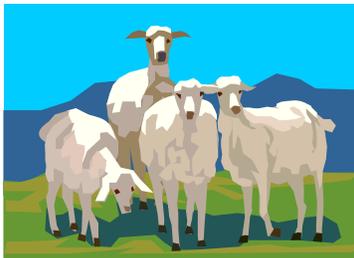


Welcome to the Sheep and Goat Farmers' Workshop



Programme

8-8:30 Meet and greet -- tea, coffee and snacks

8:30-9:30 Invited Presentations

Welcome Address Dr. Jennifer Ketzis, RUSVM and Ms. Alex Veach,
President of the RUSVM Student Chapter of the
American Association of Small Ruminant Practitioners

How do I house and feed my goat to help
prevent parasite problems? Dr. Adriano Vatta, RUSVM

Feed supplements and CARDI programs Dr. Sylvia Borucki, McGill University
Dr. Ansari Hosein, CARDI/CARICOM

Small ruminant diseases and conditions Dr. Jerry Roberson, RUSVM

Safety and roaming animals Dr. Lesroy Henry, Ministry of Agriculture

9:45-11:00 Hands-on Rotations

Weighing animals Drs. Adriano Vatta and Jennifer Ketzis

Foot care Dr. Jerry Roberson

Night time security Dr. JQ Robinson, RUSVM

11:00-12:00

Light lunch

Round table discussion with all presenters and Dr. Shell, Mr. Pemberton and Mr. Worrell

Feedback survey



RUSVM Student Chapter of the American Association of Small Ruminant Practitioners

Why weigh goats and sheep?

Weighing animals can be useful to estimate growth rates, determine the level of feed supplements needed, assist in determining market weight and to determine accurate dosing of drugs and dewormers. By weighing goats and sheep prior to treating with drugs, more accurate doses can be given. When doses are too low, the drug does not work like it should. Also, when animals are regularly underdosed, the drug can lose its effect on the worms and microbes. If it is not possible to weigh all of the animals, weigh several animals of each age group and then use the dose that is best for the heaviest animals in an age group.

A bathroom scale can be used for most young animals and some older animals. Stand on the scale while holding the animal. Make sure the scale is flat. Then subtract the weight obtained by your weight.

$(\text{Weight of person} + \text{Animal}) - (\text{weight of person}) = \text{weight of animal.}$

