UF IFAS Extension UNIVERSITY of FLORIDA

Small Ruminant Update

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Fecal Egg Counts: How to Collect, Process and Analyze Samples

Kevin Korus

Small ruminant animals are susceptible to infection by a number of internal parasites. One of the most problematic parasites of small ruminants is the barber pole worm (*Haemonchus contortus*), which belongs to the suborder Strongylida and it is a blood sucker parasite that resides in the intestines (Figure 1.). This microscopic roundworm, or nematode, is a prolific reproducer, and a single female can produce around 250,000 eggs during its lifespan of 25-50 days.

Infected animals will appear anemic (pale eye and gum membranes), lethargic, and may have reduced milk production. “Bottle jaw” is another symptom that occurs from fluid build-up under the animal’s jaw. Although all ages of animals can become infected, those that are 6 months or younger are more susceptible. Death may be the result in severely infected animals or in animals with underlying health conditions.

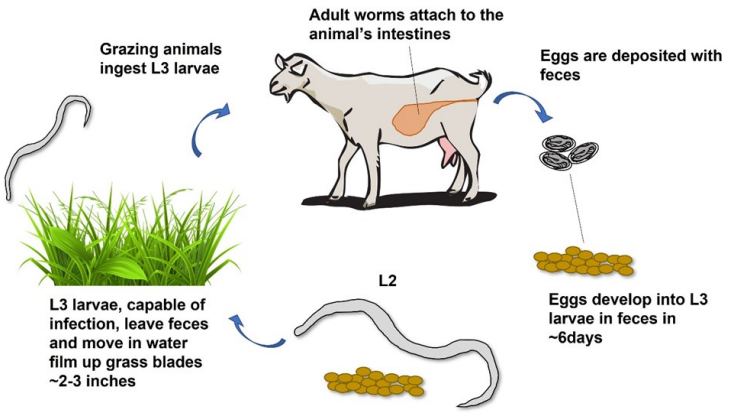

Figure 1. Life cycle of the barber pole worm.

The process by which we evaluate the number of parasites in an infected animal involves evaluation of their fecal material. Parasite eggs can be separated from fecal debris using a flotation fluid (saline solution). The buoyant nature of parasite eggs allows them to float to the surface and be viewed at the top of a specialized microscope slide (Figure 2).

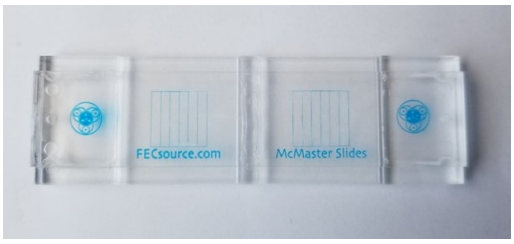

Figure 2. McMaster microscope slide.

Fecal egg counts can be used to identify and measure the amount of strongylid eggs per gram of manure. Samples must be viewed through a compound microscope with magnification from 100 to 400x. The following is a summary of the Modified McMaster Fecal Egg counting procedure developed by the USDA Sustainable Agriculture Research and Education Program in collaboration with The University of Rhode Island and Virginia Tech.

Conducting Fecal Egg Counts

Sample Collection. To accurately assess the levels of parasitic worms in each animal, fresh fecal samples need to be collected and analyzed for each individual animal. Samples should be taken directly from the animal and not collected from the ground. Steps for collecting a proper rectal fecal sample can be found on page 2 of the McMaster Fecal Egg County Procedure (see reference below). After samples have been collected, make sure that they are labeled and stored in the refrigerator. If many samples need to be collected at one time have a cooler with ice handy to store samples until they can be put into the refrigerator.

Alternatively, samples can be collected from animals IMMEDIATELY after depositing; however, feces that sit on the ground can become contaminated by many other organisms. Samples are more readily collected from animals that have been at rest. If necessary, pen the animals for a while before collecting.

Sample Processing. Samples are macerated, mixed with flotation solution and strained through mesh fabric like cheesecloth. This liquid solution is then loaded into specialized McMaster slides for viewing with a compound microscope. It is important to load the two chambers of the McMaster slide without allowing air bubbles. Air bubbles reduce the amount of solution in each well and alter the true egg count. To reduce the likelihood of air bubbles, use a transfer pipette to load the wells from the top by holding the slide at a 45° angle.

