



Common Diseases of the Beef Cattle Herd

Alfredo DiCostanzo, Ph.D.
University of Minnesota Beef Team

Lesson 1

Introduction

Beef cattle producers are required to understand several aspects of their operations including complex subject matter related to their cattle nutrition, genetics, reproduction, and health and disease prevention. Typically, with experience brought on by time, communication with other producers, and by attending educational seminars, most producers become quite adept at handling issues related to nutrition, genetics, and reproduction; however, health and disease prevention are topics that are difficult to stay updated on as they are complex, and constantly change as pathogens mutate or their incidence change, and disease prevention becomes more sophisticated. Therefore, a simple reference chart and accompanying documentation in support of concepts highlighted in reference charts are often tools highly valued by producers who also must be well versed in other production factors influencing profitability of their enterprises such as cattle and grain markets, human resources, etc.

The following is the first in a series of six lessons related to beef cow-calf health management. The members of the University of Minnesota Beef Team and their advisers recommended that the first lesson highlight the most common cow herd diseases. The approach I have taken to this lesson is to focus on two reference tables that producers can consult throughout the course and later as they manage their operations. These tables highlight the most common diseases of the cow (Table 1) and calf (Table 2), starting with the approximate production phase during which the disease may be most common. The most common symptom or system affected is also described along with the causing agent, preventative measures and treatment (if available). The tables are by no means a complete listing of diseases or conditions, symptoms, causing agents, preventative or treatment options. They are not intended to substitute for common sense choices such as calling a veterinarian or to disregard professional advice as soon as any disease or condition is discovered, but they are merely listings of diseases and conditions producers may encounter, and wish to use as reference to locate a health problem to begin managing it with their veterinarian. The column on preventative measures and treatment may also serve as a guide for what diseases are preventable by vaccination, and what a typical medicine chest at a farm or ranch should contain for antibiotic and other treatment options. Additionally two reference tables, one containing a short list of approved antimicrobials for the beef herd (Table 3), and one containing the ingredient and trade name of recently approved antibiotics and their withdrawal times (Table 4) are provided to complement information in Tables 1 and 2. The following sections contain further explanation for each of the tables listing common diseases of the beef herd.

Common Diseases of Cows

Perhaps the single most highly impacting condition affecting cow productivity is abortion, followed by performance-affecting or debilitating conditions such as internal parasites, lameness or footrot. In well-managed herds, clostridial or viral diseases causing systemic or respiratory distress are rare. However, conditions brought about by environmental stressors such as heat, drought, nitrate- or other toxin concentrating plants may be somewhat common.

Abortion. From Table 1, it is clear that several micro-organisms and other stressors cause abortion. It is also clear that for most agents causing abortion, vaccines exist and must be used according to veterinarian recommendations to ensure prevention of this performance-robbing condition.

An attempt was made to define the period during which abortion occurs to determine the causing agent (Table 1). One thing is clear, several factors and organisms cause abortion at any point during the gestation period. Of particular interest are the effects of the BVD virus on the fetus. When cows are infected early after fertilization, they may have reduced conception. Then, infection during the first four months of gestation may lead to embryonic death, abortion, growth retardation and persistent infection (PI-infected calves). Congenital malformations occur when the fetus is infected during month four to six of gestation. Fetal mummification, premature births and weak calves are also seen in fetal infection with BVD virus. Other conditions such as heat stress, exposure to toxins from forbs, and listeriosis also lead to abortions at any time during gestation.

Specific late abortions are caused by IBR, campylobacteriosis, brucellosis and leptospirosis. These diseases are all preventable with the use of the appropriate vaccine and vaccination procedures.

Incidentally, two organisms causing abortion during the first trimester happen to be protozoa (neosporosis and trichomoniasis). These diseases are best prevented by adequate management. Control of dogs, coyotes and other canidae is necessary to prevent contamination of feed sources with feces from these species. Testing bulls prior to purchase and culling of bulls positive for trichomoniasis are recommended to keep this disease under control.

Parasites. Two main types of parasites cause performance losses in cows and calves. Internal parasites often lead to reduced milk production and light weaning weights. Well-managed herds rely on timely dewormer applications to reduce impact of parasite loads on cattle performance. *Fasciola hepatica* and *Fascioloides magna* disrupt liver function and lead to weight loss and reduced weaning weights. Veterinarians must be consulted to make the determination as to which of these two parasites may be causing performance losses to direct the appropriate corrective action.

External parasites such as flies or ticks are also known to affect cow and calf performance. Abuse or misuse of specific insecticides may lead to development of resistance in affected insects. Therefore, close consultation with veterinarians is required to implement external parasite control plans that remain effective in future years.

