

GETTING STARTED IN THE MEAT GOAT BUSINESS

Bulletin I, Vol. IV



Establishing the Meat Goat Facility



by

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To My Producers

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New publications from the "Getting Started in the Meat Goat Business" series are coming soon

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INTRODUCTION

When starting a meat goat enterprise, it is important to develop a good facility plan and to purchase the appropriate equipment to operate your farm efficiently. Adequate facilities are required to confine and protect the herd from predatory animals as well as to provide an area for shelter, feeding and kidding. This is especially true if kidding occurs during periods of inclement weather conditions. Careful consideration must also be given to how the animals will be restrained and controlled during



Fig 1. Restaining the animal for routine management practices.

routine management practices such as hoof trimming, ear tagging, administering medications and weighing. If handled properly, goats are less likely to become stressed and obtain injuries that can seriously affect productivity in the herd.

The facility designed for meat goats should include plans for building fences, shelters, a catch pen, a working chute (optional) and a storage shed. It is also important to identify where these structures will be located on the farm to save on labor and energy and to provide the best view and shelter from the wind, cold and rain (see appendix A).

Selecting the Facility Site

If you need to acquire land to start your operation, contact the county planning commissioner's office to find out which land is zoned

for agriculture. Land located near residential or industrial areas may have some restrictions placed on it related to animal and chemical use. If you are considering purchasing land, it is also important to determine the following: 1. How the borders of the land are defined; 2. If the land is suitable for farming; 3.) How much fencing is required for the property (Humphrey and Mussen 1994); 4. If the land is accessible to electricity and water and 5. Does the land have the tendency to flood. When goats are penned in areas that are prone to flooding chances are they will develop foot rot or other infectious diseases.

If you need to obtain soil survey maps of your land, contact the county extension office or the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) in your area for assistance. NRCS also sponsors the Environmental Quality Incentive Program (Eqip) that provides financial and technical assistance for eligible participants. The EQIP program can provide assistance for cross fencing, overseeding pastures for winter grazing and the installation of a well for your livestock if you qualified for funding. The Eqip program is a cost-share initiative and contracts are selected on a competitive basis annually (NRCS, 2005).



The Buck's Facility

On the goat farm, the buck's facility should be at least 400 feet away from the rest of the herd. A 6 x 8 shed, facing south easterly and downwind from the does' area are the basic requirements for the buck's shelter. The size of the shed will also depend on how many bucks will use the shelter. The shed should be sturdy and enclosed with a fence to construct a small pen or loafing yard for grazing and to limit the buck's range. You may also want to build a mound of dirt (5 to 6 ft tall and 5 x 5 ft. wide at the top of the mound) in the center of the pen to provide exercise and to prevent the buck from being bored. This mound must be 8 feet away from the fence line, so the buck can not jump out of his pen (Esminger, 2002).

The pen must also be strong to keep the buck in the facility and away from the does in heat. If he escapes, chances are the buck will get into the does' area and breed the herd at the wrong time, breed his own offsprings and/or breed the younger goats (less than 80 pounds) in the herd which may stunt their future reproductive performance. Unplanned pregnancies can also make it very difficult to maintain accurate production records, to develop a good breeding program, to evaluate reproduction efficiency in the herd and to fulfill production and marketing goals.

The Does' Facility

The does' facility should be sturdy and large enough to accommodate the entire herd because goats tend to fight more when they are confined in over crowded shelters or pens. Head butting is a common display of aggression among goats. Normally, neither parties are injured; however, in some cases the fighting may resort to blows in the abdominal area or rear of the opponent animal. This type of trauma can lead to abortions in pregnant does or other injuries such as severe bruising or puncturing of the skin. Therefore if the does or buck will be confined, provide 20 to 30 square feet of space per animal for sleeping and eating. Provide an additional 30 square feet for exercise. Does that are not confined require less space (10 to 15 square feet of space per animal; McGowan, 1986). For an example, if the animals are confined, a 8 x 16 (ft.) three-sided shed is sufficient space for 4 to 6 mature goats. If they are not confined and have access to pasture, 8 to 12 adult goats can share this shelter, but maintain a stocking rate of 7 to 10 goats per two acres of land for year-round grazing. This rule of thumb should also be applied when providing shelter for the buck.

Fighting may also occur when the goats are establishing the pecking order in the herd, when new animals are introduced into the herd or when there is not enough space around the feeding trough. In many cases, the smaller and/or weaker animals may be pushed away from the feeding trough. As a result of this type of treatment, the goats are usually much thinner and less productive than the rest of the animals in the

herd. This situation may be resolved by: 1 Removing the aggressive animals to a separate area during feeding time, 2. Feeding the smaller and weaker animals together, 3. Feeding the herd in individual stalls (labor intensive); 4. Culling the aggressive animals, 5. Feeding the herd outside of the shelter whenever possible or 6. Provide at least 16 linear inches (12" for kids) of space for each adult animal at the feed trough (Juergenson, 1971).

The Kids' Facility

After weaning, a separate area may be required for the animals that are kept for replacements or for animals that will be held and marketed at a later time. If males are kept beyond 4 months of age, keep them separate from the females. The shelter should be structural sound, and have adequate space. Make sure all of the goat areas are accessible to water and electricity, if electric fencing is desired.

Shelters for Goats

Goats can adapt and reproduce under various environmental conditions. In many cases, a simple house will suffice in areas where the weather is mild. If the weather is extremely windy, cold or wet then a house with three sides and a good roof may be necessary to prevent respiratory problems or hypothermia in the herd. During the warmer months of the year, adequate shelters may be required to protect the herd from the summer heat. The shelters should be draft-free, dry, facing away from prevailing winds and have access to natural lighting and adequate ventilation. Good ventilation is necessary to prevent the build up of toxic gases, fumes and dust which can be detrimental to the animal's health and performance.

Types of Shelters

Not everyone can afford the luxury of a barn for sheltering their animals. However, shelters for meat goats can be very simple inexpensive structures. Examples of shelters include calf hut-

ches, polydome, quonset, existing farm structures, portable sheds or the three-sided goat house.



Fig. 2 A roof from an old farm building and a gasoline drum which are used for shelter.

Portable Sheds (Mobile Houses)

Portable sheds are relatively inexpensive and cost less than \$300 to build. These sheds can be enclosed on three sides to protect the herd from the cold, rain and wind or they can be constructed without sides and used for shade. Portable sheds are also built on skids which are ideal for using in a rotational grazing system. Unlike permanent structures, portable sheds can be moved with the goat herd as they are rotated from one paddock to another using a small truck or tractor. These sheds are 8 feet



Fig. 3 Portable shed designed by Mr. William Smith, Kingdom Links International, Inc.

in width. The front eave is 4 1/2 feet in height and the rear eave is 3 1/2 feet in height. The shelter can provide enough space for 3 to 4 adult goats. For a schematic drawing of the portable shed refer to appendices D and E.

The Three-Sided House

The three-sided shelter is a permanent structure that is enclosed on three sides and

can be used for feeding, kidding and to protect the herd from adverse climatic conditions. Variations of this type of shed are widely used throughout the U.S. The size of the shed will depend on the number of animals that will have access to the house. The roof of the house should be slanted (front eave 6' to 8' high and rear eave 4' to 6') and adequate drainage must be provided around the shelter to prevent the accumulation of water in the loafing area. The house should open to the south or east, preferably in the opposite direction of the winds and towards



Fig. 4 The front view of a three-sided house.

the sun. In this way, the herd will receive warmth from the rising sun during the morning hours and by midday the sun will begin to set behind the house to provide shade from the heat of the day. Hay racks and feeding stalls can be built along the interior side of the wall. If there is enough space in the shelter, feed can be stored in 180 liter drums (47.5 gallons).

