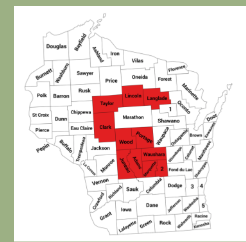
Extension
UNIVERSITY OF WISCONSIN–MADISON

Extension Central News



Summer Edition 2023

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EXTENSION CENTRAL NEWS

A cooperative effort of multiple Central Wisconsin Counties and Wisconsin Extension.

Our Mission

To be the primary source of research based agricultural information and education for the agricultural community in Central Wisconsin.

Artificial Insemination Course:

This will be a hybrid course with both online sessions and in person sessions. Attending all sessions is required to complete this course.

Evening classroom sessions will occur via Zoom on October 10th and 11th from 7 - 9 pm.

In-person sessions will occur on October 19th from 4 - 6:30 pm and on October 20th from 9am to noon. If needed, attendees are responsible for their overnight accommodations in the Dorchester area (not included in the registration fee for this program.)

Fee: $95.00 per person

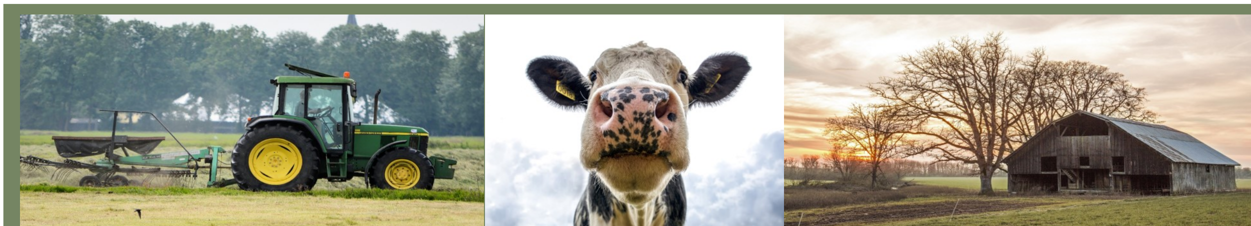
Location for October 19th and 20th for the in-person session:

Bach Farms

W861 Co Rd A

Dorchester, WI 54425

Register at: https://go.wisc.edu/ai



Handle Vaccines and Equipment with Care

By Sandy Stuttgen, DVM, Agriculture Educator, UW Madison Division of Extension Taylor County

Vaccinations are part of many herd health programs. Multi-dose (repeater) syringes are commonly used for vaccinating groups of animals. Transfer needles are used to quickly and cleanly mix vaccines. Our handling of both vaccines and vaccinating equipment can cause undesirable consequences including rendering the vaccine in-effective and harming the animal.

Vaccines are destroyed by heat and sunlight. Both modified live and killed vaccines need to be always kept cool (never frozen) and away from sunlight during storage and administration. Use chute-side coolers and ice packs to keep vaccines and the syringes used to administer them cold and in the dark. If purchasing them online, make sure vaccines arrive cold on ice-packs, and if purchasing them directly from a supplier, be sure to transport them on an ice pack in an enclosed container (box, bag or cooler) so they don't get exposed to sunlight.

The risk for inactivating vaccines, and the risk for tissue irritation or abscess formation increases when contaminated syringes and transfer needles are used. Properly cleaning, sanitizing, and storing multi-dose syringes and transfer needles will reduce contamination from many viruses, bacteria, and fungi.

TWO TYPES AVAILABLE

Disposable multi-dose syringes and vacutainer needles (which may be used as a transfer needle) are available. These are sterile out of the package for use during one processing event. Change the syringe if the inside of the barrel or tubing becomes contaminated (for example with dirt, blood, or body fluids). Read the label to determine if these syringes may be re-used after sanitizing with heat. Use a new vacutainer needle each time a product is mixed, as they are single-use items.

Non-disposable multi-dose syringes and transfer needles should be manufactured to withstand heat sanitization but read the label to verify that. Change to a previously cleaned and sanitized syringe or transfer needle during processing if the inside of the needle, barrel, or tubing becomes contaminated.

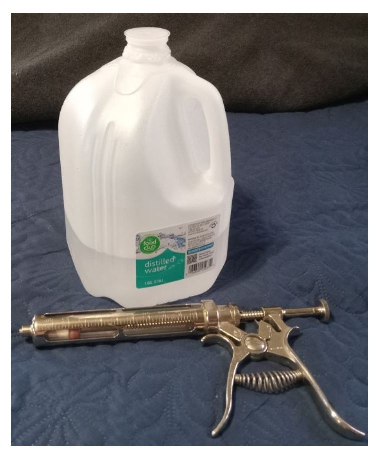
Small herd owners should decide if the time and labor required for cleaning, sanitizing, and correctly storing multi-dose syringes and transfer needles between events is better served by using disposable products.

