



# Wild & Woolly



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## The Risks of Global "Worming"

For decades, the overuse of antibiotics has encouraged the evolution of drug-resistant bacteria, which, though they have never broken out and caused an epidemic in the way that was once feared, have nevertheless been responsible for many deaths that might otherwise have been avoided.

Now something similar seems to be happening in agriculture. The overuse of drugs against parasitic worms, which infest stock animals means that these, too, are becoming drug-resistant. That is bad for the animals' health and welfare, and equally bad for farmers' profits.



This, at least, is the conclusion drawn by Ray Kaplan, Ph.D., a parasitologist at the University of Georgia who has just published a review of research on the problem. His results, which appear in *Veterinary Parasitology*, make grim reading.

Sheep and goats are the worst affected. Studies in Australia, Brazil and the United States suggest that animals in half or more of farms in many parts of these countries are infested with drug-resistant worms. In some cases, the parasites are resistant to every drug that can be thrown at them.

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## The Cost of Anthelmintic Resistance

Researchers in New Zealand were able to measure the economic impact of anthelmintic resistance by comparing productivity parameters in groups of lambs treated with either a highly effective anthelmintic or an anthelmintic which three species of resistant worms were known to be present.

Ten farmlets, each stocked with 30 lambs, were rotationally grazed for five months, with monthly treatments of either albendazole (Valbazen®), to which resistance existed, or a new combination product containing derquantel and abamectin (DQL-ABA), to which there was no resistance.

Anthelmintic efficacy was measured at the last two treatment dates by fecal egg count reduction test with larval cultures.



Albendazole demonstrated efficacies of 48.4% and 40.9% for *Trichostrongylus* spp. and *Teladorsagia circumcincta* respectively. By contrast, the DQL-ABA treatments were > 99% effective against all genera.

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*Special Thanks to all the volunteers and extension workers who assisted with the skillathon.*



Michael Cropp



Charlie Sasscer



Junior Participation

## Results of Junior Sheep & Wool Skillathon

Sixty-one youth competed in the 2012 Junior Sheep & Wool Skillathon: 17 junior, 20 intermediate and 24 senior. The annual skillathon is hosted by the Maryland Sheep & Wool Festival and is held at the Howard County Fairgrounds.

The top-placing junior (ages 8-10) was Chet Boden from Virginia. Brody Miskimon from Cecil County was the second place junior. Kevin Spicer from Howard County placed third.

The top-placing intermediate (ages 11-13) was Katie Burroughs from Calvert County. Cameron Dorsey from Frederick County placed second. Magdalena Goodmuth from Howard County was third.

The senior competitors were split into two groups. Among members of the Maryland state skillathon team, Charlie Sasscer placed first and had the most points among all seniors. Helen King and Sarah Manning placed second and third, respectively.

Among the rest of the seniors, Aislinn Latham from Frederick County was the top-placing senior (ages 14-18). Cody Boden from Virginia placed second. Brianne Hevner from Carroll County was the third place senior.

This year's skillathon was challenging, consisting of the following stations: breed ID, forage ID, equipment ID, retail meat ID, meat judging, hay judging, fleece judging, numbers, parts, quiz, and a senior problem.

Premiums, ribbons, and t-shirts were provided by the festival committee of the Maryland Sheep Breeders Association.

*Editor's note: We are still searching for a venue for a junior goat skillathon.*

## Possible Genetic Test OPP

By Kreg Leymaster and Mike Heaton  
U.S. Animal Research Center (USMARC)  
Clay Center, Nebraska

### The Problem

Ovine progressive pneumonia virus (OPPV) and Visna/Maedi virus (VMV) cause an incurable, slow-acting, wasting disease that affects millions of sheep worldwide. These are ovine lentivirus strains that target the immune system causing persistent retroviral infections.

The disease affects multiple tissues, including those of the respiratory and central nervous systems.