The estimated cost to build a three-sided goat shed will range between \$500 to \$1,600. The cost of the shed will depend on the size of the house, what type of flooring is used and if the house has a loafing yard (holding area used to confine the herd). Refer to appendices B and C for building instructions.

Flooring For Goat Shelters

Typically, dirt floors are used in shelters for goats. Clean straw (3-4 inches in length), low quality hay or pine shavings are often used for bedding. Concrete floors on the other hand, are easy to clean and disinfect. These floors are also good for keeping the animals hooves tri-

mmed, but will not altogether replace hoof trimming.

Wooden floors will eventually splinter, chip, swell, peel, rot, warp, bend or crack. thus, making them unsafe to walk on. Wooden floors are also prone to absorbing and trapping microorganisms on its surface. These organism are difficult to dislodge by simply rinsing them. Once trapped, the bacteria will survive in a dormant stage for long periods of time.

Slotted floors work best in goat sheds that are built high off the ground. The manure will fall onto the ground through the slots in the floor. Thus, the shelter is cleaner, drier, and healthier for the animals. The manure should be removed periodically to prevent the build-up of ammonia or other toxic fumes that can be harmful to the animals. If desired, the manure can later be used for compost.

The Catch Pen

Catch pens (holding area) are convenient for handling or restraining the herd. The pen should be small to limit the animals movement. It can be assembled using cow panel (welded fence wire) and wooden post or T-post (see figure 7). The pen can be portable or installed permanently depending on your need. Another option is to build a loafing yard to enclose the goat house. This yard can be used to confine and secure the herd overnight or when there is no one around for extended periods. The loafing yard can be built using wooden post, fence wire and cow panel. The panel should be installed at least 6 inches into the ground or 4 inches deep on concrete floors. Fence wire can then be stapled to the exterior side of the post to prevent the goats from sticking their heads through the openings of the panel. A small catch pen can also be built inside of the loafing yard for working with the animals (refer to appendix C).

Working Chute (Raceway)

It may also be helpful to build a working chute to assemble the herd for treatments. The chute can lead the goats from the crowding pen to the

holding chute. The chute should be at least 10 feet long, 4 feet high and between 18 to 22 inches wide. Longer chutes can cause crowding and trampling at the front end of the raceway. The chute should be divided into sections with sliding gates to channel the herd into the working area. The sides of the chute should be solid to prevent outside distractions and to prevent the animals from jumping out of the chute. A series of canvas flaps should be suspended half way down into the chute to help keep the goats heads down (Harwell and Pinkerton, 1993).

A portable scale can be placed at the entrance of the releasing pen to weigh the herd or a head gate with a cage can be substituted for the scale to restrain the goats during deworming and vaccinating. After the task has been completed the animals can be moved back into the pen as shown in appendix F.



Fencing for Goats

Goats are quite curious, agile creatures that love to climb. Therefore, adequate fencing is necessary for keeping the goats in and the predators (i.e., feral dogs, coyotes, bobcats, the family pet dog) out. The key is to limit the range of the herd by confining the animals into a fenced in area. Like most livestock, goats will test the fence to find a way to escape. A good fence is therefore, extremely important and one of the most expensive investments in establishing a facility for goats. The cost of building a fence is generally affected by the shape of the paddocks, the distance of the post (8-12 feet) and the type of materials that will be used. Regular wooden post (pressure treated) can be substituted for metal-T-post; and in some cases, fiberglass post, rebar or step-n-post may be used for fencing materials (refer to appendices H-I).

Conventional Fencing

The conventional fencing system involves stapling woven wire (48 inches wide) to the interior side of the wooden post. Two strands of barbed wire are then stapled above the wire near the

top of the fence post to form the perimeter fence. A third strand can be stapled to the post close

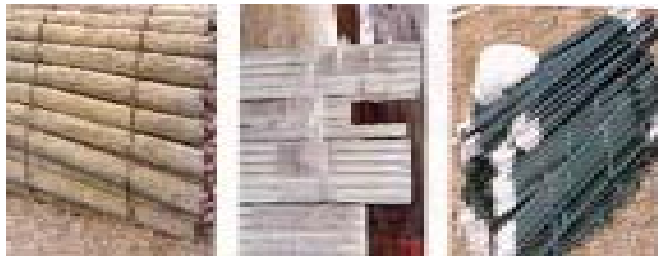


Fig. 5 Wooden posts (left) fiberglass posts (center) and metal T- posts (right).

to the ground to keep predators from crawling under the fence.

The perimeter fence is the first line of defense against predators. It is usually permanent and can last for years if properly installed. This fence can be divided (interior fence) into half acre blocks (or larger) to establish a rotational grazing system that includes grasses, forbs and browse (woody or bushy plants) to meet most of the nutritional demands of the herd. Some of the

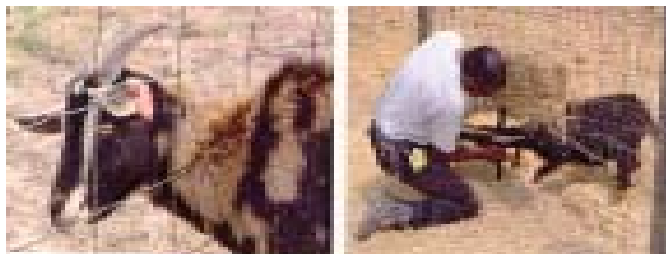


Fig. 6 The doe is stuck in the fence wire and requires assistance to get free.

benefits of a rotational grazing system include the ability to control overgrazing and to reduce disease outbreaks in the herd.

From a goat's perspective, "the grass is always greener on the other side of the fence." Because of their curious nature, goats with horns can often be found with their heads stuck between the openings in the fence wire. This problem may result in the animal hanging itself in the wire while attempting to get free, the animal may become vulnerable to predator attacks while entangled in the fence wire or over time the fence may sustain some damage. This problem can be prevented by purchasing goat net wire that is specifically made with larger openings (stays are

10 to 12 inches apart) than standard fences (vertical stays are 6 to 8 inches). This type of fence allows the animals to remove their heads from the goat wire without assistance. Other options include taping pvc pipe to the goats' horns (temporary solution), purchasing net with

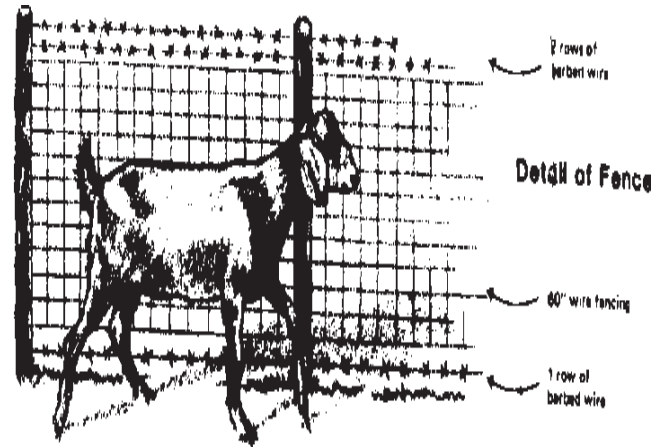


Fig. 7 Conventional fencing and PVC pipe wrapped around the horns of the goat in the picture below.

with smaller openings than standard fences (3 inch stays), dehorning the animal or substituting the barb wire for smooth electrified wire. To control predators, the wire should be installed on the exterior side of the post at least 8 inches above the ground (see figure 13). The electric wire will also prevent the animals from sticking their heads through the wire to graze along the fence line after they have been shocked a couple of times. This wire can also be installed on the interior side of the post.

Electric Fencing

Electric fencing is probably one of the best methods of confining your animals while keeping intruders out (see fig. 14). This type of fencing is made up of seven electric wires alternating between charged and grounded (not charged) for the first five wires and charged for the last two wires. The wire should be high tensile (12 1/2 gauged), spaced 6 to 8 inches

Hog, Sheep, Goat and Predator Control Fence.