CLEAN and HEAT SANITIZE

Multi-dose syringes and vacutainer needles must be properly cleaned, heat sanitized and stored between uses. To accomplish this, you will need a clean work area, stove, or microwave, tap (potable) water, a small scrub brush, distilled or deionized (purified) water, and a thermometer to measure the water temperature. Wash and dry your hands before starting. The steps described here use only tap and purified water and do not render the equipment sterile. While not killing all microbes, these steps are acceptable for cleaning and sanitizing this equipment.

1. Begin by brushing the syringe exterior and mechanism in warm tap water. Use a mild soap if the exterior is excessively dirty but keep soap away from the inside of the barrel and the syringe tip where the needle attaches. Repeatedly rinse with clear water.

2. Using hot (180º F) purified water, repeatedly rinse the syringe interior (barrel and/or tubing) and transfer needles. If possible, disassemble the syringe for better rinsing. Three to five rinses are adequate.



3. Boil or microwave transfer needles and all syringe parts that contact the vaccine (barrel, needle attachment, plunger, and tubing). It is not necessary to sanitize the syringe mechanism.

- Stove: bring purified water to a boil. Completely submerge the syringe or the disassembled syringe parts, and tubing. Boil for 5 minutes.
- Microwave: wrap 5-10 layers of wet paper towels around an individual syringe or its disassembled parts. If not disassembled, fill barrel with purified water. Fill the tubing with purified water. Place the wet paper towel-wrapped syringe and tubing in an open plastic resealable bag. Microwave 5 minutes on HIGH. The paper towels must remain wet otherwise they could start on fire. Multiple wet layers of paper towels will prevent sparks from microwaving metal.
- Submerge metal transfer needles in a container of purified water and microwave on HIGH for at least 2 minutes. The water must not evaporate to expose the transfer needles. Transfer needles may also be microwaved on HIGH for 2 minutes between layers of wet paper towels as described above for syringes.

4. Re-assemble the syringe while it is still warm without touching the interior surface of the syringe barrel, the syringe tip or plunger. The plunger may be lubricated by spraying it with vegetable oil or medical-grade syringe lubricant.

5. Lastly, rinse the assembled syringe with hot (> 180º F) purified water. Squirt all remaining water out of the syringe.

STORING

After cooling in a clean, draft free space, seal the assembled syringe in a plastic bag. Store in a freezer. Bring it to room temperature and rinse with hot (>180º F) purified water just prior to next use. Vaccines do not tolerate heat; let the syringe cool to room temperature (<72ºF) before filling. Allow transfer needles to drain and dry before storing them at room temperature in a clean, sealed container.

We want our vaccination program to be successful. Vaccines and the equipment used for administering them must be handled with care to avoid rendering the products ineffective or harming the animal.

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Is it Time to Retire the Moldboard Plow?

Richard Halopka, CCA
Senior Outreach Specialist
UW-Madison Division of Extension Clark County Crops & Soils

July 2022 was an end of an era. John Deere decided to end greater than 150 years of manufacturing moldboard plows. The last one will roll off the line in February of 2023.
With that, I will answer the question I've been asked many times. Should we still use a moldboard plow in crop production? Today, advancements in tillage implements, plus with changes to crop rotations and as John Deere has decided, is it time to retire the moldboard plow?

There may be a place to use a moldboard plow; however, crop rotations are producing more acres of annual crops, there are water quality concerns, need to improve soil health, and concerns with soil erosion, it may be time to retire the moldboard plow and consider a change in tillage management.

The question comes up mainly when a livestock/dairy farmer has decided to reduce his workload, retire from livestock/dairy farming, and just grow annual crops (corn, soybean, small grain).

As an educator, I need to provide some evidence that we should retire the moldboard plow. To support this observation from my days at Iowa State, I developed a case study to answer this question. A retiring dairy farmer asked if he could use a moldboard plow with a corn/soybean rotation without increasing his soil erosion potential. I developed nine exhibits in this case study. We will base the decision to or not to use a moldboard plow based on P-index. The exhibits are all six-year rotations developed using Snap-plus. A P-index correlates soil loss from RULES II calculations determined by tillage practices and phosphorus levels in the soil. The goal is a P-index below 6.

