



# UF IFAS Range Cattle REC



## Youth Field Day

June 29 – July 3  
2020

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# 2020 Youth Field Day

~ *Schedule & Instructors* ~

**Monday, 6/29**

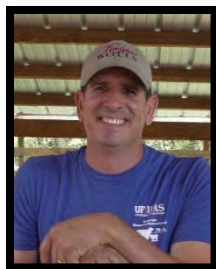


2:00 -2:45 PM, Wired Wildlife

Bethany Wight, UF/IFAS Range Cattle REC,  
Biological Scientist - [bwight@ufl.edu](mailto:bwight@ufl.edu)

Tyler Buckley, UF Wildlife Ecology  
Conservation, M.S. Student -  
[charlesbuckley@ufl.edu](mailto:charlesbuckley@ufl.edu)

**Tuesday, 6/30**



2:00 -2:45 PM, Halter Breaking

Matt Warren, Livestock Judge and Club Calf Producer  
[flatwoodscattle@gmail.com](mailto:flatwoodscattle@gmail.com)

**Wednesday, 7/1 - there are 2 sessions that day!**



2:00 -2:45 PM, Feed n' Stuff

Chris Prevatt, UF/IFAS Range Cattle REC, State  
Specialized Agent, Beef Cattle & Forage Economics -  
[prevacg@ufl.edu](mailto:prevacg@ufl.edu)

Christa Kirby, Manatee Co. Extension, Livestock Agent -  
[ccarlson@ufl.edu](mailto:ccarlson@ufl.edu)

Julie Warren, UF/IFAS Range Cattle REC,  
Biological Scientist - [jwarren01@ufl.edu](mailto:jwarren01@ufl.edu)

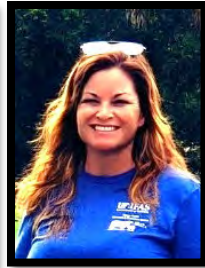


3:00 - 3:45 PM, Plants: To eat or not to eat?

Brent Sellers, UF/IFAS Range Cattle REC, Extension Weed Specialist and CD - [sellersb@ufl.edu](mailto:sellersb@ufl.edu)

Clay Cooper, Citrus Co. Extension, Agriculture/Natural Resources Agent - [coop1632@ufl.edu](mailto:coop1632@ufl.edu)

### Thursday, 7/2

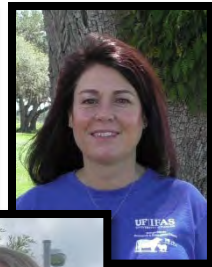
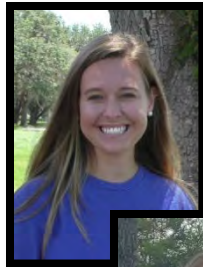


2:00 -2:45 PM, MILK IT! Lactation Station

Lauren Butler, UF/IFAS Okeechobee Co. Extension, Livestock Agent/ CED - [l.butler@ufl.edu](mailto:l.butler@ufl.edu)

Colleen Larson, UF/IFAS Okeechobee Co. Extension, Regional Dairy Agent - [cclarson@ufl.edu](mailto:cclarson@ufl.edu)

### Friday, 7/3



2:00 – 2:45 PM, Reproduction Deconstruction

Taylor Davis, UF/IFAS Highlands Co. Extension, Livestock Agent - [tpohl@ufl.edu](mailto:tpohl@ufl.edu)

Sonja Crawford, UF/IFAS Hendry Co. Extension, Livestock /4-H Agent - [sycr@ufl.edu](mailto:sycr@ufl.edu)



Liz Palmer, UF Animal Science, Ph.D. Student - [e.palmer@ufl.edu](mailto:e.palmer@ufl.edu)

The recordings of these class sessions will be posted on our website at:

<https://rcrec-ona.ifas.ufl.edu/virtual-classroom/>

# Youth Field Day 2020

## **Committee Members**

Lauren Butler

UF/IFAS Okeechobee Co. Extension, Agriculture and Livestock Agent/ CED

Sonja Crawford

UF/IFAS Hendry Co. Extension, Livestock /4-H Agent

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UF/IFAS Highlands Co. Extension, Livestock Agent

Andrea Dunlap

UF/IFAS Range Cattle REC, Marketing/Communications Coordinator

Christa Kirby

UF/IFAS Manatee Co. Extension, Livestock Agent

Colleen Larson

UF/IFAS Okeechobee Co. Extension, Regional Dairy Agent

Chris Prevatt

UF/IFAS Range Cattle REC, State Specialized Agent, Livestock & Forage Economics

Brent Sellers

UF/IFAS Range Cattle REC, Extension Weed Specialist and Center Director

Julie Warren

UF/IFAS Range Cattle REC, Biological Scientist

Bethany Wight

UF/IFAS Range Cattle REC, Biological Scientist

## UF/IFAS Range Cattle Research and Education Center - Quick Facts

- **This Station was established in 1941** for two purposes: 1) to learn how to produce quality forage on the sandy cut-over pinelands; 2) to investigate breeding, feeding, and management of beef cattle.
- Much of the proposed land had been sold during the 1915 boom in 10, 20 and 40-acre tracts to people throughout the U.S.A. In the late 1920s when the land boom broke, most of the Station area was returned to the county because of unpaid taxes. Hardee Farms and Ranch Inc., Wauchula, redeemed the tax certificates and later sold a large part of the land to the Station Trustees at \$2.25 per acre. Funds for the **purchase of this land** were obtained through private donation and grants from the Hardee Board of County Commissioners.
- The center has been its current size (**2,840 acres**) since 1960.
- **Modern conveniences:** Electric power was provided in 1946, an all-weather road in 1952, and phone service in 1954.
- **The purpose of the center** is to conduct research and provide information that will solve problems related to improving profitability of beef, forage and field crops, and dairy production in central and south Florida.
- The center has **6 faculty members** doing work in soil and water science, animal science (beef cattle), forages, weed science, economics, and wildlife ecology conservation.
- The center has **17 support personnel**- office manager, research coordinator/farm manager, herdsman, biological scientists, educational media/communications coordinator, custodian, ag. technicians, auto/equipment mechanic, field work assistant, maintenance, and a secretary.
- Currently there are **6 Ph.D. students, 5 M.S. students, and several International Exchange Visitors: short-term & research scholars and interns** at the center. Students come to the center to do research toward the degree they are pursuing. We have hosted students from Brazil, Honduras, India, Africa, China, Turkey, Russia, and North America.
- Currently the Range Cattle REC has about **600 mature cows, 100 yearling heifers, and 35 bulls. Breeds** include Angus, Brangus, Braford, Brahman, and crossbred cattle.

