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Livestock Update

Beef - Horse - Poultry - Sheep - Swine

February 2014

This LIVESTOCK UPDATE contains timely subject matter on beef cattle, horses, poultry, sheep, swine, and related junior work. Use this material as you see fit for local newspapers, radio programs, newsletters, and for the formulation of recommendations.

IN THIS ISSUE:

Scott P. Greiner, Extension Project Leader
Department of Animal & Poultry Sciences

Dates to Remember

BEEF

MARCH

16 Virginia BCIA Southwest Virginia Bull Test Open House. 1:00 - 4:00 PM. Hillwinds Farm. Dublin. ***Contact***: Scott Greiner, (540) 231-9159 or email: sgreiner@vt.edu

22 Virginia BCIA Southwest Virginia Bull Test Sale. 12:00 Noon. Umberger Sale Facility. Wytheville. ***Contact***: Scott Greiner, (540) 231-9159 or email: sgreiner@vt.edu

HORSE

MARCH

21-23 EquiSmartz State Educational Contests. Lexington. ***Contact:*** Celeste Crisman, (540) 231-9162 or email: ccrisman@vt.edu

JULY

28 thru 8/2 Southern Regional 4-H Horse Championships. Raleigh, NC. ***Contact:*** Celeste Crisman, (540) 231-9162 or email: ccrisman@vt.edu

February Beef Herd Management Advisor

Scott P. Greiner & Mark A. McCann
Extension Beef Specialists, Virginia Tech
sgreiner@vt.edu, mmccnn@vt.edu

The outlook for the cattle business is exciting. The combination of lower feed prices and potentially record cattle prices are enough to excite anyone's imagination. Is it the time to expand the cow herd or cash in on high prices? There has never been a better time to take advantage of enterprise budgets as a tool. Enterprise budgets can provide a summary of annual production costs, and make it easier to identify the factors which impact your bottom line in both the cost and revenue columns. Specific items such as the cost to develop replacement heifers can be evaluated. By combining budgets with key assumptions it is possible to consider the adoption of certain management practices in terms of their costs and potential returns. Good examples would be the addition of a timed AI program or perhaps revisiting the economics of creep feeding in the light of grain costs and calf prices. History has taught us that grazed forages are our best value for the cow. The addition of clovers to pastures, strategic weed control and stockpiling are management options worthy of consideration in the upcoming year to reduce reliance on harvested forages and feedstuffs and decrease annual feed costs.

Spring Calving Herds (January-March)

General

- Prepare for calving season by checking inventory and securing necessary supplies (ob equipment, tube feeder, colostrum supplement, ear tags, animal health products, calving book, etc.)
- Move pregnant heifers and early calving cows to calving area about 2 weeks before due date
- Check cows frequently during calving season. Optimal interval is to check calving females is every 4 hours.
- Utilize calving area that is clean and well drained. Reduce exposure to scours by moving 2-3 day old pairs out of calving area to separate pasture (reduce commingling of newborn calves with older calves).
- Identify calves promptly at birth. Record birth weight, calving ease score, teat/udder score, and mothering ability of cow.

Nutrition and Forages

- Evaluate growth of yearling heifers with goal of reaching 60-65% of mature weight by breeding. Depending on forage quality, supplementation maybe needed to meet weight gain target.
- Feed better quality hay during late gestation and early lactation. If quality is unknown, submit sample for nutrient analysis (local extension office can assist). Target quality is 11-12% crude protein and 58-60% TDN. Supplement protein and/or energy as needed.
- Frost seed clovers mid to late month. Four lbs red clover and 2lbs of ladino is recommended. Best success will be achieved by choosing areas with little or no plant residue.

Herd Health

- Ensure colostrum intake first few hours of life in newborn calves. Supplement if necessary. Newborn calves need 10% of body weight in colostrums first 24 hours of life.
- Provide selenium and vitamin A & D injections to newborn calves

- Castrate commercial calves at birth
- Monitor calves closely for scours, have treatment supplies on hand.
- Evaluate lice control program and consult your veterinarian for recommendations.

Genetics

- Make plans for spring bull-buying season. Evaluate current herd bulls for progeny performance and soundness. Establish herd genetic goals, and selection criteria for AI sires and new herd bulls. Order semen.
- Collect yearling performance data (weight, height, scrotal, ultrasound) in seedstock herds.

Fall Calving Herds (September-November)

General

- Monitor cows closely during breeding season for signs of returned estrus. Contact veterinarian to evaluate fertility of bull if many cows repeat cycle. Remove bulls to maintain controlled calving season (60-90 days).
- Begin planning marketing strategy for calf crop.
- Plan to pregnancy check heifers as soon as possible post breeding.

Nutrition and Forages

- Begin creep feeding or creep grazing calves if desired.
- Once breeding concludes, supplementation should be adjusted to mid-lactation nutritional requirements.
- Frost seed clovers mid to late month. Four lbs red clover and 2 lbs of ladino is recommended. Best success will be achieved by choosing areas with little or no plant residue.

Herd Health

- Monitor calves closely for health issues, particularly respiratory disease.
- Administer 7-way clostridial vaccine and respiratory vaccinations (especially if killed products are used; booster dose given at preweaning) to calves.
- Evaluate lice control program and consult your veterinarian for recommendations.
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Genetics

- Make plans for spring bull-buying season. Evaluate current herd bulls for progeny performance and soundness.

March Beef Herd Management Advisor

Scott P. Greiner & Mark A. McCann
Extension Beef Specialists, Virginia Tech
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Cattle prices have reached new heights and the market outlooks are projecting continued good times for the foreseeable future. Given the high value of each individual calf when marketed, it is a worthwhile exercise to review factors which impact the number of calves weaned and identify your operation's management schemes which may need improvement to enhance percentage of calves born, weaned, and marketed. Conception rate is the largest influencer of calves born and is usually affected by nutrition. Often times cow herd feeding decisions are based on convenience and affordability, rather than focusing on nutrient needs. If conception rate is below 90%, then nutritional factors could be such that less than optimal reproductive rate is being obtained. Given the value of additional pregnancies, supplemental nutrition could be both warranted and affordable. Health and bull breeding soundness are additional areas which affect calving rate. Reviewing your calf losses and their potential causes can highlight areas where extra investment can return additional profits in today's economic environment.

Spring Calving Herds (January-March)

General

- Calving season is in full swing. Check cows frequently during calving season- optimal interval is to observe calving females every four hours (heifers more frequently if possible).
- Identify calves promptly at birth. Record birth weight, calving ease score, teat/udder score, and mothering ability of cow.
- Monitor young calves for scours. Prevent scours by keeping calving area clean and well drained. Moving 2-3 day old pairs out of calving area to separate pasture (reduce commingling of newborn calves with older calves) help reduce exposure to scours.

