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West Virginia Small Ruminant Management Performance Record System

Project leaders Jim Pritchard and Brad Smith of WVU Extension and Project Director Fane Irvine have completed the “West Virginia Small Ruminant Management Performance Record System”. The Record System is a Microsoft Access database. Because Microsoft Access is not installed on most home computers, and is a fairly expensive program, the Project purchased special software that allows the database to “stand-alone”, this means that a producer does not have to purchase Microsoft Access in order to use the system. Producers are being enrolled in the system in spring 2005.

Performance records give the producer the ability to select and maintain a flock/herd that will perform at a higher level of production. Having a flock/herd that is

producing at a higher level gives the producer greater efficiency, and in turn allows the producer to lower costs of production. Although producers can do things to increase market value of their sheep/goats, it can often be more effective to reduce the cost of production, thus increasing the return from the sheep or goat enterprise. Every producer has animals that perform better (or poorer) than the average of the group of animals; this is because of the genetic variation that exists in the entire natural world. Because of this genetic variation, producers can select for particular traits that are economically important to their operation, in this case valuable traits include ability to breed out-of-season, growth rate and litter size. Data from WVU Extension service showed that the

lowest one-third of the sheep flock yielded little or no net income. With this program, both the higher producing and lower producing animals can be identified so that each producer can make management decisions to improve their flock/herd.

The Performance Record System can measure the productivity of the breeding females and males used as sires. The system ranks those animals, so a comparison of females/males to each other can be made; this is helpful in making breeding decisions. For example, the ewes that are the very highest performers can be mated to a specific ram for the purpose of producing replacement females.

The Performance Record System allows the producer to keep both “birth-to-weaning” and “post-

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weaning” records so that top performing replacements can be identified. With the use of performance records that can be maintained with the West Virginia Small Ruminant Management Performance Record System, producers can make a great deal of genetic improvement in a very short time.

As the market place shifts more toward a global basis, US producers must stay competitive with imports from overseas. With the West Virginia Small Ruminant Management Performance Record System, producers can improve their flocks or herds so that they can maintain their portion of the market.

The West Virginia Small

Ruminant Management Performance Record System will be available to producers starting May 2005. Although completed testing of all aspects of the program must be performed before it is available to producers.

Experimental Ram Lamb Performance Test

The West Virginia Sheep Management Project, the West Virginia University Extension Service and the West Virginia Agriculture and Forestry Experiment Station have made plans to conduct an experimental ram lamb performance test at Reymann Memorial Farm in Wardensville, during the spring/summer of 2005. Reymann Memorial Farm is the site of the West Virginia Beef Sire Evaluation Program, an annual sire evaluation, which aides both the seed stock and commercial beef producers of West Virginia. The performance testing center currently has a system in place to measure the individual feed efficiency of each bull on test. Feed is the largest cost item in the production of either sheep or cattle; therefore, selecting animals for feed efficiency can decrease costs and increase net returns to the livestock producer.

To aide the producer by offering feed efficiency and performance data, the WVSMP, WVU Extension, and the WVAES will attempt to offer to the sheep producers of West Virginia the same quality data and sire selection available to the cattle producers of the State. Inspection of the facilities indicates that it will be possible to measure feed efficiency of ram lambs with the “GrowSafe 4000E” system already in place at Reymann Memorial Farm. The first step will be to test that possibility with growing ram lambs.

The “GrowSafe 4000E” System was installed at Reymann Memorial Farm during the 2003-2004 West Virginia Bull Test Evaluation Program. This system of hardware and software includes feed troughs mounted on load cells. An antenna grid is

incorporated in each trough, and animals are fitted with electronic ear tags that are read by the antenna grid. An animal feeding at a trough is identified at five-second intervals and feed available in each trough is weighed every second, with accuracy within 5 grams. The animal identification and feed consumed data are sent wireless via a communication panel to a computer with software to compile individual feed intake and individual feeding events. It is hoped that the sensitivity of this system will allow measurement of the individual feed intakes of ram lambs, so that feed efficiency can be calculated.

