

Goat Producer's Newsletter

Terry Hutchens, MS, Animal and Food Sciences UK
Robert Harmon, PhD, Animal and Food Sciences UK

Myth Busters

The University of Kentucky as well as Kentucky State University Extension Specialist and Associates are available to all counties in the state for meetings during the week and weekends as need by the **Local County Extension Personnel**. All that is need to schedule a meeting is to contact the appropriate County Extension Agent and coordinate a meeting date.

2004 County Assessment of FAMACHA

Hank Schweickart, KSU,; Keith Hackworth, UK, Linda Sexton, UK,; Paul Sizemore, UK; Tony Shirley, UK; Wanda Miick, KSU

Terry K. Hutchens, UK; Patty Scharko, UK and Gil Myers, Consulting Parasitologist, Jimmy Henning UK,

The Cooperative Extension Services at the University of Kentucky and Kentucky State University jointly collaborated in the evaluation of **FAMACHA**. FAMACHA is a novel management tool used in the battle against the intestinal parasite, *Haemonchus contortus*. This prolific parasite has been described as a primary barrier to the development of the small ruminant industry throughout the world.

UK county extension agents and KSU small farm assistants conducted a pilot study in 8 Kentucky counties. This report describes the results of 5 of the 8 counties involved.

The primary objective was to become familiar with the process and to evaluate the accuracy of the method under Kentucky conditions.

FAMACHA is a novel technique that evaluates the



Gray eye membranes indicates anemia.

degree of anemia found in sheep or goats by examining the lower eye membrane and matching the color of the membrane with a FAMACHA eye membrane color match chart.

FAMACHA is only effective in evaluating the blood feeding effects of the gastro-intestinal parasite *Haemonchus contortus* or barber pole worm. This particular parasite is much more destructive than most stomach worms because of the tremendous reproduction potential _ 5000 eggs/female/day and blood feeding on the parasitized animal. Many workers estimate that as much as 10% of the total blood volume may be engorged by these parasites each day. Parasitized animals become anemic to the point of extreme weakness and death.

County Study, Table 1

Table 1

Summation of 2004 County FAMACHA Data for 106 Goats

Location	Dates of Samples (Range)	# of Samples	Average Days between Samples	Average Body Condition Score	FAMACHA Readings (1,2,3,4,5)	Average Fecal Egg Counts	Average # Of Animals De-Wormed	% of Herd De-Wormed
Mercer	July 8-Oct 20	5	18	3.16	3	72.8	11	55
Russell	July 8-Sept 14	4	17	3.65	2	125.11	10	45
Greenup	July 8-Sept 13	3	9	2.99	2.9	N/A	16	78
Owsley	Aug 12-Sept 23	4	10	2.5	3	31.45	7	27
Knott	July 7-Sept 29	6	14	3.27	3	55.33	11	54
Overall Averages			13.6	3.11	2.78	71.17	11.00	52

Five KY. counties, 5 producers and 106 goats participated in the study. The counties are shown above. All counties extension agents and small farm assistants participating in the trial selected a farmer/cooperator and approximately 20 goats in each study. The trial was conducted during prime *H. contortus* conditions that consisted of warm weather and high moisture levels. The study dates ranged from July 8 – October 20. The least number of FAMACHA sample was 3 and 6.

During each FAMACHA sampling period, 3 animals determined to be free of anemia and 3 animals showing signs of anemia were subjected to fecal egg count (FEC) analysis for determination of number of *H. contortus* eggs per gram of feces.

As stated in previous newsletters, FAMACHA readings 1 and 2 were **not** dewormed while readings 3,4 and 5 were dewormed.

In addition, body condition scores (BCS) were determined at each FAMACHA sampling. BCS of 1 shows no fat cover over the transverse proc-

cesses and 5 shows an extensive cover.