Nutrition and Forages

- Replace free-choice minerals with a high magnesium mineral to prevent grass tetany. Monitor intake to insure cows are consuming the recommended amount. No other source of salt or minerals should be available.
- Evaluate growth of yearling heifers with goal of reaching 60-65% of mature weight by breeding. Depending on forage quality, supplementation maybe needed to meet weight gain target.
- Feed high quality hay to minimize supplementation and cow weight loss.
- Although pasture green up is beginning and nutrient content of new growth is high, cows cannot consume enough to meet their nutritional needs. Restricting cows to smaller hay feeding areas will allow new pasture growth to get a faster start.
- Fertilize hay areas with K and P according to soil test recommendations. Add nitrogen at the rate of 40-70lbs/acre.

Herd Health

- Observe newborn calves to ensure colostrum intake first few hours of life. Supplement if necessary. Newborn calves need 10% of body weight in colostrums during first 24 hours of life.
- Provide selenium and vitamin A & D injections to newborn calves
- Castrate commercial calves at birth

- Monitor calf health closely, particularly for signs of scours and pneumonia, have treatment supplies on hand.
- Consult with your veterinarian concerning pre-breeding vaccination schedule for cow herd and yearling heifers. Plan early to allow 30-day vaccination window prior to breeding season.

Reproduction

- Plan AI and synchronization program to be used during breeding season. Order supplies and semen.
- Schedule and conduct breeding soundness exams on herd sires, including annual vaccinations. Do so prior to spring bull sales to allow time to secure replacements as necessary.

Genetics

- Closely examine herd genetic goals and selection criteria for both AI and natural service sires. Establish herd strengths and weaknesses from genetic standpoint, and benchmark EPD criteria accordingly. Make plans for spring bull-buying season.
- Schedule and collect remaining yearling performance data (weight, height, scrotal, ultrasound) in seedstock herds.

Fall Calving Herds (September-November)

General

- Pull bulls to maintain a 60-90 day calving season. Monitor body condition and soundness of bulls.
- Schedule and conduct pregnancy diagnosis with veterinarian 45-60 days following breeding season. Make plans to pregnancy check heifers as soon as possible after bull removal. This will allow options in marketing open heifers.
- Evaluate potential options for marketing of calf crop, including time of weaning, and backgrounding strategy.

Nutrition and Forages

- Begin creep feeding or creep grazing calves if desired.
- Cows are entering latter portion of lactation, above average to good quality hay should meet nutritional requirements.
- Although pasture green-up is beginning, hay should be continued to be offered until consumption declines significantly.
- Reserve high quality hay and a pasture area for calves post-weaning.
- Fertilize hay areas with K and P according to soil test recommendations. Add nitrogen at the rate of 40-70lbs/acre.

Herd Health

- Consult with veterinarian on pre-weaning vaccination protocol for calf crop. Monitor calves closely for health issues, particularly respiratory disease.

Genetics

- Make plans for remaining spring bull sales. Closely examine herd genetic goals and selection criteria for both AI and natural service sires. Establish herd strengths and weaknesses from genetic standpoint, and benchmark EPD criteria accordingly.
- Collect 205-day weights on calf crop at appropriate time (AHIR age range 120-280 days), along with cow weights, hip heights and body condition scores (cow mature size data taken within 45 days of calf weaning measure).

Sire Selection – Job #1

Dr. Scott P. Greiner
Extension Animal Scientist, Virginia Tech

Its bull buying season! From a genetic standpoint, sire selection is the most important decision a cattle producer makes. Essentially all genetic improvement in commercial herds is the direct result of sire selection. Consider the fact that 87.5% of the genetics of an individual calf were inherited from three sires in that calf's pedigree (50% from the sire, 25% from the dam's sire, and 12.5% from the dam's maternal grandsire). This fact alone emphasizes the importance of proper sire selection, and the impact that each sire has on economically relevant traits. For herds with small numbers of cows and in single-sire herds, the importance of an individual sire is even further exaggerated- as one sire alone accounts for a large proportion of the genetics represented in each calf crop. Relative to other production and management decisions, sire selection is an infrequent occurrence for many cow-calf producers. However, these decisions have long-term impact relative to the productivity and profitability of the cow-calf enterprise.

Successful sire selection starts with having a game plan prior to the bull buying season in order to formulate a job description for the new herd sire. In other words, from a genetic improvement standpoint the responsibilities and qualifications for the new herd sire need to be determined. The key to this process is records and an assessment of the current status of the herd genetically, and identification of those trait(s) which require selection pressure in the next generation. This selection pressure may increase, decrease, or maintain the current level of genetic merit in the herd depending on the current level of performance for each of the relevant traits.

The first step in this process is to examine herd goal. Herd goals serve as the foundation for sire selection and provide guidance as to traits with the most economic importance. Defining the production and marketing system, along with management strategies and environment are key factors. Secondly, determine herd strengths and weaknesses. Basic records are necessary to identify herd strengths and weaknesses. Performance parameters such as calving percentage, weaning percentage, weaning weights, sale weights, carcass merit, feed usage, etc. are necessary to serve as the basis for assessing areas of strength and those needing attention. Thirdly, establish selection priorities. Concentrate on those factors which stand to have the largest impact on profitability. Remember that income is derived from performance which in influenced by both genetics and environment (management). Focus on the handful of priority traits rather than attempting to change many traits simultaneously.

Expected Progeny Differences have proven to be the most effective tool for genetic improvement of beef cattle. Once selection criteria have been established, benchmarks or an acceptable range of EPDs can be established for application to bull-buying. For example, if the goal is to increase weaning weight of the calf crop, WW EPD would be defined as a primary EPD selection criteria for a new bull. The questions become: What WW EPD does the bull ideally need to have? Is there a minimum? or maximum? In most situations, there is likely a range in EPD values that would be considered optimum. The adage that "more is better" is often not applicable in most selection scenarios when it comes to EPDs. Higher WW EPDs would certainly achieve the goal of enhancing weaning weights; however, there may also be correlated reductions in calving ease due to higher birth weights or potential increases in mature cow size for heifers retained as replacements. Balanced trait selection is always

important and defining an optimum EPD range as a benchmark is compatible with this strategy.

Defining the optimum EPD range or benchmark, however, can be challenging. Knowledge of the EPD value of former and current sires in the herd can provide valuable insight and assistance in this matter. Associating EPD values on current/former sires with the performance of their progeny can be useful to establish a benchmark from which to select future sires. In the previous example, where enhanced weaning weights was a goal, it would be advantageous to know the WW EPD values of current sires. Accordingly, we could then set our WW EPD goal higher in comparison. Similar examples can be applied to calving ease, milk, and carcass traits. The basic premise is that defining where we are headed genetically is much easier if we can characterize where we have been.

