

## **Natural Goat & Alpaca Care** **Second Edition**

***Pat Coleby***

This book is available from CSIRO PUBLISHING through our secure online ordering facility at <http://www.publish.csiro.au/> or from:

Customer Service  
CSIRO PUBLISHING  
PO Box 1139  
Collingwood Victoria 3066  
Australia

Telephone +61 3 9662 7666  
Freecall 1800 645 051 (Australia only)  
Fax +61 3 9662 7555  
Email [publishing.sales@csiro.au](mailto:publishing.sales@csiro.au)

© Pat Coleby 2002

The sample pages following are provided solely for information purposes and may not be reproduced, stored or transmitted in any form or by any means without prior permission of the copyright owner. Contact CSIRO PUBLISHING for all permission requests.

## The farm

---

### Choosing a property

Choosing a property is more often a matter of finance than any other factor. But assuming money is not an object, choose a farm with plenty of established trees, and if possible, areas of young trees which can be fenced off until they are large enough for the goats not to wreck the foliage. Dry-land farms are better than wet swampy ones; marginal land that is wild and of little use for commercial agriculture will often suit goats very well. They will, however, tame it in a few years, when it should become part of the regular farm operations. Coastal belts with high humidity and rainfall are *not* good for goats, or other types of stock.

If the buyer has a couple of properties lined up it would be worth spending \$100 on an analysis to see which would be the cheapest to pull into line.

If there are established fences, they will need to be made goat-proof, or, which is what I do, they can be managed so that the goats have the run of the farm. The larger stock are confined to their own paddocks, so that only the boundary fences will have to be goat-proof. Goats do better when choosing the grazing that suits them, according to the weather and time of year.

Established sheds are highly desirable on any property, placed so the goats can use one or some of them as shelters when they need it. For milkers, the plant and sheds will be needed for drafting, milking and feeding. For fibre or meat goats, shelters and drafting yards will be necessary, and for the former a shearing complex as well. Meat goats will need drafting yards and loading facilities and would appreciate having shelter in some form.

Goats are complementary to sheep as they find quite palatable many plants that the sheep will not touch. Cashmeres and meat goats run with sheep will be fine but it is important to remember that Angoras must be supervised at kidding time (see Chapter 12). It should also be remembered that goats, sheep (and deer) share the same internal parasites. Running goats with cattle, unless the farm is fairly large and run on sound organic lines, is not a good idea. Cattle in small areas tend to pug up the ground too much. Years ago goats were often run with cattle as they were reckoned to stop contagious abortion. In fact the abortion was not contagious, but was caused by a weed, so several cases would occur at once. The goats ate the weed without any ill effects—so no abortion.

Horses and goats seem to get on well, the goats often eating what the horses leave in the way of weeds and different grasses. There should be plenty of room and care must be taken to see that the horses do not chase the goats.

## Mineral requirements

Goats and camelids have higher mineral requirements than other domesticated animals because they are natural browsers. Deer also share this characteristic, as those running them in traditional farming situations are discovering. Trees and shrubs are higher in minerals than grass. Their roots reach deep into the soil to obtain the minerals, which have not been leached and farmed out as they have on the surface.

Those who farm goats or any other browser must remember this high mineral requirement. If they do not, the moment of truth, with sick and dying goats, almost invariably occurs within three years. When the land is as bad as in the analysis on page 10, it arrives much earlier. The deficiencies catch up and the farmer is left wondering what happened—this is when the enterprise is usually abandoned. Meat and fleece goats that are not invariably hand fed like milkers can be given the basic stocklick used by other species (explained in Chapter 6). Camelids will take this too.

Iodine is not, strictly speaking, a mineral and cannot be shown on an analysis, but most of Australia, including Tasmania, is iodine deficient. Seaweed products help to supply the shortfall.

## Soil analysis

The single most important factor is to have a full analysis done of the land, so that the exact state of the mineral balance is known. Then remedial action can be taken where necessary, and the goats' diets may be supplemented with those minerals that are missing. Treating land with minerals is less damaging for the environment than conventional fertilisers and goats, like all stock, do not benefit from the latter. In fact whenever there is trouble on the farm it can in 99% of cases be traced back to the annual top dressing with chemical fertilisers. It has been known for some time that phosphatic and nitrogenous fertilisers inhibit a great many minerals, especially copper, 100%.