### Contact us:

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Website - <http://rcrec-ona.ifas.ufl.edu>

# Range Cattle REC Cattle Management

Herdsman, Austin Bateman

## January

1. Cow breeding season begins (1<sup>st</sup> week)
2. Early wean calves from 1<sup>st</sup> calf heifers (1<sup>st</sup> week)

## April

1. Remove bulls following 90-day breeding season:
  - a. Vaccinate bulls with Cattlemaster 4 + VL 5, Ultrabac 8, and worm
2. Work all cows and calves;
  - a. Weigh and Body Condition Score (BCS) Cows
  - b. Weigh calves
  - c. Worm cows
  - d. Vaccinate calves with Bovi-Shield Gold 5, Ultrabac 8, One-Shot pasturella, worm
3. Pregnancy check yearling heifers via ultrasound;
  - a. Vaccinate heifers with Cattlemaster 4 + VL 5, and worm

## June

1. Pregnancy check cows and Brucella test
2. (greater than or equal to 30 days from prior) Vaccinate calves with Bovi-Shield Gold 5 and Ultrabac 8, One-Shot pasturella, and worm

## July

1. (greater than or equal to 30 days from prior) Wean calves and ship

## August

1. Work replacement heifers before going onto fall studies;
  - a. Brand, Bangs vaccinate, worm

## September

1. Work and sort mature cowherds prior to winter feeding studies;
  - a. Vaccinate with Cattlemaster 4 + VL5, Ultrabac 8, and worm

## October

1. Work bulls;
  - a. Breeding Soundness Exam (BSE), Brucella test, trich test
  - b. Vaccinate with Bovi-Shield FP4 + VL5, Ultrabac 8, and worm

## December

1. Begin heifer breeding as per schedule

## ~ Web Resources ~

### **Electronic Data Information Source (EDIS) -**

EDIS is the Electronic Data Information Source of UF/IFAS Extension, a collection of information on topics relevant to you: profitable and sustainable agriculture, our environment and natural resources, 4-H and other youth programs, Florida-friendly landscapes, communities that are vibrant and prosperous, and economic well-being and life quality for individuals and families.

<http://edis.ifas.ufl.edu/>

### **Florida Automated Weather Network (FAWN) -**

Weather data is collected every 15 minutes at 43 sites located across Florida.

<http://fawn.ifas.ufl.edu/>

### **UF IFAS Range Cattle REC -**

Learn about upcoming events, see program and contact information for faculty members, and view media resources in the virtual classroom.

<http://rcrec-ona.ifas.ufl.edu/>

### **UF IFAS Range Cattle REC - Rangeland Wildlife and Ecosystems Program Website**

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

### **UF IFAS Extension - Solutions for your life -**

Each Florida County has an extension office. Do you know about yours? Follow this link to locate your local office and find out about the services they offer. Here you will also learn about the Research Centers and Demonstration Sites in Florida.

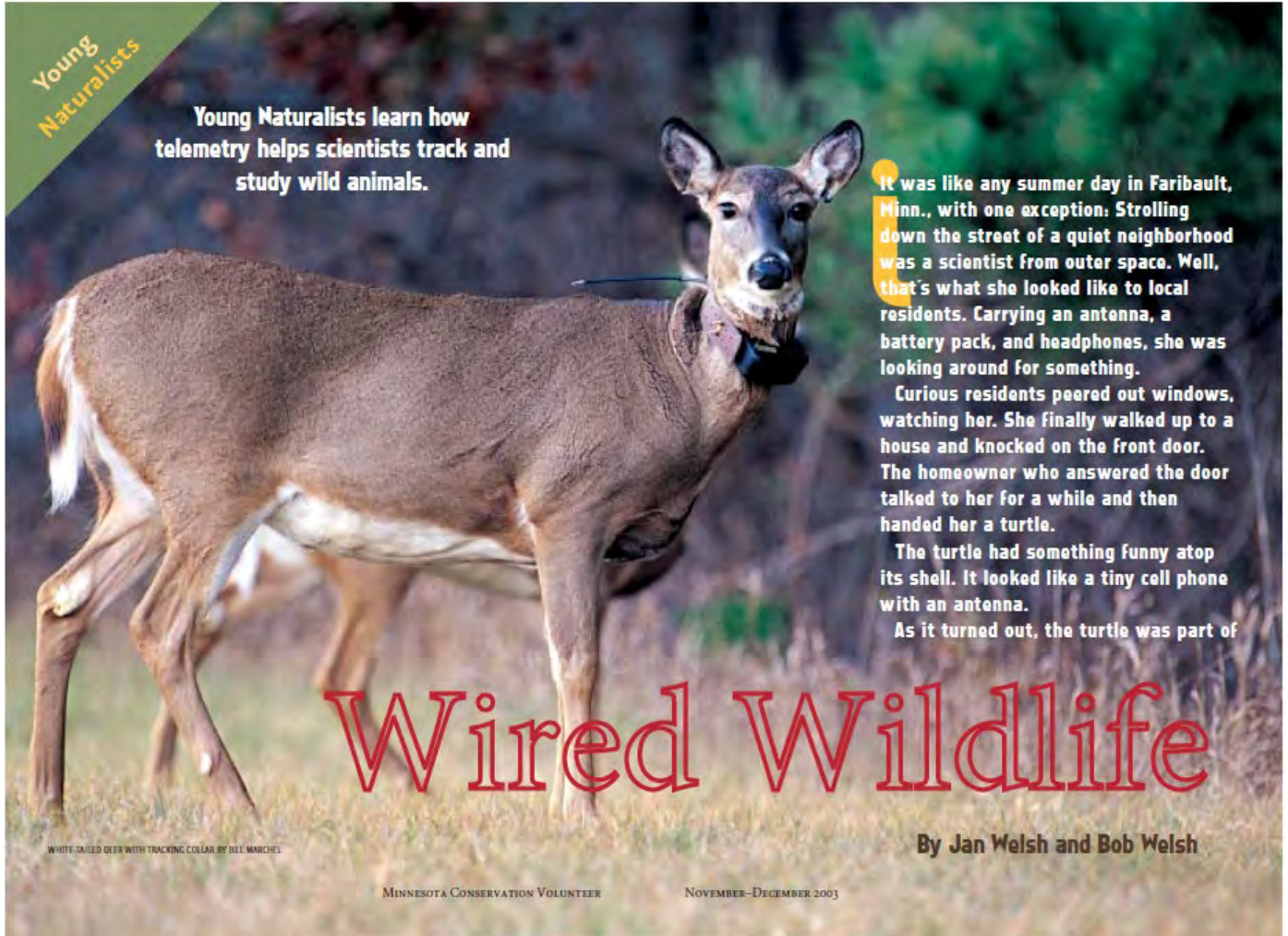
<http://solutionsforyourlife.ufl.edu/map/>



# Wired Wildlife

Bethany Wight and Tyler Buckley

Adapted for the RCREC 2020 Virtual Youth Field Day



Young Naturalists

Young Naturalists learn how telemetry helps scientists track and study wild animals.

It was like any summer day in Faribault, Minn., with one exception. Strolling down the street of a quiet neighborhood was a scientist from outer space. Well, that's what she looked like to local residents. Carrying an antenna, a battery pack, and headphones, she was looking around for something.

Curious residents peered out windows, watching her. She finally walked up to a house and knocked on the front door. The homeowner who answered the door talked to her for a while and then handed her a turtle.

The turtle had something funny atop its shell. It looked like a tiny cell phone with an antenna.

As it turned out, the turtle was part of

## Wired Wildlife

By Jan Welsh and Bob Welsh

WHITE-TAILED DEER WITH TRACKING COLLAR BY DEE MARCHET

MINNESOTA CONSERVATION VOLUNTEER

NOVEMBER–DECEMBER 2003

a study by the Department of Natural Resources Nongame Wildlife Program. Several months earlier a researcher had captured the wood turtle near the Straight River, glued a radio transmitter to her shell, and returned her to the river.

A child had found the turtle and taken her home. Meanwhile, the scientist had used a device called a *receiver* to pick up the radio transmitter's electrical signal and follow it to the child's house.

Standing on the child's doorstep, the scientist explained the wood turtle is a threatened species in Minnesota and that scientists were using radio

tracking to learn more about how wood turtles use their river habitat. Scientists hoped to improve the chances of survival for the state's rare wood turtles. The child gave the turtle to the scientist, who returned it to its home on the Straight River.

