

This presentation is part of an educational modular program designed to provide new and beginning farmers and ranchers with relevant information to initiate, improve and run their agricultural operations



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# Goat production



**This project is partly sponsored by USDA-NIFA-BFRDP 2010-03143.**

# Raising goats on pasture



# Raising goats



- Contrary to the popular image of goats thriving on tin cans, goats actually require a more nutritious diet than do other ruminants
  - Their shorter digestive system doesn't retain food for as long, and thus not digest nutrients fully
  - This quicker digestion allows them to eat larger quantities of food to make up for their reduced absorption of nutrients, but it is goats' unique grazing behavior that really enables them to thrive on pasture
  - With their small mouths and flexible lips, grazing goats are able to select the highly nutritious parts of plants and leave parts that are less nutritious
  - This gives them an advantage over cattle that graze by taking large mouthfuls, within that large mouthful there might be a great quantity of poor-quality forage, including some that is dead or overly mature



# Raising goats



- Each goat is able to consume up to 3-5% of its body weight in dry matter daily (perhaps more if the forage is highly digestible)
- To consume that amount, however, goats must be pastured in an area with a large quantity of available vegetative forage
- Goats will eat less when they are moved to poor pastures

## Some factors that influence food intake are:

- Age, size, stage and level of production of the animal
- Animal's health
- Animal's forage preferences (which are influenced by its mother and peers)
- Weather
- Palatability of food available
- Digestibility (fiber content)
- Maturity of forage



# Raising goats

- Goats prefer browsing (eating woody plants) but will also graze on grasses and weeds. Goats are known to stand on their hind legs to reach leaves and brush
- Since goats, cattle and sheep prefer different forages, in many pastures situations these species do not compete for the same food
- Therefore, they can be managed quite successfully in a multispecies grazing system, allowing the land to be more fully and generate more income
- Land grazed by both goats and cattle returns 25% more than land grazed only by cattle



<http://www.highgroundorganics.com/our-farm/restoration-and-research/attachment/goats-and-cows-march-28-2007/>



<http://suemtravels.wordpress.com/2011/11/07/cable-bay-hike/olympus-digital-camera-117/>

# Raising goats

- Adding goats to a grazing system will have weed control benefits. Goats will eat such weeds as leafy spurge, multiflora rose and brambles decreasing the need for commercial herbicides or mowing
- Meat and fiber goats are particularly useful for brush control



Multiflora  
rose



Leafy  
spurge



<http://extension.entm.purdue.edu/caps/plants.html>



# Overgrazing



- When grazing goats, farmers must protect their pastures from being overgrazed.



- Overgrazing can:
  - Reduce the longevity of the stand and exposes more soil to erosion
  - Eventually kill the plants
  - Mean the animals don't get enough food
  - Increase the chance of goats ingesting internal parasites larvae
  - Create bare spots, creating opportunities for undesirable weeds and erosion

- The end result of overgrazing is reduced performance of both the pasture and the animals, and health problems for the animals
- To prevent overgrazing, farmers should be careful to understock rather than overstock land and always remove animals from a pasture when the pasture is grazed down to about 3 to 4 inches
- Browse must be managed so that it is maintained and not killed. If you want long-term production of browse, you must rotate the animals and not allow the area to become over-browsed

# Grazing

- In some operations particularly dairies, goats are raised in confinement and all their feed is brought to them. However allowing the goats to graze can lower costs in the following ways
  - By reducing purchased grain costs
  - By eliminating forage harvesting costs
  - By eliminating manure removal costs
  - By lowering fertilizer costs as manure nutrients are returned to the soil