In North America, OPP is one of the most costly diseases affecting sheep due to decreased productivity, "hard bag",

lameness, and early culling of ewes. Previous research at USMARC showed that infected ewes are 20% less productive than uninfected ewes. A study reported in 2003 by USDA's Animal and Plant Health Inspection Service showed that 36% of sheep operations and 24% of all animals tested in the U.S. were infected with the virus.

Once infected with the virus, sheep are carriers throughout life as there is no effective treatment or vaccine. Our aim at USMARC was to identify sheep genes that influence OPPV infection.

### A Genetic Approach

We designed a genome-wide association study to test whether or not sheep have

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## Possible Genetic Toss OPP - ( continued from page 3)

genetic variation that protects against OPPV infection. Our study became possible with development of the Ovine SNP50 BeadChip in 2009 by the International Sheep Genomics Consortium (ISGC). The OvineSNP50 BeadChip is a commercially available set of 50,000 genotyping tests.

These tests were applied to matched pairs of ewes that had received a lifetime of natural OPPV exposure at US-MARC. Each pair of sheep contained one infected ewe and an uninfected ewe of the same age, breed, and flock. In other words, they were matched “case-control” pairs.

### The Findings

Using this approach we discovered a gene (*TMEM154*) that affects susceptibility to OPPV infection. There were three major variants (called haplotypes 1, 2 and 3) of the *TMEM154* gene. In more than 8,000 sheep tested, 97% had some combination of these three haplotypes.

Haplotypes 2 and 3 were strongly associated with OPPV infection and considered to be “susceptibility alleles”. One copy of the haplotype 2 or 3 was needed to increase susceptibility to OPPV infection.

Studies are underway at USMARC to determine whether or not haplotypes 2 and 3 are expressed in an additive or dominant manner compared to haplotype 1. In contrast to ewes with one copy of haplotype 2 or 3, those with two copies of haplotype 1 were many times less likely to be infected.



These findings were quickly confirmed with the help of other USDA scientists at the Animal Disease Research Unit in Pullman, WA, and those at the U.S. Sheep Experiment Station in Dubois, ID.

We suggest that one genetic strategy to reduce OPPV is to reduce the overall frequency of *TMEM154* haplotypes 2 and 3.

We also observed six additional *TMEM154* haplotypes that occur at low frequencies, yet may also confer low susceptibility like haplotype 1. For example, it appears that haplotype 4 encodes a non-functional protein and may confer OPPV resistance.

Although rare, sheep with two copies of haplotype 4 (referred to as “4,4 knockouts”) have remained uninfected despite a lifetime of significant OPPV exposure. Because the scientific and production information on 4,4 knockouts are very limited, additional research is needed to determine the effects of haplotype 4 before any recommendations can be made to use this haplotype to lower OPPV infection.

Currently, the effects of *TMEM154* variants on OPPV infection rates are being studied at USMARC under conditions of natural challenge to provide selection guidelines for industry use.

### The Caveat

Although these findings are promising, OPPV is a highly adaptable virus and it is not known if selection for *TMEM154* haplotype 1 will reduce the incidence of OPPV infection in all flocks. To that end, research is being conducted at USMARC to determine if some OPPV strains have adapted to infect sheep with *TMEM154* haplotype 1.

Other sheep genes are also being evaluated as possible gateways for OPPV infection in the presence of specific *TMEM154* haplotypes. Additionally, adverse production conditions like high animal density, indoor housing with poor ventilation, and moist climates, may enhance virus transmission and overcome sheep genetic resistance.

### Opportunity for Genetic Testing

In collaboration with animal genotype provider GeneSeek®, a Neogen Corporation Company based in Lincoln, Nebraska, USMARC is developing a *TMEM154* genotyping test for commercial use. Scientists at both institutions have validated the test performance in USMARC sheep and the results will be submitted to a scientific journal for publication.

