

AGRICULTURE

Pneumonia in Sheep and Goats

By Dave Van Metre, DVM, DACVIM
Professor/Extension Veterinarian,
Colorado State University

Pneumonia is an infection of the lung tissue with multiple causes. It is an important medical problem of sheep and goats of all ages. In younger animals, various bacteria, viruses, and parasites of the upper and lower respiratory tract are often involved in the development of pneumonia. In adults, these same disease-causing agents can create pneumonia.

In sheep, a systemic virus known as Ovine Progressive Pneumonia Virus (OPPV) can play an important role.

In goats, a similar systemic virus, the Caprine Arthritis and Encephalitis Virus (CAEV), can cause pneumonia.

The word "systemic" means that OPPV and CAEV are viruses that can affect multiple organs, including the lungs. These viruses can also affect the brain, udder and the joints. In certain climates, parasites (worms) can travel from the gastrointestinal tract to the lungs, causing pneumonia.

What conditions increase the risk of pneumonia?

Animals of all ages:

- Overcrowded barns with poor ventilation
- Poor sanitation — urine and feces can release gases that harm the respiratory tract, and wet bedding can cause the animals to become chilled.
- Excessive dust
- Wide variation in environmental temperature (for example, cold nights followed by warm days)
- High humidity
- Stress: Transport, birthing, heavy milk production, weaning, and fighting other diseases are examples of stresses that can make sheep and goats more susceptible to pneumonia.

Young animals:

- Failure to ingest adequate amounts of first milk (colostrum)
- Bottle feeding — if the nipple orifice on the bottle is cut too large, the milk in the bottle may flow into the lamb or kid's mouth too quickly, causing it to run down the windpipe into the lungs.

Adults:

- Infection with the OPP or CAE virus
- Is pneumonia contagious?**

Whether or not pneumonia is contagious — meaning capable of spreading from animal to animal — depends on the causative bacteria and / or viruses involved. Most viral diseases of the respiratory tract, including the OPP and CAE viruses, are contagious, and can spread among sheep and goats. Certain bacteria can be transmitted from animal to animal in respiratory secretions, but many of these bacteria reside in low numbers in the mouth and nose of normal, healthy animals. When one or more of the causative conditions listed above occur, these normal bacteria can increase in number rapidly and invade the lungs to cause pneumonia. Therefore, pneumonia can be viewed as both a contagious disease and a disease that can arise from the animal's own bacteria; the latter scenario is considered common

when causative conditions are present.

What are the signs of pneumonia?

- The earliest sign of pneumonia is dullness — the affected animal is less active and alert than normal
- Fever — the rectal temperature is best measured early in the morning, when the animal's body temperature is least likely to be affected by daily activity and warm daytime temperatures. A rectal temperature that is greater than 103 — 103.5 degrees F (39.4 — 39.7 degrees C) may be indicative of pneumonia.
- Coughing
- Thick, white colored nasal discharge
- Rapid or labored breathing (note: it is normal for these animals to breathe rapidly during warm weather)
- Falling behind from the flock or herd (decreased performance)

How is pneumonia treated, and can it be prevented?

There are no medicines available for treatment of viral infections in sheep or goats. Your veterinarian may recommend that certain antibiotics be administered to the affected animal to either 1) treat an existing bacterial pneumonia, or 2) to prevent bacteria from causing pneumonia as a complication to a viral infection. Consult your veterinarian to discuss which antibiotic might best suit your animal's needs. Always read the label on these medications and follow the directions carefully.

Prevention requires a clear understanding of the role of the causative conditions in development of this disease. Inspect the animal's environment for any of the conditions listed above that might cause pneumonia, and correct these. Make sure that the animal has dry bedding, good clean feed, clean water, and fresh air.

Consult with your veterinarian to determine if parasites might be the cause of pneumonia in your animals. Pneumonia caused by parasites will not be completely cured by antibiotics, although some improvement might be seen with antibiotic treatment (because the bacteria may infect the tissues damaged by the parasites).

Infection with the OPP or CAE viruses results in a life-long infection that the animal's immune system cannot cure. However, infected animals can survive if they are well cared for. Your veterinarian can test the blood of your animals to determine if they have been infected with these viruses, and can discuss the options for controlling these diseases.

