



Drought: Herd Management and Vaccination Considerations

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Drought Decisions

- Weaning calves or strip and ship?
 - Calf Management
- Culling Cows?
 - Cow Management
- Don't forget, management for next year



Calf Considerations

Bovine Respiratory Disease

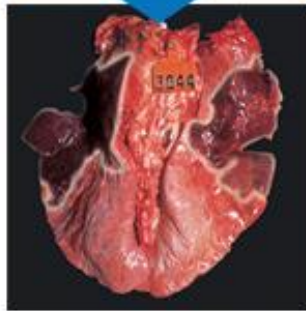
- Remains the largest challenge facing the beef industry.
- Cost is \$500 million+ annually
- Fresh weaned, naïve calves are the most susceptible.

Bovine Respiratory Disease

Healthy Lungs



Effects of Pneumonia



Irreversible Lung Damage



BRDC

- Viral

- Bovine Respiratory Syncytial Virus
- Parainfluenza 3 (PI3)
- Adenovirus
- BVDV
- Infectious Bovine Rhinotracheitis (IBR)

- Bacterial

- *Pasturella multocida*
- *M. Haemolytica*
- *Histophilus somni*
- *Mycoplasma bovis*

- Blackleg = Clostridials

How Do We Protect Calves?

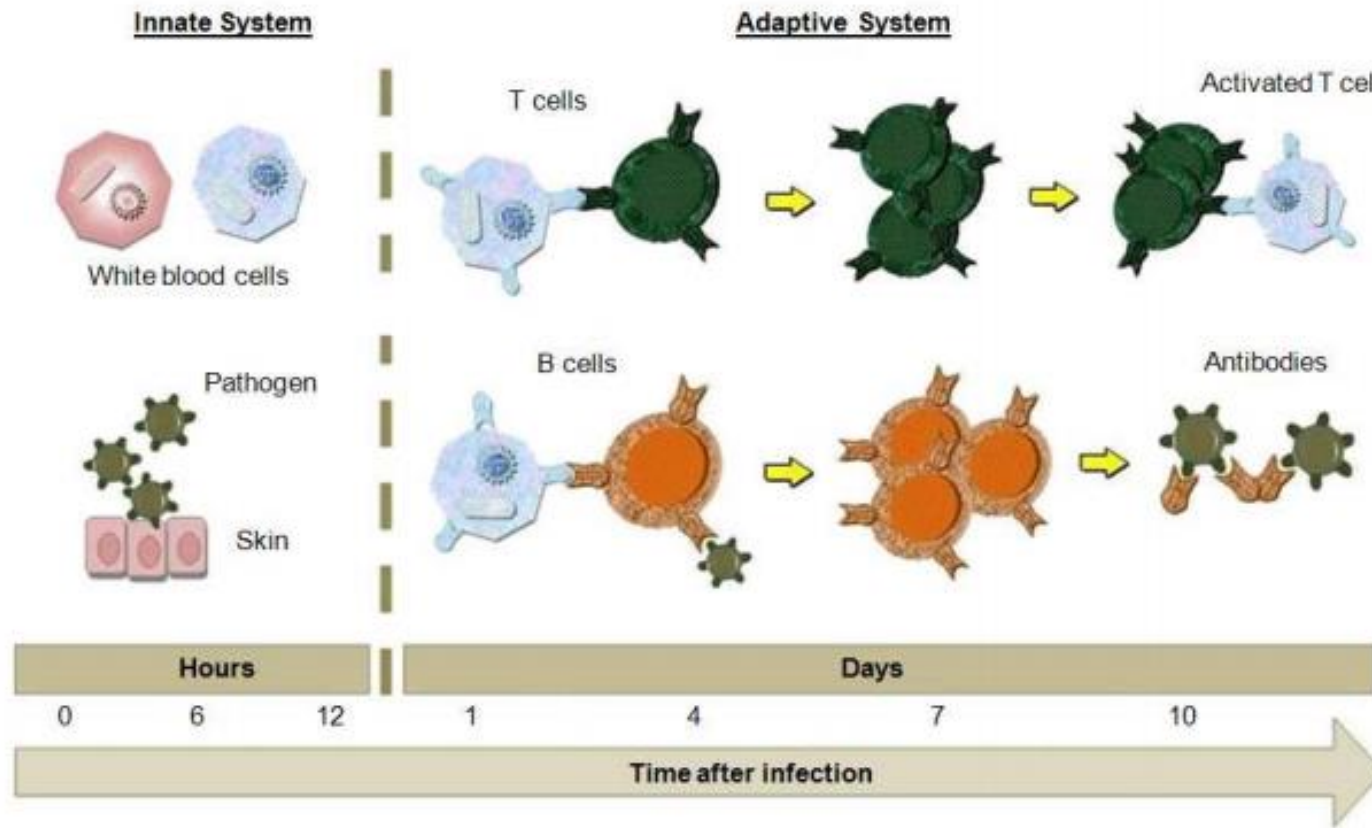
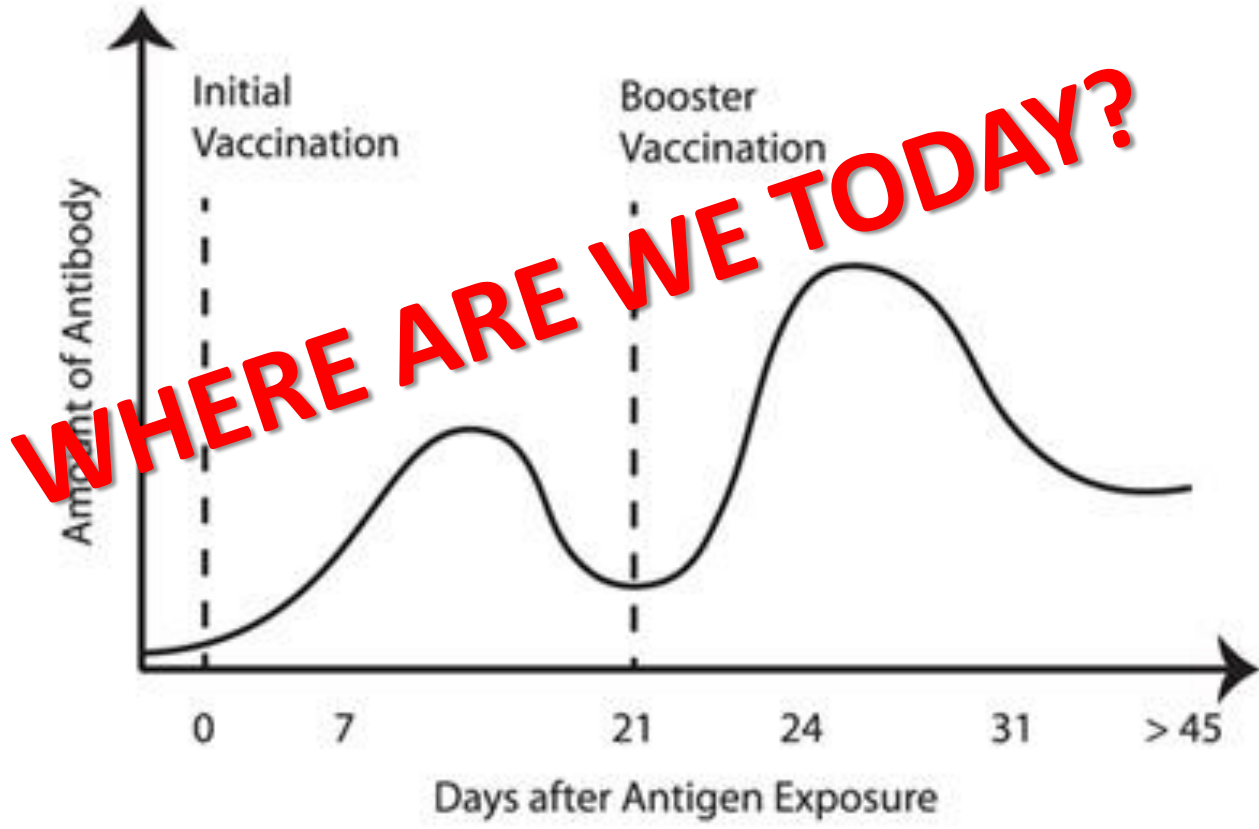


Figure 1. Components of the immune system. Based on Abbas and Lichtman (2007).