( Continued on page 4 )

## Levamisole Is Back!

Prohibit™ soluble drench (levamisole) is again being manufactured (by Agri-Labs) and is back on the market. Check with suppliers to determine availability. Prohibit™ had been on prolonged back order (twice before), as Agri-Labs awaited FDA approval.



The availability of levamisole is welcomed news for the sheep and goat industry, as levamisole is often the most effective anthelmintic, especially in flocks and herds that have high levels of resistance to the other drug families (benzimidazoles and macrocyclic lactones, especially avermectins).

Levamisole is FDA-approved for use in sheep, whereas its use in goats must meet the requirements of the extra-label drug law. Compared to other anthelmintics, levamisole has a narrower margin of safety, thus it is imperative that the drug be administered (orally) according to an accurate weight.

Levamisole is from the class of anthelmintics called nicotinic agonists. Nicotinic agonists include two groups of anti-parasitic drugs: tetrahydropyrimidines (TETR) and imadazothiazoles (IMID). The TETR group includes pyrantel (Strongid®) and morantel (Rumatel®), which are only effective against adult worms.

Levamisole is a member of the IMID group. It is effective against adult and larval stages of stomach, intestinal, and lung worms. There is conflicting evidence as to whether it is effective against arrested or "hypobiotic" larvae. Levamisole has no efficacy against tapeworms or liver flukes.

As with all anthelmintics, levamisole should be used judiciously to preserve its long-term effectiveness. Selective deworming of animals showing clinical signs of parasitism (FAMACHA© scores of 3, 4, or 5) is advised. It is not recommended that all animals in a flock or herd be dewormed or that animals be moved to a clean pasture after dosing.

## Possible Genetic Test OPP (continued from page 3)

The aim of this test is to correctly determine the *TMEM154* haplotypes for each animal tested. The genetic test is expected to be available to producers by May 2012. Additional information on sample submission and testing will be available at <http://www.neogen.com/GeneSeek/>.

As strategies for *TMEM154* genetic testing are evaluated under field conditions, additional genetic guidelines for reducing the incidence of OPPV infection will emerge. Ultimately, information and products of this research will be used to select for animals less likely to be infected by OPPV.

Mike Heaton is a member of the ISGC and has conducted genomics research with sheep and cattle at the USMARC for 16 years. His research is centered on the host-pathogen interface and includes DNA-based trace back of diseased animals.

Kreg Leymaster has conducted genetic research with sheep at the USMARC for 34 years. His major focus has been the evaluation of maternal and paternal breeds in terminal mating systems and helping producers to use experimental results.

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Editor's note: CAE (caprine arthritic encephalitis) and OPP are closely-related lentiviruses. There is evidence to suggest that both viruses can cross-infect sheep and goats.

## “UMES Specialist Provides Assistance in Nepal

*By Enrique Nelson Escobar, Assistant Professor  
University of Maryland Eastern Shore*

At the beginning of 2012, USAID/Nepal's Education for Income Generation Program and Winrock International (Farmer to Farmer Program) invited Dr. Enrique Nelson Escobar (UMES Small Ruminant Specialist) to work with marginalized small goat farmers in areas where there was political and armed conflict in the past.

### **Brief background Information on Nepal:**

Nepal is a landlocked country located in South Asia, in the Indian subcontinent. It covers an area of 147,180 square kilometer (56,827 square miles). Nepal is bordered by the People's Republic of China on the north and by the Republic of India on the east, west and south.

Nepal is slightly larger than the state of Arkansas and has a population of approximately 29,331,000 Nepalese. Kathmandu is the capital city. It is the largest metropolitan city in the country with an estimated population of one million people.

Nepal is divided into fourteen zones and seventy-five districts. A permanent chief district officer is appointed to each

district. He is responsible for maintaining law and order and also coordinates the work of various agencies and government ministries.

