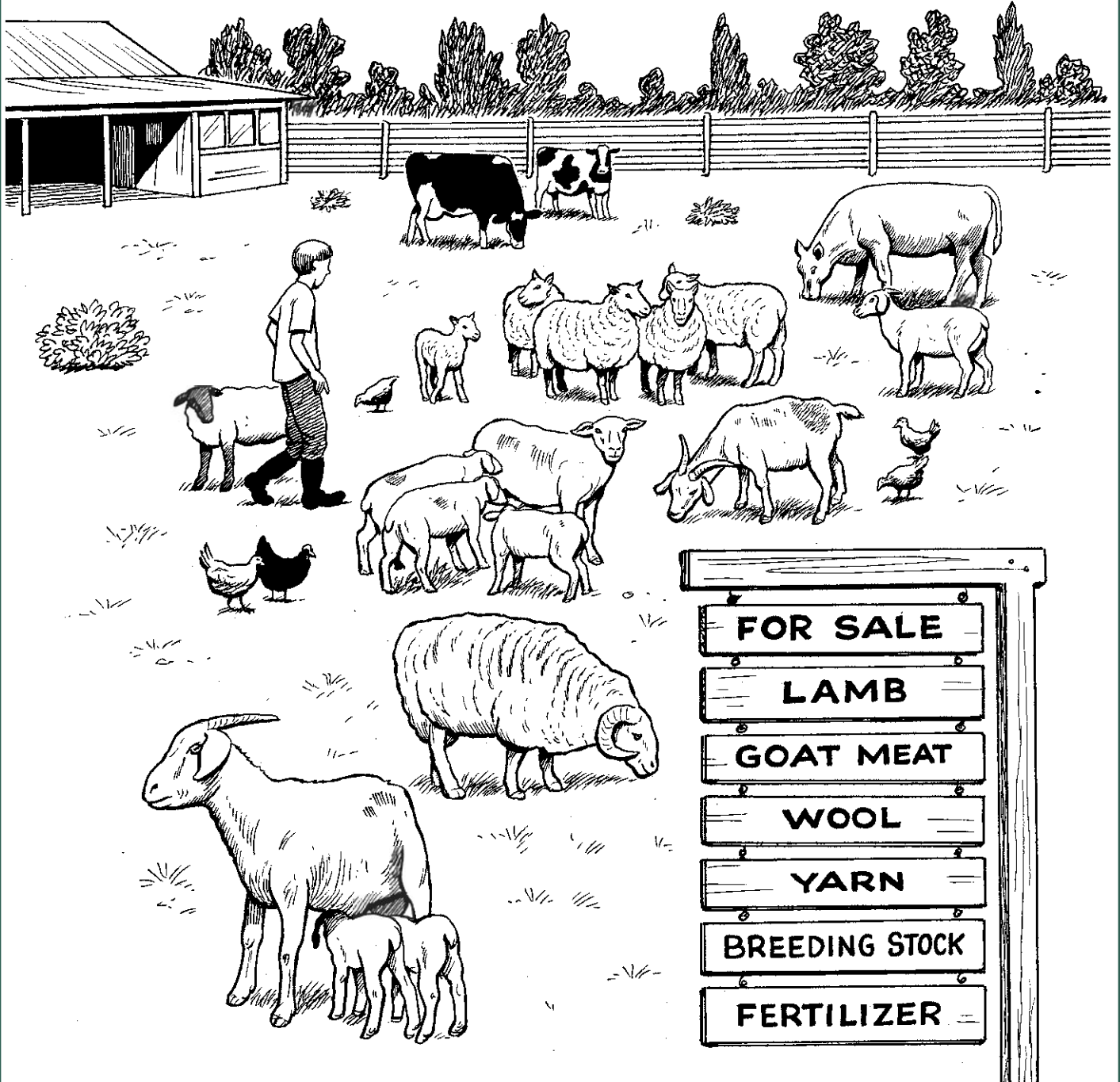




An Illustrated Guide to



Sheep and Goat Production



A Publication of ATTRA - National Sustainable Agriculture Information Service • 1-800-346-9140 • www.attra.ncat.org

ATTRA—National Sustainable Agriculture Information Service is managed by the National Center for Appropriate Technology (NCAT) and is funded under a grant from the United States Department of Agriculture's Rural Business-Cooperative Service. Visit the NCAT Web site (www.ncat.org/sarc_current.php) for more information on our sustainable agriculture projects.

Funding for the development of this publication was provided by the USDA Risk Management Agency.



Contents

Selection.....	3
Feeding and Pasture.....	5
Breeding and Young Stock	8
Health	12
Equipment and Handling	15
Marketing.....	16
Conclusion.....	18
Resources	18

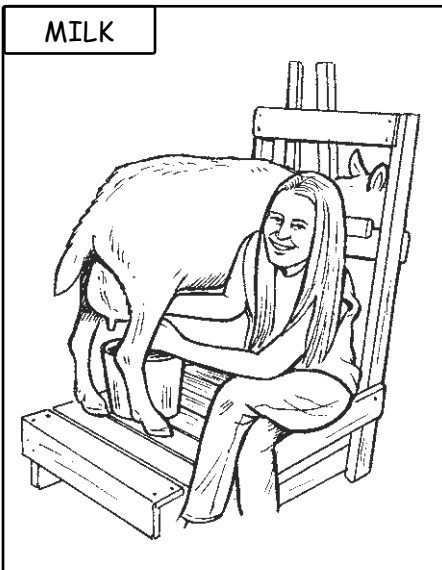
Related ATTRA Publications

- Goats: Sustainable Production Overview
- Meat Goats: Sustainable Production
- Dairy Goats: Sustainable Production
- Sustainable Sheep Production
- Dairy Sheep
- Small Ruminant Sustainability Checksheet
- Managing Internal Parasites in Sheep and Goats
- Pasture, Rangeland and Grazing Management
- Ruminant Nutrition for Graziers

INTRODUCTION

Sheep and goats are versatile animals and can be valuable and enjoyable additions to many farms.

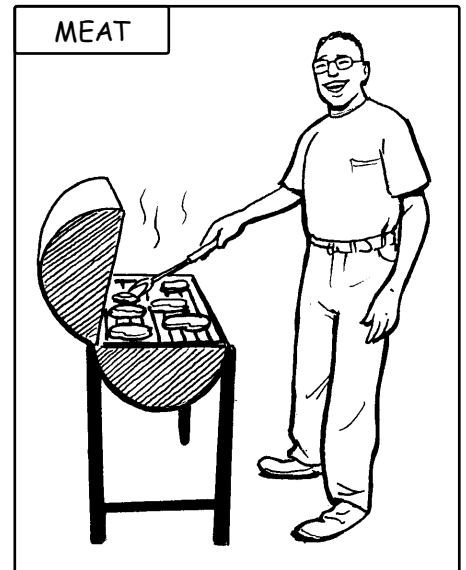
MILK



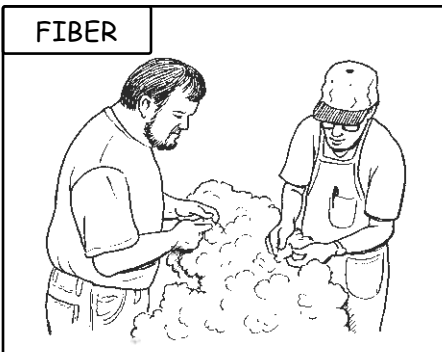
BRUSH CONTROL



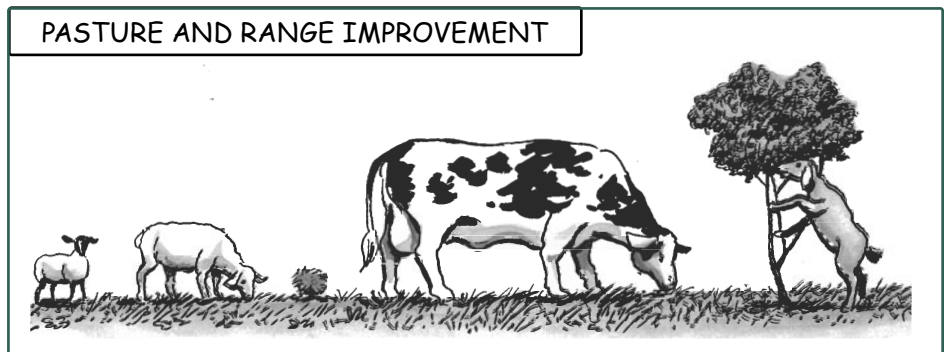
MEAT



FIBER



PASTURE AND RANGE IMPROVEMENT

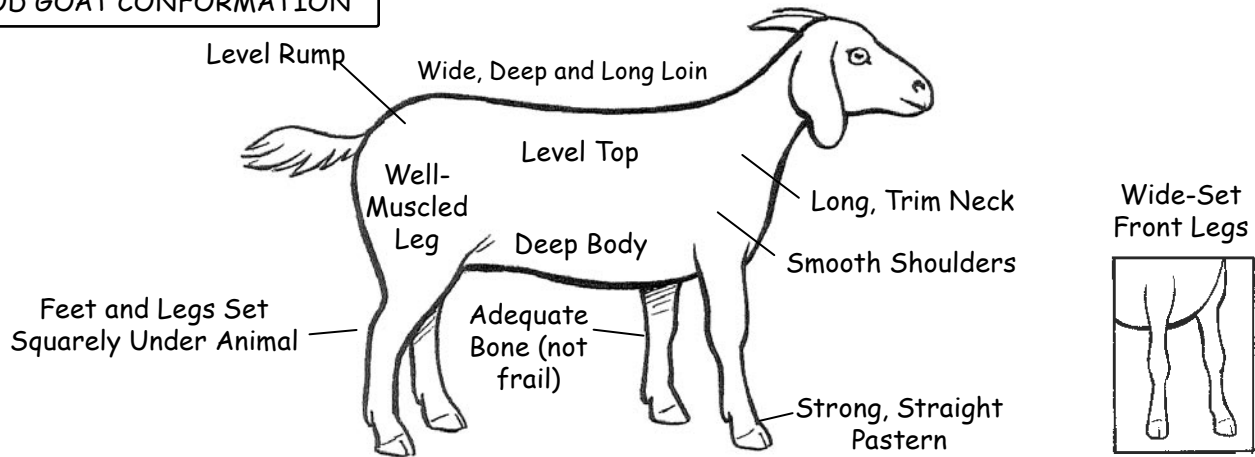


Following are some things you need to know before adding sheep or goats to your farm.

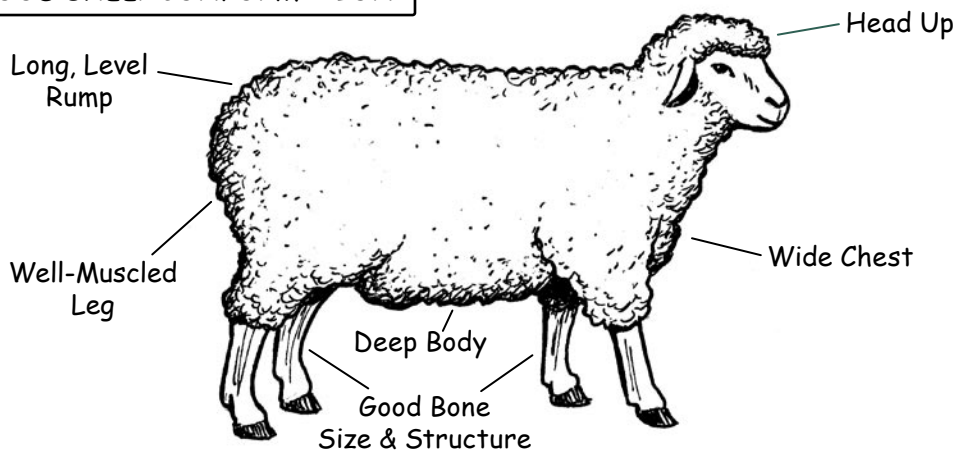
SELECTION

Your sheep or goat business will be much more enjoyable and successful if you begin with healthy animals with proper conformation. These are characteristics you should look for when selecting stock.