FAMACHA's Stabilizing Effect on Herd Parasite Management

The summation of the data table (see page 2) tabulates the result of the study. The most apparent observation is the stabilizing of parasitism within the herd. The current FAMACHA recommendation is to check the herd at 2-week intervals during peak *H. contortus* season. In our case the average number of days between samplings was (9-18) days. The body condition of the animals was stable and acceptable at 3.11.

FAMACHA readings remained high 2.78 on the average throughout the parasite season. Surprisingly, only 52% of the animals were dewormed during one sampling period. However, the lowest percentage of the herds dewormed was 27% and the greatest percentage was 78%.

What were the Primary Differences between the herds?

Stocking rate or animals/acre was the primary difference. Let's use some commonly expected cow-

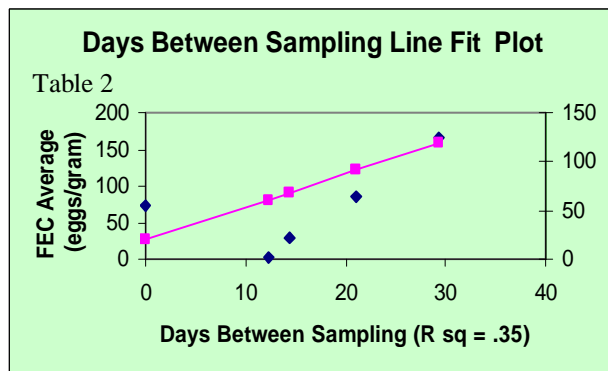
sence. A 1000 lb cow in KY has 2 + acres allotted per year. Any way you look at it, six, 150 lb does or eight, 125 lb does equals the body weight of 1 cow.

1. Therefore, our recommended stocking rate is 3-4 does/acre. However goats consume almost three times more forage dry matter that does a cow. Therefore, by the beginning of the parasite season, (June, July, August, September), many pastures had been grazed well below desirable heights.
2. Wood land browse during summer months. Goats were not contained on parasite, contaminated pastures the entire grazing season. Goats were browse in wood lots for 2-3 months following the spring grass flow. You don't have woodland browse? Plant small blocks of summer annuals such as sorghum sudan grass, forage soybeans, or millet or locate weed lots. Become mobile.
 - ?? Expand the grazing area beyond the farm boundaries.
 - ?? Formularize yourself with portable fencing and water systems.
3. More successful farmers had some ability to move animals from one paddock to the next, allowing regrowth and maintaining a pasture grazing height above the 3-4 inch infection zone.

Days between Sampling vs. FEC (eggs/gram)

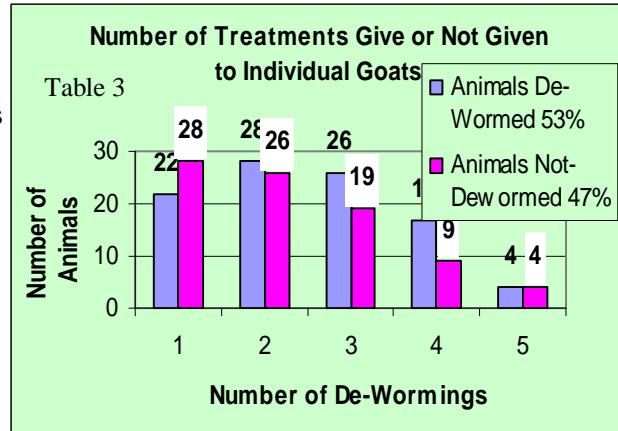
There is a relationship between the number of eggs per gram of feces found in goat fecal materials and days between inspections. In this case, in order to keep egg counts at 60 eggs/g or less, inspection should be made at intervals 15 and 20 days. (Table 2).

Likewise, days between sampling and number of animals treated within the herd shows a need for a similar range of 15 to 20 days.