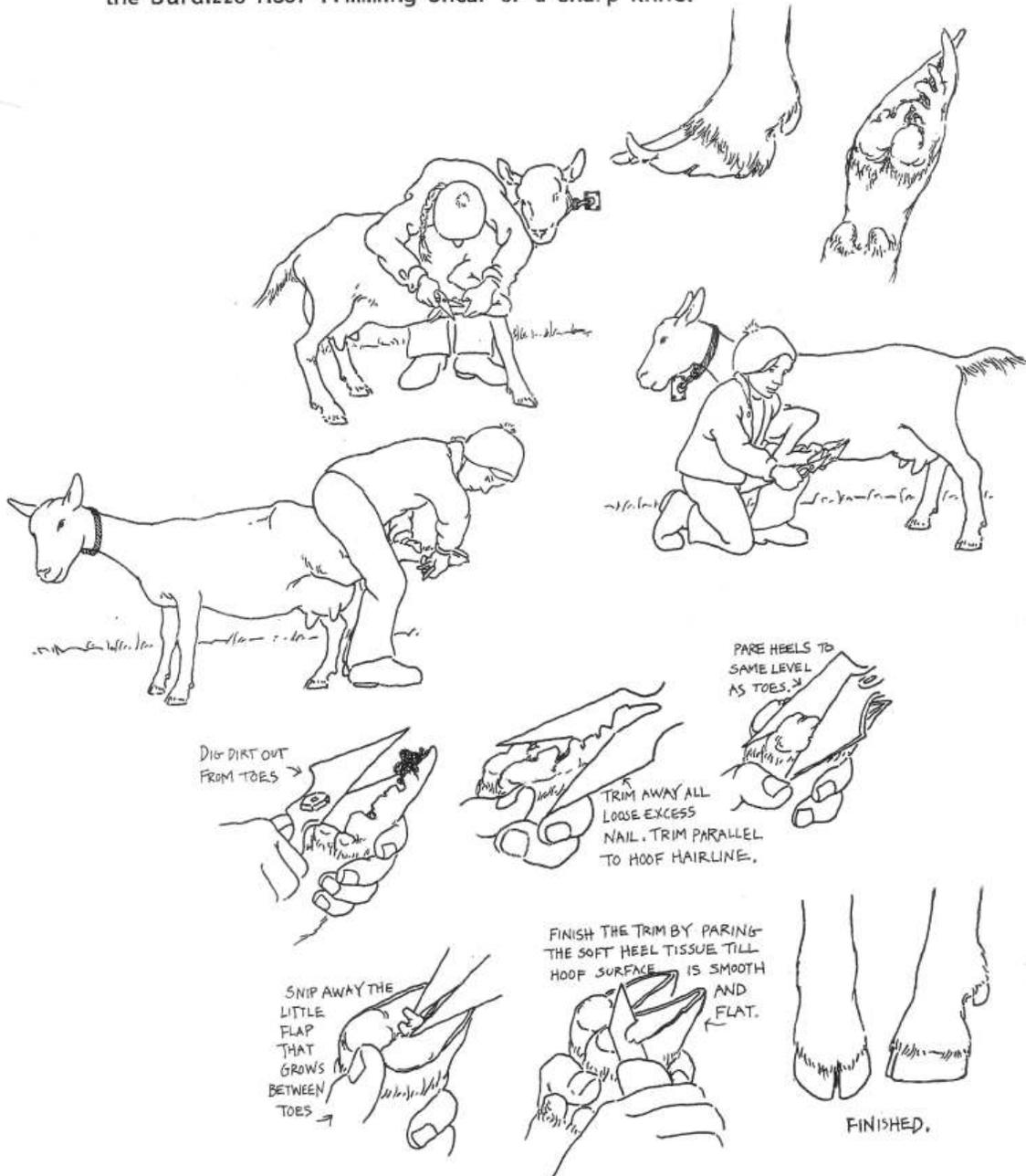
Measuring tapes can be used to measure the girth of a goat or sheep in inches or centimeters. The measurement can then be converted to pounds or kilograms. This is not as accurate as using a scale. There are many conversion charts, but many are specific for different breeds of sheep and goats. Discuss with your extension officer the best conversion chart to use for the breed of sheep or goats that you have.

Hoof Trimming

Foot infections that can result in lameness are easy to prevent with regular hoof trimming. Any sharp knife can be used to trim the feet. The following pictures apply to sheep and goats.

HOOF TRIMMING

While it is possible for goats on a rough terrain to wear down their hooves, most will need trimming at regular intervals. The diagrams below show the proper trimming method. Use either shears such as the Burdizzo Hoof Trimming Shear or a sharp knife.



From: Raising Goats for Milk and Meat, 1985, Rosalee Sinn, Heifer Project International.

HOW DO I LOOK AFTER THE FEET OF MY GOAT?

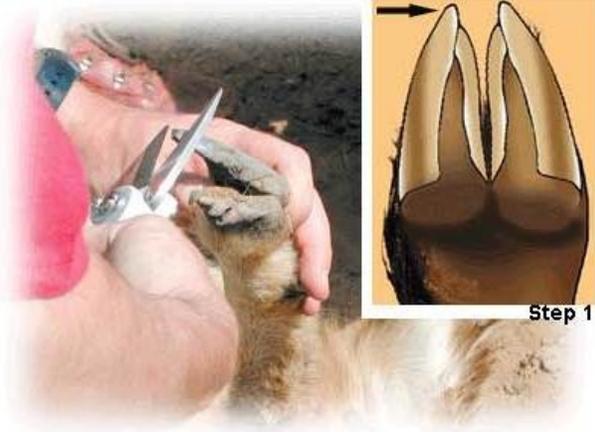
- Use a pair of hoof shears to trim the hooves when necessary