The topography in Nepal is very well defined into three distinctive regions: a) the southern flat river plains (terai),



*(Nepalese goat farmers learning to use the FAMACHA® card to identify goats in need of anthelmintic treatment.)*

*( Continued on page 11)*

## Sire and Dam: Who Determines What ?

Many sheep and goat producers are quick to credit their ram or buck when they have a significant number of multiple births (twins and triplets) born. But, they are giving credit to the wrong animal.



The dam determines the maximum number of offspring that can be born via her ovulation rate. If she only ovulates one egg, there's not much the male can do to turn that single ovulation into twins, although sometimes a fertilized embryo will split, resulting in the birth of identical twins.

One way the male does contribute to the incidence of multiple births is through the viability of the conceptus (embryo). Research has identified differences in embryo survival among different sires and sire lines. Thus, females bred to a male with high embryo survival will give birth to more offspring than females bred to a male with low embryo survival (all other factors being equal).

What the male does determine is the sex of the offspring. Females have two of the same kind of sex chromosomes (XX), whereas males have two distinct sex chromosomes (XY). Whichever sex chromosome the male contributes will determine the genetic sex of the offspring: XX (female) or XY (male).

At the same time, there are various maternal factors that can affect the sex ratio of offspring. The "default" sex is female. Theories suggest that females in better body condition will produce more male offspring and that wild animals can adapt the sex ratio to enhance survival of their species.

While reproduction is complicated, for the most part, the female determines the number of offspring and the male determines the sex of the offspring.



## Comparison Of Meat: Pen vs. Pasture-fed Goats

As part of last year's preliminary study comparing carcasses from pen-fed goats to carcasses from pasture-raised goats, a portion of the *longissimus dorsi* (rib eye) muscle from each carcass was submitted to Dr. Henry Zerby's meat lab at Ohio State University for further analysis. The analyses took several months.

### Results

There was no difference in the percentage of protein or intramuscular fat in the samples from the pen vs. pasture-fed goats. The samples contained an average of 23.3 percent protein and 1.03 percent intramuscular fat.

The fatty acid data is much more complex and harder to interpret, as the percentages of 28 different fatty acids were compared. Statistical differences were detected in 8 of the 28 fatty acids that were measured in the lab.



The table gives the number of grams (g) of each fatty acid per 100 g of fat. The final column in the table indicates whether or not the differences measured were statistically significant.

The meat from the pen-fed goats had a higher portion of mono-unsaturated fat (MUFA), whereas the meat from the pasture-raised goats had more poly-unsaturated (PUFA) and saturated fat (SFA). It is not known if any of the differences detected are relevant to human health.

### Fatty acid nomenclature

A fatty acid is a carboxylic acid with an even number of carbon chains. Short-chained fatty acids have fewer than six carbons. Medium chained fatty acids have 6-12 carbons. Long-chained fatty acids have more than 12 carbons. Very long chained fatty acids have more than 22 carbons.

Fatty acids without double bonds between the carbon atoms (e.g. 14:0) are saturated fatty acids (SFA). Fatty acids with double bonds (e.g. 18:1) are unsaturated fatty acids. Monounsaturated fatty acids (MUFA) have one double bond (e.g. 18:1). Polyunsaturated fatty acids (PUFA) have more than one double bond (e.g. 22:3) and can occur in either a cis or trans configuration.