On page 10 is an analysis by the firm SWEP, whose details are given in the Appendix.

## Understanding the analysis

Desired level is an indication of the best levels for mixed pastures under reasonable rainfall conditions. These can vary as they depend on the cation exchange capacity (CEC) which is different on every farm. CEC is the soil's ability to hold and release nutrients as necessary; calculating it depends on the amount of hydrogen in the soil. It takes many years to degrade the soil—restoration can be achieved much more quickly. The unexpected bonus of this sort of reclamation project is not only the visible improvement of the pasture, but even before that becomes obvious the improvement in the condition of goats and alpacas will be very marked. They all do best on chemical-free, naturally treated soils.

## Remedial measures

The analysis above is a fair example of a good-to-middling analysis in Australia. Once the gypsum and dolomite have been spread, the farm should be well on the way to recovery if the process is followed up by aeration. The low potassium level will rise as the land is being treated naturally; in the animal's diet, cider vinegar is useful for supplying the missing potassium until it does. See Chapter 10.

### Example of a soil analysis from an Australian farm

Items	Result	Desirable level
Colour: dark grey		
Texture: fine sand loam		
pH (1.5 water)	5.00	
pH (1:5 01M c12)	4.5	
Electric conductivity EC us/cm	200	<300
Total soluble salt TSS ppm	660	<300
Available calcium Ca ppm	860	1800–2400
Available magnesium Mg ppm	160	430–600
Available sodium Na ppm	207	<184
Available hydrogen H ppm	114	<64
Available nitrogen N ppm	8.20	25
Available phosphorus P ppm	13.60	30
Available potassium K ppm	121	190
Available sulphur S ppm	4.10	
Available copper Cu ppm	0.20	2
Available zinc Zn ppm	3.00	7
Available iron Fe ppm	23	>20
Available manganese Mn ppm	2	>20
Available cobalt Ca ppm	0.03	>1.0
Available molybdenum Mo ppm	0.30	1.0
Available boron B ppm	0.60	0.6–1.0
Total organic matter OM %	9.90	6–10
Total phosphorus ppm	217	
Cation exchange capacity CEC	16.04	
Exchangeable sodium percentage ESP	4.93	<5
Calcium/magnesium ratio Ca/Mg	3.23	2–4

#### Percentages of Ca, Mg, Na and K, and percentage of CEC

		Percentage (%)	Percentage of CEC
Exchangeable calcium Ca	62.90%	23.57%	
Exchangeable magnesium Mg	19.47%	7.29%	
Exchangeable sodium Na	13.14%	4.93%	
Exchangeable potassium K	4.49%	1.68%	
Exchangeable hydrogen H	62.53		
	100.00%	100.00%	

#### Recommendations

Gypsum	1 tonne to the hectare
Dolomite	1 tonne to the hectare

Top dressing will depend entirely on the calcium to magnesium ratios and the sulphur levels. Strangely enough it is possible to have a near-perfect pH and for those ratios to be right out of balance. So an analysis is essential. Then the land must be treated with the lime minerals—gypsum, lime or dolomite—depending on the ratios of sulphur, calcium or magnesium shown. It is important to have the total phosphorus monitored as I have yet to see a farm in Australia where there was not a 'bank' of total 'locked up' phosphorus. For grazing animals like alpacas and goats it would not be necessary for that mineral to be applied at any time. Phosphorus is derived from animal manures and the lime minerals acting on the 'locked up' total phosphorus. According to the agronomist Neal Kinsey, the locked up phosphorus cannot be used until the calcium and magnesium in the soil are at the right level; he also says that sulphur is the fastest-growing deficiency in the world today.

#### Reasons for mineral shortfalls

Analyses throughout the farming areas in Australia show enormous deficiencies in some or all minerals. Calcium and/or magnesium and/or sulphur are always in short supply or badly out of balance. This is partly due to the great age of this continent and millennia of leaching. But it is also due to the over-use of sodic and/or acidifying chemical fertilisers which have been found to inhibit many minerals, including magnesium, sulphur and most of the trace minerals. The latter cannot be spread or replaced while the pH is below 5.5 or they will be leached out, and when the top dressing brings the pH up to that level many of the trace minerals become available again anyway.

