Keeping the moisture content of food materials strictly within specifications is key to operational excellence and optimal properties of the final product.

This application note describes how METTLER TOLEDO Halogen Moisture Analyzers advance the analysis of food materials and deliver precise data on moisture content within minutes.

**HB43-S**
Halogen Moisture Analyzer
Moisture in food and food ingredients is frequently analyzed before, during and after the manufacturing process to ensure the final product meets the desired overall properties and standards. This application note illustrates the fast and easy moisture determination with METTLER TOLEDO Halogen Moisture Analyzers, exemplified with tortilla chips.

Moisture determines food quality
Texture, taste, appearance, mouth feel as well as shelf-life are affected by the water content. The product must retain its properties up to the time when it is consumed. Therefore, ensuring the optimal moisture content is a key aspect of quality control.

Moisture in food: legal requirements and economical aspects
When truckloads of raw material are delivered to the factory, the moisture content is now routinely verified to ensure specifications are met. This protects the buyer from paying for water instead of valuable supplies.

Optimal moisture for optimal food processing
The frying temperature of french fries is adjusted to the moisture content of the potatoes to guarantee that the fries are always golden and crispy. Precise monitoring of moisture during production empowers the plant operator to apply optimal settings for best product quality and highest production yield.

Halogen Moisture Analyzers for quick and reliable results
The drying oven is the typical reference method noted in food regulations. However, quality and process control of raw materials, semifinished and final products usually needs information on moisture much quicker to enable timely interventions. A much faster and cost-effective alternative to the drying oven are the Halogen Moisture Analyzers from METTLER TOLEDO. These too are based on the LOD (loss on drying) principle but provide reliable results in minutes instead of hours. The benefit is obvious: fast testing enables 100% control of goods, e.g. on the receiving dock: “After the first out of spec delivery was detected, the instrument was paid for”, a content customer states.

HB43-S Proven reliability and ruggedness
The HB43-S moisture balance is designed for the food industry. It is robust and easy-to-use. It has proven reliability during 24/7 operation on the factory and has convinced many IFS and BRC certified companies to rely on METTLER TOLEDO Halogen Moisture Analyzers.

100 validated food methods
The HB43-S features an integrated library of 100 food methods, all referenced to an official drying oven standard. A food company can save up to a full day of work in the lab on method development by benefiting from the method library.

Figure 1: Method library of HB43-S

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1 National food regulations such as SLMB (Swiss Food Regulation)
2 International Food Standard
3 British Retail Consortium
Material and Methods

- HB43-S Halogen Moisture Analyzer, METTLER TOLEDO
- Tortilla Chips

Instruction how to use HB43-S to determine moisture in tortilla chips

1. Press button «A» to select method for tortilla chips
   - Drying Program: Standard
   - Switch-off criterion 3 (1mg/50sec)
   - Drying Temperature: 130°C

2. Weigh approx. 3g of ground tortilla chips into tared sample pan

3. Close lid to begin measurement

4. The result shows the moisture content of the sample

Results

The moisture content of tortilla chips is measured with the HB43-S for quality control. The result obtained is 2.47% MC. This moisture content guarantees delicious taste and the special crunchy mouth feel with every bite over the entire shelf-life of the tortilla chips.
Correlation HB43-S versus Drying Oven for Tortilla Chips

To prove precision of HB43-S results, a comparison study with tortilla chips is performed. Results are compared to the drying oven method (SLMB-method No. 449.1, 1999). The study shows that the HB43-S achieves highly repeatable results corresponding to the drying oven in minutes instead of hours.

<table>
<thead>
<tr>
<th>HB43-S</th>
<th>Drying Oven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean [%MC]</td>
<td>Mean [%MC]</td>
</tr>
<tr>
<td>SD</td>
<td>SD</td>
</tr>
<tr>
<td>Time [min]</td>
<td>Time [min]</td>
</tr>
<tr>
<td>Tortilla chips</td>
<td>2.47 0.05 6</td>
</tr>
<tr>
<td></td>
<td>2.52 0.01 240</td>
</tr>
</tbody>
</table>

Table 1: Results of moisture content determination by HB43-S (6 measurements) and by drying oven. MC = moisture content, SD = standard deviation.

Conclusion

The HB43-S is well suited for the moisture analysis of raw materials, intermediate products and finished products, both on the factory floor and in the lab.

The METTLER TOLEDO Halogen Moisture Analyzers ensure optimal product quality and maximize production yield by providing precise and reliable moisture information within minutes.

www.mt.com/moisture

For more information