Assemble a Calf Crop Resilient to the Challenges of Disease

By Justin Kleffer, DVM, Clinical Veterinarian,
Assistant Professor, Office of the Attending
Veterinarian and Department of Animal Sciences,
The Ohio State University

Now that calving is completed, the days are longer, and the grass is growing (hopefully), it is time to start preparing for the weaning and eventual sale or feedlot finishing of your calf crop and development of your replacement females. Once the cow calf pairs have been kicked out to pasture in the spring, there is a tendency to put off or ignore the steps needed not only to set the feedlot calf up for success, but also to lay the groundwork for proper health for your new heifers.

Management techniques such as castration and dehorning should take place as soon as possible. Waiting too long to remove the testicles, either by banding or cutting, increases the risk of bleeding and infection, and knocks the calf off feed for an extended period of time. The smaller the calf, the less attached they are to their testicles. Removal of horns, if present, can be done at birth or shortly thereafter using caustic dehorning paste on the horn buds. If scooping of the horns is the method you employ, make sure to do this before the horns reach 2 inches in length to avoid having an open sinus cavity in the head, which is prone to infection and fly-strike. In both of these techniques, pain control for these procedures is highly recommended and easy to perform. This is critical both from a welfare perspective, and the added bonus of keeping the calf on feed during the healing process.

Vaccinations are also a critical aspect of calf prep that are often misunderstood or under-utilized. As you may know, when a calf hits the ground they have no immune globulin proteins circulating in their blood stream to help fight infections. All of their initial immune globulins come from the colostrum at the first feeding, which needs to take place ideally within the first six hours after birth. The ability of the calf to absorb immune globulins past 24 hours of age is almost zero. These proteins are made by the dam, and concentrated in colostrum prior to birth, this is why vaccination of pregnant cows is essential in providing immunity for the calf. Once the calf is up and nursing, those immune globulins provide immediate resistance to disease.

As the calf ages, the colostrum immune glob-

ulin levels start to drop off over time, and are mostly gone by around 3-4 months of age. This is an important concept to understand for two reasons: First, giving the calf an injectable vaccine before this time frame means that any antigens for diseases you are vaccinating for (IBR, BRSV, PL3, etc.) will be neutralized by the immune globulins delivered in the colostrum. Essentially, if you have vaccinated the pregnant cow for those same diseases, and the calf nursed properly, there is no need to deliver those same vaccines to the calf prior to 4 months of age.

The second reason not to give an injectable vaccine before this time frame is that the calf's immune system is not ready to see and react to the vaccine. It takes time for the white blood cells responsible for the development of a systemic immune response to learn their jobs and be able to react to invading bugs. One important exception to the use of vaccines in young calves is the use of intra-nasal vaccines. These vaccines provide a localized immunity in the nose very quickly, and are not interfered with by colostrum immunity. This is why these vaccines can be given immediately after birth, and at any time in the production cycle safely and effectively.

Timing of vaccines is also imperative. For example, when the first round of a vaccine is given to a 5 month old steer calf, it takes time for the responsible white blood cells to find that vaccine and take it to the lymph nodes where antibodies can be produced. This process on average takes about 21 days. This is why most vaccines are labeled with directions indicating at least a one month wait before administering a booster shot. If we give the booster shot before the immune system has had time to create antibodies and a memory of the bug, we will not have that second strong immune response from the booster that provides superior protection.

Completion of these management techniques and vaccine protocols prior to the stress of weaning, comingling and transport will help you assemble a calf crop more resilient to disease challenges. Combined with a low stress weaning technique carried out 6 weeks prior to leaving the farm, this type of strategic planning for superior health provides a calf for which buyers will want to pay a premium. Consult with your herd veterinarian to design a vaccination and calf management plan that fits your type of operation.