Breed percentile rankings are additional tools that can assist with EPD selection and benchmarking. It is useful to understand where a particular bull ranks within a breed for traits of interest. This ranking provides documentation as to the genetic merit of the bull compared to others within the breed. Percentile rankings are readily available in sire summaries published by breed associations. With this information, bulls can be specifically evaluated as to where their EPDs rank relative to all animals in the breed for specific traits. The following table provides a brief summary of percentile rankings in Angus and Purebred Simmental bulls for calving ease, yearling weight, milk, and marbling EPDs. It is important to note that percentile rankings do not reflect genetic differences for traits between breeds, and can be utilized only on a within-breed basis. Utilizing the percentile table, it can be determined that an Angus bull with a Calving Ease EPD of +9 or higher ranks in the upper 25% of the breed for calving ease, and would be a strong candidate for use on heifers. Similarly, a Simmental bull with a milk EPD of +25 is slightly higher than the Simmental breed average for milk. These percentile rankings also illustrate practical differences between EPDs. In other words, differences of a couple of pounds of WW or YW EPD between bulls are rather insignificant in the grand scheme of selection, as examination of the percentile rankings for these differences reveal that these bulls would essentially rank identically within the breed. Using percentile tables in conjunction with goals are useful in establishing target windows of acceptability for EPD profiles of new bull purchases (ie. minimums and maximums). Establishing these target windows of acceptability for the traits of interest is a useful tool in balanced trait selection.

Percentile Rankings for Angus and Purebred Simmental Bulls (Spring 2014)

	Angus				Purebred Simmental			
Percentile Rank	CE	YW	Milk	MB	CE	YW	Milk	MB
10%	+11	+106	+31	+.78	+13.5	+112	+30	+.32
25%	+9	+96	+28	+.59	+11.5	+103	+27	+.23
50% (breed avg)	+6	+85	+24	+.41	+9.3	+93	+24	+.13
75%	+3	+73	+20	+.25	+7.1	+83	+21	+.03
90%	-1	+61	+15	+.11	+5.1	+74	+18	-.06

In summary, EPDs are a powerful selection tool and establishment of herd goals and benchmarks are important for optimal utilization. Tracking performance of progeny and percentile ranks are two mechanisms that assist in the establishment of benchmarks to be applied to bull-buying decisions.

Management of the Young Beef Bull

Dr. Scott P. Greiner
Extension Animal Scientist, Virginia Tech

Management Prior to the Breeding Season

Most newly purchased yearling bulls have recently completed a performance evaluation, which provided a relatively high plane of nutrition through the yearling phase. Ideally, after completion of this evaluation, the energy level of the diet will be reduced and/or intake limited to prevent excessive fat deposition with the goal of having a body condition score 6 at turn-out. This will give the bull adequate reserves of energy for use during the breeding season. Yearling bulls can be expected to lose 100 pounds or more during the course of the breeding season.

Acquiring a new yearling bull at least 60 to 90 prior to the breeding season is critical from several aspects. First, this leaves ample time for the new bull to get adjusted to the feed and environment of his new home, as well as an opportunity for several new bulls to be commingled for a period of time prior to turnout. Secondly, adequate exercise, in combination with a proper nutritional program, is essential to “harden” these bulls up prior to the breeding season. A facility for the newly acquired bull that allows for ample exercise will help create bulls that are physically fit for the breeding season. The nutrition of the bull will be dependent on body condition. Yearling bulls are still growing and developing, and should be targeted to gain 2.0 to 2.5 pounds per day from a year of age through the breeding season. Bulls weighing approximately 1200 pounds will consume 25 to 30 pounds of dry matter per day. This intake may consist of high quality pasture plus 12 lbs corn, grass legume hay plus 12 lbs corn, or 80 lbs corn silage plus 2 lbs protein supplement. Provide adequate clean water, and a complete mineral free-choice. Prior to the breeding season, all bulls should receive breeding soundness exams (BSE) to assure fertility. Because a variety of factors may affect bull fertility, it may be advisable to re-test young bulls before the breeding season even if it has only been a few months since the pre-sale BSE. Just as importantly, all herd bulls need to have a BSE annually prior to the breeding season, not just as yearlings.

Management During the Breeding Season

The breeding season should be kept to a maximum of 60 days for young bulls. This will prevent over-use of the bull, severe weight loss and reduced libido. Severe weight loss may impair future growth and development of the young bull, and reduce his lifetime usefulness. When practical, supplementing young bulls with grain during the breeding season will reduce excessive weight loss.

In single-sire situations, young bulls can normally be expected to breed a number of females approximately equal to their age in months. Using this rule of thumb, a newly purchased bull that is 18 months of age could be placed with 18 cows or heifers. Bulls used together in multiple-sire breeding pastures should be of similar age and size. Young bulls cannot compete with older bulls in the same breeding pasture. A common practice is to rotate bulls among different breeding pastures every 21 to 28 days. This practice decreases the breeding pressure on a single bull. Some producers use older bulls early in the breeding season, and then replace them with young bulls. The appropriate bull to female ratio will vary from one operation to the next based on bull age, condition, fertility, and libido, as well as size of the breeding pasture, available forage supply, length of the breeding season and number of bulls with a group of cows.

All bulls should be observed closely to monitor their breeding behavior and libido to ensure they are servicing and settling cows. Additionally, observe the cowherd to monitor their estrous cycles. Many females coming back into heat may be the result of an infertile or subfertile bull. All bulls should be monitored for injury or lameness that may compromise their breeding capability.

Management After the Breeding Season

Young bulls require a relatively high plane of nutrition following the breeding season to replenish body condition and meet demands for continued growth. Yearling bulls should be maintained in a separate lot from mature bulls, so these additional nutritional requirements can be provided. Body condition and projected mature size of the bull will determine his nutrient requirements during the 9 months following the breeding season. Bulls should be kept away from cows in an isolated facility or pasture after the breeding season. In the winter months, provide cover from extreme weather that may cause frostbite to the scrotum resulting in decreased fertility.

Cattle Botulism Kills Feeder Cattle in Virginia

Dr. Dee Whittier, Extension Veterinarian, Cattle
College of Veterinary Medicine, Virginia Tech

A recent outbreak of a devastating disease on a Southwest Virginia stocker farm reminds us that a disease called botulism can be a real threat. In the stocker outbreak of botulism, 35 steers that had been well managed and were completely healthy before the outbreak died!

The botulism bacteria is related to the blackleg one. They both produce a very potent poison, frequently called a toxin. They both grow in areas where there is little oxygen. They both survive as spores for many years in the soil.

Botulism has been reported to kill many species of animals and birds. Cases have been documented in people, chickens, horses, wildlife, goats, sheep, reptiles and fish.

For a long time it was believed that the bacteria only grew in protein rich substances, especially meats and dead animals, and then caused disease and death when these are consumed. Now it is understood that the bacteria can grow in other foods and feedstuffs under the right conditions, that it may actually grow in the digestive tracts of animals after the spores are consumed and that it can grow in infected wounds on rare occasions.