Fatty acid	Type	Pasture	Pen	Different?
14:0	SFA	1.22	1.38	No
14:1	MUFA	0.17	0.08	No
15:0	SAT	1.27	0.57	No
16:0	SFA	20.77	21.83	No
16:1	MUFA	1.13	1.60	Yes
18:0	SFA	20.52	19.54	No
18:1 trans-4,5	MUFA	0.03	0.08	No
18:1 cis-11	MUFA	0.45	0.53	No
18:1 trans 6-8	MUFA	0.45	0.54	No
18:1 trans-9	MUFA	0.60	0.44	No
18:1 trans-10	MUFA	0.51	0.79	Yes
18:1 trans-11	MUFA	1.85	1.06	Yes
18:1 trans-12	MUFA	0.46	0.34	No
18:1 cis-9	MUFA	24.69	32.18	Yes
18:1 cis-11	MUFA	1.60	1.26	No
18:2	PUFA	7.47	8.57	No
18:3 and 20:1	PUFA	2.04	1.08	Yes
18:3 cis 9, trans-11	PUFA	0.05	0.04	No
20:3 n-6	PUFA	0.02	0.07	No
20:3 n-3	PUFA	5.72	4.55	No
20:4	PUFA	0.13	0.08	No
20:5	PUFA	2.47	0.97	Yes
22:0	SFA	0.93	0.70	No
22:1	MUFA	3.22	0.77	No
22:6	PUFA	0.59	0.25	Yes
24:0	SFA	1.24	0.83	No
24:1	MUFA	0.85	0.39	Yes
TOTAL MUFA		36.01	40.06	
TOTAL PUFA		18.49	15.61	
TOTAL SFA		45.95	44.85	

A cis configuration (e.g. 18:1 cis 11) means that adjacent hydrogen atoms are on the same side of the double bond.

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## Dairy Sheep Symposium to Be Held In Northern Virginia

The 18th Annual DSANA<sup>1</sup> Sheep Symposium (formerly called Great Lakes Dairy Sheep Symposium) will be held October 18-20, 2012, at the Holiday Inn Washington Dulles in Dulles, Virginia.

The DSANA Dairy Sheep Symposium is the major annual event of the dairy sheep industry in North America. For 18 years, this event has attracted dairy sheep producers from Canada, Mexico and throughout the United States. As a small but growing industry, the symposium provides critical connections among producers.

The first day includes talks directed towards beginning producers. The second day features presentations by innovative producers and top scientists from North America and Europe to bring the latest information on dairy sheep production and sheep milk processing to our domestic industry. The final day will include a tour to two local dairy sheep producers and processing plants that manufacture sheep milk cheeses.



The DSANA Dairy Sheep Symposium provides an educational environment and fosters connections among dairy sheep producers, processor and researchers.

<sup>1</sup>Dairy Sheep Association of North America

Editor's note: This year's symposium will include a visit to Shepherd Manor's Creamery in New Windsor, Maryland's first certified sheep dairy.

## Zeranol Improves Feedlot Performance of Lambs

Mexican researchers were able to significantly improve the feedlot performance of 3/4 Dorper x 1/4 Katahdin lambs.

Twenty-four lambs implanted with 12 g of zeranol (a single Ralgro pellet) grew 20 percent faster than non-implanted lambs. The implanted lambs had a feed-to-gain ratio that was 20 percent higher than the non-implanted lambs.

In another experiment, the researchers determined that twice-implanted (d-0 and d-28) lambs grew faster than non-implanted lambs and lambs that received a single dose (d-0) of zeranol.

Ralgro is approved by the Food & Drug Administration for use in lambs. There is no withdrawal period.

Source: 2011 Annual Meeting Abstracts, American Society of Animal Science



## Comparison Of Meat: Pen vs. Pasture-fed Goats (continued from page 6)

A trans configuration (e.g. 18:1 trans-11), by contrast, means that the next two hydrogen atoms are bound to opposite sides of the double bond. As a result, they do not cause the chain to bend much, and their shape is similar to straight saturated fatty acids. These are trans fats.

### 2012

A similar analysis will be done with the carcasses from this year's pen vs. pasture study.

*Thanks to Dr. Dahlia J. O'Brien at Delaware State University for conducting the statistical analysis of the data. Thanks to Dr. Ken Turner from USDA-ARS for covering the cost of the meat analysis.*

## What's New In The World of Science ?

Scientists have cloned a rare Himalayan goat in Indian-controlled Kashmir in a bid to increase numbers of the animal, famed for their silky soft undercoats. The first clone is a female kid called "Noori", meaning "light" in Arabic.