#### Magnesium and gypsum

There are areas (around Moama and Tocumwal on the Victorian/NSW border for example) where magnesium is plentiful, so an analysis is necessary in all cases. Only calcium and/or gypsum will be needed where magnesium is too high. Sulphur is another important mineral nearly always in short supply. According to the CSIRO it is inhibited when conventional fertilisers have been over-used. Gypsum (calcium sulphate) can be

used alone or mixed with dolomite or lime to replace it. Or, in non-clayey soils, yellow sulphur may be mixed in with the top dressing.

#### After top dressing

Top dressed minerals can take a year or more to reach the food chain—longer in a drought—or when the soil is particularly poor. But usually a marked improvement in pasture quality will be noted the spring after the first top dressing. This is particularly noticeable in terms of the levels of weed infestation. All weeds are a sign of soil ill health and imbalance.

Other land improvement measures which will help restore the humus in the soil include soil aeration, tree planting programmes and spreading manure. This is better composted if possible, but spreading it straight from the sheds is better than none at all.

#### Irrigation

After living in a drought belt for many years, where the goats were very healthy, I moved to an irrigation farm with relief, thinking they would enjoy year-round green grass. Five years on I finally admitted that goats are not suited to that type of farming. They always chose the unirrigated parts of the farm to graze, even during drought. Like most grazing animals they tend to do better on dry country if feed is obtainable.

#### Feeding minerals

For milking goats it is necessary to provide supplementary sources of trace minerals and dolomite as an ongoing part of the husbandry. Their requirement can never be met by grazing. The amounts of extra minerals given may be reduced in time according to how sick the land has been originally but they can never be withdrawn completely. Fleece and meat goats, once the land is in really good heart, will need few extras, the demands on them not being so great. Trace minerals that were originally missing will gradually become available again as the health and the pH of the land improve. Alpacas that are hand fed benefit from exactly the same diet.

### Pasture and scrub

Goats thrive on mixed pasture that contains what are commonly known as weeds as well as grasses and legumes. Blackberry, thistles, docks and different kinds of herbs, shrubs, and fodder trees, both European and local, all are much prized. However fodder trees must be protected, or the goats, in time, will eat them out as they do blackberries and most other weeds. The minerals in all these are higher than those found in grass alone and goats 'do' very well while clearing them out. Goats that receive the right amount of copper in their licks/diet will not ring-bark trees, even when they eat the foliage.

### Weed control

Meat and feral goats have been used successfully in blackberry- and scrub-clearing programmes. It should be remembered that blackberries are a sign of low lime minerals in the soil (*Acres USA*). The milkers tear their udders and the fleece goats get hung up by their fleeces, but ferals and Boers do very well as scrub clearers. As one forestry works manager put it to me: 'Getting the goats in was one of the best moves I ever made. The men hated using the chemicals, but they enjoy having the goats. The clearing is being done more successfully and the morale is better.' In that case it was a re-forestation programme, and about 40 goats of indeterminate ancestry were acquired, with a quantity of electric fencing. The whole operation cost considerably less and was more effective than the spraying programme that preceded it.

### Fodder belts

Fodder trees should be planted in belts behind fences through which the goats can browse, but not destroy them. Mountainous, rocky and well-treed areas, ideally with some coast line, make the best goat country. David Mackenzie, in his classic book *Goat Husbandry*, writes of goats kept in those conditions. This is why he blandly confirms that goats should not get diseases; they would be unlikely to do so in such situations as they can obtain everything they need. However, for the majority of goat farmers, wherever they are, their goats have to survive and stay healthy in the farm

complex, which is not nearly so easy! Goats, like all farm animals, are better lightly stocked—20 goats can be run to the hectare—but a great deal of experience and expertise is needed to do it successfully. Four goats to the hectare is more realistic.

## Control

This can mean different things in different countries—Maltese and Greek herdsmen control their goats by age-old methods that do not involve fences, except for yarding them at night. The goats learn to stay within a certain distance of the herdsmen or a stick that he puts in the ground. Goats can be, as people soon discover, highly intelligent and responsive to human beings.

The easiest way to control goats is to have their pastures attractive enough for them to want to stay on the right side of the fence! Also, as they are gregarious, it is easier to keep several goats in a paddock—one alone may be quiet unhappy and determined to escape. When I bring strange goats into my herd situation, beyond a few battles to establish the pecking order, they never try to leave the others. Particular attention should be paid to the prevailing wind. Like sheep, goats go into the wind and the stronger it is the



Figure 2.1 Herding Australian style.

more they do so. For example, in an area where north winds are frequent, all fences on the north side (particularly if they are against a road) must be extra well built.

