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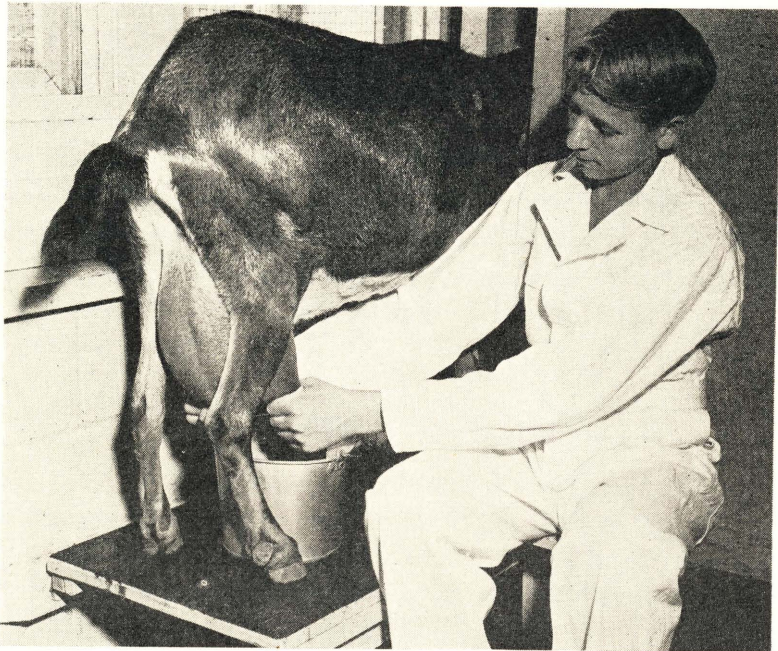
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MARCH 1947

MILK GOATS

By E. C. SCHEIDENHELM AND EARL WEAVER



A good young doe should produce annually approximately 700 quarts of 4-percent milk.

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ACKNOWLEDGMENT

Figures 1, 2 and 3 are used through courtesy of *Dairy Goat Journal*, Columbia, Missouri. All other photographs were taken at Chikaming herd, formerly at Harbert, Michigan, with permission of Mrs. Carl Sandburg.

Milk Goats

By E. C. SCHEIDENHELM and EARL WEAVER*

The handling of milk goats either for family use alone or as an extensive commercial enterprise has developed gradually in the United States. Indications are that such will continue. Unusual interest has arisen in milk goats since 1945 because of the return of war veterans to their former homes or to new homes they were establishing, often in "fringe" areas near towns. In this period, too, many families have been facing difficulties in obtaining desired quantities of dairy products.

Before one decides to purchase even one or two does he must assure himself that he can provide adequate facilities for housing and feeding them. If he contemplates commercial operation he must be certain that satisfactory market outlets for the milk already exist or can be established.

USES FOR THE MILK

Goats' milk is primarily used as household milk for drinking and in cooking though it may be used in the home for making other dairy products, such as cheese, butter, ice cream or sherbets. Some interest has developed in recent years in the commercial evaporation of the milk; the product is in good demand.

Because of the unusual market value of goats' milk for beverage purposes in this country it is not widely used in making the other dairy products. Many times, however, a family with a few goats finds the milk supply is greater than that needed for drinking or cooking. The extra milk is used for other products. Cheese making especially appeals to some. Procedures for making various types of cheese are available in Farmers' Bulletin FB-920 of the United States Department of Agriculture.**

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Because the fat globules in goats' milk are extremely small, the cream does not rise readily nor completely. Efficient separation can be done only with a mechanical separator. For these reasons the milk is not commonly used for butter. Furthermore, goats' butter is quite white unless artificial coloring is used.

An important use for goats' milk is for invalids and infants where difficulties in nutrition have arisen. Many cases respond readily when goats' milk is used. Some adults too are unable to tolerate cows' milk but find goats' milk most satisfactory. It must be realized the use of goats' milk is not restricted to the unusual or abnormal cases. It has a wide range of usefulness for all members of a family.