GOOD GOAT CONFORMATION



GOOD SHEEP CONFORMATION



Animals with good conformation are:

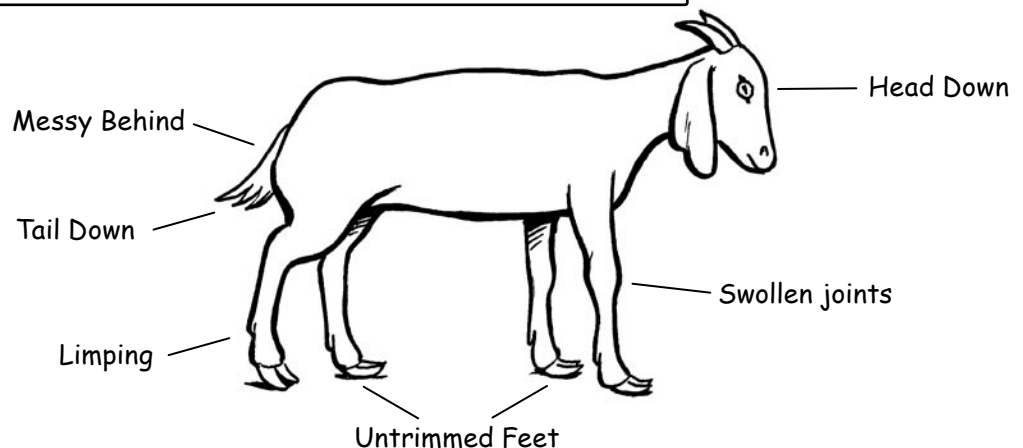
- Strong in structure
- Deep bodied
- Wide chested
- Able to walk squarely on feet and legs

Animals in good health are:

- Robust
- Alert
- Bright eyed
- Lively

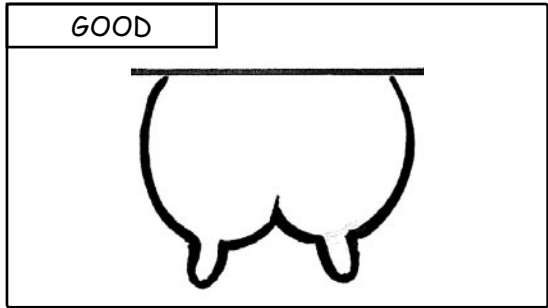
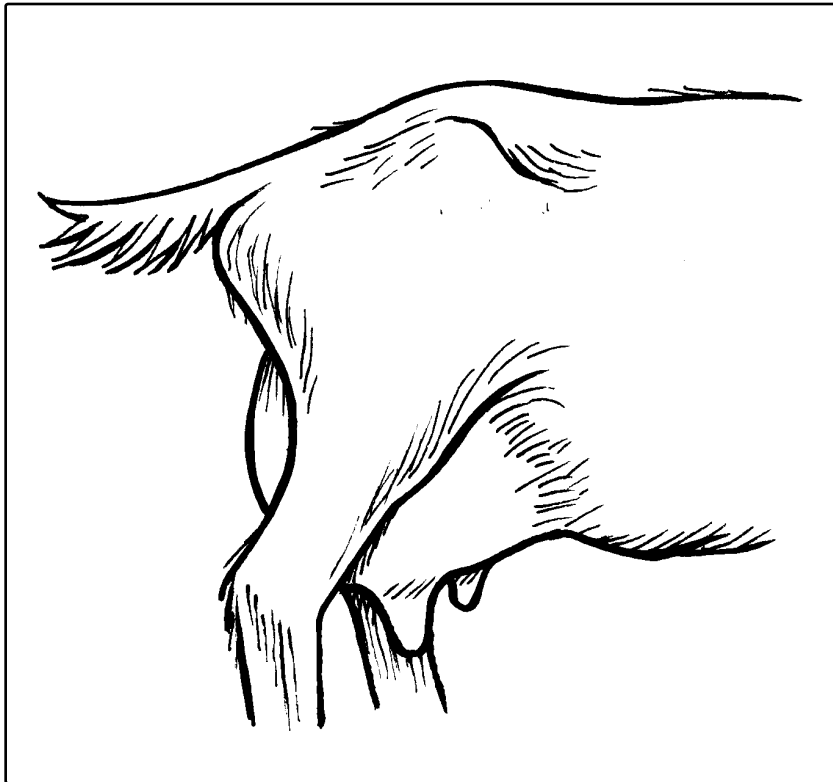
Healthy goats are shiny with a smooth coat and are free of abscesses.

AVOID ANIMALS WITH SIGNS OF POOR HEALTH

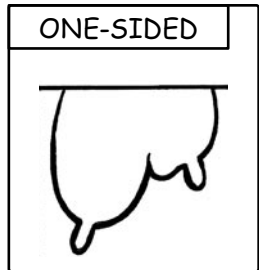
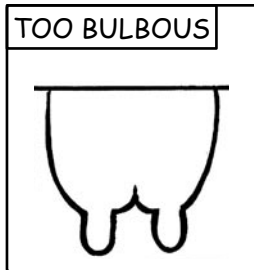


SELECTION continued

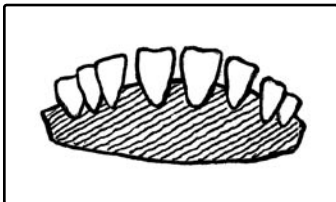
Does and ewes should have a well-balanced udder with two functional teats.



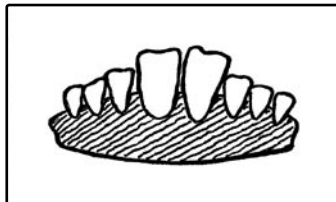
Avoid animals with really small or really large teats. Other udders to avoid:



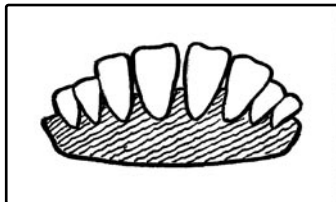
Select animals with good teeth and a proper bite. You can determine an animal's age by looking at its teeth.



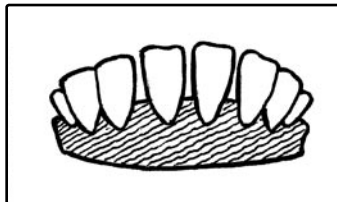
MILK TEETH (Baby Teeth): Less than 1 year of age



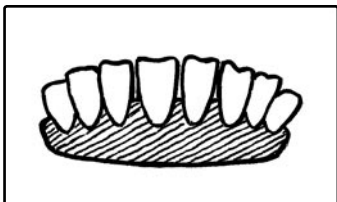
2 ADULT TEETH: 1 Year



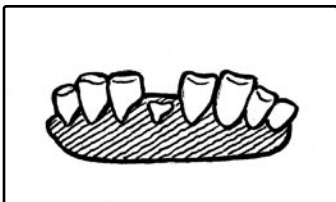
4 ADULT TEETH: 2 years



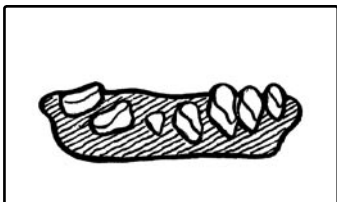
6 ADULT TEETH: 3 years



ALL 8 ADULT TEETH: 4 years



WORN MOUTH or BROKEN MOUTH: Over 5 years of age

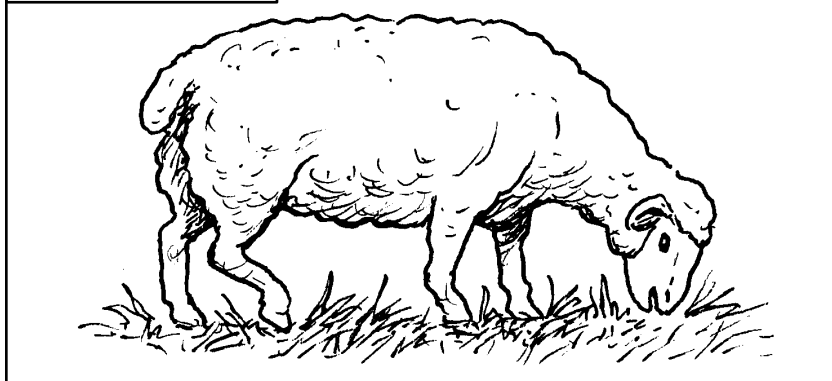


GUMMY: Aged

FEEDING AND PASTURE

- Goats prefer to browse, or eat things such as brush, leaves, and small trees.
- Sheep prefer to eat broadleaf plants (forbs) and grasses.
- Sheep and goats are able to select the most nutritious parts of a plant.

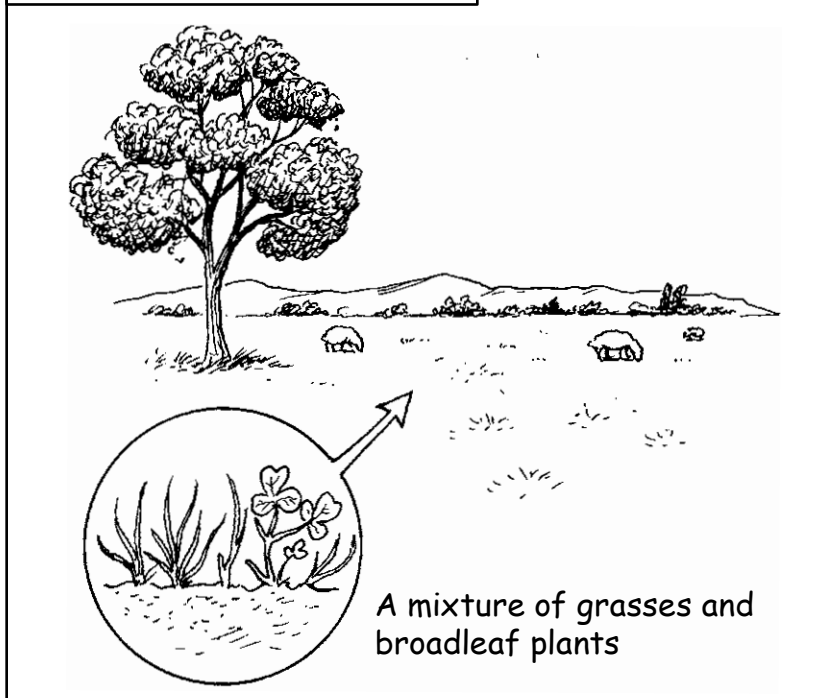
SHEEP GRAZING



GOAT BROWSING



DIVERSE, HEALTHY PASTURE



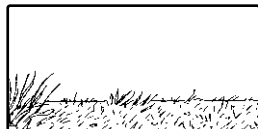
- Sheep and goats like to have a variety of forages to choose from.
- If you provide diverse forages to your animals, they are able to select a diet that meets their nutritional needs.
- It is important to always provide a clean water supply and fresh minerals.