## Fencing

There is a bewildering choice of fencing on the market these days—much of it practicable for goats. The ideal permanent fence for me is eight-strand cattle boundary netting, with two or three plain strands on the top, 10 cm apart. Another strand should be strained along the bottom of the netting, and an optional one in the middle. All should be stapled to the netting. This fencing is good for goats who are not starving and/or not jumpers—both are equally difficult to control! Personally I would not have a jumper on the place—goats are very quick learners.

The fences should be good-quality ringlock type. Some farmers tell me they prefer hinge joint, because the joints do not come apart under pressure like cheap ringlock. I find goats eventually (sooner rather than later) fold hinge joint like a concertina, no matter how well strained. Bird netting is useless for goats; no matter how well supported, they always end up wrecking it.

All wire fences must be properly strained and the strainer sections should preferably be the square type. If it is the one-post type with the angled support it must be fully enclosed or the goats will run up it and jump over.

If money is unlimited, posts 3 m or so apart with four or five good rails, weldmesh or chainlink fencing are ideal. For the last two the posts should be a maximum of 3 m apart and the wire 1.5–2 m high. Even on farms where good cattle-wire fences are used, runs to contain bucks or young in-season females must be built like this; nothing else will keep the bucks and the does apart. I have known large, over-keen bucks (milk type) to break through a brand new weldmesh fence in 24 hours. In these cases re-enforcement is obviously necessary! Heavy pipe (old bore pipe is ideal), one 50 cm from the ground and another a further 40 cm above it, at butting height, works well. Bucks as keen and strong as that are not too usual.

Wooden paling fences, in countries where wood is cheap and easy to get, make good paddock fences for small areas. The palings should be 10–12 cm apart, and 113 cm high.

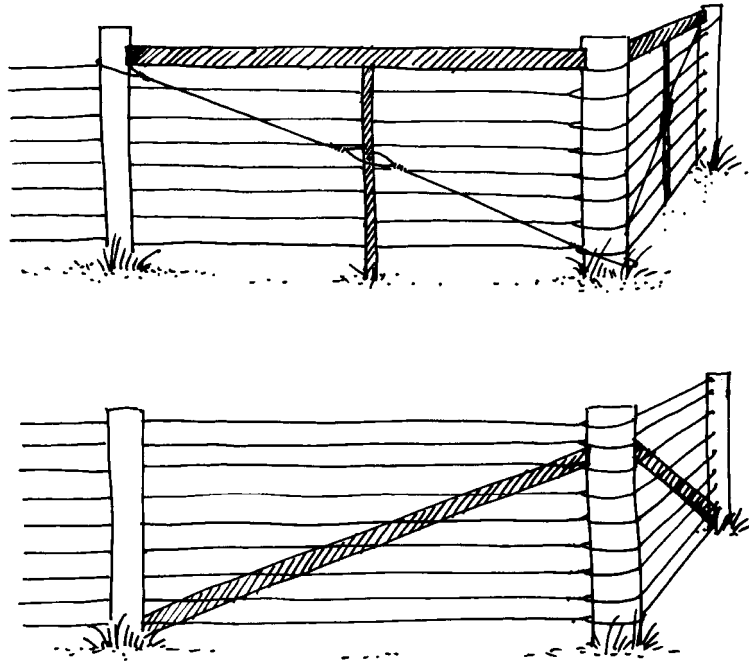


Figure 2.2 Corner assemblies.

### Electric systems

Electric fences can be used as a back-up. The buck mentioned above would have thought twice if there had been two ‘hot wires’ at butting height inside his run. These strands should be about 10 cm from the fence and are effective after training—one buck had three attempts at biting them before he admitted defeat!