Upcoming Events

OSU Extension Morrow County Events
for September, October, November:

- September**
- Sept. 12: Mini Garden Class @ 6 p.m. Ag Credit Building upstairs conference room
- Sept. 15: Plant Swap @ 10:30 a.m. Johnsville Library

- Sept. 27: Preparing your bee hives for winter from 6:30-8:30 p.m. Ag Credit Building upstairs conference room

October

- Oct. 17: Putting your garden to rest @ 6 p.m. Ag Credit Building upstairs conference room

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November:

- Nov. 1: Forcing Bulbs Class @ 6 p.m. Johnsville Library
- Nov. 14: Holiday wreath make and take @ 6 p.m. Ag Credit Building upstairs conference room

AGRICULTURE

Adding Distillers Grain and Soy Hulls to Sheep Diets

By Jeff Held,
SDSU Sheep Extension Specialists
(Previously published as an Extension Extra:
South Dakota State University Cooperative Extension Service)

Feeding Soy Hulls and Dried Distillers Grain with Solubles to Sheep

Co-products from corn and soybean processing industries can be excellent sources of nutrients for livestock. With the growth of ethanol production from corn and increasing number of soybeans processed in the Upper Midwest, livestock producers have many nutrient-dense co-product feed resources readily available. In the Upper Midwest distillers dried grain with solubles (DDGS) derived from ethanol production and soybean hulls (SH) from soybean processing have created the greatest interest to sheep producers.

Interestingly these co-products are both high fiber-low starch in content, much like forages. Yet DDGS is classified as a protein feed and SH could be classified as an energy feedstuff.

As often found with co-product feed ingredients, these have unique nutrient profiles and physical characteristics that require attention when formulating diets. They often can serve multiple roles in diet formulation: energy, protein, or forage. Many producers are simply unfamiliar with the effect of DDGS or SH on diet palatability, level of performance, cost effectiveness, and health status.

For sheep producers the key attractions of these feeds are cost effectiveness, animal performance, and reduced labor.



2018 Garden Series

OSU Extension Morrow County Master Gardener Volunteer would like to invite you to join them for their 2018 Garden Series. They will be offering various garden topics throughout the year.

The following classes will be held at our office 5362 US Hwy 42 Mt. Gilcard, in the upstairs conference room. They all start at 6:00 pm.

September 12th: Mini Gardens

September 27th: Preparing your Bee Hives for winter

October 17th: Putting Your Garden to Rest

November 14th: Wreath Make and Take
For more information, contact Carri Jagger, ANR Educator at 419-947-1070 or Jagger.6@osu.edu,

Morrow County Scarlet & Gray News

The key physical characteristic that offers diet formulation flexibility is the high fiber and low starch content. Both DDGS and SH are energy-dense feeds that can safely replace a portion of traditional forage or grain in diets, since the high fiber-low starch physical characteristics have lower rumen acidosis potential compared to grain-based diets.

Cost per pound of nutrient will influence their inclusion into sheep diets. Economically, DDGS is currently best suited to serve as a protein feed since it competes most favorably with traditional protein feeds like soybean meal. Pelleted SH can be an economical source of forage or serve as an energy feedstuff substituting for corn or barley. For nutrient content, see Table 1.

Table 1. Nutrient content**

	DDGS	Corn	SH
Crude protein	29	9	12
TDN	90	88	77
Fat	10.6	4.3	2.6
Calcium	0.28	0.02	0.55
Phosphorus	0.79	0.30	0.17
Magnesium (ppm)	19	7.9	10
Copper (ppm)	6	2.5	17.8

**Dry matter basis

Using soybean hulls in sheep diets

Using pelleted SH for mature breeding ewes as a forage source has increased dramatically across the Upper Midwest during the past 5 years, especially in drought stricken areas.

Recommendations for SH use in ewe diets have been based on research at the SDSU sheep research unit where non-pregnant mature ewes were fed slightly above maintenance requirement by offering 4 lb of pelleted soybean hulls and 1 lb of long-stemmed alfalfa hay daily. Ewes were

fed this diet for 60 days with no ill health, and ewe body weight change was a positive 0.1 lb per day. (In beef and dairy cattle studies, recommendations are to limit soybean hulls to 40% of dry matter intake due to concern for bloat.)

Studies with growing lambs fed SH based diets have reported excellent growth performance and palatability. Soy hulls stimulate intake; studies demonstrate that intake increases linearly with higher levels of soy hulls.

Although SH is a high fiber feedstuff, the rate and extent of fermentation in the rumen is rapid, leading to increased rate of passage; it is these features that contribute to increased feed intake. Growing lambs fed a diet containing 70% SH had a reported dry matter intake equivalent to 4.5% of animal body weight. Compared to more traditional corn based diets, lamb dry matter intake of SH is often increased by 0.5 to 1.0% of animal body weight.