Be Aware of Predictable Trends

FAMACHA readings decreased (became more anemic) with increases of months on study. Likewise, FECs increased as the grazing season advanced through the months. Remember that *H. contortus* increases exponentially on pasture given good growing conditions (temperature, free moisture and susceptible host). Therefore the parasite challenge for the goats become increasingly greater as time spent grazing and months ad-



vance. Similarly, BCSs may trend down as the summer advances, parasite prevalence increases and the grass becomes more fibrous and lower in quality.

Deworming Statistics for Individual Animals Within the Herd

The bar graph below describes the deworming status of individual animals within each of the 5 herds. Overall for a period of approximately 90 days under ideal parasite infection conditions, only 53% of the animals were dewormed at any one FAMACHA sampling period, leaving 47% of the goats without need of treatment (Table 3). There were no deaths or disease related to *H. contortus* infection during the study. The first two columns in table 3, showing goats that were de-wormed and not de-wormed on the first FAMACHA inspection. There were 22 goats de-wormed and 28 goats that were not de-wormed. Likewise, for columns 2, 3, 4 and 5 showing the number of treatments given on the X axes.

From a stand point of selecting individuals within the herd for genetic resistance to parasitism, goats making up columns 3, 4 and 5 and identified as (*Animals Not-Dewormed*) should provide a valuable resource of genetic resistance to parasitism. There were 19 goats out of 106 that were not de-wormed for three consecutive FAMACHA inspec-

tions. Similarly, there were 9 goats/106 and 4 goats/106 that were not de-wormed following 4 and 5 FAMACHA inspections.

Conclusions

FAMACHA is an effective management tool for *H. contortus*. The overall effect is a stabilization of parasitism within the goat herd resulting in a steady state condition in overall goat health.

The technique can identify anemic as well as non-anemic animals allowing preferential treatment between goats in the herd. In general, only half of the animals at anyone inspection needed treatment. Drug costs were cut in half and perhaps most importantly, the development of parasites with resistance to the drug of choice has been also been reduced and delayed. Furthermore, the FAMACHA process identified 19 goats from 106 goats (18% of the population) that may have genetic resistance for *H. contortus*.

FAMACHA is a labor intensive processes requiring all goats to be inspected at least every 14 to 21 days. The long term effect of reducing the number parasites resistant to available drugs may be well worth the labor output and cost.

Where to Get FAMACHA Kits

FAMACHA kits are available from FAMACHA trainers. This can be your County Extension Agent, veterinarian or other professionals within the sheep and goat community who have completed a training course. They cannot be ordered directly by untrained individuals. Your name must be in the FAMACHA data base stating that you have completed a training course.

Training courses will be offered to County Extension Agents and Small Farm Assistance in May of 2005. Extension Agents can then begin the training process for their clientele.

FAMACHA charts are available from Dr. Kaplan's lab at the University of Georgia.

Chart prices are as follows: \$13 each for 1-4 charts, \$11 each for 5-24 charts, \$10 each for 25 or more, \$9 for 100 or more.

Department of Infectious Diseases
College of Veterinary Medicine
University of Georgia
Athens, GA 30602
famacha@vet.uga.edu

fax (706) 542-0059
www.scsrpc.org

FDA PERMITS THE USE OF SELENIUM YEAST IN SHEEP AND GOAT FEED

March 8, 2005

In response to a stakeholder request, FDA's Center for Veterinary Medicine will exercise enforcement discretion to allow for the use of selenium yeast in complete feed for sheep or goats at levels not to exceed 0.3 part per million (ppm) added selenium (Se). This decision applies to any firm that manufactures and markets selenium yeast within the specifications of FDA's food additive regulation. FDA has approved selenium yeast as a food additive in the complete feed for chickens, turkeys, swine, beef cattle, and dairy cattle at a level not to exceed 0.3 ppm of added selenium [Code of Federal Regulations , Title 21, Part 573.920(h) --].

Questions on the use of selenium yeast in sheep or goat feed may be directed to Dr. William Burkholder, FDA/Center for Veterinary Medicine (HFV-228), 7519 Standish Place, Rockville, MD 20855, telephone 240-453-6865, or email William.Burkholder@fda.hhs.gov ...

