



# SAMPLING & ANALYSIS OF HAY MOISTURE

## MANUAL CORE SAMPLING METHODOLOGY

This brief guide will walk you through how to collect and analyse hay samples manually using a coring tube and common tools.

**i** Prepare your equipment ahead of time and perform analysis immediately after sampling. Samples must be well sealed and ideally kept at a stable temperature.

## EQUIPMENT REQUIRED /

### For sampling

- **Coring tube** with sharp cutter. A spare cutter is also advised.
- **Battery Drill** – Good quality, high torque drill with two fully charged batteries. Coring quickly drains batteries, especially UHD bales.
- **Bucket** to mix the sample increments.
- **Zip-lock bags** – e.g. Glad sandwich bags, 22cm x 25cm [9in x 10in]].
- **Permanent Marker** – e.g. Sharpie.
- **Insulated box** – Room temp. Esky or similar, to store the samples in.

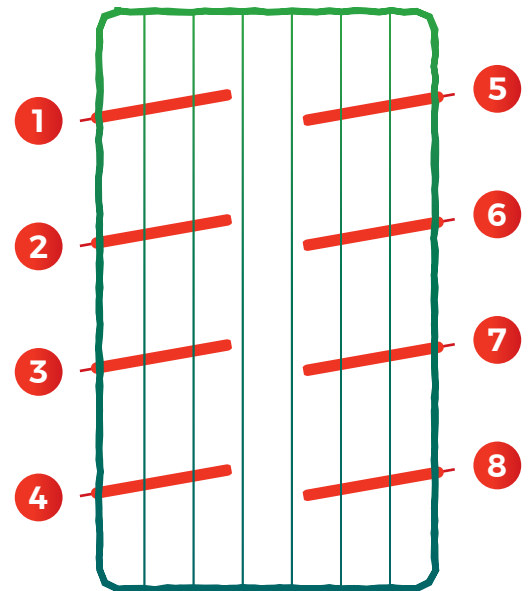
### For analysis

- **Microwave Oven** – A small, 750W oven is ideal. If possible, operate at half power to reduce risk of charring.
- **Microwave safe dish** – Do not use a paper plate.
- **Glass or cup** and a source of water.
- **Scales** – Must be accurate to 0.1 grams.



## SAMPLE COLLECTION /

- Take a zip-lock bag and mark it with the sample number corresponding to the bale being sampled.
- From each side of the hay bale, take four cores halfway up the bale at a slight angle across the flakes (as shown to the right). These are called sample increments.
- Place these increments into the bucket. Once all the increments for that bale (8x) are in the bucket, gently stir to mix them, then fill a zip-lock bag with the mixed increments. This is the sub-sample, which we now simply call the sample.
- Squeeze the air out of the bag and seal it. Place this bag inside another bag, squeeze out the air, and seal the second bag. Finally, place the sample in an insulated box (cooler) and discard any remnants from the bucket.



Top-down view of bale



Take 4 samples from each side



## MOISTURE ANALYSIS /

1. Place the plate on the scales and press "tare" to zero them.
2. Spread approximately 100 grams of the sample hay on the plate.
3. Note this sample weight as **W1**
4. Fill the cup with cold water and place it in the back corner of the microwave oven.
5. Run the microwave oven for 2 minutes (at half power if possible).
6. Take the sample out, note the new weight, then replace the heated water with fresh cold water.
7. Put the sample back into the oven and heat for a further 2 minutes (at half power if possible).
8. Repeat steps 6 and 7 above until the sample weight changes by less than 0.1 grams. Call this final weight **W2**. If charring occurs, use the last weight noted.
9. Calculate moisture percentage by weight (**M**) using this formula:



$$\frac{(W1 - W2)}{W1} \times 100 = M$$