The “GrowSafe 4000E” was developed for cattle, therefore some modifications need to be made to allow the system be used for rams. These modifications will include installation of platforms,

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which will enable the rams to consume feed from the troughs. It also is necessary to limit the depth of the troughs, so that the feed is always within reach of the rams. The number of rams that can be fed at each trough is unknown, so that will be a major factor tested in the experiment in 2005. We also need to know how the system will work with rams of different sizes, so both wool-type and hair-type rams will be studied. Thus, it was decided to “test the system” this year using ram lambs from WVU flocks. WVU will make 40 ram lambs available for testing the system. If it is possible to accurately test rams using this system, we anticipate having a West Virginia Small Ruminant Ram Evaluation Program available to producers in 2006.

When the West Virginia Small Ruminant Evaluation Center begins testing rams consigned by individual producers in 2006, the rams will be evaluated using data for several variables. Feed efficiency, maternal traits, reproductive performance, growth rate, frame size, structural soundness, and breed character will be evaluated in such a manner that

these traits can be used by producers to select rams that most closely match the needs of their management programs. Wool traits, such as staple length and black fiber content will also be evaluated, and if consignors wish to have fiber diameter included for their rams, that measure will also be available. It will be the responsibility of the consignor to provide the maternal data, including type of birth, birth weight, type of rearing, and weaning weight. Producers will be encouraged to use the West Virginia Small Ruminant Performance Record System to keep this information and to submit it to the evaluation process.

Animal health is of great importance to both producers buying rams, to project activities and to operation of the test facility. Consigned rams will be tested for all major health concerns including Scrapie, Johne’s Disease, Spider Syndrome, and Ovine Progressive Pneumonia.

If tests are successful and demand for the test develops as expected, then funding for expansion of the test will be sought. If additional pens are constructed and feeders are installed, then ram lambs can be tested at different

times of the year so as to allow animals born at different times to be evaluated during the period of maximum growth rate. It is important to evaluate the rams at this time to insure tests occur during the optimal stage of the growth curve. Additional pens will allow the West Virginia Sheep Management Project to conduct progeny tests on sires, allowing mature rams, past their maximum growth stage, to be compared genetically. In addition, these facilities will allow the project to perform research trials to develop adjustment factors for carcass traits determined by ultrasonography of the lambs.

There is great value for economic development of the sheep industry in conducting ram lamb evaluations and, as has already been learned from the work with cattle in the “GrowSafe 4000E” system, much can be learned from related research. This research project offers the West Virginia Sheep Management Project, WVU Extension and the Davis College of Agriculture, Forestry, and Consumer Sciences a valuable opportunity to take a leading role in an industry that has great potential.

The established purposes of the West Virginia ram lamb test will be:

- 1) To have a common environment and unbiased evaluation of economically important traits of young sires to be used in West Virginia flocks.
- 2) To provide a test that is available to producers with both small and large flocks. Producers will have the opportunity to test rams for either home use or to be consigned to an annual Performance-tested Ram Sale. Thus both purebred and crossbred rams will be tested.
- 3) To promote performance testing of all sheep in West Virginia flocks.

Nutrition, Feeds and Feeding of Goats Raised for Meat and Milk

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Herbivores are animals that feed on plant material for their diets. Animals that feed on plant materials can be classified as monogastrics, ruminants, or camelids, based on the process by which they digest the plant substances. Monogastrics are animals that have one simple stomach. The monogastric herbivores (actually they have an enlarged and active cecum which allows them to utilize cellulosic materials. It is the true monogastrics, e.g. pigs and poultry that do not make full use of cellulose) do not use cellulose well; these include horses and rabbits. Both horses and rabbits have enlarged areas in the gut and cecum where fermentation occurs. Ruminants are animals with four compartments in the fore part of the digestive system and they chew their cud. Ruminants use fermentation to break down cellulose in the rumen compartment of the digestive system. There are about 155 ruminant species in the world. Camelids differ from ruminants in that they have only three compartments in the fore part of the digestive system. Goats are true ruminants, however a goat's feeding behavior differs from most other domestic animals. This article begins to explain these differences and how their management should differ.

