In Arkansas, we are blessed with a vast abundance of forestland teeming with wildlife and, in addition, beautiful fall and winter weather that makes for great hunting seasons. Many Arkansans look passionately forward to this time of year to test their hunting skills and to try new ways to attract game, oftentimes on privately held land that very often features considerable amounts of wooded areas.

Faculty from the UofA Animal Science Department and Forest Resources Extension in Little Rock started a new project this fall in collaboration with the USDA-ARS Small Farms Research Center in Booneville, Arkansas, to address some questions evolving around the establishment and persistence of food plots for deer. Landowners have experimented with commercially available “food plot mixes” and with forages to attract and retain deer on their hunting grounds. A major challenge is finding a forage crop that possesses good nutritive value, establishes and grows well in forested areas and persists over longer periods. Forages of choice may be legumes among other crops, and published research as well as anecdotal reports by landowners suggest that both annual and perennial types are suited to attract game animals.

Although woodlands are the native habitat for deer, much of the vegetation growing there is unsuitable. These animals have very selective food habits, and only a small percentage of the plants are preferred, according to the Arkansas Game and Fish Commission. Despite being selective in their browsing behavior, deer are adapted to a variety of food sources, each of which may play an important role during certain times of the year when other, sometimes more preferred, food sources are not available. During fall and winter, diverse and sufficient food supply is especially crucial as deer must add fat for higher energy requirements and increased activity for mating behavior. During that time, the quality of deer habitat becomes apparent, and shortcomings may affect future deer harvests. This is an opportunity for landowners to provide deer with food plots to supplement the animals’ native range. It should be understood, however, that a healthy environment is a requirement for successfully keeping deer or other wildlife attracted to the area. Native habitat cannot be replaced with any food plot; in fact, habitat improvement along with careful selection of food plot sites may render the best results. Besides clovers, wheat and ryegrass are preferred crops eaten by deer, as these

Food Plot Research Aims at Improving Wildlife Management and Habitat
Dr. Dirk Philipp, Assistant Professor

Planting of arrowleaf and white clover food plots in pine alleyways at USDA-ARS, Booneville.
plants are relatively low in fiber, resulting in higher digestibility than other woody plants and forbs.

For our food plot project, we intend to investigate the persistence of arrowleaf and white clover grown between rows of pine trees (“alleyways”) varying 12 and 32 feet in width, providing several different degrees of light penetration. In addition, we included an open control area to compare growth under usual conditions with that under shade. Before planting last October, considerable work had to be performed to prepare the seedbeds. Personnel from the Small Farms Research Center cleared alleyways of woody vegetation and brush-hogged every row. We then used a hay rake to remove pine needles and duff as much as possible. Lime and K and P fertilizer were applied before rows were disked several times to break up soil and grass sods. Disking depth was kept shallow to avoid disturbance of pine tree roots. A coulter packer-equipped Brillion broadcast seeder was used to plant arrowleaf clover at 21 lb/acre and white clover at 10 lb/acre. Seeds came coated and pre-inoculated by the manufacturer.

An initial assessment of plots indicated that planting was successful. It appears that the number of seedlings was similar across all treatments. In some wider alleyways, weed pressure appears to be higher, while in more narrow rows, competition from weeds appears relatively low, probably due to less light penetration among possible other factors. During this phase, photosynthesis is of less importance to the emerging seedlings than later during their life cycle; therefore, biomass production may vary drastically once sampling starts next spring. Light penetration will be measured using permanently installed sensors. Height and circumferences of the pine trees lining the alleyways will also be recorded as part of an initial site characterization.

We plan to conduct this study for two years and anticipate drawing conclusions regarding the persistence of both clover species under differing amounts of light. Ideally, this research will help landowners to establish and maintain food plots more efficiently and retain deer populations more reliably.

Cow Pieology 101 – The Study of Cow Pies

Dr. Tom Troxel, Professor

There’s the science to beef cattle production and then there’s the art to beef cattle production. Art can only take beef cattle producers so far, and then science must fine-tune the operation. The successful beef cattle producer must mix the science and art of beef cattle production in order to make wise management decisions. If one (science or art) is neglected, then the information required to make management decisions is incomplete.