Chinese scientists have cloned a genetically-modified sheep containing a "good" type of fat that is naturally found in nuts, seeds, fish, and leafy greens and helps to reduce the risk of heart attacks and cardiovascular disease. "Peng Peng" has a roundworm fat gene.

Italian researchers have identified a gene mutation (K222) that may be responsible for goat resistance to scrapie. Further research is needed to confirm the results of case-control studies in Italy, France, and Greece.



Researchers at the University of Warwick demonstrated that prompt administration of an antibiotic injection to sheep with footrot (or foot scald) can significantly reduce the prevalence of lameness in a flock. The British researchers have also identified a gene that might be linked to the ability of *Dichelobacter nodosus* (the bacteria that causes footrot) to invade the skin.

Researchers at Delaware State University determined pumpkin seed oil to be ineffective as an anthelmintic when administered to Katahdin lambs artificially-challenged with *Haemonchus contortus* worm larvae.

In an experiment conducted at Langston University (in Oklahoma), garlic supplementation had no effect on internal parasitism in lactating Boer and Spanish does.

When administered prior to the onset of clinical disease, scientists in the United Kingdom were able to prevent the development of prion disease in scrapie-infected mice using monoclonal antibodies. Treatment was not effective if it was administered after the onset of clinical disease.

A Utah State University researcher used balloons to simulate bloat in cannulated lambs. He then "taught" lambs to choose foods based on the effects of bloat. The next step is to determine if lambs will make similar choices under field conditions.

### *The Risks of Global "Worming" (continued from page 1)*

Cattle, too, are afflicted. Kaplan cites work done in Argentina, Brazil, and New Zealand. And horses suffer as well, with resistant worms turning up in both America and Europe.

The root of the problem is what Kaplan refers to as "global worming"--giving drugs prophylactically to all livestock rather than reserving them for use as a treatment when an animal actually becomes infested. It is common sense, of course, to try to prevent infestation rather than merely treating it once it has arisen. Unfortunately, such promiscuous use of drugs is the best way to put selection pressure on the worms and encourage the evolution of resistant strains.

What is needed, says Kaplan, is more selective drug use and better management. Worms are not evenly distributed. Instead, a minority of animals play host to most of them. Aiming treatment at those animals would reduce the likelihood of resistance emerging without harming a farmer's ability to control infestations. Better husbandry might help, too. Not grazing so many animals on a given patch of land would discourage transmission.

No one farmer is to blame. This is a tragedy of the commons, in which sensible individual decisions have led to a collective difficulty. But it might behoove farmers to think more about how they use anti-worm drugs. If they do not, they may find that those drugs have become useless.

Source: *ASI Weekly*, June 18, 2012 (Reprinted in part from *The Economist*)



## Participating Flocks Needed for Foot Health Project

By Richard Brzozowski  
University of Maine

The University of Maine Cooperative Extension received a multi-year grant from Northeast SARE in 2010 for an applied research project to Eliminate the Effects of Footrot in Sheep Flocks in the Northeast. So far, we have gathered data from over 750 sheep from eleven farms in the region. The protocol developed for the research project has proven to be immediately applicable and appropriate for sheep farms with foot health problems. Our ultimate hope is to find a genetic link for footrot resistance.



In 2012, this research project will focus on specific sheep breeds (Katahdin, Merino and Rambouillet) to help us determine a possible genetic connection. We are seeking sheep producers within the 12-state region (ME, NH, VT, CT, MA, RI, NY, PA, NJ, DE, MD and WV) with flocks of sheep with a history of footrot and lameness. We seek farms that have sheep within the flock that include individual sheep with footrot and individual sheep that are not infected with footrot.

