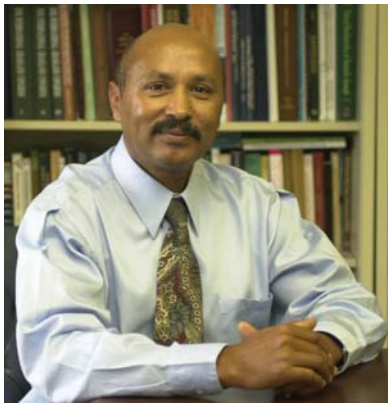
Goat Newsletter

Cooperative Extension Program
Langston University

The Newsletter of the E (Kika) de la Garza American Institute for Goat Research *Fall 2006*

From the Director's Desk



Merriam-Webster defines planning as "to devise or project the realization or achievement of". Therefore, planning is very important for optimal functioning of any organization regardless of the particular time of year and activities underway. And there are many different levels of planning to be considered.

Recently the University has been conducting Strategic Planning, of which the Institute has been a part. For this type of long-term planning, one needs to express considerable insightful vision and optimism about future resources that will be available/secured, but with maintenance of some degree of realism. Planning is just as critical on a day-to-day, short-term basis. In fact, without effective short-term planning, opportunities for long-range planning may not be available. As an example of short-term planning, considerable time is spent in coordinating use of animals for research and extension activities, assigning appropriate tasks to available personnel, hiring of suitable faculty and staff, procuring and managing equipment and supplies, etc. Our faculty and staff members must constantly manage their time balancing between short-range and long-range planning. Not an easy feat but we have some of the best-qualified faculty and staff found anywhere.

Now moving somewhat away from planning and towards impacts and rewards of good planning, the research program is steadily churning along as usual. For example, Dr. **Zaisen Wang** has an experiment underway in which potential anthelmintic properties of two 'natural' products, ones sometimes talked about in the popular press, are being investigated. Likewise, Drs. **Steve Hart** and **Zaisen Wang** are starting a similar experiment with an additional product.

Our major current dairy goat project, one dealing with advantages, disadvantages, and physiological considerations of extended lactations, and being performed by Drs. **Maristela Rovai** and **Terry Gipson**, is nearing the end of the first standard-length lactation period. This project, as well as many others of the Institute, involves important collaboration with other individuals and institutions. In fact, Dr. Tony Capuco of the Bovine Functional Genomics Laboratory, Animal and Natural Resources Institute, USDA /ARS and Dr. Steve Ellis of Clemson University spent several days here providing training in mammary gland sampling during May.

We are always exploring methods to remove major obstacles to profitability goat production. One example is the aforementioned extended lactation project which addresses the highly seasonal supply of goat milk. Some dairy goat producers may want to extend the lactation period of their does in order to produce milk during the seasonal period of low milk supply, thereby

Goat Newsletter is published quarterly by the Cooperative Extension Service of the E (Kika) de la Garza American Institute for Goat Research, Langston University, Langston, Oklahoma.

Dr. Marvin Burns,
Dean,
School of Agriculture and Applied Sciences

Dr. Vernon Jones,
Associate Dean,
School of Agriculture and Applied Sciences

Dr. Tilahun Sahlu,
Director,
E (Kika) de la Garza American Institute for Goat Research

E (Kika) de la Garza American Institute for Goat Research
Langston University
P.O. Box 730
Langston, OK 73050
Phone: (405) 466-3836
FAX: (405) 466-3138
http://www2.luresext.edu

Newsletter Editor
Dr. Terry A. Gipson

taking advantage of increased commodity prices. However, a biological and economical understanding of the mechanisms of extended lactation is necessary. In the extended lactation project, does will be randomly assigned to four treatments. One treatment will be the standard lactation group. The second treatment will be the modified extended lactation group where does will be bred, milked for 16 months dried-off and rebred. The third treatment will be the continuous extended lactation group with subsequent rebreeding. The fourth treatment will be the continuous extended lactation group without subsequent rebreeding. It is hoped that this project will shed some light on extended lactations.

From the extension side, we have also been very busy. Dr. **Steve Hart** supervised the successful 2006 Buck Performance Test and was also very busy with numerous activities at the Oklahoma State Fair and the Tulsa State Fair. Dr. Hart was superintendent for the ABGA breeding doe/buck show and the IBGA at the breeding doe/buck show at the Oklahoma State Fair in September. The ABGA show had 360 entries and the IBGA show had 180 entries. This year, as in the past several years, Dr. Hart has assisted with the Birthing Center at the Tulsa State Fair. Dr. Hart arranged for 8 pregnant does to be exhibited in the Birthing Center. We are happy to report that 7 does kidded with a total of 17 kids and again this year the goats were the stars of the show. Everyone loved them.