MEAT

The meat of goats is known as chevon. Young goats furnish meat of excellent quality and palatability though it has a somewhat "gamey" flavor. Some persons do not relish the chevon from older animals.

COMPOSITION OF GOATS' MILK

Goats' milk varies widely in the percentages of its various components. The breed is an important factor that affects the milk composition. Individuals of the same breed also show variations. The season of the year, the stage in the lactation period and the age of the doe also have some influence. It must be realized that the amount or kind of feed does not materially affect milk composition; feeds determine chiefly the quantity of milk that is produced.

At the Michigan Agricultural Experiment Station, Trout reported analyses of samples of milk of three breeds as shown in Table 1.

While the fact is not revealed in Table 1, it must be realized that the milk from the individual goats in each breed varied widely. In the Toggenburgs, for instance, the fat in the milk from different

TABLE 1—*The average percentage composition of goats' milk.*

Breed	Fat	Solids not fat	Total solids	Ash
Nubian	4.41	9.25	13.67	0.94
Saanan	4.18	9.42	13.60	*
Toggenburg	3.54	8.77	12.31	0.90

*Not determined.

TABLE 2—*Comparison in percentage composition of goats' and cows' milk.*

	Fat	Solids not fat	Total solids	Ash
Goats.....	3.84	9.01	12.85	0.92
Cows.....	3.80	8.95	12.75	0.65

does varied from 2.7 percent up to 4.9 percent, with the breed average of 3.54 percent as shown in the table. Variations in fat are larger than in the other components.

Trout also reported analyses on the milk of does designated as of "mixed breeds". These figures are given in Table 2 along with comparable figures for average cows' milk.

Except for the much greater ash content in goats' milk, it is very similar to the milk of cows. While not shown in Table 2, most comparative analyses show the goats' milk contains less sugar. A claim often made that goats' milk is alkaline is not based on fact. Most analyses show that goats' milk is slightly more acid than cows' milk.

FLAVOR

Goats' milk that is properly produced carries a mild, characteristic flavor that to most persons is wholly desirable. A person with quite discerning taste can distinguish between goats' and cows' milk, but a frequent belief that goats' milk always has an undesirable flavor is not correct. With proper feeding and management, healthy does produce milk of choice flavor.

It is emphasized that bucks emit an offensive odor which is especially serious during the normal breeding season. Unless the does and their milk are properly isolated from the buck's premises an undesirable flavor will appear in the milk. Many times, too, the does are treated more as scavengers than as milk-producing animals and are forced to eat many weeds or other unsatisfactory materials which can cause off-flavors.

It is often true also that the facilities for handling only one or two milking goats are not adequate, and that proper milking practices, sanitation, and milk cooling are sometimes neglected. This may lead to the contamination of the milk and result in poor keeping qualities. These unfavorable conditions usually manifest themselves in off-flavors.

ADAPTATIONS

Milk goats are adapted to the climate in any section of this country. They are hardy and able to withstand either severe cold winter or hot, arid summer conditions.

Most goats are in small family herds consisting of only one or two does. Many families can maintain a few goats on limited premises where it would be impossible to keep a cow.

When all costs are considered, it is not possible to produce commercial milk so cheaply from goats as from cows. However, the goats' milk commands a higher price in most markets. Commercial goat dairies offer opportunities in many towns and cities. But no one should expect success by merely procuring a tract of rough, brush or timber land with the hope it can serve as a source of cheap feed for a commercial goat herd.

PROCEDURE FOR A BEGINNER

A person who contemplates goat keeping and who has no experience in the work must first of all reassure himself of his willingness to learn and his desire to handle goats successfully. Problems arise to confuse and bewilder a beginner. However, literature in the form of books, bulletins and magazines is available. Frequent visits and consultations with persons who have experience are of especial benefit. In procuring the first individual animals the counsel of a dependable, experienced person is quite necessary.