Maintain proper forage height; don't let your animals graze forage under two inches.

OVERGRAZED



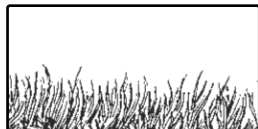
SPOT GRAZED



TOO SHORT



JUST RIGHT



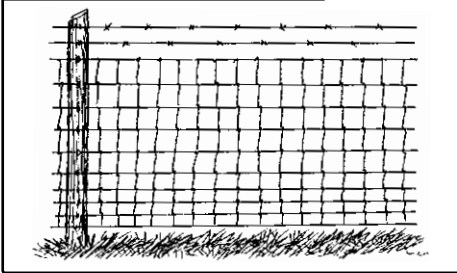
TOO TALL



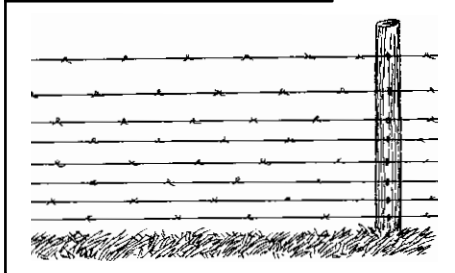
FEEDING AND PASTURE *continued*

- Proper fencing is necessary for sheep and goat production. You must have adequate fencing in place before getting animals!
- There are many options to keep animals in and predators out.

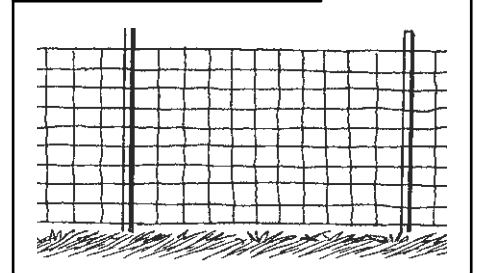
WOVEN WIRE WITH BARBED WIRE



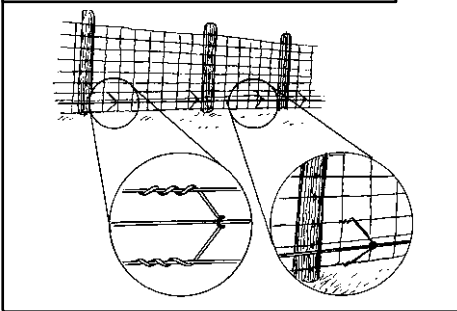
MULTIPLE STRANDS OF BARBED WIRE



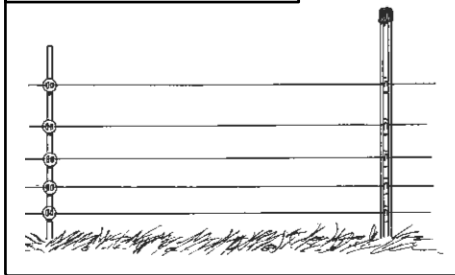
PORTABLE ELECTRIC NET FENCING



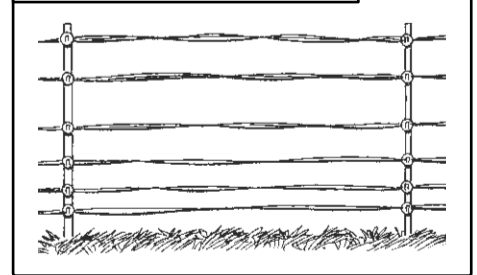
OFF-SET ELECTRIC FENCE



FIVE STRANDS OF ELECTRIC WIRE

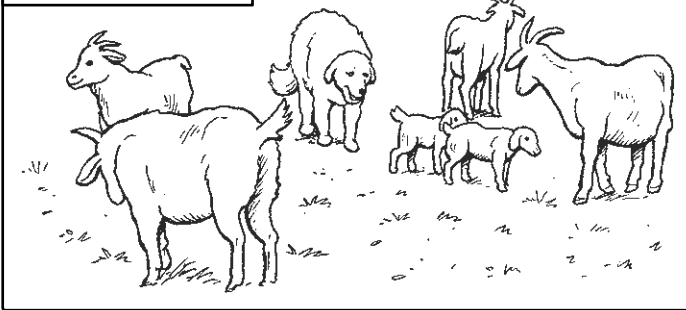


MULTIPLE STRANDS OF ELECTRIC POLYTAPE



There are many methods for dealing with potential predators.

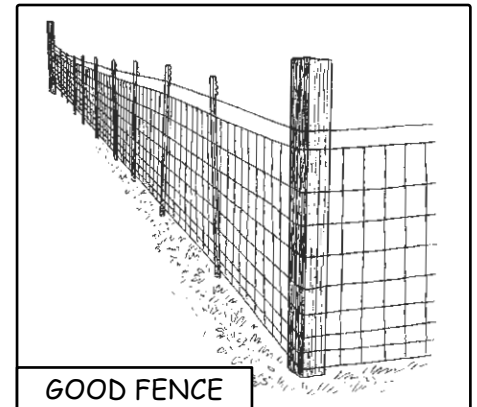
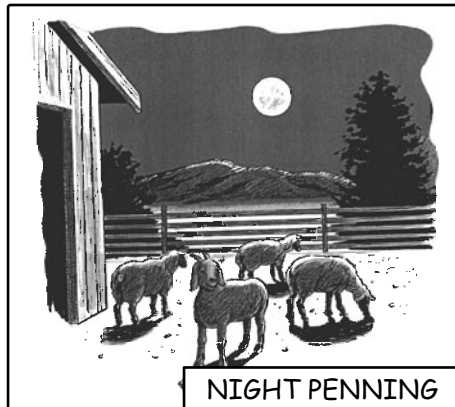
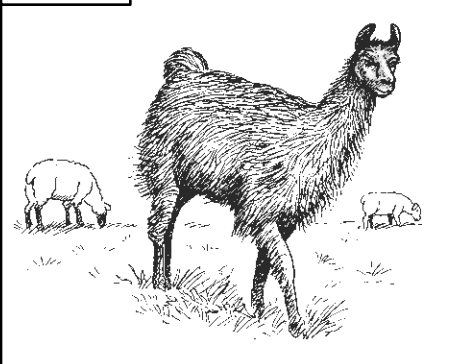
GUARDIAN DOG



DONKEY

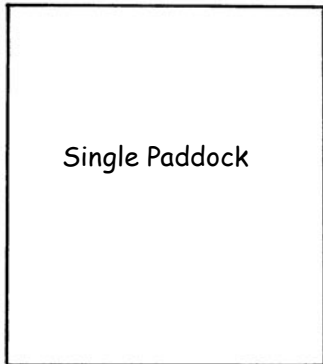


LLAMA

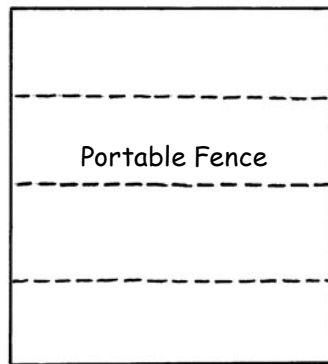


FEEDING AND PASTURE *continued*

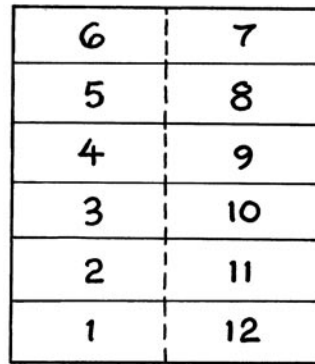
- Allow pastures and forages a time to rest after periods of grazing.
- Having multiple pastures or paddocks (see below) to rotate animals through will use forages more efficiently. Use a combination of permanent and portable fencing to subdivide paddocks. Numbers indicate possible number of paddocks and grazing sequence.



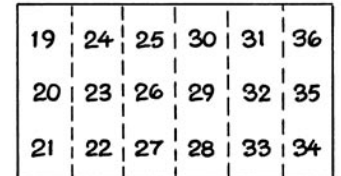
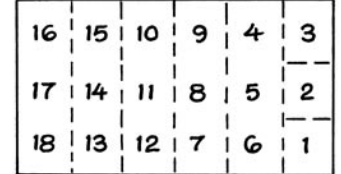
CONTINUOUS
GRAZING



STRIP GRAZING

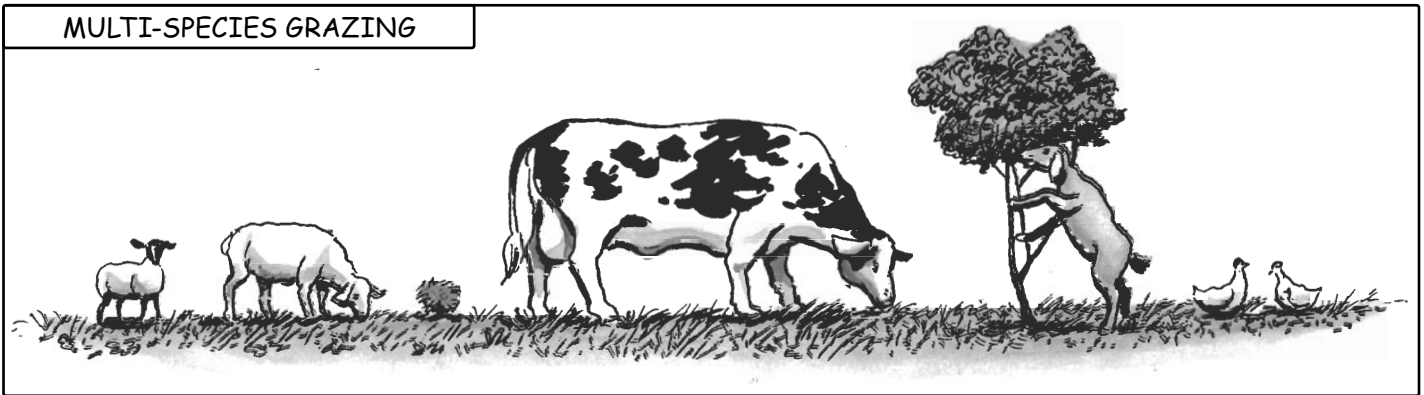


ROTATIONAL
GRAZING



INTENSIVE
ROTATIONAL GRAZING

- Sheep, goats, and cattle have different forage preferences. The animals won't compete for food, and pastures will be evenly grazed.
- You can run different species together, or you can follow one species with another in a rotation.



It is important to manage forages so that animals maintain proper body condition. You don't want your animals too fat or too thin. Look at spine, hip bones, ribs, and legs.