Cow pieology is the study of cow pies, but it’s certainly not a science. It’s an art that beef cattle producers have practiced for many years. Many beef producers observe cow pies to determine when to start supplemental feeding or when to rotate the cattle to a different pasture. The shape, size, color and texture can tell a story about the cow’s diet quality.

By observing the cow pie, one can get an indication of the quality of the animal’s diet. This hay met the cow’s requirements for protein (7.8 percent) and TDN (53.2 percent). This cow pie was flat, round and dark in color. The fiber content in the hay was low (28.2 percent); therefore, the hay was easily digested.

The cow pie in Figure 2 shows a remarkably different shape. It was not flat and round but rather the cow pie is hard, stacked and showed grooves or waves. When this cow pie landed on the ground, it stacked one on top of the other. This cow was eating hay that tested 5.1 percent protein, 31.5 percent fiber and 53.7 percent TDN. A cow pie with this shape usually is a sign of high fiber and low digestibility. In this example, the protein content was very low (5.1 percent). Because of the low protein in the diet, the digestibility of the protein and other nutrients is often seriously decreased. A supply of protein above the minimum promotes healthy microorganisms in the rumen to aid the digestion process.
Due to the poor hay growing conditions in 2011, a lot of cow pies in January and February will be looking like Figure 2. During this time of year, many cows will be lactating; therefore, body condition will decline, milk production will be reduced, colostrum concentration will be reduced, which may result in increased calf scours, and cows will take longer to re-breed. Overall cow herd productivity will be reduced for not only the current year but for the next year as well.

The cow pie in Figure 3 was from a cow eating hay with more fiber (32.8 percent), as compared to the Figure 2 cow pie, but it also had more protein (8.8 percent). Because the protein requirement was being met, more of the hay was digested and the shape of the cow pie was different. The TDN level was only 46.3 percent. If this cow continued to eat this hay without additional supplement, body condition would diminish. By observing cow pies, a change in diet quality can be observed before a decrease in body condition occurs.

The science of forage testing is the key to proper supplementation. A forage test provides the nutrient contents of hay. Knowing the nutrient composition of hay allows for the comparison between hay nutrients and the nutrient requirements of the cattle being fed. If the animals’ needs are greater than what’s provided in the hay, a least-cost feed supplement can be developed.

Least-cost supplemental feeding generally involves grouping animals based on their nutritional requirements, forage testing and identifying the costs of feed grains. To minimize feed costs, cattle with different nutritional requirements should be grouped separately and supplemented accordingly. Commingling cattle with different requirements (for example, non-lactating cows in the same field as lactating cows) can cause either overfeeding and waste of costly supplements or underfeeding and poor cattle performance. Knowing the nutrient composition of the forage allows feeding lower-quality hay to cattle with lower nutrient requirements and feeding higher-quality hay to cattle with greater requirements. If the nutrients in the hay are less than the requirements of the cattle being fed, a least-cost supplement can be formulated based on local grain prices and alternative feed sources.

Remember, the “art” of cow pieology may indicate a supplement is needed, but it is the “science” of forage testing that indicates which and how much supplement is needed. To be successful in the cow-calf business, one must mix the science of beef cattle production with the art of beef cattle production. The art of beef production must be mastered before the science can be applied, for it is the art that identifies when the science should be used, changed or adapted. Forage testing and least-cost rations are important “science” that when combined with the “art” of cow pieology will keep cattle healthy and efficient.

For additional information about forage testing, contact your local county Extension office.

Selection of Junior Livestock Projects

Steven M. Jones, Associate Professor

The junior livestock program is a unique opportunity to use live animals to develop youth. Youth learn something about agriculture and livestock production and develop an appreciation for the livestock industry, but the main objectives are to teach life skills and help youth become productive citizens. The experience of youth owning and working with animals, being responsible for their care, health and growth, and exhibiting them in a competitive environment is a tremendous character-building process. It is important for youth to have a positive experience with their projects to assist this learning process. The first step in the process is selection of the animal. If one of the goals in youth livestock projects is a positive experience, choosing a quality animal the youth can be proud of then becomes important.