EXPECTED MILK YIELD OF A DOE

A good, young 2-year-old doe in her first lactation, or milking period, can be expected to produce an average of over 2 quarts of milk daily for 10 months or 300 days. Thus a total of 700 quarts is considered commendable for a young doe for the entire lactation period. Since a quart of milk weighs 2.15 pounds, this is equivalent to a total production of about 1500 pounds for the period. A doe that is 3 years old when she kids and starts her lactation can be expected to produce about 5 percent more than a 2-year-old. Similarly this increased yield can be expected for each year's additional age up to 6 or 7 years. Beyond 6 or 7 years of age the annual production will decline.

In general, it is desirable that a doe's annual milk yield should exceed her own body weight by at least 10 times.

But it must be recognized the yields indicated above are for individuals that are better than average. It must not be expected that average does will provide such yields even under the care of experienced persons. A beginner could well be satisfied with average yields per doe of 1,000 to 1,200 pounds for a year.

BREEDS

The majority of the short haired goats in this country are the so-called Common or American type, which excludes those animals of the improved breeds. These common goats are of variable colors but with a predominance of white or brown. Both sexes usually have horns. These goats are of medium size, with a rather blocky conformation, and they frequently lack in udder capacity and other dairy characteristics. Few such animals are desirable milk producers, though an occasional one may yield quite well. When the common does are mated to bucks of the improved breeds the resultant grades are quite commendable.

The five more notable improved breeds of milk goats are: French Alpines, Rock Alpine, Nubian, Saanen, Toggenburg.

French Alpine

Animals of this breed are of variable colors from solid white to solid black or these in varying combinations, tints and shades. The color may combine the gray, tan, red, bay or brown. To describe particular combinations breeders often use the terms: con blanc or con clair, chamoisee sundgau. The lighter colors generally predominate on the head, neck, front legs and fore part of the body.

French Alpines are usually hornless, but in this breed horns appear with more frequency than in the Swiss breeds, Saanen and Toggenburg. The French Alpine is a quite sturdy animal, weighing as much or more than the animals of any of the improved breeds. The does often exceed 130 pounds and the bucks 185 to 190 pounds. Records of milk production in this breed compare favorably with those of the Swiss breeds and the Nubians.

As the name indicates, the French Alpines were developed in the mountainous regions of France. Their development in the United States began largely with an importation to this country in 1920. Thus this breed has had the most recent development of any of the breeds in the United States.

Rock Alpine

This breed was originated about 40 years ago and developed by a breeder in California, Mrs. Mary Rock. It is the only breed of American origin among the improved breeds. In characteristics the Rock Alpines are quite similar to the French Alpines. Their records of production are not numerous; neither do the records run as high as those of the other breeds.

Nubian

Nubians were originally developed in Africa. Some of them were greatly improved in England and this stock on importation to the United States was formerly called the Anglo-Nubian. A characteristic of Nubians is the large drooping ear and the distinctly convex nose. The lower jaw protrudes noticeably. They are of variable colors ranging from black to white with intermediate tints and may be spotted. A color pattern like the Toggenburg, to be described later, is objectionable.



Fig. 1. Nubian.