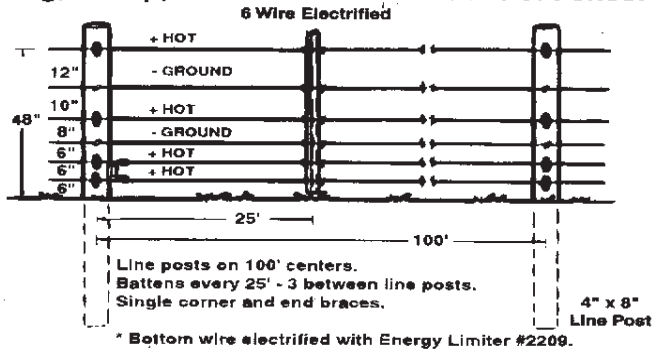


Fig. 8 Diagram of electric fencing.

apart near the ground and spaced 8-12 inches apart for the top strands. The height of the fence should be at least 48 inches tall.

The effectiveness of the fence will depend on its ability to deliver a painful shock without causing permanent harm when an animal, human or predator touches it. The electric fence requires three basic components: the fence design, the energizer (charger) and the grounding system.

The fencing design will depend on the type of animal that will be controlled, the materials used and the characteristics of the site (i.e., soil moisture). The energizer is used to send an electric current through the fence line. A voltmeter can be used to determine if there is sufficient voltage on the fence to control the goat herd. A charger that emits at least 4,000 volts of electricity is generally sufficient for goats (Schoenian, 1999). Lightning arrestors and surge protectors are also recommended to reduce the damage that can occur to the charger and fence line.

Solar-powered chargers are another option for areas that have no access to electric. Some solar chargers cannot handle a lot of weeds or brush because they have a small gel battery with a two to five watt solar panel. After a few years, the battery may also require replacing. If there is a problem with a new solar charger, be sure the panel is not in the shade and is directly facing the sun at noon.

Electric fencing must also be properly grounded, for the charge to complete its circuit and effectively shock intruders. If the ground is very dry, you may need more than three eight foot ground rods. Ground rods should be ten feet apart and at least forty to fifty feet away from other existing rods (Kencove, 2004).

Electric Portable Netting

Electro portable netting is lightweight (8-13 lbs. per 164 ft.) and gives you versatility to control grazing and the ability to make temporary paddocks, pens or to construct temporary interior fences. It is also easy to install on fence curves, corners, hills, dips and can act as its own gate (Premiere 1, 2003). Electric netting is a prefabricated fence of electroplastic twines, plastic posts (every 12 ft.) and vertical plastic struts (every 12 inches). When energized, the results are an impenetrable mesh of electric wires from 35 to 42" in height depending on the type of netting that is purchased.

Occasionally the goats may become entangled in the netting. When this occurs, the animal may receive a bad burn or it may die. Entanglement



Fig. 9 Checking the charge on the fence (left) and electric portable netting (right).

can be prevented by the following: 1. Never allow the goats on both sides of the netting at the same time; 2. Never use the netting to separate the does from their offsprings; 3. Never allow animals to be driven against the net; 4. Never leave the netting off when the herd is near because the animals may lose their fear of it (Premier 1, 2001) and 5. Always make sure the charger is on and has adequate voltage before the herd has been released into the paddock for the first time. Once the animals are shocked a few times, they will quickly learn to avoid and respect the fence line.

Gates

Gates should be the right size for the fence opening to prevent the goats from escaping from the facility. The gate entrances should be wide

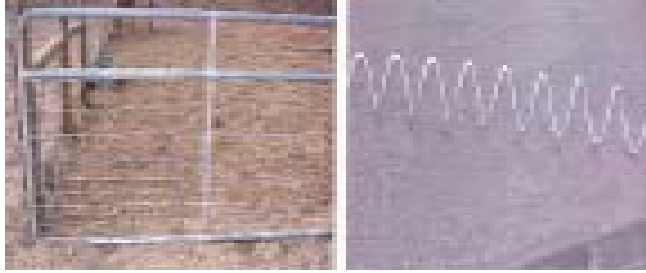


Fig. 10. A farm gate (left) and a wire panel hinge (right; sold by Premier 1).

enough to allow a tractor in for disking and planting pasture grasses and legumes or for transporting animals, feed and equipment. Hang



Fig. 11 Use nylon rope to secure the panel to the post.

the gates low enough to the ground to prevent predators from crawling underneath the gate.

Generally, gates are from 8 to 12 feet wide and cost between \$50 to \$150. A gate can also be constructed using cow panel (fence welded wire) and wood or just cow panel for the interior gates (see figure 18 and 20). Wire panel hinges can be used to hang panel gates. The hinges can be reinforced at the top of the gate using a nylon rope (Premiere 1, 2003)

Storage Shed

When feed and hay are protected from the weather it can be stored indefinitely with mini-



Fig. 12 A small storage shed.



Fig. 13 Square bales (left) and round bales (right) of hay (Ball, D. et., 1998).

imum nutrient losses. A storage shed can be built to protect the hay and feed from various environmental conditions. The size of the shed will depend on the kind of feed that will be used, the climate, the proportion of feed that will be produced on the farm, how much hay will be required to feed the herd during the winter months and if the shed will also be used to store equipment.

Round bales can be placed on top of crushed rocks, a concrete slab, wooden pallets or on any surface that keeps the hay from making direct contact with the ground to reduce deterioration. Line the round bales in rows that run north and south with the flat ends of the bales touching each other (fig. 21). Unless a cover is used to protect the hay from the rain, never allow the rounded ends of the bales to touch. This will allow the water to drain properly and prevent the hay quality from declining. The hay should be stored in sunny areas and never in flood zones or

under trees (Ball et. al., 1998).



Fig. 14 A feed bin holds 1/2 a ton of feed.

Feed can be stored in containers with a close fitting or hinged lids to prevent the entry of rodents or other vermin. Materials used should be waterproof to prevent the feed from spoiling. Plastic pickle barrels or metal garage cans, preferably the latter, are convenient for storing small amounts of feed (up to 250 pounds). These storage containers can be purchased at a feed store.

Equipment

Over the last twenty years, there has been a dramatic increase in the number of farmers raising goats for meat production. Sydell (manufacture of sheep and goat equipment) and other companies are now selling equipment especially designed to assemble, handle and

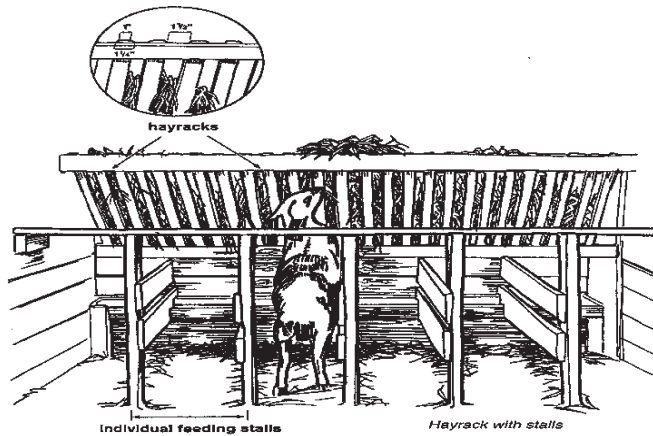


Fig. 15. Individual feeding stalls.

Feed bunks, upright silos, grain bins, or trench silos are also useful for storing larger quantities of feed.

