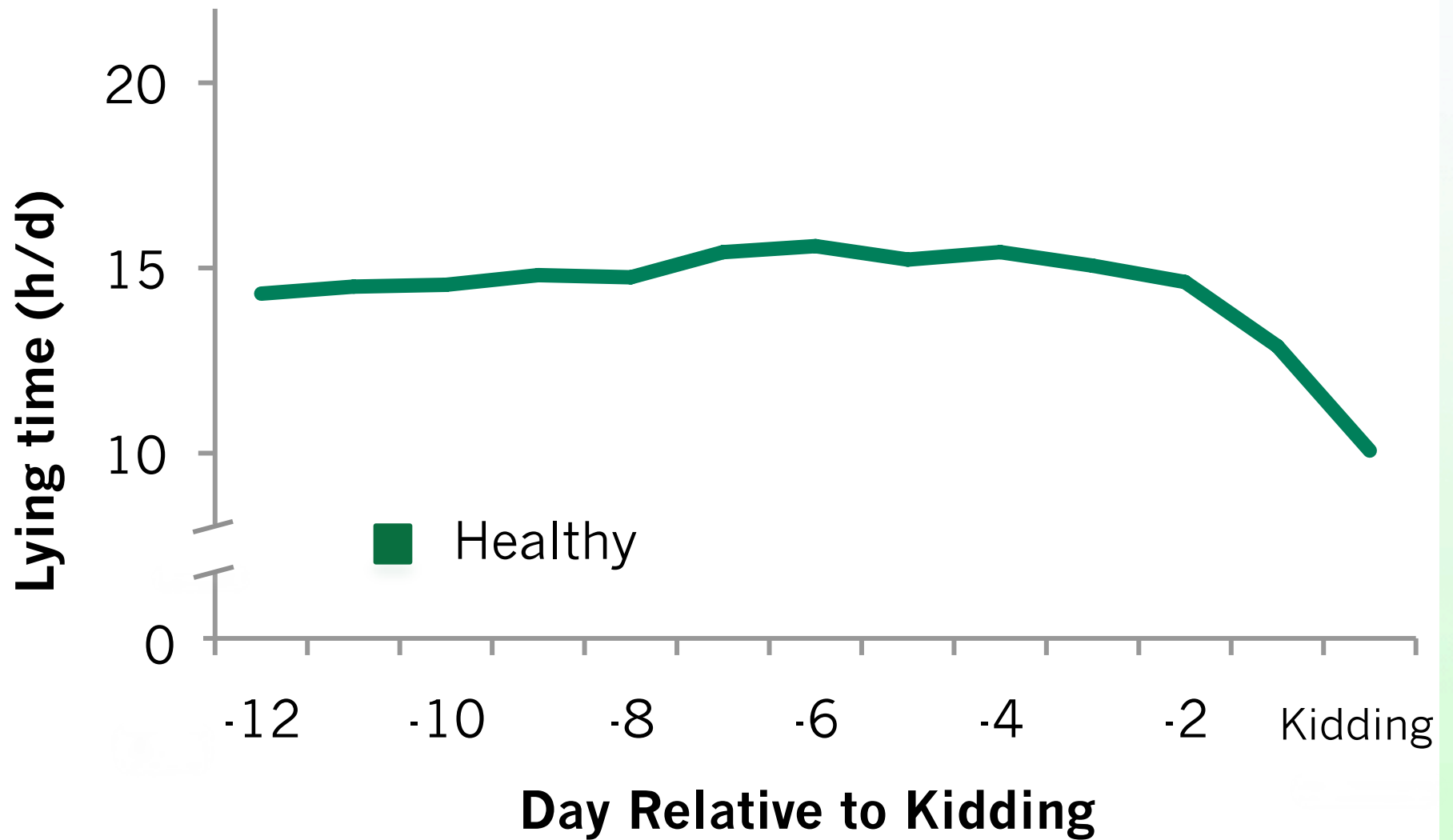
Farm which managed dry period according to milk production