## DETECTIVE DEVICE

**T**his process of remotely sending signals over a distance in order to record information is called *telemetry*. In radio telemetry, transmitters send signals that can be picked up by a special receiver.

Once the transmitter is in place and



CHRISTOPHER KOCHANNY, ADVANCED TELEMETRY SYSTEMS, INC.

**Picking up signals.** A researcher dials a certain setting on a receiver hanging at her waist. She holds an antenna that picks up a signal from a radio transmitter attached to a turtle. The signal tells her in which direction the turtle is located. To find out the turtle's location, she must move to another spot. Turn to page 39 to discover how she locates the turtle without seeing it.

MINNESOTA CONSERVATION VOLUNTEER

giving off signals, researchers can track the animal with the receiver (see photo below left). The receiver collects and amplifies the signals so researchers can hear them.

Think of the transmitter and receiver this way: You're riding in a car and want to listen to BE-BOP 99.1 on the radio. By turning on the radio and dialing the setting 99.1, you pick up a signal that delivers music. A radio station sends the signal through a tall antenna, or transmitter.

For wildlife telemetry the animal wears a transmitter. Using a radio receiver and dialing a certain setting, the researcher hears a beep when the

animal is within range.

Telemetry is a tool in wildlife and fisheries research because it helps researchers learn how various kinds of animals live and what they need to be healthy. It's useful when a researcher cannot physically follow an animal on its day-to-day routine. For example, a person would find it tricky or impossible to follow a bird in flight or a fish in a lake or river. Telemetry also makes it possible to learn a lot about an animal without being seen by it. This is important because an animal's natural behavior may change if it knows a human is nearby.

**Sticking to rare turtles.** A wildlife researcher glues a tiny transmitter to a wood turtle's carapace (top shell). At the end of the tracking study, the researcher will retrieve the turtle and simply pop off the transmitter without harming the carapace.

ERIK R. WILD



NOVEMBER–DECEMBER 2003

## How Telemetry Works

The examples in this story use conventional radio telemetry, which is the oldest and most common way to track animals. Researchers can also electronically track animals using Global Positioning System telemetry and satellite telemetry. Here's how each works.

### CONVENTIONAL TELEMTRY

Using a conventional receiver, a researcher can map an animal's location and movements. This conventional telemetry works well for animals that travel less than 6 miles.

The radio transmitter's signal tells a wildlife researcher in which direction the animal is but not how far away it is located. After using the antenna to find the animal's direction, the researcher takes a compass reading and records it on a

map. The researcher draws a line on the map from the spot where he or she is standing in the direction of the animal. By quickly moving to another spot and listening, the researcher can draw another directional line toward the animal. The spot where the two lines meet on the map is where the animal is. This technique, known as *triangulation*, estimates the location of the animal without disturbing it. More readings increase the accuracy.

### GPS TELEMTRY

Collars that use the Global Positioning System (GPS) can show where an animal has been for up to a year. The GPS collar stores the location information gathered from satellites revolving around Earth. After retrieving the collar from the animal,

the researcher downloads the data to a computer.

GPS collars cost much more than conventional transmitters do, and the battery wears out faster. However, the GPS collects data 24 hours a day, seven days a week, so the researcher doesn't have to track the animal directly.

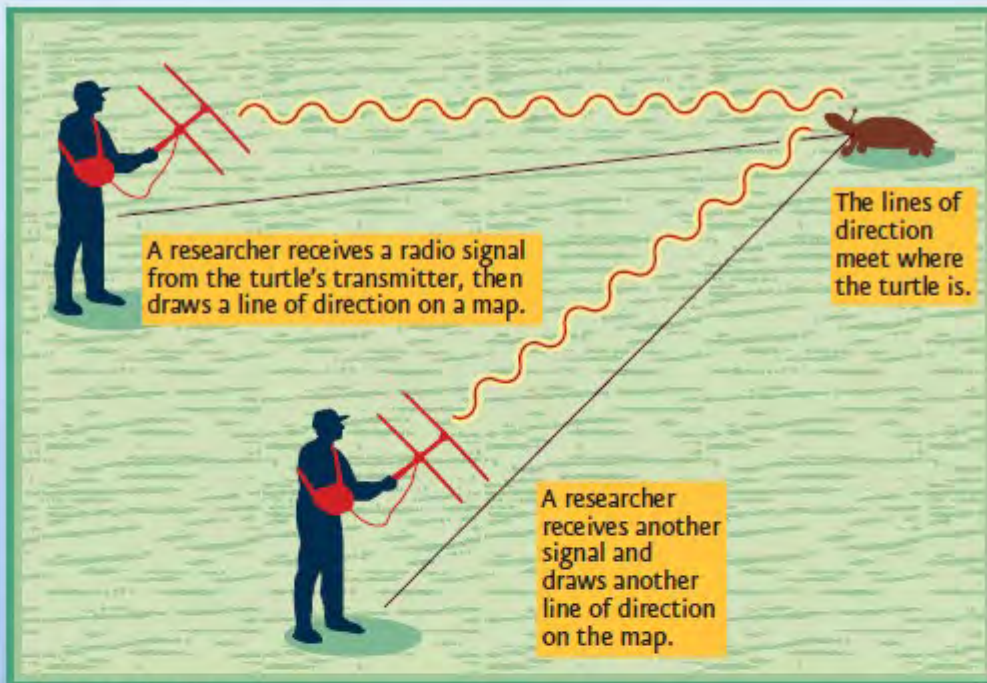


ILLUSTRATION BY MATT KANIA

**How to find a turtle.** The illustration above shows how researchers use a map, a radio transmitter on a turtle, and radio receivers to locate the turtle.

## SATELLITE TELEMETRY

This tracking method is especially useful for whales, migratory birds, and other animals that migrate great distances. A transmitter on the animal sends location information

to satellites revolving around Earth.

The satellites relay the data to stations on land, where it is translated into a usable form. The researcher can then get the information over the Internet.

## FISH TO FOLLOW

**d**NR fisheries researchers hook up tiny radio transmitters to fish to find out where they travel in spring, summer, fall, and winter. For example, researchers used telemetry to study muskies (muskellunge) on a 70-mile stretch of the Mississippi River from Brainerd to Sartell. Thirteen muskies, ranging in length from 36 to 48 inches, received surgical implants of small radio transmitters. Using the signals, the researchers tracked the muskies' seasonal movements, studied their use of

habitat, and discovered where the fish spawn (reproduce).

## SNAKE CHASE

**t**elemetry helped wildlife researchers track and study bullsnakes in the grasslands of Crow Hassen Park Reserve, west of Minneapolis. Once plentiful in prairie habitat, bullsnakes disappeared as farms and roads changed the land. When researchers reintroduced bullsnakes to the park's grassland areas, they wanted to see how the snakes adapted. So, in 1991, they

**Minding moose.** A helicopter prepares to leave after wildlife biologists attached a radio collar to a moose. Big as they are, moose are not easy to find because they live in large, often remote areas.



U.S. FISH AND WILDLIFE SERVICE

MINNESOTA CONSERVATION VOLUNTEER

implanted six bullsnakes with tiny radio transmitters and followed their slithering movements for 18 months. In 1992 they recaptured the snakes and removed the transmitters.

The researchers discovered that bullsnakes move around more than anyone had previously thought they did. In a week, one snake traveled at least a mile from one spot to another. Depending on the route it crawled, the snake might have covered even more ground.

By going to see the snakes' location, the researchers learned that in the

summer the snakes spend 60 percent of their time living underground, often in gopher burrows. When above ground, the snakes stay under a layer of dead grass and other plants.

