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# Livestock

## Livestock supplementary feeding in mixed farming systems

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### Key messages

- **Supplementary feeding is a useful option in mixed farming systems to meet livestock production requirements that are lacking in the natural feedbase and to overcome enterprise reliance on annual pastures.**
- **The mixed farming management calendar, livestock health and husbandry, nutrition and enterprise logistics are important considerations when undertaking supplementary feeding programs.**

### What is the issue?

In mixed farming areas in the southern region of Australia, annual pastures are one of the main sources of nutrition for livestock, however there is generally a

short window of opportunity in the growing season in which this feedbase can be utilised for grazing due to the abruptness of change in both pasture quantity and quality. Variable weather, as well as the severity and prevalence of dry seasons and droughts affects the productivity and longevity of pastures in this Mediterranean climate region. These fluctuating conditions need to be planned for, and carefully managed within current farming systems for the sustainability of the natural feedbase and for the productivity and profitability of mixed enterprises.

Supplementary feeding is often used in grazing systems to help meet livestock production requirements (energy, protein, vitamins and/or minerals) that may be lacking in the natural feedbase and can also be used as a regular part of the production cycle to help match feed demand to supply which is necessitated by prolonged summer/autumn periods without pasture growth. The extent to which supplementary feeding is used depends on seasonal conditions, physiological status of the animal and enterprise or target market objectives.

This article will inform livestock producers and advisors about the essential nutritional, health and practical knowledge that is required when undertaking supplementary feeding programs.

### Why is this important?

Supplementary feeding can be used to meet the nutritional needs of livestock at different stages of their life. Animal requirements can vary significantly depending on age, size, and whether the animal is growing, dry, pregnant or lactating. Feed quality and quantity will also differ according to whether livestock are being fed for production, maintenance or survival purposes.

Before starting a supplementary feeding program, the potential benefits and risks need to be addressed to determine if it is worth the time and cost to undertake, as opposed to alternatives such as agistment or selling stock. It is important to set enterprise and animal objectives in order to analyse the cost-benefit ratio, particularly in mixed farming operations, where benefits will largely depend on how much supplementary feed can be sourced on farm versus what needs to be purchased.

Key factors that need to be considered include:

- opportunities to sell or agist stock (current sale price, wool price, agistment cost/logistics)
- current stocking rate and flock structure (number and type of sheep, physiological status, breeding stock)
- quantity and quality of the existing feed base (pastures/stubbles)
- current supplementary feed reserves on farm and cost/availability of off-farm supplementary feed (grain/hay/silage quantity and quality)
- short/long term climate/weather forecast (time of year, expected rainfall/temperatures)
- existing equipment and infrastructure (containment areas, feed storage, mixing machinery, feeding equipment)
- joining/lambing, shearing and weaning times (altering to suit current season or environment better i.e. matching feed demand to supply)
- long-term enterprise outcome (productivity vs. profitability, sustainability of natural resource base i.e. pasture)

## What can be done?

### Management calendar

One of the most important management decisions in mixed farming enterprises is how the timing of the livestock reproduction cycle fits in with the growing season to match animal physiological state to feed on offer, which can sometime present challenges associated with the cropping program. The livestock management calendar (joining, lambing/calving, shearing, weaning, husbandry) will determine feed quantity and quality required as well as the scheduling of supplementary feeding programs.

### Health and husbandry

Another significant consideration is planning livestock husbandry around feed type and availability. Condition scoring is a vital measurement to understand animal condition and is useful to assist with feed budgeting for production, maintenance or survival. It is imperative to maintain stock in a minimum condition score of two (ideally maintain score three) and to follow published guidelines when supplementary feeding in order to meet livestock requirements. It is crucial to have husbandry programs up to date as certain deficiencies, toxicities, diseases and other health issues can be more prominent in dry conditions (see EPFS Summary 2017 article '*Sheep health issues in dry years*').