The botulism toxin causes paralysis of muscles and the clinical signs and death are related to this effect. Affected cattle are typically observed initially as being depressed with heads and ears down. However, they have normal temperatures and still try to eat, different from the most common sick cattle presentation with respiratory disease. As the disease progresses, it becomes obvious that cattle cannot swallow well, become increasingly weak and then go down. With high doses of the toxin, animals may die in hours. Cattle that have less toxin in their system may be down for days before their respiratory system finally fails and death occurs.

Of course, finding the source of the bacteria/toxin and removing it as soon as possible is crucial to reduce losses. Any source of feed that could contain dead animals should be highly suspected. Examples of ways to have dead animals in feeds might be poisoned rodents or wildlife baled into round bales. In Australia, where botulism is quite common, animals deficient in phosphorus may chew on dead animals or bones and ingest the toxins from this source.

It would seem that, once the offending feedstuff has been removed, cattle deaths would soon cease. In fact, this is seldom the case. Animal deaths continue for up to two weeks after the feedstuffs have been removed. Whether toxins continue to leave the rumen for this long period of time or whether spores in the digestive tract grow and produce toxins inside the cattle is not known.

It is now obvious that botulism can grow in ensiled forages under certain conditions. In several instances ensiled cereal haylages (baleage) has been the source of the disease. It is not well understood why botulism bacteria and toxins would be in these feedstuffs. Is there something different about cereal haylages than grass hays? Is the ensiling process different in baleage resulting in conditions that allow the spores to grow and the toxin to be produced? Is ensiling not complete because haylage is too wet or too dry? Is there more soil contamination with soils

containing spores on fields drilled with cereal crops than established hay fields? All of these questions remain unanswered.

Treatments for botulism have had limited success. Substances that absorb toxins such as charcoals and absorptive clays may have some value. Cattle that are not severely affected might benefit from supportive care including drenching with water and electrolytes and gruels to provide nutrition.

Vaccination is practiced quite extensively in Australia to prevent the disease. No cattle botulism vaccine is available in the US. There is, however, one USDA approved horse botulism vaccine.

A number of outbreaks of botulism in cattle have occurred in the mid-Atlantic US. All reported cases have occurred in cattle eating harvested feed rather than grazing (different from Australia reports). These have been seen in dairy cows, beef cows and stocker/backgrounding settings.

The outbreak in Southwest Virginia was associated with groups of calves consuming triticale baleage. Eventually a test revealed the presence of the toxin in these bales. The bales were very well made and prior testing indicated good ensiling with pH's in the 4 to 5 range. A very efficient rake might have resulted in more soil contamination than is desirable.

Does the risk of botulism suggest that making baleage from cereal crops (rye, wheat, barley, triticale, etc.) should be curtailed? Presently, the incidence of botulism has not been high enough to justify this recommendation. However, the disastrous nature of an outbreak will give some producers pause. The best recommendations that can currently be made are to avoid contamination of baleage with soils and to handle baleage so as to encourage a rapid ensiling process.

Botulism is an uncommon problem in cattle that usually has disastrous outcomes. Producers should watch cattle for depression without a fever and act quickly when suspicious signs are seen in cattle.

Frost Seeding to Improve Pasture Quality

Peter Callan, Extension Agent, Culpeper County, Agriculture and Natural Resources, Farm Business Management peter.callan@vt.edu (540) 727-3435 ext. 342

Frost seeding is an excellent way to incorporate legumes into a pasture. Preparation for frost seeding starts in the previous growing season.

Pastures that will be frost seeded need to be grazed tight or close prior to seeding. There must be spots of bare soil showing so that there is soil/seed contact. If there is residue on the soil, it will be difficult for the seed to reach the soil and the young seedlings to grow through the residue.

There are several advantages of frost seeding legumes into grass pasture. Yields are higher with grass-legume mixtures. There will be higher tolerance to drought if a legume with a taproot (e.g. red clover) is seeded into the pasture. Legumes fix nitrogen which is used for fertilizer in grasses. By incorporating legumes into a grass pasture there will be a major reduction in fertilizer costs because no additional nitrogen is needed. Research conducted by Virginia Tech Forage Specialist Chris Teutsch has shown that legumes increase the protein concentration in a pasture because the legumes have higher protein levels than grasses.

Seed selection is important to insure that the frost seeding generates a stand. Alfalfa does not frost seed and must be drilled into a pasture. Red and white (ladino) clovers work well in frost seeding. Red clover is a key pasture legume because it is easily established with frost seeding. It is a short lived perennial with a life of 2-3 years. One disadvantage of red clover is that it does not reseed. White clover is well adapted to short, close grazing and produces high quality forage. Another important advantage of white clover is that it re-seeds. Red and white clovers require soil pH levels to 6.0-6.5 levels. Soil testing needs to be done in the fall prior to seeding. Lime may be applied in the fall to bring pH up to desired levels. Fertility levels should be medium or higher. The seeding rates on a per acre basis are as follows: red clover 3-6 pounds, white clover 1-2 pounds (VA Tech Agronomy Handbook, 2000).

Legume inoculation is critical to the establishment of legumes. Bacteria, called rhizobia, can live in the nodules of legume roots and can fix nitrogen from the air. The bacteria make the nitrogen available for the grasses. It is essential that the seed be inoculated with the proper strain of rhizobia bacteria prior to frost seeding. It is recommended that a type of inoculum be used that contains a sticker (a glue-like material) which makes the bacteria adhere to the seed. Because the inoculum contains living organisms (bacteria), it should be stored in a cool dry place. Some of the seed companies coat their legume seeds with inoculant. Producers who plant legume seeds coated with inoculant should follow the sellers' recommendations for planting these seeds. As an extra precaution, some producers will purchase inoculant and coat the inoculant coated seeds at the cost of $.10 per pound.

Producers may consider taking the additional precautions of frost seeding legumes at the high end of recommended levels and inoculating seed coated with an inoculant as a way to achieve a thick stand in the event of poor soil seed contact, reduced germination and levels of seed inoculation. Thus they will not have to seed the pasture a second time.

Frost seeding can be done any time that there is freezing and thawing of the ground in your area. Freezing and thawing causes the seed to be incorporated into the soil. As previously

mentioned, there must be seed/soil contact for the seed to germinate. The earlier is better. It is recommended that Virginia producers frost seed in February and March.

Frost seeding enables producers to improve the quality and yields of their pastures. In addition, frost seeding red and white clovers into a pasture provides nitrogen for grasses which results in significantly lower fertilizer costs.

2014 Southwest Bull Test: Sale, Open House, & Bred Heifer Sale

Dr. Scott P. Greiner
Extension Animal Scientist, Virginia Tech

An open house will be hosted at the Virginia Beef Cattle Improvement Association's Southwest Virginia Bull Test on Sunday afternoon, March 16th from 1:00 to 4:00 PM. Cattle producers and others interested are invited to attend. The Southwest Bull Test Station is located at Hillwinds Farm, owned and operated by Tim Sutphin of Dublin, Virginia. The station is located just outside Dublin. From Dublin, travel south on Route 11 just over two miles, and turn right on Thornspring Road/Rt. 643 (Cougar Express convenience store on corner). Proceed on Thornspring Road a little over a mile and the facility is on the left.