An electric wire run about 12 cm out from the top of a fence will stop goats leaning over to reach trees. If a fence is to be totally electrified, the strands will have to be near enough to stop goats getting through them, that is five or six wires. Alternatively, electric netting, which is expensive, can be used for small areas. Goats have the ability, many times proven, to assess when an electric fence is *not* functioning; they can hear the current passing through. I ran a

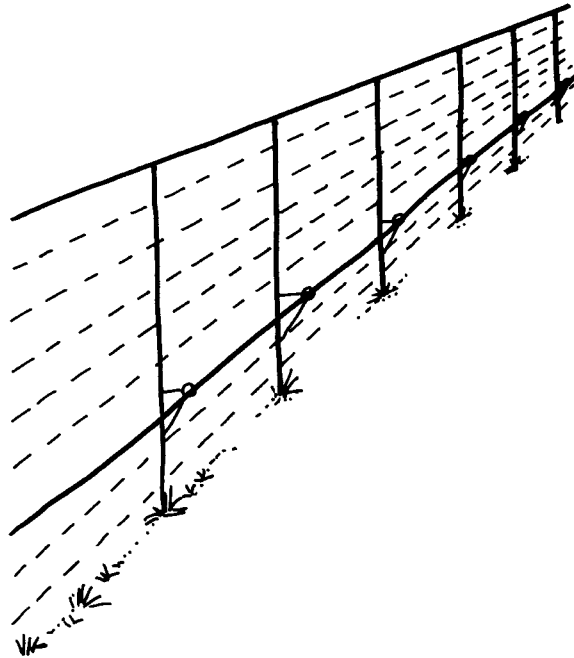


Figure 2.3 'Hot wire' at butting or rubbing level.

single strand at the top of a fence and have often seen them 'listening' to find out if it was operative.

A single electric strand 50 cm high will work as an interim measure to control goats in temporary situations. After a short time they learn to manage it. I have even found that in some cases their scraping underneath the hot wire gives them an obviously pleasurable 'kick'! For an electric fence to be fully effective the goats should be trained to respect it. The best treatment is to make them touch it with their noses, it seems they can quite easily tolerate the current on the main parts of their bodies. Pressing the animal's nose onto the fence (which can often give a second-hand kick), or putting some food on the far side so that the goats touch the live wire trying to reach it, can be the solution. My personal preference is for well-built permanent wire fences with a hot wire as an extra restraint or back-up if needed.

## Hedges

European-style hedges would have to be thick and high to contain goats and ideally should have wire fences built in front of them to stop too much damage.

## Fences for kids

Fences round kid runs must be good enough to teach them that they can only get to the other side when released from the run. This should train them for life and is very important.



Figure 2.4 Kids in a secure yard.

## Housing and shelter

All goats need shelter from the weather—rain or sun. Trees or even rock formations can provide shelter, but some roofed buildings will probably be necessary as well. The sheds should be made facing the direction least prone to high winds; in most parts of Australia this seems to be the east or sometimes north—rely on local knowledge.

The sheds must be large enough to accommodate all the goats in a paddock. Several sheds are really better than one as often the stronger goats will make sure those low in the pecking order cannot enter their shelters. The horn width of fibre goats must also be taken into consideration. All sheds should be high enough for someone to stand upright and have a means of closing them off so the goats can be handled.

For one or two goats a small portable 'A' frame, or old tanks, can be used as shelter, but again, care must be taken that one goat does not stop the others entering. In country areas where old tanks are easily obtainable, very good shelters can be made by halving them and setting them on frames. Unfortunately these days tanks are made of lighter steel than they were forty years ago so they might not be as long-lasting as they once were.



Figure 2.5 Goats in a converted stable.

## Dairy

Milkers should be provided with lounging sheds containing racks for feeding hay ad lib in wet weather. They may not always use them, but they certainly will not remain productive if shelter is not available at all times. See Chapter 13 for shed plans.

