

Russell County Agriculture and Natural Resources Dec. - Jan. Newsletter



Cooperative Extension Service

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THINGS TO REMEMBER:

- Free Soil testing until funds are depleted. Limit 5 free test per Russell County land owner and/or household.
- Remember to Like us on Facebook: Russell County Extension Office- ANR to stay up to date on events.
- Office Closed December 26th - January 2nd, reopen Tuesday January 3rd
- Office closed January 16th, 2023
- List of upcoming meetings attached in this newsletter.

Hope you enjoy this edition of our Dec-Jan newsletter and find info that helps you, in your operation. Inputs into all area of agriculture continue to a big concern for everyone. Remember that our office is here to help you find research based info/ideas for issues that are important to you, on your farm.

Jonathan Oakes, CEA for
Agriculture and Natural Resources



Reproductive Failure in Cattle-Frequently Asked Questions about Leptospirosis

Dr. Michelle Arnold, UK Veterinary Diagnostic Laboratory

“Reproductive failure” is an all-encompassing term if a cow loses a calf during pregnancy or if she fails to get pregnant. Causes of reproductive failure are often divided into infectious and non-infectious categories. Examples of “non-infectious” include poor cow nutrition (lack of energy and micronutrients such as selenium/Vitamin E); bull infertility, disease, and injury; breeding season management (shortened breeding season, insufficient bull-to-cow ratios); genetic and some congenital abnormalities that result in fetal death; and toxic agents such as nitrates, phytoestrogens, and drugs including steroids and prostaglandins.

“Infectious” causes are bacteria, viruses, protozoal and fungal agents that directly or indirectly damage the placenta and/or the fetus. Examples include the BVD virus, IBR virus, the protozoan *Neospora caninum* and many species of the bacterium *Leptospira*, among many others. This series of articles will explore the most common infectious causes of abortion and reproductive failure in cattle and available options for control and prevention.

What is Leptospirosis or “Lepto”? Leptospirosis is a complicated bacterial disease commonly associated with abortions, stillbirths, premature births, and infertility in cattle. However, this bacterium also causes sickness and death in cattle, dogs, sheep, and horses worldwide and is an important zoonotic disease affecting an estimated 1 million humans annually. Farmers, veterinarians, and those working in meat processing facilities are at highest risk to contract the disease.

What causes leptospirosis? The disease is caused by a unique, highly coiled, Gram-negative bacterium known as a “spirochete” belonging to the genus *Leptospira*. These “leptospire” are highly motile due to their spiral shape and, once inside a host animal, they enter the bloodstream and replicate in many different organs including the liver, kidney, spleen, reproductive tract, eyes and central nervous system. The immune system will produce antibodies that usually clear the organism from the blood and tissues rather quickly except from the kidney. Leptospire take up residence primarily in the kidney and are excreted in the urine for months to even years after infection, depending on the species of *Leptospira* and the animal infected. Less frequently, leptospire persist in the male and female genital tract and mammary gland of females and may be excreted in semen, uterine discharges, and milk.

How do cattle become infected with leptospire? Transmission of the organism is most often through direct contact with infected urine, placental fluids, semen, or milk. However, transmission may also occur by coming in contact with areas contaminated with infected urine, such as stagnant ponds or swampy areas with standing water. The leptospire survive in the environment for long periods of time (approximately 6 months in the right conditions) in stagnant water as well as in warm and moist soils but die quickly when dry or in cold temperatures. Entry into the animal may be through penetration of *intact* mucous membranes such as through the mouth and the conjunctiva of the eye, or through damaged or water-softened skin. The organism may also be transferred during breeding and also during pregnancy from dam to fetus.

