The Importance of an Effective Vaccination Program in Your Herd

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What is currently included in your vaccine protocol?



Vaccination is no silver bullet! No herds are the same!







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Why is this important?

Over \$500 Million per year Reported annual financial impact of reproductive loss in U.S. beef herds

- > Open cows
- > Abortions
- Young calf deaths



https://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Ag_Atlas_Maps/Livestock_and_Animals/Livestock,_Poultry_and_Other_Animals/07-M145.php Bellows, et. al. Review: Cost of Reproductive Diseases and Conditions in Cattle. The Professional Animal Scientist 18:26-32. US Cattle Inventory: http://usda.mannlib.cornell.edu/usda/current/Catt/O1-31-2017.pdf



Why is this important?







Pneumonia is the most common cause of death and poor performance in dairy cattle under 120 days of age and 36.6% of dairy heifers have one or more cases of pneumonia during this time period.

Average Daily Gain targeting can **drop to half** and may never recover completely increasing lifetime costs and **reducing efficiency of production.** Cost per case: increased costs by **\$212** per sick heifer compered to heathy heifers and additional costs for the rest of the in-contact group. Dairy heifers have an average reduction of **513 Lb in milk production** in the first lactation and **30 day increase** in time to first calving.



Vaccination does not equal immunization!

- Not all animals respond the same!
- Vaccine choice (vaccines are not all the same!)
- Vaccine storage and handling.
- Vaccination time.



What is wrong with this picture?



Development of Disease



Not all vaccines are the same!



Contains a weakened (modified) form of the virus
Triggers a strong immune response – mimics natural infection
Faster protection – usually after one dose

Longer-lasting immunity

Handling requirements: Must be mixed before use, sensitive to heat/sunlight Risk for pregnant cattle



Contains a dead virus or bacteria – cannot replicate

- No risk of the vaccine causing disease
- Easier to handle

Normally trigger weaker immune response - requires booster doses



Not all vaccines are the same!



Contains a specific component of the pathogen – cannot replicate
No risk of the vaccine causing disease
Target immune response – lower risk of side effects

Weaker immune response - requires adjuvants and booster shots



Highly effective against toxin mediated diseases
Faster protection – usually after one dose
Longer lasting immunity

Longer-lasting immunity

Can require frequent doses to keep immunity – requires booster doses



What You Need to Know....

Pasteurella multocida Mannheimia haemolytica Histophilus somni Mycoplasma bovis

When we think about the virus... IBR and BVD should be the cornerstones of any herd health reproductive prevention strategy.

> Bovine Respiratory Syncytial Virus (BRSV) ParaInfluenza 3 (PI3) Adenovirus Bovine Viral Diarrhea Virus (BVDV) Infectious Bovine Rhinotracheitis (IBR)

> > Stress and Crowding

Weaning



Are there meaningful differences in reproductive vaccines?





USDA sets bar high for achieving IBR and BVD reproductive claims

Only vaccines listing <u>specific fetal protection label claim language</u> against IBR and/or BVD have shown sufficient evidence of efficacy against the reproductive impacts of the listed disease

Fetal Protection label claims:

- 1. IBR Abortion
- 2. BVD Persistent Infection
- 3. BVD Fetal Infection

Many manufacturers have added "FP" to their packaging to assist consumers in identifying vaccines that have met the USDA standards for providing <u>Fetal Protection</u>.

USDA Veterinary Services Memorandum NO. 800.212

Zoetis is the only manufacturer to feature a full lineup of "FP" vaccines that help cows protect their unborn calves from IBR abortion and BVD Types 1 & 2 persistent infection, backed by a Fetal Protection Guarantee¹.

Vaccine	Manufacturer	IBR Abortion	BVD Types 1 & 2 Persistent Infection	Fetal Protection Guarantee ¹
Bovi-Shield [®] GOLD FP	zoetis			\mathbf{i}
PregGuard [®] GOLD FP	zoetis			
CattleMaster® GOLD FP	z oetis			
Any cow, any calf, anytime				

¹ Against IBR abortion and BVD types 1 and 2 persistent infection

Have vaccines undergone technological advancements?