### Nutrition

Feed budgeting is an important tool that utilises pasture growth rates and animal intake information to help make informed decisions about management of livestock nutrition. To maintain good rumen function and animal health, supplementary feeding should satisfy the animal's need for protein, energy, fibre, vitamins and minerals for all regulatory necessary functions.

Key factors affecting these functions include:

- **Water:** Clean, cool, fresh water is the most important requirement for sheep, regardless of feed type. The amount of water livestock consume depends on many factors, including the weather, type of feed, quality of water and the animal's physiological stage. High flow rate is important for accessibility.
- **Energy:** The energy component of the diet is responsible for an animal's ability to maintain internal stability to compensate for environmental changes and is the major driver of livestock

performance. Energy is also critical for fat deposition as well as overall meat and wool production and reproduction. It can be sourced from pasture, grains and hay and is measured as megajoules of metabolisable energy (MJ of ME).

- **Protein:** The amount of protein in the livestock diet determines growth; muscle and wool growth and milk production. Therefore it is a vital element for young, growing animals and pregnant or lactating stock. Protein can be sourced from pasture, grains (particularly legumes), hay and silage and is measured as crude protein (CP%).
- **Fibre:** Fibre is the part of a plant that cannot be digested and is essential for normal rumen function, as it ensures mechanical and chemical breakdown of feed. Roughages, such as hay or straw, have high fibre content and need to be supplied as part of the supplementary diet in order for livestock to digest other key nutrients.
- **Vitamins:** Vitamins are organic compounds that are required by animals in very small amounts. Vitamin deficiencies rarely occur in livestock if being fed a balanced ration, as most of the key vitamins (A, D, E and B) are sourced from the environment (sunlight, plant matter, hay, grain) or are produced by the animal themselves (i.e. B complex vitamins are received through milk to activate the microbial population in the rumen in order to aid digestion).

- **Minerals:** Macro minerals required by livestock include calcium, phosphorous and sodium, which are generally sourced from feed or water resources, however certain rations (such as grain-based diets), regions and animals at particular physiological stages can become deficient whereby a supplement is required. Micro minerals include selenium, copper and cobalt, which may have to be supplemented in small amounts in deficient regions.

### **Logistics**

The feed chosen to use in supplementary programs should be selected according to what on-farm feed is available, off-farm feed that is readily accessible and affordable, and fodder types that are easy to store and handle. It is also important to consider the enterprise's production objectives (e.g. weight gain, meeting pregnancy/lactation requirement, maintenance rations etc.) and align the most suitable feed source with this productivity and/or profitability target to minimise the cost of the supplementation program.

There are many different types of machinery, technologies and equipment existing to make supplementary feeding timelier and more labour efficient, however the cost-benefit analyses of these improvements to livestock enterprises should be calculated according to how often this feeding system will be used.

In the absence of paddock feed for long periods of time, it is worthwhile considering using containment areas to remove livestock from paddocks due to the risk of erosion. These fenced areas can be quite beneficial, as the infrastructure can be utilised for other operations throughout the year, particularly if they are located near yards and sheds.

### **What does this mean?**

Feeding livestock is a significant financial and labour cost to any mixed enterprise, which is usually managed by sourcing feed on-farm through the natural feedbase. However, the reliance on annual pastures as a consistent feed source is becoming more risky due to climate variability and changes in farming system practices, making it even more important to

understand how supplementary feeding programs can fit into mixed farming enterprise operations.

Feed budgeting is imperative to assess supplementary feed requirements under a range of seasonal outcomes. Farmers should consider having enough supplementary feed stocks obtainable for up to two years of marginal pasture availability. The ultimate supplementation feed strategy undertaken will depend on the livestock type, enterprise objective and seasonal timing (i.e. scheduling of the intended market or within the animal production calendar). All approaches will require an increased labour commitment to the mixed enterprise, therefore the impact from an economic and social perspective will have to be considered also.

### **Useful resources**

Feeding and managing sheep in dry times, Department of Agriculture Western Australia (DAWA), Primary Industries and Resources South Australia (PIRSA) and Australian Wool Innovation Limited (AWI), 2005.