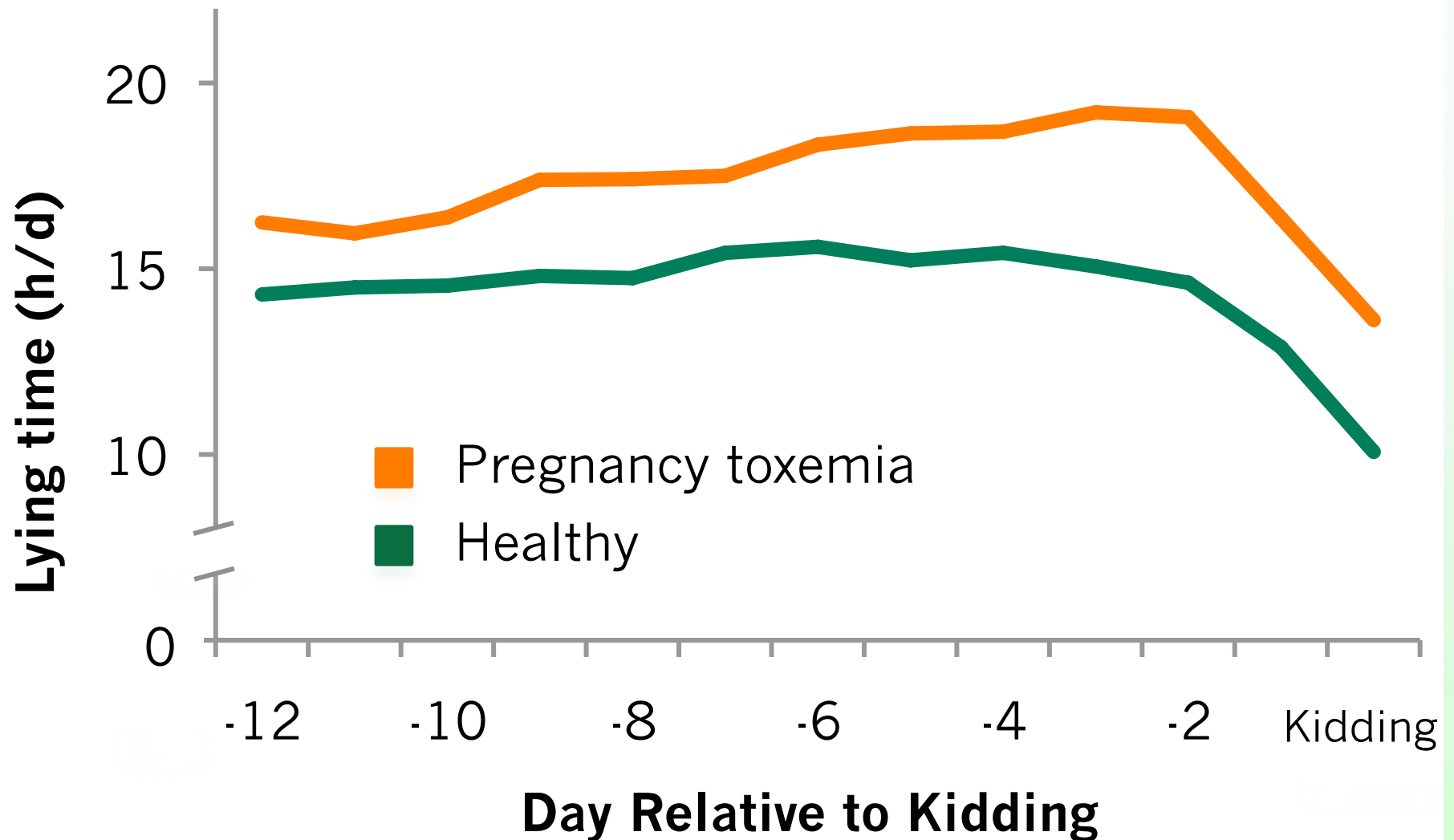


# More ketosis than pregnancy toxemia

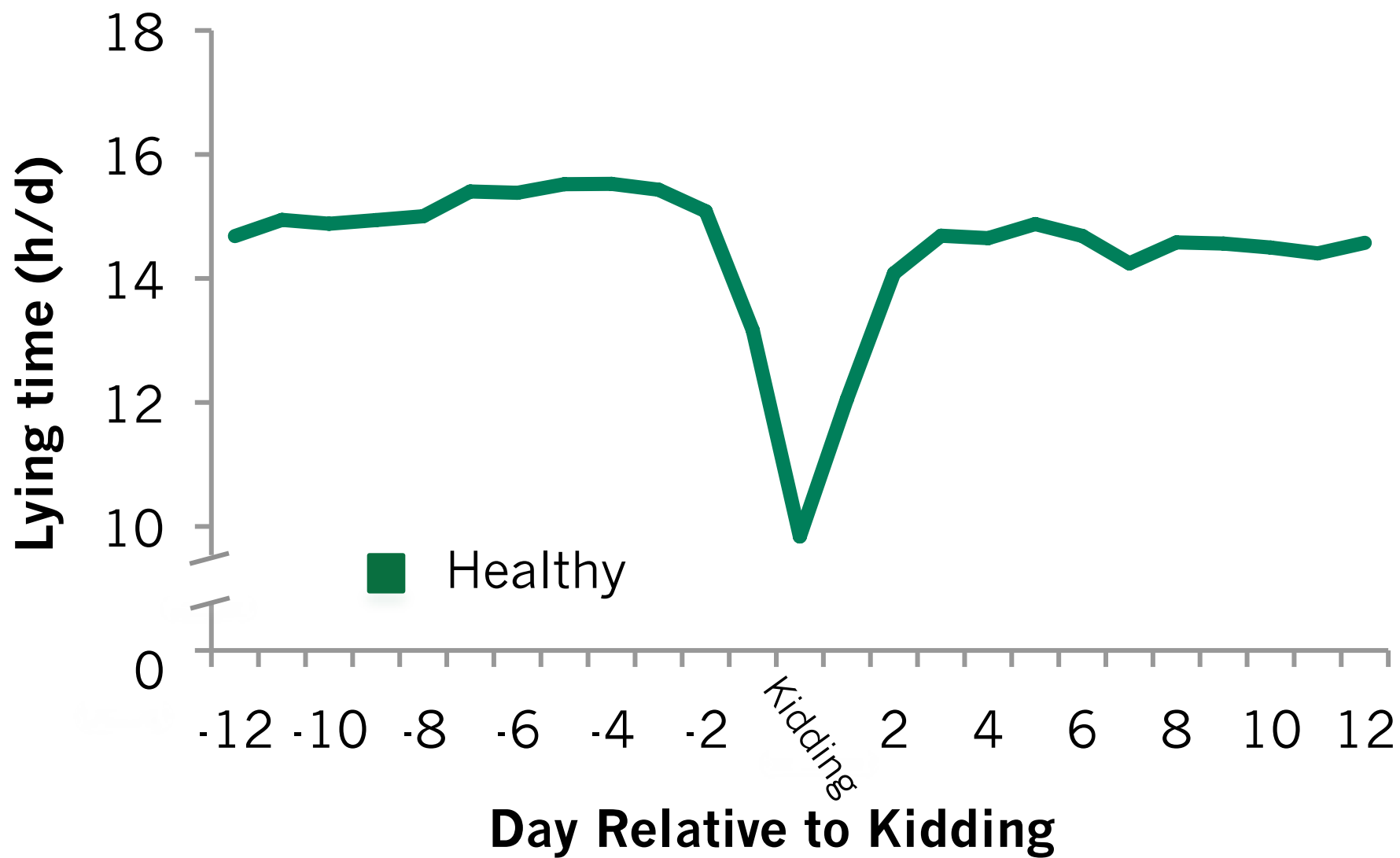