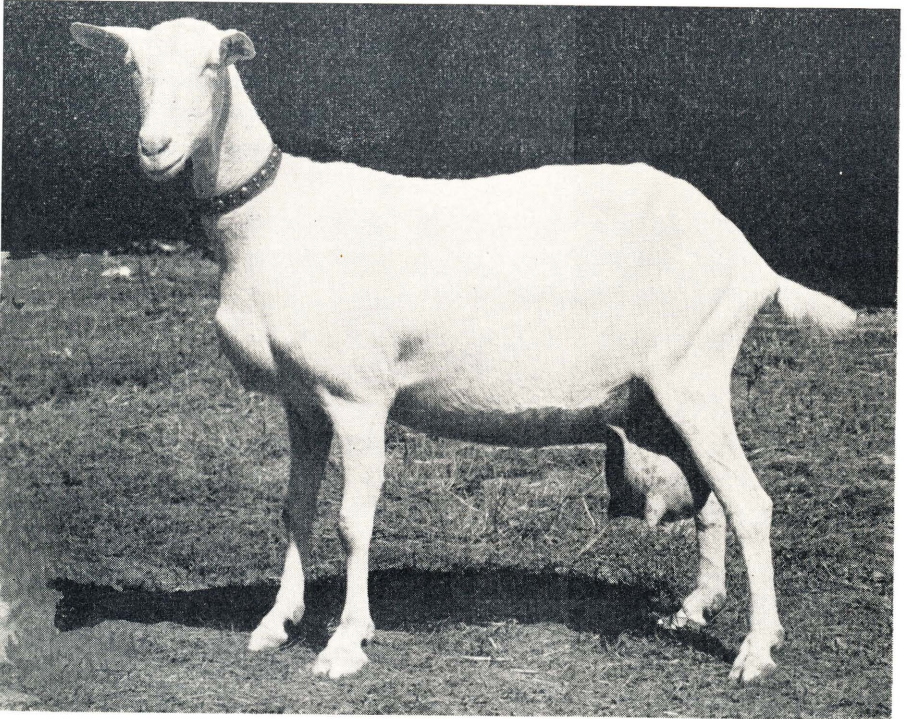


Fig. 2. Saanen.

Nubians are quite notable in their freedom from horns. The does weigh approximately 130 pounds, the bucks 170 pounds. They have quite excellent dairy conformation. Many goat breeders report more ease in getting Nubian does to breed and kid throughout all seasons of the year than seems possible with the does of other breeds. This helps to insure a more even milk supply the year round. It is often claimed that bucks of this breed are not so offensive in their habits and odor as those of other breeds.

As milk producers, the Nubians rank below the Swiss breeds but their milk usually tests higher averaging up to 4.41 percent as shown in Table 1.

Saanen

This breed carries the white color, though a tint of creaminess is permitted. They are usually short-haired except a strip along the back and down on the flanks. They are hornless, the presence of horns being quite objectionable. Saanens are nearly as large as

French Alpines, the preferable weight being above 130 pounds for does and 185 pounds for bucks.

No breed exceeds the Saanen in dairy conformation and productivity. Table 1 shows the average test of their milk to be 4.18 per cent. They play a significant role in the milk goat industry in this country.

The Saanen breed originated in Switzerland. They were first imported to the United States early in this century and their development here has been most substantial.

Toggenburg

This breed carries a prevailing color of either light or dark brown with white or light gray on the underline and the legs below the hocks and knees. A white-brindle mark on each side of the face is a characteristic. The wattles under the neck are conspicuous. Like



Fig. 3. Toggenburg.

the Saanen, the occasional horned Toggenburg is discredited. The short-haired animals are preferred. Long hair is more frequent among bucks and is subject to less discrimination than among does.

The weight of Toggenburgs is slightly less than Saanens, the desired weight of does being above 125 pounds and of bucks above 160 pounds.

Toggenburgs are the most numerous of the improved breeds in the United States. While they are liberal milkers the milk tests lowest of the breeds, Table 1 showing the average test at 3.54 percent.

The breed originated in Switzerland, the first importations coming to the United States over 50 years ago.

REGISTRY ASSOCIATIONS

There are two associations in this country that maintain registries of milk goats:

American Milk Goat Record Association, Sherborn, Massachusetts

American Goat Society, Inc., 1514 Windsor St., Columbia, Missouri
The former association, often designated A. M. G. R. A., is the older, having been established in 1903, the latter, A. G. S., in 1935. The older association has devoted itself not only to the recording of purebred goats but has included attention to high-grade producing animals of unrecorded ancestry. The other society has largely confined its activities to purebred goats which include those that trace to imported stock.

Both organizations have programs for the production testing of individual does and herds. Also both associations have available for distribution numerous pamphlets and bulletins dealing with all phases of the milk goat business.

MAGAZINES

The Dairy Goat Journal, Columbia, Missouri, is published monthly and is effective in assisting milk goat owners. *Better Goatkeeping*, Ipswich, Massachusetts, also published monthly, was established only in 1945 and is proving most attractive and helpful to persons interested in milk goats. *The Goat World* is published monthly at Portland, Oregon.