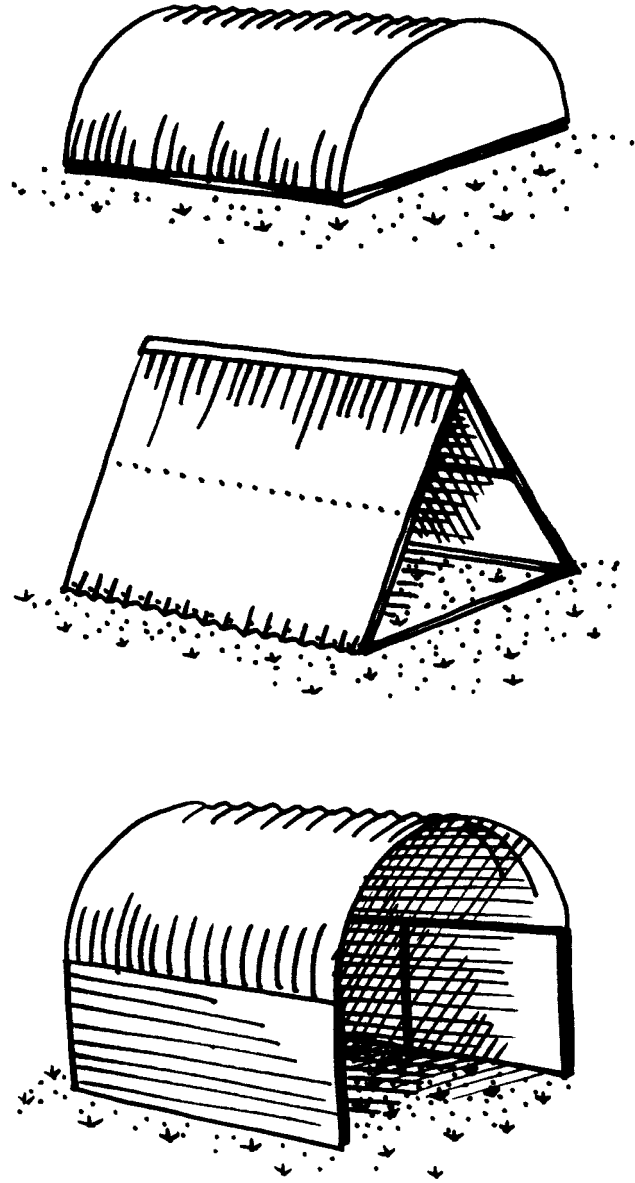


Figure 2.6 Shelters.

## Bucks

For dairy bucks separate yards or small paddocks are necessary to stop fighting in the breeding season. These should be divided by a tree plantation or passage and the run should be a minimum of 15 m square. Each run will need its own house—like the tank shed shown in Figure 2.6. These runs need to be rested, top dressed with dolomite and eaten off if necessary at three- or four-monthly intervals. A horse will clean out after goats and is a useful management resource; they do not share the same interior parasites. Several bucks can be run in a group out of the breeding season. Take care that playing does not degenerate into bullying—either the young bucks by the seniors, or, more seriously, an older buck by a strong young one. Should this happen the older buck may pine away and die. This has caused the death of several valuable bucks in dairy studs.

## Floors in houses

Concrete is really the only answer for flooring in sheds, regardless of size and building materials. Dairy does have an astonishing throughput of urine, once reckoned at 40 litres (8 gallons) a day—a slight exaggeration I feel! But when the grass is green, goat sheds can, overnight, be reduced to a condition that has to be seen to be believed. I have tried other materials for flooring but I always come back to concrete, the only floor which can be totally cleaned. Deep littering is *not* a success with goats, no matter how dry the area or how well set up; it becomes too wet and hot and finally causes disease.

Slatted wooden floors high enough to be cleaned out underneath are also good, but expensive. Care must be taken to see that the animals on them are not subjected to draughts.

## Feedlots

Feedlots have been used for goats world-wide. Laurel Acres in California ran about 2000 head using this system and managed to last longer than most, but apparently the feedlot system does not really suit goats. A Canadian goat-keeper agreed with me that the lack of exercise was probably the crucial factor in its breakdown.

On the farm where she worked, sickness and vet's bills had reached disastrous levels. After spending a week with my milking herd, which often roamed 4 or 5 km a day, she felt their good health was partly due to this exercise.

The barns housing commercial herds in the UK seem to work reasonably well, but no one expects the goats to live confined for too many years. The average age seems to be up to six; then they are sold off and replaced. Thus each doe spends about four years in the sheds. Ideally goats, like all species, must have exercise if they are to remain healthy. The late Frank Thebridge, who bred many high-producing goats in NSW in the early days, told me the same thing. He particularly emphasised the importance of exercise for in-kid does.

#### Meat and fibre requirements

Meat and fleece goats need shelter from wind, sun and rain. Fleece goats, both Cashmere and Angora, need better fences and handling yards. Boers on the other hand are much more placid and easy to manage.