# Goats with pregnancy toxemia lay down up to 3 hours more per day

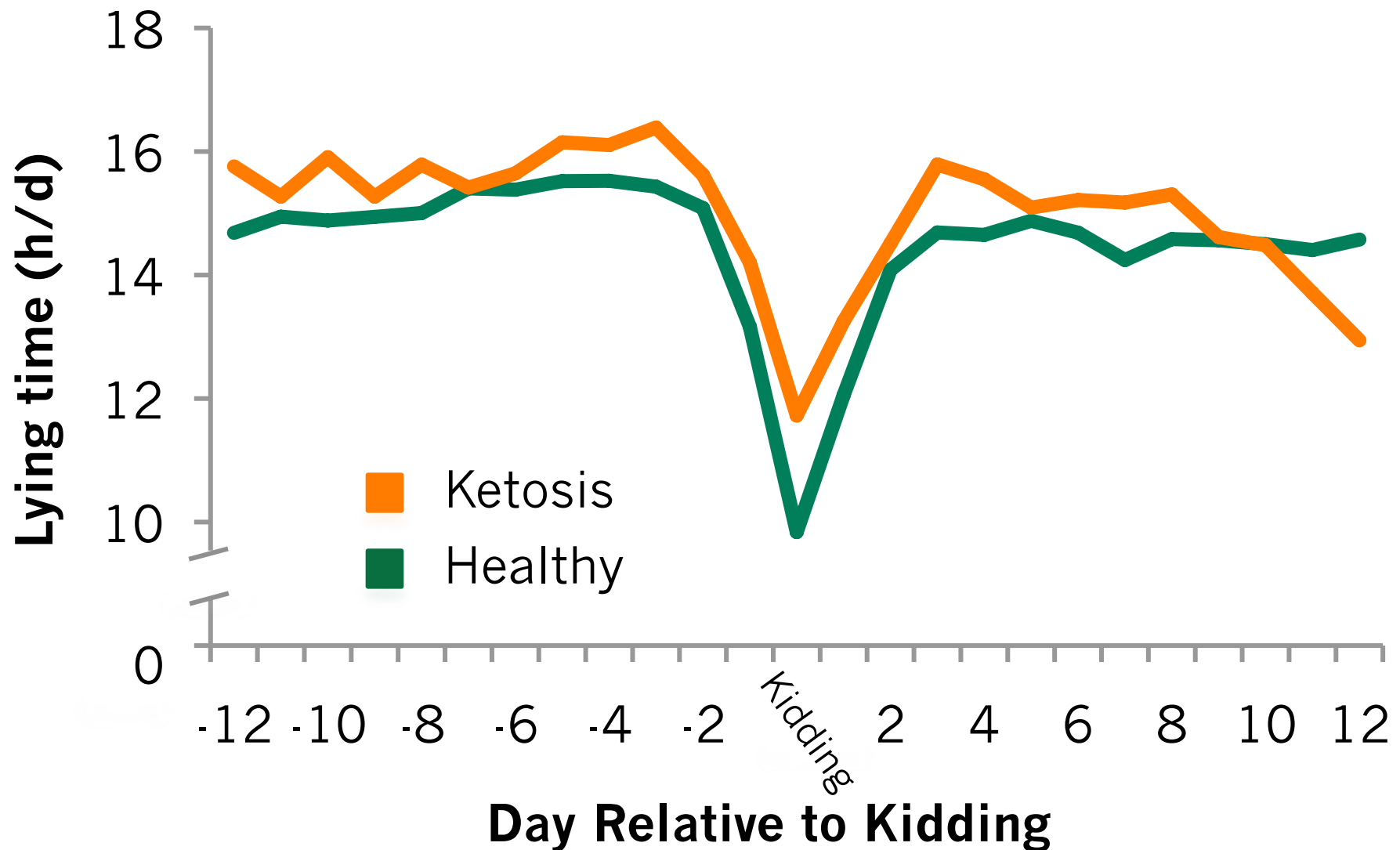


Zobel et al. (submitted)