From the telemetry study, researchers learned that bullsnakes need large blocks of grassland without roads to survive. Crossing roads is deadly to bullsnakes.

At least 640 acres of land (about one square mile) is needed to support enough adult snakes to reproduce enough young to keep the snake population going.

JOHN MORIARTY



**Inside snakes.** A bullsnake has surgery to implant a radio transmitter in its body. A mask covers the snake's head and delivers anesthesia before surgery. The transmitter will allow researchers to track the snake's movements in open country as it slithers into sandy burrows to find rodents to eat. Minnesota's longest snake has become less common because of being run over by cars and losing habitat as farms and houses have taken over grasslands.

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## STRANGE BEEPS

**W**hat happens if an animal with a transmitter dies? The transmitter has a switch inside that detects animal movement. When the animal does not move for a long time, the transmitter beeps at a different rate. This tells the listener that the animal might have died. Researchers then find the animal and investigate the cause of death.

**Just right.** Radio collars come in all sizes. At left, a thick leather collar, as big as a man's belt, will fit a moose. An elastic radio collar (center) works well for a fawn because it expands as the young deer grows. At right, a ring-sized collar of plastic-coated wire suits a mouse perfectly.

## MOOSE MEANDERS

**One** DNR moose study is trying to answer the question of why northwestern Minnesota has fewer moose today than it had years ago. The population has dropped from more than 4,000 moose in the early 1980s to fewer than 300 in 2003.

For the five-year study, researchers captured 152 moose and fitted them with radio collars or radio ear tags. They took samples of blood, hair, and feces (droppings), and later tested the samples in a laboratory. They found major problems: Most moose had parasites (liver flukes, brainworms, winter ticks, lungworms), and most had low amounts of copper (a trace element needed to be healthy).



DEBORAH ROSE

MINNESOTA CONSERVATION VOLUNTEER



- Adopt-A-Moose, run by DNR and U.S. Fish and Wildlife Service, reported results of a radio-telemetry study of north-western Minnesota moose completed in 2000. Visit [midwest.fws.gov/agassiz/moose/adopt.html](http://midwest.fws.gov/agassiz/moose/adopt.html).
- Highway to the Tropics is a 1995–2002 project to track the migratory routes, stopovers, and wintering grounds of Swainson's hawks and ospreys. Visit [www.raptor.cvm.umn.edu/content.asp?page=3000](http://www.raptor.cvm.umn.edu/content.asp?page=3000).
- Advanced Telemetry Systems, Inc., Isanti, sells equipment and offers advice for wildlife telemetry. See [www.atstrack.com](http://www.atstrack.com).
- Eyes on Wildlife offers hands-on wildlife study opportunities for students. See [www.mnstate.edu/regsci/eyes/project.html](http://www.mnstate.edu/regsci/eyes/project.html).

In the following study years, researchers were able to get close enough to radio-collared female moose to collect droppings for pregnancy tests. They found fewer than half of the females were pregnant most years.

## DEER IN WINTER

For 13 years the DNR Wildlife Research Unit at Grand Rapids has been using radio telemetry to study white-tailed deer in north-central Minnesota. The goal is to see

*Jan Welsh is a wildlife education specialist for DNR Nongame Wildlife Program. Bob Welsh is acting DNR wildlife manager for the central Minnesota region.*

how much deer use conifers, especially northern white cedar and balsam fir, and determine just how important conifer stands are to winter survival of deer.

Researchers have captured and radio-collared almost 400 female deer, including 43 newborn females. They have also radio-collared 47 male fawns. The electronic tracking enables the researchers to answer questions about migration patterns, the number of deer that survive each year, causes of death, number of newborns, where the deer live, and how they use their habitat.

The researchers are studying how changes in snow depth and outdoor temperatures might lead to changes in deer habits and survival. ●

NOVEMBER–DECEMBER 2003

Adapted for this field day. View the original file online at [https://files.dnr.state.mn.us/mcvmagazine/young\\_naturalists/young-naturalists-article/telemetry/wiredlife.pdf](https://files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/telemetry/wiredlife.pdf)

## **Getting that Calf Halter Broke**

Matt Warren

Halter breaking a show calf can be a long process. It takes commitment and consistency on your part to make the process easier. Many steps, time, lots of hard work, and patience needs to be involved to make it a successful project.

One thing to remember is that cattle are sort of like people, they all have different types of personalities. Some good and some you do not want to be around. Remember this when you go to pick out your show calf. If you look at a pasture of calves and one picks their head up and runs the other way before you even go through the gate, no matter how good they look, don't even consider them. Trust me... it just makes your project no fun and it is not worth it. Look for a reasonably calm calf. This sometimes reflects on how the breeder handles their calves along with genetics. Some cattle are not used to people when they come out of a big herd, so it is imperative that you move quietly and calmly around these animals. They have what is called a flight zone. This is basically the same as your personal space. You do not want someone you may not know in your personal space. This is considered a flight zone with cattle.

When halter breaking your calf, this is your attempt to decrease their flight zone. This takes patience. Growing up, I used to put a halter on the calf in the chute at the producer's place, then put it on a trailer and bring it home. We would tie it to a fence and feed and water it right there tied up. I would try to slowly get close to them without it trying to catch me or trying to break the rope. As I got into college in Kansas, I talked with other show cattle people that would halter break and learned some interesting ways to make this job easier. There is not a wrong or right way, but there are different ways. If your parents showed cattle, they had their own way of halter breaking. It worked for them so don't think it was a wrong way. It may just be a different way.

### **Getting Them Home**

I would suggest letting them settle in for several days before you start to handle them. Remember they are in a totally new area so they are stressed and not sure of their surroundings. I encourage you to spend some time just sitting by the pen, maybe when you feed them. This will get the process started of them getting to know you and used to you being around them. Once you feel they have settled in, then you can start to work with them.

### **Time to Start**

I like to start in a 12 x 12 to a 16 X 16-foot pen. I put four panels together if needed. Stand in the center and keep a show stick with you. The calf will circle around you looking for a way out. Make sure the panels are anchored down as I have seen them try to go under and lift the panels up with their head. They will continue to circle you. When they stop, take a step away from them (This is relieving the pressure as a reward for them stopping). When

they seem to settle a little more, use the show stick as an extended arm. Just lay the stick on the animal's back. Their instinct is to move away from it. Try to keep it on them until they stop, then relieve the pressure by taking it off. Then do it again and again. Scratch them on the back or hip. When they are comfortable with the stick, then take a step with your arm stretched out with the stick. Try to scratch them. (Remember never face them head to head and always try to touch them from behind the shoulder or the point of the shoulder). You are breaking down their flight zone at this point and allowing them to know you are not there to hurt them. Continue to do this and when the calf looks comfortable and seems to be a little relaxed, walk away from the calf for about 15 seconds then walk to them again. This will get them used to you walking up to them.

### **Haltering the Calf**

I use a rope halter with a slide ring so when the calf walks to you, the pressure is relieved. I will take the halter and rub them with it, just like I am rubbing the calf but keep the halter in your rubbing hand. This will allow the calf to realize the halter is not going to hurt them. If the animal allows, ease it over their head. Most of the time I use the show stick to "fish it" over their head. Once the halter is on, I will pull the calf to me from the side. This is when they realize the halter is on. Be patient if they run around. This is the reason I like to use a small pen. As they get used to it, gently pull them to the side. When they take a step then relieve the pressure and give back to them. This is sort of a reward for them. Every time they take a step give back to them.

