Managing pastures to meet feeder steer requirements

NSW Agriculture
PO Box 376
Casino NSW 2470
Ph: 02 6662 2288
Fax: 02 6662 1107
Email: bill.hoffman@agric.nsw.gov.au

Bill Hoffman

Session 3c - Part 1

Introduction

Understanding feeder steer specifications for the different market options, being able to make accurate live assessments and understanding the genetic potential of different animals are all important for feeder steer producers. It is just as important though to understand the nutritional requirements of these animals and to be able to accurately assess the ability of different pastures and pasture systems to meet these requirements.

Without this knowledge and understanding, production targets may not be met regardless of the animal's performance ability.

For a livestock producer, a key productive issue is the efficient conversion of pasture to animal products. To achieve this, many variables must be considered as the interactions that occur when animals graze pasture are much more complex than they may appear.

This paper aims to cover some of the practical aspects associated with this complex issue.

Pasture intake

The critical factor determining the production level of livestock grazing pasture is the amount of that pasture the animals are able to consume, otherwise known as intake.

Intake is not just influenced by the quantity of pasture available; the pasture's quality is also a major factor.

Pasture quantity

Pasture quantity, which is usually described as herbage mass, is expressed in *kilograms of pasture dry matter per hectare (kg DM/ha).* Herbage mass refers to the total amount of pasture present, assuming a cut was taken at ground level and includes both green and dead material. Some of this material (below about 4cm) may be unavailable to the grazing animal.

Herbage mass is important because if it drops below a certain level cattle are unable to consume sufficient pasture to maintain their weight. When herbage mass is low animals must spend more time grazing to meet their nutritional requirements since each bite of pasture harvests a smaller amount. Despite the extended grazing period they may be unable to consume sufficient quantity to satisfy their requirements.

Similarly there is a point at which intake will not increase even if more pasture is made available because animals physically cannot consume more.

The relationship between herbage mass and intake is shown in Figure 3c-1. Intake rises sharply as herbage mass increases to around 2300 kg DM/ha and then levels out.

Pasture Quality

Numerous quality characteristics of pasture can influence intake by livestock. From a practical point of view *digestibility* and the *proportion of legume* are probably the most useful indicators.

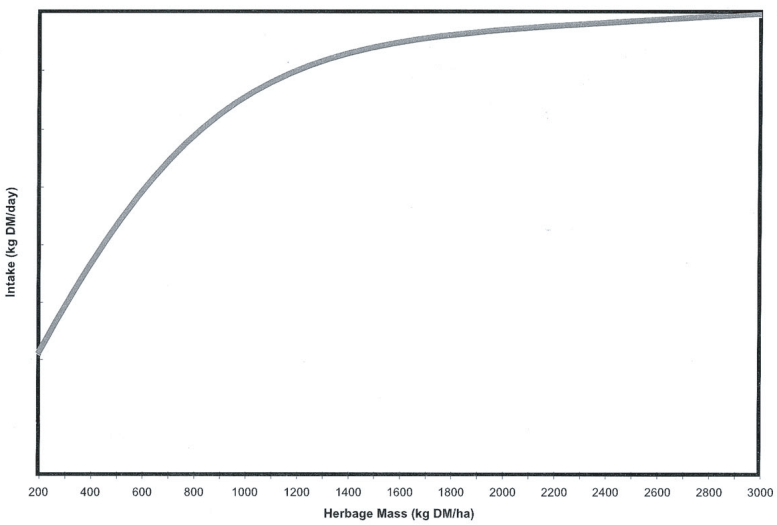

Figure 3c-1. Influence of herbage mass on intake of cattle

Digestibility

Digestibility, expressed as a percentage, provides a prediction of the proportion of the pasture consumed which is actually used by the animal. For example, if the digestibility of a pasture is said to be 70%, approximately 70% of the dry matter consumed will be used by the animal to meet its nutritional requirements and 30% will pass out as faeces.

Digestibility influences the time feed spends in the animal's stomach. A pasture high in digestibility will move quickly through the animal allowing it to consume more. More pasture consumed equates to higher production.

On a pasture of low digestibility, even though plenty may be available, stock will meet their appetite limit before their nutritional requirements are met.

Digestibility is a useful measure of quality because:

- It is directly and positively related to the energy content of the pasture. Energy in feed is assessed as megajoules metabolisable energy per kg of dry matter (MJ ME/kg DM) and is needed by animals for body functions.
- Digestibility is positively related to protein content — when digestibility is high, protein content also will be high. However, there is variation between pasture species in protein content. For example, clovers are generally higher in protein than grasses.
- Digestibility directly relates to the speed of digestion and therefore the movement of feed through the animal. In general, pastures with higher levels of digestibility will be digested more rapidly allowing for greater intake and so greater animal production.

Digestibility differs between pasture species and varieties, parts of a plant and by the stage of growth of the plant.

- *Species* - Legumes usually have a higher digestibility than grasses. Maintaining legumes in the pasture mix will improve the overall quality and livestock production potential of the pasture.

  At the same stage of growth, the digestibility of tropical pasture is usually 10 to 15% below that of temperate pastures.
- *Parts of the plant* - Leaf material is of higher digestibility than stem. Pasture management that maintains pasture with a high proportion of leaf will provide a pasture of higher digestibility and so improved livestock performance. As well, by maintaining leaf area on a plant, its ability to recover following grazing is quicker.
- *Stage of growth* - The stage of growth of pasture plants has a major influence on digestibility.

  Young, actively growing plants, said to be in the vegetative stage, will have the highest digestibility. Digestibility decreases as plants mature, particularly as they enter their

reproductive phase and prepare to flower.

Following flowering the plant enters senescence and digestibility declines rapidly. This situation is characterised by declining green herbage and a rapid increase in the proportion of dry matter.

To optimise livestock production, grazing management should aim to keep pastures in the growth phase for as long as possible, delaying the onset of flowering and an associated decrease in digestibility.

Proportion of legume

Legumes are critical components of pastures, being the major source of nitrogen for pasture grasses. Legumes are also important to livestock production.

Legumes at the same stage of growth will often be of higher digestibility than grasses. Intakes can be expected to be higher on pastures containing greater proportions of legume.

Protein levels of legumes are usually superior to grasses especially as they approach maturity.

Livestock production

Herbage mass and pasture quality are not stand-alone issues in grazing management because they interact. At a low herbage mass where quality is high, intake can be limited by small bite size. Conversely, at a high herbage mass where quality is low, intake may be limited by slow movement of the feed through the animal.

Due to these interactions, there may have to be trade-offs to fit in with practical pasture management plans but still achieve a satisfactory level of livestock production. Where high levels of production are required though (eg, above 1kg per day liveweight gain in young steers) there is less opportunity for trade-offs. Digestibility will need to be above 70% and the amount of green pasture material available around 2300 kg DM/ha.

Conclusions

To achieve production targets, feeder steer producers need to know the performance potential of their pastures and manage them in a profitable and sustainable manner. This will mean:

- Knowing the different pastures' seasonal growth patterns.
- Identifying periods of low and high pasture quantity.
- Identifying periods of low and high pasture quality.
- Using management options to utilise excess pasture and also fill in gaps.
- Managing pastures to keep them in their active and most productive phase for as long as possible.
- Using well-adapted perennial species that suit the environment and the enterprise.
- Using inputs such as fertiliser strategically to achieve healthy productive pastures.
- Continually seeking out and using new knowledge and skills.

Acknowledgement

This paper is based largely on material contained in the PROGRAZE workshop series manual.