

Calculating Dry Matter (DM) of samples

The quality of the diet offered to dairy cows is largely dependent on the forage upon which it is based. Unfortunately, the quality of the forage can vary considerably as you progress through the clamp or the paddock and this can lead to variations in the feed that is offered. As the dry matter (DM) content is probably the most critical and variable components in forage it is essential that we can assess DM quickly, easily and regularly to ensure accurate feed formulation. The procedure described below is a simple test that can be performed on farm to measure DM; ideally on a weekly basis.

Items required

- Suitable probe or fork
- Microwave oven
- Small clean bucket
- Scissors and/or grass clippers
- Scales (accurately weighing to the nearest gram)
- Microwave proof dish
- Glass (suitable for use in a microwave) and capable of holding 100ml of water
- Record sheets (Appendix 1), pen and calculator

In the clamp

1. The aim is to sample an area representative of the forage that will be used during that week (as below).
2. Using a fork, dig into the face of the silage clamp so to avoid the drier or wetter silage at the pit face. If using a probe then push this through to the depth required.
3. Take a fist full of silage from each sample point and put it into the bucket.
4. Mix the silage sample by hand so that the sample is evenly distributed.



In the field

1. If weather conditions are stable a weekly sample will suffice. However, where weather is variable then samples need to be taken more frequently to adjust pasture DM allocation.
2. Using clippers take a sample representative of the grazing area.
3. Cut the sample into manageable lengths (50 to 100mm) and put sample into the bucket.
4. Mix the sample by hand so that the sample is evenly distributed.

In the feed kitchen

1. Pre-weigh the microwave dish (Weight 1) and then zero the scales.
2. Accurately weigh approximately 100g or a quantity that comfortably fits in the microwavable dish and record weight (Weight 2). Ensure all sample is contained within the dish as any 'overhang' may fall off and give a false DM.
3. Place approximately 100ml of water in a glass and put it in the back of the microwave oven. This is important as it prevents the sample from going on fire.
4. Place the sample in the microwave oven and set to 80% of power rating.
5. Set the time to 10 minutes.
6. Remove the sample and weigh (Weight 3).
7. Dry for a further 2 min, remove and weigh, if the weight is the same as Weight 3 then the sample is dry (Weight 4). If it is lower, then dry for a further 2 min and repeat the weighing. Drying time will ultimately depend on microwave power.



Formulae for calculating DM

$$DM \% = \frac{Weight\ 4 - Weight\ 1}{Weight\ 2} \times 100$$

Once you have analysed the forage for DM content it is important that one acts upon the information gathered. This will involve readjusting the allocation of forage, whether it is in the paddock if one is using cut and weigh for pasture allocations or if forages then adjusting the quantity added to the diet feeder. This can be done quite readily by using the formula below:

$$\frac{\text{Previous forage allocation} \times \text{old DM}}{\text{new DM}} = \text{New Forage allocation}$$

Example: If the DM of the forage goes from 30 % down to 26 % and the feed offered was 3,600kg then:

$$\frac{3600 \times 30}{26} = 4,153kg$$

So our new feed allocation will be 4,153kg