Using DDGS in sheep diets

Ewe lactation studies using DDGS compared to soybean meal as a protein supplement show no difference in ewe body condition score or suckling lamb gain. A lactation study using DDGS to replace 2/3 of the grain (corn), equating to 25% of the diet, improved triplet-reared lamb growth performance by 12%. There was no difference in single and twin reared lambs.

Studies using DDGS in lamb growing-finishing diets are scarce. This lack of DDGS research could be related to current general lamb feeding practices: Lamb rations are generally offered ad lib in self-feeders with maximum expected gain. Pelleted lamb protein supplements containing protein, minerals, vitamins, and feed additives are commonly used to reduce feed ingredient sorting and refusal.

Table 2. Feeding guidelines - ewe rations (200 lb ewes). Numbers in parentheses () are for lactating ewes.

Ingredient	TRADITIONAL		LIMITED FORAGE		
	Ad-libitum	(Limit Fed)	A	B	C
Alfalfa	8	6	3	2	1
\$80/ton	(8)	(8)	(4)	(3)	(2)
Grass hay	8	6			
\$60/ton	(8)				
Corn	1	1	(1)	(1)	(1)
\$180/bu	(2)	(2)			
DDGS	(1)		1	1	1
\$65/ton	(1)		(2)	(2)	(2)
Soyhulls			2	3	4
\$80/ton			(2)	(3)	(4)

Your decision will be based on:

Cost-Equipment-Convenience

Limited Forage Rations: ≤ 20% DDGS

At least 1 lb long-stemmed forage with soyhulls

However, the high cost of commercially manufactured lamb protein supplements has created producer interest in inclusion of DDGS and other co-products in lamb diets. Since the level of crude protein in DDGS is approximately 40% lower than in soybean meal (30 vs. 48% CP), the cost per unit of crude protein will need to favor DDGS to substitute for soybean meal in mixed lamb diets.

Even when the economics favor DDGS the high inclusion rate adds considerably more phosphorus to the diet, creating greater diet formulation challenges.

Editors Note: Please note that the values found in Table 2 are reflective of ingredient pricing when the article was first published in 2006.

Good Management Practices for Fall Grazing

By Ted Wiseman, OSU Extension Educator
ANR, Perry County

(Previously published in Farm and Dairy:
August 9, 2018)

Fall pasture management is a critical period for pastures. For many of us we have had adequate rainfall up until recently and pastures have done well to this point. As we transition into late summer and early fall it is critical to pay close attention to your forages. Some pastures may be stockpiled, but those intended to be grazed this fall still need time to rest.

It's very tempting to use those forages that green up late in the fall. Management decisions made this fall will greatly impact forage growth next year.

Fall activity:

During the fall, forages are doing a couple of things, such as root regeneration and forming new shoots or growing points. We only see the growing leaves of the plants; one must consider the other half of the plant which is below ground.

During the growing season, the leaves are feeding the entire plant. If we remove too much

of the leaves we are reducing the plant's ability to produce carbohydrates through photosynthesis. These carbohydrates are stored, for the most part, in the crown of the plants compared to the roots. During times of drought, plants will shed roots. Shorter roots reduce the ability to take in moisture and nutrients. Even with fertilizer applications shooter roots are less productive.

Overgrazing results in shorter leaves reducing the plant's rate of carbohydrate production. Carbohydrates are stored in the crown of the plants which is generally in the lower 3 to 4 inches of the plant for most cool-season pastures.

This is why recommendations are to leave stubble heights no lower than four to six inches, either from grazing or by mowing. In the fall these crown tillers are brown or dormant often thought to be dead. These crowns not only provide nutrients for the new growth but provide physical protection from extreme weather conditions.

Early fall is an ideal time to take soil samples. Based upon the results you can apply the recommended rates of lime or fertilizer. This will also

help in root regeneration and regrowth.

Fertilizer application:

Nitrogen application in the fall along with adequate moisture will increase pasture growth. Generally, no more than 40 to 50 pounds of nitrogen should be applied. Typically in our area, fertilizer applications should be made no later than the first of October. High nitrogen applications will keep the plants from starting the overwintering process.

Too much nitrogen too late could result in winter damage due to the excessive growth reducing sugar concentrations in the stubble. Proline is what protects plant cells from winter damage or death. If not enough time is allowed or too much nitrogen is applied the plant does not have enough time for this process to occur.

Scouting pastures this time of year and giving plants enough time to store carbohydrates in the fall is critical for long-term productivity.

