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**Lecture title: Determination of moisture in green feedstuff samples**

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**Summary:**

Determination of moisture in green feedstuffs samples should be dried in two stages.

In the first stage, **100 gm**. of green feedstuff is dried after it's chopping. **Drying of feedstuffs should be put at (70 °C) in oven for 16 hours for the purpose of determination of primary moisture**.

In the second stage ,the dried sample is ground finely and(1-2) gm. of the sample is put in oven at **(150°C) for 1/2 hour for the purpose of determination of secondary moisture .**

**The purpose of drying green feedstuffs following two stages is to prevent the occurrence the case of hardness which prevent leakage of moisture from the lower layers of the sample .** Hence, little fraction of the moisture may remain in the sample leading to false results.

Total moisture of the green feedstuffs is estimated following the equation:-

**Total percentage% =**

**primary moisture (%) +** $\frac{\textbf{secondary moisture}\ (\%)*(\mathbf{100}-\textbf{primary moisture}\ \%)}{\mathbf{100}}$

**Dry matter (%) = 100 - Total moisture percentage.**

**Note : in calculation operations, multiplications , division , addition and subtraction are performed .**

**in the case of brackets , the calculation is performed between the brackets and then outside the brackets .**

## Example ( 1 ) :-

Two hundred grams (200gm.) of green alfalfa feed sample was dried primarily at (70 °C) for 16 hours. After drying, the weight became (40gm). 2 gm. of the primarily dried sample was taken and was further dried at (150 °C) for half an hour to became (1.6 gm.).

Estimate primary, secondary and total percentage of moisture in sample.

## Solution:-

Primary moisture % = $\frac{\boldsymbol{weight\ of\ moisture}}{\boldsymbol{weight\ of\ sample}} * 100$

$= \frac{\boldsymbol{weight\ of\ sample\ before\ drying - weight\ of\ sample\ after\ drying}}{\boldsymbol{weight\ of\ sample\ before\ drying}} * \mathbf{100}$

$= \frac{200-40}{200} * 100 = 80\%$

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Secondary moisture (%) =

$\frac{\boldsymbol{weight\ of\ sample\ before\ drying - weight\ of\ sample\ after\ drying}}{\boldsymbol{weight\ of\ sample\ before\ drying}} * \mathbf{100}$

$= \frac{2-1.6}{2} * 100 = 20\%$

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Total moisture percentage (%) =

$$\textbf{primary moisture (\%)} + \frac{\textbf{secondary moisture (\%)} * (\textbf{100} - \textbf{primary moisture (\%)})}{\textbf{100}}$$

$$= 80 + \frac{20 * (100 - 80)}{100}$$

$$= 80 + \frac{400}{100}$$

$$= 84\%$$

## Example ( 2 ) : -

If you know that the percentage of primary moisture content of the green fodder( alfalfa) was (70%) and the secondary moisture was ( 5%) .Calculate the Total moisture and Dry matter percentage of this fodder ?

## Solution :-

Total moisture percentage (%) =

$$\textbf{primary moisture (\%)} + \frac{\textbf{secondary moisture (\%)} * (\textbf{100} - \textbf{primary moisture (\%)})}{\textbf{100}}$$

$$= 70 + \frac{5 * (100 - 70)}{100}$$

$$= 70 + \frac{5*30}{100}$$

$$= 70 + \frac{150}{100}$$

$$= 70 + 1.5$$

$$= 71.5\ \%$$

Dry matter = 100 – Total moisture (%)

$$= 100 - 71.5$$

$$= 28.5\ \%$$