Feeders

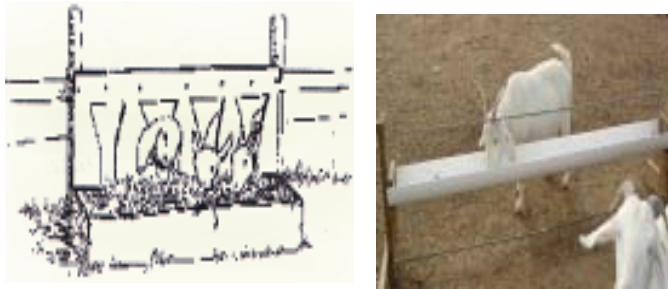


Fig. 16. A key hole feeder (left) Sinn, 1989 and a feeding trough made with pvc pipe.

Feeding directly from the ground or allowing the goats to sit, stand, urinate or defecate in their feeding trough is considered wasteful and unsanitary. This type of management can quickly lead to the spread of contagious diseases in the herd. There are several ways feed and hay can be provided for the goat herd. This includes hog feeders, buckets, feed troughs, pans, creep feeders, key hole manager, hay baskets, hay racks, hay mangers and individual feeding stalls. Trough's can also be constructed using pvc pipe cut in half lengthwise (8 inches in diameter) and placed inside a wooden stall for support (see figure 25). This type of trough is easy to keep clean and disinfect and can last for several years.



Fig. 17. A headgate with chute (Sydell, 2001).

restrain sheep and goats during routine management practices. Corrals, head gates, stanchions (fitting stands), weighing scales and



Fig. 18 A head and cage on the left and a stanchion (right).

chutes are some of the equipment that is available for goat producers. A trailer will also be required to transport the animals to livestock auctions or to special sales. Cattle trailers can be very expensive therefore, check the classified ads in the local newspaper for used farm equipment that may cost less to purchase.

Protecting The Goat Herd

If predators are a serious problem on your farm, it may be to your advantage to purchase a guardian animal to provide extra security for your livestock. According to the USDA (bulletin, 650), predators caused \$27.4 million in losses to the sheep and goat industry in 1990. While coyotes and bobcats are a problem in some areas, wild dogs and even the family pet dog can annihilate the entire herd in a short period of time. Because of predation problems,



Fig. 19 A doe that was attack by a pack dogs and lost both ears.

a growing number of producers are purchasing guardian animals (i.e., llamas, burros and dogs) to protect their goats and sheep.

Burros

Some producers have found that burro's are very effective in protecting their goat herd from predators. Other producers have not found this to be true. In fact, it has been



reported that burro's are effective against predators if the herd is in the same area as the guardian animal when the attack occurs. Furthermore, burro's have also been known to chase and stomp the younger animals in the herd to death. Therefore, the following guidelines may be helpful in using burro's as guardian animals: 1. Use a jenny (female) or a castrated male; 2. Use only one burro per group of animals; 3. Place the burro with a group of goats for a few hours each day shortly after birth; 4. Allow 4-6 weeks for a naive burro to bond with the herd; 5. Remove burro's during kidding to prevent accidental injuries; 6. Test new burros response to dogs

and 7. Use burro's with a small herd of goats, less than 300 (USDA- APHIS , Bulletin).

Canies

There are many breeds of dogs (i.e., Great Pyrenees, Komondor, Akbash, Maremma and Anatolian Shepherds) that are used to protect goats and sheep from predators. A good livestock guarding dog stays with the animals without harming them and aggressively keep intruders out (USDA, Bulletin 650). Guardian dogs are com-



Fig. 20 The Great Pyrenees (left) and the Komondor (right)..



Fig. 21 The Maremma (left) and the Anatolian Shepherd (right).

monly used to confront and chase away intruders. However, at the same time they must be able to be handled for routine vaccinations and deworming.



Fig. 22 The Akbash

the rest of their lives. This socializing period gives

the animal a chance to bond with the herd. The number of dogs required to guard the herd will



Fig. 23 Guardian dogs with a Boer buck.

depend on the size of the pasture and the terrain. If the terrain is hilly, rough or bushy this will require the dog to work harder, thus more than one dog may be needed to patrol 400 acres of land (USDA, 1994).

1994).

Before purchasing guardian animals, find a reputable breeder. The local goat associations or extension office may be able to provide you with a list of reputable animal breeders. The typical price for guardian dogs range from \$200 to \$450. Refer to the chart in appendix G to determine which breed will best meet your needs.

Dead Animal Disposal

All livestock operations will experience losses due to death. The Solid Waste Disposal Act (SWDA) of Florida, states that disposal of dead animals including diseased dead animals must be conducted in accordance with all other federal and state laws and regulations. Dumping of animal carcasses on the road or right-of-way or any place where the carcasses can be devoured by beast or bird is prohibited in the state of Florida. Violators of the SWDA are subject to charges of a second degree misdemeanor. Therefore, dead carcasses (i.e., horses, cattle or goats) due to disease must be disposed of by burning, burying or by delivering the carcass to a licenced rendering company.

Types of Dead Animal Disposals

1.) Rendering is the process of cooking raw animal materials to produce other products (i.e., bone

meal). The type of carcass and volume will determine if this option is feasible for you.

2.) Incineration is an acceptable method of disposal if performed properly. Economics must be considered as large amounts of energy are required to achieve a proper burn. Check with your state's Department of Environmental Protection to determine if a license is required to install and use a incinerator in your area.

3.) Burial Pit is a common method for managing dead animals. Do not construct burial pits in porous soils or in areas with a high ground water level or shallow aquifers. Keep the bottom of the pit at least 3 feet above any water bearing formation. Do not place burial pits in areas subject to flooding. Locate burial pits in medium to fine textured soils at least 295 feet away from a body of water or well and bury the carcass at least 2 feet below the surface of the ground.

4.) Other Methods of dead animal disposal include refrigeration (for holding the carcass temporary to be rendered or burned) or composting, however, check with your state to find out which methods are permissible. If death losses results from a reportable disease, contact the state veterinarian or your county extension office to determine if the disease needs to be reported and to establish a safe method of disposal which should halt the spread of the disease.

In order to avoid air, soil and water contaminations and complaints from your neighbors, decide how you will dispose of your animals if they should die. This decision should be made before you purchase any animals for your goat facility.

A Final Note

Understanding how goats think and reacts in certain situations will definitely be helpful in designing your facility. A great deal of thought must also be given to developing a facility that has good visual appeal, especially if your animals will be sold directly from the farm. Fences, shelters, storage facilities and gates

should always be kept in good repair. The facility should be free from debris such as hardware, feed bags, manure, appliances, bottles, broken glass, needles, cans, auto parts or other

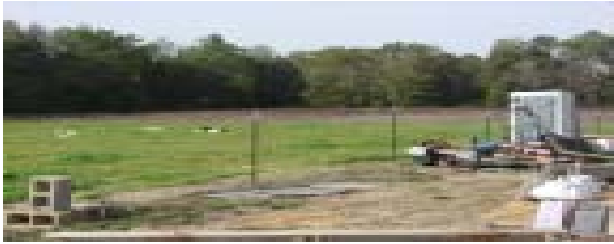


Fig. 24 Wooden boards, cylinder blocks, old appliances etc. are lying around the facility. materials that can affect the aesthetics' of the farm.

A disorganized and unsanitary facility can create a breeding ground for disease, insect and rodent infestations and affect your business opportunities. Other producers and customers may decide to take their business elsewhere because naturally they will assume that



Fig. 25 Wooden boards with nail protruding outward.

your animals were managed in the same manner as your facility. An untidy facility and poor management practices can also increase consumers' risk for developing food borne illnesses from eating products produced from your farm.

In recent years, it has been recognized that most food borne related illnesses (i.e., *Salmonella*, *Listeriosis*, *E. coli H0157:H7*) start on the farm. Once an outbreak occurs, efforts are made to trace back where the meat was processed and the farm the animal (s) originated from. In most cases, the remaining animal(s) on the suspect farm will be quarantined and/or destroyed. These measures are taken to prevent the further spread of the disease. Unfortunately, an incident of this nature may destroy your reputation and ruin any future business prospects.

