



Herd Health and Vaccinations

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Implementing Vaccination Protocols

- If it's not broken, don't try to fix it
- Vaccination is one method of increasing herd immunity to various diseases
 - You cannot vaccinate your way out of poor management
 - Vaccinations should be administered before expected exposure
 - Vaccines must be stored, handled and administered properly to be effective

Reduce the risk of disease

- Change the housing density of the animals
- Quarantine new animals before mixing them with the rest of the herd
- Make the animals more immune to the disease
 - Stimulate the immune system to “remember” the disease
 - Natural/controlled exposure to disease
 - Vaccination

Vaccines

- *Definition:* A biological preparation that improves the individual immunity to a particular pathogen
 - Bacteria, viruses, protozoa, toxins
 - Does not ensure immunity – it stimulates the body to produce its own immunity.
- Components
 - Pathogen – Entire organism or part of the organism
 - Adjuvant – Enhances the immune response to the vaccine
 - Carrier – Water-based, oil-based, oral pellet

A good vaccine will...

- Stimulate a strong immune response
- Cause no adverse effects/reactions
- Be economical
- Be suitable for mass vaccination
 - Safe for humans
 - Easy to administer



Inactivated/Killed Vaccines

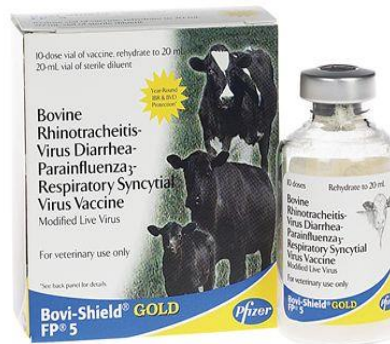
- The disease agent is killed and cannot replicate in the host animal
 - Killed virus
 - Killed bacteria (bacterin)
- Requires an adjuvant to produce a strong immune response
- **Advantage:** Will not become virulent and cause disease
 - Already prepared (stable storage)
- **Disadvantage:** Adjuvant may cause adverse effects
 - Shorter-lived immunity



Modified Live/Attenuated Vaccines

- The organism is attenuated – the virulence is reduced beyond its capability of causing disease
- The living organism replicates and creates an immune response in the host animal
- Does not require an adjuvant
- **Advantages:** Fewer adverse reactions when used properly
 - Longer-lived immunity than killed vaccines
- **Disadvantages:** There is a chance the vaccine will revert to a virulent form (not common)
 - Requires proper storage and mixing at the time of use
 - **DO NOT GIVE TO PREGNANT ANIMALS** – Unless they were properly vaccinated with that vaccine pre-breeding

Modified Live/Attenuated Vaccines



25 DOSE REHYDRATE TO 50ml

Brucella Abortus Vaccine, Strain RB-51 Live Culture

For use in healthy female cattle as an aid in the prevention of infection and abortion caused by **Brucella abortus**.

For use by or under the supervision of a veterinarian.

This Product License is Conditional Efficacy and Potency Studies in Progress

US VET LICENSE No. 188
Professional Biological Company
4950 York Street, Denver, Colorado 80216

RB-51

Other Types of Vaccines

■ Toxoid

- Inactivated toxins (e.g. Tetanus)
- Stimulate an immune response to the toxin responsible for causing disease, not the organism creating/secretng the toxin initially



■ Recombinant DNA Vaccine

- DNA coding for the immune-stimulating proteins from the pathogen are inserted into a vector (eg. Canarypox virus)
- The vector replicates in the host like a modified live vaccine
- Example: Recombinant West Nile Virus Vaccine (Horses)



■ Subunit Vaccine

- Immune-stimulating proteins are identified, purified and combined with an adjuvant
- Example: Lyme disease vaccine for dogs

Autogenous Vaccines

- “Self-made” vaccines
- Created from cultures of pathogens from a particular ranch or population of animals
- Useful for controlling specific strains of disease when other measures have failed
- Requires an adjuvant
- Not tested for safety or efficacy (No USDA regulation)
- Examples:
 - Bovine Warts (*bovine papilloma virus*)
 - Bovine Pinkeye (*moraxella bovis*, *moraxella bovoculi*)



Factors to consider when deciding on a vaccination program

1. Presence of the particular diseases in the herd
2. Medical and economic consequences of infection
3. Adverse side effects associated with vaccination
4. Vaccine efficacy
5. Vaccine cost



Factors to consider when deciding on a vaccination program

There is no “standard” vaccination program that can be recommended for all animals; each situation must be evaluated individually.