Approximately 142 bulls will sell at the Virginia BCIA Southwest Bull Test Sale on Saturday, March 22, 12:00 noon at the Danny Umberger sale facility, just outside Wytheville. These bulls include 67 fall-born senior bulls and 75 spring-born junior bulls. Breeds include 87 Angus, 4 Charolais, 8 Gelbvieh & Gelbvieh Balancers, 8 Polled Hereford, 35 Simmental & SimAngus. Only bulls which meet stringent BCIA criteria will sell. This includes complete breeding soundness exams (including semen evaluation) on fall-born bulls, volume buyer discounts, and an enhanced soundness and fertility guarantee on all bulls selling.

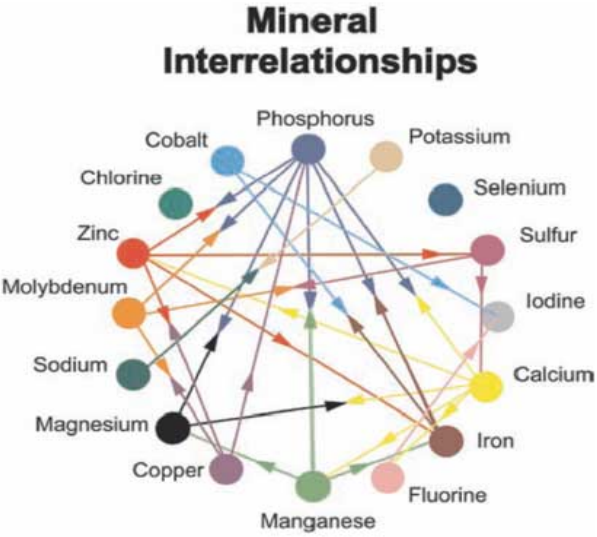
The BCIA-Influenced Bred Heifer Sale will be held in conjunction with the bull sale. A select group of approximately 40 fall-calving bred heifers from leading producers will be offered immediately following the bulls. All heifers will be certified through the Virginia Premium Assured Heifer Program, which verifies health, genetics, and management procedures. Service sires for the heifers will feature highly proven, AI sires selected for calving ease and performance.

For complete details and progress reports visit the Virginia BCIA website http://www.bcia.apsc.vt.edu or phone 540-231-2257. Video clips of the bulls and an online catalog will also be posted.

Minerals and Vitamins for Sheep

Dr. Mark A. McCann
Extension Animal Scientist, Virginia Tech

Of sheep nutrition topics, mineral and vitamin nutrition are rarely considered the most interesting. A couple factors probably contribute to the issue. One is that we are primarily concerned when there is too much or too little of a particular element. Most nutritional symptoms are related to toxicity or deficiency levels. In between the two extremes there is little visual we can detect that would indicate mineral status. Another contributing factor to diagnosing issues related to minerals is there are several key interactions between several minerals which can impact absorption or utilization. The figure below depicts the interrelationship between various minerals.



In most production situations, forage in the form of hay or pasture supplies the majority of minerals needed. Proper fertilization, harvest maturity and incorporating legumes into grasses all positively impact the mineral content of forages. Since forage provides the bulk the minerals needed, providing a quality mineral supplement can make up the difference between forages and animal requirements. In Table 1 are shown the various minerals of concern, levels found in good forage, and the requirements for these nutrients by various classes of sheep. The requirements are based upon the Nutrient Requirements of Sheep, Sixth Edition (1985), and the forage values based upon pasture and hay samples taken in southwest, central and the Shenandoah Valley areas of Virginia over the last several years.

Table 1. Minerals in Forage and Required by Sheep

		Class of Sheep and Their Requirements (in diet Dry		
		Mature Ewe		Young Lamb
Nutrient	Good Forage	Early Pregnancy	Nursing Twins	Fast Gain
Calcium,%	.62	.25	.4	.55
Phosphorous, %	.32	.2	.3	.25
Potassium, %	2.3	.5	.8	.6
Magnesium, %	.25	.12	.18	.12
Sulfur,%	.25	.15	.25	.15
Sodium,%	.02	.10	.15	.10
Iron, PPM	354	40	40	40
Copper, PPM	9	10	10	10
Manganese, PPM	70	40	40	40
Zinc, PPM	31	30	30	30
Selenium, PPM	.15	.3	.3	.3

Macro-minerals are required in larger amounts, with that requirement expressed as a % of the diet or as grams per head per day. In Table 1, above, they are shown on the first 6 rows of the table. Some of these are already in sufficient quantity in forages, so supplementation is not

needed. Others are never in adequate amounts, so they must always be in a supplement. Finally, there are those that are marginal in forage and supplementation is sometimes needed.

- Adequate Potassium
- Deficient Sodium (when combined with Chlorine, makes salt)
- Marginal Calcium, Magnesium, Phosphorous, Sulfur

Calcium is often in adequate amounts in forages, and legumes have higher levels than do grasses. It is a relatively inexpensive mineral to add to feeds or mineral supplements. Grains and grain crop silages have high levels of phosphorous and very low levels of calcium. Many grain byproducts such as distiller's grains, corn gluten feed and wheat midds have higher phosphorus content than the grain. In many situations forage phosphorus is low due to soils are low in phosphorous fertility levels. Because phosphorous is important to reproduction and growth, it is often included in minerals for the ewe flock year around. It is the most expensive macro-mineral to add to a mineral supplement. Magnesium is often low in lush forage growing in early spring or when spring-like conditions occur. A deficiency of Magnesium causes grass tetany, a problem in cows that rarely occurs with ewes.

Micro-minerals or trace minerals are needed in very small quantities. The requirement by animals for these minerals is expressed in milligrams per head per day or in parts per million. Just as with the macro-minerals, some are adequate, others are deficient, and several are marginal.

- Adequate Manganese, Iron, Copper
- Deficient Selenium
- Marginal Zinc

Iron is often added to minerals (iron oxide or ferric oxide on the tag), even though the required amount is included in the forage that is consumed in the basal diet. The reason it is added is to give minerals the typical reddish-brown color. However, iron can interfere with the uptake of other minerals that are not in large amounts, such as zinc. Thus, it is recommended that iron not be added to complete minerals for sheep.

Zinc, Copper, and Selenium are all important in many physiological functions, including the immune response and disease-fighting ability. Our soils are often deficient in Selenium, making forage grown on those soils also deficient. Consequently, it is strongly recommended to include Selenium in mineral mixtures for sheep of all ages. The rules, for adding maximum levels of Se for sheep, are:

- 0.3 Parts per Million (PPM) in the total diet
- 0.7 mg per head per day
- 90 PPM in a free-choice mineral mixture

Because Se is not stored in the body for very long, frequent intake or dosing of Se is critical. A good sheep mineral needs to be available at all times that contains at least 50 or 60 PPM of Se. Assume Se is not included in a mineral product. If it is included, the amount must be stated on the label of the product. It often is stated as a percent. To convert % to PPM, move the decimal4 places to the right. Thus, a product with 60 PPM would be stated to include 0.006% Se.

