

# LAMB SURVIVAL IN INTENSIVE REARING CONDITIONS

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“Life isn’t about waiting for the storm  
to pass....

- *Vivian Greene*



“Life isn’t about waiting for the storm to pass.... it’s about learning how to dance in the rain.”

– *Vivian Greene*



# Lamb Survival

- Opposite of survival - mortality
  - part of the discussion
  - to know what to improve - know what is causing flock deaths
    - target management practices to these
- Ultimate goal - improving lamb “thrival”
  - reducing illness (morbidity) and mortality

# Lamb Mortality

- Economic Issue - decreased revenue - reduces lambs available for sale - market
  - reduces number of replacement ewes
  - reduces breeding stock available to sell
  - increased expenses - higher veterinary costs - visits and medications
- Animal welfare issue - illness and death are painful
  - welfare concerns - breathlessness, hypothermia, hunger, illness, pain/injury
- Mental wellness issue - symptom - underlying issue - undiagnosed, untreated
  - cause - lambing season - best and the worst of times

# Lamb Mortality

- Need to de-normalize lamb loss
  - refuse to accept that is a normal part of the industry
  - de-normalize it on your farm - “farm-blind”
- Prioritize - youngstock health
- Youngstock mortality is a reflection of farm management
- Good news - majority of causes - influenced by us
- Positive Feedback loop - less you lose - the less you want to lose

# Dead lambs tell tales

- Postmortems - key component - youngstock health program
  1. Learn to do a basic one yourself
  2. Recruit flock veterinarian - singles or batched (by age)
  3. Drop off to Animal Health Laboratory (Guelph)
    - you control what and how to work it up - basic gross to “the works”
  - power in numbers - more you do, the more you know - “1” vs. “13”
  - what makes you sick doesn’t always kill ya’

- Limitations of postmortems
  - have to be done or frozen asap
  - little ability to diagnose diarrhea issues
  - essential to provide a good history

“blind pathologist”



## Quantify

- De-normalizing mortality starts with measuring...
- Shake the mentality - if you don't count them - they don't exist

## Compare

- Don't just leave it at counting
- Need to compare.....  
..... to averages for the industry
- Not to berate ourselves - but to motivate
- Need goals to strive for



# Quantify

Lamb ID	Sex	Litter size	Birth Weight (lbs)	Age at Death			
				< 48 hours	49 hrs - 7 days	8 days to weaning	Weaning to shipping
L23	F	TW	3	x			
L15	M	S	14		x		
M2	F	Q	4			x	
K61	M	S	11				x

Change what is controllable ....

...change your response to what is not

# Industry Baselines

- Aim for less than 7.5% lamb mortality
  - less than 1% 0-48 hours
  - less than 0.5% 48-7days
  - less than 5% preweaned group
  - less than 1% post-weaning
- Low mortality producers - less than 1% overall
- High mortality - 20-25%

# Patterns

- Epidemiology - study of patterns of disease
  - the use of these patterns to improve health
- Causes of Death - farm-specific - channel your inner Dr. Fauci
  - record data, analyze data, undertake diagnostic tests (fecals, postmortems, etc.)



# 0-48 hours after birth

## Causes of Death

### 1. Starvation

- a. Dystocia-related - over-sized singles
  - triplets, quads
- trauma
- lack of oxygen
  - hypothermia
  - reduced movements
  - lack of nursing
- b. Mismothering

## Management

### 1. a.

- **Prevent dystocia**
- minimize singletons - teaser rams
- ensure ewes adequate sized
- timely checking of lambing flock
  
- **TLC for brain-damaged kids and abandoned lambs**
- bottle-feeding, stomach-tubing

# 0-48 hours after birth

## Causes of Death

### 1. Starvation

- c. Low birthweight - hypothermic
  - late standing
  - reduced udder seeking

## Management

### 1. c. Good nutritional status - ewes

- ultrasound - feed ewes with triplets or more separately

### d. Measure temperatures at birth

- Ideally 39-40°C or 102-104°F
- Additional heat source - radiant heater with fan is best