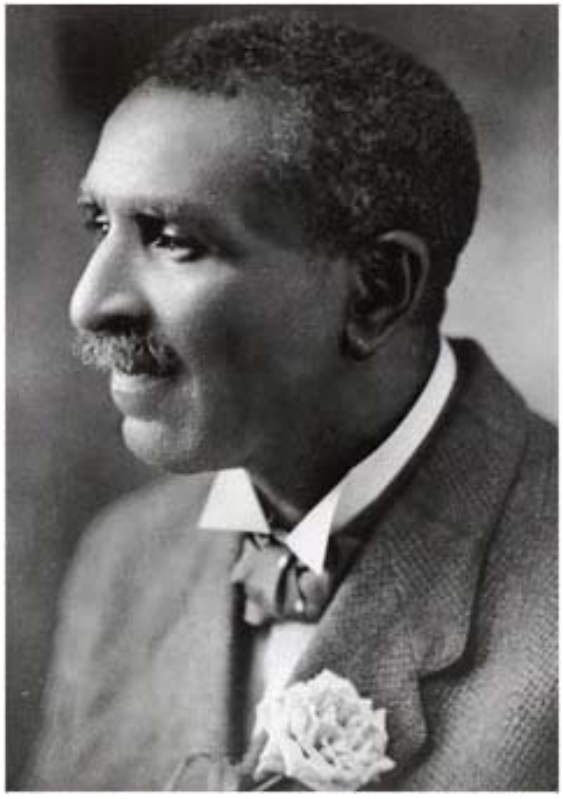
The fall is also the time for our artificial insemination workshops and this year Drs. **Lionel Dawson** and **Terry Gipson** have held their normal workshops in Langston and Tahlequah, and have also included a workshop in Antlers, OK. The aspect of the workshop that all the participants enjoy the most is the hands-on actual insemination of the doe. If you have not had the opportunity to attend one of the artificial insemination workshops, the program includes presentations on basic anatomy and physiology of female reproduction, on small ruminant reproduction emphasizing estrus detection and estrus synchronization, on AI kit contents, on semen tanks, and on semen handling. The program culminates with the practical hands-on insemination of live animals. Even if you are not considering artificial insemination, the knowledge gained about reproduction is very valuable.

We also have numerous domestic and foreign visitors throughout the season. For example, Dr. Cal Ferrell visited to collaborate on the USDA 1890 Capacity Building grant entitled The Ability of Goats to Withstand Harsh Nutritional Environments and Dr. Luthando Dziba from the Agricultural Research Council of South Africa, visited to discuss potential future research collaboration.

George Washington Carver Agricultural Excellence Award

"Vision gives rise to hope. Hope creates a desire to help others." - George W. Carver

The U.S. Agency for International Development (USAID) recently announced that Drs. **Tilahun Sahlu**, **Terry Gipson**, **Arthur Goetsch**, **Roger Merkel**, and **Steve Zeng** of the American Institute for Goat Research at Langston University (LU/AIGR) will share the 2006 George Washington Carver Agricultural Excellence Award (GWC). The GWC Award is awarded annually to an individual, team, or unit at a Minority Serving Institution, African-American university or research center in recognition of accomplishments in the field of agriculture that have helped to improve the quality of life for people in developing countries. This USAID award is named after Dr. Carver, whose innovative, pioneering work in agriculture, while he was a scientist and educator at Tuskegee University, has resulted in agricultural products and processes that have enhanced the quality of life for people all over the world.



The GWC Award ceremony will be held on December 14, 2006 in Washington, DC and the Langston University team will receive a plaque and honorarium honoring their significant, positive impact on international agriculture.

