

# How to Use a Koster Tester in Seven Easy Steps

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Dry matter, or the percentage of a plant that is not water, is influenced by harvest time and is a critical component of forage quality and feed value. Depending on the forage, missing the dry matter window (too low or too high) can impact forage storage, forage digestibility and animal nutrition. Analyzing the dry matter of forages before harvesting can help a producer ensure their animals are getting an accurate amount of nutrients while ensuring their forage stores for the appropriate amount of time. One way to determine dry matter content is by using a Koster tester. Similar to a forced air oven, it forces heated air upward through the forage sample to evaporate the moisture (water) from the sample. Samples may take between 20 to 45 minutes to dry, depending on the initial moisture content. These seven easy steps for using a Koster tester will help you determine dry matter (DM) content of forages.

**Step 1:** Set a weigh scale on a flat and level surface. \*Note: Make sure the scale has the ability to measure in grams.

**Step 2:** Place the empty basket from inside the Koster tester on the scale. Record the weight.

**Step 3:** Add forage sample to the basket until the scale reads 100 grams over the weight of the basket. Record this weight.

- First, silages should be chopped down by chipper-shredder, hedge trimmers, scissors, etc. to a consistent size that is similar to what you plan to feed in your ration.

**Step 4:** Place the basket with the sample in the drying unit and dry for approximately 30 minutes. Drier feed (i.e. hay) may take less time compared to wetter feed (i.e. grass). See the table below for additional detail:

Forage	Expected DM Content	Suggested Drying Time
Grass silage	20 to 25 percent	45 minutes
Grass silage	30 to 35 percent	30 minutes
Grass silage	40 to 50 percent	25 minutes
Haylage	60 to 80 percent	20 minutes
Corn silage	25 to 40 percent	30 minutes

Adapted from: (Koster Moisture Tester Quick-guide, 2020)

**Step 5:** Remove the sample basket from the Koster tester and place it on the scale to weigh it. Record the weight.

**Step 6:** Place the sample basket back in the drying unit, and dry for five additional minutes.

**Step 7:** Remove the sample basket, weigh it, and record the new weight.

**Step 8:** Repeat steps 6 and 7 until there is no more than one gram decrease in weight.

**Step 9:** Calculate the dry matter (DM) content of the forage.

- $$\frac{\text{Final weight of basket and feed from step 8} - \text{weight of basket from step 2}}{\text{Initial weight of basket and feed from step 3} - \text{weight of basket from step 2}} \times 100 = \text{DM percent}$$

## **Additional Information**

- Do not touch the heating element while in use. Allow to cool fully before storing.
- Do not use near flammable materials or liquids.
- Do not use for very wet products as water might drip onto electrical components.
- Wipe down with a lightly damp cloth to clean.
- Make sure both the Koster tester and the scale are on a flat, level and dry surface.

## **References**

- Grussing, T. and W. Rusche. 2020. Silage Moisture Testing Tips. SDSU Extension, Brookings, South Dakota.
- Koster Forage Moisture Tester. 2000. Vita Plus, Madison, Wisconsin.
- Koster Moisture Tester Instruction Manual. 2020. Mosegarden A/S, Holstebro, Denmark.
- Koster Moisture Tester Quick-guide. 2020. Mosegarden A/S, Holstebro, Denmark.
- Our Story. 2007. Koster Moisture Tester, Inc, Canton, Ohio.

## Koster Tester Worksheet

Weight of empty Koster tester basket (**step 2**):

\_\_\_\_\_ grams

Weight of forage inside Koster tester basket (**step 3**):

\_\_\_\_\_ grams

Weight of samples dried first time (**step 5**):

\_\_\_\_\_ grams

Weight of sample dried each time until no more than one gram difference in weight (**steps 6-8**):

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams

\_\_\_\_\_ grams (final weight **step 8**)

Calculate the dry matter (DM) content of the forage:

$$\frac{\text{Final weight of basket and feed from step 8} - \text{weight of basket from step 2}}{\text{Initial weight of basket and feed from step 3} - \text{weight of basket from step 2}} \times 100 = \text{DM percent}$$

## Koster Tester Worksheet: Example

Weight of empty Koster tester basket (**step 2**):

100 grams

Weight of forage inside Koster tester basket (**step 3**):

200 grams

Weight of samples dried first time (**step 5**):

185 grams

Weight of sample dried each time until no more than one gram difference in weight (**steps 6-8**):

175 grams

161 grams

170 grams

160 grams (final weight **step 8**)

163 grams

Calculate the dry matter (DM) content of the forage:

$$\frac{160 \text{ grams} - 100 \text{ grams}}{200 \text{ grams} - 100 \text{ grams}} \times 100 = \text{DM percent}$$

$$0.6 \times 100 = \text{DM percent}$$

$$60 \text{ percent} = \text{DM percent}$$

***\*\*This forage sample has a 60 percent dry matter content***

There are Koster testers located at county Extension offices across Tennessee. For more information or to request to use a Koster tester, please contact your [county Extension agent](#) or Liz Eckelkamp at 865-974-8167 or [eeckelka@utk.edu](mailto:eeckelka@utk.edu). More resources are also available on the [UT Dairy](#) website.



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