# Controlled grazing

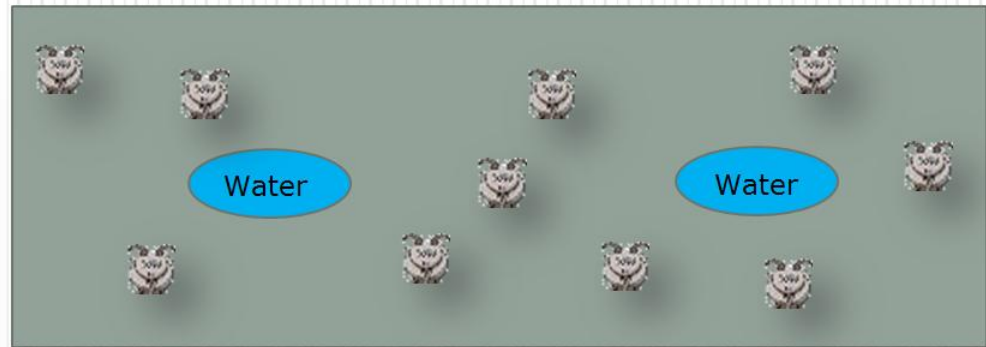


- In the US, continuous grazing is a common practice, characterized by giving the animals unrestricted access to all the pastures throughout the year
- However feeding goats in a sustainable and economical way is better accomplished by a controlled, rotational grazing system, also known as management intensive grazing (MIG)
  - This system is more commonly used for cattle than with sheep or goats
  - It is based in dividing the pasture into smaller areas and controlling the access of the animals into each paddock

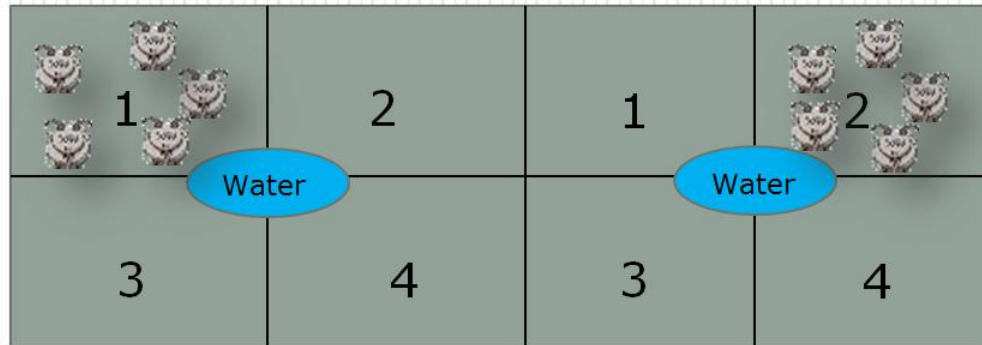
- Better use of the pasture
- More uniform grazing
- Can harvest surplus for hay
- Water is closer to the animals