Hoof shears (Photo: Leslie Harris on)

- Trim hooves regularly so that they keep their normal shape
- This will help ensure that the goat does not develop foot problems or go lame
- You will need an assistant to hold the goat for you while you trim its hooves
- The assistant must put the animal in a comfortable sitting position
- Using the tip of the hoof shears, remove dirt and mud from the hoof
- Determine the level of the sole of the hoof before starting to cut any of the wall of the hoof away
- Gradually trim the hooves down until you can see the white line of new hoof growth
- The following pictures show how to trim the hooves
- First trim off the point of the hoof of one claw

From: Goatkeepers' Animal Health Care Manual. 2007. Editors: AF Vatta, MA Abbott, JF de Villiers, SA Gumede, LJS Harrison, RC Krecek, BA Letty, N Mapeyi, RA Pearson. Agricultural Research Council.



First trim off the point of the hoof of one claw (Photo: Leslie Harris on)



One foot's hooves trimmed, one foot's hooves still to be trimmed (Photo: Leslie Harris on)

- Then trim the outer side of the hoof



- Finally trim the inner side of the hoof. Then repeat the process on the hoof of the other claw



Trimming along inner side of hoof (Photo: Leslie Harrison)



Hoof after trimming (Photo: Leslie Harrison)

Note: It may not be possible to restore the normal shape to overgrown hooves at the first attempt. You may need to do this by gradually reshaping the hooves over a few weeks.

Sheep and goat safety

Sheep and goat safety during the day and at night is one of the most important issues facing livestock owners. Dog attacks at night and during the day when animals are kept in pens results at a minimum in stress and in the worse case in death. Free roaming animals also can be attacked by dogs, hit by cars and stolen.

Free roaming animals have the advantage of finding their own food and spreading their parasites over a wider area. However, safety cannot be controlled under this situation. It also is not possible to control breeding, prevent animals from obtaining diseases from other animals or improve nutrition.

Keeping animals in pens requires more management of the animals. However, this can improve production and safety. Good fencing can protect the sheep and goats in pens. Trained guard animals (donkeys and dogs) also can protect the sheep and goats in pens. Penned animals do require very different management methods, including increased attention to nutrition and diseases. However, the more time spent on nutrition and diseases can result in better weight gain, healthier animals, more offspring and more profit.

How do I house my sheep and goat?

A well constructed goat or sheep house should have the following elements:

- A good roof to keep the sheep and goats dry.
- A raised floor to keep the sheep and goats dry.
- Slats in the floor to allow droppings and other dirt to fall through on to the ground below the house and to allow air to pass through the house. This will help prevent parasites such as worms and coccidia from becoming a problem in the animals.
- A strong secure door that can be locked to keep the goats inside, dry and safe from predators and thieves.
- A water bucket and a feed trough which are easy to clean and easy for the goats to drink and eat from.
- A container for a mineral block that is raised off the floor and protected from the rain.

The goat house should be kept in good repair and should not contain any sharp objects which might injure the animals.

How do I water and feed my goat?

Good feeding and plenty of clean water are important to help your goat stay healthy and productive.

Clean water should be available at all times, especially when the sheep and goats have lambs and kids which they are suckling. Offer water at least four times a day to the animals if it is not freely available.

A sheep and goat normally obtains most of the nutrients it needs from grazing. Ideally they need to spend six to eight hours a day grazing and browsing.

If you are keeping your sheep and goat confined to its house at all times, you will need to provide enough cut forage so that the animals always have access to fresh food.

In the dry season the quality of the food available decreases and it is especially important to provide some supplementary food for the animals, especially if they are in late pregnancy or early lactation.

Supplementary feeding

Sheep and goats need both energy and protein to keep healthy. Legume forages are better than grasses as they are high in protein as well as energy. Ideally four types of forage should be fed to ensure that the diet is balanced.