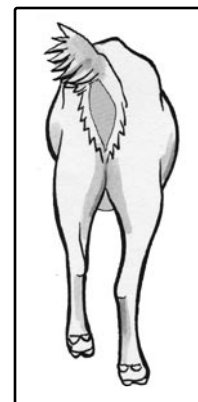
TOO THIN



THIN



SATISFACTORY

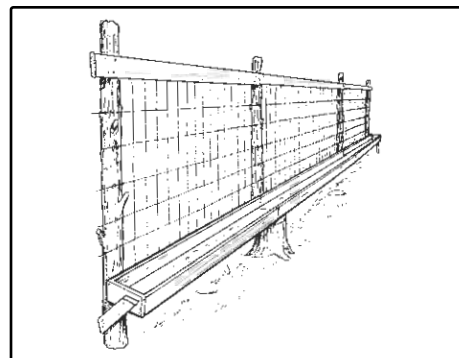
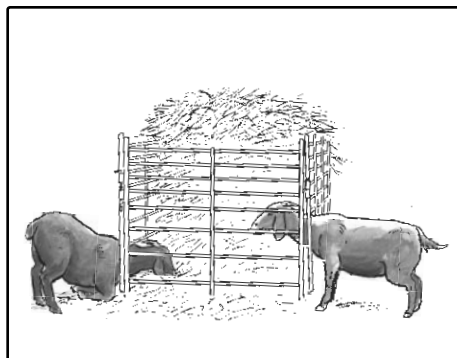
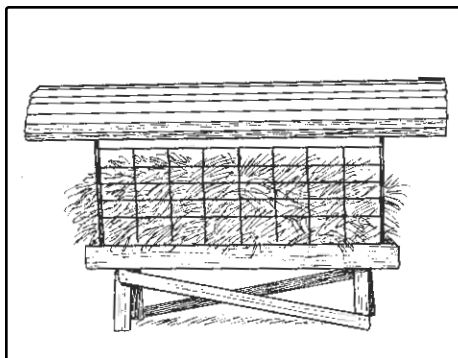
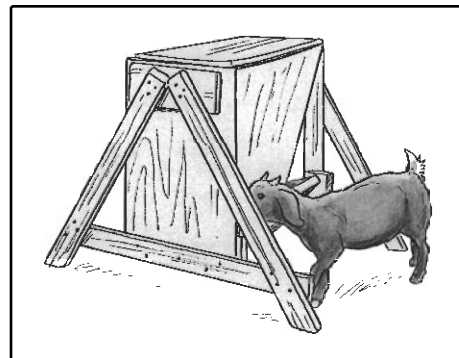
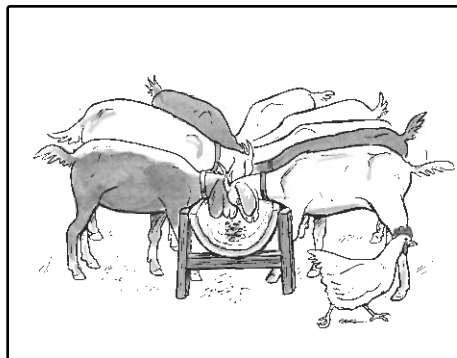
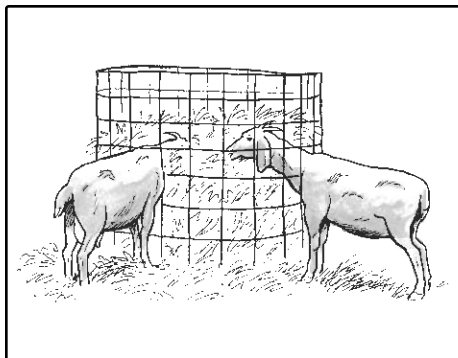
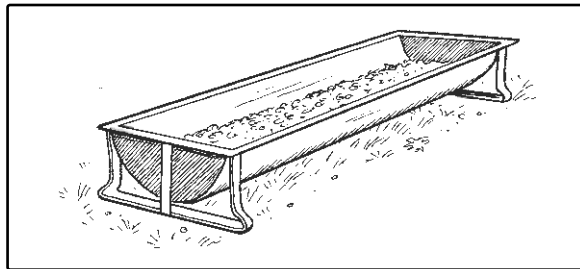


SATISFACTORY
BUT TENDING
TOWARDS FAT



TOO FAT

- Occasionally hay or grain will have to be fed. Use proper feeders to keep feed clean and off of the ground.
- Use a hay feeder to reduce waste.
- There are various options for feeders.



BREEDING AND YOUNG STOCK

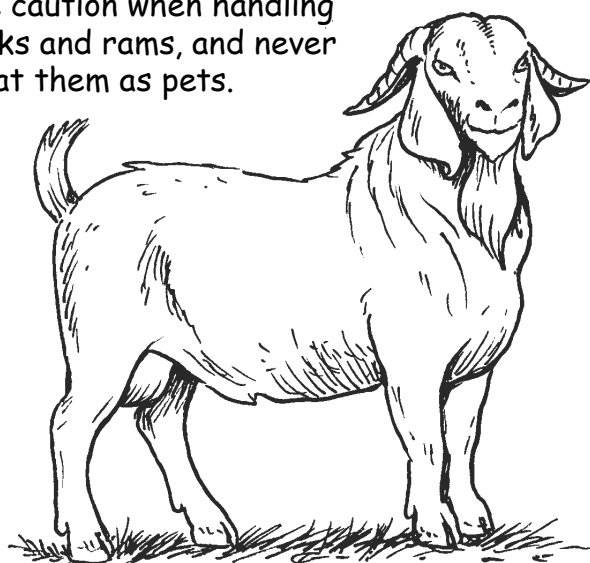
The foundation of your herd is the herd sire. It is worth spending money and attention on a good buck or ram.

Selection considerations:

- Fertility
- Health and hardiness
- Adaptation to environment and management
- Internal parasite resistance
- Body type
- Marketing goals

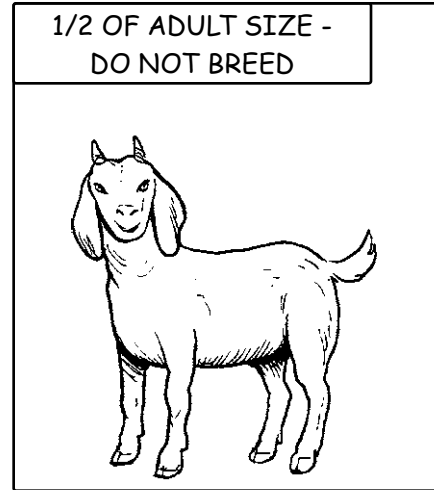
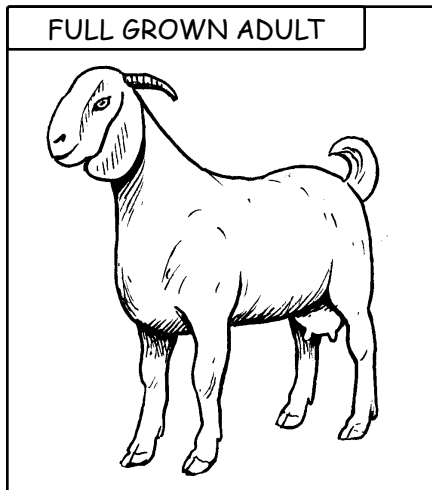
MEAT GOAT BUCK

Use caution when handling bucks and rams, and never treat them as pets.



BREEDING AND YOUNG STOCK *continued*

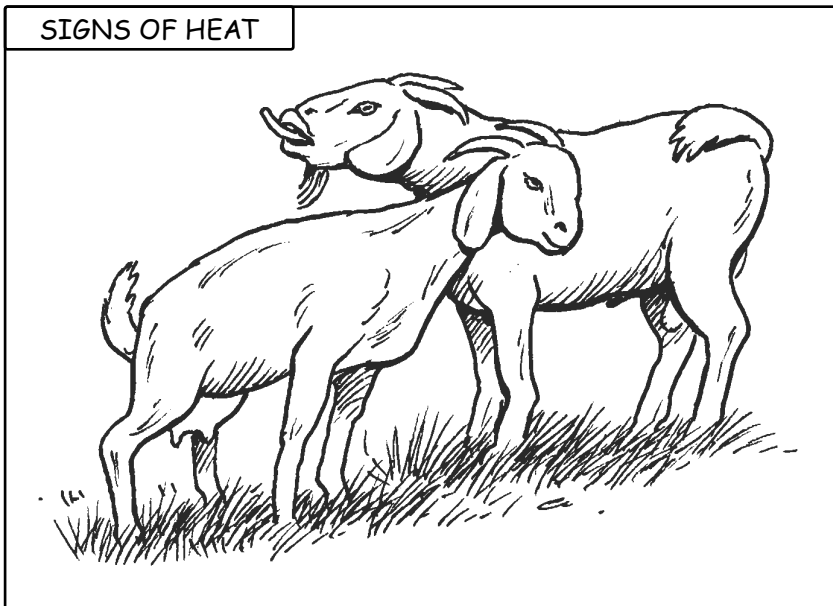
If ewes and does are at least 3/4 of their adult size, they can lamb or kid at one year of age.



The usual breeding season is August to January. Kids and lambs will arrive five months after breeding.

Turn the buck or ram with the females five months before you want the kids or lambs to be born. Watch the herd or flock and note breeding activity.

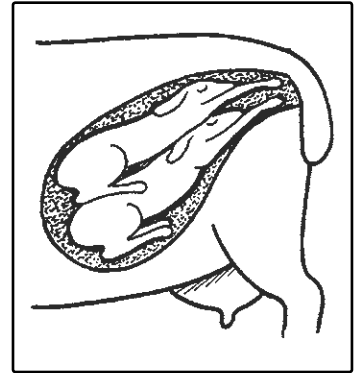
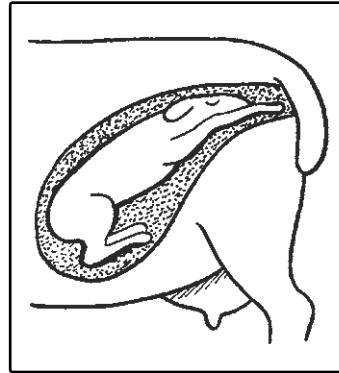
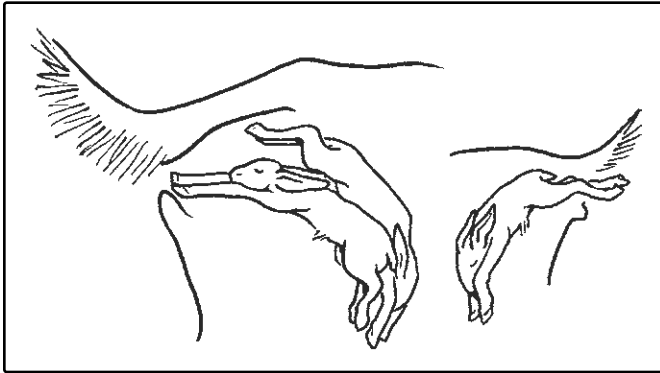
CALCULATING DUE DATES	
date BRED	date DUE
Jan. 1	May 31
Feb. 10	July 10
Mar. 2	July 30
Apr. 1	Aug. 29
May 1	Sept. 28
June 30	Nov. 27
July 30	Dec. 27
Aug. 29	Jan. 26
Sept. 28	Feb. 25
Oct. 28	Mar. 27
Nov. 27	Apr. 26
Dec. 27	May 26



Records are useful for decision-making. Here is an example of a kidding record.