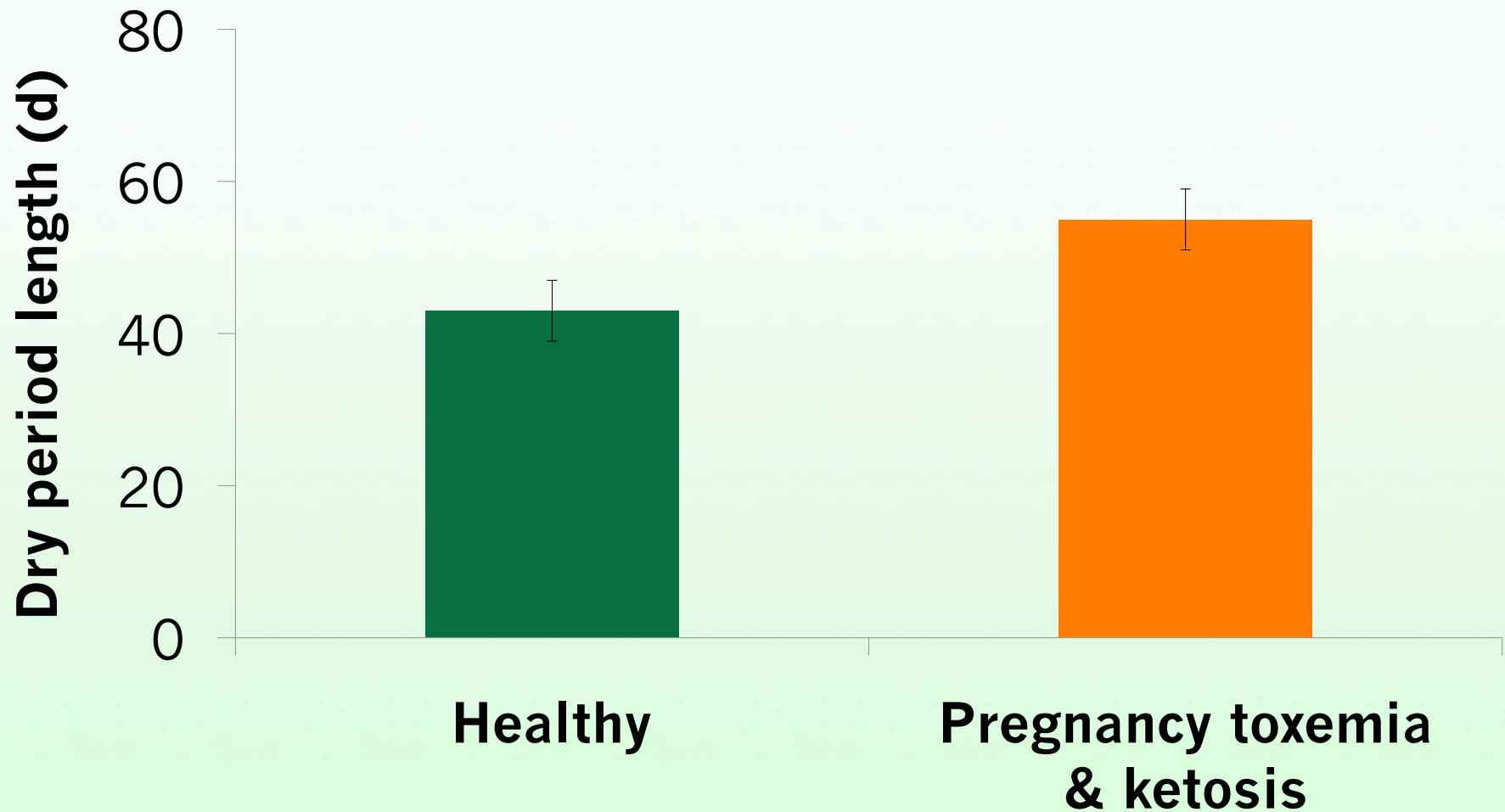




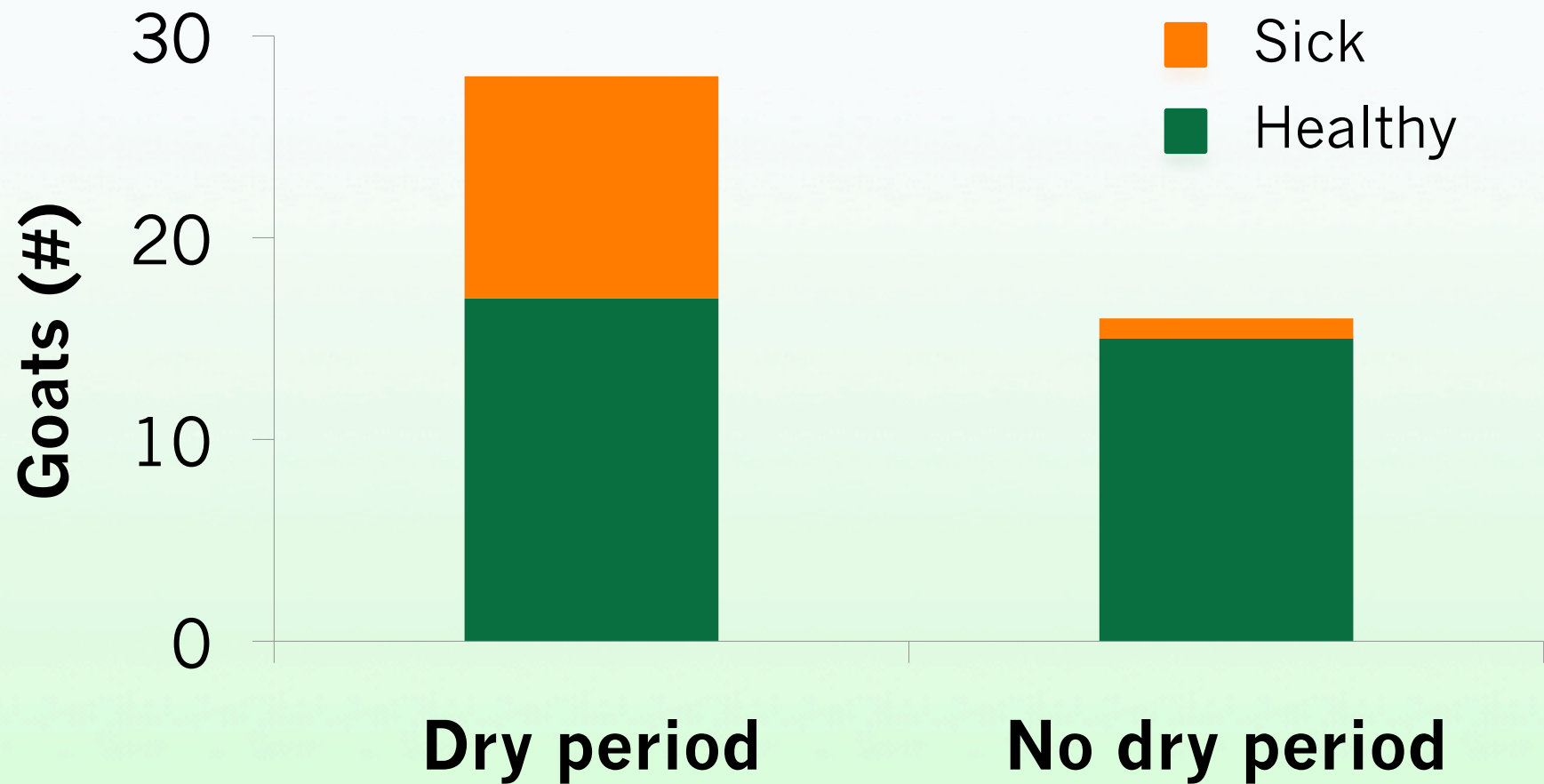
# Overall goats with ketosis lay 1 hour longer, most noticeable around kidding



# Does which remained healthy had shorter dry periods



# Fewer does became sick when no dry period provided



Fisher's exact test,  $P = 0.04$

Zobel et al. (submitted)