# 0-48 hours after birth

## Causes of Death

### 2. Septicemia

- Overwhelming bacterial infection

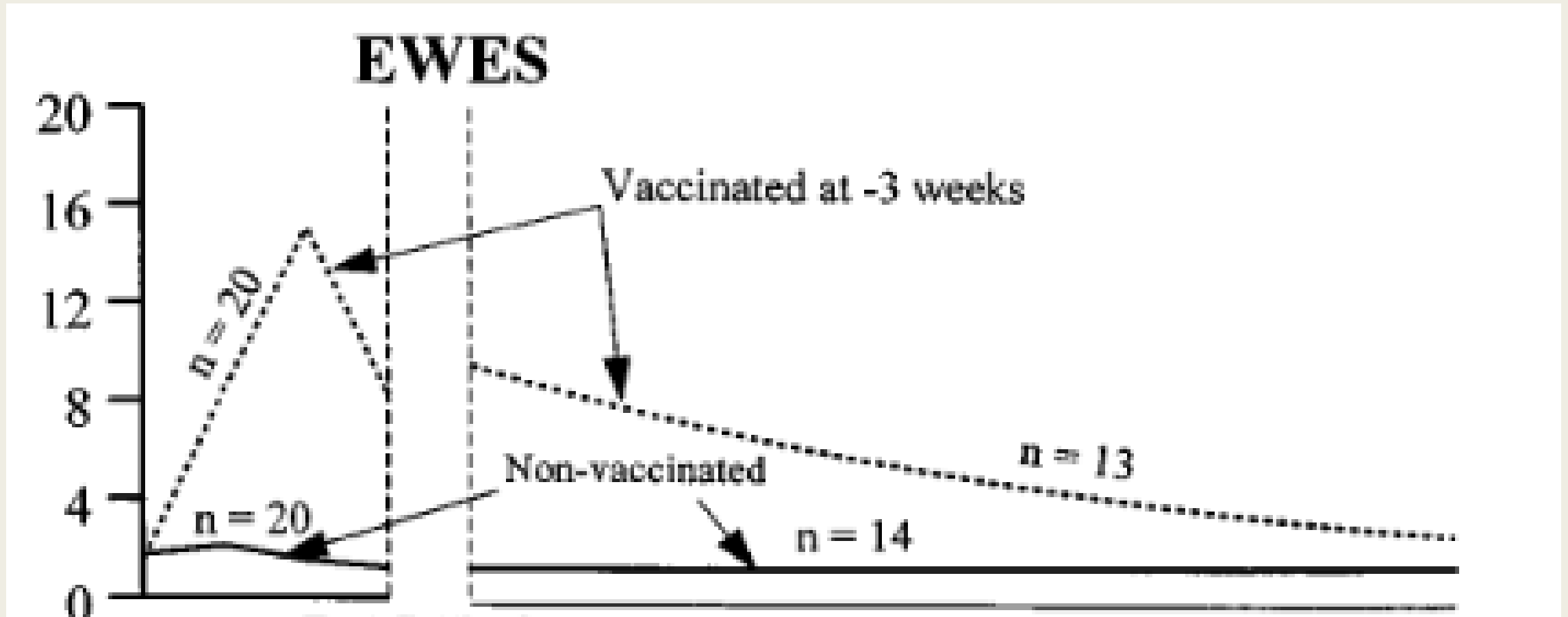
## Management

### 2. a. Colostrum Management

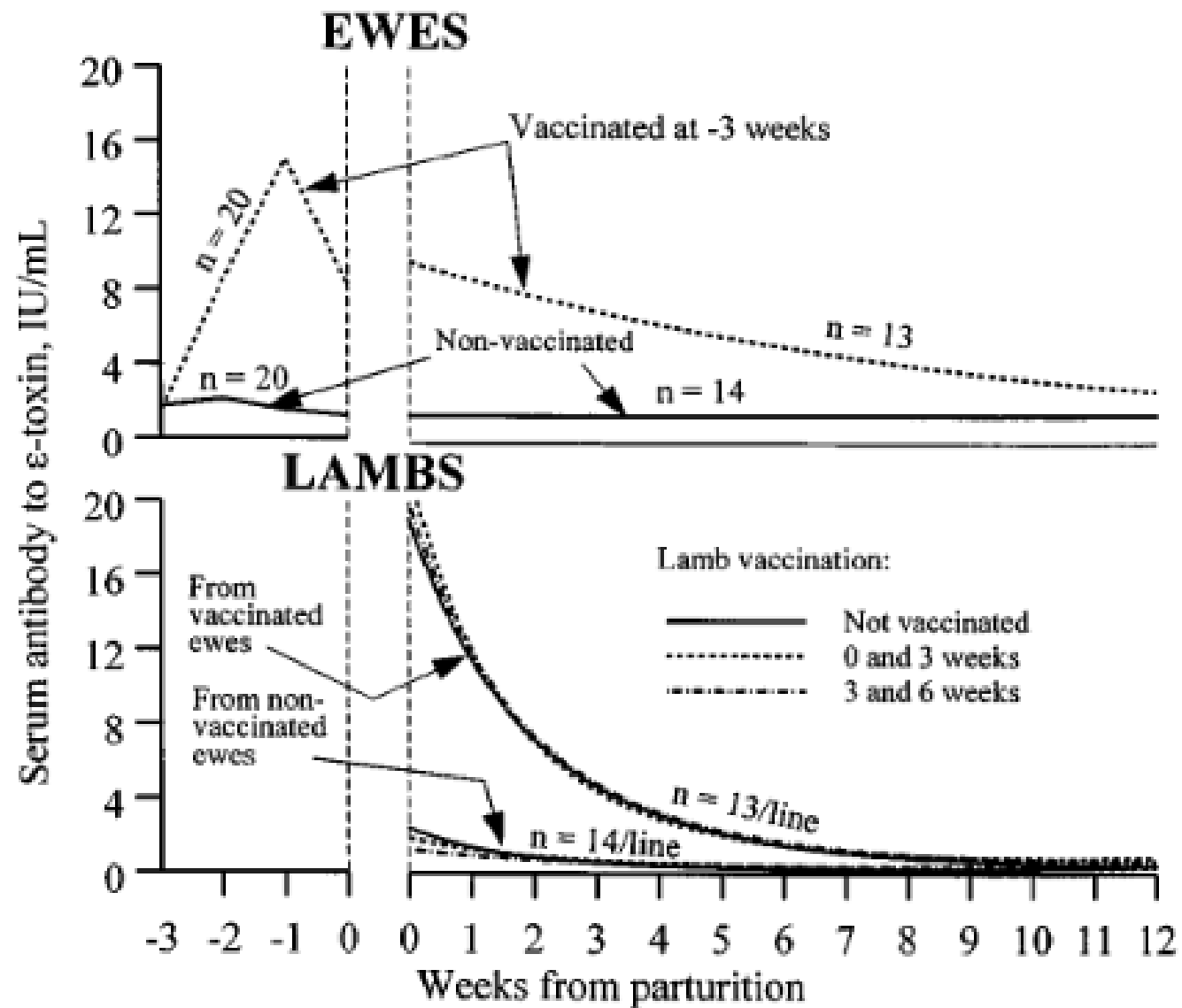
- first meal within 2 hours (50mls/kg)
- 2 more meals within next 22-24 hours (75mls/kg)
- good quality - greater than 19-20% - Brix
- vaccinate ewes to improve quality
- 15g colostrum replacer = 1% on Brix