### **The Lead**

After I feel comfortable with how they react to the halter, I will then turn them into a larger pen so there is more room to practice. I stand at the end of the rope to pull them off to the side. When they cross over and take a step to you, relieve the pressure. Keep repeating this until they continue to walk with you. Patience pays in this process. Remember, when you pull head to head with an animal, they will most likely just lock up and hold tight and then you are in a tug-a-war contest. Always pull them off to the side. This will pull them off balance and they will have to take a step towards you. Stay committed and consistent with this process and your calf will learn to lead.

### **Show Time**

When working with a show calf, consistency will always pay off. The more time you can spend with them, the easier the showmanship techniques will be evident. Walk them around the yard. Practice setting them up without the show stick. Use the halter as your forward and reverse when setting them up. When you are about to stop, turn and walk backwards and watch the animal walk into place. Use the halter to back them up a step or to pull them forward a step. The quicker you can get them set up in the ring, the better chance of you getting called back in showmanship. Do not ever stop learning or listening. Watch other people at shows and critique them. Then listen to what the judge says about their showing technique. A reason you see some of the same people getting called back

time and time again is not because they have an expensive calf or because of who they are. It is because they have put in the time at home and practiced with their calf.

Some good slogans to remember:

**“Practice like you’ve never won. Perform like you’ve never lost.”**

**“Find a good animal and outwork everyone else.”**

**“Never hope for it more than you work for it.”**

## **Feed N' Stuff**

Chris Prevatt, Christa Kirby, and Julie Warren



Feed costs can account for a large proportion of cash costs in beef cattle operations. Today we will take a deeper look at supplementing beef cattle. Energy and protein supplementation are often required to properly balance diets for growing cattle and for meeting the nutritional needs of lactating cows. This is especially true when low quality stored forages are the majority of the diet, as is often the case during the winter hay feeding period.

### **Energy**

Corn (88% TDN, 9% CP)

Citrus Pulp Pellets (79% TDN, 7% CP)

Energy is a critical nutrient in all beef cattle diets. Energy provides the body with the ability to do work. For Beef Cattle, work includes growth, reproduction, movement, feed digestion, and for Cows, lactation. Sometimes, energy supplementation is needed to meet the animal's nutrient requirements. In beef cattle rations energy is usually expressed as Total Digestible Nutrients (TDN). Protein, carbohydrates, and fats provide the energy in beef cattle diets. Beef Cattle require energy for grazing, traveling, growth, fetal development, milk production, maintenance, reproduction, and digestion. When digestible energy becomes limiting in beef cattle diets, both intake and animal performance can suffer. For optimal animal performance, adequate amounts of digestible energy are required!

### **Protein**

Cottonseed Meal (76% TDN, 41% CP)

Dried Distillers Grain (89% TDN, 28% CP)

Corn Gluten Feed (80% TDN, 22% CP)

Whole Cottonseed (95% TDN, 23% CP)

Molasses is another protein supplement option. It is derived from raw sugarcane during the refining process. It has been used to supplement low quality forages throughout Florida for years. Molasses is highly palatable and easy to get cattle to eat. Traditionally, molasses is delivered to the cattle through lick tanks or tubs. This is a very flexible form of

supplementation as other feeds or products can be added to make a slurry. This allows cattle producers to better meet their animal's nutritional requirements.

Protein is a critical nutrient in all beef cattle diets. Sometimes, protein supplementation is needed to meet the animal's nutrient requirements. In beef cattle rations energy is usually expressed as crude protein (CP). Protein is one of the main building blocks of the body. It is a major component of muscles, the nervous system and connective tissue. Adequate dietary protein is essential for maintenance, growth, lactation, and reproduction. Young, growing cattle, in particular, need relatively high levels of crude protein in their diets to support muscle growth. Some signs of protein deficiency include reduced appetite, weight loss, poor growth, depressed reproductive performance, and reduced milk production. Providing adequate protein in beef cattle diets is important for animal health and productivity, as well as ranch profitability.

### **Fiber**

Cottonseed Hulls (45% TDN, 5% CP)

Mixed Grass Pasture Hay (50% TDN, 9% CP)

Fiber is all about keeping the rumen functional. Cottonseed hulls and Mixed Grass Pasture Hay are popular in drylot situations because they satisfy the "roughage factor" in the rumen. For the rumen to work correctly, it has to have a slowly degrading fiber that will scratch the walls of the rumen to stimulate muscle contractions in the wall of the rumen. This keeps the contents of the rumen agitating, this is just like the contents of a washing machine, this allows the microorganisms to attach to the material and begin fermentation. In pasture situations, the forages that livestock eat supply the fiber needed for the "roughage factor" in their diets.

### **Forages (Bahagrass, Bermudagrass, Limpograss, Stargrass, Crabgrass, etc.)**

Beef cattle diets in Florida are primarily forage based. The energy and protein composition of forages typically varies by forage species, soil nutrients, and forage maturity. Cool-season annual forages like annual ryegrass tend to contain higher crude protein levels than warm-season forages like bahiagrass. Forage quality generally decreases with increasing forage maturity. As plants mature, cell walls become more lignified and less digestible. Forage digestibility declines tremendously when forages become over mature before cutting or grazing. High temperatures tend to increase plant lignification (production of the indigestible compound lignin), thus lowering digestibility in forages. Highly lignified forages are slower to digest than less lignified forages and feeds. Increasing lignin levels in forages cattle consume increases time the forage spends in the rumen, decreases dry matter intake, and reduces animal performance. While many factors affect forage digestibility and ultimately TDN, the primary factor producers can control is forage maturity.

## **Minerals**

It is essential for cattle to have access to trace minerals. These minerals are used for the metabolic process associated with growth, health, and reproduction. Grazing cattle are often deficient in trace minerals. Cattle on feed and forage should be supplemented with trace minerals regularly. Some ways to supplement are through free choice where animals have access at all times, injectable, and block, just to name a few. Each method has advantages and disadvantages. You have to choose what method fits best with your operation.

## **Water**

Water is the most essential nutrient in cattle diets. Without water they will die. It is essential that a safe supply of drinking water be provided. Water is required in cattle diets for body temperature regulation, growth, reproduction, lactation, metabolism, mineral balance, and many other body functions. Water intake can vary throughout the year depending on things such as dry matter or feed and forage intake, stage of production, outside temperature, and humidity in their environment.

## **Summary**

Digestible energy, as compared to crude protein, is more likely to be deficient in forage-based beef cattle diets in Florida. Protein, carbohydrates, and fats serve as energy sources in beef cattle diets. There are several options available for supplemental energy, protein, and fiber sources for beef cattle diets. Young, growing cattle and lactating cows are classes of cattle most likely to require energy and protein supplementation. Prices, forms, and nutrient density of supplements vary widely. For more information on supplementation and forage in beef cattle diets, please contact your local UF/IFAS County Extension office.

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## **Plants: To eat or not to eat?**

Brent Sellers and Clay Cooper

Why do plants contain poisonous substances? Well, let's think about a plant. It cannot move, meaning they have to sit in one place and deal with their environment. So, they need to be able to defend themselves. Plants do this in a variety of ways, but one common way is through chemical production within the plant. These chemicals are sometimes poisonous to humans and/or animals. Sometimes these poisonous chemicals are found throughout the plant, only in certain parts of the plant, or are only present in unripened fruit.

Obviously, it is to our benefit to learn as much as possible about plants, especially if you enjoy the outdoors. In the Midwest, for example, poison hemlock looks very similar to wild carrot, which also looks like the domestic carrot people grow in their gardens. In other plants, certain growth stages are safer than others. One common plant that is found in Florida and has this characteristic is common pokeweed. This plant is fairly non-toxic during the early stages of growth in the spring, but becomes toxic as the plant matures. In other plants, you can only eat the ripe fruits, as the green fruits are usually poisonous.