Reference:

Zajac, A., Petersson, K., and Burdett, H. 2014. How To Do The Modified McMaster Fecal Egg Counting Procedure. Virginia-Maryland Regional College of Veterinary Medicine. Virginia Tech. University of Rhode Island. https://web.uri.edu/sheepngoat/files/McMaster-Test_Final3.pdf

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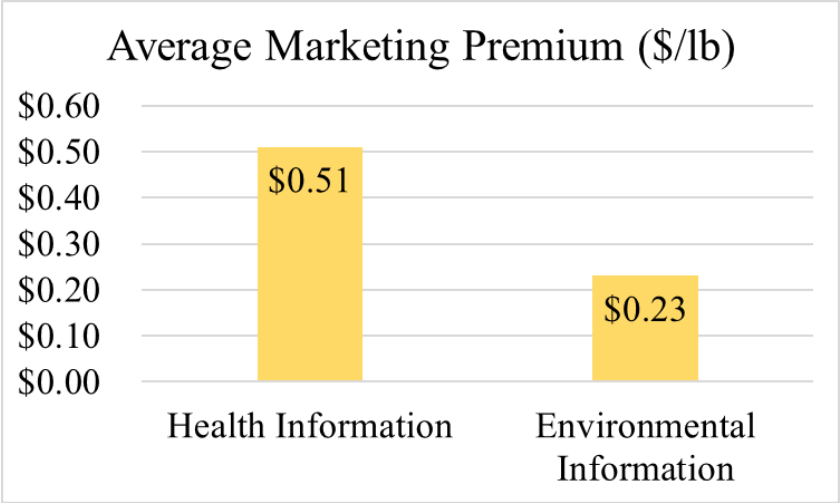
Exploring Florida Consumer Preferences for Goat and Sheep Meat

Meri Hambaryan and John Lai

A study was conducted to examine market segments of goat and lamb consumers in Florida, to gain a better understanding of consumers' preferences for goat meat and identify willingness to pay (WTP) for attributes, such as price, locally produced, quality, organic certified, and USDA certified. Moreover, a closer examination of potential economic premiums related to health and environmental benefits would help further identify opportunities to differentiate products. This knowledge can help develop marketing strategies to promote the emerging goat and sheep meat industry in Florida. To analyze consumer preferences towards different attributes of goat and sheep meat, an online survey was conducted using Qualtrics. A sample of 1037 adult Floridians who consume meat products and are the primary shoppers in their household was obtained. A choice experiment was embedded within the survey to measure consumer preferences for the following attributes: price (U. S. dollar per pound), Fresh from Florida labeling, quality (regarding a marbling quantity in meat), organic certification, and USDA Inspected. health, and religion-related food restrictions.

In addition, the survey included questions about socio-demographic information (i.e., gender, age, race, income range, education level, household size), as well as information about food-related lifestyles, health, and religion-related food restrictions. The latent class analysis model and a logit model were used to examine market segmentation and factors affecting consumer decisions.

Results indicate that quality may play a role in consumer behavior when considering purchases of meat products. Furthermore, younger generation consumers are expected to be willing to pay more for goat meat as they may looking for a healthier protein option. Results also highlighted the influence of information about health and environmental benefits, which could lead to an increase in the WTP premium for goat meat. For example, goat meat products marketed as having health benefits was associated with a $0.51 premium compared to a similar product without any health benefits. As it relates to environmental benefits, there was a $0.23 premium compared to goat meat products without the benefits. As the goat and lamb meat industry in Florida continues to grow, it is important to consider the differences in preferences across consumer market segments, including demographics and consumer behavior.



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Thinking About Pasture Management for Small Ruminants: Grazing Management

Marcelo Wallau

Discussions on grazing management generally generate some heater arguments of this method vs. that method and so on. Some follow one grazing guru, some another, and "what I do is best, all else is wrong". I am frequently in the middle of some of those discussion, and it can get quite exciting. A colleague and I recently wrote about "Reflections on rotational versus continuous stocking" for Progressive Forage to explore some of those discussions. In fact, the "grazing method" (correct technical term would be "stocking method", when we refer to how we move, or don't, the animals) has less effect on overall performance of a pasture management or overall grazing system than many other aspects. Let's get started from the beginning!

The single most important factor affecting the outcome of grazing systems is the balance between offer and demand. And offer always comes first! We need to make sure we can offer and adjust the demand to it.

The other way around will not work. In technical terms, we call carrying capacity (head or lbs. of animal live weight per acre). How many animals can my pasture or farm support, without degrading, and to achieve the determined production goals we have. The carrying capacity is determined by the target herbage allowance, which is the balance between forage biomass on a dry matter basis and animal live weight (normally between 1:1 on some annual forages, to 3:1 on perennial forages). Many factors influence carrying capacity, such as the forage species, season, weather, fertility, and management. Herbage allowance is a simple concept but complicated to implement, as it requires frequent measures of forage biomass. That's why many times we use proxies such as pasture height to be maintained (in a continuous stocking) or "in and out" heights (on rotational). (I explore some of those concepts in this article).