Participating farms agree to follow a 28-day protocol under the direction of the research team to eliminate the disease from the farm. The research team makes at least two visits to each farm to trim and score the feet of each sheep, collect data and teach the shepherd how to trim and score feet. Supplies and tools are provided to each participating farm. All information is confidential. For more information about the research project and the protocol see the project website <http://umaine.edu/sheep/>

If you are interested in participating in this applied research project this spring, summer or fall, please submit an application as soon as possible. The application might take 5 minutes to complete. The application can be found at this link <http://umaine.edu/sheep/apply/>

Feel free to call or email me if you have any questions. Richard Brzozowski, Principle Investigator, University of Maine Cooperative Extension, (207) 781-6099 or [richard.brzozowski@umaine.edu](mailto:richard.brzozowski@umaine.edu)

## The Cost of Anthelmintic Resistance - (continued from page 1)



The difference in live-weight gain was 9 kg (19.8 lbs.) in favor of the DQL-ABA treatments. Significant differences in body condition scores, fecal breech soiling and fleece weights were also recorded, all in favor of the DQL-ABA treatments. The time required for 50% of the animals to reach a target live-weight of 38 kg (83.6 lbs.) was significantly shorter (by 17 days) in those animals treated with DQL-ABA.

The production cost of using an anthelmintic which is not achieving the expected levels of efficacy due to anthelmintic resistance was clearly demonstrated. The loss of productivity due to sub-clinical parasitism was also demonstrated by these results.

Source: *Veterinary Parasitology*, May 2012.

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## 49 Bucks Start Pasture Test

Forty-nine (49) bucks are participating in the 2012 Western Maryland Pasture-Based Meat Goat Performance Test. The test is conducted annually by University of Maryland Extension and is held at the Western Maryland Research & Education Center in Keedysville.

The 49 bucks come from 13 producers from 7 states including Delaware, Indiana, Kentucky, Maryland, Tennessee, Vermont, and Virginia. This year's test welcomes five new consigners.

Ninety-percent of the goats in this year's test are Kiko or Kiko cross. In addition, there are two fullblood Boers, two Myotonics, and a Spanish buck.

While on test, the bucks consume a pasture-only diet. They are handled bi-weekly and evaluated for growth, parasite resistance (fecal egg counts), and parasite resilience (FAMACHA scores).

Those meeting Gold, Silver, and Bronze standards for each of the criteria will be eligible to sell via auction on Saturday, September 15. The buck sale will be held at the test site.

To follow the progress of this year's test, be sure to visit the blog at <http://mdgoatstest.blogspot.com>.



*(Dr. Mara Mullinex is the official veterinarian for the goat)*

## Goat Study Underway: Pen vs. Pasture

In addition to conducting a buck performance test, University of Maryland Extension will be carrying out a study to determine the differences between pen-fed vs. pasture-raised meat goats. Carcass traits, performance traits, and economics will be compared between two groups of weaned, mostly Kiko and Kiko-cross bucklings (avg. weight 45 lbs.).

The pen-fed goats (n=15) will have unlimited access to grass hay and be hand-fed grain (whole barley + a protein pellet) once per day, based on appetite. In last year's preliminary study, grain consumption averaged 1 lb. per head per day over a 112-day period.

The pasture-raised goats (n=15) will graze alongside the bucks in the 2012 Western Maryland Pasture Based Meat Goat Test. They will consume a pasture-only diet and will not receive any supplemental feed. Both groups of goats will have free choice minerals.

The study goats will be handled bi-weekly. The same data that is collected on the goats in the performance test will be collected on the goats in the comparison study: body weights, FAMACHA®, body condition, coat condition, and dag scores. Fecal samples will be collected bi-weekly to determine individual fecal egg

counts. Towards the end of the study, the goats will be ultrasounded to determine backfat thickness and rib eye area.

At the end of the feeding period, the study goats will be harvested to collect carcass data. The carcasses will be deboned to determine yields of bone, fat, and lean (meat). A sample of the longissimus dorsi muscle will be analyzed (by the Ohio State University meat lab) to determine fatty acid content.

