Forage Management for Fiber Animals

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Good forage management geared towards -

- Keeping your enterprise healthy and sustainable (environmentally and financially).
  - Healthy productive plants
  - Healthy productive animals
  - Nutrition
  - Parasite Loads
Tools for determining nutrition and health

- Diversity of pasture plants
- Plant Productivity – dry matter content
- Forage analysis
- Body condition scoring, animal production records
- Your eyes and mind*
Plant Diversity – palatable plants?
Dry Matter Content

- How much is actually out there? How does it vary from season to season, year to year?
- Can start out by sampling pastures to get some real data
- Then relate it to pasture height/density or appearance
Dry matter content helps us

- Evaluate plant health
- Animals - Match reproductive needs to availability of nutrition
- Determine how many animals you can put in a section for how many days
In a pasture-based sheep or goat farm

- Usually try to have animals lactating when most nutrition available from pasture
- Rather than kidding/lambing in winter when would needs lots of high quality stored forage ->
- Kid or lamb in April/May
- May delay birthing until herd can safely kid/lamb out on pasture -> less labor, less hassle
Ability to utilize different types of forage depends partially on -

- Unique characteristics of your animal species and their effect on
  - Plant and animal health
  - Internal parasite loads
Matching nutrition to the animal’s needs -

- What phase in production are they?
  
Pregnant? - Energy
Lactating? – Protein, energy, calcium
Growing?

- How much are they producing?
Goats are:

- Very social animal - Learn their eating habits from their herd
- Appear to have a higher dry matter intake than many other livestock species
Intermediate feeders – prefer forbs and browse but also graze grasses – crave variety→ on the move
Angora goats – extremely heavy producers of fiber, very seasonal breeders, twins rare
Angora Goats – When is Nutrition Critical?

- Just before and after breeding – flushing, growth of young does?
- Late gestation – last 6 to 8 wks – energy critical
- Early lactation – first 12 to 16 weeks
- Weaning – post weaning growth
- Keep in mind that we are often shearing 2 X a year – prior to kidding and shortly before or after weaning
Angora wethers

- Mohair very responsive to nutrition especially protein
- Optimal nutrition – fiber may thicken somewhat but usually not greatly affected
- Genetics, age, and sex are much stronger influences
- Urinary Calculi – have a Ca : P ration of $\geq 2:1$
Cashmere type goats

- Not heavy yielders of fiber – not a significant nutritional demand
- Shorn once a year – Cashmere growth affected by day length. Growth starts at the Summer Solstice (longest day June 20), Ends at Winter Solstice (shortest day Dec 20).
- Shed a couple of months later.
- Stress of lactation - fleeces can be prematurely shed
- Therefore, often breed to kid shortly after cashmere harvested
- Some cashmeres will breed out of season
Cashmere Goats – When is Nutrition Critical?

- Breeding - To flush or not?

- Late Pregnancy/Early Lactation – level of nutrition strongly affects number of secondary follicle (cashmere producing) formed in the kid

- Cashmere growing period – June 20 – Dec 20
  Goats should not be losing weight. Otherwise yield and length of fiber suffer. Thickness?
Mobile upper lip allows goats to be selective eaters. Sheep do not have mobile upper lip.
Sheep – Also intermediate feeders – However, prefer grass although they will also graze forbs and browse. Graze close to ground.
Camelids – Alpacas, Llamas

- Substantially larger than goats and sheep – especially llamas
- Intermediate feeders – adapted to arid/sparse vegetation
- Pseudo-ruminants
  - Chew cud
  - 3 compartments to stomach – no omasum
Periods of critical nutrition

- Moderate fleece production – not a great drain on nutrition
- Long gestations
- Last third of pregnancy
- Early lactation
- Growth
Goat and sheep are small ruminants, so

- they have a rapid rate of passage of food through their rumens ->
- do not utilize mature highly fibrous forages as well as large ruminants do
- Therefore, fermentable fiber content of pasture very important
- Fermentable fiber – fiber that rumen microbes can digest
- Llamas more like cattle in using fiber
3 PHASES OF PASTURE GROWTH

PHASE I
- LEAFY
- IMMATURE

PHASE II
- LEAFY
- VEGETATIVE

PHASE III
- STEMMY
- MATURE

NUMBER OF DAYS GROWTH:
0 5 10 15 20 25

LOW QUALITY
HIGH QUALITY

LOW QUANTITY
HIGH QUANTITY

SPRING
SUMMER
Phase 1 – Beginning to grow
Beginning Phase III
Pasture health

- Usually recommend going into a pasture at the top of Phase 2, and
- Moving out of a pasture at the top of Phase 1
- 5 day rule - Move animals out of a section before they start defoliating the very palatable new growth, often around 5 days –depends on amount of forage out there and rate of regrowth (weather related).
Moving goats and sheep before significant new growth is attacked is critical
Moving goats and sheep into a field at the top of the vegetative phase before it can reach the mature phase makes lots of sense.