### **How plants poison:**

1. Ingestion – A person/animal has to eat part of a poisonous plant.
2. Contact – A person/animal has to contact a plant that causes skin irritation.
3. Absorption/Inhalation – A person/animal absorbs the poison through the skin or inhales it into the respiratory system.

There is a range to plant poisoning. Some plants cause only minor discomfort (upset stomach, headaches), while others can cause death. A common question is “How poisonous is this plant?” It is extremely difficult to know how poisonous a particular plant is because:

1. Some plants require contact with a large amount of the plant before noticing any adverse reaction, while others may cause death with only a very small amount.
2. Every plant varies in the amount of toxin produced due to different growing conditions as well as the age of the plant (older plants tend to contain more poison – but this is not always true).
3. Every person has a different level of sensitivity to toxic substances.

It is very difficult to know if an unknown plant is poisonous or not. Some people will watch animals to see if they will eat an unknown plant. Does this mean that humans can eat the same plant that animals eat? Not necessarily. There are several misconceptions about poisonous plants:

1. *Watch the animals and eat what they eat.* While this is usually true, some animals can eat plants that are poisonous to humans.
2. *Boil the plant in water and any poisons will be removed.* This is true for young shoots of common pokeweed as well as some other plants, but boiling does not remove all poisons of some plants.
3. *Plants with a red color are poisonous.* Some plants that are red are poisonous, but not all.



Reading these common misconceptions, it is easy to see that there is no “golden rule” that tells us if a plant is poisonous. Learning as much as possible about plant species is the only way you will know if a plant is poisonous.

### **Reasons plants contain poisonous or potentially poisonous compounds:**

1. Plants cannot move, but they defend themselves through “chemical warfare” or through other means (thorns, prickles, irritants).
2. Discourage herbivores from eating it by making compounds that discourage, sicken, or kill a herbivore:
  - a. Discouragement: compounds which make the plant taste bitter
  - b. Sicken: compounds which cause nausea, diarrhea, etc.
  - c. Kill: compounds that results in death
3. Timing and place of chemical production is often well choreographed to manipulate animal behavior. For example, the green tomato contains tomatine causing intestinal irritation. This discourages animals from eating the fruits when seeds are immature. After ripening, the toxic compound decreases and animals will find it attractive, eat the fruit and spread the seed.
4. Some animals and insects use toxic plants to their advantage. For example, the monarch butterfly uses milkweed nectar as a food source. Milkweed contains a cardiac glycoside. Birds that prey on monarch butterflies often leave the butterflies alone if they have been feeding on milkweed, because the butterflies have a bitter taste.
5. Animals are not the only target. Some plants also make compounds that are lethal to other plants. This is called allelopathy.

### **Types of Poisonous Compounds and Plants:**

1. Poisonous plants.
  - a. Alkaloids. These are nitrogen-bearing alkaline chemicals that originate in plants. They are derived from amino acids, the building blocks of proteins, which especially affect the nervous system. At least 40% of all plant families include plants that contain these compounds. Many plants have different alkaloids present, each with a specific activity. Some alkaloids are useful medicines; others are harmful, even fatal. Most are bitter tasting. The liver, with the assistance of enzymes, processes the alkaloids that enter the body, rendering some harmless there, while making others more toxic. One common alkaloid, which many of us seek daily, is caffeine.
    - i. elderberry
    - ii. jimsonweed
    - iii. Mexican prickly poppy

- b. Cardiac glycosides. Glycosides are toxins in which at least one sugar molecule is linked with oxygen to another compound, often nitrogen-based. They become harmful when the sugar molecule is stripped off, as in the process of digestion.
  - i. elderberry
  - ii. clover
  - iii. bracken fern
  - iv. oleander
  - v. lima beans (ones in the store are not poisonous-toxin has been reduced by plant breeding techniques)
  
- c. Cyanide. Cyanogenic glycosides are present in many plants and are converted to hydrogen cyanide or prussic acid when plant cells are damaged. The concentration of cyanogenic glycosides within a plant is variable: growth stage, moisture and time of day can all influence plant cyanogenic glycoside levels. Fertilization and herbicide application can increase cyanogenic glycoside concentrations. Chronic cyanide poisoning from eating sublethal doses over time causes loss of nerve function. Acute cyanide poisoning causes death.
  - i. cherry species
  - ii. johnsongrass
  - iii. many fruit trees (leaves and seeds)
  
- d. Others
  - i. Castor bean: ricin
  - ii. Pokeweed: phytoaccigenin and phytolaccatoxin
  - iii. Rosary pea: abrin
  - iv. Avocado: unidentified (seeds, leaves, twigs, bark)

## 2. Plants that cause mild discouragement.

- a. Oxalic acid. Oxalates are unstable salts of oxalic acid. When eaten, they break down to release the highly poisonous acid. The sour flavor of sorrel (*Rumex* species), wood sorrel (*Oxalis*), and even rhubarb is due to the presence of the acid. Some plants may contain differing amounts of potassium or calcium salts, rendering them unsafe, particularly in the buckwheat and goosefoot families.
  - i. yellow woodsorrel
  - ii. rhubarb (not common in Florida)
  - iii. philodendron
  - iv. caladium

- b. Saponins. Saponins are glycosides with a distinctive foaming characteristic. They are found in many plants, but get their name from the soapwort plant (Saponaria), the root of which was used historically as a soap. Some saponins reduce the feed intake and growth rate of nonruminant animals while others are not very harmful. For example, the saponins found in oats and spinach increase and accelerate the body's ability to absorb calcium and silicon, thus assisting in digestion. Certain pasture weeds contain substantial quantities of dangerous saponins and result in life threatening toxicities for certain animal species.
  - i. potatoes
  - ii. tomatoes
  - iii. yucca
  - iv. asparagus fern
  
- c. Tannins. Tannins are naturally occurring plant compounds. Their main characteristic is that they bind and precipitate proteins. They can have a large influence on the nutritive values of many foods eaten by humans and animals. Tannins are common in grapes, persimmon, blueberry, tea, legume forages, and legume weeds (hemp sesbania).
  - i. hemp sesbania
  - ii. corn
  - iii. grapes
  - iv. persimmon
  - v. blueberry

## Poisonous Plant References

### Books and Flip-decks:

Poisonous Pasture Plants of Florida – University of Florida, Circular SP 457. Contact the IFAS Bookstore: <http://ifasbooks.ifas.ufl.edu/>

Approximate cost: \$10

Poisonous Plants of the Southeastern United States – University of Florida, Circular SP57. Contact the IFAS Bookstore: <http://ifasbooks.ifas.ufl.edu/>

Approximate cost: \$12

A Guide to Plant Poisoning of Animals in North America by A.P. Knight and R.G. Walter.