Which animals carry (“host”) this organism and are responsible for spread of disease? This is where the complicated life cycle of this organism must be explained to understand the wide range of disease symptoms that may be observed in cattle. To begin, it is important to distinguish two different types of “hosts”: 1) maintenance or reservoir hosts and 2) incidental or accidental hosts. A “maintenance host” is an animal that can carry and spread the leptospirosis organism but not experience any obvious sickness from it. These are also known as “reservoir hosts” because this animal’s immune system allows the leptospire to survive and duplicate themselves then be excreted in urine and spread to other animals. Maintenance hosts for leptospire are often wildlife species including skunks, rats, raccoons, and opossums but can be domestic animals (dogs) or livestock (pigs, cattle), depending on which type of leptospire (known as a “serovar”) is

involved (Table 1). For example, cattle serve as the maintenance host for the *Leptospira* serovar called “Hardjo type hardjo-bovis”, often abbreviated as “Hardjo”. Transmission from one infected cow to another healthy cow with serovar Hardjo is efficient, and the infection rate can be very high in an unvaccinated herd. When a cow is initially infected with serovar Hardjo, she may exhibit a few mild signs such as low fever but there will be very little antibody production by the immune system and the leptospires will stay primarily in the kidney and be persistently shed in her urine for a prolonged period of time (months to years). In addition, the organism can also localize in male and female reproductive tracts and be shed in semen and uterine discharges.

An “incidental host” or “accidental host” is an animal that gets infected with a *Leptospira* serovar not normally found in that animal (infected “by accident”) which results in clinical disease that may be severe. Incidental hosts are not reservoirs of infection and transmission of the organism is uncommon within a herd. Infection of an incidental host usually occurs in areas contaminated with urine from maintenance hosts. For example, cattle are incidental hosts for the *Leptospira* serovar “Pomona” which is carried by feral swine, opossums, skunks, and raccoons (the maintenance hosts) and transmitted to cattle from water or feed contaminated with their urine. Once infected, cattle (especially calves) with Pomona often show significant signs of disease, the immune system rapidly produces antibodies and there is a short carrier state in the kidney when cattle shed the organism in urine.

Table 1: Common *Leptospira* Isolates in Ruminants

Species	Serovar	Maintenance Host	Incidental Hosts
<i>L. borgpetersenii</i>	Hardjo (type hardjo-bovis)	Cattle (repro failure)	Sheep, goats
<i>L. kirschneri</i>	Grippotyphosa	Raccoons, muskrats, squirrels	Cattle, sheep, horses, dogs
<i>L. interrogans</i>	Pomona	Swine, opossums, skunks, raccoons	Horses, cattle, sheep, goats, dogs
<i>L. interrogans</i>	Canicola	Dogs	Cattle
<i>L. interrogans</i>	Icterohaemorrhagiae	Rats	Dogs, cattle, swine
<i>L. interrogans</i>	Bratislava	Pigs, mice, horses	Dogs, cattle, horses
<i>L. interrogans</i>	Hardjo (type hardjoprajitno)	Cattle-Europe only (milk drop)	Sheep, goats

What are the symptoms of leptospirosis? Clinical signs or symptoms of disease in cattle depend on which *Leptospira* serovar is involved and if cattle serve as a maintenance host or incidental host for this specific type. There are over 250 serovars of *Leptospira* but the two most important serovars affecting cattle in North America are Hardjo and Pomona, with Grippotyphosa, Canicola and Icterohaemorrhagiae much less frequently diagnosed. Most bovine leptospirosis is caused by the serovar Hardjo, which causes infertility and reproductive failure. Cows with Hardjo are twice as likely to fail to conceive and experience a significantly longer time interval from calving to conception.

Infection in pregnant cows with non-Hardjo strains, mostly Pomona and Grippotyphosa, results in abortion (usually late term), stillbirth, or birth of premature and weak infected calves. Retention of fetal membranes may follow abortion. Lactating dairy cows may exhibit “milk drop syndrome”, characterized as a drop in milk production for 2-10 days where the milk has the consistency of colostrum, thick clots, yellowish color, and high somatic cell count, but the udder remains soft. In calves, a severe, rapidly progressing disease may occur when infected with incidental serovars, especially Pomona. Symptoms of high fever, extreme weakness, red urine, rapid breathing due to anemia and death are all possible. Cows may experience a loss of milk production with very prolonged recovery.