Many state associations of milk goat owners publish their own magazines and bulletins.

All these magazines, in both their news and advertising columns, furnish information about animals for sale, items of equipment in goat handling, lists of owners and breeders, and methods found effective in handling goats.

STATE ASSOCIATIONS

In most states there are organizations of goat breeders established to render many services needed by such breeders and especially by beginners. Every enterprising, progressive owner of dairy goats should identify himself with his state organization. A prospective dairy goat breeder can obtain the name of the secretary of the state association on request to one of the registry associations or magazines. As previously mentioned above, many of these associations furnish members or inquirers their own magazines or bulletins.

BREEDING AND HANDLING

Normally the dairy goat females will breed only in the fall or early winter. The gestation period is about 5 months or 145 to 152 days; kids are born in the spring. However, it is not unusual to find does that will breed at other seasons. Nubian does will breed throughout a wider seasonal range than the other breeds. With the possibility of breeding some does for kidding in other seasons than spring the desired distribution of milk production throughout the year can be more nearly achieved.

Many owners of milk goats prefer not to breed the young doe, or doeling, until she is 15 or 16 months old. However, if the doeling is well grown she can be bred as early as one year old. The date of breeding should always be recorded so the owner can anticipate with accuracy when the doe will kid.

Just prior to kidding the doe should be given light, laxative feeds. Pasture is excellent. In winter seasons good legume hay serves best. Before kidding a concentrate mixture of oats and bran is excellent. This may be fed dry or as a warm mash. These same feeds are desired too for a day or two after the kids are born.

Usually a doe will need no extra attention in kidding. The proper presentation is for the kid's fore feet to appear first followed by the head. If the doe should labor for several hours without delivery one should determine if the birth is proceeding normally and if assistance should be given. If the owner is not experienced, a veterinarian should be called.

It is well to realize that twins or even triplets may be expected. Older does produce more multiple births than younger does.

A new-born kid should nurse within an hour. The colostrum is a distinct aid to the kid in facilitating the elimination of the first feces, or meconium, and in supplying vitamins that are essential.

FEEDING THE MILKING DOE

The feeding of milk goats involves the same principles and practices as the feeding of milk cows. The amount of feed a goat needs per year is about a fifth or sixth as much as would be used by a cow. Roughly, in a pasture season of about 7 months one doe will use about a fifth of an acre of pasture. During a year's period a doe will need 600 or 700 pounds of hay and about 400 pounds of concentrates, depending upon her producing ability.



Fig. 4. Use of stanchions and feed pails in feeding and watering goats.

The best roughage for goats is good pasture or some crop that can be cut daily and fed green. For winter feeding nothing surpasses good quality legume hay. A doe will eat 2 or 3 pounds daily. Some succulent feed is desirable in winter too. Since silage is seldom feasible for goat herds, some kind of roots or wet beet pulp will be found advantageous. Often because pasture is not available hay must be fed the year around.

There is some controversy whether goats will eat browse such as leaves, twigs and brush or even weeds in preference to grass. In any event these animals can utilize such materials to considerable advantage. To avoid off-flavors in the milk the goats should be kept away from some of these materials for 2 or 3 hours prior to milking.

The suitable concentrate mixture for milking does will depend upon the kind and quality of roughage being fed. With good legume hay the following mixture is suitable:

ground corn	300 pounds
ground oats	300 pounds
high protein concentrate	100 pounds

In this mixture the high protein concentrate may be soybean meal, cottonseed meal or linseed meal or even ground soybeans. The corn or oats can be displaced with wheat, barley or some other cereal. It is important to provide concentrates relatively high in energy value and without too much fiber. With the home-mixed concentrates, salt and steamed bone meal should be incorporated at the rate of one percent of each.

Many goat owners and especially those with only one or two does will find it most convenient to buy a ready mixed concentrate feed such as one carrying 16 percent protein. Such a feed should contain no more than 10 percent fiber. Approximately one pound of concentrates will be fed for each three or four pounds of milk the doe is producing. This will vary with the individual animal and depend somewhat on the kind and quality of roughage being fed.