### b. Navel dipping

- lambs don't get swollen navels - calves but bacteria still enter - enter bloodstream



Vaccination Schedules to Raise Antibody Concentrations Against e-Toxin of *Clostridium perfringens* in Ewes and Their Triplet Lambs, de la Rosa et al. 1997



Vaccination Schedules to Raise Antibody Concentrations Against  $\epsilon$ -Toxin of *Clostridium perfringens* Ewes and Their Triplet Lambs, de la Rosa et al. 1997



# 0-48 hours after birth

## Causes of Death

### 3. Pneumonia

- coughing, huffing - almost from birth
  - born with immature lungs
  - more prone to infection
- Abortion hangovers
  - Premature lambs - triplets and greater
    - shorter pregnancies
  - Improper tubing technique
    - aspiration pneumonia

## Management

### 3. - Vaccinate ewes

- Q Fever
  - Chlamydia
- **Supportive care** - pneumonia cases  
increased risk starving

# 0-48 hours after birth

## Causes of Death

### 4. Diarrhea

- from ingesting environmental pathogens before colostrum
- inadequate colostrum ingestion
  - more common in triplets, etc.
  - lambs underlying conditions

## Management

### 4. Colostrum Management

- get animals nursing asap
- bottle or tube-feed triplets and quads.....
- feed colostrum for 2-3 days (bottle babies)

# 0-48 hours after birth

## **Tool kit**

- Thermometer
- Vitamin E/Se - separate needles!
- Stomach tube with 60 cc syringe or Trusti Tuber
- External heat source - preferably with fan
- Brix refractometer
- Frozen sheep colostrum - brix greater than 19-20%
- Sheep colostrum product

## **Skill set**

- Recognizing dystocia - intervening sooner rather than later
- Training all staff - taking temperatures
- Stomach tubing - be comfortable - when in doubt tube

# 48 hours to 7 days

## Causes of Death

1. Pneumonia
2. Diarrhea
3. Septicemia
4. Starvation

## Management

- Tighten up management of first 48 hours
- Careful monitoring of new moms/bad moms (pen longer)
- Better to intervene than not to
  - extra bottles, electrolytes

# 7 days - weaning

## Causes of Death

**\* Greatest risk period \***

### 1. Pneumonia

- Mannheimia, Pasteurella, Biberstenia
- Coughing - better outcome vs. huffers

## Management

- Environment - animals that drink a lot - pee a lot
- Evaporated ammonia - burns protective barriers of respiratory tract - lets bacteria in
- Bedding, bedding, bedding
- Humidity 60-80% ideal
- Temperature/humidity monitors
- Ventilate - no ventilation system can overcome an overstocking problem

# 7 days - weaning

## Causes of Death

### 2. Diarrhea - fecal tests

- bacterial culture and fecal float - parasites
- time of occurrence - linked to cause
- Cryptosporidium - as early as 7-10 days
- Coccidia - not before 3 weeks

## Management

- Crypto - prevent from entering
  - environmental
- Coccidia - minimize transitional stress
  - prevent environmental build-up
  - Monensin or Decoxx in feed - preventative
  - Baycox early, but too early - outbreaks