Branding Vaccination?

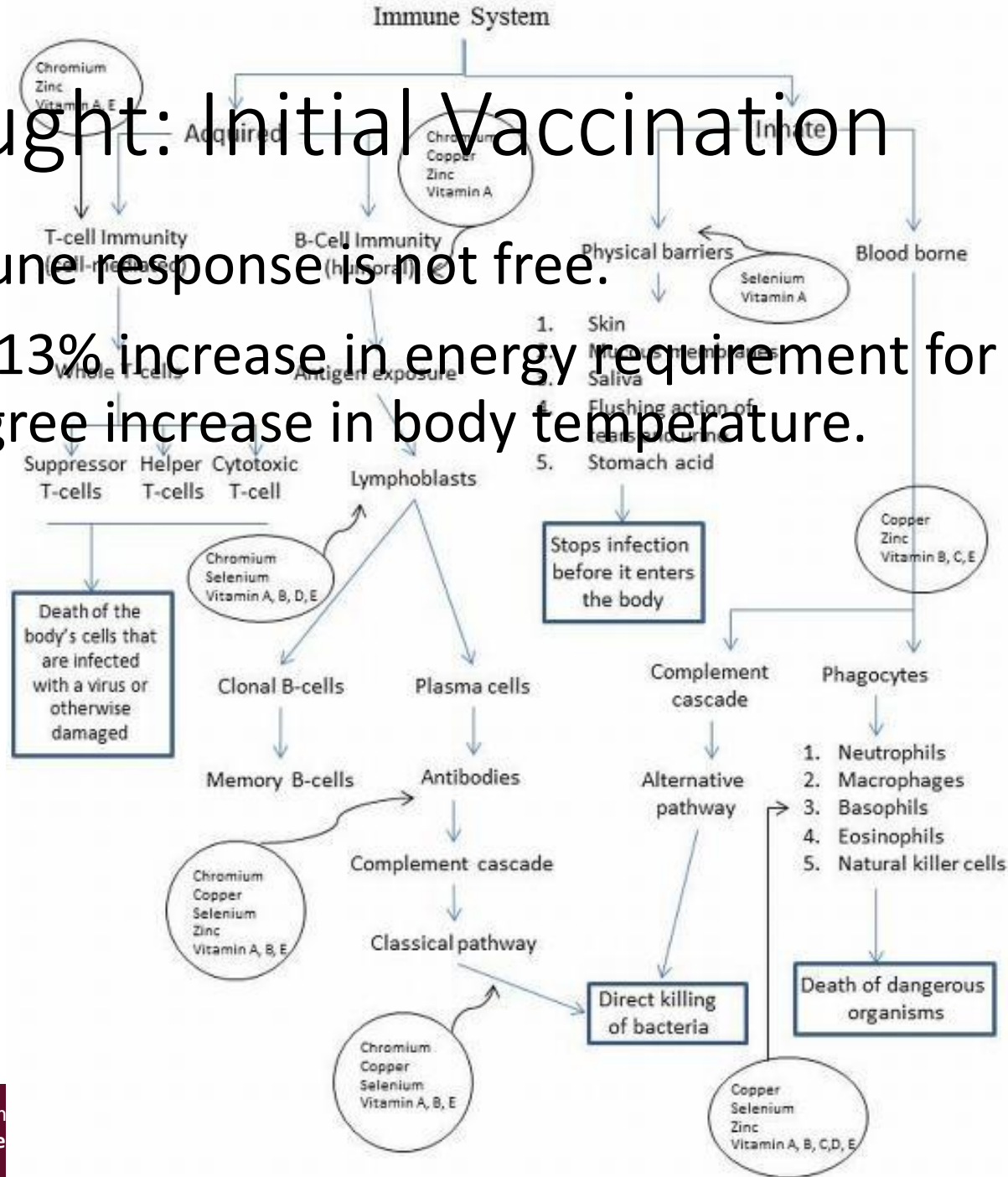
- Yes but just blackleg = No
- Colostrum antibodies have largely worn off
- Blackleg does not protect against BRD
- Vaccination program must be approached as an initial vaccine

Initial Vaccination Near Weaning

- Remember, the initial antibody response takes about 14 days to peak.
- The antibody level helps provide protection.
- Vaccinating on the day of weaning will not provide full protection until 14 days later.
- When will those calves break?