Copper (Cu) can be toxic to sheep. Although there is an important function of Cu in the body, and thus it is a required mineral, excess amounts are concentrated in the liver rather than being excreted. Over time, this excess of Cu can destroy liver tissue, resulting in death of the animal. Our soils, and thus the forages grown on them, contain Cu levels that are close to the animals' requirements. Consequently, sheep minerals for the mid-Atlantic region should not have any Cu added to them.

**Note These levels are too low for cattle and goats, thus properly formulated minerals for these species always have Cu added to them. Mineral mixtures formulated for cattle and goats can be toxic to sheep if used for a long time.

Vitamins

Sheep, with their ruminant digestive system, can make vitamins from the raw materials consumed in their diet. They do this very well with all of the B-Vitamins; thus these are not any concern with sheep. Vitamins A and E are made from compounds found in green forage. Vitamin A can be stored in the liver for 2 or 3 months after sheep have been eating green forage for several months. Consequently, when eating fresh pasture or hay no supplemental vitamins are needed. However, when sheep are eating forage that is old, weathered, mature, or otherwise low in Vitamin A precursor (carotene), then this Vitamin should be added to the mineral mixture. Other feeds that will result in inadequate Vitamin A levels are corn silage, corn stalks, and straw.

Vitamin D is made from exposure to sunshine. For sheep housed indoors for more than 2 to 4 weeks, such as lambs being finished in confinement, Vitamin D should be included in the diet.

Most commercial minerals for sheep designed for free-choice feeding will contain added Vitamins A, D, and E. When making a total mixed ration, vitamin premixes can be added inexpensively to the formulation if a free-choice mineral is not going to be fed.

Table 2. Vitamins in Forage and Required by Sheep

		Class of Sheep and Their Requirements (in diet Dry		
		Mature Ewe		Young Lamb
Nutrient	Good Forage	Early Pregnancy	Nursing Twins	Fast Gain
VitA, IU/lb DM	50,000	1000	1200	500
Vit D, IU/lb DM	500	100	100	100
Vit E, IU/lb DM	10	7	7	7

Intake of Mineral

Sheep do not eat the same amount of mineral throughout the year. They have a craving for salt, and consume a complete mineral to get salt. Some ingredients, such as dicalcium phosphate and especially magnesium oxide, are not very palatable; thus intake may be lower when these ingredients are included. Often grain products or artificial flavor enhancers are added to mineral mixes to encourage higher intake. Intake is higher when consuming lush fresh forage, such as in the early spring. During the dry summer months intake is lower, this is also the case when sheep are eating hay. If a water source is nearby intake is higher than when water is a great distance away. In addition to nearby water, intake is higher if mineral feeders are located in shady areas or along paths frequently traveled by sheep.

Composition of Minerals (Feed Tag Information)

By law the tag on a mineral product must contain certain information. It must contain guarantees of various minerals included in the product. The minimum information to be stated is:

- Minimum and Maximum Calcium
- Minimum Phosphorous
- Minimum and Maximum Salt
- Minimum and Maximum Copper (if added, or if it exceeds 20 PPM)
- Minimum Selenium
- Minimum Vitamin A

Information about other minerals and vitamins may be displayed on the label. If a product contains a feed additive (antibiotic, ionophore or coccidiostat), it will say "Medicated" on the label, and the FDA-approved purpose and feeding directions for that additive will be stated. FDA-approved coccidia control products include Lasalocid (brand name Bovatec) which is to be fed at between 15 and 70 mg per head per day in a complete feed. Monensin (brand name Rumensin) is not approved for sheep, but is approved for goats in a complete feed at the rate of 20 g/ton. Decoquinate (brand name Deccox) is approved for both sheep and goats at the rate of 22.7 mg/100 pounds of bodyweight.

Form of Mineral Supplement

Minerals and salt products are available in loose, granular form and in block form. Because blocks are hard enough to shed rainwater, it is sometimes difficult for sheep to get enough mineral from licking them. In addition, sheep have broken their teeth on blocks. Finally, few if any complete minerals are in block form. Loose minerals must be put in a covered feeder of some type to keep rain out so they don't cake and become hard. Loose mineral mixes are the recommended form of mineral for sheep.

Types of Mineral Supplements

Sheep producers with forage-based feeding programs normally provide minerals in a self-feeder to their animals. They normally do not mix minerals with other feeds that are fed each day, as is the case with pigs, poultry, dairy, and beef feedlots. There are several types of free-choice mineral mixtures available to sheep. These are:

White Salt — The only minerals this contains are Sodium and Chlorine. This is not an adequate mineral supplement. Often contains Iodine, and is therefore called Iodized Salt.

Trace Mineral Salt (TMS) — TMS is White Salt with added Trace Minerals. No macrominerals are included. Often colored red from the Iron compounds added. Unless specifically stated, TMS contains no added Selenium, although there are some TMS products that do. TMS with added Selenium is considered to be the minimum acceptable mineral supplement for sheep, and only then sheep consuming high quality pasture.

Complete Mineral — A mixture containing salt, the macrominerals Calcium and Phosphorous, and trace minerals. May or may not have added Selenium. Magnesium may be added, but perhaps not enough to prevent grass tetany. Often the ratio of Calcium to Phosphorous is in the product name, such as 2:1 or 4:1. Because Phosphorous is the needed item and Calcium is normally adequate, a lower ratio is more appropriate for forage-based feeding programs. A higher ratio just dilutes the Phosphorous with Calcium-containing ingredients.

Lambs fed a high-grain diet

The rapidly growing lamb fed a high grain diet can experience many nutritionally related problems. One of these is called urinary calculi, a blockage of the urinary tract caused by "stones" that develop. An unsupplemented high grain ration contains an excess of phosphorous and small amounts of Calcium. The requirement (table 1 is for calcium in higher amounts than Phosphorous. This reversal of Ca:P ratio results in a change in the pH of the urine and the development of mineral-based precipitates in the urinary tract.

One solution to this problem is to use ammonium chloride in the ration. This changes the pH of the urine back towards normal, thus preventing the precipitates from forming. However, the Ca:P imbalance still persists. This is best fixed by feeding the lamb a mineral supplement that

provides lots of Ca and little or no P. Ground limestone (feed grade) added to a complete ration at the rate of 1% of the mixture is recommended. In this way the diet will contain the recommended Ca:P ratio of at least 2:1, even though the actual amounts of both Ca and P will greatly exceed the animal's requirements for these minerals. Many lamb feeders use added limestone plus ammonium chloride in the same feed.