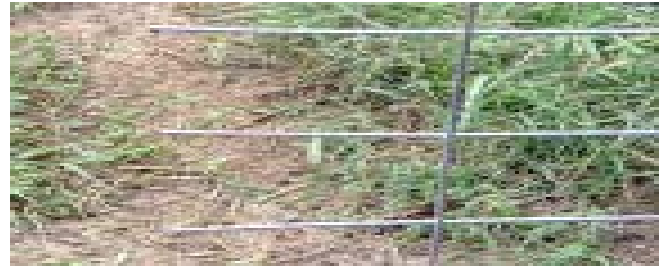


Fig. 26 A young goat died after it was impaled on the sharp prongs of this cow panel.

A farm that is in disorder can also lead to safety issues for man and animal alike. In the U.S. today, the number of personal injury suits are increasing at an alarming rates. Studies revealed that 95% of the court cases involving injuries results in damages being awarded. The types of situations from which claims might arise against personal liability insurances include suits for personal injuries caused by animals, equipment or personal acts (Esminger, 2002). Injuries can also occur to livestock, especially if nails and other sharp or pointed objects are left in the field (see fig. 37).

Therefore when developing a facility plan, careful thought should also be given to animal and public health issues as well as preventing hazardous conditions on your farm. The proper drainage systems, pest control (i.e., rodents, birds and insects), manure removal and disposal of dead animals must also be taken under consideration.

References

1. Ball, D. et. al., 1998. Minimizing Losses in Hay Storage and Feeding. Auburn University, Auburn, AL. Circular 98-1.
2. Esminger, M.E. 2002. Sheep and Goat Science, 6th edition. Interstate Publisher, Inc., Danville IL.
3. Harwell, L. and F. Pinkerton (no date). Housing, Fencing, Working Facilities and Predators. [www. goatworld.com/articles](http://www.goatworld.com/articles)
4. Humphrey, S. and Eric Mussen. 1994. Small Farm Handbook. Small Farm Program, University of California, Division of Agriculture and Nature Resources. Publication SFP001.

5. Juergenson, E. 1971. Handbook of Livestock Equipment. Interstate Publisher, Inc., Danville IL.
6. Kaufman, P. and D. Rutz. 2000. Pest Management Recommendations for Sheep, Goats, and Swine. Department of Entomology Cornell University.
7. Koehler, P.G. and J.F. Butler. Revised 2002. External Parasites Around Animal Facilities. Publication ENY-255. Uni. of Florida, IFAS Extension. 8. McGowan, C.H., Circular 644. Raising a Small Flock of Goats for Meat and Milk.
9. Microsoft Cliparts, 1995.
10. Schoenian, S. 1999. Facilities and Equipment for Commercial Meat Goat Production. University of Maryland Coop. Ext. www.sheepandgoat.com/articles/goathouse.htm
11. Sinn, R. 1986 Raising Goats for Milk and Meat. Heifer Project International.
12. Texas Agriculture Extension Service. Benefits and Problems (No date).
13. United States Department of Agriculture. 1994. bulletin 650.
14. Well, A. 1999. Integrated Parasite Management for Livestock. ATTRA: National Sustainable Agriculture Information Center.
6. Sydell, 1-800-842-1369 (goat equipment)
7. Tractor Supply 1-386-752-4256 (fences, feed, gates, etc.)

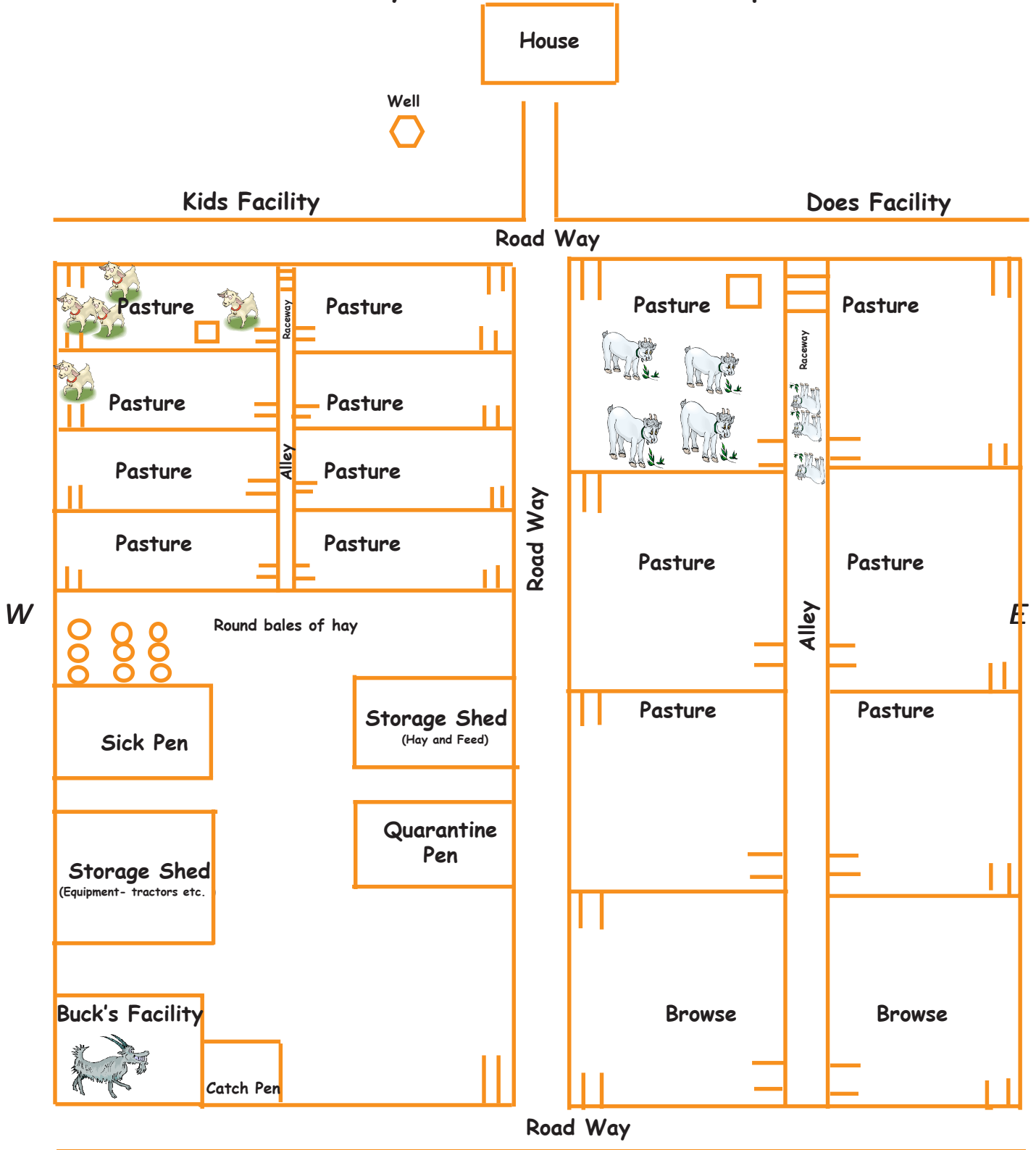
Websites

1. Attra: National Sustainable Agriculture Information Service
<http://www.attra.org>
2. Natural Resources Conservation Service
<http://www.nrcs.usda.gov/>
3. Farm Service Agency
<http://www.fsa.usda.gov.uk>
4. Goats R US
<http://www.goatsrus.com>
5. Florida Meat Goat Association
<http://FMGA.nasumilu.com>
6. Solid Waste Disposal Act for Florida
<http://www.nasda.org/nasda/nasda/foundation/STATE/Florida.pdf>
7. Intervet, Inc.
<http://www.intervetusa.com>

Vendors

1. Flemming Outdoors, 1-800-624-4493(fencing)
2. Gallagher, 1-800-531-5908 (chargers)
3. Jeffers, 1-800-Jeffers (agricultural supplies)
4. Kencove, 1-800-536-2683 (fencing)
5. Premiere 1, 1-800-282-6631 (fencing)

Appendix A N Facility Plan For A Meat Goat Operation



*This plan should only be used as a guideline because one facility design will not work for all farms situations. The landscape and resources will vary between farms (Facility was designed by author of this publication).