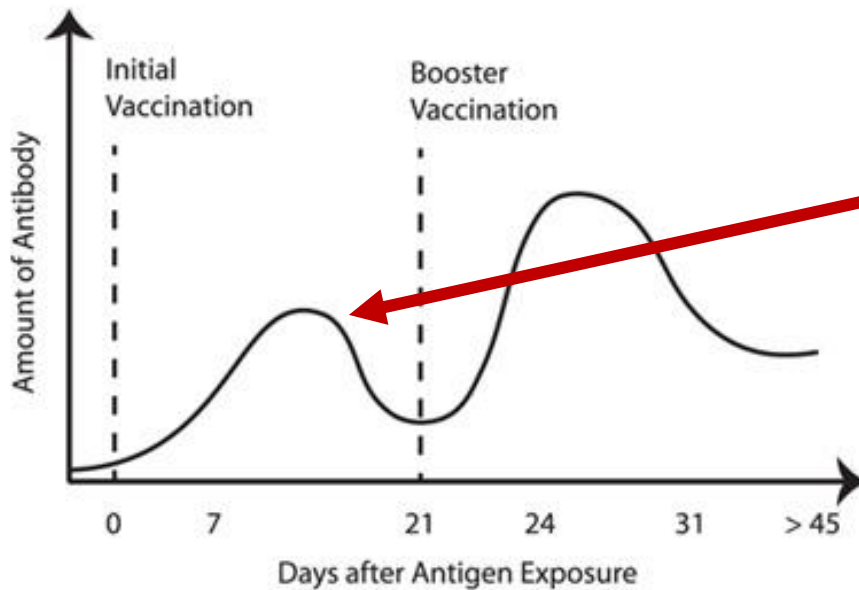
Drought: Initial Vaccination

- Immune response is not free.
- 10%-13% increase in energy requirement for every 1 degree increase in body temperature.



Drought Scenario Vaccination at Weaning

- Calves are stressed
- Calves have been nutrient restricted
- You administer a vaccine. How effective?