To implement this concept, the easiest way to do is looking into the Extension literature and consult your local extension agent to determine what is the regular productivity of your forage species in your area. Does not need to be precise but is a number we can work with. From there, think about the historical management of your pasture, how many animals you normally keep (the stocking rate), the condition of the pasture, how it has performed in the past, etc. We want to always have a good stand of forage and avoid overgrazing. If it is too short, or becoming weedy, or patchy, then we know it is being overgrazed and we might need to act to improve fertility, reduce weeds and potentially replant the pasture.

Now, if we only have one forage species, let's say bahiagrass, we have a big issue: bahiagrass just grows from mid-spring to mid-fall, slow in the early and late stages, and faster during the summer. That means 1) if I adjust my stocking rate to the maximum production, the pasture is overgrazed in the spring, which will delay and reduce the peak of growth in the summer; and 2) there is no forage during the winter. Now we go to concept 2 that is diversification, as we talked about in the Summer's newsletter. We need different forage species that can offer forage at different times of the year and matching the quality of those forages to the nutrient demands of our herd.

Once we know that our stocking rate (the actual number of animals or lbs of live weight per acre) is below carrying capacity (i.e., I am not overstocked), and that we have forage for our animal all (or most of the) year, then we can think of what stocking management to implement. Rotational stocking has no intrinsic and absolute advantage over continuous stocking. Both are bad if overgrazed, and both can perform well if correctly adjusted. What I have seen is that people implementing rotational stocking are becoming better stockperson, for the simple fact they are there in the pasture more frequently, observing the animals, learning the cycles. In fact, even if you have continuous stocking, you should be doing that! There is no room for putting the animals in a pasture and leaving them unchecked! That is bad management, period! What is better about rotational stocking then? "Prescribed grazing on pastureland" from about 10 years ago for NRCS, Dr. Sollenberger and collaborators found that once basic premises were met (e.g., adjusting herbage allowance), there was an average of 30% increase in animal output on rotational stocking than continuous, because of improved herbage utilization. Rotational stocking allows managers to capitalize on the "exponential growth" phase of the pasture, and from there is possible to increase stocking rate a bit because of the better pasture growth.

Another term that comes frequently is "mob grazing" (and many subsidiaries, like high density, flash grazing, etc.). The simple definition is to use a high stocking density (high number of animals in each paddock) rotating on a daily (or even more frequent) basis. That, however, does not tell me anything about the pasture situation. If mob stocking results in overgrazing, for the same reasons mentioned above, then it is bad! If we have the stocking rate adjusted (i.e., considering the whole pasture, not each of the rotation paddocks), then we can make it work. Results, however, are not quite what some people say… Just one example, Dr. Tracy, from Virginia Tech, has compared mob, rotational and continuous stocking, and at the end there is greater forage loss, overmature (low quality) forage, more soil compaction and less animal performance in mob stocking compare to the other two. And, very important, mob stocking *will not* overcome overgrazing, no matter what they tell you!

If your demand is higher than offer, no management practice (other than reducing stocking rate) will improve the other two. And, very important, mob stocking *will not* overcome overgrazing, no matter what they tell you! If your demand is higher than offer, no management practice (other than reducing stocking rate) will improve your pasture management!!

Even with rotational stocking proponents, there are different approaches. One of the approaches (Figure 1) is to target using the top 40% of the canopy height, so animals are grazing the best forage, and there is plenty of leaves left behind for photosynthesis, to ensure fast plant regrowth. In this approach, the rotation happens much faster (sometimes within 2 weeks we are back grazing paddock number 1). Another great benefit of an approach like that, where animals are not grazing down to the bottom of the canopy, is the reduction in gastrointestinal parasite pressure. Dr. Savian (in the same experiment as Figure 1) observed that by removing only the top portion of the canopy, the lambs had 30% of the egg count compared to removing 80% of the total height.