Goats are not grazers such as cattle that have a diet of strictly grass species, nor are goats true browsers such as white-tailed deer, which feed on shrubs and

twigs. However, goats fall into an intermediate group, which display feeding habits of both grazers and browsers. Goats have evolved as intermediate feeders to allow for feeding flexibility to ensure survival. Sheep may display similar intermediate habits, but tend to consume more grasses than do goats. Data collected in Texas grazing areas suggest that sheep prefer 22% browse, 17% forbs, and 61% grasses. The dietary preference of goats includes 43% browse, 12% forbs, and 45% grasses as opposed to cattle, whose diet consists of 81% grasses.

There are several anatomical features that are unique to the goat. A goat's salivary glands are relatively large, like other selective eaters. Their muzzle is narrow allowing them to select what they want to consume more easily. Goats have a split and flexible lip allowing them to grasp plant parts for feeding. The tongue of the goat is slender and agile. Like other selective eaters, the goat eats plant parts that are highly and easily digestible. The liver in a goat is relatively large, allowing more the absorption of fermented cells more rapidly and to detoxify the chemicals located in browse, this allows the goat to process feeds that other ruminants would have problems utilizing. The rate of passage in the digestive system requires hindgut fermentation be more important than that of grazers, because the rate of passage in

the goat is quicker than in sheep and cattle.

Like other small animals, goats have higher relative nutrient requirements, making it necessary for a goat to consume higher quality diets. Goats will sample different parts of the feed before selecting a preferred feed stuff. Goats spend more time eating and less time ruminating than sheep. Goats will select the more digestible feed when offered to them, they will select high quality leaves and will not consume the stems. If feeds are of low quality, a larger allocation is required to meet the dietary needs. However, the digestive system can process only so much feed in a given time. It is important that the volume of intake contains the needed nutrients required by the animal. The digestive system of a goat is sensitive to badly preserved feeds containing oxidized fats, urea, and high levels of some minerals. Intake of poor quality or refusal of feed may be a create problems if goats are in early lactation, late gestation, or high milk production when extra energy demands are relatively high.

Goats are selective in their pasture feeding, meaning they choose the plants they want to eat. Increasing stocking density can increase pasture utilization. A higher stocking density forces animals to compete for the forages in the pasture. Removing plants that we consider undesir-

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able, in the course of making pasture improvements, may actually remove the preferred feed of goats on that pasture. Goats on pasture will move around more than in search of preferred plant types and plant parts. Goats will select

be up to 5 to 6% of body weight. During late pregnancy dry matter intake per unit body weight will decrease. This is the result of the growing fetus requiring more space in the body cavity, decreasing the rumen volume. Feed intake during late stages of gestation must provide proper amount of nutrients or pregnancy toxemia may occur.

At the onset

formulated blocks that are more suitable for meat goats.

Minerals are very important in goat nutrition. The calcium to phosphorus ratio should not be less than 1.2 to 1.0 and at least 2 to 1 for bucks. Ammonium chloride should be added to the diet of bucks on high concentrate diets. Copper and molybdenum must be kept between 2:1 and 10:1 copper to molybdenum ratio. Goats, unlike sheep, are not sensitive to copper, goats need more than 20 parts per million. Sheep minerals should not be used for goats because of the reduced copper level in sheep mineral.

Most research on domestic animals has been with cattle, sheep, and non-ruminant animals, goat research is only conducted at a few experiment stations. Goat research in other countries is focused on different production systems. Because of the limited scientific literature on goat nutrition, the first figures on the requirements of goats were extrapolations from cattle and sheep research. We can expect a new generation of data to be forthcoming in the next year or so through a document and website being developed at Langston University in Oklahoma.

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vegetation with a high leaf to stem ratio, and prefer growing grasses, especially annuals and low growing bushes. The goat's selective nature results in a more favorable diet.

There is great potential for better pasture utilization by including goats along with other species. Goats, sheep, cattle, and horses all have different forage preferences. Diversity of forage resources determines level of advantages of diverse animal species.

