# Determining Dry Matter Content & Making Adjustments

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The basis for feeding and formulating diets for dairy animals is based on knowing an accurate dry matter intake (DMI) amount. This, in turn, is highly dependent on knowing the dry matter (DM) content of each feed and forage in the diet or TMR. The amount of DMI depends on several factors. First, is the size of the animal – not only the body weight of the animal, but whether it is a yearling or a mature cow. The second important factor, if it is a milking cow, is the milk production level. Cows milking more tend to eat more. A third factor, of lesser importance, is the season of the year. Temperature, humidity, and wind speed, can make a difference. Forage type and moisture also affect intake, as well as fermentation quality, molds, heating, and other palatability issues.

Determining DM content of fresh or ensiled forage is relatively easy. It is usually done by determining the weight difference of the forage after drying it for an hour. Using a Koster tester is very common but other methods work as well. Keep in mind, to determine an accurate DM content, it is imperative to make sure you have gotten all of the moisture out of the sample.

First, don't use too large of a sample, a half-cup or a quarter pound is plenty. From this, precisely measure a 100 g sample of wet forage. Dry the sample 30 minutes. Record the weight and dry for another 10 minutes. Put your sample on the scale again (it should weigh less) and record the weight. Continue drying the sample in 10-minute intervals until two samples in a row are the same DM. Once finished, divide the dry weight by the wet weight and multiply by 100 to get the percent DM. Subtract that number from 100 to get the percent moisture.

**Example 1.** Weigh out 100 g of corn silage. After drying, the sample now weighs 35 g.

35/100 = .35 x 100 = 35% DM or

100 – 35% = 65% moisture in corn silage (good corn silage moisture content is 65-68%).

**Example 2.** Is corn silage ready to chop? Weigh out 100 g of freshly chopped corn silage. After drying one hour, the sample weighs 28 g.

28/100 = .28 x 100 = 28% DM or

100 – 28 = 72% moisture. We know this is too wet for chopping and will check again in a couple of days.

**Example 3.** You are feeding TMR to your milking cows. The last couple of days they seem to be eating a lot more; you realize you are feeding about 10% more per day. Has something changed? If there is no real change in the weather, perhaps you need to check the DM of your silage and haylage. After repeating the moisture testing procedures, you find the corn silage is measuring at 64% moisture. Last week, however, it measured at 66%. Is this the cause for more consumption? Probably not. A difference this small may fall within the margin of error. You should check the haylage DM as well.

After drying, you find the haylage moisture level is now 62%, when last week it was 49%. This is a substantial difference. At the new 62% moisture level, how much do you change the haylage amount in the ration?

You've been feeding 23 lbs of haylage and 50 lbs of corn silage/head/day which translates into 11.73 lbs of dry haylage fed last week,

(23 lbs x 51% DM = 23 x .51 = 11.73 lbs).

The new moisture level is 62%, meaning the haylage is 38% DM (100 – 62 = 38).

Now, divide the old DM by the new DM: 51/38 = 1.34 (this is your multiplying factor for the old amount you were feeding).

1.34 x 23 = 30.82 or 31 lbs/head/day to feed each cow this week, compared to

23 lbs/cow/day last week.

In a 100 cow herd, that would be 8 lbs difference x 100, or 800 lbs more per day. No wonder they were eating everything fed, you were 800 lbs short.

If you think the corn silage is getting a little drier, then make a correction there as well.

100 – 64% moisture = 36% DM.

100 – 66% moisture = 34% DM last week.

34/36 = .94 multiplying factor.

Multiply .94 x 50 lbs of corn silage fed last week. You should now feed .94 x 50 = 47 lbs this week.

So, for a herd of 100 cows you should now be feeding 300 lbs less corn silage and 800 lbs more haylage.

This example illustrates why it is important to check the moisture of your forages weekly. If both forages in the ration experience a change in moisture, as in this example with one getting wetter and one getting drier, you might not always notice your cows eating more or less. Since corn silage and haylage do not substitute equally for each other on a DM nutrient basis, you could be compromising the entire ration and causing a loss in milk production in the process.