Water should be supplied the goats at all times.

HOUSING

Most dairy goat owners will need to provide quarters for only one or two does and possibly one or two kids. Twenty-five to thirty square feet of floor space as a box-stall is sufficient for a doe. The kid may occupy a penned-off corner of this for a short time. Hence,

Fig. 5. Slatted flooring hinged at the base. The sections can be raised to clean them. Note the gutter in the left foreground.



the housing for a small herd may not be too elaborate nor costly. A "lean-to" built at the garage or some other building will often be adequate; a small separate shed can be built.

The milking stand requires a space of at least 3 by 4 feet and should be provided in a location convenient to the pen.

Goats do not require much bedding. In fact, they do better on a slatted floor through which the drippings may escape. If there are a number of does to be kept in one pen a drain gutter should be placed in the center of the floor and the platform sloped toward it.

Goats must be kept in dry quarters free from drafts.

Outdoor exercise lots require well built fences. Woven wire or slats are satisfactory and should be at least 5 feet high. Electric fence has proved very satisfactory.

MILKING

The most comfortable arrangement for milking is a stand for the goat with a stanchion, a feed receptacle and a seat for the person doing the milking. (See cover picture.) The stand should be 18 or

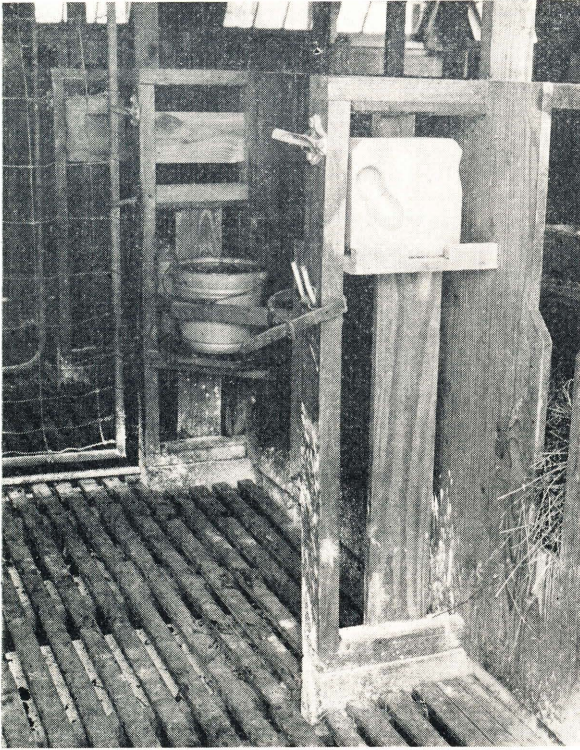


Fig. 6. View through an open gate into an individual pen. The salt block serves two adjoining pens.

20 inches off the floor. The platform for the doe should be 2 feet wide and 3 feet long, with a "run" built up from the floor. A folding type of stand attached to the wall with hinges can be conveniently folded against the wall when not in use.

Milking is usually done twice a day though in some herds on production tests the does are milked three times. Punctuality and regularity in handling goats are important.

CARE OF THE MILK

Goats are inherently clean, fastidious animals. It is easy to produce wholesome, high quality milk from them. The milker must be careful during the milking process to avoid contamination. The pails, strainer and all utensils must be thoroughly cleaned and sanitized. Nothing contributes more to superior quality of milk than prompt, efficient cooling. The quicker the milk can be cooled to 50° F. or below the more acceptable the milk will be.

RAISING THE KIDS

Two important cautions in raising kids are to keep them warm and dry and to avoid over-feeding. If hand-feeding is to be practiced it is best to start immediately. The kids should be fed three times daily. A pint of milk at each feeding for the first week is usually satisfactory. Milk feeding can well be continued for at least 2 months and then be stopped gradually. Thereafter, a calf meal or starter can be used. Each kid should be confined individually for feeding. Even if milk feeding is continued beyond 2 months the kids should be weaned by 5 months.