Key:  Manure Compost Pile
 Gate  Portable shed

 Dead Animal Disposal Pit

Appendix B

SUGGESTED MATERIALS FOR CONSTRUCTION OF GOAT HOUSING

MATERIAL	NUMBER	SIZE
Lumber	12 - 10'	2 x 4
	4 - 8'	2 x 4
	4 - 10'	2 x 4
	4 - 8'	1 x 4
Post	8 - 8'	2" x 6"
	5 - 10'	2" to 3"
Crimp Roofing Sheets	11	10 ft. GAV S-V
Exterior Plywood	12	3/4 x 4 x 8
Hurricane Fastners	20	
Nails	15 1b	8d
	10 1b	16d

Roofs

Rafters	12 - 2" x 4" x 10'
Purline	6 - 2" x 4" x 18" (4-10') & (4-8')
Sheet Metal	11 sheets 10' long Double V

Two Ends

3 sheets plywood 3/4" exterior

Back

4 1/2 sheets plywood 3/4" exterior

Partitions

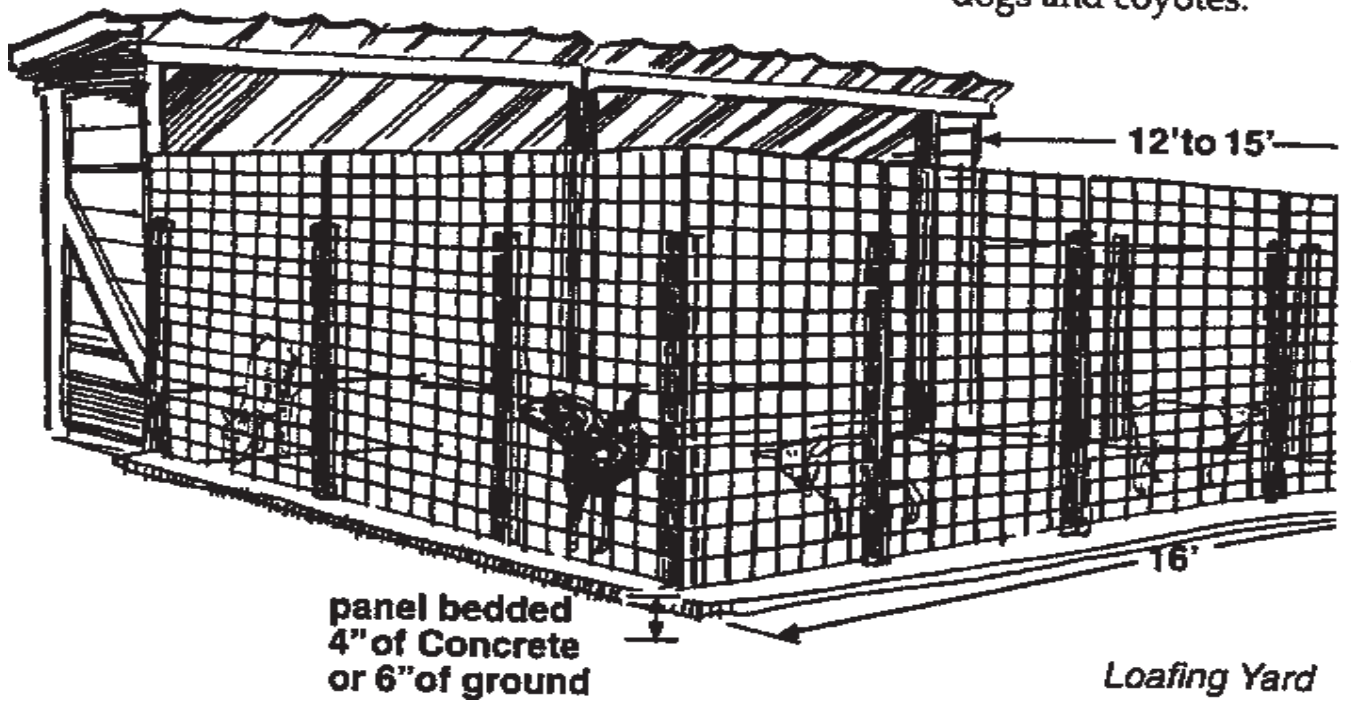
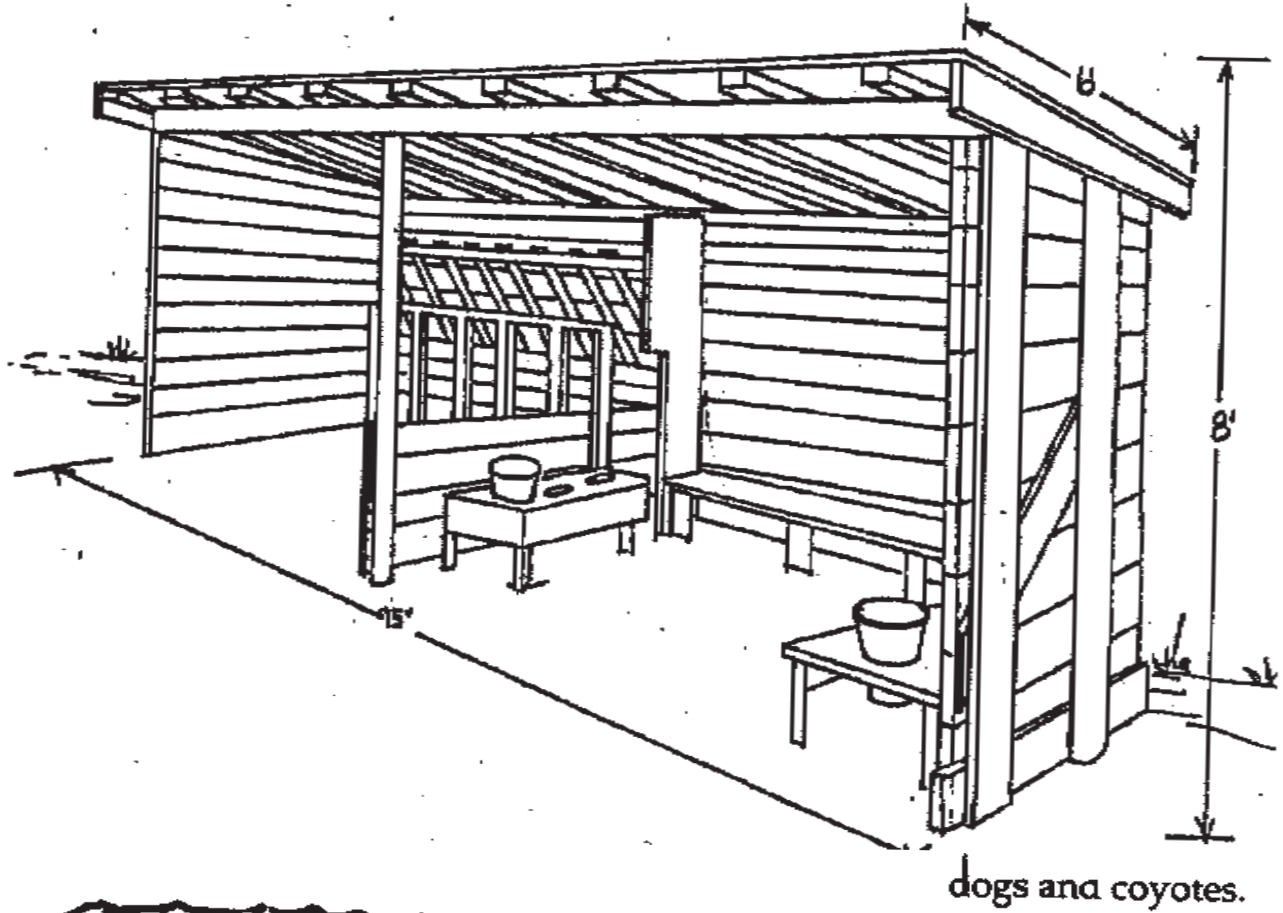
4 sheets plywood 3/4" exterior

Top Still Support

2 x 6 x 68' - (2-10') & (6-8')

Suggested Materials for Construction of Goat Housing (McGowan, 1986).