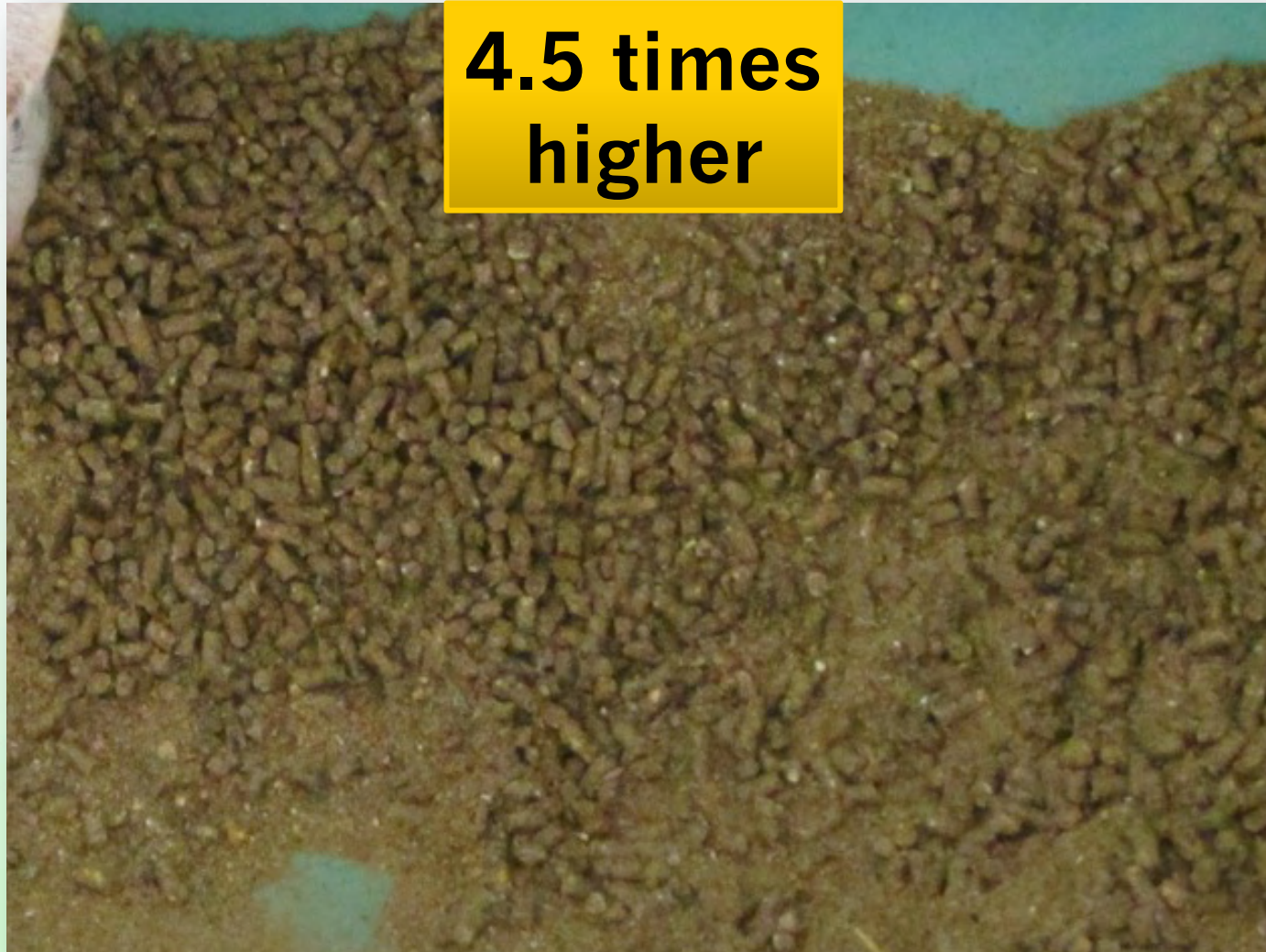
# What increased the odds of sickness?



*Zobel et al., submitted*



# What increased the odds of sickness?





Purpose of study was not to evaluate the efficacy of one feed versus another...



...but we did record observations  
on each farm that allowed for  
feed related comments to be  
provided to each producer



# Recap: Pregnancy toxemia and Ketosis

Does lying more prior to kidding should be watched carefully – could be at risk!

Healthy does = shorter dry periods (but likely a function of managing around milk production)

Number of kids and feeding regime increased the odds of a doe becoming sick



# Things to consider



Body condition  
*(not just fat goats!)*

# Things to consider



Build up of fine materials

Acidosis





# Things to consider

Frequent cleaning and adding new feed



# Things to consider

## Forage





**First steps?**

# Applying the science

**Standard operating procedures (SOPs)**



# Applying the science

## **Standard operating procedures (SOPs)**

Choose one or two of the most important things you want to address on your farm (e.g., improving milking hygiene)

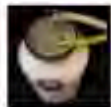


## Standard Operating Procedure: Milking

*To help ensure that cattle are milked consistently, and that milk is harvested in a way that prevents contamination and promotes udder health.*

Before all else: Wear gloves! Hands to be clean and dry.

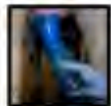
**The following milking procedure is to be done on 4 cows at a time.**



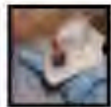
1. Identify cows that are treated, fresh, or otherwise not to be milked with the regular herd [**cows ① ② ③ ④**].



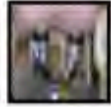
2. Wipe off sand, stimulate and strip each quarter [**cows ① to ④**].



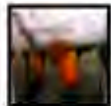
3. Pre-dip with sanitizer. Make sure dip covers whole teat [**cow ①**].



4. Using a clean paper towel for each cow, wipe off pre-dip. Pay particular attention to cleaning teat ends [**cow ①**].



5. Once teats are dry, attach milking unit silently (no air squawking) within 60 seconds from the time the teats were first stimulated. Adjust hoses and units as necessary [**cow ①**].