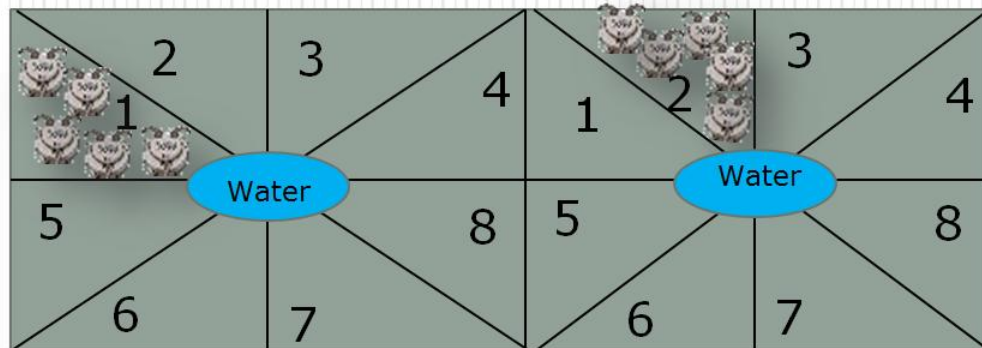
## Continuous grazing



## Rotational grazing

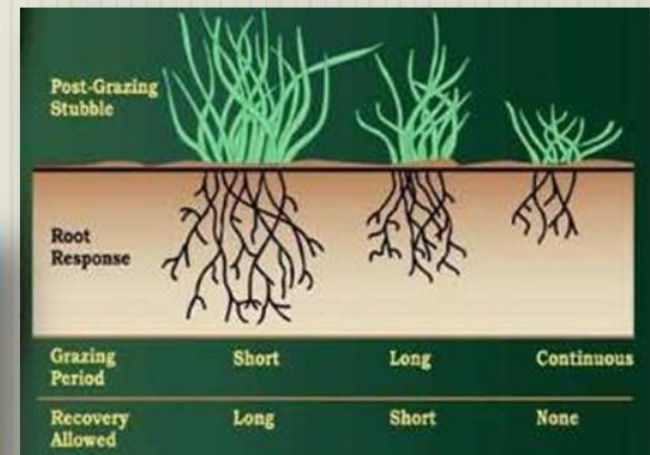


## Intensive grazing



# Controlled grazing

- In this grazing system, animals are moved frequently to fresh pasture to maximize quality and quantity of forage growth
- The herds graze one portion of the pasture, or a paddock, while allowing the others to recover
- Resting grazed lands allow vegetation to renew energy masses, deepen root systems and increases total biomass production



<http://www.ext.colostate.edu/sam/pasture.html>

# Benefits of MIG

- Pasture forage plants can grow back without using up all their root reserves
- Woody plants may need to be rested a full year to remain a forage source for goats
- Legumes and native grasses may reappear in the pasture, and producers often report that the pasture plant community becomes more diverse
- MIG can improve the pasture, extend the grazing season, and enable the producer to provide a higher quality forage at a lower cost with fewer purchased inputs
- MIG can be useful in reducing internal parasite problems, if farmers are careful to move the goats to a new pasture before the forage plants are grazed too short (too short is less than about 4 inches)



# MIG notes



- There aren't any real problems with MIG, however it does require adequate fencing as well as sufficient watering and shelter facilities
- MIG requires significantly more management skills and may need a lot more work than normal grazing
  - Generally animals are kept in the paddocks for only a few days (less than 1 day and up to 10 days)
  - How long the animals can stay in the paddock depends on:
    - Number of animals
    - Quality and quantity of the forage
    - Intensity of management
    - Time of the year
    - Stage of growth of the forage
- When beginning with IG, make big paddocks and use long rotations
  - As producers become more familiar with the pasture plants and the goats' grazing habits, they usually subdivide paddocks with electric fence
- Temporary subdivisions allow the producer to define the paddock in response to different growing conditions and the goats' changing feed requirements



# More MIG notes

## MINERALS

- Minerals need to be available at all times. It is best to feed calcium, phosphorus and trace minerals in a salt mixture to ensure that the animals actually eat them
- Test your forages to determine their mineral content and adjust mineral supplements as needed
- Mineral content of forage is quite variable across the country, and the type, stage and level of production of the animals, therefore no one mineral supplement formula is right for all locations or situations
- Your local extension agent can have your forage analyzed



<http://www.mysouthernheart.com/?cat=28>



<http://www.doublel.com/goat-and-sheep-universal-block-holder.html>

# More MIG notes

## WATER

- Fresh, clean water must always be available
- Animals can have access to a central water source available from every subdivision or water is provided separately to each of the pasture's subdivision
- This can be a challenge and it is another capital expense
- Feed intake will decrease more for goats than for cattle or sheep if clean water is not readily available



# Fencing



- **Fencing is the most critical factor in raising goats on pasture**
- There is nothing more frustrating than having to constantly chase goats back into the pasture
- Fencing will also be the greatest expense, other than the initial cost of the animals



# Goat Reproduction



# Reproduction

- Female goats (does) reach puberty at seven to ten months of age, depending on the breed and nutrition, and should be at 60-75% of their adult weight at breeding to prevent difficult kidding
- Does will have higher lifetime production and be more profitable if they are bred after they turn one year old
- Does should kid every year thereafter until at least the age of seven or eight, if they remain healthy
- Most goats are seasonal breeders, reacting to shorter days as a cue for breeding
  - Breeding usually extends from September to February
  - Some dairy goats can breed outside of that season (Saanen, Alpines and Nubians) as well as the Boers for meat