# 7 days - weaning

## Causes of Death

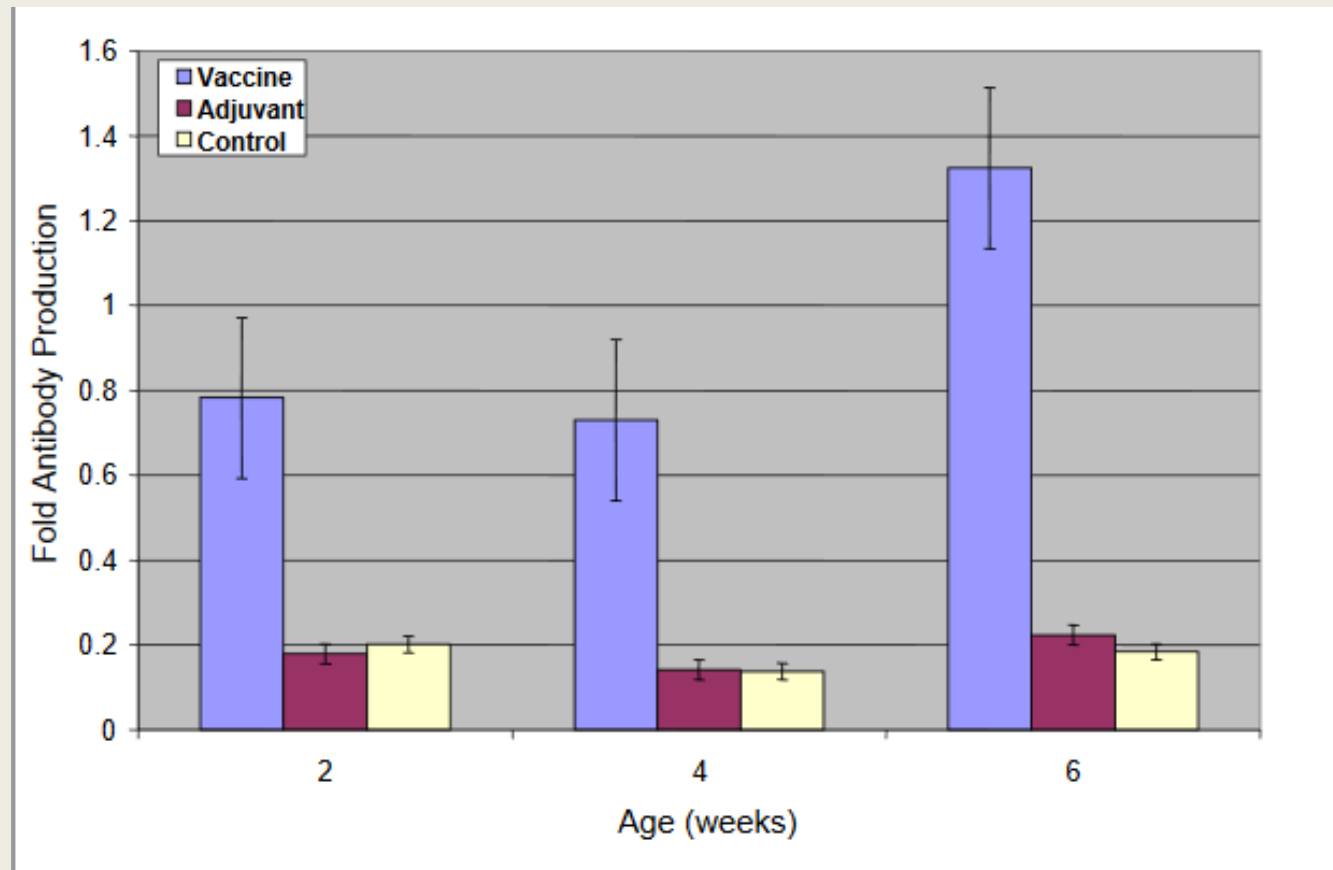
### 3. Enterotoxemia

- sudden death
- Clostridial perfringens type C/D
- it's the toxins (beta, epsilon) not the bacteria that cause the problem

## Management

- Immunity - diet
- Vaccinate the ewes during pregnancy (~3 weeks before due)
- Avoid drastic feed changes
- Keep pen near feeders well-bedded
- 1<sup>st</sup> Clostridial Vaccine (10-12 weeks) or earlier depending on age of greatest risk (note: lambs receiving bovine colostrum replacer may have limited protection)