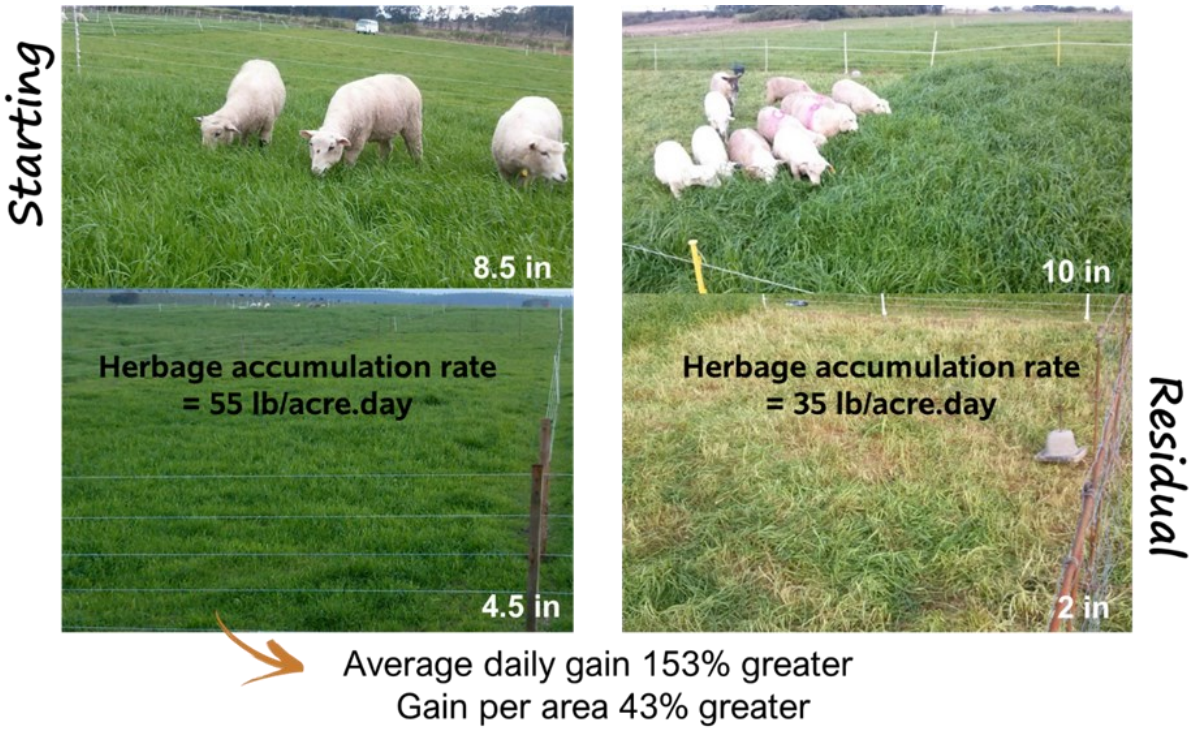

Figure 1. Sheep grazing Italian ryegrass on rotational systems, a lenient and more frequent approach (40% removal; left) and a traditional rotation with longer regrowth interval and 80% biomass removal (right). The first approach resulted in greater animal gain per day and per area. Note the color of the residual forage on the right side, composed mostly by stems and senescent leaves, that have lower photosynthetic capacity compared to the residual on the right. Source: Jean Savian.

A lot of the grazing system is about your goals, management style, knowledge, operation and more. There is no one that is best overall, and frequently we need to use multiple approaches to achieve our production goals. Keep in mind what really makes the difference, and what are the factors that affect the outcomes. As we say in science, think of the mechanism behind the phenomenon being observed, and not just on the outcome. Consult your local extension agent for more information and get their help on planning and implementing a grazing system for you! For more information, feel free to reach out to us at forages@ifas.ufl.edu.

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Annie Wallau

Health Benefits

Nutrient Rich

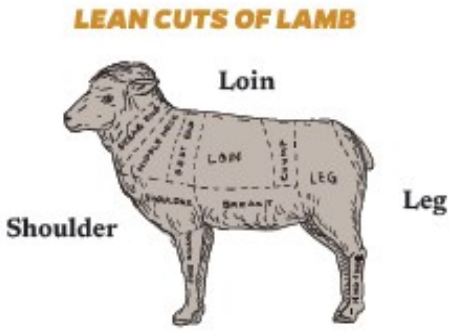
A 3oz. serving of lamb is naturally nutrient rich. It is packed with an array of essential nutrients needed for overall health and immune function.

Excellent source of protein, niacin, vitamin B12, zinc and selenium.

Good source of iron and phosphorus.

A 3 oz. serving of lamb delivers 23 grams of protein, almost half of your daily protein needs.

Lamb is a lean protein option! On average, a 3oz. serving has only 160 calories.



