

## Three key aspects to successful feeding of kale

Winter feeding programmes aim to do two things. To get the cows off the milking platform for the winter to allow increases in pasture cover; and to improve the body condition of cows. However, in many cases Body Condition Score (BCS) targets are not met and the consequence on the following year's milk production and reproductive performance can be significant.

Kale is a great feed source for increasing body condition in dairy cows. Recent work by Agricom has highlighted three key aspects of feeding kale which are essential if BCS targets are to be met.

### Diet Formula

The winter kale allowance for dairy cows typically ranges from less than 4 up to 14 kg DM/cow/day. This results in an intake of up to 12 kg DM/cow/day. There needs to be a clear distinction between allowance (the amount of forage offered) and intake (the amount of forage actually eaten). For example offering 10 kg/cow/day seldom results in an intake of more than 9 kg/cow/day and usually around 8 kg/cow/day.

Diet formulation should take into account the required energy to achieve the wintering outcomes and the cost per cow per day.

For example, an 8 kg/cow/day allowance of kale with 2 kg each of straw and hay should give a cow enough energy for a 0.5 BCS gain over 8 weeks. If an increase of more than a full BCS is required, daily allowances of 14 kg per cow may need to be offered. In a majority of cases BCS targets are not being met because allowances are not sufficient to supply the energy required.

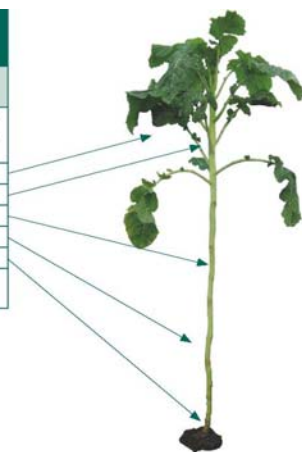
### Utilisation

For kale cultivars grouped as giant types, leaf and petiole accounted for 24% of the total DM yield with the balance as stem. For Sovereign kale, leaf and petiole accounted for 44% of total DM yield with the balance in stem. For all cultivars quality was highest in leaf compared with stem, and highest in the upper stem relative to the lower. The quality of giant-type leaf material was similar to Sovereign leaf but stem quality was poorer in each comparable quarter. This difference in stem quality impacted on the predicted diet quality. For example, cows eating 84% of Sovereign (leaving just the lower stem) would have a diet quality (12.0 MJ ME/kg DM) greater than an equivalent cow grazing 80% (leaving just the lower stem) of a giant type (11.0 MJ ME/kg DM) (Table 1). The lower stem has very low quality, and is not recommended to feed to dairy cows.

Table 1. Botanical Composition Of Different Styles Of Kales And The Associated Quality (Mean Of 49 Paddocks Of Kale). (Judson and Edwards, 2008)

Plant Part	Medium Stem Sovereign			Giant Types (Gruner, Burley, Rawara)		
	% of Total DM	Energy (MJ ME/kg DM)	Diet ME* (MJ ME/kg DM)	% of Total DM	Energy (MJ ME/kg DM)	Diet ME* (MJ ME/kg DM)
Leaf	44	12.9	12.9	24	12.7	12.7
Upper stem	11	12.4	12.8	17	11.6	12.2
Upper mid	14	11.6	12.6	19	9.7	11.4
Lower mid	15	9.4	12.0	20	9.8	11.0
Lower	16	8.6	11.5	20	6.6	10.1

\* Diet ME refers to the average quantity of the diet as more kale components are eaten.



The implication of this quality data is that utilisation will affect the quality of the diet. As you eat more of the kale plant, metabolisable energy of the diet decreases because the lower stems are of poor quality.

High rates of kale utilisation (greater than 90%) are generally associated with low daily intakes, reduced diet quality, and reduced BCS gains.

### Allocation

Many farmers use a daily shifting programme, or twice daily (if wet conditions prevail). A general recommendation is that kale crops are fed off along the longest face. Be aware that on long grazing faces, especially on high-yielding crops, allocation is very sensitive to break width. For example, on a 300 m face with a 15 tonne DM crop, each 60 cm reduction in break width represents a reduction of approximately 1 kg DM /cow in allowance.

In general, allocation of kale appears to be less accurate. In a recent survey\* 2/3 of the dairy herds measured missed their kale intake by more than 1 kg DM and some by more than 8 kg DM/cow/day. Low kale intakes, as a result of poor allocation, are likely to lead to cows not reaching their BCS target of 5 at calving, which has a significant impact on the a cow's milk production and reproductive performance.

### **Key messages**

- Formulate your allocation and diet based on a plan – how much condition needs to put on over winter.
- Optimise utilisation – eat the good stuff and leave the lower stem.
- Allocate accurately – get the fence in the right place

\*(Judson and Edwards, 2008, New Zealand Grasslands Association Proceeding. 70. 249-254).