KIDDING						
Animal ID	Bred	Due	Kidded	No. in Litter	Sire	Comments

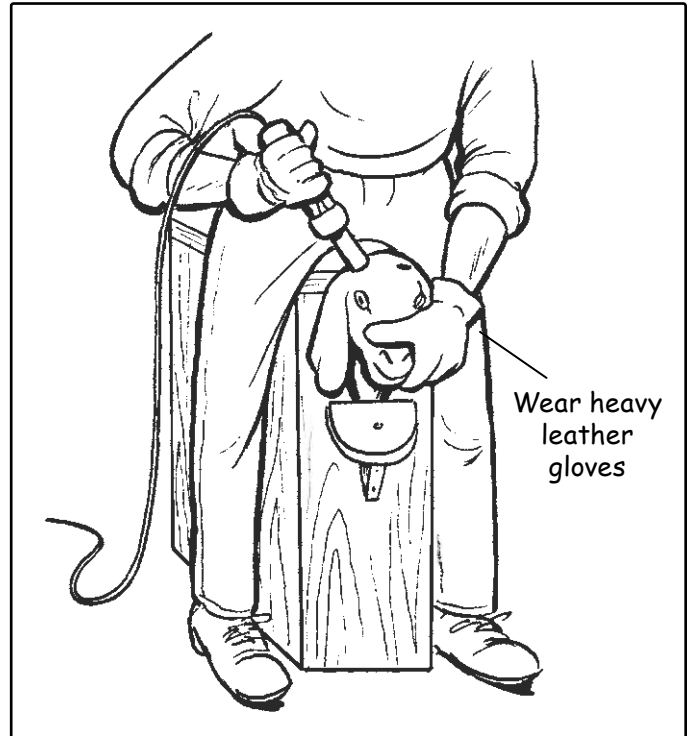
This is how a kid or lamb is normally born. It usually takes about an hour of labor.



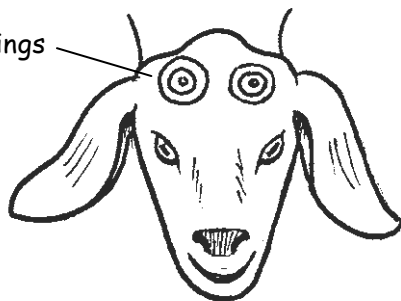
Colostrum (the first milk) contains vital antibodies and nutrients. Be sure all kids and lambs receive colostrum shortly after birth. Contact your vet or ATTRA for more information on newborn care.

Disbudding dairy goat kids (to be done before 10 days of age):

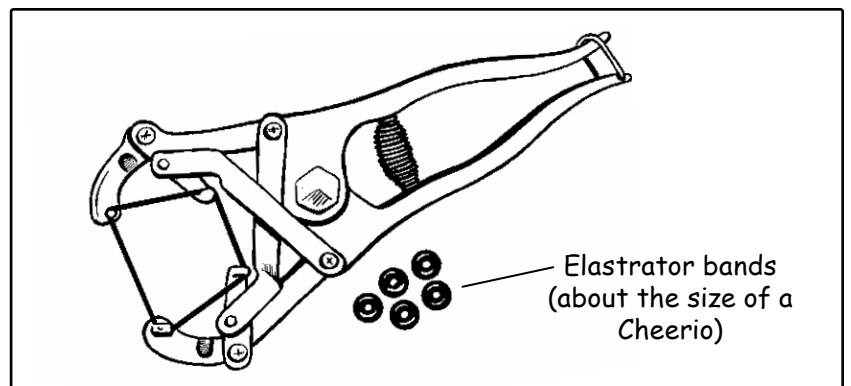
1. heat iron
2. restrain kid
3. hold hot iron over horn bud as shown for 10-20 seconds.
4. check for copper rings on both horn buds.



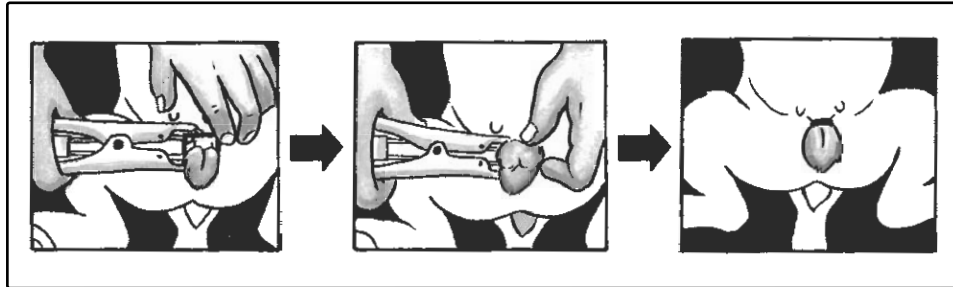
Copper-colored rings



Elastrator tool for docking tails and castrating lambs and kids.



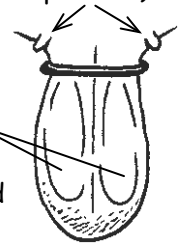
Castrating with elastrator (to be done before 10 days of age).



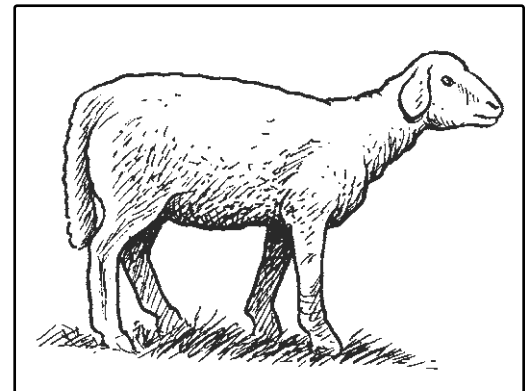
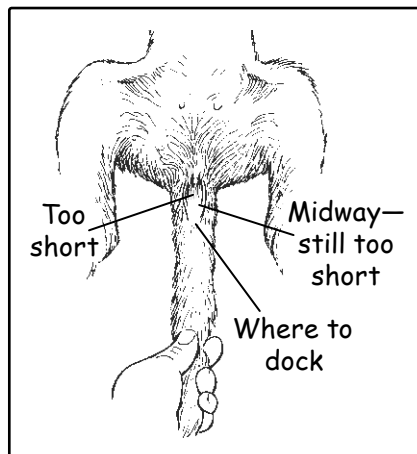
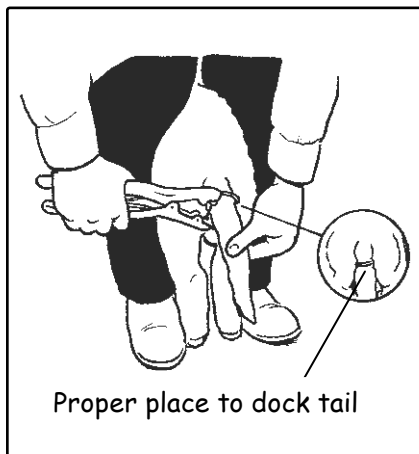
TESTICLES

Rudimentary teats (be sure they are not pinched)

Be sure both testicles are below the elastrator band

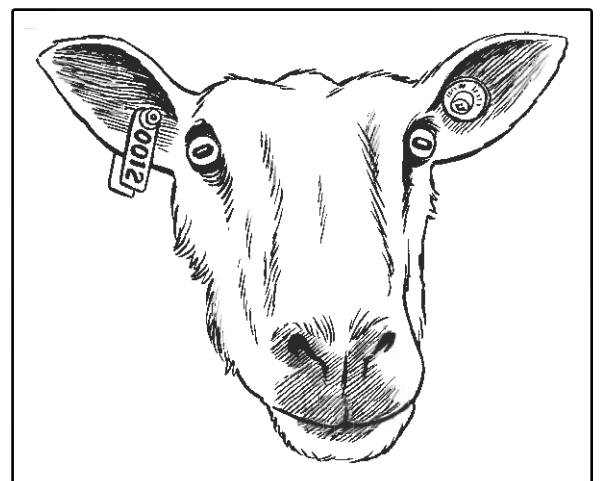
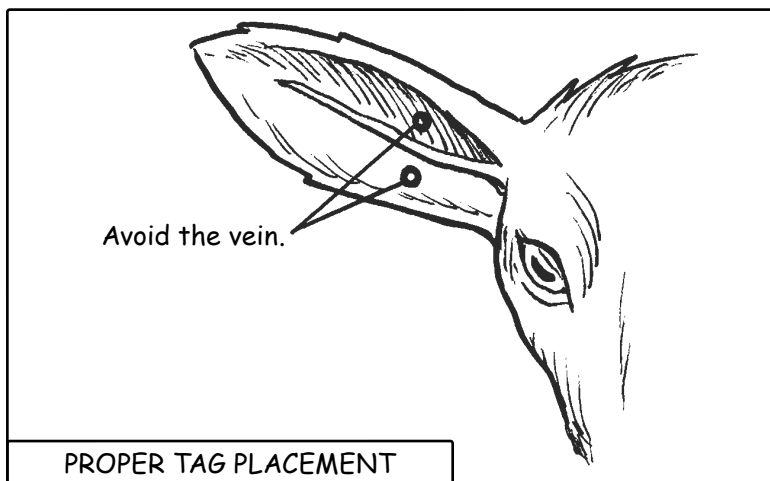


Docking a lamb's tail with elastrator.



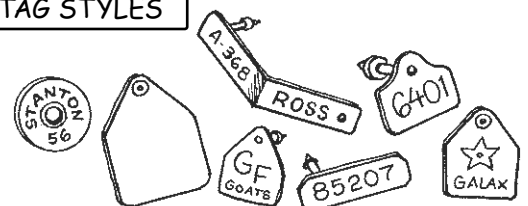
Hair sheep do not need to have their tails docked.

All animals should be permanently identified with ear tags, tattoos, or ear notching.



- All states require certain sheep and goats to be officially identified on change of ownership, as part of USDA's Scrapie program.
- Call 1-866-USDA-TAG for information and to request your free tags.

TAG STYLES



HEALTH

- Healthy, productive animals are more profitable and enjoyable to raise. Refer to the *Selection* section for signs of healthy and sick animals.
- It is important to have a working relationship with a veterinarian. A veterinarian can help with prevention, diagnosis, and treatment of disease.

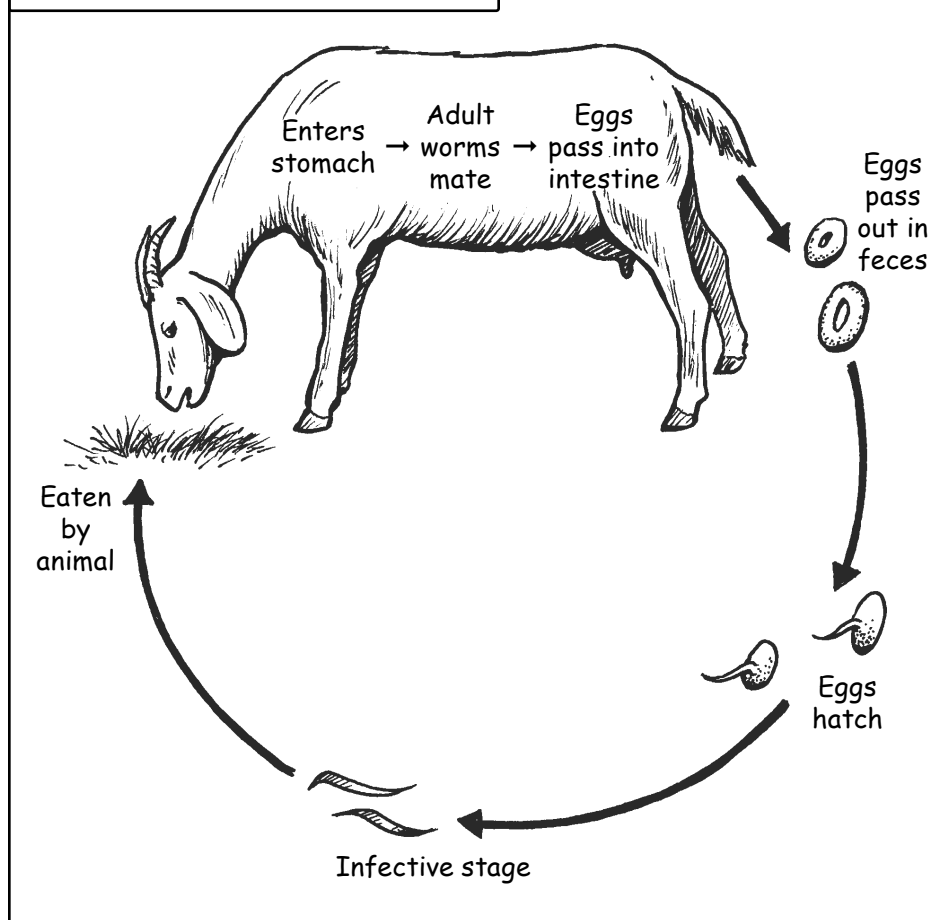


Keep records of health treatments, including day of treatment and withdrawal periods.