Originally, this farm family used a rotation of 3 years of hay, 2 years of corn grain or silage, and then reseed into a hay crop using a small grain cover. The allowable soil loss for a Loyal series soil is 4 tons per acre; this rotation resulted in a 1.9-ton soil loss over the rotation of 6 years. This is exhibit 1 below and it is acceptable. Review the following exhibits. All exhibits are based on a six-year rotation with a corn/soybean rotation. I will comment after to support the case removing the moldboard plow as a tillage practice.

Exhibit 1

Tolerable soil loss with crop rotation of oats/alfalfa seeding-3 years hay- corn grain-corn silage with fall moldboard plowing

RUSEL II soil loss	Rotation P-Index
1.9 tons/acre	2*

Exhibit 2

Tolerable soil loss with corn/soybean rotation with fall moldboard plowing

RUSEL II soil loss	Rotation P-Index
6.2 tons/acre	7*

Exhibit 3

Tolerable soil loss with corn/soybean rotation with spring moldboard plowing

RUSEL II soil loss	Rotation P-Index
5.9 tons/acre	6*

Exhibit 4

Tolerable soil loss with corn/soybean rotation with fall chisel plow and one spring tillage pass

RUSEL II soil loss	Rotation P-Index
4.1 tons/acre	4*

Exhibit 5

Tolerable soil loss with corn/soybean rotation with spring chisel plow and one spring tillage

RUSEL II soil loss	Rotation P-Index
3.6 tons/acre	4*

Exhibit 6

Tolerable soil loss with corn/soybean rotation with spring chisel plow of corn ground and one tillage pass in spring to soybeans and spring vertical tillage only on soybean ground to corn

RUSEL II soil loss	Rotation P-Index
3.5 tons/acre	4*

Exhibit 7

Tolerable soil loss with corn/soybean rotation with only spring vertical tillage of corn ground to soybean and soybean ground with only spring vertical tillage planted to corn

RUSEL II soil loss	Rotation P-Index
2.8 tons/acre	3*

Exhibit 8

Tolerable soil loss with corn/soybean rotation with spring chisel plow of corn ground and one spring tillage pass to soybean and spring vertical tillage only on soybean ground planted with a fall cover crop to corn

RUSEL II soil loss	Rotation P-Index
3.1 tons/acre	3*

Exhibit 9

Tolerable soil loss with corn/soybean rotation after 8 years with no-till for both corn and soybeans

RUSEL II soil loss	Rotation P-Index
0.9 tons/acre	1*

***All exhibits were developed using Loyal soil series (LoB), P = 22 ppm.**

With water quality concerns a high priority in Wisconsin, you can see from Exhibit 2 and 3, moldboard plowing is not the choice if the farmer wishes to be sustainable. With soil losses this large, the loss of soil and nutrients will contribute to surface and possibly groundwater concerns.

As a farm manager, many decisions may be difficult, but with a change in crop rotation to multiple years of annual crops, a moldboard plow may not be necessary in the future. The exception may be in organic production or coming out of a heavy sod.

Farmers should also be aware of public perception. In 2023, many people have no connection to agriculture and this past spring many people may have seen soil loss in ditches from recreational fall tillage. From the exhibits above, by not performing fall tillage, there was a half-ton reduction in soil erosion.

So, what does a 4 ton per acre soil loss entail? The soil loss depth would be the thickness of a dime across one acre. This spring people observed road ditches filled with sediment along fields with fall tillage. There is a cost to the taxpayer in a township and county to remove this sediment, which in addition to causing harm to water quality will also cost your township tax dollars to remove sediments to prevent damage to roads.

If the goal is to improve water quality, improve soil health, and have a sustainable farm, tillage management changes must be part of the discussion.

Many farmers believe soil loss is a cost of doing business. In the future it may cost the farmer more to remove sediments from roadway ditches beyond cost of purchasing crop nutrients from the soil loss off their fields.

Yes, it is time to retire the moldboard plow just as John Deere has done. It is time to evaluate what you do on your farm and understand the cost of your tillage decisions.

Water in Wisconsin is plentiful, but at some point, the public may require a farmer to pay for their soil erosion and potential harm it may cause to water quality in Wisconsin.

If you have questions about tillage practices, crop rotation, no-till, or other conservation measures to improve water quality contact your county Extension agriculture educator, land conservation office, NRCS office or myself richard.halopka@wisc.edu .