How is leptospirosis diagnosed and treated? Diagnosis of this disease is not necessarily a simple task. Traditionally, two blood samples (in red top blood tubes) drawn at least 1 week apart after an abortion are submitted to measure antibodies against the most common serovars. Incidental infections (for example, Pomona) will show a rapid rise in antibody numbers (called “titers”) over time that are diagnostic. However,

since cattle are the maintenance host of serovar Hardjo, the antibody numbers may remain low if reproductive failure is due to Hardjo. Vaccination also confuses the interpretation of results because blood tests do not differentiate antibodies due to infection or antibodies due to vaccine. Therefore, multiple types of tests may be required to rule this disease in or out. Currently, urine is the preferred sample as it can be tested for leptospires through a variety of assays, especially PCR, to identify the organism. Animals diagnosed with leptospirosis can be treated with injectable long-acting oxytetracycline to remove the organism from the kidney. Research is ongoing if additional treatment is needed to clear infections within the genital tract. Consult your veterinarian for detailed advice regarding diagnosis and treatment options.

What methods are used to control and prevent leptospirosis in cattle? New infections are best prevented through early vaccination with products containing the most common serovars affecting cattle. The leptospirosis fraction of most reproductive vaccines is often denoted as “L 5” in the vaccine name, representing Hardjo, Pomona, Grippotyphosa, Canicola and Icterohaemorrhagiae. In addition, several vaccine manufacturers have added extra protection against serovar Hardjo type hardjo-bovis and this is denoted with “HB” in the vaccine name. Spirovac® (Zoetis) is a vaccine for Leptospirosis only, specifically for the prevention of infection by *Leptospira borgpetersenii* serovar Hardjo type hardjo-bovis, including reproductive and renal tract colonization, and urinary shedding for up to 12 months. It is worth mentioning that cattle already infected with leptospirosis must be treated with antibiotics first to remove the organism before vaccination is effective.

Control is accomplished by prevention of exposure, annual vaccination and treatment if needed. Reduction of cattle exposure to infected urine, especially fencing off stagnant ponds and swampy areas, and preventing urine contamination of feedstuffs will significantly reduce transmission of the organism. Personal protective equipment should be used when working with cattle suspected to be infected to prevent human disease.

Consider Pasture, Rangeland, and Forage Insurance as a Risk Management Tool

Dr. Kenny Burdine, Extension Professor, Livestock Marketing, University of Kentucky

The most recent drought monitor, released on October 27th, shows the majority of the United States dealing with drought, or abnormally dry, conditions. While I sincerely hope some of those regions received some much needed rain recently, I do think this provides an opportunity to discuss Pasture, Rangeland, and Forage (PRF) Insurance. PRF insurance provides an opportunity for producers to purchase rainfall coverage for perennial forages used for pasture and / or hay production. Producers have until December 1st to enroll for 2023, so I thought I would focus this discussion on three reminders for producers as they consider PRF insurance for the upcoming year.

PRF is a Single-Peril Index Insurance Product

Producers first need to understand that indemnities from PRF are not based on rainfall at their farm, but rather on actual and historical rainfall for a 0.25 degree latitude by 0.25 degree longitude grid, where their farm is located. Daily rainfall for each grid is collected through NOAA weather stations and used by the program. Certainly, there should be a correlation between rainfall amounts for a given grid and the farms within it, but variability will exist. This variability creates a type of “basis” risk that isn’t that different than an insurance product like Livestock Risk Protection Insurance, which pays based on changes in the CME® Feeder Cattle Index, rather than local prices. It is also important to understand that PRF insurance does not protect against extremely high rainfall levels, or any other challenge that might impact forage production. It simply provides coverage for less than normal rainfall levels over 2 month periods during the year.

The Premium Subsidy for PRF is Significant

The premium subsidy levels for PRF depend on the level of coverage that is selected, but exceed 50% in all cases. The USDA Risk Management Agency (USDA-RMA) has intended for this to be relatively affordable so that farmers will be more likely to utilize it. While indemnities may not be received in a given year, the subsidy levels suggest that indemnities should exceed premium levels over a large number of years. Given this, producers may want to consider scaling the coverage upward to increase the base value per acre they are insuring. Base values per acre can be increased by up to 150% by increasing the productivity factor.