<http://www.4bootfarm.com/funonthefarm.html>



[http://en.wikipedia.org/wiki/File:Baby\\_goats\\_jan\\_2007.jpg](http://en.wikipedia.org/wiki/File:Baby_goats_jan_2007.jpg)



<http://www.ansi.okstate.edu/breeds/goats/boer/>

# Reproduction



Goats come into estrous approximately every 18 to 22 days

- Signs of heat include tail wagging, swollen vulva, mounting behavior, decreased appetite, increased frequency of urination and a general increase in activity and bleating (some can be very loud)
- The estrus can last from 12 to 48 hours. With that duration, the standing heat (the period the doe stands firmly when a buck attempt to mount) lasts about 12-36 hours. Ovulation usually occurs 12 to 36 hours from the beginning of the standing heat
- Does in heat (estrus) are at the proper stage for breeding; at this time, they will be receptive to the buck. Except that on occasion, some does may find the buck sexually unattractive and will not stand to be bred.



<http://www.extension.org/pages/19336/goat-feeding-the-lactating-doe>

# Reproduction

## Buck effect

- Exposure to a buck (uncastrated male goat) stimulates the females (does) to exhibit estrus (the fertile part of their cycle)
  - This is important to know if you want to induce and synchronize the estrus of your herd as part of your breeding program
- Some people prefer to keep the bucks completely separated from the females during most of the year to avoid the smell and sight stimulation from the male, and only bring them together for the breeding season

Marker bucks can be used to detect females in estrus (heat) to separate them for breeding



<http://www.extension.org/pages/19270/estrous-synchronization-buck-effect>

# Reproduction

- Kids are born about 150 days after breeding
- Planning breeding so that kids are born during the height of forage production in the spring makes efficient use of the pasture
- Keeping accurate breeding records will allow you to know when kids are due and help you prepare for their arrival



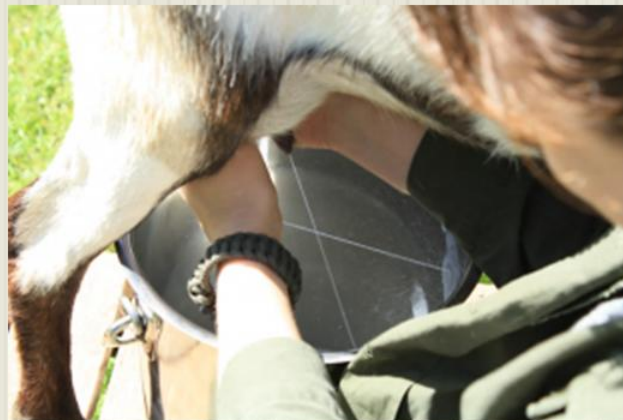
<http://www.ultimategoatfansite.com/picture/this-is-what-a-newborn-goat-looks-like>



[http://www.canada.com/story\\_print.html?id=9b38b271-1a74-469b-b183-f7c7db2cebd4&sponsor=](http://www.canada.com/story_print.html?id=9b38b271-1a74-469b-b183-f7c7db2cebd4&sponsor=)

# Reproduction

- Milk production is another important factor to consider when planning the breeding season
  - Breeding season may be manipulated through the use of lights and hormone therapy
  - However milk production is less for a doe that kids in the fall than when she kids in the spring
  - Some goat milk markets demand year-round production



# Reproduction



- Male goats (bucks) reach puberty earlier than females and must either be separated from them by the age of four months or be castrated to prevent unwanted breeding
- Buck kids can be used as herd sires at 8-10 months, but should not be used heavily as mature bucks
- Have your veterinarian test them for fertility and soundness before the breeding season
  - This is called the breeding soundness exam



# Breeding soundness exam



- Physical exam can check the buck for structural soundness and abnormalities in the sex glands and organs
- The scrotal circumference (at the widest point) should be measured, since this correlates with fertility and semen production.