Cattle Master Gold[®] FP[®] 5 Bovi-Shield Gold[®] FP[®] 5 VL5 HB





Bovi Shield[®] 4 CattleMaster[®] 4

Technological improvements



Zoetis Vaccine Technology Improvements

- >Additional Antigens
- Plaque purification and cloning
- Proprietary adjuvants: PreZent A[™] and Amphigen[®]
- Proprietary shear force processing system
- Ultrafiltration process for purification
- Stabilizers



What You Need to Know....

Pasteurella multocida Mannheimia haemolytica Histophilus somni Mycoplasma bovis

When we think about the bacteria...

Mannheimia and Mycoplasma bovis should be the prioritize protection.

Bovine Respiratory Syncytial Virus (BRSV) ParaInfluenza 3 (PI3) Adenovirus Bovine Viral Diarrhea Virus (BVDV) Infectious Bovine Rhinotracheitis (IBR)



Stress and Crowding

Weaning



One Shot

ONE SHOT[®] vaccines stimulate anti-leukotoxin antibodies to provide predictable protection against the leukotoxins produced by *M. haemolytica*. Protecting against damaging leukotoxins helps reduce lung lesions.⁴



ONE SHOT[®] vaccines produce anti-leukotoxin antibodies (blue) and capsular antibodies (orange). The capsular antigens attach to the surface of the *M. haemolytica* bacteria (green), while the anti-leukotoxin antibodies neutralize leukotoxin (red). If leukotoxin isn't neutralized, it attacks and destroys white blood cells in the lungs. With help from the capsular antibodies, white blood cells (purple) engulf and destroy *M. haemolytica*, and the anti-leukotoxin antibodies prevent leukotoxin from causing serious lung damage.

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One Shot



ONE SHOT DELIVERS FAST PROTECTION⁶

 ONE SHOT and ONE SHOT ULTRA 8 were the only vaccines that induced antibody titers to *M. haemolytica* and leukotoxin that were significantly (P < 0.05) higher than the controls.⁶

One Shot

One Shot

VS.



Once PMH*

(some assembly required by calf)







Are we doing this for the cattle or us?

Remember 513 lb reduction in milk production in first lactation.



Vaccine Storage









Vaccine Storage

- Storage begins at delivery
- Refrigerator temp should be 35-46°F (2-8°C)
- Have a max/min/average reading thermometer in the middle of the fridge with convenient readability (Logging function is very useful)
- Do not store vaccines near cold air duct, inside doors or on the floor of fridge
- No food or colostrum should be kept in the same fridge as vaccines
- Inventory should be rotated to prevent outdating





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Vaccine Storage

Partial bottles of mixed vaccine should be discarded if not used within 1-2 hours of mixing









Common Vaccine Reactions

- Mild fever (1–2°F above normal) and decreased appetite for 12–36 hours
- Lethargy or dull behavior for a short period
- Swelling at injection site (may last several days to weeks)
- Temporary drop in milk production (in lactating cows)





Common Vaccine Reactions

Rare but Serious Reactions (Veterinary Attention Needed):

- Anaphylactic reaction (severe allergic response).
- Symptoms: difficulty breathing, collapse, swelling around eyes/muzzle, rapid heart rate.
- Immediate emergency; epinephrine may be required.
- Abortion or early embryonic loss can occur if MLV is given to pregnant animals without appropriate label use.
- Death.
- Extremely rare, typically tied to improper administration, severe allergic reaction, or underlying disease





Building your vaccination program

- Consider age of the animal on timing for that vaccine.
- Time of vaccination: stressor factors and best immunization 2-3 weeks prior the higher challenge period.
- Consider vaccine stacking. Specially for gram negative agents (never more than 2 at a time.)
- Follow boost recommendations per label.
 - Heifers is the key time to build strong immunity.
 - Mature cows usually annual boosters and often on dry off period.

Work with your veterinarian to build a practical and effective protocol!





Revisit cow vaccination protocol..... Are you adequately protecting your animals??

Address timing and approach to calf vaccination to ensure that calves have protection they need to handle challenges they will face on next phase of production!







Thank You

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