

ESTABLISHING HERD IMMUNITY

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Developing herd immunity is becoming more important as the incidence and spread of disease continues to increase. Increased movement of cattle throughout our industry increases the odds of exposure to pathogens that were not common in the cow calf industry several years ago. Because the increased number of diseases, higher levels of exposure and the incidence of "outbreaks" it makes good management sense to immunize your herd as adequately as possible.

In order to establish "herd" immunity every ranch needs an individual plan. There is no "one" program that fits everyone. However, there are several things that are common to most cattle operations. Herd immunity begins with proper immunization and management of replacement females entering the herd. It doesn't matter whether cows are purchased or raised and retained into the breeding herd, the time to immunize replacement females is prior to placement into the breeding herd.

Replacement heifers that are retained into the herd should be immunized against as many potential pathogens as possible between weaning and breeding. This is normally a six-month window in which valuable management practices can be implemented. Unfortunately most of the time little to nothing is done to immunize these heifers. Lifelong immunity can be established during this weaning phase with virtually no risk to the rest of the cow herd.

Purchased cows should always be quarantined from the rest of the herd. Quarantine should last for at least three weeks. This also allows time to establish immunity in these cows before they expose the rest of the herd to pathogens or before the rest of the herd exposes them to potentially harmful organisms.

Regardless of the diseases targeted in the immunization program all cattle have to be administered two vaccinations for each disease. An initial vaccination and a booster vaccination **have** to be given to each and every individual to establish initial immunity. Not only do they have to be given, vaccines they have to be handled and administered properly. Additional information on administration and handling of vaccine can be received by contacting the extension office for a copy of *Chute-Side Cattle Working*.

It is difficult to make blanket statements about what a herd needs to be immunized against. However, there are several diseases that are prevalent enough and costly enough to the industry that all producers should include them in a vaccination and immunization program. Others may be ranch or area specific and can or should be included after consultation with your veterinarian.

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Targeted Pathogens

The most common disease causing a problem in Texas cow herds is Leptospirosis. There are several strains of Lepto (as it commonly referred to as), most vaccines provide protection for the five most common strains of Lepto. Lepto can be spread between cattle and wildlife so there is always a chance of exposure. It can be spread through drinking water and through animal contact. Never assume your cattle will not be exposed.

Lepto vaccines, even under the best of conditions, do not provide for more than six months of adequate immunity to vaccinated animals. Lepto vaccinations need to be boosted 30 to 60 days prior to the beginning of the transmission season. Initial immunization should be given during the development phase for heifers and the quarantine period for replacement cows and bulls.

Respiratory diseases: The pathogens involved in the Bovine Respiratory Disease (BRD) complex can also cause problems in the reproductive performance of the breeding herd. By immunizing the cow herd you can protect against reproductive losses and reduce death and sickness losses in the calf-crop resulting from viral infections. The viral component of BRD is comprised of Infectious Bovine Rhinotracheitis (IBR), Parainfluenza 3 (PI3), Bovine Viral Diarrhea (BVD) and Bovine Respiratory Syncytial Virus (BRSV).

Several strains of bacteria are also components in BRD. These bacteria are normally associated as secondary infections that occur after viral lesions are formed and immunity is impaired by one or more of the viral components. When death occurs due to respiratory disease it is usually due to complications from bacterial infections. Bacteria most commonly associated with BRD are *Pasteurella Hemolytica* (PH), *Pasteurella Multocida* (PM), and *Haemophilus Somnus* (HS). Of these bacterial pathogens PH is the most prevalent.

In calves there can be losses simply due to bacterial infections. Calf pneumonia causes a fairly quick death in infected calves. Often calves will die within 48 hours of initial symptoms if not treated with antibiotics.

There are many vaccines on the market to aid in the prevention of BRD. Research and field trials are demonstrating the effectiveness of Modified Live Vaccines (MLV) when used in development of herd immunity. Although currently limited to use in non-pregnant cows, calves nursing non-pregnant cows and weaned calves, these products establish a higher level of immunity than Killed (K) viral vaccines. These K products can be used effectively when MLV vaccines cannot be used. The most logical time to use K vaccines is in the immunization of pregnant purchased cows during the quarantine period. All other animals can be immunized more effectively with use of MLV vaccines. Retained heifers should be immunized with MLV products during the weaning and development phase. Some veterinarians are currently recommending vaccination of one to two month old calves with MLV vaccines prior to the breeding season for the cow herd. Although this is not "practical" for most operations, if BRD or it's associated pathogens are a problem it may be the best approach to controlling losses.

If PH, PM or HS are a problem by themselves there are vaccines that can aid in the prevention of these diseases as well. Of particular concern in the breeding herd is HS. This bacteria can also cause late term abortions. Control is possible with an effective vaccination program and sanitary management of the cow-herd. Since these organisms are a problem primarily in weaned calves it makes sense to include these in the vaccination program during the weaning and development phase.

Sexually transmitted diseases: The most common sexually transmitted diseases are Campylobacteriosis, (more commonly referred to as Vibriosis or Vibrio) and Trichomoniasis (Trich). Vibrio is a bacterial infection that causes pregnancy losses in early gestation. Vibrio can be controlled with a properly timed vaccination program. For the most effective control the breeding herd should be vaccinated approximately 60 days prior to the onset of the breeding season. This is not a time that we normally gather cows and work them through the chute. However, if Vibrio is a problem this will be necessary to prevent the spread of the disease. Realistically, vibrio vaccines can be given when the calves are weaned and the cows are palpated, dewormed, and other annual vaccination boosters are given.