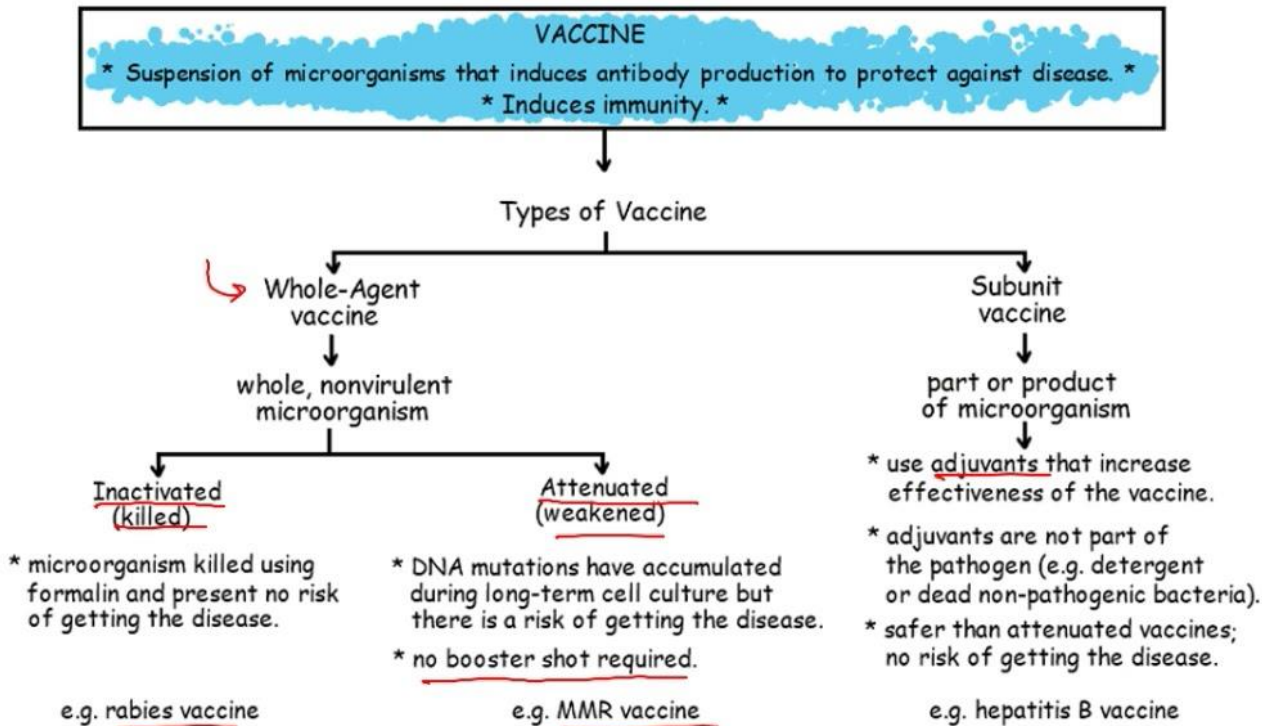


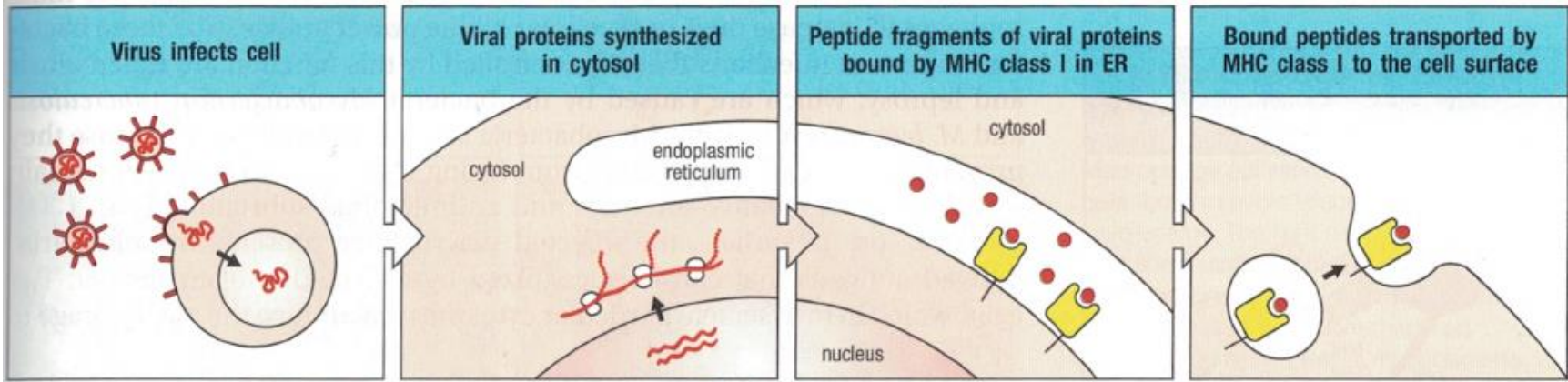
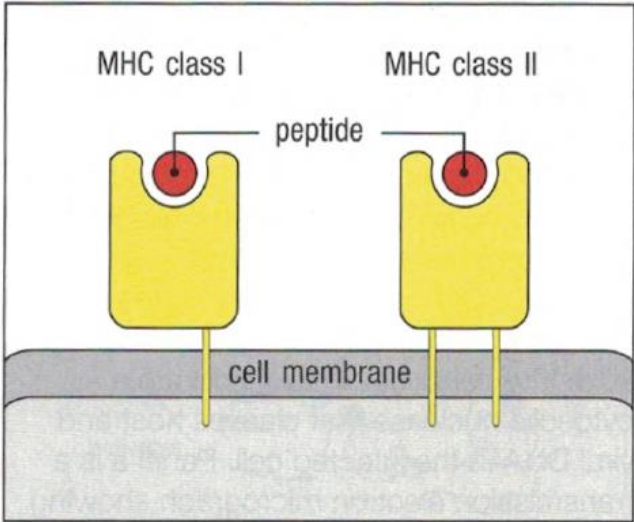
- Peak can be reduced
- Less pathogen challenge required to initiate more severe infections

Initial Vaccination: Type of Vaccination

www.shomusbiology.com

Classification of vaccines





How Do We Protect Calves?