HEALTH				
Animal ID	Date	Condition	Treatment	Comments

- Internal parasites are one of the primary health concerns for sheep and goat producers.
- Parasite eggs are passed by the animals, and infective larvae are picked up from pasture.

INTERNAL PARASITE LIFE CYCLE



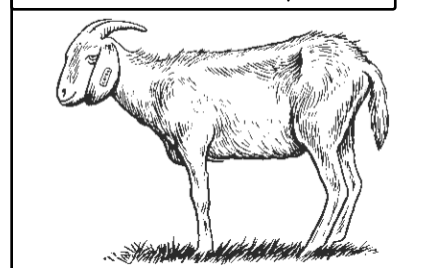
Signs of parasitism include:

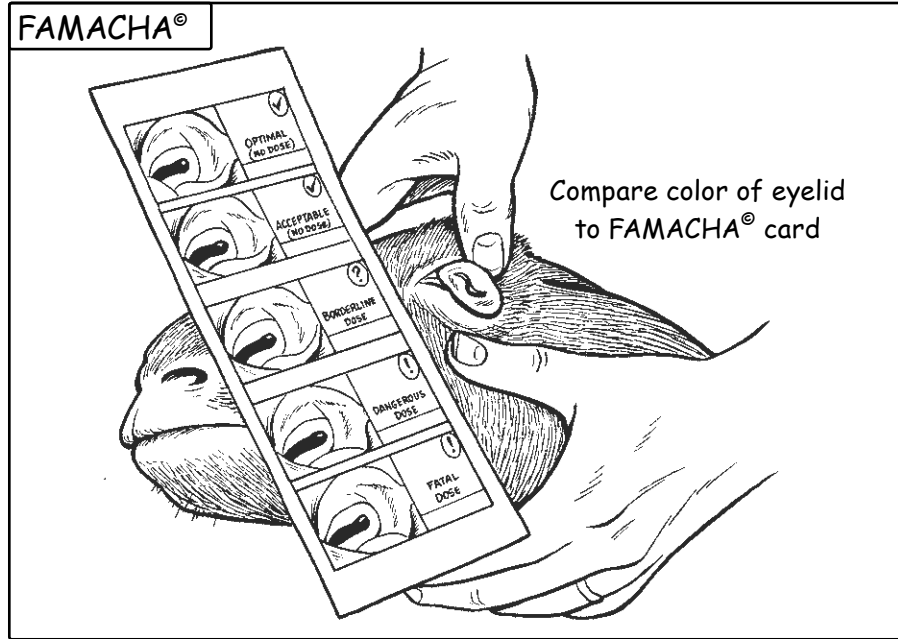
- Rough hair coat
- Thin/unthrifty
- Bottle jaw
- Anemia

BOTTLE JAW



ROUGH HAIR COAT, THIN



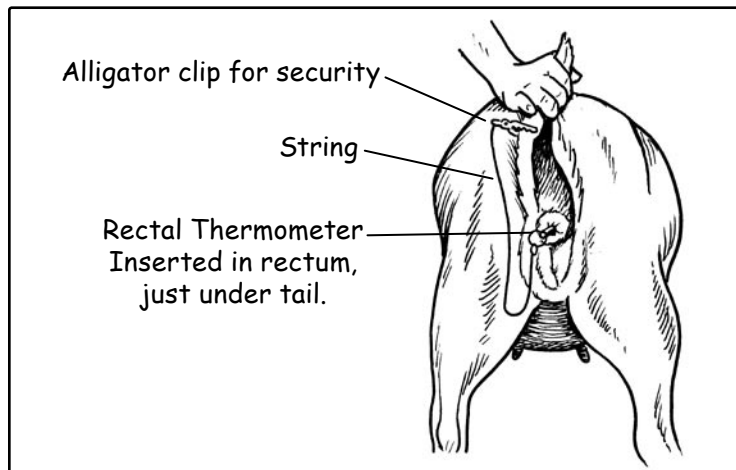
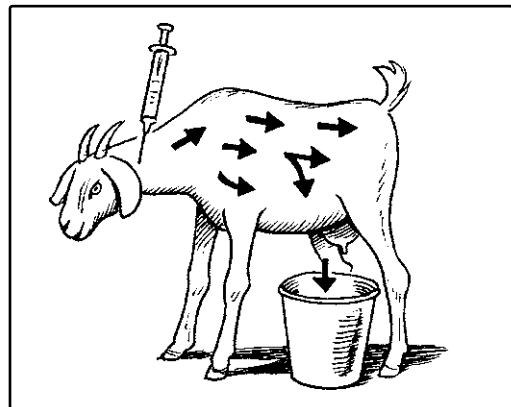
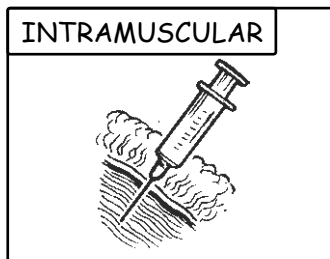
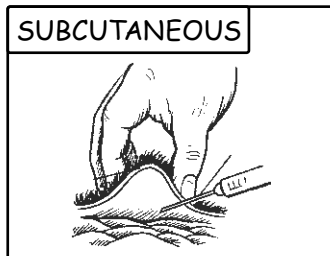
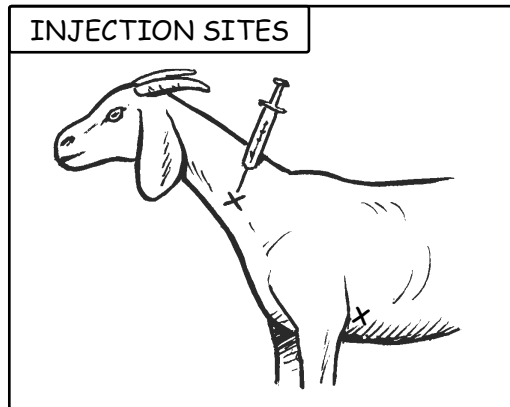


- FAMACHA® is a tool used to identify anemic animals (a sign of parasitism). By using FAMACHA® producers can identify and treat only the animals that need deworming.
- This system is useful where barberpole worms are the main parasite. Contact your veterinarian to learn more about FAMACHA®. Also see www.scsrpc.org.

There are many vaccinations that can be given. The most common vaccinations are CD-T (clostridium/overeating disease and tetanus).

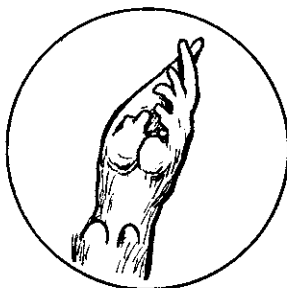
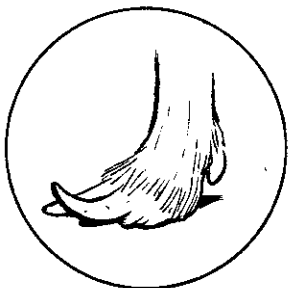
Injection methods

When administering drugs, pay close attention to dosages and withdrawal periods. Most drugs have a withdrawal time for meat and milk.

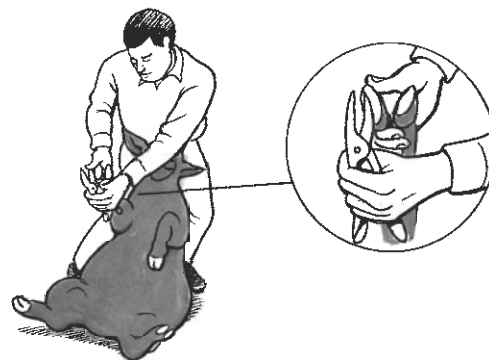


- Knowing how to take your animals' temperature is helpful in determining signs of illness.
- Normal temperature of sheep and goats is 102° F

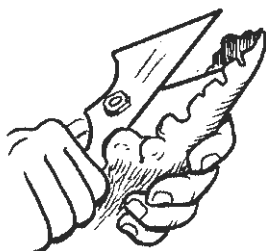
Occasionally sheep and goats need to have their hooves trimmed. Keeping hooves trimmed helps animals to walk properly and helps prevent other hoof problems such as foot rot.



TRIMMING SHEEP HOOVES

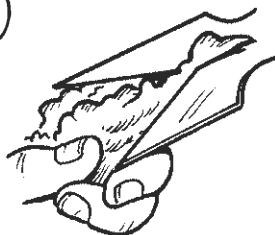


1



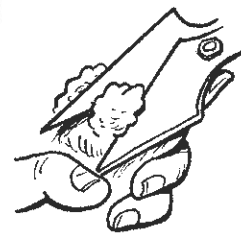
Dig dirt out from toes.

2



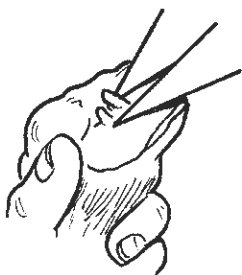
Trim, parallel to hoof hair-line, all loose excess nail.

3



Pare heels to same level as toes.

4



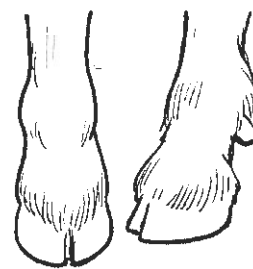
Snip away growth between toes.

5



Pare the soft heel tissue until hoof surface is smooth and flat.

6



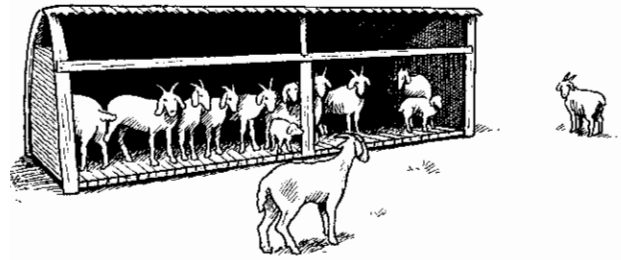
Finished hooves.