Lamb, grass-fed, leg, whole (shank & sirloin), boneless

Lean only, cooked (roasted)

Nutrition Facts	
Serving size	3 oz (84g)
Amount Per Serving Calories	140
	% Daily Value*
Total Fat 5g	6%
Saturated Fat 2g	10%
Trans Fat 0g	
Cholesterol 75mg	25%
Sodium 50mg	2%
Total Carbohydrate 0g	0%
Dietary Fiber 0g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 23g	46%
Vitamin D 0mcg	0%
Calcium 5mg	0%
Iron 2mg	10%
Potassium 280mg	6%
Niacin	45%
Vitamin B12	80%
Phosphorus	15%
Magnesium	6%
Zinc	35%
Selenium	25%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

One serving is 3 oz. of cooked lamb
(the size of a deck of cards)

Sources: USDA Nutrient Data Set for Retail Lamb Cuts, 2017 and Dietary Guidelines of Americans 2020-2025.

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The Inaugural Small Ruminant Short Course and Ram Test Sale was a Success!

Izabella Toledo

The Inaugural Small Ruminant Short Course and Ram Test Sale was held at UF in Gainesville, FL on September 16-17, 2022. The organization of the short course was a collaborative effort between the UF/IFAS Department of Animal Sciences, the UF College of Veterinary Medicine, UF/IFAS Extension, and Florida A&M University Cooperative Extension. The event attracted 150 participants, which included producers, UF faculty, extension agents, students and veterinarians.

The program was the first one of its kind in the southeast region of U.S. and it was focused on the future direction of the small ruminant industry, best management practices, and the latest information on specific production and management tools that may impact new and existing small ruminant enterprises.

The two-day event combined expert talks and UF research updates with the UF Ram Sale event and the UF North Florida Livestock agents group practical demonstrations. In addition, a producer panel moderated by Dr. Marcelo Wallau from UF and Angela McKenzie-Jakes from Florida A&M, provided great exchange of expertise and knowledge among producers.

We had the privilege to get outstanding individuals to speak at the Small Ruminant Short Course, including the renowned Susan Schoenian, a sheep and goat retired extension specialist from the University of Maryland.

The responses of the event exit survey (n=58) were very satisfactory, which can be translated to the high quality of the program. Among the survey participants, 95% responded that they learned something valuable, 88% will share the learned information with others, 81% said the information shared during the program will impact their operation, 69% will make changes on their operations based on what they learned during the program and 87% of the respondents emphasized that the program added knowledge to help them make better management decisions. Overall, the majority of the participants (93%) were highly satisfied with the program!

The Organizing Committee is grateful to faculty, staff, students, and volunteers, which were essential in the planning, execution and success of the event. We thank all participants that chose to attend the Inaugural Small Ruminant Short Course and Ram Test Sale. We hope the program exceeded your expectations and provided you with valuable information that will impact your small ruminant enterprise. Last but not least, we thank all of the sponsors that believed in our event, without their help, the event would not be possible!

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Meat Sheep Alliance of Florida

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Recipe Corner

Moroccan Lamb Meatballs

Ingredients

Meatballs
1lb (500g) of lamb mince (ground lamb)
1 small onion, grated (~1/2 cup)
1/2 cup breadcrumbs
1 egg
2 cloves garlic, crushed
1/4 cup coriander/cilantro leaves and stems, finely chopped
1 tsp each cumin, coriander, paprika
1/2 tsp each cinnamon, cayenne pepper
1/2 tsp salt
Black pepper
1tbsp olive oil

Minted Yoghurt Sauce
1 cup plain yoghurt
1 clove garlic, crushed
2 tbsp fresh mint, finely chopped
Squeeze of lemon juice
Salt and pepper

Instructions
1. Mix minted yoghurt sauce ingredients in a bowl. Set aside for 20+ minutes
2. Place meatball ingredients except oil in a bowl. Mix well.
3. Measure out 1 heaped tablespoon, then roll into balls. Repeat with the remining mixture (22-24 meatballs)
4. Heat oil in a skillet over medium heat. Cook until brown all over (~8 minutes)
5. OVEN option: preheat at 200C/390F. Spray with oil and bake for 20 minutes
6. Serve in a pita pocket with salad or simply finish with yoghurt sauce and serve with fresh mint.
7. Enjoy!

Upcoming Events

The UF Small Ruminant Update Newsletter is published quarterly by the IFAS/ UF Extension, as an educational and informational service. Please address any questions to Izabella Toledo, the Dairy Regional Specialized Agent of the Northeast District and Editor of the Small Ruminant Update Newsletter. E-mail: izatol@ufl.edu