Animal age, type, number, use, stocking density, exposure to diseases, cost, operations facilities and management, geographic location, etc., etc.

Veterinary Vaccines



- Regulated by USDA, not FDA
- Labels on licensed vaccines make different claims and should be carefully studied when evaluating products.
- **USDA Claims:**
 - Prevents Infection
 - Prevents Disease
 - Aids in Disease Prevention
 - Aids in Disease Control
 - Other Claims
- Each of these claims represents a different level of performance outcome that might be important in selection of a specific vaccine.

5-WAY MLV VACCINES USDA LABEL CLAIM COMPARISON CHART

	Indications	Bovi-Shield GOLD® 5 ¹	Titanium® 5	Pyramid® 5	Vista® 5 SQ	Arsenal® 4.1	Express® 5
Respiratory Claims	IBR						
	VIREMIA – BVD Types 1 and 2		–	–	–	–	–
	BVD Type 1						
	BVD Type 2						
	BRSV						
	PI ₂						
	DURATION OF IMMUNITY (DOI) (🕒)	≥ 279 DAYS ¹	–	–	≥ 182–206 DAYS ⁴	–	–
	Approved for Use in Pregnant Cows & Calves Nursing Pregnant Cows	APPROVED ²	CONTRAINDICATED	APPROVED ³	CONTRAINDICATED	CONTRAINDICATED	APPROVED ⁵
	Route of Administration	IM/SC ¹	IM/SC	IM/SC	SC	SC	SC
	Age Restrictions	4 to 5 months or older for BVD viremia claim only (no other age restrictions)	No age restrictions	No age restrictions	3 months or older	2 weeks or older	No age restrictions

USDA Label Claims



¹ Prevents IBR respiratory disease, BVD viremia, and IBR and BVD Types 1 and 2 respiratory DOI claims apply only to SC route of administration. Intramuscular respiratory IBR claim is "aids in prevention."

² Bovi-Shield GOLD 5 requires prior prebreeding vaccination. Follow label directions.

³ Provided the cows were vaccinated prebreeding according to label instructions with Pyramid 5, Pyramid 10, or Pyramid 2 + Type II BVD.

⁴ DOI of at least 182 days for IBR, at least 206 days for BVD Type 1 and at least 200 days for BVD Type 2.

⁵ Provided the cows were vaccinated prebreeding with any Express FP vaccine.

***LABEL INDICATIONS:** The Bovi-Shield GOLD[®] line and PregGuard GOLD FP 10 are recommended for vaccination of healthy cows and heifers approximately one month prior to breeding. These products also can be administered to pregnant cattle provided they were vaccinated, according to label directions, with any Bovi-Shield GOLD FP or PregGuard GOLD FP vaccine prior to breeding initially and within 12 months thereafter. Failure to follow label directions may result in abortions. The Bovi-Shield GOLD line may be administered to calves nursing pregnant cows, provided their dams were vaccinated within the last 12 months as described above. **Consistent with good vaccination practices, heifers should receive at least two vaccine doses, with the second dose administered approximately 30 days prebreeding.**

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Source: North American compendium and advertising as of Jan. 15, 2011.

Veterinary vaccines

- Injectable vs. Intra-nasal?
- USDA approved products, under conditional licensure, have demonstrated host-animal safety and a reasonable expectation of efficacy.
- Autogenous vaccine regulations do not require confirmation of:
 - 1) Efficacy
 - 2) Potency correlated to efficacy
 - 3) Host-animal safety to the USDA prior to product licensure and use.

Specific Diseases

■ Reproductive Disease

■ Viruses

- Infectious Bovine Rhinotracheitis (IBR)
- Bovine Virus Diarrhea (BVD)
 - Types I & II

■ Bacteria

- Leptospirosis
- Campylobacter (Vibro)

■ Respiratory Disease

■ Viruses

- Infectious Bovine Rhinotracheitis (IBR)
- Bovine Virus Diarrhea (BVD)
 - Types I & II
- Parainfluenza-3 (PI-3)
- Bovine Respiratory Syncytial Virus (BRSV)