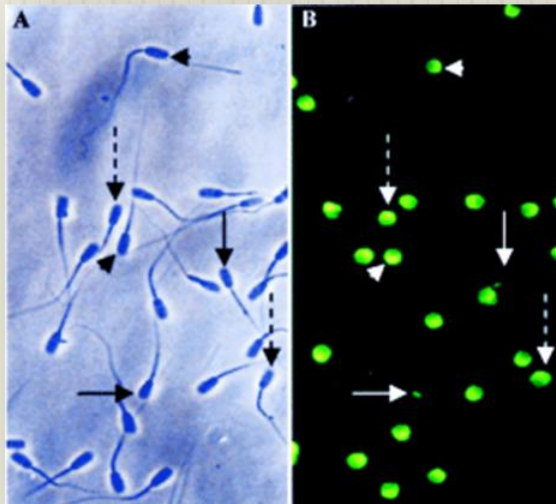
## **Scrotal circumference**

- As a general rule, dairy bucks should measure 25-28 cm at 100 pounds
- Meat bucks should measure 26-29 cm at 100 pounds
- Larger bucks should measure 34 to 36
- 

- Finally, the bucks libido should be monitored. A full-grown, healthy buck should easily service up to 50 does
- Bucks should not be bred to their daughters; inbreeding tends to expose genetic problems and lead to weaker stock

# Breeding soundness exam

- Have a semen sample tested for motility and sperm concentration. A normal concentration is around 2 billion sperm per cubic centimeter of semen, with approximately 70% motility
- The sperm's morphology should be evaluated to determine whether they are mature and whether there are abnormalities
- At least 80% of the sperm should be normal



Photograph of goat sperm acrosome stained with FITC-PNA. **A)** Image obtained by phase contrast microscope. **B)** The same field of image **A**, obtained by fluorescence microscope. Arrowhead indicates intact acrosome; arrow with dashed line indicates partially damaged acrosome; and arrow with solid line indicates lost acrosome. Magnification  $\times 350$

<http://www.biolreprod.org/content/69/4/1245/F1.expansion>

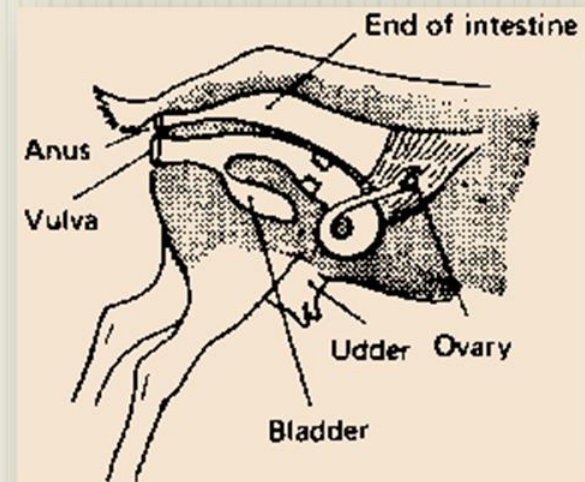
# Artificial Insemination

- Some goat producers (especially those who raise dairy goats) use artificial insemination (AI) for breeding
- This requires excellent heat detection skills and is more labor-intensive than natural services, but AI allows the economical use of outstanding sires



<http://www.reproductionenterprises.com/supplies>

Goat Artificial Insemination kit



<http://tamilgoats.blogspot.com/>

# Kid management

- Raising healthy kids is essential for the operation. Kids are replacement stock, or can be sold as breeding stock or slaughtered for meat
  - Kids MUST receive colostrum soon after birth (within the first day of their life)
  - Kids raised by their mothers usually grow better than those that are bottle fed

**However, bottle feeding can be a better choice if:**

- In herds where caprine-arthritis encephalitis is a concern, kids must be bottle-fed heat-treated colostrum and milk instead of natural nursing
- Also in dairy herds, it may be more economical to separate the kids from the mothers, feed kids with a milk replacer, and sell the extra goat milk (after feeding them colostrum)



[http://www.blackmesaranchonline.com/animals/dairy\\_goats\\_4sale\\_intro.htm](http://www.blackmesaranchonline.com/animals/dairy_goats_4sale_intro.htm)