Multiple Approaches are Possible for Covered Months

Finally, I think it is important that producers give some thought to the months they want to cover. Producers must select coverage in a minimum of two, two-month periods and can place no more than 60% of their coverage value in any single two-month interval. A month also may not be double-covered. For example, one cannot cover the June-July interval and the July-August interval, because July is double-covered. However, one could put 60% of the value in a two month interval that included July.

A logical approach would be to cover months in which rainfall and forage productivity are of the most concern. For example, someone may choose to cover June-July and August-September, if they are concerned about the summer months. A producer who is more dependent on fall pasture growth to stockpile forage may choose to stretch coverage into the fall months. Producers should also discuss this with their insurance agent as they are likely to have valuable insights as well. Most importantly, producers should give this some thought and be deliberate about this decision.

While no insurance product is perfect, PRF insurance does provide producers with a relatively inexpensive opportunity to get some protection against less than normal rainfall levels. Producers have until December 1st to sign up for coverage for the 2023 calendar year, so the time is right to be thinking about it. In addition to talking with your insurance agent, a great deal of information can be found on the PRF page of the USDA-RMA website at <https://www.rma.usda.gov/en/Policy-and-Procedure/Insurance-Plans/Pasture-Rangeland-Forage>.

Forage Timely Tips: December

Posted on [December 1, 2022](#), KY Forage News

- ✓ Begin utilizing stockpiled pastures. Graze pastures with orchardgrass and clovers first. Save tall fescue pastures for late winter grazing. ✓ Using polywire, strip graze stockpiled pastures to improve Utilization. Start at the water source and allocate enough forage to for 2-3 days. Back fencing is not necessary since pastures are not regrowing this time of the year. ✓ Make plans to frost seed red and white clover onto closely grazed tall fescue pastures in February. Seed supplies of improved varieties may be tight. ✓ Begin hay feeding as stockpiled forage is used up. ✓ Supplement hay with commodity feeds as needed. ✓ Minimizing waste by utilizing ring feeders.

How Bugs Get Ready for Winter

By Jonathan L. Larson, Entomology Extension Specialist

As the season continues to cool, life outside is preparing for the cold. This includes the insects and spiders who must be able to survive exposure to freezing and sub-freezing temperatures. Insect development and survivorship is at the whim of the climate around them, in particular, temperature drives their lives. Some folks may be hoping that Old Man Winter will provide some free pest control in December or January. Unfortunately, insects have adapted many ways of mitigating the effects of cold and will be able to survive thanks to these

“overwintering strategies.” When it comes to dealing with cold, there are two main ways for an insect to survive—either get away from the cold area completely or find local shelter that will provide some shielding.

Migration



Figure 1: Monarch butterflies are some of the most famous migrating insects. They pack their bags every autumn to fly to Mexico from the northern United States. This extravagant overwintering strategy is something many people enjoy watching as the butterflies fly through town. (Photo: Jonathan Larson, UK)

Some insects may behave similarly to human “snowbirds” and simply leave when things start to get cold. Migration is a great way to not get cold, as a species you will simply go somewhere warmer! One of the most famous examples of this behavior is the monarch butterfly (Figure 1). In the autumn, these orange and black beauties will start to fly south from northern states, progressively moving towards Mexico. Once they arrive in Mexico, they fly towards the oyamel fir forests north of Mexico City where they will cluster together until spring. Another butterfly species, the painted lady, also migrates long distances and dragonflies are also noted for logging in a lot of frequent flier miles in response to cold.

Cold Tolerance

If they don't pack up and go, then insects are still going to need to survive the winter to get populations restarted the next spring. For many species, this will mean finding an area that can protect them from cold air temperatures. It is important to point out that all species of insects have a lower lethal temperature, meaning there is a cold temperature that will kill them. Insects can't warm their own bodies; their body temperature is dictated by their local climate. However, there is also a set amount of time that they must stay at that temperature for death to set in. If their temperature rises above that lower lethal temp, then the clock resets and they may survive. This gives scientists a freezing equation of temperature and time to know when bugs might die from cold.