■ Bacteria

- Pasteurella/Mannheimia
- Histophilus somnus

Specific Diseases

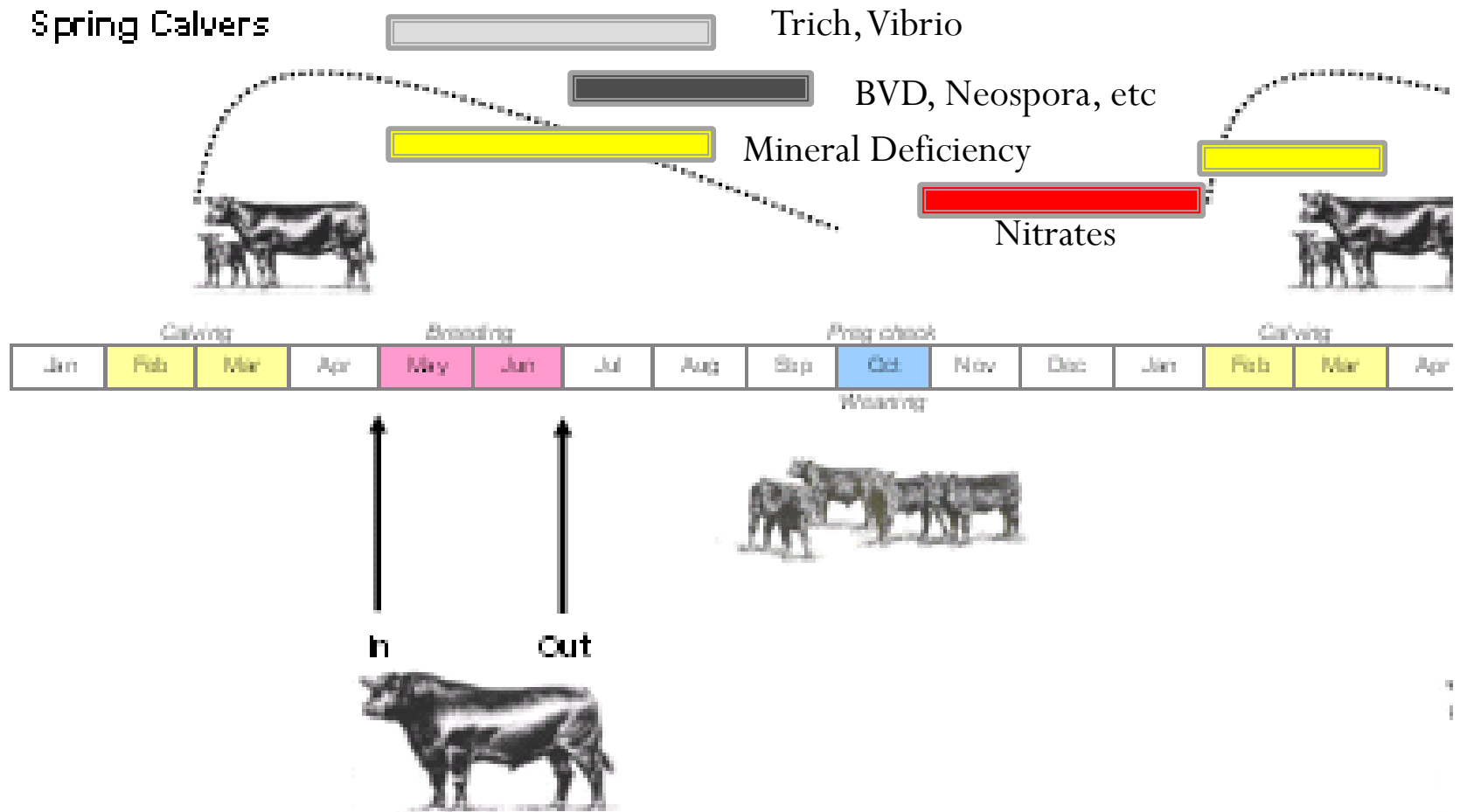
- Clostridial Diseases
 - Blackleg
 - Tetanus
 - Redwater disease
 - C. Perfringens



- Optional/ Case-based
 - Scours Vaccines
 - Anaplasmosis
 - Anthrax
 - Tritrichomonas
 - Neospora
 - Pinkeye
 - Rabies



Exposures



Vaccine failure

Correct administration

Animal responds

**Vaccine given too late,
Animal already infected**

**Wrong strain or
organism used**

**Nonprotective
antigens used**

Animal fails to respond

**Prior passive
immunization**

**Animal
immunosuppressed**

Biological variation

Inadequate vaccine

Incorrect Administration

**Inappropriate
route of
administration**

**Death of
live vaccine**

**Administered to
passively
protected animal**