Footrot. This condition is caused by a pathogen present in the soil, which infects the hoof tissue when conditions are right (wet, muddy conditions). Preventative measures include managing alleyways and paths to permit good drainage and/or use of Cu and Zn supplements to strengthen hoof tissue.

Wasting diseases. Both tuberculosis and Johne's disease are caused by bacteria of the same species (*Mycobacterium*), and both lead to reduced performance, overall wasting, and, in the case of tuberculosis, impacts on inter-state and international trade. Managing these diseases through bio-security measures (to be discussed in Lesson 3) is important to reduce risk of infection within and across herds.

Table 1. Common diseases of adult cattle					
Phase	Main symptom	Disease or condition	Causing agent	Preventative	Treatment
Breeding					
bacteria	Abortion, last 5 mo	Brucellosis	<i>Brucella abortus</i>	Vaccine	Not available
bacteria	Abortion, last 3 mo	Leptospirosis	<i>Leptospira spp</i>	Vaccine	Tetracycline
bacteria	Abortion, 5 to 8 mo	Campylobacteriosis	<i>Campylobacter fetus</i>	Vaccine	Streptomycin
bacteria	Abortion	Listeriosis	<i>Listeria monocytogenes</i>	Management	Cephalosporin
protozoa	Abortion, after 3 mo	Neosporosis	<i>Neospora caninum</i>	Canidae control	Not available
protozoa	Abortion, first 2 mo	Trichomoniasis	<i>Trichomonas foetus</i>	Culling	Not available
virus	Abortion	BVD ^a	<i>BVD virus</i>	Vaccine	Supportive therapy
virus	Abortion, last 5 mo	IBR ^b	<i>Bovine herpesvirus</i>	Vaccine	Secondary infections
browse	Abortion, last 3 mo	Estrogenic	Ponderosa needles	Avoid ingestion	
forbs	Abortion	Alkaloid from Locoweed	<i>Oxytropis or Astragalus sp</i>	Avoid ingestion	
forbs	Abortion	Saponin from Broomweed	<i>Gutierrezia sarothrae</i>	Avoid ingestion	
feed	Abortion	Estrogenic	Mycotoxins	Avoid ingestion	
environment	Abortion	Fetal hypotension	Heat stress		
Lactation					
forage	Staggering	Grass tetany	Low Mg intake	Management	Ca and Mg IV
forage	Tremors	Nitrate poisoning	Excess nitrate	Management	
bacteria	Swollen udder	Mastitis	<i>Staphylococcus, Streptococcus, and Corynebacterium</i>	Environmental management	Not practical

Table 1. continued					
parasites	Lameness	Foot rot	<i>Fusobacterium necrophorum</i>	Cu, Zn feeding	Penicillin G
bacteria	Blindness	Pinkeye	<i>Moraxella bovis</i>	Management	Tetracycline
bacteria	Anemia	Anaplasmosis	<i>Anaplasma spp.</i>	Vaccine, CTC feeding	Tetracycline
bacteria	Lumpy jaw	Actinomycosis	<i>Actinomyces spp.</i>		Penicillin G
bacteria	Wooden tongue	Actinobacillosis	<i>Actinobaccillus spp.</i>	Vaccine	Cephalosporin
parasites	Unthrifty	Internal parasites	<i>Trichostrongylus , Ostertagia, Nematodirus</i>	Dewormers	Not practical
parasites	Unthrifty	Internal parasites	<i>Fasciola hepatica</i>	Clorsulon, Albendazole	
parasites	Unthrifty	Internal parasites	<i>Fascioloides magna</i>	Not available	
flies	Unthrifty	Horse flies	<i>Tabanus spp.</i>	Pyrethroid compounds	
Calving					
various	Reproductive	Retained placenta	<i>Abortive diseases</i>	Preventing disease	Removal not recommended
virus	Mummified fetus Weak calves	Bovine viral diarrhea	<i>BVD virus</i>	Vaccine	Supportive therapy
bacteria	Staggering	Anthrax	<i>Bacillus anthracis</i>	Vaccine	Sudden onset
Other					
bacteria	Wasting	Johne's	<i>Mycobacterium paratuberculosis</i>	Culling	Not available
bacteria	Wasting	Tuberculosis	<i>Mycobacterium tuberculosis, M. bovis, and M. avium</i>	Culling	Not practical
^a Bovine viral diarrhea. ^b Infectious bovine rhinotracheitis virus.					