# Kid management

- Castration

- Male slaughter goats are often castrated, since the meat can have a strong flavor in intact males more than four months old
- Males should be castrated at an early age to reduce stress on the animals
  - Castration with elastic bands should be done within a week of birth
  - There is some concern that animals may contract tetanus if they are castrated with bands
- Some ethnic groups however want intact males, so it is important to know your market, so you can plan for the management of your herd

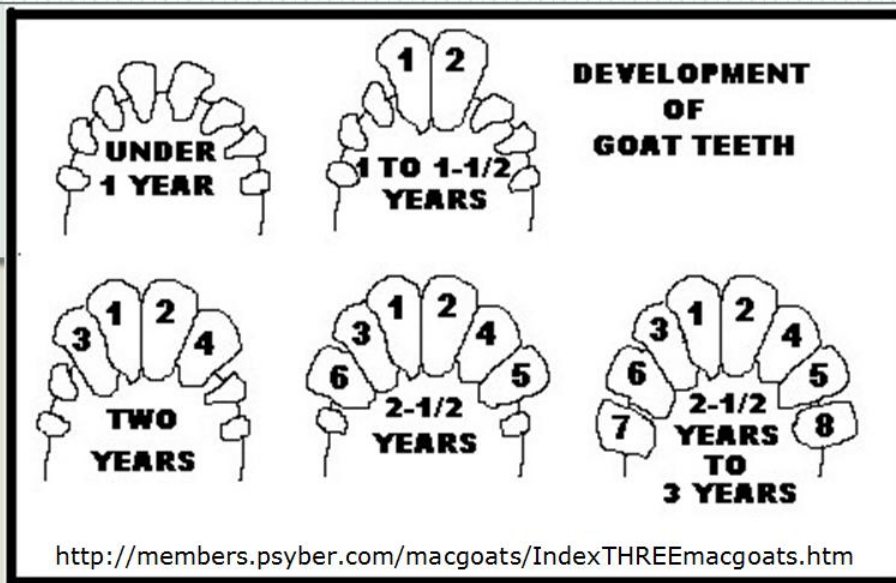
# Kid management



## Disbudding

- Disbudding is often done in goat dairies to prevent problems with horns in the milking parlor and to avoid accidental or intentional injuries
- Kids should be disbudded between three and seven days after birth, using a specially designed disbudding iron that is very hot
- Disbudding paste is a caustic substance that will destroy the bud, but it can severely damage any other tissue that is exposed (skin, eyes, ears) if runoff occurs
- Some people choose polled goats to avoid disbudding animals and problems with horns altogether, however there seems to be some linkage between polledness and infertility problems in offsprings.





- The eight teeth in the lower front jaw of your goat can help you to tell his age
- They are not an exact or perfect guide, as various factors such as diet and genetics will influence the growth of teeth
- There are no upper front teeth in the goat's mouth, instead they have a tough toothless "dental pad"
  - Remember that goats are born with teeth!
  - In older animals, after 5 years, the age of the animals is estimated by the wear on the teeth. Also the teeth will spread and then sometimes they may get loose and fall out

This presentation was prepared by:



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# Want more information?



ATTRA  
publications  
<https://attra.ncat.org/>



Illustrated guide to sheep and goat production

Goats: sustainable production overview

Dairy goats: sustainable production overview

Meat goats: sustainable production overview

Managing internal parasites in sheep and goats

# Want more information?



National Goat Handbook

[http://members.toast.net/dawog/Goats/national\\_goat\\_handbook.pdf](http://members.toast.net/dawog/Goats/national_goat_handbook.pdf)

Breeds of Livestock (goats)

<http://www.ansi.okstate.edu/breeds/goats/>

American Dairy Goat Association

<http://www.adga.org/>

Dairy goat journal

<http://www.dairygoatjournal.com/>

Boer Goats Home

<http://www.boergoatshome.com/>

Meat Goat production (Susan Schoenian, University of Maryland)

<http://www.sheepandgoat.com/articles/meatgoat.htm>