



## A guide to the grazing requirements of fibre and meat goats

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### Introduction

*This Agriculture Note provides practical information about grazing goats on commercial farms. It discusses management practices that affect goat health, welfare and production. The information is based on scientific experiments conducted in Victoria.*

Other Agriculture Notes discuss the nutritional requirements for breeding does, and the effects of feeding goat meat production.

### Usefulness of stocking rates

The figures discussed in this Agriculture Note are for **guidance purposes**, and that they cannot be accurate given the variable nature of rainfall patterns in Australia and the range of management practices used by Australian farmers. Essentially the figures help farm managers get into the right “ball park” for average typical seasonal conditions. Impacts of climate change will further complicate the application of specific information.

### Stocking rate

The rate of stocking of pasture with animals is the single most important management decision that influences productivity and economic viability of fibre producing farms in Australia.

**The stocking rate of pastures is the number of animals per unit area of land, irrespective of the amount of forage available.**

Stocking rate is the most powerful management tool available to producers in regulating the amount of herbage available to animals. The determination of the optimum stocking rate is complex and depends on several different criteria that may conflict.

### Effects of changing stocking rate

Increasing the stocking rate:

- reduces the available feed per animal, and
- normally reduces production per animal.

At a higher stocking rate, the reduced production per animal is usually compensated for by the greater number of animals so that:

- production per unit area is increased, and
- the greater total number of animals leads to greater demands for labour.

When stocking rates are too high:

- pasture production is reduced,
- the proportion of less palatable pasture species in the pasture can increase,
- the pasture community can be destroyed,
- the conservation of the soil will be endangered particularly during droughts,
- stress on stock, stock health and appearance are all compromised, and
- stock may not reach market specifications within one production year.

### Carrying capacity

**Carrying capacity is the stocking rate at the optimum number of animals per unit of available forage.**

Carrying capacity is commonly determined by expressing the number of stock carried during a feed shortage such as winter, in terms of dry sheep equivalents (DSE).

The estimate of carrying capacity is **subjective** as it varies with:

- the severity of seasons,
- judgement, and
- whether biological or economic factors are used to determine optimum grazing pressure.

### Dry sheep equivalents (DSE)

The dry sheep equivalent is widely accepted in Australia as the livestock unit to which the feed requirements of other types of livestock can be related most satisfactorily. DSE's are also used when comparing the profitability of different farming enterprises.

**A DSE is the estimated energy required to maintain the body weight of a two year old wether Merino sheep (a non-breeding animal) weighing 45 kg.**

### Comparing different farm animals

Different species of farm animal and different phases in the life of animals have been given a DSE rating to allow general comparisons between livestock enterprises. Comparisons require careful judgement as *DSE's only approximate* the energy requirements of animals in different physiological states, climate conditions, level of production and of different body weight.

A full list of DSE ratings for cattle and sheep are provided in the Agriculture Note AG0590 Dry sheep equivalents for comparing different classes of livestock (McLaren 1997).

Published values of the DSE rating of different classes of livestock represent the requirements of animals on the "average" farm.

### DSE rating depends on growth and production

The DSE requirement of any particular animal depends on:

- average body weight,
- rate of body weight growth,
- pregnancy status,
- lactation status,
- activity, and
- cold stress.

Thus heavier and faster growing animals will require more energy, usually provided by an increased provision of pasture, compared to lighter or slower growing animals.

It is common that as faster growing animals have higher energy requirements they have a higher DSE rating than non-growing but heavier animals.

### How many DSE's can my farm carry

#### Rule of thumb for estimating DSEs

A common rule for estimating a properties potential carrying capacity or DSE is to relate pasture production to rainfall. This method is obviously a generalised approximation but it can be a useful starting point.

$$\text{Potential stocking rate (DSE/ha)} = \frac{[(\text{Annual rainfall mm} - 250) \times 1.3]}{25}$$

#### Obtain advice from Government Department or consultant

DSEs depend on many factors including pasture type, fertiliser application etc, so the best rule of thumb is to consult your state Government Department dealing with land management.

Departments of Agriculture conducted many stocking rate experiments during the 1950s to the 1980s and it is quite possible that an experiment was conducted in a district close to your property.

Local agricultural consultants can also provide advice on the appropriate carrying capacity for your pasture and farm management system. Many farm business economists and consultants calculate the actual carrying capacity on clients properties each year during benchmarking evaluations of farm enterprises.

### Using DSEs to initially stock your property

The most useful method of establishing the grazing stock numbers of a property is to:

- determine the area of your property in hectares (ha),
- determine the potential carrying capacity of the property in DSE/ha,
- multiply the property area by the carrying capacity to calculate total available DSEs,
- apportion the total available DSEs to the various grazing species.

For example, an owner wishes to calculate how many breeding does can be grazed on a 240 ha property. The average carrying capacity of the farm is 8 DSE/ha. The breeding does and their kids have a DSE rating of 3.

The total available DSEs = 240 ha x 8 DSE/ha = 1920 DSE.

The total number of does (with their kids) which can be grazed = 1920 divided by 3 = 640 does.

If a farm has areas of crop, forest or for other uses then these areas must be subtracted from the total area available for grazing.