If kids are born with horns they should be dehorned. This may be done with caustic potash or with the hot debudding irons and

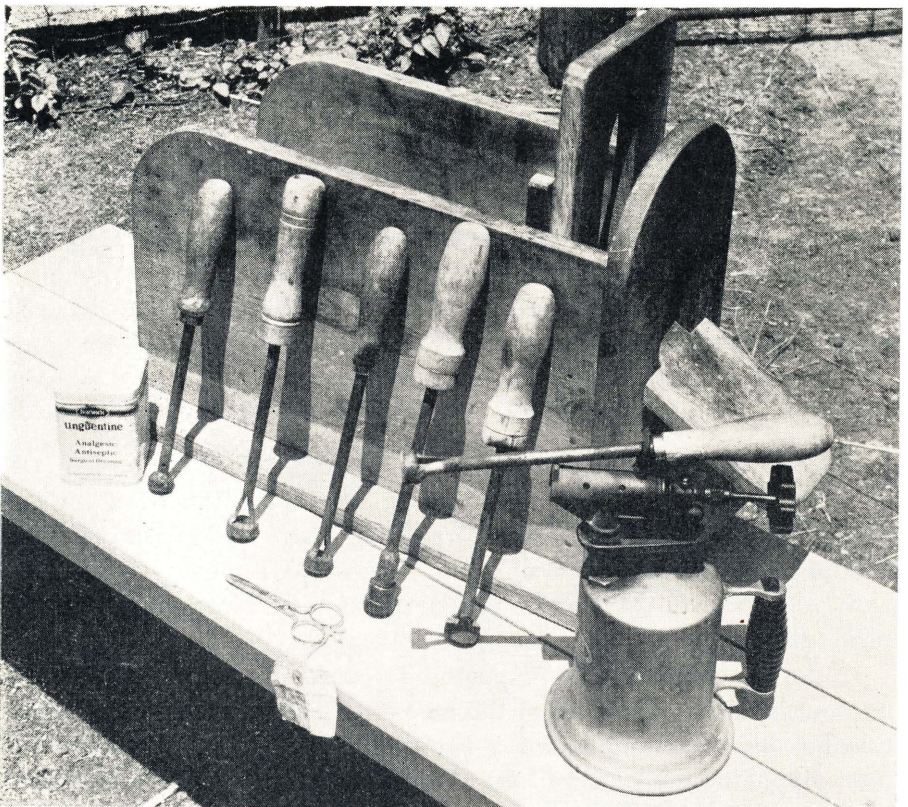


Fig. 7. Satisfactory equipment for debudding.

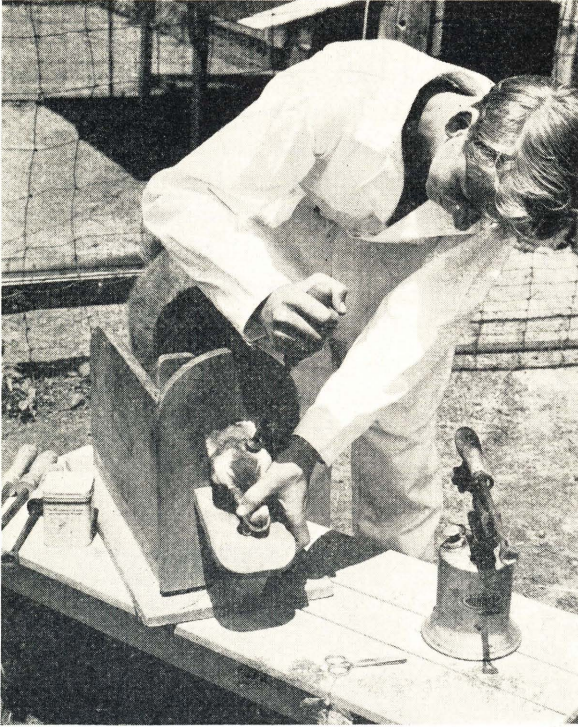


Fig. 8. Debudding a young kid.

should be done when the kids are only a day or two of age, after one has definitely assured himself that the kids have horns.