So don't be greedy and keep an eye on stubble height and use those soil test results to make economic decisions to make your pastures productive for many years.



AGRICULTURE



What accounts for variability in grain protein levels in corn?

By Alexander Lindsey,
Stan Smith, Peter Thomason

We've recently heard comments and questions concerning the varying levels of grain protein levels being found in shelled corn. Some feed companies have reported seeing many samples in the upper 6% and lower 7% protein range this year but there are reports of levels that are nearly 9%. Some feed mill operations are using 7% as the default value based on this year and last year's levels. However, in the past, higher grain protein levels (% +2) have been cited for corn. Are the reports of low levels in 2016 and 2017 an anomaly? What could be accounting for these varying protein levels in corn?

Environmental conditions (esp. those affecting soil moisture), cultural practices (nitrogen fertilization, plant population, drainage) and hybrids genetics all influence grain protein. Production factors and favorable growing conditions that increase grain yield usually increase the starch concentration of grain while reducing the grain protein concentration (except when yield increases as a result of N fertilizer application). We generally had favorable growing conditions in 2017 (and much better than expected yields); however, some areas experienced excessive rainfall in May and July, and other areas were dry in August and September and variable soil moisture may have contributed to the varying grain N%. Soil moisture is a major factor influencing grain protein concentration. Generally, grain protein concentrations are highest in dry years and lowest in years with excess soil moisture. Data from past Ohio Corn Performance Tests indicate that % grain protein (reported as % dry matter or DM, equivalent to 0% grain moisture) may vary by as much as 2 to 3 % points in the same hybrid depending on the growing season (w/drought 10-11% DM, w/good rainfall 8-9% DM). Excessive soil moisture (like that associated with many fields in 2017) can result in loss of soil N through either leaching or denitrification and result in N deficiency - leading to lower grain protein. Moisture stress (drought) can limit a corn plant's ability to produce dry matter (including starch) and "dilute" the N or protein in the grain tissue. As a result, grain protein concentration in drought stressed corn can often be higher than normal.

Table 1 shows the grain protein levels and grain yields from OSU field trials from 2012-2014 with normal (May) and late (June) planting dates. It seems in a really good year (2013 May planting), protein levels were right at 9.2% DM. However, in a good year that turned dry (June 2013 and all of 2014), protein levels were lower (8.75% DM). In the drought year (2012), protein levels were up (10-10.9%) but yield was down. Again, all of these are on DM basis. Grain protein levels were reduced slightly by the later June planting dates.

If reported at 15.5% moisture basis (Table 2), the same data set as shown in Table 1 drops in protein level dramatically (down 1.3-1.5% closer to the 7% value). This may explain some of the varying protein levels we are hearing about. It

may be there is a discrepancy at what moisture protein is being tested/reported at (rather than a major change in values). It's important to be able to compare grain lots with different protein and moisture levels.

For example, say you want to determine which grain lot below has a higher grain protein:

- Lot 1: 7.3% grain protein at 18.0% grain moisture
- Lot 2: 8.1% grain protein at 9.0% grain moisture

If we convert the grain protein levels of the two lots to a 0% grain moisture or on a dry matter basis (DM) we can make a comparison -

- Lot 1: $(7.3/(100-18.0)) \times 100 = 8.9\%$ DM protein
- Lot 2: $(8.1/(100-9.0)) \times 100 = 8.9\%$ DM protein.

Converting these two lots to DM basis shows they have the same level of protein, even though their raw values are almost 1% different.

Nitrogen management practices that minimize N losses and N deficiencies help to optimize protein concentrations. Grain N concentration will respond to N fertilizer application up to a point, but beyond that, increases in N application often have little effect on grain protein concentration. Past Penn State work suggests that the optimum N application rate for corn protein is similar to that required for optimum grain yield. Differences in protein content are present

By Harold Watters, CPAg/CCA

The FSR Agronomy College is held in partnership with the Ohio AgriBusiness Association & OSU Extension. The event is designed to educate agronomists, Certified Crop Advisers, custom applicators and farmers on current agronomy issues. The full-day event features time with OSU Extension staff in the field in the agronomy plots on the east side of the Farm Science Review grounds. Breakout sessions will feature topics including a weed management update, weed and

Farm Science Review Agronomy College is Sept. 11th

By Laura Alkerman, Disability Services
Coordinator for Ohio AgrAbility

Chronic pain is common among farmers and gardeners because of the physical nature of their work. Pushing, pulling, lifting, carrying, and walking can all aggravate existing conditions, or cause new disabling or painful conditions. If a farmer or gardener has a disability, chronic pain may be a side effect of that disability. Some strategies to manage the pain are to use medication, exercise, hydrotherapy (using ice or heat), meditation, stretching and "working through the pain". Ignoring or working through the pain is not a good strategy, because it may aggravate a chronic condition or disability, or cause an injury, which cause more pain, and loss of ability to work.