Summary

Mineral supplementation need not be complicated or expensive. Intake of minerals by sheep needs to be monitored to ensure that amounts adequate to meet the needs are consumed. Excessive intake is costly and does not result in higher production. By focusing on forage production and quality first, then providing minerals that are likely to be deficient, producers can cost effectively meet the mineral needs of their sheep.

Adapted from Minerals and Vitamins for Sheep, Mark Wahlberg (2004). Disclaimer: Mention of specific brand names is for information only. No recommendation or endorsement is implied.

Lambing Time Management

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Lambing season is a very enjoyable time of year for many shepherds. Investment of time and sound management practices pay dividends for producers during lambing time. The profitability of a sheep operation is largely dependent upon maximizing the number of lambs marketed per ewe exposed, while minimizing costs of production. Since most lamb deaths occur at or shortly after birth, lambing time is critical. The three primary causes of death of lambs around lambing time are difficulty during the birthing process, starvation, and hypothermia. Management practices at lambing time are essential for the economic viability of the sheep operation.

Dystocia (lambing problems) has been shown to be a significant cause of lamb mortality. Losses due to stillbirths and dystocia can be reduced by frequent visits to the lambing barn and timely assistance of ewes. Pregnant ewes should be checked every 3-4 hours. Many shepherds do their last check at 11 p.m. or midnight and then again at 5 or 6 a.m. Ewes that will lamb between these times usually show signs at the late night observation. Ewes close to lambing will be restless and may try to claim other newborn lambs. Ewes in labor will normally separate themselves, and frequently choose a corner or area along a wall or feedbunk to nest and deliver. The lambing area should be dry and well bedded, and sources of cold drafts that will chill newborn lambs should be eliminated. It is not necessary to have a heated lambing barn- a dry, draft-free area is more important. The lambing process can vary considerably between ewes. Ewes in labor should be left undisturbed. However, once the ewe begins forceful straining and the water bags are passed, delivery should normally take place within 45-60 minutes. Once the front legs are visible, lambs should be born within 30-45 minutes. After the first lamb is born, subsequent lambs are normally delivered within 30 minutes. Prolonged delivery beyond these times may indicate lambing difficulty, and the ewe should be examined and assisted if necessary. Prior to assisting the ewe, the examiner should wash the ewe's vulva with mild soap and water. Likewise, the shepherd should thoroughly wash their hands and arms and wear an OB sleeve when assisting or examining a ewe. When assistance is required to deliver one lamb, the uterus should be examined for additional lambs. For lambs that are pulled, a piece of straw may be gently inserted into the nostril as an irritant to help stimulate breathing.

When possible, ewes should be allowed to give birth where they initially bed down. Moving ewes to individual pens when they start lambing may prolong the birthing process and cause other complications. Additionally, allowing ewes to complete the lambing process before moving them to jugs will keep the jugs drier and help prevent injury to lambs in multiple birth situations. Lambing jugs should measure at least 5 ft. x 5 ft., with a maximum slat spacing of 3 in. Large breeds and multiple births may require larger jugs. The environment of the jug is critical to newborn lamb health and survival. The jugs should be kept well bedded, dry, and free of drafts. For facilities with cement floors, a base of lime or sawdust/shavings is recommended under straw. Cement floors can be cold and damp, and therefore a source of chilling and pneumonia in newborn lambs. When feasible, lambing jugs should be cleaned between ewes.

The first 24-48 hours after birth are a critical time for the ewe and her lambs. During this time, bonding occurs between the ewe and her lambs. The jugs also assist the shepherd in keeping

a close eye on the ewe and lambs during this time. Upon moving the ewe into the jug, the lambs' navels should be immersed in a 7% iodine solution. Iodine helps prevent infection and promotes drying of the navel.

Colostrum is the milk produced by the ewe up to 18 hours after birth. It has important nutritional value for the newborn lamb. Colostrum also contains essential antibodies that provide protection against certain diseases for the newborn lamb, and provides energy to keep the lamb warm. Newborn lambs are susceptible to hypothermia due to their large body surface area in relation to body weight, and relatively low energy reserves.

Lambs should receive adequate intakes of colostrum within 30-60 minutes after birth. To help insure this, the ewe's teats should be stripped to remove the wax plugs that frequently obstruct the teat. In some cases, lambs that appear to be nursing may not be getting milk due to these plugs. Stripping the teats will also confirm the ewe has milk. Lambs should be monitored closely to make sure they nurse. Lambs that have nursed will have a full stomach upon palpation. Crutching ewes prior to lambing will enhance the lamb's ability to access the udder, particularly with long-fleeced ewes. Lambs that have not nursed should be assisted. Most lambs have a strong suckling reflex shortly after birth, and will nurse when presented a teat. It may be necessary to close the lamb's mouth on the teat and/or squirt milk in the lamb's mouth to initiate suckling. An effort should be made to help the lamb nurse the ewe before other methods are used to get colostrum into the lamb.

In some cases, the lamb is unable to nurse the ewe even with assistance. These lambs may be small, weak, chilled, rejected by the ewe, or injured. In these cases, stomach tube feeding is necessary to get colostrum into the lamb. Lamb stomach tubes that attach to syringes are available commercially, and should be on hand for all shepherds. For lambs that require tubing, start with 2-4 oz. the first feeding (30 cc equals ~1 oz.). Many times, this first feeding will energize weak or chilled lambs, and they will respond and be able to nurse on their own thereafter. If not, the lamb may require an additional tube feed an hour or two later. As a guideline, a 10 pounds lamb needs approximately 16 oz. of colostrum the first 24 hours of life.

Virginia is largely a Selenium deficient state. Deficiency of Selenium and/or Vitamin E causes white muscle disease in lambs. For prevention of this disease and all-around flock health and performance, the ewe flock should be provided a high-selenium complete mineral mix specifically formulated for sheep during gestation (fed free-choice). Additionally, lambs should receive supplemental Vitamin E and Selenium in the first few days after birth.

Experiences With CIDRs in the Virginia Tech Dorset Flock

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Fall lambing appeals to sheep producers for a variety of reasons. Fall-born lambs typically are well-suited to take advantage of strong winter or early spring market prices. Additionally, there is growing demand for fall-born lambs to meet the needs of youth which have spring market lamb shows. Favorable weather and forage production associated with fall lambing compliment these marketing opportunities. The primary limitation to fall-lambing is the ability to get a suitable percentage of ewes pregnant during a spring breeding season. Among the options producers have to enhance spring breeding success is hormonal control of the estrous cycle to induce ovulation in ewes. The sheep EAZI-BREED CIDR provides producers a user-friendly, readily available option to enhance spring breeding. The CIDR is a vaginal insert which releases progesterone, and is labeled to induce estrus in ewes during seasonal anestrus. The CIDR is a simple, easy-to-use device that is inserted into the ewe for five days, with ram introduction to immediately follow. Following is a summary of results of utilizing CIDRs in the Virginia Tech Dorset flock located on campus.