Approximate cost: \$70

### Websites:

Cornell University: <http://www.ansci.cornell.edu/plants/index.html>

Purdue University:

[http://www.extension.purdue.edu/extmedia/WS/WS\\_37\\_ToxicPlants08.pdf](http://www.extension.purdue.edu/extmedia/WS/WS_37_ToxicPlants08.pdf)

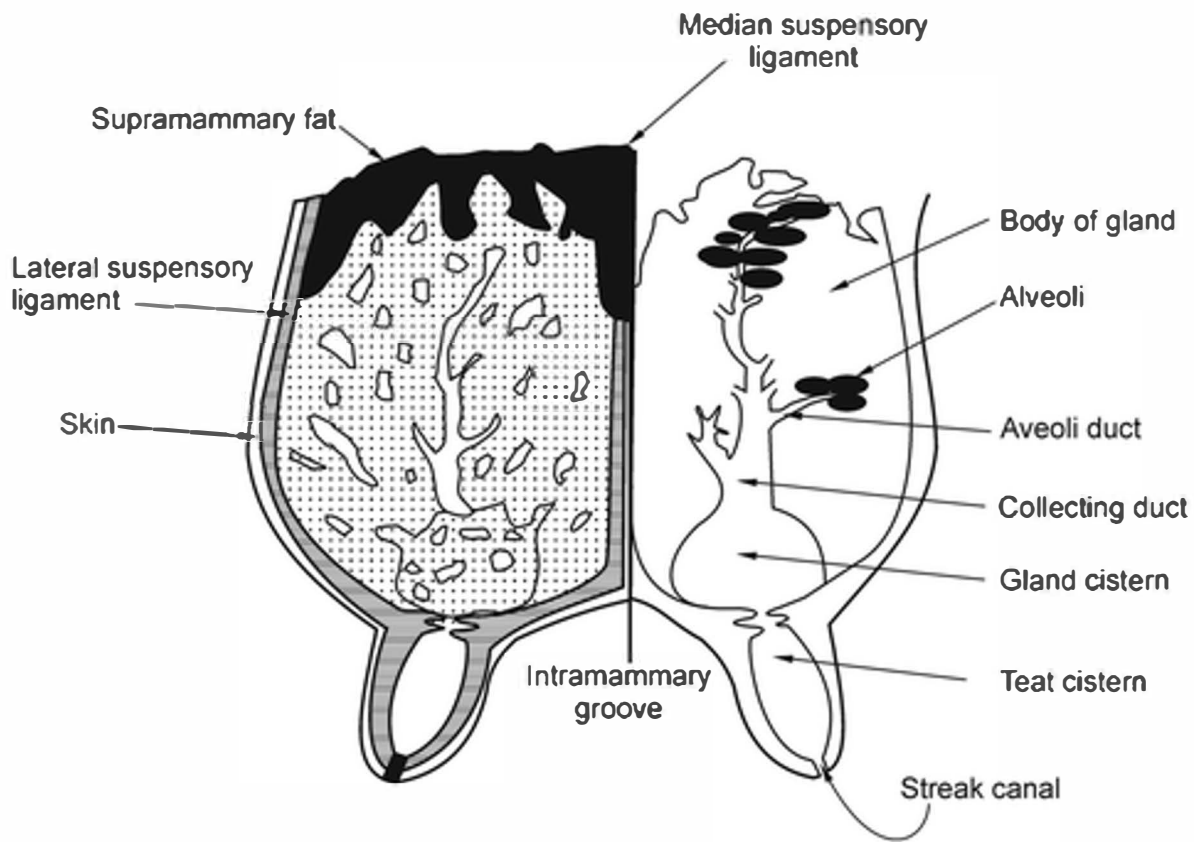
University of Pennsylvania: <http://research.vet.upenn.edu/poisonousplants>

### Common Plants that are Toxic to Livestock in Florida

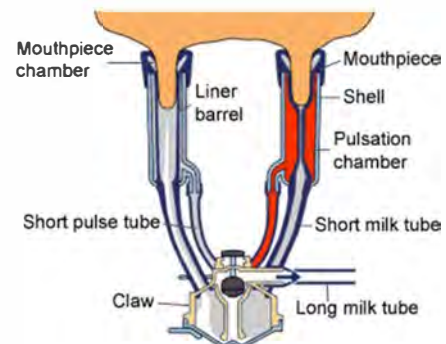
Common Name	Genus and Species
atamasco lily	<i>Zephyranthes atamasca</i>
autumn sneezeweed	<i>Helenium autumnale</i>
bitter sneezeweed	<i>Helenium amrum</i>
black cherry	<i>Prunus serotina</i>
black locust	<i>Robinia pseudoacacia</i>
black nightshade	<i>Solanum nigrum</i>
bladderpod	<i>Glottidium vesicarium</i>
bracken fern	<i>Pteridium aquilinum</i>
buttercup	<i>Ranunculus sardous</i>
castor bean	<i>Ricinus communis</i>
chinaberry	<i>Melia azederach</i>
Chinese tallow tree	<i>Sapium sebiferum</i>
Choke cherry	<i>Prunus virginiana</i>
coffee senna	<i>Senna occidentalis</i>
common buttonbush	<i>Cephalanthus occidentalis</i>
common cocklebur	<i>Xanthium strumarium</i>
common yarrow	<i>Achillea millefoium</i>
eastern baccharis	<i>Baccharis hlififolia</i>
fetterbush	<i>Leucothoe axillaris, racemosa</i>
fly poison	<i>Amianthium muscaetoxicum</i>
great laurel	<i>Rhododendron maximum</i>
hairy vetch	<i>Vicia villosa</i>
horsenettle	<i>Solanum carolinense</i>
jimsonweed	<i>Datura stramonium</i>
johnsongrass	<i>Sorghum halepense</i>
lantana	<i>Lantana camara</i>
laurel cherry	<i>Prunus caroliniana</i>
maleberry	<i>Lyonia ligustrina</i>
Mexican pricklepoppy	<i>Argemone mexicana</i>
milkweed	<i>Asclepias spp.</i>
mountain laurel	<i>Kalmia latifolia</i>
mustard	<i>Brassica spp.</i>
oleander	<i>Nerium oleander</i>
perilla mint	<i>Perilla frutescens</i>
poison hemlock	<i>Conium maculatum</i>
poison ivy	<i>Toxicodendron radicans</i>
poison oak	<i>Toxicodendron toxicarium</i>
poison sumac	<i>Toxicodendron vernix</i>
pokeweed	<i>Phytolacca americana</i>
rattlebox	<i>Sesbania punicea</i>
red buckeye	<i>Aesculus pavia</i>
red maple	<i>Acer rubrum</i>
redroot pigweed	<i>Amaranthus retroflexus</i>
hemp sesbania	<i>Sesbania exaltata</i>
showy croton	<i>Crotalaria spectabilis</i>
sicklepod	<i>Senna obtusifolia</i>
spotted water hemlock	<i>Cicuta maculata</i>
St. John's wort	<i>Hypericum spp.</i>
sweet clover	<i>Melilotus spp.</i>
sweetshrub	<i>Calycanthus floridus</i>
yellow jessamine	<i>Gelsemium sempervirens</i>

# Milk It! Lactation Station

Colleen Larson and Lauren Butler



## Milking Unit (Teat Cup Cluster)



# Reproduction Deconstruction

Sonja Crawford, Taylor Davis, and Liz Palmer

## Definitions

**Cervix** – Located between vagina and uterus. It is the structure consisting of thick dense connective tissue. Annular folds (rings or ridges) within the cervix may be distinguished by rectal palpation. It forms a barrier between the internal and external environment. The cervix is considered one of the landmarks when palpating.

**Estrogen** – This hormone is produced by the follicle in non-pregnant females and placenta in late pregnancy. Induces heat.

**Follicle Stimulating Hormone (FSH)** – This hormone causes the ovaries to produce estrogen.

**Fornix Vagina** – Is the first ring of the cervix that protrudes into the vagina and produces a pocket between the wall of the vagina and cervix.