This year's study is being funded by a grant from the Maryland Grain Producers Utilization Board.



*(Erin Canfield provides daily care for the goats in the test and study)*



## UMES Specialist Provides Assistance Nepal (continued from page 5)

b) a central hill region and c) the rugged mountains (the Himalayas) in the north. Mount Everest at 8,848 meters (29,029 feet) above sea level, is the highest mountain in the world. It is called Sagamatha by the locals.



There are two prevalent breeds of goats in Nepal, Khari in the hills and Terai in the plains.

### **The Assignment:**

Winrock International's Farmer-to-Farmer Program requested a volunteer to work with the marginalized ethnic minorities (dalits) and conflict-affected youth (between the ages of 16-30) to train them on goat nutrition (fodder, forage, and local concentrates for smallholders' goat production systems).

The training materials focused on a) the general nutritional concepts of pregnant does and kids, b) use of the FAMACHA© card for smart use of anthelmintics in goats and c) castration of bucklings using elastrators and rubber bands. These activities were conducted with the existing goat herds owned by Nepalese farmers in conjunction with Winrock's Education for Income Generation (EIG) Program in the Midwestern Region of Nepal.

Once in-country, the training targeted two groups of participants: a) EIG Program beneficiaries and b) Local Service Providers (LSPs). Trainings consisted of two 45-minute sessions (classroom-style), followed by hands-on sessions which covered the concepts explained during the classroom sessions.

Goats (8.47 million head in Nepal) are a principal and adapted livestock species in the four visited districts in Nepal. The EIG Program has established an evident and effective network with goat beneficiaries and local livestock government officials. Testimony from goat beneficiaries indicates a significant contribution that the EIG Program has made to enhance their income in the past year.

Goats are a cash crop in Nepal, managed mostly by marginalized women. The training-enhanced adoption of technology will result in additional revenue for the households. In total, 209 Nepalese goat farmers (142 women and 67 men) were trained during the 22-day visit.

Dr. Escobar's training activities were supported by Dr. Santosh Kumar Karn, DVM and Mr. Amar Thing, MS, both with the Nepal Winrock's Education for Income Generation Program.



*Dr. Escobar training Nepalese goat farmers*

## Calendar of Events

### **July 21**

West Virginia Performance Tested Ram and Buck Sale  
Reymann Memorial Farm,  
Wardensville, West Virginia  
Info: Brad Smith at (304) 257-4688 or  
Brad.Smith@mail.wvu.edu

### **July 27-28**

National Sheep Symposium  
Clay County Fairgrounds, Spencer Iowa  
Info: <http://www.aep.iastate.edu/sheep/homepage/html>

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August 4

Pennsylvania Performance Tested Ram and Buck Sale  
Pennsylvania Livestock Evaluation Center, PA Furnace, PA  
Info: Greg Hubbard at (814) 238-252 or  
ghubbard@state.pa.us

August 25

Virginia Performance Tested Ram Sale  
Virginia Tech Shenandoah Valley REC, Steele's Tavern, VA  
Info: Scott Greiner at (540) 231-9159 or sgreiner@vt.edu

September 15

Western Maryland Pasture-Based Meat Goat  
Performance Test Sale of top-performing bucks  
Western Maryland Research & Education  
Center, Keedysville, MD  
Info: Susan Schoenian at (301) 432-2767 x343 or  
sschoen@umd.edu

October 18-20

North American Dairy Sheep Symposium  
Holiday Inn Washington Dulles, Dulles, Virginia  
Info: [www.dsana.org](http://www.dsana.org)

October 27

Maryland Sheep Breeders Association  
Annual Meeting and Dinner  
Howard County Fairgrounds, West Friendship, Maryland  
Info: Kelly Cole at (240) 446-0996 or kc137f@yahoo.com

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More information on sheep, goats, and upcoming events can be accessed at:

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