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Determining Dry Matter using the microwave method

Firstly, select a sample that is representative of the material you are analysing. Chop the sample down into 3-4cm pieces using scissors or secateurs, so that you have around 100g of "wet" material. Mix the material together to reduce variation, subdivide and subsample for analysis.
Place an empty plastic Chinese takeaway container on the scales, allow to settle until the weight appears on the display. Hit the 'tare' or 'zero' button and record the weight (A). Next, put your chopped up sample into the container and then record the weight on the scales (B). Place the sample into the microwave together with a small cup of water (helps absorb the microwaves as the sample dries out and avoids fires!).

Estimating moisture in a hay sample using the microwave method

Depending on sample volume, water content and microwave wattage, initial drying times can take up to 5 minutes. If using a 1000W microwave, it is better to start with shorter drying times (i.e 2 minutes initially).
Once finished, pull the sample out of the microwave and weigh and record weight. Stir the sample around and place sample back into the microwave for another 1-3 minutes and re-weigh and record weight. Repeat this process until the weight matches the previous sample or is within 1g of previous sample and record this weight (C). This indicates that the sample has no more moisture to loose and is at a constant weight.

To calculate Dry matter (DM):

(C - A) / (B – A) x 100

Empty container (A) = 10.2g
Container + wet sample (B) = 74.5g
Container + dry sample (C) = 42.9g

DM = (42.9 – 10.2) / (74.5 – 10.2) x 100
= (32.7) / (64.3) x 100
= 0.5085 x 100
= 50.85% DM

To calculate moisture:
= 100 – DM
= 100 – 50.85
= 49.15% Moisture

Hints

1. If using the microwave method to determine DM or Moisture at home, the sample cannot be used at the lab for quality assessment since the heat of the microwave will denature (break down) the protein in the sample. Similarly, with silage samples, heating the sample can remove volatile compounds containing energy.
2. This method works well for silages and green pastures but is less accurate for hays or drier samples with dry matter > 80%.
3. Do not collect samples on a wet day or samples that contain dew as this will add bias to the initial wet weight. Wait until the afternoon when samples are dry or collect sample the next day.
4. Complete the microwave method as soon as possible after harvesting the material. If you get it home and notice condensation inside the bag, your plants are respiring and loosing moisture so you will not get an accurate DM determination. If you will not be analysing for some time, place the sample in an airtight container in the fridge.
5. The microwave method needs to be adapted for use based on type of microwave and sample to be analysed. Start with lower cycle times and build up drying times as you become more experienced.