



FARMER LED, FARMER DRIVEN

**Crop Utilisation and Nutrition
Maximising the Potential of Forage Crops
A Monitor Farm Scotland Innovation Project**



Robert Marshall's cattle on forage crop and baled silage, Lumphanan

The Deeside Monitor Farm Forage Crop Innovation Project followed and evaluated several outwintering systems in winter 2024/25.



CROP UTILISATION AND NUTRITION

Outwintering systems host numerous benefits including reduced winter-feeding costs, housing requirements, bedding costs and fuel and machinery while increasing the productivity of the land, soil fertility and animal health.

It is important to maximise utilisation to reduce waste of the crops. This can happen when animals have too much access, when they may eat the leaves, leaving behind bulbs or stalky material, or they trample and damage crops. Grazing crops behind an electric wire which is regularly moved is best practice; this should ideally have a long narrow feed face, allowing good access for all animals to the fresh break of crop.

Calculating an animal’s allocation, needs you to get a dry matter analysis of the crop, and the predicted intake from the grazing beast.

DRY MATTER YIELD

A calculation of the dry matter yield gives an indication of fodder availability in the field, stocking numbers and length of time grazing. A leafy brassica crop can be calculated using a meter square placed into the crop.

The crop from within this area should be cut to one inch above the ground and weighed to achieve the fresh weight. This sample weight should be multiplied by 10,000 to calculate the fresh weight/hectare.

This can then be multiplied by the dry matter percentage and divided by 1,000 to get the tonnes of dry matter. An example of this is shown below where dry matter is estimated at 12%:

Total weight	4.25kg fresh weight per 1m ²
Fresh weight/ha (4.25 x 10,000)	42,500kg FW/ha
Dry Matter (42,5000 x 12% DM)	5,100kg DM
Dry Matter/ha (5,100 / 1,000)	5.10t DM

Table 1: Example dry matter for a mixed brassica field.

ANIMALS’ POTENTIAL INTAKE

An intake amount per kg of liveweight will give the animal’s potential daily forage intake. For example, a 30kg lamb could eat 3x4% of its bodyweight per day = 1.2kg dry matter/day.

Dry cows eat	1.5% of their liveweight
Growing cattle eat	3% of their liveweight
Finishing steers eat	2.5% of its liveweight
Replacement heifers eat	2.5% of her liveweight
Dry and pregnant ewes eat	2% of her liveweight
An early lactation ewe eats	3% of her liveweight
Growing lambs eat	4% of their liveweight

Table 2: Feed intake predications

DAILY ALLOCATION

A daily allocation can now be calculated for the animals grazing the forage crop.

In this example from the 2024/25 winter, a mixed brassica crop is offered to 65 dry cows.



Liveweight of animals	680kg
Crop yield	5.14t DM
Estimated DM intake (680kg x 1.5%)	10kg
Crop inclusion of the diet	60%
Daily requirement from the crop (10kg x 0.6)	6.00 kg DM
Feeding period	45 days
Total DM requirement per animal (6kg x 45)	270kg DM
Number of animals grazed	65
Total required for the herd (270kg x 65)	17,550kgDM or 17.55t dm
Crop utilised (t DM/ha) x tonnes @ 70% utilised (yield 5.14t x 0.7)	3.6
Area required for feeding (17.55/3.6)	4.87ha
Area available	4.04ha

Table 3: Real example of forage calculations

The plan of holding 65 cows for 45 days on this crop changed after the calculation was carried out.

Instead, 63 cows were on the area for a total of 90 days and had access to 60% of the brassica crop for the first two months, They were then gradually offered a larger amount of supplementary forage in silage and straw which accounted for 80% of their diet, allowing to keep the cows out for a longer time, taking pressure off buildings and straw supplies.

NUTRITION

The nutritional value of forage crops varies greatly. It is good practice to analyse each crop to determine the dry matter and nutritional value, which varies year on year. It's important to understand the nutritional value of the crops, to balance the protein and energy of the diet.

The analysis of one stubble turnip crop from this project showed they would supply 76% of the energy required for a 650kg cow in mid pregnancy and 67% for the same cow in late pregnancy. However, this stubble turnip crop would have supplied 100% of the energy required for an in-calf heifer (560kg).

Similarly with sheep, the stubble turnips would supply 77% of the energy required for a 70kg pregnant ewe and 97% , nearly all, of the energy requirements of a growing lamb.

It should be noted that many forage crops have a low structural fibre content and can be high in water soluble carbohydrates. It is important to supply fibre with forage crop rations to prevent digestive problems. Recommendations are to offer a maximum of 70% of a forage crop and 30% of supplementary forage e.g. hay, silage or straw.



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