Some insects may prepare for the cold and ultimately can survive being frozen. These species can produce natural anti-freezes that prevent them from freezing solid or lowering the normal lethal temperature. Other species may be able to control where ice crystals ultimately form in their body. They would let their fat bodies freeze for example rather than their digestive system.



Figure 2: Bagworm bags are made of insect silk and materials from the host tree (bits of leaves and needles mostly) and provide protection for the caterpillar inside the bag for the summer. In the winter though, some bags will contain eggs that are protected by the bag as well. (Photo: Jonathan Larson, UK)

If these freeze tolerance methods aren't in their toolbox, an insect species is going to have to find a way to keep warm in a chilling environment. One trick bugs use is to go into winter as either eggs or pupae, stages of life that require much less food and are already semi protected. Mother bugs may lay their eggs in leaf litter, down in the soil, or provide extra protection. Bagworms and spotted lanternflies are good examples of moms that go the extra mile. Female bagworms never leave their bag-like construction, they lay their eggs inside with them and then perish (Figure 2). The bag then keeps those eggs slightly warmer than they would be outside. Spotted lanternfly females will “spray” a substance on top of their eggs, which helps the eggs to survive the winter.

Pupating insects often burrow into soil or leaf litter to finish the job. Once covered, they have a natural blanket between them and the cold air temps. Wood boring pests can also be highlighted as they are inside of a tree, under the bark and are rarely exposed to the frigid cold that may be hovering just outside their tree.

Some species may go into winter as adults. Brown marmorated stink bugs, multicolored Asian lady beetles, and boxelder bugs are some famous examples. Part of their fame is due to their penchant for using human buildings for their overwintering habitat. Instead of their usual hiding under logs or stones, they have found our homes to be deluxe, heated hideaways! This intersection of insect winter ecology and humanity can be quite annoying.

Pest-proofing Homes

If you have a history of dealing with winter infestations, your house most likely represents an ideal overwintering site to them. It may be down to the height of your home, its geographic situation, or even the color of the exterior. The best thing you can do for these issues is to pest proof the home as best as you can.

- Inspect your home and check for cracks around windows, doors, pipes, and chimneys and seal openings with silicone or silicone-latex caulk. You can consult another [KPN article](#) for more information on pest-proofing and using insecticides on the outside of the home.
- If you find insects congregating on the exterior of your home, you can spray them with soapy water to kill them before they get inside.
- When stinkbugs or lady beetles are discovered inside, simply vacuum up living specimens and dispose of them outside.
- Using bug bombs or other insecticides in the home will not help to deal with the lady beetles and will only serve to expose the people inside to residues. An exterior application of a perimeter insecticide may help to exclude some of these pests. This should be done with a pest control professional or by using a registered product (for example, Orthro Home Defense) and strictly following the label instructions.



The Depths of Winter

Tony Edwards – National Weather Service



When asking Kentuckians to reminisce about the worst winter storm they can remember, what comes to mind likely varies by region. Those in the west will likely recall the Ice Storm of 2009 when ice up to two inches thick coated everything and the power was out for weeks. Those in the Bluegrass will likely think back to January 1994, when one to two feet of snow fell, then an arctic blast sent temperatures plunging to a state record of 37 below zero in Shelbyville. Those in east Kentucky will likely recollect the Blizzard of 1993 when heavy snow and strong winds whipped up snow drifts of six to ten feet and temperatures plunged below zero.

While the likelihood that a similar winter storm will occur in your region this winter is remote, it does beg the question - are you ready if it does?

Probably the most effective step you can take at home to make it through the worst that winter can bring is assembling an Emergency Kit. Your kit should contain, at a minimum, 72 hours worth of food, water and prescription medications for everyone in your household, including your pets! If you heat with electricity, it's also important to ensure you have an alternate heat source. If that alternate heat source is a wood stove, make sure the chimney is clean before building a fire.

In severe winter storms, even venturing out to the barn to tend to the animals can be life-threatening! Horses and other animals struggle in severe winter conditions and will likely consume more hay than normal. Water sources will freeze up and require constant chopping of holes in the ice so animals can drink. Firewood stores will also be consumed quickly and propane may run out. These are just a few hardships to plan for.