Appendix C



Schematic Drawing of a Goat House (McGowan, 1986).

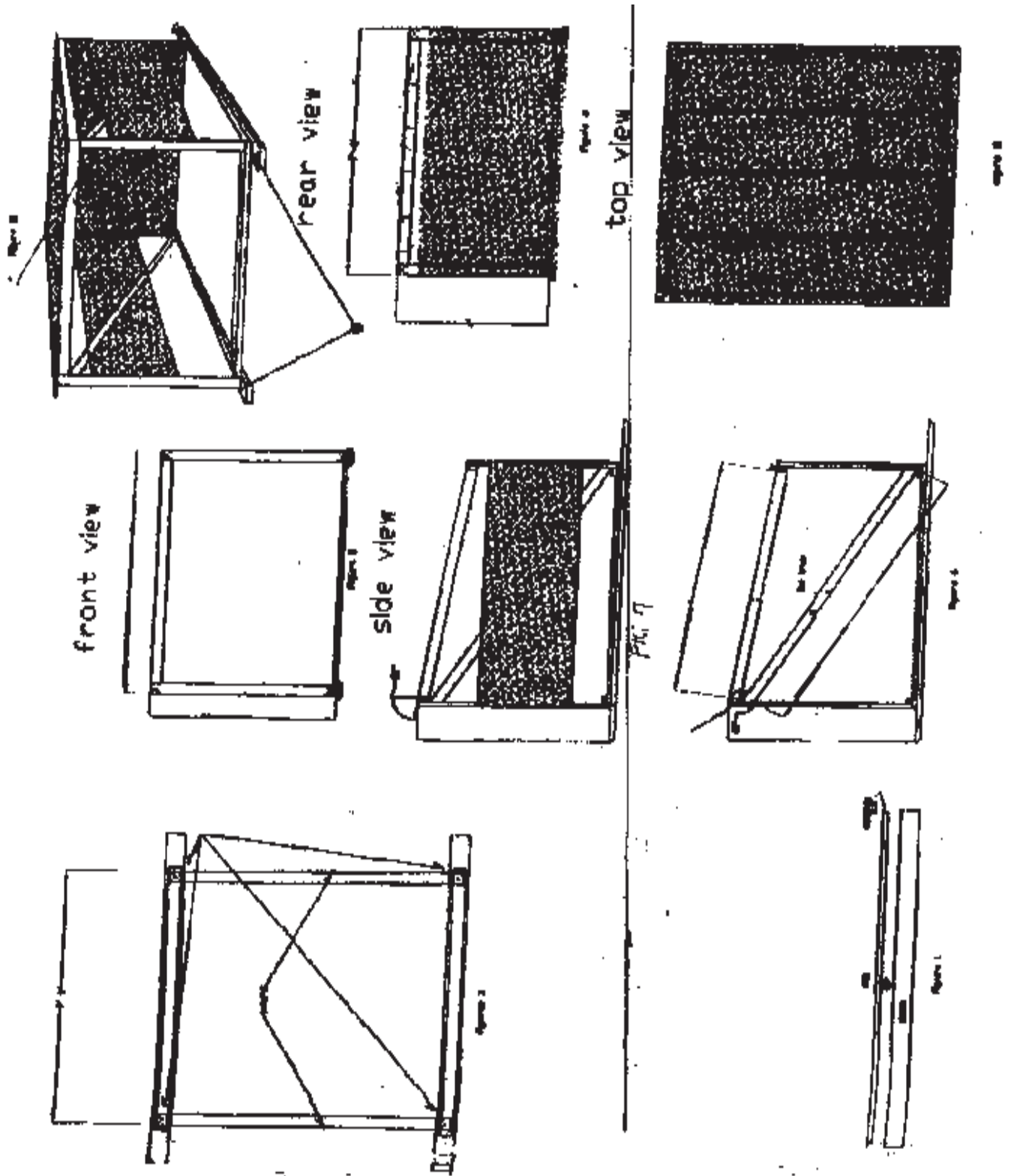
Appendix D
Mobile Goat House
Designed by Mr. William Smith

MATERIALS	
15 - 2x4x8	100 - 3 inch screw galvanized
2 - 2x4x10	30 ft - swing chain
4 - 1/2x4x8 plywood	20 - nail staples large
50 - 1 5/8 inch screws galvanized	1 - tube of corking

* 1 1/2 inch screws for plywood; Use the 3 inch screws for every thing else.

CONSTRUCTION
1. Cut 45 degree angle on both ends of your 2x6x10 (refer to figure 1.)
2. Cut one 2x4x8 in half (two 4ft. pieces).
3. Cut one 2x4x8 into two 3 ft. 10 inch pieces.
4. Attach the 2x4x4 to each side of th front of the 2x6x10 measured 17 1/4' from the end (front will be whatever end you attached them to -see figure 6).
5. Attach the 2x4x3' 10" to the rear of the 2x6x10 measured 17 1/4' from end (which would be the only end left - see figure 6)
6. Cut 10- 2x4x8 into 2x4x7 ft 6 inches Attach one to 2x6x10 at the front fig. 6 Attach one to 2x6x10 at the rear fig. 3 Attach two on each side at top one vertical and one horizontal. Attach four across top from side to side evenly spaced 2' 1" apart.
7. Attach one 2x4x8 for your braces on each side. See fig. 7. Attach one 2x4x7/8" to the back. Use three 3' screws.
8. Cut one sheet of plywood in half. The long way to 1/2x2x7' 6" giving you two 1/2x2x7'x6" pieces. Attach one to each side. Twelve inched from the bottom using 1 1/2 inch screws.
9. Attach two sheets of plywood to the top 1/2x4x8 fig10.
10. Cut 1/2x4x8 plywood to 1/2x4x7' 6"
11. Attach one sheet of plywood to the back of shed 1/2x4x7' 6"
12. Attach 15ft of swing chain to each end of your shed, by using nail staples. Nail to the 2x6x10 (see fig. 11)
13. Use corking to seal the top center of the plywood.
14. Hook your vehicle of choice to this shed and boogie. ●

Appendix E



Schematic Drawing of a Mobile (Portable) Goat House (Kingdom Links International).
Schematic Drawing of a Mobile (Portable) Goat House (Kingdom Links International).