Not all of these strategies will work for everyone, and some may be impossible because of a disabling condition or physical ability. Please

Table 1: Percent Protein (reported on a 0% grain moisture or dry matter basis) at three OSU research farms.

Year	Plant date	Northwest ARS		Western ARS		OARDC, Wooster (West Badger)		
		% Protein	**Yield (bu/a)	% Protein	Yield (bu/a)	% Protein	Yield (bu/a)	Average Protein
2012	May	11.8	142	10.1	217	10.8	186	10.9
	June	10.0	177	9.7	184	10.4	191	10.0
2013	May	9.5	215	8.7	234	9.4	242	9.2
	June	9.1	203	8.4	186	8.8	189	8.8
2014	May	8.0	183	9.1	204	9.1	225	8.7
	June	8.9	161	8.9	178	8.5	154	8.8

**Reported yield is adjusted to 15.5% moisture

Overall Average: 9.4

Table 2: Percent Protein (reported on a 15.5% grain moisture basis) at three OSU research farms.

Year	Plant date	Northwest ARS		Western ARS		OARDC, Wooster (West Badger)		
		% Protein	**Yield (bu/a)	% Protein	Yield (bu/a)	% Protein	Yield (bu/a)	Average Protein
2012	May	10.0	142	8.5	217	9.1	186	8.2
	June	8.5	177	8.2	184	8.8	191	8.5
2013	May	8.0	215	7.4	234	7.9	242	7.8
	June	7.7	203	7.1	186	7.4	189	7.4
2014	May	6.8	183	7.7	204	7.7	225	7.4
	June	7.5	161	7.5	178	7.2	154	7.4

**Reported yield is adjusted to 15.5% moisture

Overall Average: 7.9

among hybrids. Grain protein levels typically vary by about 1.5 percentage points in corn hybrid trials. (Some specialty corns developed for enhanced nutritional content may exhibit protein levels greater than our commodity grain hybrids.) Usually the variability in corn grain protein is greater from year to year (environmental effects)

than it is within a performance trial (genetic effects). Of course, within a performance test (with hybrids in close proximity and pollen drift), we have the "xenon" effect to deal with. The hybrids we plant today require high populations to optimize yields and this has resulted in grain with a higher starch content and lower protein content.

crop screen, variable rate soybean seeding, an update to the Tri-State Fertilizer Recommendations, the new Ohio Phosphorus Index, and some how we will squeeze in even more. CCA and pesticide application credits available to those attending.

Date: September 11, 2018

Location: Farm Science Review - Molly Caren Agricultural Center, London, OH

Time: Check-in begins at 8:30 a.m.; sessions begin at 9 a.m. and concludes at 4:00 p.m.

Cost: \$120

Registration: Go to the following website to register: http://oaba.net/awsoaba/pt/sd/calendar/67757/PARENT/layout_details/false

Contact: Janice Welshimer at 614-326-7520 or by email: jwelshimer@oaba.net

Or for additional information, Harold Watters, 937-604-2415 or by email: watters.35@osu.edu

Farming and Gardening with Chronic Pain: Strategies for Managing Your Pain

consult with a doctor before making changes in your medication, exercise or diet and nutrition.

Medication: Over the counter pain medication can be very effective at managing pain. If these pain medications do not work, a doctor may be able to prescribe a pain medication; please be aware of the risks of addiction and increased tolerance for a pain relief drug.

Exercise: If you are able to exercise this can be a very effective way to manage pain, strengthen your body, increase your flexibility and possibly reduce your risk of injury. If you do not exercise regularly, start slowly with low weights and shorter workouts.