Concentrate feeds can be given as a supplement to the forage. About 400 g per day for an adult non-pregnant goat should be fed. Feed a mixture of two to three different types of concentrate to make sure that there is a balance of protein and energy.

A spoon of salt and mineral and vitamin mix should be added to the supplementary feed provided to make sure that the requirements for vitamins and minerals are met.

The following concentrate feeds are high in energy: corn, barley, brewers' grains and cottonseed oil cake meal.

The following concentrate feeds are high in protein: fishmeal, soya bean meal, cottonseed oil cake meal and brewers' grains.

Rules for feeding

- Buy the best quality feed that you can afford to buy.
- Store the feed well – protect it from sun and rain, but prevent it from becoming mouldy.
- Offer the feed in a trough, not from the ground, to reduce the amount that is wasted or becomes soiled.
- Keep feed and water troughs clean and remove the concentrate feed that has not been eaten.
- Make any changes to the ration gradually over the period of a week.
- Crush or crack the grains to improve the intake and digestion. Soaking the grains is an alternative if crushing is not possible, but only soak the grains from three to four hours before feeding them.
- Chop grass forages into short lengths before feeding them in a trough.
- Mix feed carefully and only mix enough to feed for that day.

Parasite infections and feeding

Sick animals have a higher requirement for water, energy and protein than healthy ones, but they have a lower appetite.

This is true for most diseases, but tends to be seen very commonly with parasite infections because these are so common.

Worms cause sheep and goats to lose protein when the stomach and intestines are damaged. The animal also needs protein to repair damaged organs and to fight the infection.

Animals that have parasites may also have a requirement for more energy.

In addition to treating the animal for parasites, the quality of the feed that the animal receives is important if it is to regain its health.

Feeding sick animals

- Give a sick animal a small amount of concentrate feed five to six times a day.
- Encourage sick animals to eat with small meals, by moistening the feed and by adding molasses or salt.
- Feed freshly cut green forage as it provides a good source of vitamins.
- Feed a sick animal away from other animals to prevent it from being disturbed by the healthy ones.
- Sick animals may eat more slowly and so may need more time to eat than the healthy animals.

Acknowledgement:

These notes on housing, watering and feeding my goat have been largely extracted and adapted from: Goatkeepers' Animal Health Care Manual. 2007. Editors: AF Vatta, MA Abbott, JF de Villiers, SA Gumede, LJS Harrison, RC Krecek, BA Letty, N Mapeyi, RA Pearson. Agricultural Research Council, South Africa. Photographs: Adriano Vatta.



Simple houses can be built to house sheep and goats.



The floors of the houses should have slat to allow droppings and dirt to fall through to the ground underneath the house. This will help prevent parasite infections such as worms and coccidia.



The feed trough should be easy for the goats to eat out of.



Cut grass can be suspended off the ground to prevent it from being wasted.

CIFSRF CARICOM Food Security Project

Mulato II grass production experience in St. Kitts

One of the major factors limiting productivity of small ruminants is poor nutrition due to a shortage of good quality forages, particularly during the dry season. Natural pastures cannot support the desired productivity of sheep and goats (Fig 1). Cultivated and well maintained pastures or forage banks are required with the aim to improve the dry matter and nutrient yield of forages available on the farm.



Figure 1. Hair sheep

A forage species like the Mulato II ((*Brachiaria* hybrid CIAT 36087; Fig. 2) is easy to sow and establish, and is well adapted to the regional weather conditions (CARDI 2011). It also provides good quality and quantity of biomass and the stools are deep rooted so it is better able to withstand periods of dry weather and is difficult to be uprooted by grazing livestock thereby limiting the possibility of soil erosion and destruction of established pastures.

Land preparation and fertilization. The field was ploughed and rotovated to a fine tilth.



Figure 2. Mulato II

The land should be levelled and the stones and boulders removed from the soil if a harvester is to be used, to avoid breaking the blades. The field was fertilized with NPK 20:10:10 at a rate of 110 kg/ ha after a soil sampling and analysis was performed. A pre emergent herbicide was applied at a rate of 7.7 ml/L (pendimethalin) two weeks before seeding.