Or in Kentucky contact Steve Traylor, Feed Coordinator, University of Kentucky, Regulatory Services, Lexington, KY. 40546-0275, Phone 859-257-6528, Fax 859-323-9931.



Mercer County Extension Agent, Tony Shirley and meat goat producer Mike Royalty observing anemia symptoms while participating in the 2004 FAMACHA study.

New Publication Preview

Managing Steep Terrain for Livestock Forage Production

D.C. Ditsch, Associate Professor, Department of Plant and Soil Sciences

G. Schwab, Assistant Professor, Department of Plant and Soil Sciences

J.D. Green, Professor, Department of Plant and Soil Sciences

J.T. Johns, Professor, Department of Animal & Food Sciences

R. Coleman, Associate Professor, Department of Animal & Food Sciences

T. Hutchens, Extension Associate, Department of Animal & Food Sciences

L. Piercy, Professor, Department of Bio-Systems and Engineering

D. Amaral-Phillips, Associate Professor, Department of Animal & Food Sciences

Plants and Soil Sciences and the Animal Sciences Departments of the University of Kentucky have jointly written a publication relating to managing pasture and grazing steep terrain with cattle, sheep, horses, and goats.

How to renovate steep terrain pasture and hayfields

In Kentucky, renovation usually means adding lime and fertilizer according to soil test results, controlling undesirable weeds and increasing the legume component of the forage base (see AGR-26 for more information on pasture renovation).

Step 1. Soil test and apply needed lime and fertilizer. Legumes need a higher soil pH and fertility level than grasses. However, nitrogen fertilization should be avoided at seeding if legumes and grasses are planted at the same time. Added nitrogen stimulates grasses, which increases competition with the legume.

Step 2. Reduce competition from existing vegetation. This can be accomplished by heavy grazing or herbicide usage.

Step 3. Select the grass and legumes species/varieties that are best suited for the site (i.e. fertility level, drought tolerance, grazing vs. hay).

Step 4. Use certified seed and inoculate legumes with the appropriate strain of rhizobium bacteria to ensure nodulation.

Step 5. Plant seed at recommended rates and dates so that it makes good contact with the soil (Table 5). On non-erodible sites, this can be accomplished by light surface disturbance using a disk or chain drag. Broadcast seed followed by a second trip with a chain drag. Clovers can also be successfully seeded on steep terrain in late winter/early spring using an ATV with a small broadcast seed spreader. As the soil freezes and thaws, the seed becomes covered. This method does not work well for alfalfa. Another method is to use a no-till renovation seeder. These seeders do a good job of placing seed in good contact with the soil, but they do not reduce competition from existing vegetation. When operating on the contour of the slope, keep the seed hopper full so all seed cups remain covered for uniform planting. Seeding is not a safe to operation on steep slopes.

Grazing Goats on Steep Terrain

Goats have a very diverse diet, much more diverse than do sheep or cattle. Goats have been described by grazing ecologists as browsers, but they can be opportunistic generalists because they consume the most palatable forage first and move on to the next level within the palatability and nutritional plane.

Goats prefer to graze uphill in a zigzag motion and conversely, graze very little coming down hill. They often graze steep

slopes and around rocky areas first, showing a preference for areas inaccessible to cattle and sheep. Furthermore, goats generally approach the feeding area from the outermost boundary of the feeding perimeter and eat toward the center and forward to the initial starting point.

Goats often return to the starting point of the grazing area and congregate for resting and rumination. This grazing habit creates a concaved grazing pattern that provides maximum visibility of the surroundings for the grazing goat herd.