Table 2. Common diseases of calves until weaning					
Phase	Main symptom	Disease or condition	Causing agent	Preventative	Treatment
Birth					
bacteria	Scours, 3 to 5 d	Calf scours	<i>Escherichia coli</i>	Vaccine	Electrolytes
bacteria	Scours, first 14 d	Calf scours	<i>Salmonella spp.</i>	Not available	Antibiotics ^a
virus	Scours, 5 to 15 d	Calf scours	<i>Rota- and Coronavirus</i>	Vaccine	Electrolytes
protozoa	Scours, 5 to 35 d	Calf scours	<i>Cryptosporidium parvum</i>	Management	Not available
virus	Respiratory	Pneumonia	BRD ^b complex	Management	Supportive therapy
bacteria	Respiratory	Pneumonia	<i>Pasteurella multocida, Mannheimia haemolytica, and Mycoplasma bovis</i>	Management	Antibiotics ^a
Before weaning					
protozoa	Scours, over 1 mo	Coccidiosis	<i>Eimeria spp.</i>	Management	Amprolium, Sulfaquinoxaline
virus	Respiratory	Pneumonia	BRD complex	Vaccine	Supportive therapy
bacteria	Respiratory	Pneumonia	<i>Pasteurella multocida, Mannheimia haemolytica, and Mycoplasma bovis</i>	Vaccine	Antibiotics ^a
bacteria	Systemic toxemia	Clostridial diseases	<i>Clostridium spp.</i>	Vaccine	Not available
environment	Off feed, laminitis	Acidosis	Low rumen pH	Management	Supportive therapy
forage	Bloat	Frothy bloat	Legumes	Management	Poloxalene
grain	Bloat	Gas bloat	Grain overload	Management	Cannulation
fungi	Skin disease	Ringworm	<i>Trichophyton spp.</i>		Topical
^a Choice of antibiotics to be determined in consultation with a veterinarian.					
^b Bovine respiratory disease.					

Common Diseases of Calves

Scours and BRD (bovine respiratory disease) are perhaps the most highly impacting conditions in calves. Beyond these, transitioning calves to post-weaning diets may lead to acidosis, bloat or both. Therefore, digestive disorders are considered particularly when producers retain calves on backgrounding diets during the winter.

Scours. Table 2 is organized so that the reader may attempt identification of the scours-causing agent based on the onset of scours. *E. coli* and *Salmonella* (both intestinal tract bacteria) cause scours in young calves while viral or protozoa-caused scours can occur from day 5 to day 35 of life (Table 2). Scouring calves require intensive hydration treatment to prevent death. In the case of *E. coli* and viral scours, vaccination may be used to prevent scours. Management of scours in young calves will be addressed in Lesson 5.

BRD. Calves are susceptible to respiratory disease pathogens from the moment maternal immunity begins to decline at about four months of age. Therefore, vaccination programs must be tailored to afford protection to BRD-causing pathogens consistent with this decline in maternal immunity, particularly when dealing with calves from fall-calving herds, early-weaned calves, and in preparation for a smooth transition to the feedlot (Lesson 6).

Digestive disorders. Acidosis occurs when cattle are transitioned to highly fermentable diets such as grain or grain co-product diets. Therefore, producers must establish appropriate step-up procedures to prevent development of acidosis in cattle.

Bloat may result from grazing cattle on legumes (frothy) or when feeding high-grain diets (gas bloat). It may also occur in calves that have suffered nerve damage resulting from BRD infection. Acute gas bloat must be treated immediately by cannulation as it may lead to death while frothy bloat may be prevented or treated by feeding poloxalene-containing supplements.

Table 3. Common antimicrobial and pain relievers			
Cephalosporins	Fluorquinolones	Macrolides	Penicillins
ceftiofur	danofloxacin	erythromycin	penicillin G benzathine
	enrofloxacin	tilmicosin	penicillin G procaine
		tulathromycin	
		tylosin	
Tetracyclines	Thiamphenicol	Other	Pain reliever
chlortetracycline	florfenicol	Sulfamethazine	Flunixin meglumine
oxytetracycline			
tetracycline			

Class	Ingredient	Trade name	Inject ^a	For	Do not use in	Withdrawal, d
Fluorquinolone	Danofloxacin	A-180™	SC	BRD	Veal calves	4
Fluorquinolone	Enrofloxacin	Baytril®	SC	BRD	Veal calves	28
Macrolide	Tulathromycin	Draxxin®	SC	BRD	Lactating dairy cows	18
Cephalosporin	Ceftiofur	Excede®	SC	BRD		13
Macrolide	Tilmicosin	Micotil®	SC	BRD	Breeding age dairy females	28
Thiamphenicol	Florfenicol	Nuflor®	IM, SC	BRD and Footrot	Lactating dairy cows, bulls or pregnant cows	28 d IM or 38 d SC
Tetracycline	Oxytetracycline	Tetradure™	IM, IV, SC	BRD, Footrot, Scours, Wooden Tongue, Leptospirosis, Metritis	Lactating dairy cows	28

^a SC = subcutaneous, IM = intra-muscular, IV = intravenous.