6. Repeat steps 3-5 on **cow ②** until all 4 are milking. Repeat steps 1-5 on next 4 cows [ **⑤ ⑥ ⑦ ⑧** ], and last 4 cows [ **⑨ ⑩ ⑪ ⑫** ].
7. When milk machine is finished, dip teats with disinfectant. Make sure the dip covers whole teat [**cows ① to ⑫**].

**MAXIMUM TWO PEOPLE INVOLVED WITH MILKING AT ONE TIME!**







## Standard Operating Procedure: Milking

*To help ensure that cattle are milked consistently, and that milk is harvested in a way that prevents contamination and promotes udder health.*

Before all else: Wear gloves. Hands to be clean and dry.

The following milking procedure is to be done on 4 cows at a time.



### GOALS

Ensure consistent milking  
Prevention of contamination  
Promotes udder health



4. Using a clean paper towel for each cow, wipe on pre-dip. Pay particular attention to cleaning teat ends [cow ①].

5. Once teats are dry, attach milking unit silently (no air squawking) within 60 seconds from the time the teats were first stimulated. Adjust hoses and units as necessary [cow ①].

6. Repeat steps 3-5 on cow ② until all 4 are milking. Repeat steps 1-5 on next 4 cows [ ⑤ ⑥ ⑦ ⑧ ], and last 4 cows [ ⑨ ⑩ ⑪ ⑫ ].

7. When milk machine is finished, dip teats with disinfectant. Make sure the dip covers whole teat [cows ① to ⑫ ].

**MAXIMUM TWO PEOPLE INVOLVED WITH MILKING AT ONE TIME!**





## Standard Operating Procedure: Milking

To help ensure that cattle are milked consistently, and that milk is harvested in a way that prevents contamination and promotes udder health.

Before all else: Wear gloves! Hands to be clean and dry.

The following milking procedure is done on 4 cows at a time.



1. Identify cows that are treated fresh, or otherwise not to be milked with the regular herd [cow ② ③ ④].



2. Wipe off teats with disinfectant [cows ① to ④].



3. Pre-dip teats with disinfectant at [cow ①].



4. Using teat dip, dip teats. Pay particular attention to the teat dip. Pay particular attention to the teat dip.



5. Once teats are clean and dry (or squawking) within 60 seconds, attach milking machine. Adjust hoses and teats.



6. Repeat steps 1-5 on cow ⑤. Repeat steps 1-5 on next 4 cows [ ⑤ ⑥ ⑦ ⑧ ], and next 4 cows [ ⑨ ⑩ ⑪ ⑫ ].

7. When milk machine is finished, dip teats with disinfectant. Make sure the dip covers whole teat [cows ① to ⑫].

### ABSOLUTE MUSTS

Wear gloves  
Hands to be clean and dry  
Max two people

**MAXIMUM TWO PEOPLE INVOLVED WITH MILKING AT ONE TIME!**





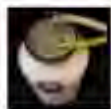


## Standard Operating Procedure: Milking

*To help ensure that cattle are milked consistently, and that milk is harvested in a way that prevents contamination and promotes udder health.*

Before all else: Wear gloves! Hands to be clean and dry.

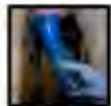
**The following milking procedure is to be done on 4 cows at a time.**



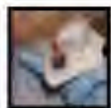
1. Identify cows that are treated, fresh, or otherwise not to be milked with the regular herd [cows ① ② ③ ④].



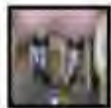
2. [cows ④ ].



3. [cows ① ].



4. [cows ① ] particular



5. [cows ① ] (milking) within 15 minutes of milking just hoses



6. Repeat steps 3-5 on **cow ②** until all 4 are milking. Repeat steps 1-5 on next 4 cows [ ⑤ ⑥ ⑦ ⑧ ], and last 4 cows [ ⑨ ⑩ ⑪ ⑫ ].