Appendix F

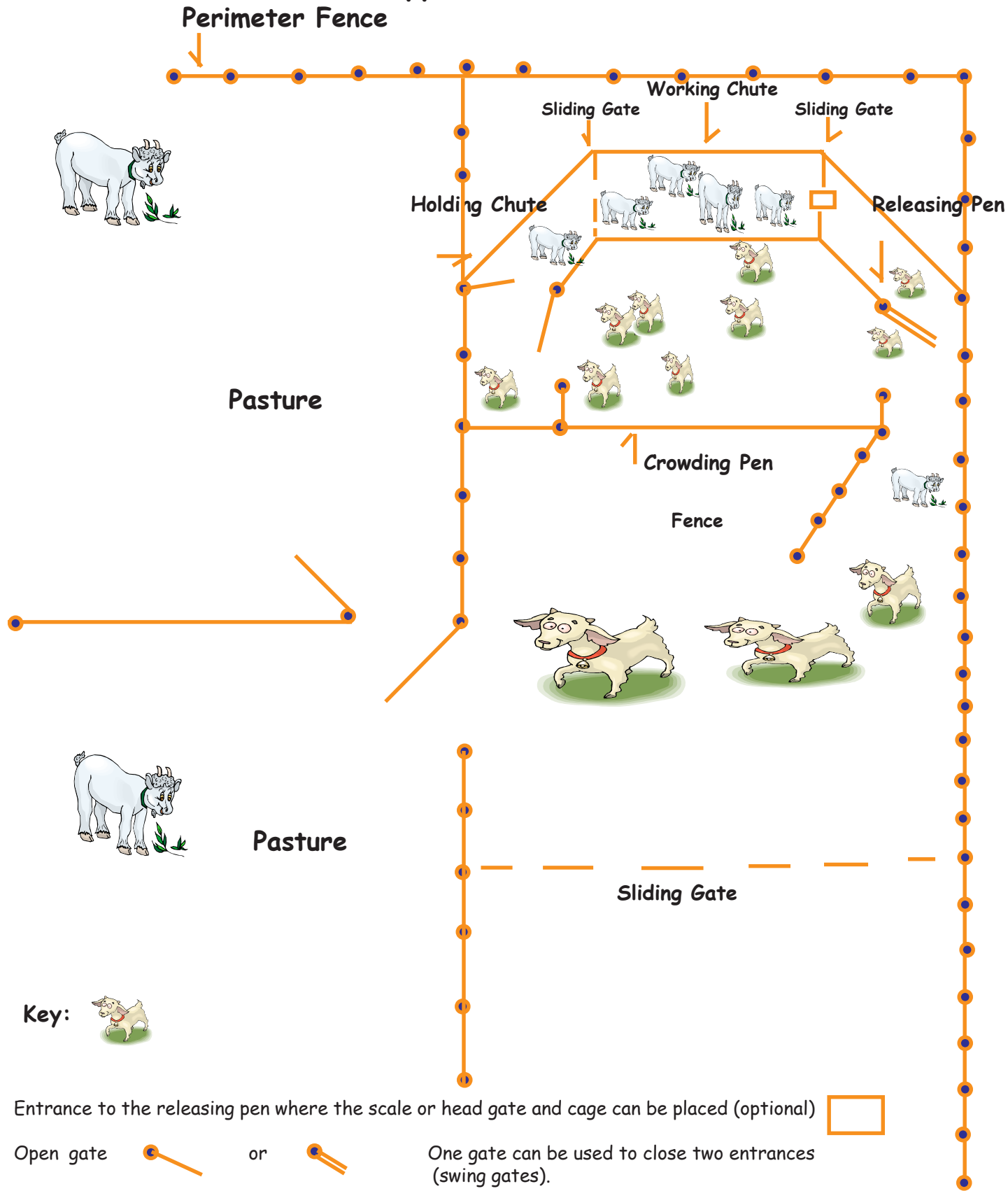


Diagram of a goat facility with a working chute, crowding pen and holding chute which can be modified to suit your needs.

Appendix G

Benefits and Problems (Percent)*

Breed	Number of dogs	Effectiveness			Economics			Slays with Sheep			Aggressive to...			Dog Injuries...			Other Problems		
		Very	Somewhat	Not	Asset	Breakdown	Liability	Mostly	Usually	Rarely	Predators	Dogs	Sheep	People	None	Mind	Major		
Circal Pyrenees	437	71	22	7	83	11	6	53	24	23	95	67	7	4	42	47	11		
Komondor	138	60	1	12	82	8	10	50	23	27	94	77	24	17	38	46	14		
Akbash	62	69	22	9	71	12	12	71	12	17	100	92	20	6	36	49	15		
Anatolian	56	77	13	10	82	8	10	69	16	15	96	86	14	9	42	48	10		
Maremma	20	70	20	10	84	5	11	79	16	5	94	94	20	5	58	24	18		
Sitar	11	40	30	30	50	0	50	30	20	50	88	89	33	25	40	40	20		
Kuvasz	7	57	29	14	80	0	20	33	33	34	100	97	40	0	0	96	14		
Hybrid	23	87	4	9	84	5	11	70	13	17	95	85	18	0	43	38	19		
Ölleri	9	43	29	28	20	20	60	33	17	50	83	100	43	29	17	50	33		
Total	763	71	21	8	82	9	9	55	22	22	95	74	14	7	41	46	13		

Data collected from 399 livestock producers

* With the exception of "number of dogs", all numbers are percentages.

Appendix H

ESTIMATED COST FOR FENCING FOR GOATS

Item

Table 1. Construction Cost of Woven Wire Fence:

Item	Amount	Cost per Unit	Total Cost
Corner Wooden Post (8 inch diameter)	58	\$15.00	\$870.00
Regular Wooden Post (4 inch diameter)	193	\$7.00	\$1,351.00
Staples	30 lbs.	\$1.03	\$30.90
Barbed Wire (3 strands of barb wire)	5 rolls (7,575 ft.)	\$30.00	\$150.00
Woven Wire (48 inch)	8 rolls (2,525 ft.)	\$105.00	\$840.00
Gate (s)	2 (12 ft. wide)	\$70	\$140.00
Labor (estimated)	72 hrs.	\$15.00	\$1,080.00
Total			\$4,461.9

20

Table 2. Construction Cost of Woven Wire Fence:

Item	Amount	Cost per Unit	Total Cost
Corner Wooden Post (8 inch diameter)	58	\$15.00	\$870.00
Regular Wooden Post (4 inch diameter)	26	\$7.00	\$182.00
Metal T-Post (6.5 ft)	167	\$3.00	\$501.00
Clips	34 bags	\$2.82/bag of 25	\$95.88
Staples	10 lbs.	\$1.03/lb.	\$10.30
Insulators (1 per post)	7 bags	\$7.00/bag (25)	\$49.00
High Tensile Wire (3 strands of 12.5 gauge high-tensile wire)	2 rolls (7,575 ft.)	\$70.00	\$140.00
Woven Wire (48 inch)	8 rolls (2,525 ft.)	\$105.00	\$840.00
Gate (s)	2 (12 ft. wide)	\$70.00	\$140.00
Labor (estimated per person)	72 hrs.	\$15.00	\$1,080.00
Total			\$3,908.18

Appendix I

Table 3. Construction Cost of High-Tensile Electric Wire Fence:

	Amount	Cost per Unit	Total Cost
Corner Wooden Post (8 inch diameter)	58	\$15.00	\$870.00
Regular Wooden Post (4 inch diameter)	193	\$7.00	\$1,351.00
Insulators (5 per post)	34 bags	\$7.00/bag of 25	\$238.00
Staples	10 lbs.	\$1.03/lb.	\$10.30
Spring Gate(s)	1	\$10.00	\$10.00
Strainers	20	\$2.00 ea.	\$40.00
High Tensile Wire (5 strands of 12.5 gauge high-tensile wire)	4 rolls (12,625 ft.)	\$70.00	\$280.00
Ground/lightning rods	3 (6ft each)	\$9.00	\$27.00
Cut-out switch	1	\$6.00	\$6.00
Energizer (6 Joule)	1 - 100 mile charger	\$170.00	\$170.00
Fence Tester	1	\$18.00	\$18.00
Labor (estimates per person)	48 hrs.	\$15.00	\$720
Total	-----	-----	\$3,740.30

*The posts in tables 1-3 are spaced 10 ft. apart

NOTES

NOTES

NOTES

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