Recent International Grants of LU/AIGR

- Ethiopia Sheep and Goat Productivity Improvement Program. 2005 -2010.
- Multinational Approaches to Enhance Goat Production in the Middle East. 2000-2008.
- International Collaboration in Goat Research and Production Web-Based Decision Support Aids. 2005-2008.
- Energy Expenditure for Activity in Free Ranging Ruminants: A Nutritional Frontier. 2005-2008.
- Effects of Acclimatization on Energy Requirements of Goats. 2005-2007.
- Improving Ethiopian Household Food Security and Enhancing the Teaching, Research and Extension Ability of Awassa College of Agriculture, Debub University, Ethiopia. 2002 - 2005.
- Al-Sharaka, The Partnership. Revitalizing the Higher Education System in Iraq. 2003 - 2004.
- Combating Micronutrient Malnutrition: Assessment of Constraints to Including Animal Source Foods in Children's Diets in Rural Ethiopia and Kenya. 2003 -2004.
- Improving Ethiopian Household Food Security and Enhancing the Teaching, Research and Extension Ability of Alemaya University, Alemaya, Ethiopia. 2002 - 2004.
- Strengthening Collaboration Between the E (Kika) de la Garza Institute for Goat Research of Langston University and the USDA MAP Project in Armenia. 2002-2003.
- Enhanced Education and Computer Capabilities: The Foundation for Sustained Collaboration. 2001-2002.
- Fostering Future Collaboration Between US Institutions and the Armenian Agricultural Academy Through Training and Information Exchange. 2001.
- Enhancing Institutional Research and Extension Capabilities for Increased Food Security Through Improved Goat Production. 1999-2002.
- Anthelmintic Plants for Internal Parasite Control in Goats. 1999-2001.
- An Institutional Partnership to Enhance Food Security and Income Generating Potential of Families in Southern Ethiopia Through Improved Goat Production and Extension. 1998-2001.

2006 Buck Test Results

The tenth annual meat buck performance test started May 13, 2006 with 56 bucks enrolled from 16 different breeders. Geographical distribution is given in the table. Bucks were given a physical examination. Half of the bucks were randomly assigned within breeder to either Calan feeders or Feed Intake Recording Equipment (FIRE) system.

State	Bucks
KS	5
MO	12
OK	9
TX	30
Total	**56**

The FIRE system is a completely automated electronic feeding system, which was developed for swine but we have adapted it to goats. Animals have an electronic eartag, which is read by an antenna in the feeder. The FIRE system automatically records body weight and feed intake. For the Calan feeders, each buck wears a collar with an electronic "key" encased in hard plastic. The key unlocks the door to only one Calan feeder, thus enabling the buck to eat out of his individual feeder. Each morning, yesterday's feed that remains in the Calan feeder is weighed and removed. Fresh feed is weighed and placed into the Calan feeder. The difference in weights between the fresh feed placed in the Calan feeder one morning and the feed remaining the next morning is the amount consumed. Because only one goat is capable of opening the Calan door and eating, it is possible to calculate the feed intake of the individual bucks. This year, half of the bucks were in the FIRE system and half were in the Calan feeders. For producers, who enrolled more than one buck in the Buck Performance Test, the test supervisor randomly assigned half of their bucks to the FIRE system and half to the Calan feeders.

Nutritionists at Langston University formulated the test ration. In 1999, the amount of salt and ammonium chloride was doubled due to problems with urinary calculi the previous year. Except for the increase in salt and ammonium chloride, the ration was unchanged from that which was used in the first two meat buck performance tests. The ration was fed free-choice during the adjustment period and during the 12-week test.

The calculated content of the ration is 16% crude protein with 2.5% fat, 20.4% fiber and 60.6% TDN. Calcium phosphorus and sodium levels are .74%, .37% and 1.07%, respectively. Zinc concentration is 33.04 ppm, copper is 17.15 ppm and selenium is .21 ppm. In 2003, competitive bids were sought for the buck-test feed and Bluebonnet Feeds of Ardmore, OK was awarded the contract to supply feed for the buck performance test for 2003, 2004, 2005, and 2006.

In early 2000, the Oklahoma performance test was designated by the American Boer Goat Association Board of Directors as an ABGA Approved Performance Test and in 2003, was sanctioned by the International Boer Goat Association, Inc.

Gain

The official performance test started on May 31 after the adjustment period was finished. Weights at the beginning of the test averaged 67 lbs with a range of 39 to 112 lbs. Weights at mid-point averaged 94 lbs with a range of 70 to 139 lbs. Weights at the end of the test averaged 122 lbs with a range of 94 to 162 lbs. Weight gain for the test averaged 55 lbs with a range of 33 to 76 lbs.

The type of feeder (Calan or FIRE) had no significant effect upon gain.

Average Daily Gain (ADG)

For the test, the bucks gained on average 0.65 lbs/day with a range of 0.39 lbs/day to 0.90 lbs/day.

Feed Efficiency (Feed Conversion Ratio)

For the test, the bucks consumed an average of 358 lbs of feed with a range of 250 to 537 lbs.

The type of feeder (Calan or FIRE) had no significant effect upon intake. Bucks on the Calan system averaged 352 lbs intake and bucks on the FIRE system averaged 363 lbs, which is a difference of 11 lbs. over the 12-week period. For the test, the bucks averaged a feed efficiency of 6.66 (feed efficiency is defined as the number of lbs. of feed needed for one lb. of gain), with a range of 4.84 to 11.11.