- Not only for Plant health and productivity, but also
- To provide good nutrition to these small ruminants
When they are forced to eat this, you are lucky if you get this.
CONTINUOUS STOCKING METHOD

The acreage remains constant but the number of animals changes.

High forage supply (spring and early summer):
- High animal numbers

Low forage supply (mid-summer and fall):
- Low animal numbers

For hay or silage
ROTATIONAL STOCKING METHOD

HIGH FORAGE SUPPLY
(SPRING AND EARLY SUMMER)

CUT FIRST

FOR HAY

OR SILAGE

GRAZE HALF - HARVEST HALF

LOW FORAGE SUPPLY
(MID-SUMMER AND FALL)

GRAZE ALL

THE NUMBER OF ANIMALS REMAIN CONSTANT BUT THE ACREAGE CHANGES
Grazing Plan Basics

- Small Paddocks
- Short Duration
- Rest Interval
- 6-8” Forage Height
SHAPE OF PADDock

YES

MAYBE

NO
GATE LOCATION

YES

NO
The ability of goats to selectively eat means they can choose a diet far higher in nutrition than the pasture average.

- As long as the grazing pressure is not too strong.
Their ability to selectively eat means they may be choosing a diet that is lower in fiber than you think.

If you supplement their forage diet with a concentrate that is low in fermentable fiber you will aggravate this problem.

If you supplement them when forages are low in high quality fiber, try to choose a concentrate high in fermentable fiber – wheat middlings, soy hulls, dried distillers grain, corn gluten feed, beet pulp, cottonseed hulls etc.
Poisons?
Browsing —

Goats love browse. Camelids and Sheep are also capable browsers depending on grazing pressure and forage choices.
How you manage animals on browse and woods depends on whether you want to eradicate the browse or sustain it

- When will you graze it?
- How much defoliation will you allow?
- How often in a grazing period
If trying to sustain browse:

- Don’t browse it early in the season before the root reserves exhausted from putting out spring growth have been replenished,

- Don’t browse it late in the season after leaves have fallen when goats will tend to girdle trunks and branches,

- Don’t defoliate it more than \(~66\%\),

- Don’t return onto it before leaf growth has recovered
Browse usually deteriorates in feed quality over a growing season slower than conventional pastures.
Pasturing Goats and Sheep in Winter

- Few goats will naturally paw through snow (very tough with ice) to get to grasses – learned response

- Small animal - Difficulty moving through deep snow
In contrast, sheep more inclined to paw, more comfortable in snow and cold temperatures for longer periods as long as they have relief from wind and snow is not too high or crusted.
Small ruminants and worms
**Haemonchus contortus**

**The Barber Pole Worm**

A blood-sucking parasite that pierces the mucosa of the abomasum (ruminant “stomach”), causing blood plasma and protein loss to the sheep or goat.

- short generation time, heavy egg producer; 5,000-10,000 eggs/worm/day
- can infest and kill host in 4 weeks
- Each worm can consume 0.05 ml blood per day
Haemonchus (Barber pole worm) and other strongyles

- pasture problem - especially if pasture is small and damp
- few larvae picked up in barn – ammonia gas from bedding pack discourages larvae survival
- infective larvae in dewdrops on grass
Does/Ewes lose immunity to worms while lactating?

In a management intensive system, when do we usually have them lactating?
Most L3s do not get more than about 2 inches high on grass blade.

L3 - Takes about 5 - 14 days from fresh fecal pellet to L-3 → Pasture becomes infective at this time
Meningeal worm (deer, brain worm)  
*Parelaphostrongylus tenuis*

- Parasite of White Tail Deer
- Small ruminants are an abnormal host (sheep, goats, llama, alpaca)
- Parasite has indirect life cycle – snails and slugs needed for infection
Larva travel from intestinal tract to spinal cord to brain, causing nerve damage (can include lameness, gait abnormality, itching) can be as extreme as paralysis or even death.