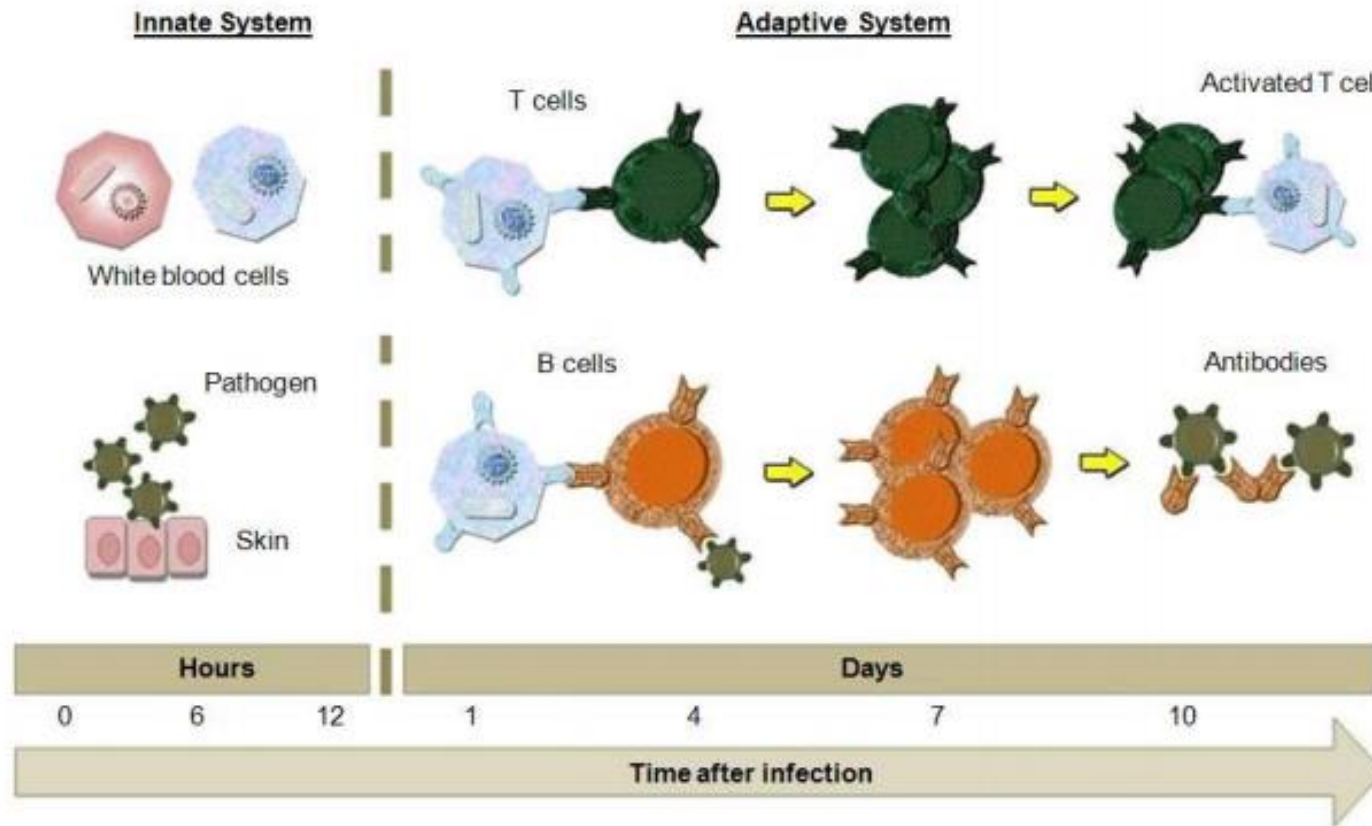


Figure 1. Components of the immune system. Based on Abbas and Lichtman (2007).

Initial Vaccine

- Modified live or chemically altered is best especially in the drought condition.
- Killed products will have less of a response at first injection (requires a 2nd injection approximately 21 days later)
- Recommend: MLV or Chemically altered for BRD pathogens + 7-, 8-, or 9-way + deworm.
- If possible, vaccinate 2 weeks prior to weaning.
- Same recommendations for calves that were vaccinated at branding; except 2 weeks prior.