Supplemental Readings and Information

Comprehensive disease and condition manual

<http://www.merckvetmanual.com/mvm/index.jsp>
http://edis.ifas.ufl.edu/TOPI_Cattle_Diseases
<http://www.cattletoday.info/diseases/index.htmlxxx>

Approved drugs

<http://dil.vetmed.vt.edu/>

Abortion

<http://extension.usu.edu/files/agpubs/beef36.pdf>
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex6973](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex6973)

Abortion checklist:

[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex6973/\\$FILE/cattleabor%20pg3.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex6973/$FILE/cattleabor%20pg3.pdf)
http://cahe.nmsu.edu/pubs/_b/b-215.html
<http://cals.arizona.edu/AREC/pubs/rmg/4%20animalcare&healthmaintenance/27%20abortiondiseasecattl e94.pdf>

Bloat

<http://www.iowabeefcenter.org/pdfs/bch/03115.pdf>
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex6769](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex6769)
<http://www.iowabeefcenter.org/pdfs/bch/03510.pdf>

BVD and PI calves

<http://admin.caes.uga.edu/team/beef/MBVD%20PI%20and%20new%20vaccines.pdf>
<http://www.micattlemen.org/1MCABVDEarNotch.doc>
http://www.usjersey.com/Reference/bvd_pi.pdf

Footrot

<http://www.vet.ksu.edu/depts/ClinicalSciences/agpract/articles/footrot.pdf>

Calf scours

http://www.vetmed.ucdavis.edu/vetext/INF-BE_cca/INF-BE_cca01/INF-BE_cca0102.html
http://extension.usu.edu/files/publications/factsheet/AH_Beef_25.pdf

Recently cleared antibiotics:

A-180™

http://www.pfizerah.com/product_overview.asp?drug=AV&country=US&lang=EN&species=BF

Baytril®

<http://www.bayerdvm.com/products/baytril/baytril-100.cfm>

Draxxin®

<http://www.draxxin.com/display.asp?country=us&lang=en&species=bf&drug=dr&sec=100>

Excede®

<http://www.excede.com/display.asp?country=US&lang=EN&drug=XT&species=BF&sec=100>

Micotil®

http://www.elanco.com/images/micotil_cis_12152005.pdf

Nuflor®

<http://www.nuflor.com/home.html>

Tetradure™

<http://www.tetradure.com/>

Notes

Lesson 1 Quiz

Common Diseases of the Beef Cattle Herd

True or False

1. External parasites are the single most important factor affecting productivity in the US cow herd.

2. Liver flukes can be caused by at least two types of organisms.

3. Tuberculosis and Brucellosis are contagious diseases which lead to cattle wasting.

4. Mastitis does not affect beef cows.

5. Scours (diarrhea) is the single most impacting condition in newborn calves.

Multiple choice

6. Abortive diseases of the first trimester are:
 - Leptospirosis
 - Bovine viral diarrhea
 - Listeriosis
 - Trichomoniasis
 - Brucellosis

7. The well-stocked beef herd medicine chest must contain at least:
 - Penicillin G procaine
 - Tetracycline
 - Streptomycin
 - Flunixin meglumine
 - Electrolytes
 - Cloranfenicol

8. Match the onset of scours and the pathogen that causes it:

Scours beginning on (day of age)	Agent
5 to 35 days	<i>Salmonella spp</i>
First 14 days	<i>Cryptosporidium parvum</i>
5 to 15 days	<i>Escherichia coli</i>
3 to 5 days	<i>Rota- and Coronavirus</i>

9. Diseases to consider vaccinating calves after 4 months of age:

- Scours
- Clostridial diseases
- IBR
- Lumpjaw
- BVD
- Coccidiosis
- Pneumonia

10. Disease for which there are no treatments:

- BVD
- Pneumonia
- Brucellosis
- Footrot
- Neosporosis
- Anthrax
- Lumpjaw
- Trichomoniasis
- Anaplasmosis

PLEASE SEND QUIZ TO YOUR ASSIGNED GRADER UPON COMPLETION

Name _____ Phone _____

Address _____

Fax (Optional) _____ Email (Optional) _____

2008 Minnesota Beef Home Study Course

This lesson was prepared by:

Dr. Alfredo DiCostanzo
Professor
Beef Cattle Nutrition and Management
U of M Department of Animal Science
155A Haecker Hall
1364 Eckles Avenue
Saint Paul, MN 55108

Phone 612-624-1272
Email dicos001@umn.edu

