

2004 County Assessment of FAMACHA

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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 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 (see page 2)

One hundred and six goats were evaluated in 5 central, south central and eastern Kentucky counties. 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 to be used in the 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 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 processes and 5 shows an extreme fat cover. processes 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. 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 0.52% of the animals were dewormed during one sampling period. However, the lowest percentage of the herds dewormed was 0.27% and the greatest percentage was 0.78%.

What were the *Primary Differences* between the herds?

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

- Therefore, our recommended stocking rate is 3-4 does/acre. However goats consume almost three times more forage dry matter than does a cow. Therefore, by the beginning of the parasite season, (June, July, August, September), many pastures had been grazed well below desirable heights.
- Woodland 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.
- 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, animals became more anemic, with as the season progressed. 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 becomes increasingly greater as time spent grazing and months advance. 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 dewormed 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 dewormed for three consecutive FAMACHA inspections. Similarly, there were 9-goats/106 and 4 goats/106 that were not de-wormed following 4 and 5 FAMACHA inspections.

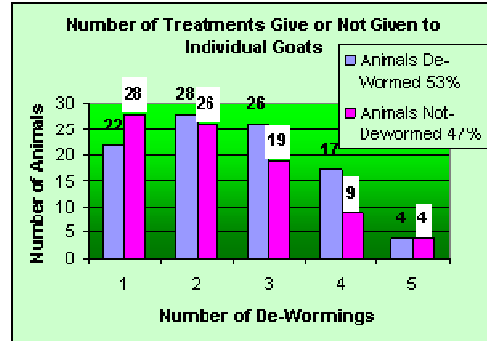
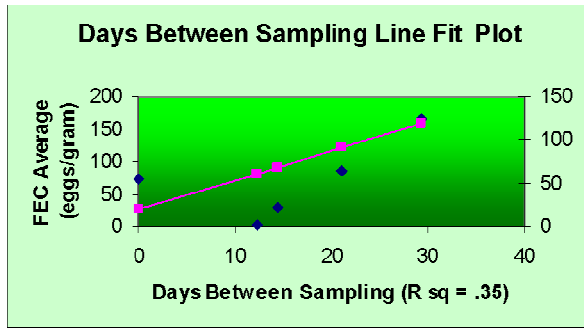
Conclusions

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 process 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.

<h2 style="text-align: center;">Summation of 2004 County FAMACHA Data for 106 Goats</h2>								
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	0.55
Russell	July 8-Sept 14	4	17	3.65	2	125.11	10	0.45
Greenup	July 8-Sept 13	3	9	2.99	2.9	N/A	16	0.78
Owsley	Aug 12-Sept 23	4	10	2.5	3	31.45	7	0.27
Knott	July 7-Sept 29	6	14	3.27	3	55.33	11	0.54
Overall Averages			13.6	3.11	2.78	71.17	11.00	0.52



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.

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