Muscling

The average loin eye area as determined by ultrasonography was 1.82 square inches with a range

of 1.38 to 2.78 square inches and the average left rear leg circumference was 16.4 inches with a range of 15.0 to 18.5 inches.

Index

For 2006, the index was calculated using the following parameters:

- 30% on efficiency (units of feed per units of gain)
- 30% on average daily gain
- 20% on area of longissimus muscle (loin) at the first lumbar site as measured by real time ultrasound adjusted by the goat's metabolic body weight,
- 20% circumference around the widest part of the hind right leg as measured with a tailor's tape adjusted by the goat's metabolic body weight.
- The adjustment to metabolic body weight gives lighter weight goats a fair comparison of muscling to heavier goats.

The deviation from the average of the parameters measured from the goats in the performance test was used in the index calculation. Thus, the average index score for bucks on-test was 100%. Bucks that are above average have indexes above 100% and those below average have index scores below 100%.

Young buck on the 2006 Buck Performance Test.

Congratulations

The Oklahoma Meat Goat Association and the Agricultural Research and Extension Program at Langston University congratulate:

- ✯ Mr. Orlin Scrivener of Cabool, MO for having the Top-Indexing buck in the 2006 Oklahoma Meat Buck Performance Test

Also, deserving congratulations are:

- ✯ Mr. Orlin Scrivener of Cabool, MO for having the #1 Fastest-Gaining buck
- ✯ Mr. Orlin Scrivener of Cabool, MO for having the #2 (tie) Fastest-Gaining buck
- ✯ Mr. Dan Wagner of Sonora, TX for having the #2 (tie) Fastest-Gaining buck
- ✯ Ms. Paula Lane of Shady Point, OK for having the #2 (tie) Fastest-Gaining buck
- ✯ Mr. Dan Wagner of Sonora, TX for having the #5 Fastest-Gaining buck
- ✯ Mr. Martin Peters of Barksdale, TX for having the Most-Feed-Efficient buck
- ✯ Mr. Marvin Shurley of Sonora, TX for having the Most-Heavily-Muscled buck

Acknowledgments

The Buck Test supervisor wishes to acknowledge Dr. Lionel Dawson of Oklahoma State University for his contributions as the admitting and on-call veterinarian, Ms. Rebecca Whittington for her management and oversight of the day-to-day activities, Mr. Jerry Hayes and Mr. Erick Loetz of Langston University for aid and supervision, Mr. Les Hutchens and his associates at Reproductive Enterprises, Inc. for conducting the ultrasound measurements for the loin eye area and the breeding soundness exams, and Bluebonnet Feeds of Ardmore, OK for custom mixing the feed. The 2006 Buck Performance Test was supervised by Dr. Steve Hart.

Research Spotlight

Abstracted by A. Goetsch

Milk and Cheese Quality.

Bulk tank goat milk from the Langston University Alpine herd was used to investigate changes in composition of goat milk during lactation and effects on the sensory quality and yield of hard and semi-hard cheeses. Milk was analyzed for fat, protein, casein, total solids, and somatic cell count (SCC) and cheese was assayed for fat, protein and moisture. Sensory evaluation of the cheeses was performed to establish the relationship between yield, quality, and sensory score. The chemical composition of goat milk changed significantly over the lactation, resulting in variation in yield and sensory quality of hard and semi-hard cheeses. While casein content of goat milk did not change significantly as lactation advanced, SCC increased from early to late lactation. There were no significant differences in flavor, body and texture, and total sensory scores of either cheese type among aging times of 8, 16, and(or) 24 weeks, which indicates that the cheeses can be consumed after 8 weeks for similar sensory quality as with longer aging. In hard cheese, yield was highly correlated with milk fat, protein, or total solids, whereas only milk total solids content was highly correlated with semi-hard cheese yield. These findings indicate need to adjust cheese making procedures over the duration of lactation to increase milk nutrient recoveries and thus increase cheese yield. However, a year-round breeding system should minimize variation in chemical composition in bulk tank goat milk during lactation and help maintain consistent quality and yield of cheeses throughout the year.

B. Fekadu, K. Soryal, S. Zeng, D. Van Hekken, B. Bah, and M. Villaquiran. 2005. Changes in goat milk composition during lactation and their effect on yield and quality of hard and semi-hard cheeses. Small Ruminant Research 59:55-63.

Betaine and Choline.