### Tethering (for small numbers)

Tethering *can* be carried out quite humanely but it very rarely is because constant supervision is necessary. Tethered goats must have access to water and shelter and they should get fresh untrampled grass two or three times a day. Goats prefer not to eat grass that has had a chain dragged over it or been trodden underfoot.

As tethered goats are at the mercy of marauding dogs, it is often better that they are not dehorned so they can protect themselves. Tethers can be of the running-wire type (see Figure 2.7). A stake or a wheel put on a stake is quite good as it will rotate, allowing the goat ease of movement, and it can be moved by rolling. Whatever the type it is very important that there should be a swivel at each end of the chain, otherwise it may get twisted and possibly strangle the goat. When tethering goats make sure there are no obstacles round which the chain can become entangled: trees, even loose branches, can cause trouble.

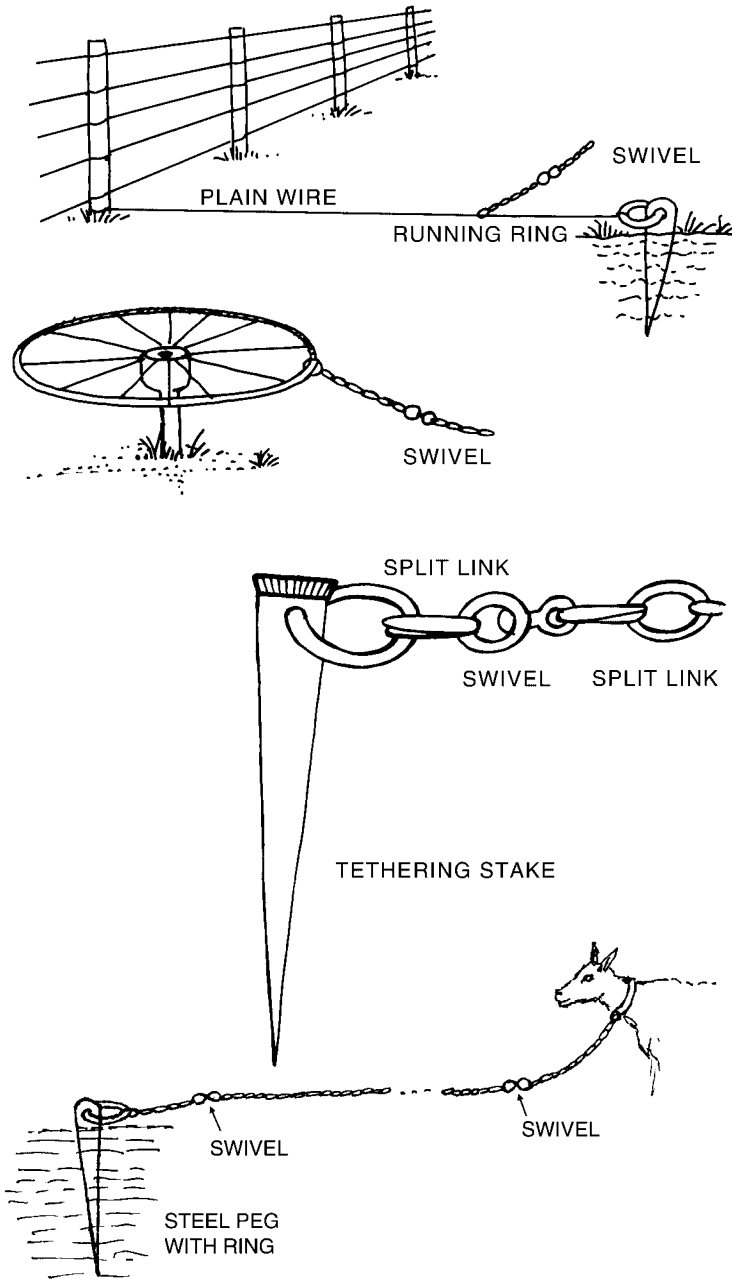


Figure 2.7 Tethers.

## Yarding

Yarding is probably preferable to tethering, as the goat can move around easily and safely without risk of getting chased or caught up. However, as with feedlotting, some way of exercising the goat(s) must be found—it is just as easy and often more entertaining to take the goat for a walk as the dog (or both)!

The yards will have to be provided with racks for hay and green fodder as well as shelter, troughs for concentrates and a permanent water supply (non-reticulated if possible).