Here are some more tips to remember when winter turns especially harsh:

- Stay dry to stay warm! Wet clothes result in much faster heat loss.
- Wear multiple layers. Trapped air between loose fitting clothing helps to insulate you from the cold. Wool keeps you warmer than cotton because wool fibers trap air pockets and when wool is exposed to damp conditions, it wicks moisture away from your skin and helps keep you dry. Also, try to use an outer layer that is water resistant.
- Cover everything you can! Wear mittens or gloves and a hat. At least half your body heat can be lost if your head isn't covered.
- Stay informed on the latest weather forecasts.

Finally, it's important to know the signs that someone is getting too cold. Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce it. Confusion, shivering, difficulty speaking, sleepiness and stiff muscles are all signs of hypothermia and signs that medical attention is urgently needed.

Preparing for the worst storm that may affect your area means you are well prepared for all of the less severe winter storms that will most assuredly come this winter, and you can sit back and enjoy the beauty of open country covered in a blanket of white.

January 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2 Office Closed	3 KY Fruit and Veg. Conf Bowling Green, KY Register Online	4 KY Fruit and Veg. Conf Bowling Green, KY Register Online	5 KY Cattlemen's Conv. Lexington, KY Register Online	6 KY Cattlemen's Conv. Lexington, KY Register Online	7
8	9	10	11	12 BQCA Training @ Russell Co. Ext. Office 5pm- Must call to reg	13	14
15	16 Office Closed	17	18 Russell County Ext. District Board Mtg @ 12pm @ Russell Co. Ext. Office	19 Farm Infrastructure CAIP Educational Mtg. @ Russell Co. Ext. Off. @5pm- Call to Reg.	20	21
22	23	24	25	26 Lake Cumberland Area Forage Series @ Russell County @ 6pm CST- Must register- Series of Meetings Counts for CAIP Ed	27	28
29	30 Making a Charcuterie Board 5-8pm CST- Cost \$20 per person or \$25 per couple- Limited space must register	31				

February 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 BQCA Training @ Russell Co. Ext. Office @ 5pm	3	4
5	6 Making a Charcuterie Board Part 2 @Russell Co. Ext Office 5-8pm	7	8	9	10	11
12	13 Preparing a Charcuterie Board @ Russell Co. Ext Office 5-8 pm	14	15	16 Lake Cumberland Forage Series Part 2 Somerset, KY @ 6:00 pm EST	17	18
19	20	21	22	23	24 Freeze Branding Workshop @ 1pm Limit 20 participants- Must call to register	25
26	27	28				



University of Kentucky
College of Agriculture,
Food and Environment
Cooperative Extension Service

Russell County Extension Office Presents

Summer Sausage Charcuterie Board Workshop Series

1/30, 2/6, & 2/13 from 5-8 PM

Must attend all 3 classes

**Summer Sausage Charcuterie Board Series: 3 part
class, must attend all 3 classes**

- January 30th: Making Your Own Cutting Board
- February 6th: Making Summer Sausage
- February 13th: Charcuterie Boards- Putting it all together

15 people max (or 10 couples) whichever occurs first

\$20 per person or \$25 per couple

Call 270-866-4477 To Reserve your Seat Today!

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LEXINGTON, KY 40546



Disabilities
accommodated
with prior notification.



Lake Cumberland Area Forage Series

Weed Control in Forage Stands - Dr. JD Green

January 26th, 2023

6:00pm CST

Russell County Extension Office

Russell Springs, KY

Maintaining Fertility on Forage Stands - Dr. Chris Teutsch

February 16th, 2023

6:00pm EST

Hal Rogers Regional Fire Training Center

Somerset, KY

Forage Establishment - Dr. Ray Smith

March 14th, 2023

6:00 PM EST

Somerset Community College (McCreary Campus)

Whitley City, KY

Optimizing Forage Quality During Harvest- Dr. Jimmy Henning

April 3rd, 2023

6:00pm EST

Casey County Extension Office

Liberty, KY

There will be a meal served prior to each program.
Attendees must RSVP to your County Agriculture Extension Agent.