Using lab tests to estimate stability and fermentation adequacy of forages

Matt Lippert, Jackie McCarville, and Lyssa Seefeldt

Laboratory tests provide information on protein, level of fiber, digestibility of fiber, minerals, which are all factors that determine the feeding quality of the forage. Today many forage tests provide information beyond the energy and protein in the feed but also the quality of fermentation of the feed and its stability in the manger. Having efficient fermentation is critical to ensure the forages being fed are highly palatable and digestible.

There are a few lab results that tell us how well the feed is fermented which include:

- Moisture/ Dry Matter (DM).
- Fermentation acids produced: lactic, acetic, propionic, and butyric.
- Protein fraction converted to ammonia (Ammonia-CP) during fermentation.
- Protein fraction subjected to too much heat of fermentation and now bound to the fiber fraction Acid Detergent Insoluble Crude Protein (AD-ICP).
- Remaining ethanol or water-soluble sugar (ESC or WSC) fractions are not converted to acids during fermentation.

DM/Moisture: Desirable fermentation is most likely in the range of 35-45% DM or 55-65% moisture, depending on the storage structure used. Both haylages that are too wet or too dry may have poor fermentation. Dry haylage will be harder to exclude oxygen out of the silo/pile. Oxygen must be depleted to begin anaerobic fermentation. Wet forage will encourage more clostridia bacteria, prolonged, excess heat producing, digestible sugar consuming, incomplete fermentation. The sample haylage is wetter than average, but still in the range where good fermentation can be achieved.

pH: Is key for evaluating the fermentation process. For the most part, when pH is in the normal range, the lower the pH the better the fermentation. This pH is 4.24 in the range of low enough to make the feed stable.

Lactic, Acetic, Propionic, and Butyric Acids:

- Lactic acid is the predominant fermentation acid found in silages. Adequate levels of lactic acid indicate minimal dry matter losses and proper fermentation. Lactic acid production is a more efficient fermentation losing less energy through fermentation than acetic acid production does, also fermentation (drop in pH occurs more rapidly). Low lactic acid production can result from: restricted fermentation due to high DM content, restricted fermentation due to cold weather, samples taken after considerable aerobic exposure, and silages high in butyric acid.
- Acetic acid provides forage with a vinegar odor and taste but helps with aerobic stability. High levels

Product:	E Hylg	**Test Mode:**	N9
		Feed Type:	Haylage - Mixed
		Sub Type:	Mixed

		Dry Basis	90% Range*
Moisture	65.49%		
Dry Matter	34.51%		
pH	4.24		
Crude Protein	%DM	21.15	15.2 - 24.3
AD-ICP	%CP	10.17	5.02 - 13.7
ND-ICP w/SS	%CP	17.21	
Protein Sol.	%CP	60.47	34.2 - 65.6

Magnesium	%DM	0.25	0.23 - 0.40
Potassium	%DM	3.28	2.05 - 3.51
Sulfur	%DM	0.26	0.18 - 0.33
Chloride	%DM	0.94	0.17 - 1.17
Lactic Acid	%DM	4.41	0.34 - 6.51
Acetic Acid	%DM	1.32	0.11 - 3.31
Propionic Acid	%DM	0.33	0.13 - 0.42
Butyric Acid	%DM	<0.01	0.02 - 0.93

*Mixed haylage statistics provided for comparison.

Partial forage analysis report for a haylage sample. Dry matter, pH, protein solubility, and volatile fatty acids help determine if the forage had good fermentation.

can be caused by extremely wet silage, prolonged fermentation, loose packing, or slow silo filling.

- Propionic acid provides forage with a sweet smell and taste. Very low levels of this acid are found in well fermented forages.
- Butyric acid (butyrate) is often associated with wet forages and increases over time in storage, (continued, lingering fermentation of remaining sugars in the forage and lactic acid and the production of amines and ammonia. What are the negatives associated with butyric acid in the forage? Butyric smells rotten, it is objectionable to the cow and intake will drop. Also, for transition cows that are prone to risk of ketosis, butyrate is a ketone, high butyrate forages are therefore already elevated for ketones, even when the liver will produce more, pushing the cow to ketone overload more easily. The prolonged butyric fermentation will deplete digestible energy sources such as sugars and lactic acid, lowering the digestibility of the feed. Also, the development of butyric acid serves as a marker of undesirable, prolonged fermentation and increased production of amines and ammonia.

Terminology

acetic acid = acetate

lactic acid = lactate

propionic acid = propionate

butyric acid = butyrate

Typical concentrations of fermentation end products in legume, grass, & corn silages, and high moisture corn.