In previous experiment at the American Institute for Goat Research, supplementation of growing Angora doelings consuming a low-protein forage with ruminally protected choline increased growth rate up to the level of animals consuming a protein adequate diet. Therefore, six Boer x Spanish goat wethers were used in an experiment to determine factors that might have been responsible for this effect. Dietary crude protein levels were 9 and 15% dry matter and levels of supplementation with ruminally protected betaine or choline were 0 and 0.9% dry matter. Neither betaine nor choline affected blood flow, packed cell volume, hemoglobin concentration, or oxygen consumption. Blood flow and oxygen consumption were greater for 15 versus 9% dietary crude protein. Arterial plasma ammonia nitrogen concentration was greater for 9 versus 15% crude protein. Compared with the Control diets, choline supplementation decreased release by the portal-drained viscera (PDV; primarily the gastrointestinal tract) release and hepatic uptake of ammonia nitrogen with the 15% crude protein diet, whereas betaine decreased PDV release and hepatic uptake of ammonia nitrogen with 9% dietary crude protein. Data from this experiment indicate that potential effects of ruminally protected betaine on performance of ruminants might involve changes in lipid metabolism, with the magnitude of alteration varying with dietary crude protein level.

V. Banskalieva, R. Puchala., A.L. Goetsch, J. Luo, T. Sahlu. 2005. Effects of ruminally protected betaine and choline on net flux of nutrients across the portal-drained viscera and liver of meat goat wethers consuming diets differing in protein concentration. Small Ruminant Research 57:193-202.

Web-based Training and Certification Program for Meat Goat Producers

Meat goat producers obtain information from many sources, some good and some bad. As the meat goat industry grows and evolves, a quality assurance program is essential. Such a program ensures the production of a safe, healthy product that satisfies consumers and increases profit for the production industry.

To ensure that quality information is disseminated to meat goat producers, Langston University partnered with Alcorn State University, American Boer Goat Association, American Kiko Goat Association, American Meat Goat Association, Florida A&M University, Fort Valley State University, Kentucky State University, Prairie View A&M University, Southern University, Tennessee Goat Producers Association, Tennessee State University, Tuskegee University, United States Boer Goat Association, University of Arkansas Pine Bluff, and Virginia State University to develop a web site for producer education. Authors of the web site modules are the most visible and best qualified persons in the selected subject areas and they represent industry as well as academia.

The objectives of this web site are:

1. *to provide reliable educational information incorporating a Quality Assurance Program that is suitable for meat goat producers, county agents and other agriculture professionals and*
2. *to provided testing methodologies allowing for certification of meat goat production for those producers desiring certification.*

At the end of the certification process (successful completion of the required modules), a fee of $25 will be required for processing the certification.

You do not need to register for certification in order to use this site. You may browse the site freely. However, you will not have access to the testing methodologies for the certification process.

The web-based training and certification program for meat goat producers was developed with funding from USDA/FSIS/OPHS project #FSIS-C-10-2004 entitled "Development of a Web-based Training and Certification Program for Meat Goat Producers."

http://www2.luresext.edu/goats/training/qa.html

Noteworthy News

In July, Drs. **Marvin Burns**, **Tilahun Sahlu**, **Roger Merkel**, and **Art Goetsch** traveled to Liberia to provide an assessment of the small ruminant sector and propose a plan to revitalize the industry in Liberia. A plan has been proposed to reinvigorate the sheep and goat industry through activities with universities, the Liberian government, and villages.

In August and October, Dr. **Steve Hart** gave presentations on parasite control in goats at workshops in College Station, PA and Ada, Ok, respectively.

In August, Dr. **Steve Har**t gave presentations on goat management in Cheyenne, OK and Oklahoma City, OK.

In September, Dr. **Roger Merkel** traveled to Indianapolis to attend a conference entitled Increased Collaboration IPM Programs Among 1890 and 1862 Land Grant Institutions and the Regional IPM Centers.

In October, Drs. **Tilahun Sahlu** and **Art Goetsch** traveled to Greece for a meeting of the "Multinational Approaches to Enhance Goat Production in the Middle East" project, which is a collaborative research, training, and extension activities project among Langston University, the Desert Research Center of Egypt, the Volcani Center in Israel, Al-Quds University in East Jerusalem working in the West Bank, and the Jordan University of Science and Technology.

In October, Drs. **Terry Gipson** and **Art Goetsch** and Mr. **Kesete Tesfai** traveled to Israel to collaborate on the "Energy Expenditure for Activity in Free Ranging Ruminants: A Nutritional Frontier" project, which is in partnership with Newe Ya'ar Research Center of the Volcani Center in Israel.

Goat Newsletter
E (Kika) de la Garza American Institute for Goat Research
Langston University
P.O. Box 730
Langston, OK 73050