The buck kids that are not be used for breeding purposes should be castrated when 2 or 3 weeks old.

DETECTING A DOE IN HEAT

The normal breeding season for the unimproved goats is the late fall or early winter. Then the kids are born 5 months later—in the spring. Does of the improved breeds of dairy goats have longer breeding seasons, encompassing late August to February. Some of them, especially in the Nubian breed, come in heat even along in the spring months.

A doe in heat can be expected to show unusual nervousness, frequent bleating, stamping of the feet or switching of the tail. These reactions are often intensified if the doe is rubbed or brushed or if some other doe approaches her. Usually the vulva will show some swelling; a slight discharge of mucus may occur.

When in heat a doe's milk yield often declines; her lack of appe-

tite may also be a symptom. If there is a buck in a nearby pen the doe's efforts to reach him confirm the fact she is in heat.

Some does may remain in heat for only 2 or 3 hours while others remain in for 3 days. Usually a heat period will continue for 1 to 2 days. If the doe is not bred or if she is bred but fails to conceive, another heat period can be anticipated in less than 21 days; in unusual cases heat may recur in less than 14 days.

THE BUCK

When a herd consists of only a few does, an owner usually prefers to avoid the expenses and trouble in keeping a buck. In such a case the does will have to be transported to a buck for service or satisfactory arrangements may be made to employ artificial insemination.

Adequate facilities as well as effective management are necessary in handling a buck. He is of a nervous disposition and quite powerful. Pens and exercise lots must be safe and substantial. Sanitary quarters are especially urgent. During the breeding season bucks often exhibit repulsive habits that contribute to the offensive odor they emit. If certain management practices are observed this problem can be minimized. Surplus long hair should be clipped; frequent washing of the animal with a suitable disinfectant is often advised; it is reported that some commercial deodorants are available.

A buck should not be so completely isolated that he cannot view other goats and activities. But he should not be housed so closely to the milking room that odors will gain entrance to the milk. Exercise is important; it preserves the animal's potency and keeps him in better condition. A loose keg in the lot for the buck to butt about is effective. It may be suspended from a wire; a suspended bag of sawdust or block of wood can also serve.

Bucks can be given the same kind of feed as used by the does. But male animals must not be allowed to grow too fat. This makes them sluggish or impotent; it is especially serious for older bucks.

DISEASES AND AILMENTS OF GOATS

While goats are rarely known to have tuberculosis or Bang's disease, periodic tests at least once a year should be made by a veterinarian to insure all animals are free of these diseases. Under conditions where exposure may have occurred the tests should be made more frequently.

The control of mastitis is often a problem. The disease may be especially serious in larger herds. If trouble is suspected a veterinarian should be consulted to test the animals and ascertain if they are affected. In recent years treatments for mastitis have been satisfactorily developed.

It is not unusual for goats to become infected with worms. The use of phenothiazine in the salt or as capsules has been found effective.

To control lice the use of a powder containing rotenone or of DDT is effective. Various commercial mixtures for lice control are available.

Bloat is not unusual among goats. If the condition appears serious, treatment must be administered. A half pint of kerosene, or of raw linseed oil with a teaspoonful of turpentine administered as a drench is effective.

For constipation a dose of Epsom salts would be indicated. Depending on the severity of the case, the dosage would vary from 2 to 4 ounces in a pint of water.

For scours of noninfectious type that often occurs in kids, a dose of oil is most effectively used. Limewater or bismuth subnitrate helps suppress excessive fermentation and thus aid in the control.

The white scours of an infectious nature is extremely serious. A veterinarian's attention is urgent for such cases.

Often goats develop long toes when confined indoors for a long period. The feet should be trimmed. A chisel or rasp or pair of pruning shears can be used. Best results are obtained when the trimming is done along the bottom of the hoof rather than by clipping vertically on a toe.