Goats are resistant to many plant toxins and anti-nutritive factors commonly found in non-agricultural areas. Therefore goats are capable of defoliating most plants species, many of which cattle will not utilize. The primary anti-nutritive factors are naturally occurring plant tannins. The tastes of tannins are bitter and generally unpalatable for cattle and for most ruminants. Tannins bind rumen proteins and render them unusable. Goats favor the bitter taste and can utilize the bound proteins as bypass protein. Bypass protein is non-degraded protein that passes directly to the abomasums, or true stomach, for more efficient utilization. Therefore, goats can sustain themselves on low protein vegetation for sometime by utilizing protein more efficiently than can cattle.

Give the opportunity; goats consume a predominance of browse (73%) and lesser amounts of grasses (23%) and forbs (4%), although the proportion will vary with availability of standing forage. Time of year and weather conditions also may dictate what goats eat. Goats tend to eat vine plant like honeysuckle early in the browse season while in wooded areas. As the weather gets warmer and the succulent plants are either consumed or no longer favored, goat consumption turns to a more diverse

plant population including hardwood seedlings and broad leaf foliage from low hanging branches. Likewise, red cedars remain untouched by goats until they become more desirable for browsing in mid-to-late winter.

This diverse grazing habit of goats helps the restoration of the plant-soil nutrient balance to degraded and eroded soils. Wood plant species store large quantities of plant nutrients within the woody tissue. These nutrients (N, P, K), remain bound in the woody tissue for very long periods of time. Woody plants must die and decompose before the nutrients are release to the soils. As goats consume a variety of woody species and assorted plant parts, plant nutrients are more rapidly released to the soil by way of goat waste degradation. This process has been observed by monitoring soil nutrient changes occurring following 3 years of goats grazing shinnery oak (*Quercus havardii*). Soil N, P, and K levels increased from 1.1 to 23.3 kg/ha and 5.5 to 25.5 kg/ha and 133 to 346 kg/ha all respectively.

Similarly, goats are a beneficial addition to a mixed species grazing pasture environment. Goats preferentially consume seedling stems of weedy plants, thus reducing the spread and perpetuation of weeds by seed. Range management scientists have observed that goats reduce the seed bank of thistles when used to control thistles and sericea lespedeza in the tall grass prairie of the western United States.

Goats can be used similarly in Kentucky's cool season pastures by allowing goats to satisfy their desire for highly preferred plant species such as blackberry, green briar, sumac, winged elm, poison ivy, ironweed, and kudzu.

Goats have a moderate preference for post oak, multiflora rose, sunflower, ragweed, hickory, Hawthorne, tall thistle and eastern red cedar, and a lesser preference but often consumed pasture pests such as Osage orange, Illinois bundleflower, hackberry, buckbush, and giant ragweed.

Finally, goats can graze in combination with cattle, horses or sheep, with the main benefit being that goats utilize and thereby suppress plant species that are not utilized by cattle. Scientists have observed that pasture utilization and carrying capacity was improved 10-24% by grazing goats with cattle.

Kentucky State University Has New Goat and Livestock Specialist

Dr. Kenneth M. Andries, Ph.D.

I was raised on a crop and livestock farm in South Central Louisiana where we raised cattle and row crops primarily. We raised sheep and goats at one point selling lambs for the 4-H club lamb market and goats to eat. My education started at Mississippi State University where I received my BS degree in Animal Science in 1990. I then went to Louisiana State University, receiving my MS degree in Animal Breeding and Genetics in 1992. My thesis project looked at production efficiency of crossbred beef cattle. I then moved to Kansas State University where I received my Ph.D. in 1996 in Animal Breeding with a minor in Meat Science. While there I looked at breed differences in growth and carcass traits of crossbred cattle. I then started working for cooperative extension service in Northwest Kansas as a county agent. Then I moved back to Louisiana to work as a 4-H youth and adult livestock agent in Avoyelles Parish. I moved to Maine in 2001 to work as the state livestock extension specialist and worked with all livestock industries except dairy cattle. I started here at Kentucky State University in January and am looking forward to working with the goat industry in the state. Please feel free to contact me at 502-597-5094 or by e-mail at kadries@gwmail.kysu.edu.