- Good health depends on you! To prevent disease, provide:
 - Good nutrition, with plenty of forage
 - Low-stress environment and handling
 - Good pasture management
 - Good sanitation
 - Protection from predators
 - Vaccinations as recommended by your veterinarian.
- Observe your animals and respond quickly to any problems.
- Animals who are poor producers or have chronic health problems should be culled.

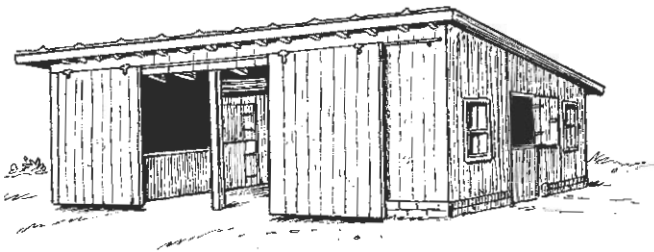
EQUIPMENT AND HANDLING

- Sheep and goats are easy to handle and do not require a lot of equipment.
- You should provide a shelter to protect animals from rain, snow, and cold winds.
- There are many different shelter options, from simple structures to more complex barns.

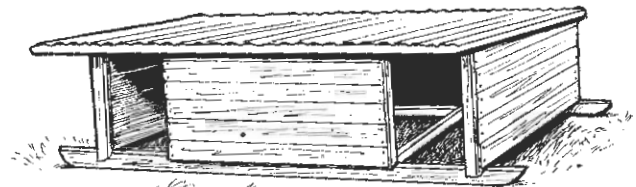
THREE-SIDED SHELTERS WITH OPEN SIDE AWAY FROM PREVAILING WINDS ARE IDEAL.



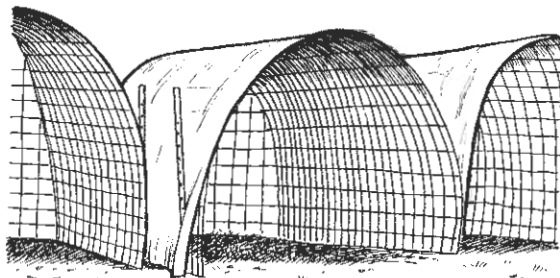
PERMANENT BARN



MOVEABLE SHELTER ON SKIDS



HOOPED CATTLE PANELS WITH TIGHT TARP



- Clean, dry, well-ventilated shelters help animals stay healthy.
- Moveable shelters help prevent manure buildup in an area.
- Shelters and working facilities can be home built for lower cost.

A catch pen, chute, and head gate are helpful when working with sheep and goats. For very small flocks, a catch pen is sufficient.

CATCH PEN AND CHUTE

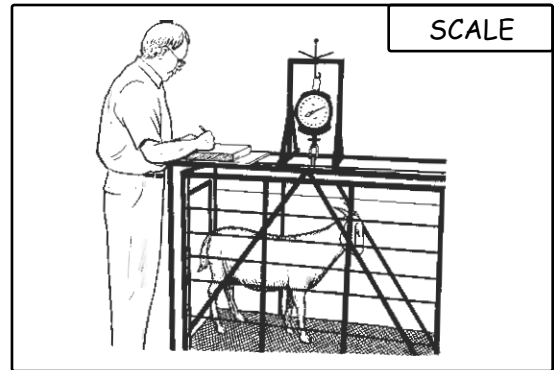


HEAD GATE

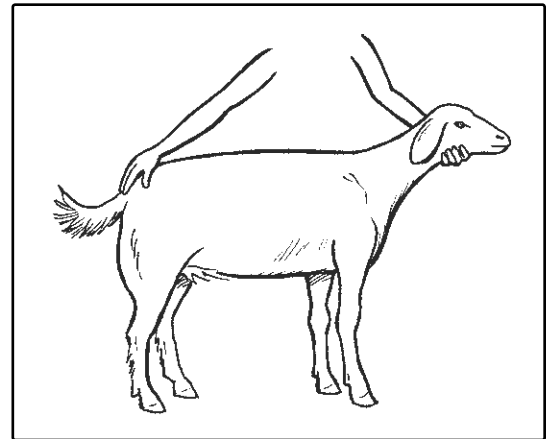


A scale is very useful. Knowing animal weight helps you:

- Monitor animal growth
- Calculate dosages of medications
- Decide when to market animals
- Determine a selling price

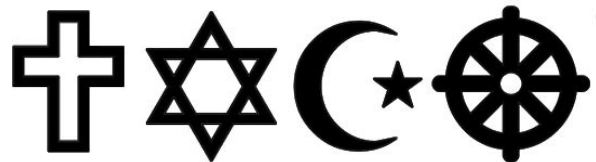


- Sheep can be restrained by setting them on their rump.
- Goats should be restrained by holding them under the jaw and the rump.
- Sheep and goats are easier to control if you keep their heads held high.



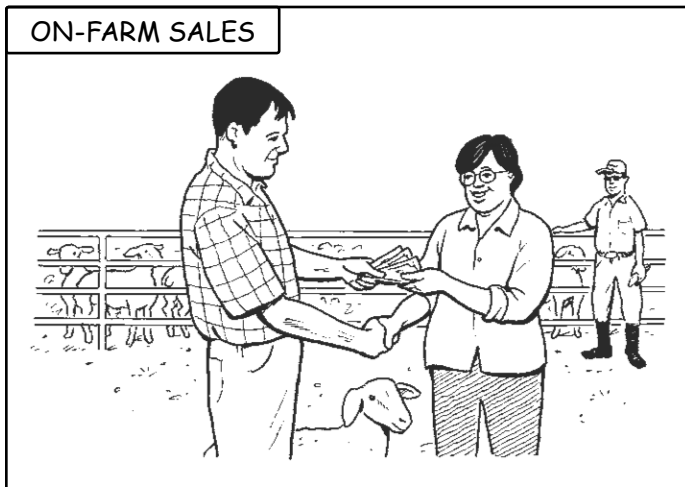
MARKETING

- When marketing sheep and goats, it is important to determine who your customers are and what they want.
- Many religious and ethnic groups prefer lamb and goat.

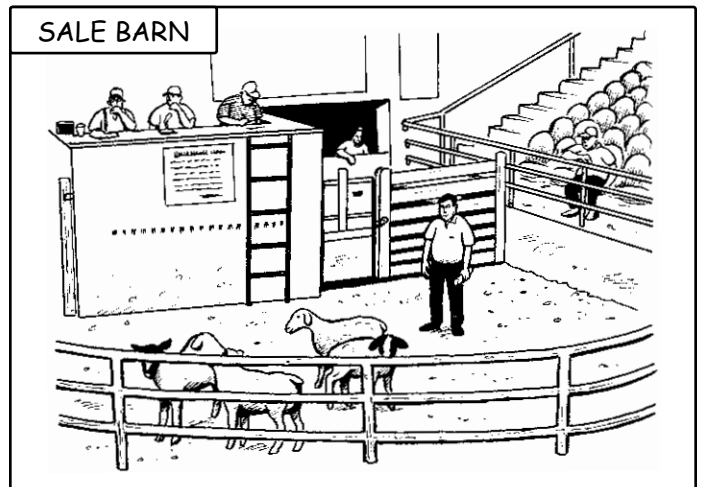


Explore local options for selling your products. Market options include:

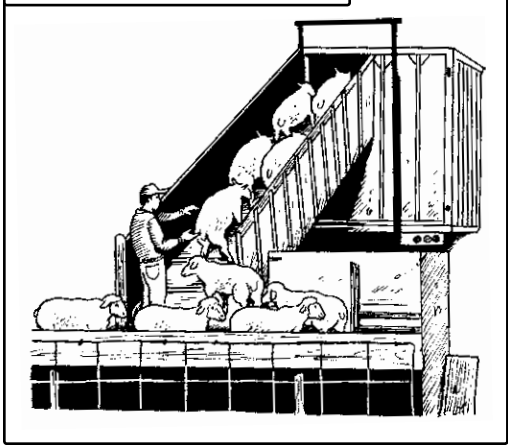
ON-FARM SALES



SALE BARN

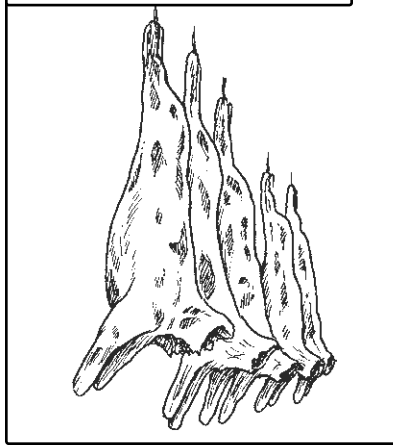


COOPERATIVE SALE



Producers pool their animals to sell a large group to a buyer.

WHOLESALE



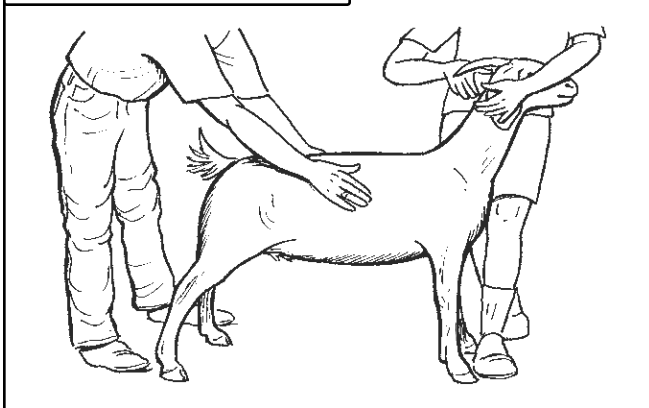
Selling carcasses to butcher shops and restaurants.

RETAIL



Selling packaged cuts.

GRADED SALE



USDA grader inspects animals. Heavier muscled animals bring a premium.

Other products:

ORGANIC



You may explore organic sheep and goat production. First determine if there is a market and if organic production would be profitable. Contact ATTRA for more information.

GRAZING SERVICES



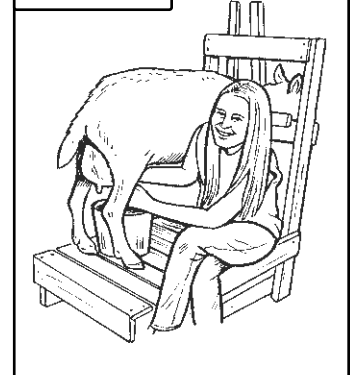
Sheep and goats can improve land by controlling brush or invasive weeds. Some landowners are willing to pay for this service.

FLEECE



Wool and mohair can be sold to individuals or to a pooled sale. Higher grade fleeces will bring a better price.