Ice or Heat: Applying ice or heat can help reduce pain, and can promote healing of an injury. Ice is good if you are swollen or want to numb the pain. Use a bag of ice or frozen peas wrapped in a kitchen towel, do not apply ice directly to your skin, you could give yourself an ice burn.

Heat is good for painful and stiff joints or muscles, it can soften and loosen muscles, and reduce pain. Use an electric heating pad, and do not lay on it, or you could burn yourself.

Meditation and Mindfulness: Meditating or listening to guided imagery can be helpful to redirect your mind away from the pain. Using guided imagery can help you imagine a relaxing place where you are not in pain. Mindfulness focuses your attention on the present moment, and how you are reacting and thinking about the pain.

Stretching, Tai Chi or Yoga: Stretching, yoga and tai chi can help with increasing flexibility, relaxing tight or stiff muscles, and building strength. All are typically done slowly, are low impact (no hard striking of the floor with your feet), and can be done without any equipment.

For more information, please contact Laura Alkerman at Alkerman.4@osu.edu, or 614-292-0622.

AGRICULTURE

Weaning Diet Options

By Justin Sexten, Ph.D., Director,
CAB Supply Development

Spring calving herds, depending on rainfall and temperatures, may be weeks or months away from weaning. For many operations, that will bring the challenge of feeding weaned calves for a short transition period. That's when nutrition is critical to end-product quality, because it influences both marbling development and calf health, which in turn also affects later quality grade. You may find local forages in short supply if your herd has had to deal with hot, dry weather this summer. One of the few "opportunities" that presents is evaluating alternative forage feeding strategies that may otherwise go untried.

You have to weigh the possible benefits as well as cost for any forage. Although many consider forage relatively inexpensive on a per-pound basis, it's virtually always the most expensive per unit of gain when compared to grains. Still, the benefits to gut health and rumen buffering keep forages included in weaning and receiving diets. To improve on averages, a good alternative should improve feed efficiency while maintaining those gut health benefits.

Independent of dietary requirements, your weaning forage model needs to fit within the ranch management program. To keep it simple, many prefer offering their ranch-weaned calves supplements and all the hay they want. The challenge with that is, calves may eat the hay independent of supplement, potentially increasing the group's range of energy intake. Free-choice hay at weaning usually signals a limited ability to either process or mix forages into a weaning diet.

Recent work from Mariah Woolsoncroft and coworkers at Oklahoma State University evaluated a combination of cottonseed hulls and soybean hulls as a forage source for receiving weaned calves. It could be mixed and delivered as a complete diet, minimizing traditional forage needs while addressing the operational challenges of storing and mixing. The 56-day experiment compared two wet-corn-gluten-based receiving diets, one with 30% prairie hay and the other having replaced hay with 15% of the total as cottonseed hulls and 15% soybean hulls.

There were no differences in performance on the diets as all calves gained more than 4 pounds (lb.) a day. Feed intake was 1.8 lb./day lower, however, for calves fed the alternative diet with hulls, resulting in improved feed efficiency. Manure consistency and pH was measured to assess gut health. Calves fed the alternative forage combination had slightly looser manure due to smaller forage particle size, but only slight pH differences.

Manure consistency is an interesting metric of gut health. Loose manure could contribute to dehydration, while dry and firm manure indicates poor diet digestibility. The slight manure differences in this experiment are more likely due to improved digestibility as indicated by compar-



ble gain with less feed intake, rather than reduced gut health.

Previous research suggests feeding higher concentrate receiving diets can improve cattle performance and efficiency, at the cost of increased respiratory treatment rates but often offset by the performance boost. In those historic experiments, the cost to carcass quality due to greater treatment rates were not evaluated, nor were the benefits of greater energy intake earlier in the feeding period. That gap could launch an interesting experiment down the road, perhaps. In this experiment, initial and total respiratory treatment rates did not differ based on forage source.

The Oklahoma State experiment did not report the calves through harvest, but performance and health data during receiving suggests we could expect comparable carcass quality when substituting a mix of cottonseed hulls and soybean hulls for forage in a weaning ration.

Identifying Agricultural Workplace Hazards

By Kent McGuire,
OSU Ag Safety and Health Coordinator

No matter if you are finishing summer farm tasks or preparing for fall harvest, it is important to assess the safety hazards within your work area. The ability to assess potential hazards before an injury occurs is a key component to safety management and protecting the safety of those working around you. All agricultural work environments present their own unique safety hazards.