Animals maintain appetite.
Treatment of *P. tenuis* in aberrant hosts

- no controlled studies
- escalation of drug dosages
- ivermectin 0.2 to 1.0 mg/kg for 1-5 d
- fenbendazole 10 to 50 mg/kg for 1-5 d
- usually both simultaneously
- anti-inflammatories important
  - corticosteroids if not pregnant: dexamethasone 0.1 mg/kg s.i.d. for 3-5 d
  - flunixin 1 mg/kg s.i.d. or b.i.d. for 3 d
Prevention of exposure

- do not pasture at edge of woods or in brush pastures - especially during wet season/early fall
- avoid low-lying poorly drained fields except under very dry conditions
- fence off deer watering spots
- use fields deer prefer for hay, not grazing
- guardian dog may help
- take advantage of hunting season!
Pasture Management to reduce barber pole worm problems

- Use clean, “safe” pastures or pasture alternatives
- Make wise management decisions about pasture height, pasture rest, and pasture rotation
- Give priority to recently weaned young stock -> lactating does/ewes -> dry animals
Use “clean or safe” pastures

What is a truly safe pasture?

1. A pasture that has not been grazed by sheep or goats for the past 6 to 12 months – however, worm populations do start to drop sharply after 45-60 days.

2. Pasture grazed solely by horses and/or cattle for the past 6 to 12 months.

3. Pasture in which a hay, baleage or silage crop has been removed.
In a grazing system for small ruminants we are:

- Generally trying to move animals before the pasture is below 3 inches and get back in before pasture gets too mature
Problem

- Pasture rest periods to control internal parasites need to be longer than normal recommendations for either pasture health or nutritional value
Things to consider when grazing small ruminants

- Are there safe “pastures” that animals can be switched to as the grazing season progresses?
  - Brush pastures, hayfield regrowth, pastures that your cattle or horses have been grazing, crop residues

- Can you disrupt the worm cycle by mowing the pasture extremely short, grazing other species, or harvesting a crop of hay, haylage or baleage before resuming grazing?
Rotational grazing in the spring appears to reduce the “barnyard effect” and delay the onset of summer parasite problems.
Barnyard Effect

- Barnyards with grass or other good forage
- Lead to high concentration of manure and internal parasites in grazing material
- Can contribute greatly to herd contamination with internal parasites
- May have a “barnyard effect” in pastures that border barn and are not rotated
Manure pile right in yard – kids born late April – barn situated in very large pasture but kids and does tend to graze right by barn where manure concentration (and worm contamination) is highest. By late July → kid loss to worms and coccidia
Please note that we are talking about herds that are rotating in the spring and summer and that by late July most of these also had high worm loads.

Worm eggs per gram in kids in herds that rotate vs herds that do not - State #1

- NoRotation
- Rotating1
- Rotating2

Herds

eggs/gm

<table>
<thead>
<tr>
<th>Herd Type</th>
<th>Worm Eggs/gm</th>
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<tbody>
<tr>
<td>NoRotation</td>
<td>23750</td>
</tr>
<tr>
<td>Rotating1</td>
<td>3575</td>
</tr>
<tr>
<td>Rotating2</td>
<td>2250</td>
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</tbody>
</table>
Some options to help reduce barnyard effect –

*Can you implement any of them?*

- lay down gravel, concrete, or herbicides
- close off access to barnyard during day and on full moon nights
- provide hay in barn at night when animals come in from pasture to cut down on night grazing in the barnyard
make barnyard small enough that very little forage present
replace barnyards with narrow lanes from pastures to barn
leave animals in rotated pastures 24 hours a day with portable shelter, water and feeder
Camelids – Dung piles
Other Pasture Concerns

- Good fencing
- Predator Control
Fencing

- Five + wires high-tensile
- Electronet? Poly wire?
- Stock fencing, page wire

- Hot fence
  - Mowing/weed wacking/herbicide

- Do most animals go over or under the fence? Page wire with wire along the ground.
- How will you stop animals from climbing on fence – offset electric insulators?
Predator Management

Guardian Animals

- You with a gun
- Llamas
- Dogs – Pyrenees, Maremmas, Mastiffs
- Donkeys, Horses
- Brood Cow
The Big Three + a few more...

- Fencing, Predators and Parasites
- What about??
  - Water
  - Minerals
  - Shade
  - Barn Access
  - Mud
What About??

- **Water** – yes but…
  - When the grass is lush they don’t drink as much
  - Lactating sheep and goats drink alot
  - Snow is adequate for non-lactating animals?
  - Pasture waterers or back to the barn?

- **Minerals** –
  don’t forget them!!
  - Barn or pasture?
  - Small amounts/day
What about??

- Mud – lanes help, be aware of runoff routes
- Shade – technically not necessary
  - Animals will use it
  - May encourage worms
  - Bug Break
- Barn Access – not necessary
  - Unless your water and minerals are there
  - Close them out?
QUESTIONS?