# Antibody response in lambs vaccinated at birth



Gailor et al., 2007 Maturity of the Lamb Immune System



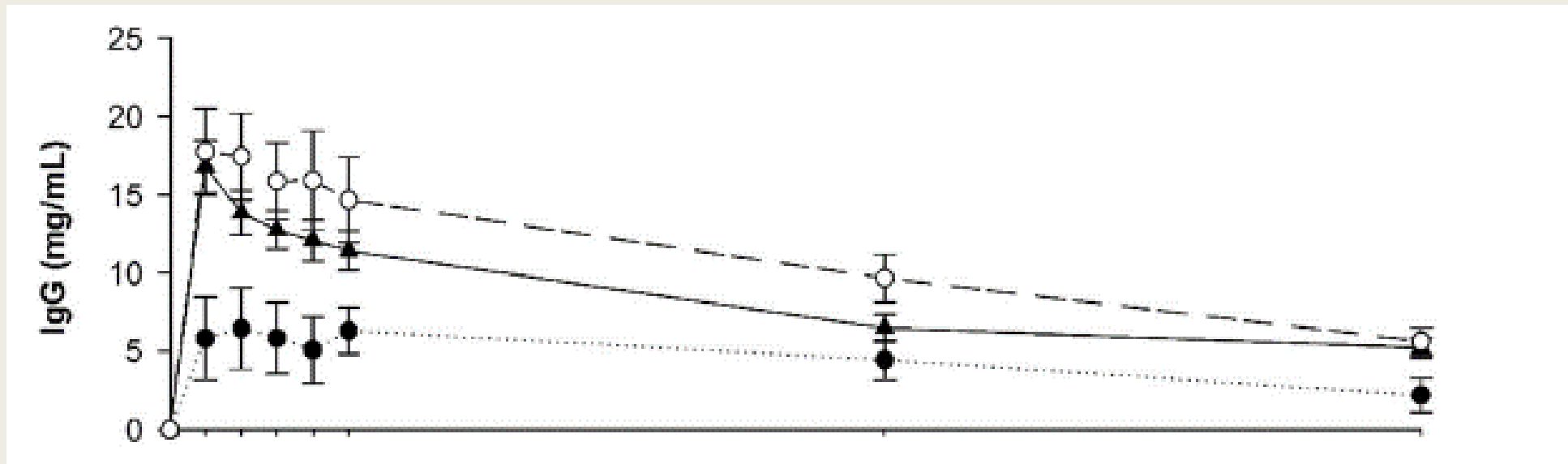
# 7 days - weaning

## Causes of Death

4. **Septicemia** - overwhelming bacteria infection

## Management

- Identify and treat infections early
- Most likely to occur when maternal antibodies wane at 2-3 weeks



# Weaning - Market Age

## Causes of Death

- These are the most painful



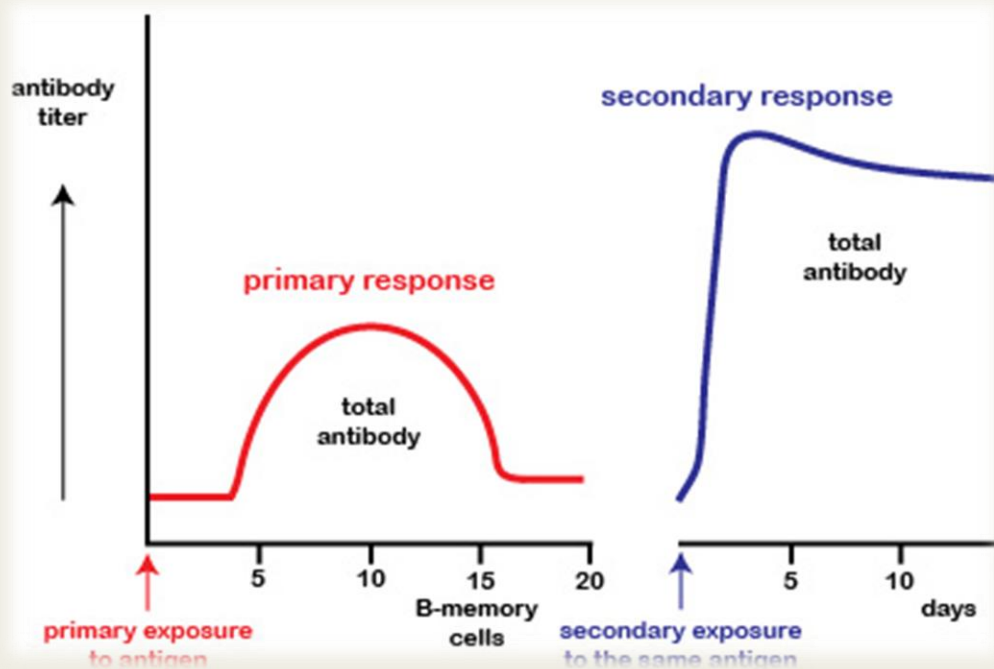
## Management

- If you have trouble here - you likely have trouble earlier on you are not acknowledging or are unaware of

# Weaning - Market Age

## Causes of Death

- Enterotoxemia



## Management

- Need that 2<sup>nd</sup> vaccine depending....
  - ewe lamb
  - have time before shipping (3 week withdrawal)