Trich is an infection caused by a protozoa. It also causes early embryonic losses but unlike Vibrio there is normally a severe infection and metritis associated with Trich. This disease is difficult to isolate in cultures taken from cows or bulls. Vaccines have recently become available to aid in the prevention and control of the organism. The most effective way to avoid infecting the herd is to purchase bulls from known origin and quarantine all incoming cows. If you want to purchase bulls of unknown origin three cultures are normally needed before the bull can be called clean. If the cow herd is infected it is common to see conception rates in the 30 to 40% range during the first year. Conception will normally increase in the following years. It will normally take five years or longer for pregnancy rates to approach normal following herd infection with Trich. The most effective way to deal with Trich is through management not vaccination. **Do not purchase bulls of unknown origin.**

Brucellosis is another disease that has plagued our industry for years. Although the Brucellosis eradication program has been plagued with problems for a long time the efforts of the state and federal agencies are close to showing long awaited results. Texas is very close to eradicating the disease. However, we are not there yet. To aid in this fight it is still wise to vaccinate heifers against Brucellosis. This needs to be done before heifers reach 10 months of age. It is best if heifers are vaccinated between 3 and 6 months of age. From a practical standpoint it makes sense to vaccinate all potential replacement heifers against brucellosis at weaning. The older a heifer is the greater the chance of her becoming a false positive on the "card test". If a heifer is over a year old do not vaccinate her against brucellosis.

A licenced veterinarian must administer the Brucellosis vaccine. It is the only one we have discussed that has to be given by the veterinarian. However, if you have any reluctance in what to vaccinate for or what or how to administer vaccines to cattle have your veterinarian administer all of the initial vaccines at the time Brucellosis vaccine is given. However, remember that Brucellosis vaccine does not have to be boosted so all other vaccines will need to be boosted in three to four weeks.

Diseases to vaccinate every cowherd against during weaning and quarantine

<u>Disease organism</u>	<u>Common name</u>
Leptospirosis -	Lepto or L-5
Infectious Bovine Rhinotracheitis -	IBR
Parainfluenza 3 -	PI 3
Bovine Viral Diarrhea -	BVD
Bovine Respiratory Syncytial Virus -	BRSV
Campylobacteriosis -	Vibrio
Haemophilus Somnus -	H. Somnus
Clostridials -	Blackleg vaccine, (4-way, 7-way or 8-way)
Brucellosis - (During weaning only)	Bangs

Diseases to consider including in a herd vaccination program

Anaplasmosis	Anaplaz
Escherichia coli	E. coli
Salmonella	Salmonella
Pasteurella Hemolytica -	Hemolytica
Pasteurella Multocida -	Multocida
Trichomoniasis -	Trich
Anthrax - (Seldom a problem in this area)	Anthrax

With the exception of Brucellosis the cow herd should also be administered a "booster" annually. The booster should be given two to three months prior to calving to stimulate the production of higher quality colostrum for the newborn. The exception to that would be the sexually transmitted diseases which should be given 60 days prior to the breeding season.

Basic Vaccination Schedule

Calves: Birth to 3 months of age*

E. coli
P. Hemolytica
IBR/PI 3 - (intranasal)

Calves: 2-6 months of age

Clostridials (7-way Blackleg)
IBR/PI 3 - (intranasal)
Lepto
H. Somnus
P. Hemolytica*

Weaned Calves and Open Replacement Heifers:

At weaning or upon arrival

Clostridials (7-way Blackleg)
IBR, PI 3, BVD, BRSV (Modified Live Virus)
Lepto-5
Vibrio
H. Somnus
Brucellosis

2 to 4 weeks post weaning/arrival

Clostridials (7-way Blackleg)
IBR, PI 3, BVD, BRSV (Modified Live Virus)
Lepto-5
Vibrio
H. Somnus
Brucellosis **

Purchased Cows:

Upon arrival

Clostridials (7-way Blackleg)
IBR, PI 3, BVD, BRSV (Killed product if pregnant, MLV if open)
Lepto-5
Vibrio
H. Somnus

3 to 4 weeks after arrival

Clostridials (7-way Blackleg)
IBR, PI 3, BVD, BRSV (Killed product if pregnant, MLV if open)
Lepto-5
Vibrio
H. Somnus

Mature Cow Herd

60 days prior to calving (or at weaning time)

Booster:

Clostridials (7-way Blackleg)

IBR, PI 3, BVD, BRSV (Killed product if pregnant, MLV if open)

Lepto-5

Vibrio ***

H. Somnus

60 days prior to the beginning of the breeding season

Vibrio

*May not be necessary on some operations.

**Only vaccinate if not done at weaning.

***Vaccinate for vibrio only if it cannot be done 60 prior to breeding.

Special Consideration

Calf Scours - If scours are a problem consider addition of the following vaccinations.

Cow herd - 60 days precalving

E. coli

Salmonella

Rotavirus

Coronavirus

Calves at birth

E. coli (administer orally immediately after birth)

Where Diseases Have a Major Impact on the Cow Herd

Type of organism	Respiratory	Reproduction	Calf Sickness/Death
Viral	IBR	IBR (IPV)	IBR
	PI 3		PI 3
	BVD	BVD	BVD
	BRSV		?
			Rotavirus
Bacterial			Coronavirus
		Lepto	Lepto
		Vibrio	
	P. Hemolytica		P. Hemolytica
	P. Multocida		P. Multocida
	H. Somnus	H. Somnus	H. Somnus
		Brucellosis	
	E. coli		E. coli
	Salmonella		Salmonella
	Protozoa		Trichomoniasis
			Cryptosporidium