### Stocking rates for goats

Detailed studies on the effects of stocking rate of goats grazing annual pastures have been completed in Victoria. These studies also examined the effects of grazing goats with Merino sheep. Measurements were made of diet selection, water intake, body weight changes, fibre production and quality, carcass growth, animal health, internal parasitism and pasture availability and composition.

As stocking rate increased the availability of pasture decreased, pasture composition changed and pasture structure was altered. The intake and diet selection of the goats was different to that of Merino sheep grazing the same pasture and the intake of parasitic larvae was also different.

### Complementary benefits from grazing with goats

#### Complementary production benefits

At the recommended carrying capacity, complementary benefits by grazing goats with sheep have been measured. Both goats and sheep were heavier, in better body condition and produced 6% to 12% more wool respectively, the wool having 1 µm greater fibre diameter. Beneficial changes in pasture composition and greatly improved ground cover were measured in pastures grazed by goats.

#### Complementary health benefits

Advantages in reduced internal parasitism were also measured when goats were grazed with sheep at low and at the recommended carrying capacity.

### **Benefits can be lost by overgrazing**

The complementary benefits and further production were lost when the stocking rate was increased to 25% above the recommended carrying capacity. When the stocking rate was 25% over the recommended carrying capacity the goats were out competed by the sheep and the health of the goats was endangered during cold wet weather and by internal parasitism. This was illustrated by reduced body condition scores of the goats. Grazing goats with sheep near the recommended stocking rate during dry autumns was associated with increased risks from cold stress following the shearing of goats.

### **Complementary benefits in weed control**

Goats eat many plant species that are regarded as weeds by graziers. Goats are more selective and flexible in their dietary habits and can browse to a greater extent compared with sheep and cattle. Thus goats offer a potential ecological agent in the control of some noxious weeds such as many species of thistle, blackberries and tussock grasses. Weed control by goats is the subject of another Agriculture Note.

### **Methods used by goats to control weeds**

The four principle methods used by goats to control weeds (Holst 1980) are:

- a) by preventing flowering and subsequent seed dispersal,
- b) by preferentially grazing the weed and so placing the weed at a competitive disadvantage relative to other plants,
- c) by mechanically damaging plants by ringbarking or structurally weakening or destroying the plant, and
- d) combinations of the above.

### **Potential increases in stocking rate**

If substantial areas of a property are covered with edible weeds then the carrying capacity of goats can be increased compared with only grazing sheep or cattle. The management of these issues is discussed by Allan et al. (1995).

It may be possible on some properties with heavy weed infestations to increase the carrying capacity by 15 to 20% when goats are used to control weed infestations.

### **Care is needed when grazing goats to control weeds**

It is essential to remember that many weeds grow during spring and summer, when moisture is available and the temperature is warm. The carrying capacity of overgrazed weeds during winter is very low. Managers are strongly advised to avoid grazing goats on overgrazed weeds as both their nutritive value and growth will be low.

### **Obtaining complementary grazing benefits with goats**

In situations where grazing properties are **fully stocked** with sheep, and no perennial edible woody weeds occur, adding one goat/ha or an extra 10% of total DSEs without reducing sheep numbers by an equivalent DSE amount would result in goats being out competed by the sheep. In this situation, goats would be more susceptible to internal

parasite infections, cold stress and poor growth and production. Pasture availability would be low and pasture short, especially during winter. The property would be overstocked, increasing the risk of long term damage to the pasture and soil.

**As a first step in grazing goats, graziers should replace some of their sheep or cattle with an equivalent amount of goats based on DSE ratings. Preferably at least 10% of grazing capacity should be provided for goats.**

**During conditions with short pasture (< 1 cm) it is recommended that that goats be given preference to the longest green pasture ahead of any sheep during pasture rotation.**

### **DSE ratings for goats**

#### **Non breeding goats**

**It is recommended that wether fibre goats (aged between 1 and 4 years) be considered as having a DSE requirement of 1 but in areas subject to long severe winters, a rating of 1.2 may be desirable.**

Additional allowances need to be made for liveweight growth, and for mature animals whose liveweight may exceed 50 kg.

**To minimise internal parasitism it is recommended that goats not be grazed at carrying capacities greater than 8 DSE/ha and that any additional grazing capacity on a property be taken up with dry sheep or cattle.**

At greater stocking rates, monitoring for internal parasites using faecal egg counting is recommended as a routine management practice. At greater stocking rates the likelihood is that additional treatment to control internal parasites will be required in early spring.

#### **Breeding goats**

The DSE requirements of these flocks is considerably greater than non breeding goats as well managed fibre goat does can rear 120 to 140% kids. Some flocks of well managed goats produce 180 to 200% kids.

**For breeding does rearing 120 to 140% kids, the DSE requirement of the breeding doe is 1.6 plus 1.4 per doe for kids kept for 12 months.**

Thus for 100 does who rear 120 kids, with the kids being kept for one year, the total DSE requirement is 300 DSEs. For further details on estimating the DSE requirements of different management systems, readers are referred to the discussion on sheep in the Agriculture Note on dry sheep equivalents (McLaren 1997).

## References

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