# Weaning - Market Age

## Causes of Death

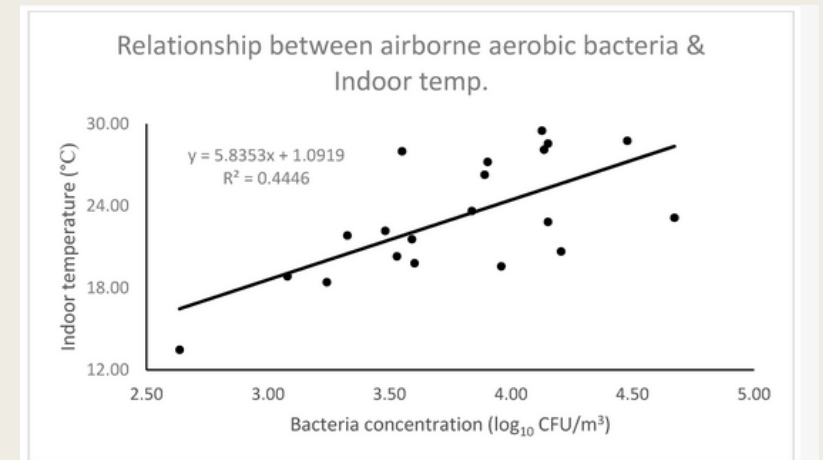
- Pneumonia

## Management

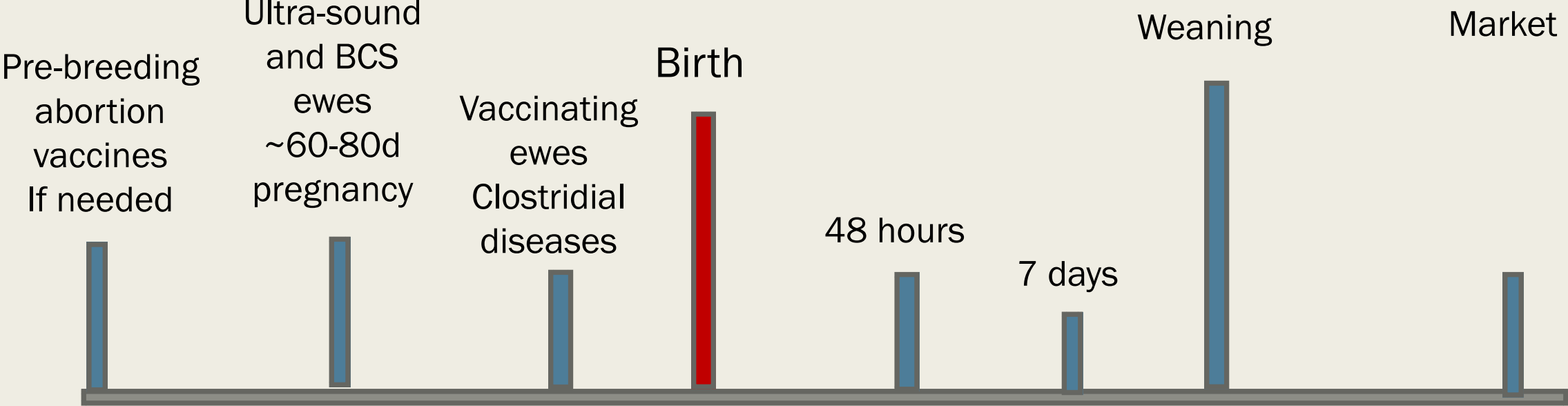
- Consider sending a couple for postmortem
- Chronic diseases wear the immune system down - can only fight so many battles
- Role of maedi-visna....
- Sensitive to weather fluctuations but don't cause pneumonia - temp and humidity

# Role of Environment and Pneumonia

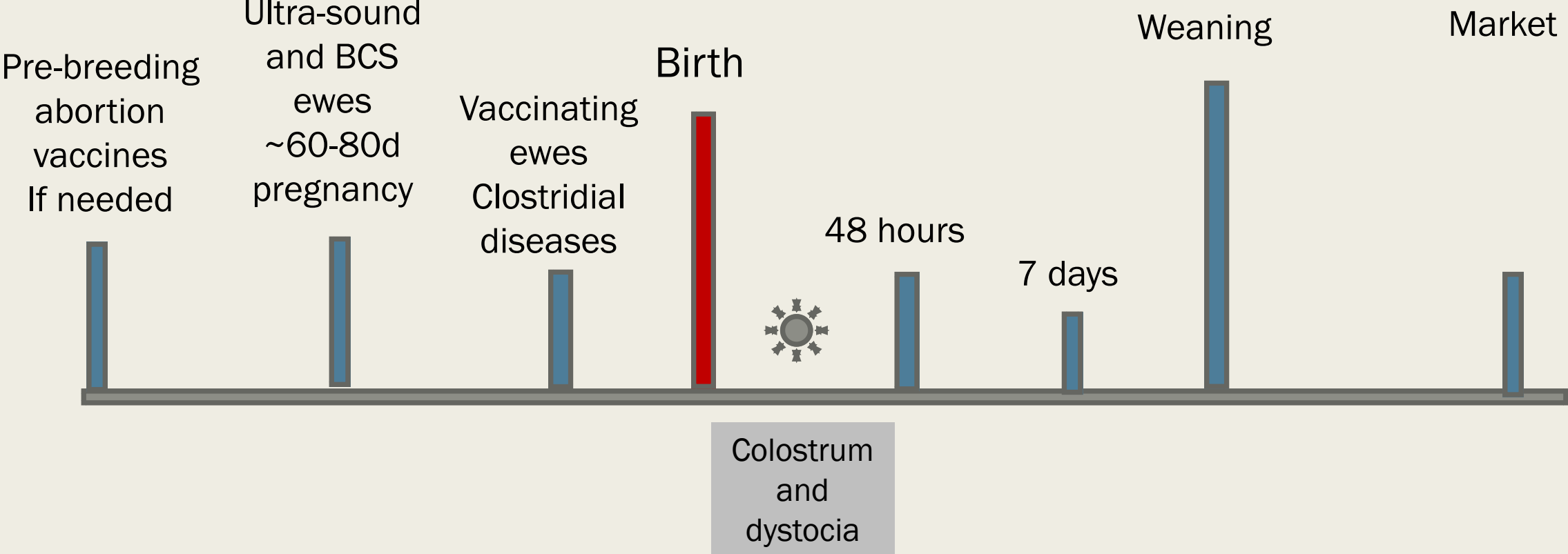
- Goal of air exchanges per h (ventilation) - remove dust particles
- Dust particles - actually mold spores - worst offender - **moldy hay**
- Most spores less than  $5\mu\text{m}$  - which means - “floats”
  - inhaled to the lungs
- Bacteria and viruses - live on the dust
- Humidity levels above 80% - allows bacteria to thrive
  - on spores less than  $5\mu\text{m}$
- Higher temperatures - increased bacterial survival