Seeding. A germination test should be performed before the seeding rate is decided (Figure 3).



Figure 3. Seeding Mulato

The rate is 11 to 18 kg/ha depending on 65 to 35 % germination rate respectively. The Mulato was seeded in rows separated 0.6 m, with a beet seed plate and the seeder was adjusted to 3.8 cm (Figure 3). Soil -moisture should be ensured for successful germination at least for 48 h.

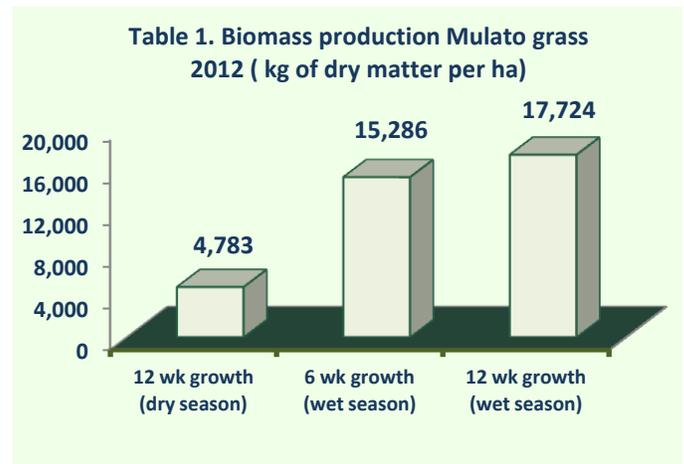
Weed control and fertilization. The Mulato grass was divided into different areas to manage the weed control, fertilization and harvest. A post-emergent, broad-leaf herbicide was applied at a rate of 4.4 ml/L (dichloro-phenoxyacetic acid) during the early stages of Mulato. After establishment, a contact non-selective herbicide was applied between rows (dimethyl-bipyridium-dichloride) to control weeds, only under no-wind conditions to avoid spray drift onto the crop. After the forage harvest or brush cut, the Mulato was fertilized with 110 to 224 kg/ha of NPK (15:15:15) or 67 to 300 kg/ha of urea based on the conditions of each section, after rainy periods.

Establishment. The Mulato II grass first seeded in February 2012 (dry season) was not successfully established and a strategic re-seeding in some of the areas was necessary in April.



The establishment was slow during the dry season (Figures 4) but Mulato achieved a 98% of the soil covered in 7 months (September 2012; Figure 5).

Results. This biomass production in the wet season (Table 1) was comparable to results found in research plots at the Sugarcane Feeds Centre (SFC) in Trinidad and Tobago (CARDI, 2008).



CONCLUSIONS Mulato II grass was successfully established in the dry season 2012 in St. Kitts and Nevis, showing promising production potential for ruminant species in the Caribbean Region.

The Canadian International Food Security Research Fund (CIFSRF) is a program of Canada's International Development Research Centre (IDRC) undertaken with the financial support of the Government of Canada provided through Foreign Affairs, Trade and Development Canada (DFATD).



CIFS RF CARICOM Food Security Project

September 2013

Improving the nutrition and health of CARICOM populations through sustainable agricultural technologies that increase food availability and diversity of food choices

Land & Water Resource Management. No. 3

Forage Conservation in the Caribbean

In St. Kitts and Nevis, as in many Caribbean islands, one of the major factors limiting productivity of small ruminants is poor nutrition due to a shortage of good quality forages, particularly during the dry season. Natural pastures cannot support the desired productivity of sheep and goats. Cultivated and well maintained pastures or forage banks are required with the aim of improving the dry matter and nutrient yield of forages available on the farm.



Figure 1. Mulato II

Technologies aimed at transferring a high production of forage during the wet season towards the dry season must also be developed. Harvesting for hay is sometimes not possible and one option for conservation is ensilage.