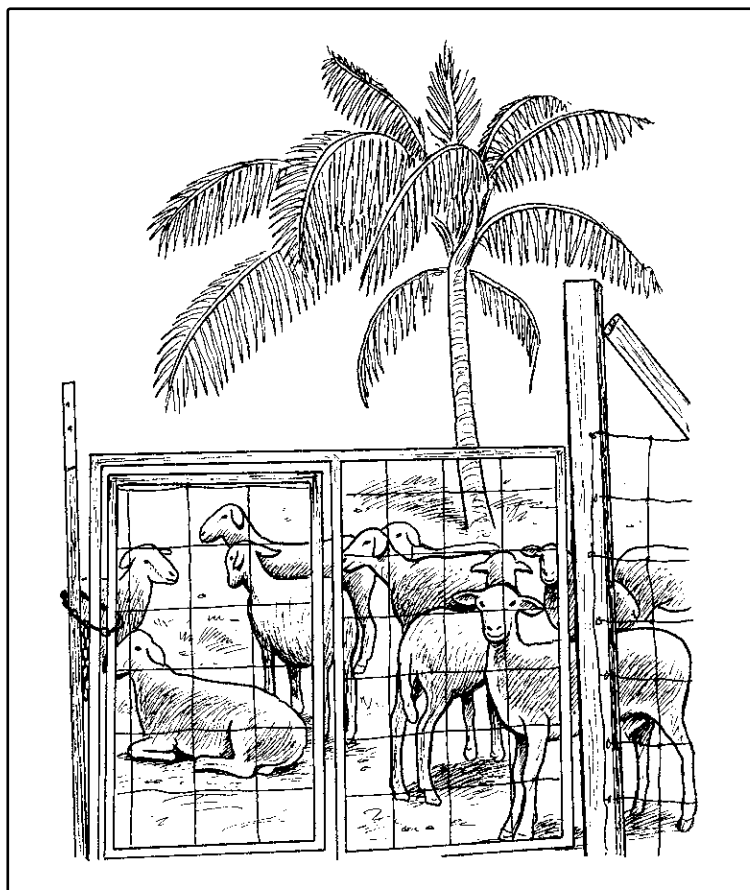
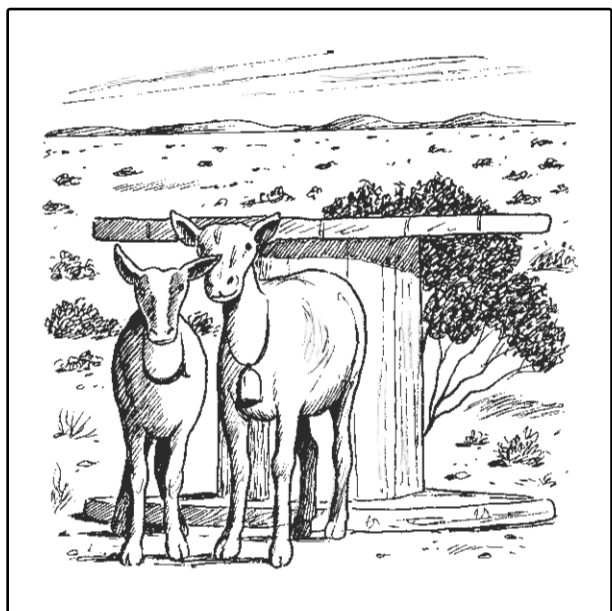
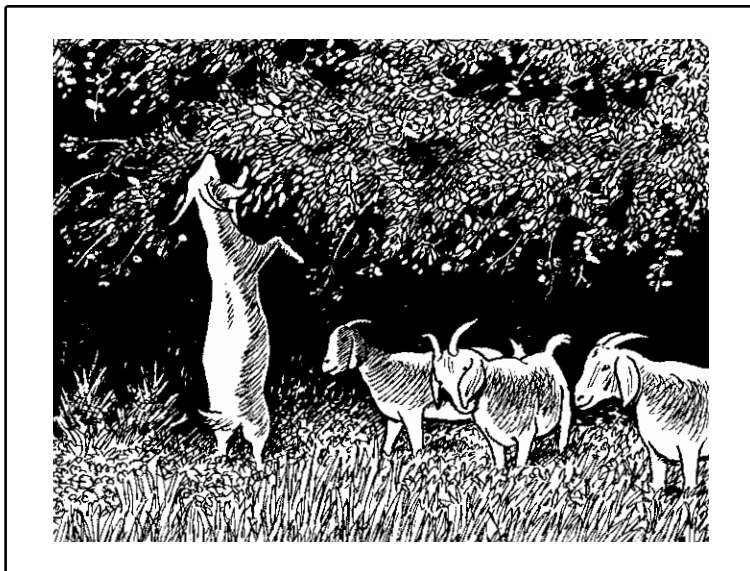
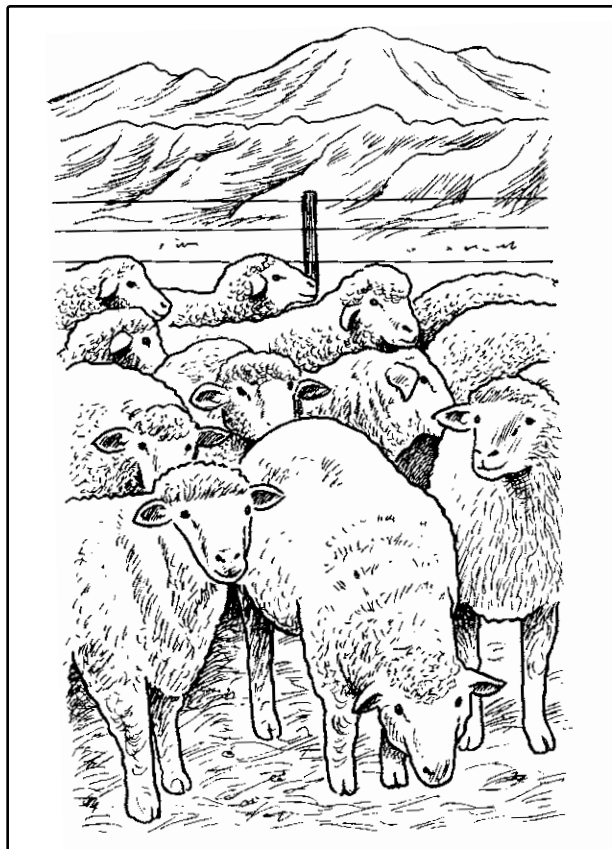
MILK



Rules for selling milk and milk products vary by state.

CONCLUSION

Wherever you live, sheep and goats may have a place on your farm. You must first determine the goals for your farm and then explore profitability of the sheep and goat enterprise. To learn more, see the resources listed on the next page.



FINDING OUT MORE: Resources for sheep and goat producers

Call **ATTRA** at 800-346-9140 or visit www.attra.ncat.org for free publications about sheep and goat production, pasture management, predator control, internal parasite control, and more.

Your local **Cooperative Extension Service** will often sponsor workshops and seminars to help you learn more. Your local agent can also put you in touch with other producers, inform you of markets in the area, and assist you in learning about regulations that affect your business. If you have difficulty locating the agent, you may call ATTRA (800-346-9140) and we will find the number.

Visit your **public library** and explore the shelves where agriculture books are located. A partial list of useful titles may be found in the ATTRA publication *Small Ruminant Resource List*. You may call 800-346-9140 to ask for a free copy of the list or download it at www.attra.ncat.org/attra-pub/small_ruminant_resources.html.

You will also find a wealth of information **online**. The *Small Ruminant Resource List* includes many good websites to explore. There are many training courses and short tutorials available online as well, including:

Maryland Small Ruminant Page
www.sheepandgoat.com

Sheep 101

<http://www.sheep101.info/>

Sheep 201

<http://www.sheep101.info/201/index.html>

Penn State Meat Goat Course

<http://bedford.extension.psu.edu/agriculture/goat/Goat%20Lessons.htm>

Langston University Master Goat Producer online course

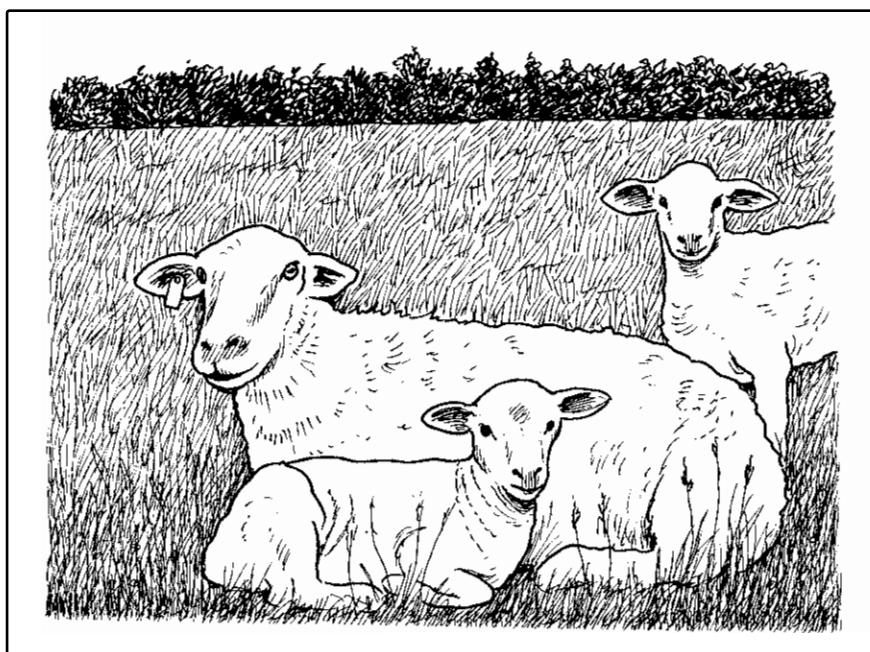
<http://www.luresext.edu/goats/training/QAtoc.html>

The Goat Dairy Library

<http://goatdairylibrary.org/>

A good **magazine** is a link to other producers and to continuing education on timely topics. The *Small Ruminant Resource List* includes some of the most relevant magazine titles.

Learning from **other producers** is most beneficial. If you have opportunity to visit another farm, you can observe practices that work well, and some that do not: you can ask questions and look at facilities and discuss markets. If possible, it is good to cooperate with others in your area to build a strong network of sheep and goat producers.



RELATED ATTRA PUBLICATIONS

- Goats: Sustainable Production Overview
- Meat Goats: Sustainable Production
- Dairy Goats: Sustainable Production
- Sustainable Sheep Production
- Dairy Sheep
- Small Ruminant Sustainability Checksheet
- Small Ruminant Resource List
- Managing Internal Parasites in Sheep and Goats
- Pasture, Rangeland and Grazing Management
- Ruminant Nutrition for Graziers
- Tools for Managing Internal Parasites in Small Ruminants: Copper Wire Particles
- Tools for Managing Internal Parasites in Small Ruminants: Sericea Lespedeza
- Predator Control for Sustainable and Organic Livestock Production
- Pastures: Sustainable Management
- Multi-Species Grazing
- Rotational Grazing
- Paddock Design, Fencing, and Water Systems for Controlled Grazing
- Value-added Dairy Options
- NCAT's Organic Livestock Workbook
- The Organic Chronicles
- Pastures: Going Organic
- Organic Farm Certification and the National Organic Program

Special thanks for reviewing this publication to:

Jack Black	Dr. An Peischel
Joe Black	Dr. Charlotte Clifford Rathert, DVM
Dr. Steve Hart	Dr. Beth Walker
Gary Jones	Stuart Weiss
Bruce Lane	
Janice Neighbor	

We would also like to thank NCAT staff members Karen Van Epen, Rex Dufour, Tracy Mumma, and Lee Rinehart for their review.

An Illustrated Guide to Sheep and Goat Production
By Linda Coffey and Margo Hale
NCAT Agriculture Specialists
© 2008 NCAT

Robert Armstrong, Illustrations
Robyn Metzger, Production

This publication is available on the Web at:
www.attra.ncat.org/attra-pub/sheep_illus.html
or
www.attra.ncat.org/attra-pub/PDF/sheep_illus.pdf

IP330
Slot 323
Version 101508