KY-Cooperative Extension Services Evaluates Foot Scald Vaccine

Extension Agents, Associates and Specialist from the University of Kentucky and Kentucky State University working jointly with Intervet Inc. to solve foot disease problems in goats. The work is being conducted in Mercer and Marion counties. Result of the study will be available for fall field days 2005.



Left to Right: Terry Hutchens, UK; Ed Lanham, UK; Patty Scharko, UK; Ken Andries, KSU; and Bobby Watts, meat goat producer.

Extension and Association Education Events Goat Happenings

Northern Kentucky Goat Association

FAMACHA Training: In April 23, contact Barbara Brown, 859-356-2478, goats@atwoodacres.com
FAMACHA Training for County Agents: Quick-sand; May 12, Marion Co.; May 19, Princeton; May 26, 1:00pm-4:00pm local time. Contact Terry Hutchens, 859-257-2465, thutchen@uky.edu
Mammoth Cave Goat Association Field Day: May 21, Boling Green, David Alexander Farm, 270-529-9330 and Joanna Coles, Cooperative Extension Agent, 270-842-1681



Foot Scald Vaccine Study

Table 5. Legume seeding rates and dates for renovating grass fields.			
Legume(s)	Seeding Rate	Seeding Date	
		lbs/ac	Spring
White clover	1-3	Feb 1 – Apr 15	Aug 1 – Sept 10
Red clover	6-12	Feb 1 – Apr 15	Aug 1 – Sept 10
Alfalfa	12-20	Mar 1 – Apr 15	Aug 1 – Sept 15
Sericea Lespedeza	30-35 (unhulled) 60 (hulled)	Mar 15-Apr 15	
Annual Lespedeza	15-25	Feb 15 – Apr 1	
Birdsfoot Trefoil	6-12 (scarified)	Mar 1 – Apr 15	Aug 1 – Sept 10
Alsike clover	4-6	Feb 1 – Apr 15	Aug 1 Sept 10
Sweet clover	10-15	Feb 1 – Apr 1	
Crownvetch	20	Apr 1 – May 15	

**University of Kentucky on Farm
Goat Forage Trials**



FAMACHA Training, Parasite Management and Avoidance Techniques: A Goat Producers Parasite Workshop, conducted by Purdue University and University of Kentucky, June 2005, will be held at the Southern Indiana Purdue Agricultural Center (SIPAC). Located 1 hr north of Owensboro KY. Contact Terry Hutchens, 859-257-2465, thutchen@uky.edu
www.ansc.purdue.edu/meatgoat/Mainpage.htm
www.agriculture.purdue.edu/pac/locations.html

Send us your event time and dates!

- ?? Mercer County Field Day, Watts Farm, will look at goat forage alternatives as well as the best means of establishing Sericea lespedeza. View the Forage Goat Garden. Field Day coming in September.
- ?? Barren County: Slaughter goats will also graze sorghum sudan and Tara, forage soybean in Barren County on the Charles Smith Goat farm.

June-Artificial Insemination Workshop for Goat Producers: Bluegrass Goat Association, E. J. Thurmond and Diane Kelley, Cooperative Extension Service, 502-863-0984, dkelley@uky.edu .

Terry Hutchens
 Extension Associate Specialist
 Animal & Food Sciences
 615 W.P. Garrigus Building
 Lexington KY, 40546-1027
 University of Kentucky /
 Kentucky State University
 Phone 859-257-2465
 Fax 859-323-1027
thutchen@uky.edu
[http://www.uky.edu/Agriculture/
 AnimalSciences/goat/goats.html](http://www.uky.edu/Agriculture/AnimalSciences/goat/goats.html)

Cooperative Extension Service

*University of Kentucky
(Your) Department
Ag Distribution Center
229 Stadium View Road
Lexington KY 40546-0229*

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