Other crops, such as grain sorghum or forage sorghum (*Sorghum bicolor*; Fig. 2), which are drought tolerant yet high yielding, have been investigated as silage crops and found to be suitable.

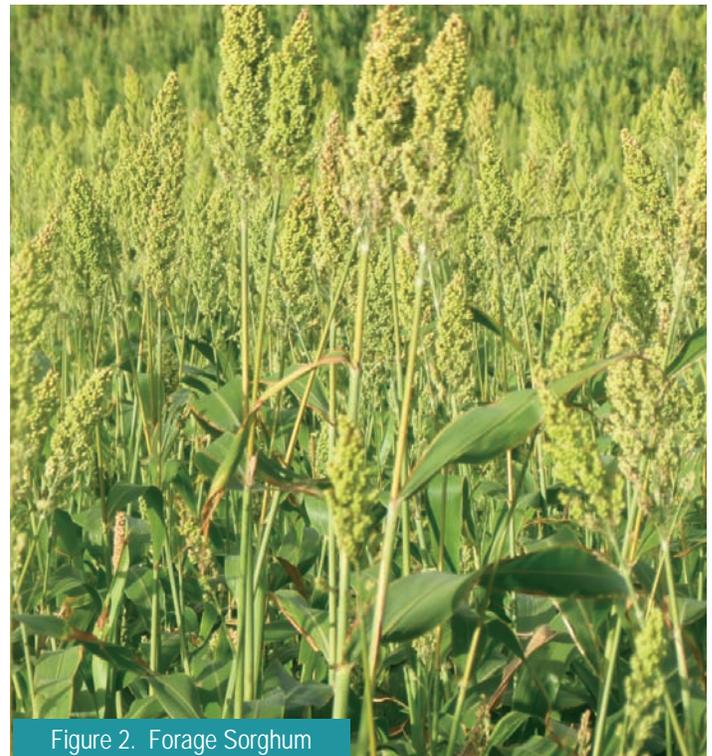


Figure 2. Forage Sorghum

For successful ensiling, the raw material needs to contain around 30% dry matter, have a high concentration of sugars at cutting (water soluble carbohydrates), and air must not be allowed to enter the system after compaction and sealing.

Ensiling method: silage bag

The forage was harvested (Fig. 3) and filled into plastic bags (drum liners: 8 mil thick; Fig. 4).



Figure 3. Forage harvester in operation

The forage packing was done by stomping on the forage inside the drum (Fig. 5), and the final compaction was done using a mechanical compactor (Fig. 6).



Figure 4. Packing the chopped forage into the bag



Figure 5. Initial compaction by stomping



Figure 6. Final compaction using a mechanical compactor



Figure 7. Securing the neck of the bag with a tie strap.



Figure 8. The neck of the bag is well secured with a tie strap



Figure 9. Opening the drum mould

The end of the bag was twisted tightly to remove all air inside the bag and the closure secured with strong twist ties (Fig. 7 and 8).

The split drum used as a 'mould' was then opened (Fig. 9). The size of the bag was 0.6m diameter at the base and 1.2m tall for sorghum (Fig. 10) and 0.6 m tall, for the Mulato II (Fig. 11).



Figure 10. Bags of Forage Sorghum silage stored on-farm in St. Kitts and Nevis



Figure 11. Bags of Mulato II silage stored on-farm in St. Kitts and Nevis



Figure 12. Temporary storage of bags of silage covered with tarpaulin in the field in St. Kitts and Nevis

Storage

The transportation and storage process requires extreme caution to avoid puncturing the silage bags. A gravel base covered with a thin layer of agricultural lime (calcium carbonate) will keep the base dry and deter rodents.

Silage bags should be stacked in a pyramid shape to a height of no more than 3 layers and covered with a tarpaulin (Fig. 12) to avoid penetration of sunlight and condensation inside the bags.

Conclusions

Both forage species, Forage Sorghum and Mulato II, proved to be successfully conserved using the silage technique, with optimal pH (4.2) obtained during 6 months of storage.