7. When milk machine is finished, dip teats with disinfectant. Make sure the dip covers whole teat [cows ① to ⑫ ].

**MAXIMUM TWO PEOPLE INVOLVED WITH MILKING AT ONE TIME!**



# Applying the science

**Keep records**

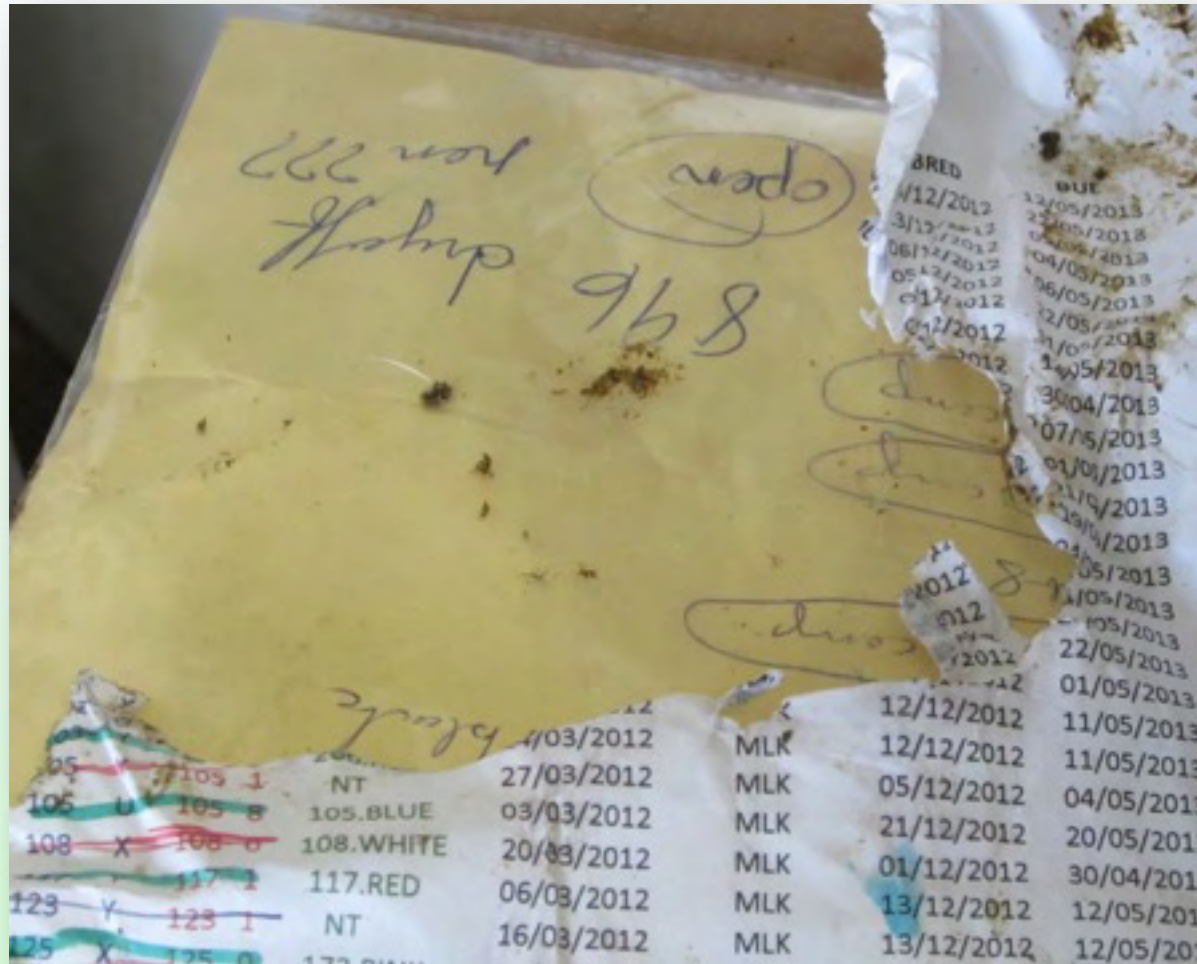
# Does not need to be fancy!

Oldest Milkers Dec 18 2012  
Prog checker ~~190~~ 84 66

682 Y ✓	30	192 G ✓	60
308 Wh ✓	60	424 Or ✓	70
467 red ✓	open	491 R ✓	60
369 orange ✓	70	453 Y ✓	55
499 Or ✓	70	976 Y ✓	60
139 Bl ✓	70	980 Y ✓	60
432 Or ✓	70	481 Or ✓	60
429 Or ✓	70	129 Bl ✓	55
305 Or ✓	70	279 Gr ✓	60
432 Y ✓	60	254 Gr ✓	60
456 R ✓	60	258 Gr ✓	70
195 B ✓	70	498 R ✓	55
262 Gr ✓	60	205 Gr ✓	60
361 Or ✓	70	93 Pink ✓	60
368 Or ✓	70	277 Gr ✓	55
475 Or ✓	60	276 Gr ✓	55
304 Or ✓	65	435 Y ✓	45

- ✓ Permanent
- ✓ Dated
- ✓ As detailed as possible

# Does not need to be fancy!



- ✓ Permanent
- ✓ Dated
- ✓ As detailed as possible
- ✓ Some advantages to digital... 😊



# Applying the science

## **Keep records**

Detailed records for each animal (e.g., kidding dates, IDs of kids, treatment records) allow you to identify issues

Helpful for when working with your vet or nutritionist

# Wrapping up

## **Dry period**

Management variable

Opportunity for improving udder health and preventing pregnancy toxemia and ketosis

## **Steps forward**

Develop standard operating procedures for your farm and keep records

# Acknowledgements

Dr. Nina von Keyerslingk

Dr. Dan Weary

Dr. Ken Leslie

**Ontario's goat producers!**



animal welfare  
program



Ontario Veterinary College  
POPULATION MEDICINE



Mark Wynands  
(research assistant)