No two areas or work tasks are the same, however there are general guidelines that can be followed:

- Confirm there are no slip, trip and fall hazards such as liquid spills, tools, grease, loose grain, or elevation changes on the floor or ground.
- Be mindful of material/chemical injuries due to splashes in the eyes or on the skin. Also watch for over-exposure in dusty environments

Winterize Precision Ag Technology and Backup Data

By Elizabeth Hawkins, John Fulton

After this season, you may be tempted to park your equipment in the shed and take a much needed winter break. You probably remembered to winterize your machinery, but you may have overlooked the need to winterize your precision ag technology. Here are some tips to ensure your monitors and sensors continue to function next season:

1. Bring technology indoors. Although precision ag technology is ruggedized to protect against harsh field conditions, the temperatures that we often experience during a Midwest winter are low enough to

Preparing your Bee Hives for Winter

If you have one hive, or many, this class is for you. On September 27th from 6:30 – 8:30 p.m. join Morrow County Apiary Inspector Doug Stanton for an informational session about preparing your bee hives for winter. The class will be held in the upstairs conference room of the Ag Credit Building, 5362 US Hwy 42, Mt. Gilead, Ohio.

Doug will be covering the following topics:

- The year in review for Beekeepers – Why last year was so bad and this year is so good.
- How bees can help soybean farmers.
- How to get your bees through the winter.
- Current threats to Honeybees
- Fall is for Planting Garlic
- Part I
- Watch for Part 2 in the spring
- If you have ever wanted to try your hand at growing garlic now is the time to think about planting it. Garlic should be planted between Halloween and Thanksgiving and you will want to start with a good seed source from a reputable seed company. Your soil should be a well-drained sandy loam with a pH between 6.0 and 7.0. Garlic needs 1 to 1.25 pounds of 19-19-19 fertilizer

per 100 square feet of bed or 1.5 to 2 pounds of 12-12-12 fertilizer per 100 square feet of bed. Only apply 1/2 of this at planting and then apply the other half in the spring when growth resumes (you will see little green sprouts peeking out of the mulch.)

• Once you have your soil worked up and fertilizer worked in you can start to plant your garlic. Garlic comes in bulbs. Depending on the type and variety, the bulbs can have anywhere from 5 - 16 cloves per bulb. Separate the cloves from the bulb when you are ready to plant. Don't worry about peeling the cloves, they will grow fine. Dig a row 2 inches deep and place your clove basal plate (big end) down. Space the cloves 4-5 inches apart and gently press them into the soil to keep them upright. Once your cloves are set out you can gently cover them up. If you are planting more than one row space your rows 12-24 inches apart. Once your cloves are covered with soil, 4 inches of mulch like clean straw or leaves should be added to the rows to protect the garlic for the winter and also to smother out any winter annual weeds.

or with vapors and mists.

- Read safety labels and understand terms such as flammable, combustible, corrosive and potential for personal injury.
- Recognize travel patterns of farm equipment and moving vehicles to reduce the potential for collisions, run-overs and other injuries.
- Verify machine guarding is in place and properly functioning to avoid equipment hazards such as pinch-points, cut points, wrap points, burns, or stored energy.
- Consider any processes that may generate flying debris or thrown objects that can cause blunt trauma including eye injuries, struck by, or punctures.
- Ensure emergency stops or shut down procedures work properly.
- Verify that air, water and hydraulic lines are in good condition to minimize uncontrolled release.
- Determine if Personal Protective Equip-

ment is being used and is proper for the job.

- Be aware of any overhead and fall hazards that may be present in your workspace.
- Consider factors like fatigue and repetitive motion

The final guideline is the most important. Take the proper actions required to fix a hazard. If immediate action can be taken, such as cleaning up spills, repairing equipment, securing loads or adjusting work processes, then do so.

A great way to identify agricultural workplace hazards is to do a site walk-through, using a safety checklist. Agricultural specific safety checklists can be found at: <http://umash.unm.edu/umash-farm-safety-check/> and <http://nasdonline.org/1627/14/d001509/how-does-safety-rate-on-your-farm-...>

For more information about OSU Ag Safety visit <http://www.agsafety.osu.edu> or contact Kent McGuire, OSU Agricultural Safety & Health, at mcguire.225@osu.edu or 614-292-0588.