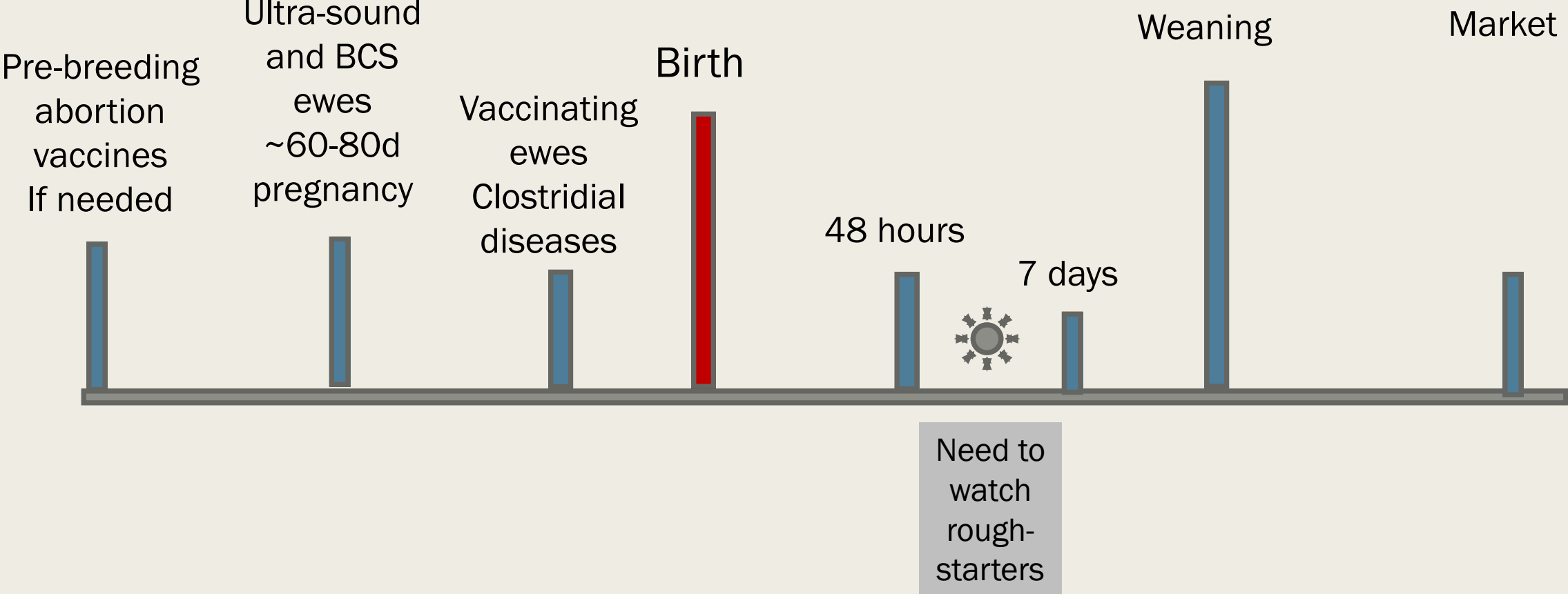
# Timeline of Opportunity



# Timeline

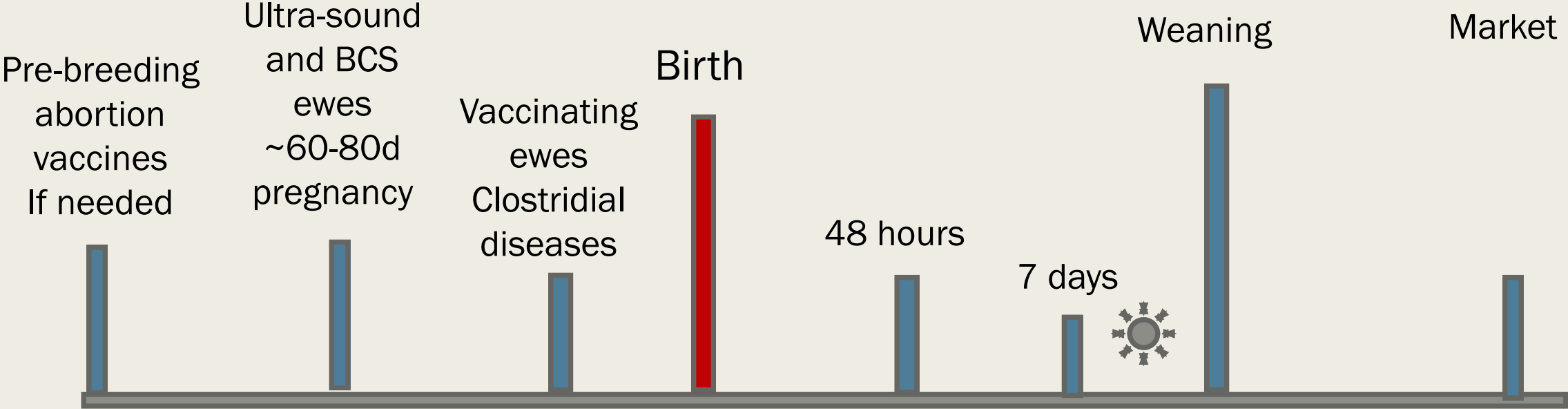


# Timeline



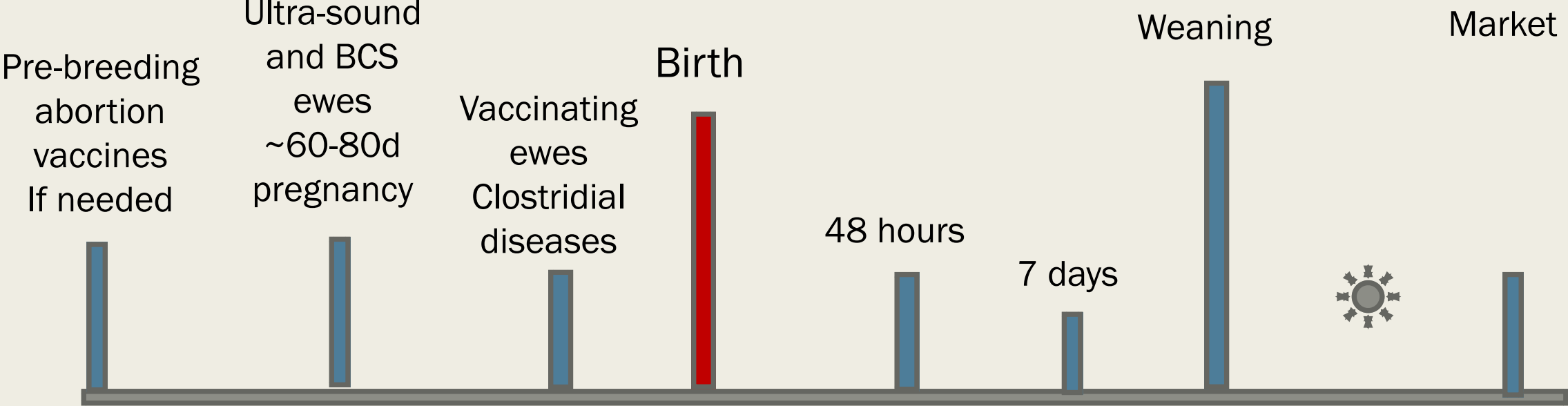


# Timeline



- Vaccinating for clostridial disease (10 weeks)
- Ventilation

# Timeline



- Watch over-stocking
- Ventilation
- Diarrhea
- 2<sup>nd</sup> vaccine 6 weeks later

# Conclusion

- Your management - directly impacts your mortality levels
- Your desire to change - influenced by:
  1. Your belief in it resulting in a favourable outcome
  2. Your perception of what others are expecting you to do - social pressure  
(from family, other producers, your vet)
  3. Your perceived belief that you can accomplish the behavioural change

# Potential Research

- Applied for funding for respiratory vaccine in a feedlot (2021) - need to know if efficacious on Ontario farms
- Impact of vaccination in younger animals
- Length of time immunity from bovine colostrum lasts in comparison to ovine
- How to protect animals immunologically vulnerable - lack of colostrum
  - bovine colostrum
- Clostridial/coccidia relationship

A Need....

Q Fever vaccine, reliable access to abortion vaccines

- lack of access is animal welfare issue