What makes a champion? There are several components that produce a champion. These include:

- **Selection** – you have to start with good genetics to produce a champion.
- **Nutrition and health** – once you have purchased your animal, you need to feed and care for it.
- **Fitting/grooming** – this is not just on show day but throughout the entire project.
- **Showmanship** – this is how you present your animal on show day.

All these elements are important and must be addressed in detail. However, the selection of the animal is the foundation on which you build the final product. The primary purpose for selecting animals is to obtain an animal that when properly fed and managed will represent the best in the industry. This means that industry standards must be identified prior to selection. These standards represent industry goals achievable by most youth livestock program participants. Judges use these standards when evaluating animals in the show ring. Animal selection is guided by the same standards used to evaluate accomplishment.

There are basic areas that need to be considered when selecting a livestock project, regardless of species. The common purpose for meat animal production and youth livestock projects is to economically produce high-quality lean meat desired by consumers. Consumers desire lean with a minimal amount of fat whether they are purchasing beef, pork,
lamb or goat. Therefore, the industry standards for each of the species are very similar. These standards are muscle, structural correctness, capacity, frame and balance.

**Muscle**

There are several reasons why individual animal muscling is important in the meat animal industry. Thicker muscled animals usually gain faster and require less feed per pound of gain since it takes more energy to grow fat than muscle. Yield is based largely on total muscle and total amount of fat cover. Therefore, heavier muscled animals will have a better yield grade at a given fat depth than similar weight thinner muscled animals. Heavy muscled animals produce more lean and less fat. Visual appraisal of muscling is one factor used in selecting breeding stock, and total animal muscling is one of the categories used to evaluate live animal conformation and usefulness to the industry. Animals of similar weight and amount of fat will have essentially the same percent of total muscle in each part of the body. Therefore, identifying muscle in those areas where it is most apparent is a direct indicator of total muscle.

**Frame and Capacity**

The greatest production efficiency is achieved by animals at the top end of weight preferred by packers and consumers. Furthermore, animals with larger frames at a given weight have more feed capacity per unit of body weight and achieve greater feed efficiency. Study industry standards for carcass quality and size as well as industry standards for breeding animal efficiency. They allow for some variation without going under the low-end carcass weight or going over the high-end of acceptability. It also allows for selection of animals that have good potential for growth and feed efficiency.

**Structural Correctness and Balance**

Strong bone and correct skeletal structure are essential for the traveling required to obtain food and to reproduce. Select animals that exhibit strong correct skeletal structure. Balance is best identified as uniformity in the appearance of muscle, trimness and skeletal structure. Avoid animals that show a weak back, crooked feet, legs that are excessively short or long or excessively deep or shallow body legs. A high level of total lifetime production improves the profitability for all species.

Selection is a process of identifying animals that when properly managed will represent the best in the industry. Animals should be selected on the basis of how well they may achieve all or most of the primary industry goals for production. These are the animals that offer the best opportunity for members to utilize their knowledge, skill and effort to attain a high level of achievement.

**Controlling Lice on Your Cattle**

Dr. Jeremy Powell, Associate Professor, and Dr. Chris Tucker, Program Associate

Even though other external parasites such as flies and ticks are not a problem this time of year, you still need to be on the lookout for signs of lice in your cattle. This problem usually starts in the late fall and builds throughout the winter months. If you have noticed your cows standing around scratching on fence posts, trees or the hay feeder, then they may be infested with lice. Typically, cattle affected by lice have rough hair coats and noticeable patches of hair loss around their face, neck, back, sides or tailhead. Infested cattle may also appear unthrifty and have a poor physical condition. Heavy infestations can reduce gain performance and have a negative economic impact on cattle.