	Legume Silage (30 – 40% DM)	Legume Silage (45 – 55% DM)	Grass Silage (30 – 35% DM)	Corn Silage (30 – 40% DM)	High Moisture Corn (70 – 75% DM)
pH	4.3 – 4.7	4.7 – 5.0	4.3 – 4.7	3.7 – 4.2	4.0 – 4.5
Lactic Acid (%)	7 – 8	2 – 4	6 – 10	4 – 7	0.5 – 2.0
Acetic Acid (%)	2 – 3	0.5 – 2.0	1 – 3	1 – 3	< 0.5
Propionic Acid (%)	< 0.5	< 0.1	< 0.1	< 0.1	< 0.1
Butyric Acid (%)	< 0.5	0	0.5 – 1.0	0	0
Ethanol (%)	0.2 – 1.0	0.5	0.5 – 1.0	1 – 3	0.2 – 2.0
Ammonia-N (% CP)	10 – 15	< 12	8 - 12	5 - 7	< 10

DM = Dry Matter | CP = Crude Protein

Adapted from: Kung and Muck. 2017. Silage Harvesting and Storage. Large Dairy Herd Management.

Near –infrared estimates of Lactic, Acetic, Propionic and Butyric Acid. Most inoculants for haylage are primarily lactic acid producers, you can often tell an inoculated forage vs. one not inoculated by the amounts of lactic and acetic acid. Inoculated forages will be higher in lactic acid. This haylage has favorable levels of both lactic and acetic acids within the normal range found in haylage samples. Butyric acid is undesirable. Wet forages are best fed quickly before the VFA profile deteriorates.

Alfalfa is harder to ferment (drop the pH as low as quickly) than grass or corn silage, this is because alfalfa is higher in minerals that buffer the pH from acid production.

Ammonia-CP: A high concentration of ammonia in silages indicates excessive breakdown of protein caused by slow drop of pH or Clostridial fermentation.

		Dry Basis	90% Range*
Crude Protein	%DM	21.15	15.2 - 24.3
AD-ICP	%CP	10.17	5.02 - 13.7
ND-ICP w/SS	%CP	17.21	
Protein Sol.	%CP	60.47	34.2 - 65.6
Ammonia-CP	%CP	6.05	1.82 - 12.3
Sugar (ESC)	%DM	1.50	1.11 - 8.06
Sugar (WSC)	%DM	2.79	1.46 - 8.94

Section of the forage analysis report that identifies the protein fraction converted to ammonia (ammonia-crude protein) during fermentation; ethanol- and water- soluble sugar.

Depending on the total diet wet haylage may provide too much very rapidly available protein compared to dryer haylage with a more desirable fermentation.

AD-ICP: If a forage heats too much in storage, some protein will become unavailable for digestion.

ESC or WSC Sugar: Higher sugar levels indicates these sugars will be available to feed heat producing bacteria when the silage is exposed to air at feed out.

Corn silage pH, fermentation acid profile, sugar, etc. have the same implications as for haylage. Some differences between corn silage and haylage:

- Corn silage is direct harvested, often in cooler weather and has less chance for adverse fermentation as compared to a windrow lying in the field.
- As direct harvested it is "cleaner" with less field "dirt" incorporated into the feed. The test that shows this is the ash level of the feed. The soil in haylage can be a source of clostridia spores for butyric acid producing fermentation.
- Corn silage is lower in minerals and ferments to a lower pH with less buffering.
- Corn silage ferments rapidly and is high in sugar. There may still be abundant sugar after complete fermentation that will be available when the feed is exposed to oxygen at feed out. This is a potential stability problem with corn silage.
- An additional test to measure yeasts and molds may be a helpful indicator to measure feed stability.

Moisture: 64.42
Dry Matter: 35.58 (Feed Avg = 35.63)

Carbohydrates	**%DM**	**N=3**	**4 yr**
ADF	21.19	21.01	22.16
aNDF	37.18	38.80	38.88
aNDFom	35.87	37.67	37.44
Lignin	3.52	3.49	4.05
Starch	36.09	34.80	34.81
Sugar (ESC)	0.90	0.85	1.67
Sugar (WSC)	3.76	4.41	4.23
Fermentation Products			
pH	3.82	3.78	3.97
Lactic Acid	6.33	6.03	3.49
Acetic Acid	1.60	2.09	1.51
Butyric Acid	0.00	0.00	0.00

Partial forage analysis for a corn silage sample. Dry matter, pH, protein solubility, and volatile fatty acids help determine if the forage had good fermentation.