Goats tend to graze fencelines and high ground first, because of the diversities in plant species that exist along fencelines. Goats have the ability and agility to stand on their back feet, giving them more availability of tall growing feedstuffs. During different times of the season, as plant species change, a goat's feeding preference also changes. The feeding behavior of goats makes feed trough design critical for minimizing feed waste and sanitation.

Feed intake of a goat can

of milk production, dry matter intake is not changed, but milk fat and protein production are maximized. During lactation the body is in a negative plane of nutrition, meaning the amount of nutrients required cannot be met by the feed intake, especially energy. This deficit can be reduced by offering high quality forage, or concentrates. However, body weight loss can be expected during early lactation.

If you use non-protein-nitrogen sources such as urea, the urea intake should be limited to 1.5% of total diet. Urea should not supply more than 1/3 total crude protein in roughage and 1/2 total crude protein in concentrate. Urea is toxic at .03-.05% of body weight. Protein/mineral blocks containing urea should be used cautiously, because the amount of urea is formulated for cattle rather than for goats. In recent years some feed manufacturers have

Approximate overlap in preference
Cattle versus Sheep = 35% overlap
Sheep versus Goats = 21% overlap
Cattle versus Goats = 8% overlap

Example of Crude Protein Values

| | |
|---------------------------|------|
| Honeysuckle buds & leaves | —16% |
| Early vegetation sumac | —14% |
| Blackberry leaves | —15% |
| Ragweed | —12% |
| Dock | —30% |
| Pig weed | —24% |
| Kudzu leaves | —22% |

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Feeds designed for sheep, horses and pet food should not be used for goats. These feeds are not balanced for the requirements of goats, and could cause nutritional problems.

Pasture management is important in goat production, producers should keep goats grazing well above the ground, which will

keep goats from ingesting parasites. Pasture rotation helps to maintain forage quality and may help in parasite control.

Flushing of goats can increase ovulation and kidding rates. Flushing involves increasing energy level of the diet 2-4 weeks prior to mating season. Flushing is most beneficial when does are in poor to modest condi-

tion. Body condition scores are available for meat goats. Flushing can be done with forage or grains. However, there is little to no benefit if does are already in good condition; fat does create problems later.

FEASIBILITY OF GOAT PRODUCTION IN WEST VIRGINIA

A Handbook for Beginners.

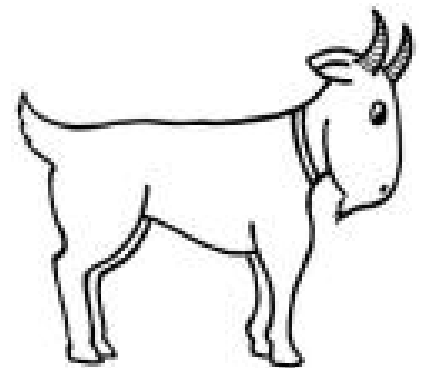
Doolarie Singh- Knights and Marlon Knights

The fastest growing animal industry in the United States (US) is the meat goat industry. The US goat industry is predominantly an infant industry with considerable growth potential. Sales of goat meat (chevon) throughout the US and particularly in the Northeast have climbed dramatically since the early eighties and are at an all time high. The Northeast market is the largest consumer base for chevon with demand emanating from various ethnic groups, and the health and gourmet food sectors. Because of the persistence in maintaining cultural practices, the demand for goat meat among ethnic groups is thought to be relatively inelastic. Further increase in demand is likely with increases in ethnic populations and improvements in their purchasing power. Growth potential also exists in the health and gourmet food sectors because of the unique taste and relative healthful nature of goat meat. However, many goat producers nationwide are limited by the availabil-

ity of accessible markets, suitable and sufficient land and technical know how. Such limitations can depress or delay supply response, even in the face of favorable prices.