Two different types of lice typically affect cattle. One is known as **chewing or biting lice**, and the other is **sucking lice** (Figure 1). The sucking louse has a long mouthpart used for sucking blood from infested cattle. Chewing lice have a wider mouthpart that they use for feeding on dead or sloughing skin. Both types of lice can cause severe irritation and itching. This leads to restlessness and an animal that is focused on rubbing and scratching instead of on eating, leading to decreased performance and unthriftiness.

One University of Nebraska study indicated that moderate to heavy lice populations may reduce weight gains of calves by as much as 0.21 lb/day. It also indicated that calves fed at a higher nutrition level had lower lice populations and were affected less severely by lice than calves fed a maintenance ration.

Lice live on their host all the time. The typical life cycle starts with adult females laying eggs (nits) which are deposited and attached to hairs close to the skin. Hatching occurs in about eight days, and development through three nymph stages occurs over the next three weeks. The feeding habits of immature lice are the same as those of the adults. After reaching the adult stage, females are ready to lay eggs within a couple of days. They outnumber the males and live about six weeks. The life cycle from egg to egg is typically completed in about four weeks during cold weather.

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Louse infestations typically begin to increase around November/December and peak out around January/February. While lice are most abundant on livestock during the winter when animals are under stress from cold weather and poor nutrition, the reproduction rate for lice slows dramatically in warm weather months. In the summer, only a few lice will persist in a herd by moving to areas on the animal that are protected from high temperatures and sunlight. Older cows or bulls are the most likely animals to carry lice through the summer months. Lice are spread by animal-to-animal contact. Nose-to-nose contact by livestock sharing a common fence can be sufficient for spread of these insects. Typically, younger stock and old thin or debilitated cattle will be affected by the worst cases in a herd. Nursing calves can also be affected. A poor nutritional state along with a high stocking rate can lead to more severe outbreaks with the affected animals rubbing out patches of hair and damaging their skin.

A variety of options exists for control of lice. The most popular formulations tend to be pour-ons because of the ease of use. There are two main categories of pour-ons for lice control – insecticides and endectocides. Insecticides for lice control include permethrin, coumaphos, lambda-cyhalothrin and cyfluthrin (these include common products such as Brute, Durasect, Ultra-Boss, Co-Ral, Saber and Cylec). Pour-on endectocides include ivermectin, doramectin, moxidectin and eprinomectin (with common products including Ivomec, Dectomax, Cydectin and Eprinex). Pour-on endectocides typically cost more than insecticide pour-ons, but they also control internal parasites. Some of the endectocides are also available as injectable formulations; however, these are only effective against sucking lice. Dust bags, backrubbers and ear tags may be useful methods for lice control as well. Most insecticides are effective against adult lice and nymphs. However, few have activity against louse eggs, potentially allowing residual populations of lice to remain on animals for some time after treatment. This means that a follow-up treatment may be required. Always follow dosage and administration directions as well as any withdrawal times specified on the label. You may obtain the Extension publication MP144, Insecticide Recommendations for Arkansas, from your county Extension office for more treatment suggestions. Or, an electronic copy of the publication can be found here: http://www.uaex.edu/Other_Areas/publications/PDF/MP144/MP-144.asp.

The 2011 Intercollegiate Livestock Team completed their final contest this fall and wrapped up a year full of honors and successes. This year’s team competed in 12 contests that ended with trips to the American Royal in Kansas City, Missouri, and the North American International Livestock Exposition in Louisville, Kentucky. They were named champion team at the Arizona National in Phoenix, Arizona, champion team in sheep and goats and third overall at the National Western in Denver, Colorado. Other highlights include a second place finish at the Dixie National in Jackson, Mississippi, and a third place finish at the Southwestern Exposition in Fort Worth, Texas. This team finished in the top ten teams overall in 9 of the 12 contests and had several individual honors.

The 2011 Intercollegiate Livestock Team would like to extend their appreciation to the Arkansas livestock producers, judging team alumni, Animal Science faculty and past and present department heads, Dr. Keith Lusby and Dr. Mike Looper, for your continued support of this program.