Vaccination Success in Drought

Goal is to immunize!

If possible, decent feed around the time of vaccination.

Don't forget water!

Mucosal immunity



Cow Considerations

If You are Forced to De-stock

- Middle-aged cows are typically the most “durable” through drought conditions.
- Watch the cull markets and call ahead; COVID continues to disrupt aspects of marketing.
- Good time to start preg checking.
 - Staging pregnancies can help culling decisions
 - Cows that bred up early and maintained a pregnancy are good candidates to keep
 - Gives you an idea of what to expect next year

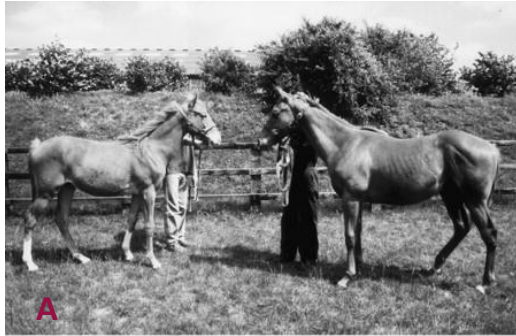
What is fetal programming?

- ENVIRONMENTAL conditions during embryonic and fetal development which impact postnatal development and long-term health, growth, and production.
 - Environmental conditions are often conditions that we have some level of control over.
 - Nutrition
 - Shelter
 - Health

Dutch Famine: 1944

- Pregnant women received only 400-800 calories/day
- Resulted in nutrient restriction at various stages of pregnancy
- Depending on which stage of pregnancy:
 - Cardiovascular disease
 - Metabolic disorders
 - Cognitive health decline with age

Example of Fetal Programming: Uterine Capacity



(A) a Tb-in-P 'restricted' yearling colt with a Tb-in-Tb control colt.

(B) a 'restricted' Tb-in-P filly (left) with a larger Tb-in-Tb control filly



(C) A P-in-Tb 'luxurious' yearling (left) compared with a P-in-P control. **(D)** a larger 'luxurious' P-in-Tb filly (right) with a smaller P-in-P control filly (left).

Allen W R et al. Reproduction 2004;127:67-77

Fetal Programming: Health

- Increased morbidity and mortality in calves born to energy restricted heifers vs. heifers on full feed (Corah et al. 1975)
- Calves from cows that were protein supplemented had reduced cases of respiratory disease in the feedlot (Mulliniks et al., 2008; Larson et al., 2009)
- Some work indicates calves born may have impaired ability to absorb colostrum (antibodies)

Inadequate Colostral Immunity

- **Preweaning**

- Risk of death
- Risk of sickness
- ADG



- **Feedlot**

- Risk of sickness
- Risk of respiratory disease
- ADG



Source: Wittum, et al AJVR 56:9 1995

Managing Drought for Next Year

- Cull to a level that allows you to keep cows in decent shape.
- If you don't have a cow vaccine program, discuss options with your local veterinarian.
- Unfortunately, no studies relative to drought and the subsequent year's calves, but the stage is set for challenges with colostrum production or antibody absorption in the calf.
- If you were able to get them bred this year, don't forget you are trying to do the same next year—don't dig a big hole.

Guide B-224; J. Wenzel

Cows and Bulls

- Long-acting viral vaccine that includes at least IBR and BVD, and may include parainfluenza-3 virus (PI3) and bovine respiratory syncytial virus (BRSV)
- Long-acting campylobacter fetus (vibrio)/leptospirosis (lepto) vaccine
- Dewormer
- 7-way clostridial booster (optional)
- Other vaccines if necessary in your area

NOTE: In the fall, bred replacement heifers should be vaccinated using the same protocol as the mature cows.

Replacement Heifers (pre-breeding)

- Modified-live IBR, BVD, PI3, BRSV (initial at 2 to 3 months of age, plus booster around weaning)
- Vibrio and 5-way leptospirosis (initial and booster around weaning)
- Dewormer
- 7-way clostridial booster (optional)
- Brucellosis (optional; if administered it must be given by an accredited veterinarian and before 1 year of age)
- Other vaccines if necessary for your area

Questions?

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