The use of CIDRs to enhance fall lambing in the VT Dorset flock was initiated in Spring 2010. The primary goal was to increase the number of ewes lambing in the fall for use in the APSC teaching program as well as meet the demand for fall-born rams for commercial producers. The following summary will present results from spring and fall breeding and lambing seasons over the past three years. Breeding season protocols were similar across years. For spring breeding, CIDRs were administered late April through mid-May. All ewes had been isolated from rams prior to synchronization. Ewes were mated in single-sire breeding groups, and rams had passed a breeding soundness evaluation prior to the breeding season. Any ewe not conceiving in the spring breeding season was subsequently exposed to rams starting in August to lamb in January-February. No synchronization protocol was used in the fall breeding season. Rams remained with the ewes for approximately three estrus cycles. Differences in synchronization treatments over the three years are outlined with results below.

<u>2011-2012 Season</u>

In 2011, a total of 59 registered Dorset ewes were synchronized with CIDRs. CIDRs were administered in late April or late May, and removed after 5 or 7 days following insertion. Ewes were mated to Dorset rams in single-sire breeding pastures. A control group (no CIDR) of 32 ewes were introduced to the same rams on the same day as the synchronized ewes. All ewes had lambed either fall 2010 or winter 2011. Open ewes from the Spring 2011 breeding were bred August-September for subsequent lambing in winter 2012. The following table summarizes breeding and lambing information for each lambing season.

	Fall Lambing 2011		Winter Lambing 2012
	CIDR[a]	Control	
No. ewes	59	32	36
No. ewes lambing	35 (59%)	14 (44%)	34 (94%)
Lambs born/ewe lambing	1.48	1.46	1.76
Lambs weaned/ewe lambing	1.21	1.31	1.67
[a] Includes ewes receiving CIDR for 5 or 7 days.			

	All Service Sires		Service Sire A		Service Sire B		Service Sire C	
	CIDR[a]	Control	CIDR[a]	Control	CIDR[a]	Control	CIDR[a]	Control
No. ewes	59	32	23	13	15	8	21	11
No. ewes lambing	35 (59%)	14 (44%)	16 (70%)	9 (69%)	2 (13%)	0 (0%)	17 (81%)	5 (45%)

As shown above, overall pregnancy rate for ewes synchronized with CIDRs was 59% compared to 44% for control ewes. Lambs born per ewe lambing was similar for synchronized vs. control ewes. Evaluation of the effect of service sire revealed one sire group (Sire B) had much lower pregnancy rates as a result of poor ram performance. Excluding ewes exposed to Sire B, overall pregnancy rate was 75% (33 of 44 ewes) for ewes receiving CIDR and 58% (14 of 24) for control ewes. Comparing fall vs. winter lambing ewes reveals a substantial difference in number of lambs born and weaned per ewe lambing.

2012-2013 Season

In spring 2012 a total of 40 Dorset ewes were synchronized with CIDRs. All synchronized ewes lambed January 15 –February 15 and were weaned on April 5. CIDRs were inserted on May 3 and removed after 5 or 7 days. A control group of 41 ewes were introduced to rams the same day as the synchronized ewes. All control ewes had lambed fall 2011. Control ewes received no CIDR. Open ewes from the Spring 2012 breeding were bred August-September for subsequent lambing in winter 2013. Results are presented below.

	Fall Lambing 2012		Winter Lambing 2013
	CIDR[a]	Control	
No. ewes	40	41	43
No. ewes lambing	25 (63%)	19 (46%)	36 (84%)
Lambs born/ewe lambing	1.25	1.58	1.79
Lambs weaned/ewe lambing	1.05	1.42	1.68
[a] Includes ewes receiving CIDR for 5 or 7 days.			

In the spring 2012 breeding season, there was no difference in pregnancy rate among the four sires utilized. Overall pregnancy rate (54%), and pregnancy rate for CIDR and Control ewes was very similar to that observed in Spring 2011. Additionally, there was no difference in pregnancy rate between 5 vs. 7-day CIDRs in either 2011 or 2012. At breeding, all ewes were weighed and Body Condition Scored. There was a tendency for thinner ewes (BCS = 2) to have slightly lower pregnancy rates than ewes in BCS 3 or 4 (50% vs. 56%). Ewes that became pregnant were an average of 13 pounds heavier at breeding compared to ewes which failed to breed in the spring. Pregnancy rates were similar across ewe ages (all were mature

ewes). As was observed in the previous year, Dorset ewes lambing in the winter vs. fall drop and wean a larger lamb crop. Additionally, observations from fall lambing ewes in both 2011 and 2012 showed fall lambing tended to have a higher incidence of stillbirths and low birth weight lambs resulting in more mortality from birth to weaning compared to winter lambing ewes.

2013 Season

In spring 2013 a total of 38 Dorset ewes were synchronized with CIDRs. All synchronized ewes lambed January–February and were weaned on March 27. CIDRs were inserted on May 16 and removed after 5 or 7 days. One half of the ewes receiving CIDRs were administered PMSG 24 hours prior to CIDR removal. A control group of 41 ewes were introduced to rams the same day as the synchronized ewes. All control ewes had lambed fall 2012. Control ewes received no CIDR. Results for the synchronization treatments are shown below.

	Fall Lambing 2013		
	CIDR[a]	CIDR+PMSG[b]	Control
No. ewes	19	19	36
No. ewes lambing	14 (74%)	14 (74%)	21 (58%)
Lambs born/ewe lambing	1.53	1.79	1.43
Lambs weaned/ewe lambing	1.31	1.79	1.19
[a] Includes ewes receiving CIDR for 5 or 7 days. [b] Includes ewes receiving CIDR for 5 or 7 days, + PMSG.			

In spring 2013, pregnancy rates were similar for ewes receiving CIDR compared to those receiving CIDR+PMSG. Both synchronized and control ewes had higher pregnancy rates in spring 2013 compared to the spring breeding seasons of 2011 and 2012, and this difference was most notable for the control, non-synchronized ewes (58% pregnant vs. 44% and 46% previous two springs). No differences in pregnancy rate among the three sires utilized in Spring 2013 were observed. Ewes receiving CIDR+PMSG had higher lambing rates than those receiving CIDR alone, although pregnancy rate was the same. Given the small number of ewes in both treatment groups, this observation requires further investigation.

Collectively, these on-farm experiences underline several key points when synchronizing ewes for spring breeding:

- Ram fertility and libido is critical, conduct BSE on rams and observe closely; use of a marking harness will increase accuracy of monitoring
- Ewe:ram ratio should not exceed 18:1 and may need to be lower depending on the age and capacity of the ram. Single ram flocks should stagger CIDR removal (every 2-3d) to avoid overworking the ram
- Ewes should be in good body condition, weaned and recovered from the weaning process
- Ewes should not be exposed to rams prior to synchronization
- Minimize stress on ewes during and immediately following breeding season (heat, transportation)
- Lambing rates will be significantly lower for fall vs. winter/spring lambing ewes