Goat production has the potential to become an economically viable option for small full-time farmers and the growing number of part-time farmers in the Northeast region. Several factors support this assumption including increasing demand in the Northeast, lower cost of production compared with other livestock, and the ability of goats to effectively utilize poorer quality forage. Pennsylvania (Philadelphia), New York, New Jersey and Washington DC (the urban Northeast) are major goat meat consumption areas within the Northeast. West Virginia (WV) is well positioned geographically to supply goats to these areas of high demand. Currently, an inadequate year round supply, low prices, as well as inconsistencies in meeting specific consumer preferences are thought

to be limiting even higher sales of chevon in the Northeast. Overall, limited information is available on the Northeast goat industry, research and extension is lacking, as is appropriate information to guide producers' management decisions. The Feasibility of Goat Production in West Virginia bulletin begins to address some of these deficiencies by initially examining the feasibility of goat production for producers in WV. This bulletin is available on the West Virginia Sheep Management Project web page at <http://www.caf.wvu.edu/avs/sheep/>



2004 Research Highlights

Applied research in the areas of sheep production and profitability along with undergraduate and graduate education and training and farmer participation are integral components of the West Virginia Sheep Management Project. Research and education are critical investments in the future of the sheep industry in West Virginia and in the U.S. The partnership between WVU and cooperating farmers not only provides educational opportunities for students, but also gives farmers the opportunity to participate and to invest in areas of research that are important to them and to their futures.

In previous studies, we have shown that progesterone treatment at ram introduction is effective in producing fertile estrus and lambing in 65 to 75% of a flock of ewes during anestrus, and used that treatment extensively to increase fall lambing rates on project cooperating farms. Because progesterone is not yet approved and available for use in sheep on an industry wide basis (we have used it experimentally under an "Investigation of New Animal Drug" application from the US Food and Drug Administration), the use of gonad-

otropin releasing hormone (GnRH) as a substitute for progesterone in conjunction with ram introduction for out-of-season breeding was begun in 2003. Treating anestrous ewes with GnRH in relation to ram introduction has been tested further this year in an experiment with 4 treatment groups. Treatments with 100 micrograms GnRH on 4 days before ram introduction (day -4), or on day -4 and on day 1 after RI, were compared to no treatment or treatment with 20 mg progesterone at ram introduction. All ewes were treated with 20 mg prostaglandin F_{2a} 12 days after rams were introduced in order to synchronize estrus and lambing in response to the treatment. Ewes marked by rams during the three days after ram introduction totaled 28.5% for controls, 50% for ewes treated with GnRH on day -4, 52% for ewes treated on day 1 as well as day -4, and 57% for ewes treated with progesterone. Ewes lambing to first service and after two services were 19 and 52% for controls, 32 and 73% for ewes treated with GnRH on day -4, 33 and 71% for ewes treated on day 1 as well as day -4, and 43 and 71% for ewes treated with progesterone. Thus the single

treatment with GnRH one day after RI was equally as effective as treatment with progesterone at ram introduction in out-of-season breeding. This finding makes an alternative treatment possible for producers if GnRH is approved for sheep, and GnRH is already available to veterinarians for treatment of cystic ovaries and for use in embryo transfer programs.

Success in out-of-season breeding has been limited to dry (non-lactating) ewes and methods currently in use have not been effective in lactating ewes in preliminary trials. Experiments initiated in Spring 2003 to test new methods have continued in 2004 and will be completed in 2005. These studies involve increased dosages of progesterone, and treatments with estrogen, gonadotropin releasing hormone or temporary weaning of lambs to test their effectiveness in allowing induction of fertile estrus in lactating ewes in response to ram introduction. If you are a producer that is interested in participating in one of the research projects offered through the West Virginia Sheep Management Project please contact the office at (304) 358-3660 or fane.irvine@mail.ev.u.edu

**The West Virginia Sheep Management Project
Annual Report is available on the project web
page**

<http://www.caf.wvu.edu/avs/sheep/>

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Mark Your Calendars!!!

May 7-8; [Maryland Sheep & Wool Festival](#) Howard County Fairgrounds, West Friendship, MD. Info: (410) 531-3647 or sheepandwool.org.

June 21-23: Hair Sheep Workshop Provide in-depth review of topics relevant to hair sheep production, update current research on hair sheep, and generate proceedings available through the internet. Virginia State University Petersburg, VA