**Lutenizing Hormone (LH)** – Is the hormone that causes the formation of the Corpus Luteum.

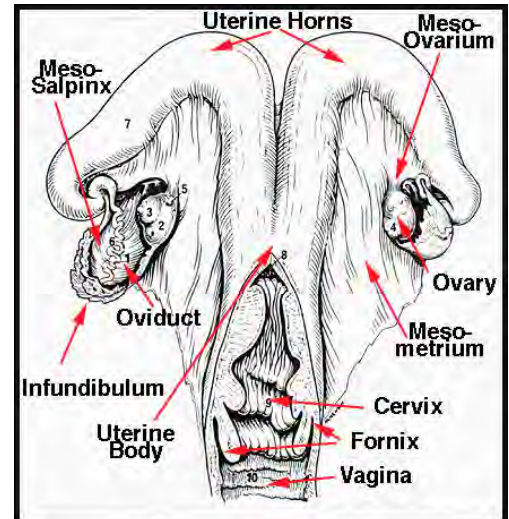
**Ovary** – Considered the primary reproductive organ of the female. Ovaries suspend from the broad ligament near the end of the oviduct and lie near the tips of the curved uterine horn. Ovaries produce eggs and hormones involved in regulating the estrous cycle and pregnancy.

**Oviduct** – The oviducts are approximately 10 inches long, ¼” in diameter and lies between each ovary and tip of the adjacent uterine horn. It is the place where fertilization takes place once the sperm and egg meet. After fertilization, the fertilized egg is transported to the uterus.

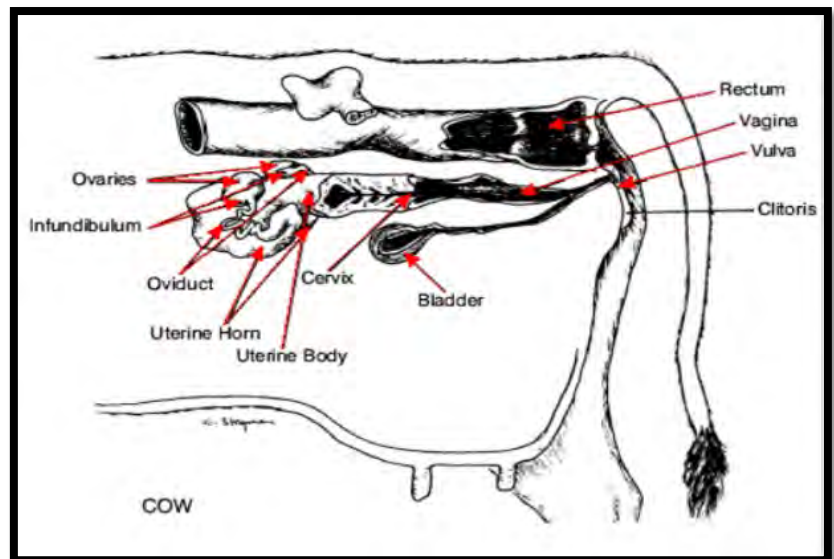
**Ovocyte** – Immature egg produced by the ovaries.

**Progesterone** – Hormone produced by the Corpus Luteum and is the maintenance of pregnancy. This hormone keeps the female out of heat. Relaxes uterus.

**Uterine Horn** – The place where the embryo develops.



[http://www.ansci.wisc.edu/ijp1/ansci\\_repro/lec/lec1\\_female\\_anat/female\\_images/images\\_label/cow\\_tract\\_drawing\\_l.jpg](http://www.ansci.wisc.edu/ijp1/ansci_repro/lec/lec1_female_anat/female_images/images_label/cow_tract_drawing_l.jpg)



<https://afghanag.ucdavis.edu/educational-materials/files/cattle-management/edliveafgpurdueunitblesson1anatomyphysiologyanimalreproductionlp.pdf>

**Uterus** – The uterus contains a body and two horns. Passageway for sperm cells from the cervix to the oviduct. This is where the fetus will be housed, protected, and nourished throughout pregnancy.

**Vagina** – Located between the opening to the bladder and the cervix. It is the semen deposit area and the passageway for the fetus at the time of birth.

**Vestibule** – Is part of the reproductive tract shared with the urinary system. It is the portion of the vagina anterior to the clitoris extending to and including the urethral opening.

**Vulva** – The external part of the reproductive tract. The thickened folds of skin of the structure are sensitive to changes in estrogen, the hormone responsible for estrus (heat). Provides protection to minimize entry of foreign material into vagina.

After a 283-day gestation period, approximately 9 months later...

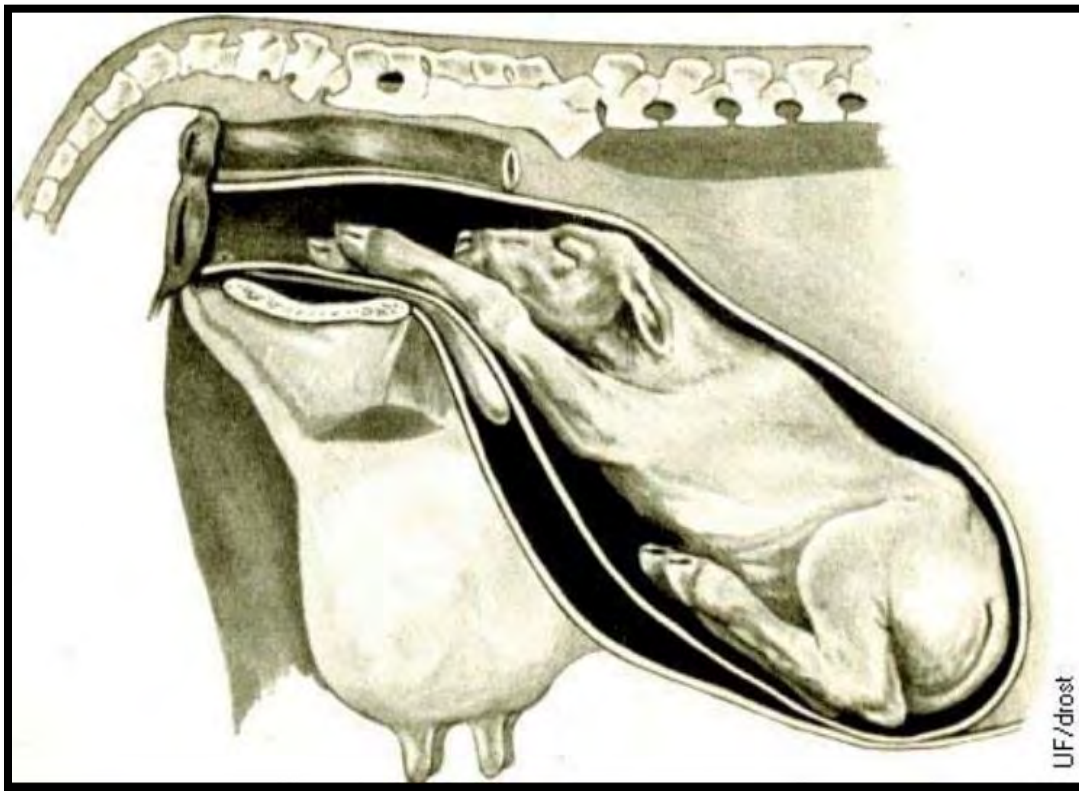


Image used with permission from Maarten Drost DVM, Dipl ACT, Professor Emeritus, College of Veterinary Medicine, University of Florida.

Source:

'Visual Guides of Animal Reproduction'

Website: <https://visgar.vetmed.ufl.edu>

Visit this website for an excellent educational resource on beef cattle reproduction 'The Visual Guide to Bovine Reproduction.'

Guides are also provided for bubaline, canine, caprine, equine, ovine, and porcine reproduction.