- If inoculant including *L. buchneri* is used, elevated levels of acetate will develop over time. While acetic acid production in haylage is an indicator of slower, less energy-efficient fermentation, acetate is a superior acid for stability, providing resistance against secondary fermentation at feed out. *L. buchneri* slowly produces acetate while in the storage phase and acetate will increase over time. This is desirable because of the higher sugars often found in corn silage that can make a feed unstable.

The examples provided come from two different widely used Midwestern laboratories. Be careful comparing results across labs. These labs do provide information on how the sample compares to lab averages or ranges.

Good forage must be more than simply high in energy and digestibility, it must also be well-preserved and palatable to support high production in dairy cattle.

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Drought decisions for cow/calf herds

Written by Adam Hartfiel

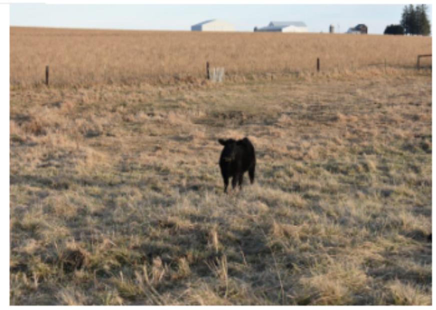

Photo by Carolyn Ihde

Rainfall through the heart of the Midwest and for most producers across Wisconsin has been a topic to avoid this past spring and summer. Hot summer days were not usually followed by stormy afternoons and much needed rainfall. Crops and pastures started to feel the hot, dry conditions in early June. Prompting conversations about reduced crop and pasture yields for all. As we approach the second half of summer and head into early fall, here are a couple things to keep in mind.

Pregnancy checks

Pregnancy diagnosis is an easy way to help make management decisions during drought or reduced forage availability. Typically, August and September are great months for ultrasounding your spring-calving cows to see if they are indeed bred for the upcoming spring. The sooner you identify open cows and heifers, the earlier you can send the open cows to market, saving feed, time, and other valuable resources. Checking replacement heifers to see if they are bred has two benefits, it will identify which animals are indeed bred, and allow open heifers to be fed out and be marketed at less than 30 months of age to maximize value. Early pregnancy in cows can be detected as early as 28-30 days after breeding when blood tests are used. These tests are typically 95-99% accurate, making decisions on marketing open animals is easier for producers right away if feed is already being stretched. Other forms of pregnancy tests like palpation and ultrasound can be performed between days 35-50. University of Wisconsin-Madison has more information available on **determining cattle pregnancy status**.

Marketing opportunities

Taking advantage of the strong market we've had this year for market cows is an option for producers trying to save their pasture and reduce or eliminate the need for purchasing forage. By marketing your older, and less productive cows, cows with bad dispositions, health problems and, cows without calves by their side, you will be saving your pasture not only for the current year, but for many more years to come. Consider marketing lactating cows that have bad feet, legs, and udders. Even though those cows may be bred back, ask yourself how long they will be able to hold a calf and themselves through a tough winter and unknown spring.

Larger cows with greater nutritional needs may also be a candidates for market if they are not fitting your operation's genetic goals. A study done by Scasra, et.al, 2015 indicated that "both moderate to large-sized cows offer advantages in calf weaning weights during extreme drought conditions due to potential advantages of balancing optimal rumen capacity and dry matter intake (DMI)." Keeping moderate to large-sized cows versus only large cows may help maintain stocking rates and forage availability when forage is limited. Holding onto cows you know will be sold later in the fall or will not make it to the next calving season will only increase internal costs, financial risks, and have potentially negative effects on cow/calf pairs already within the herd. Stay ahead of typical market seasonality this fall and make decisions early to hopefully benefit your operation in the years to come.

More information on marketing cows in your cow-calf herds and other related decisions tools can be found online following the links below.

Culling Considerations for Beef Cow-Calf Herd – Livestock (wisc.edu)

Don't let open cows eat your feed, and profits, this winter – Livestock (wisc.edu)

Plan ahead

No matter what situation you find yourself in, pre-planning options for evaluating your herd or marketing animals never hurts. Knowing where your herd stands after the breeding season will help make management decisions easier and can put you ahead of the game in terms of marketing those animals if that is the route you choose. Make a plan with your veterinarian today to check cows and heifers, order and gather supplies so you can be prepared for the weeks ahead. It is very hard to control the weather or what our yields will look like this fall, but we can control the strategies and plans we have in place to combat issues we may run into.

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