

pH Determination of Tortillas

By: Daniel J. Brooker

Principle

pH is the negative log of the hydrogen ion concentration in moles per liter of aqueous solutions. The shelf life of a tortilla is directly related to its pH. There are many factors that contribute to the shelf life of tortillas and pH is one factor that is easily measured.

Scope

This method is suitable for all types of tortillas including corn and flour tortillas.

Procedure

The pH Meter Method

Calibration: Select two standard buffers to bracket, if possible, the anticipated pH of the tortillas you are testing. For example a pH 4 buffer and a pH 7 buffer would be adequate to measure the pH of a corn tortilla at a pH of 5.2. If you are measuring the pH of a high lime tortilla you will need to use a different set of buffers such as a 7 and a 10 to measure a pH of 9.0. These buffers are available from Chem-Mex and should be at the same temperature when



calibrating, within two degrees. Follow the manufacturer's instructions for using the pH meter you have. If you are using the Hand-Held pH Meter,



Model F240, available from Chem-Mex follow these instructions:

1. Attach the pH electrode to the pH meter.
2. Remove the pH electrode from its storage bottle by screwing the cap off. Do not pull it from the bottle. Rinse the end of the electrode with distilled water, gently towel dry and vigorously stir the electrode in the pH 4.0 buffer solution.

3. Turn on the pH meter by pressing the button with the circle and vertical line.
4. To calibrate the pH meter press the CAL key followed by the CLEAR key twice.
5. Press the READ key and wait until the eye stops flashing and there is a 4.01 next to Stds: on the display.
6. Rinse the end of the electrode with distilled water, gently towel dry and vigorously stir the electrode in the pH 7.0 buffer solution.
7. Press the READ key and wait until the eye stops flashing and there is a 7.00 next to Stds: on the display.
8. Finally press the CAL key again.
9. To measure pH's simply place the rinsed electrode in the sample and press the READ key. When the auto eye stops flashing the pH displayed is the pH reading of your sample.

We have found the flat surface electrodes to be the most versatile in the tortilla factory.

These electrodes (probes) are also available from Chem-Mex. It is possible to measure the pH of masa samples with these electrodes. This is very useful when making adjustments to preservative metering systems right at the molino or mixer. We do not recommend measuring the pH of flour tortilla dough. It is much better to measure the final product on flour tortillas. With corn tortillas it is beneficial to measure the pH before and after the tortilla oven.



Sample Preparation:

1. Grind some tortilla into small pieces in a coffee grinder and take 10 grams of the ground tortilla sample and add it to an empty plastic beaker. Then add 90 grams or ml of distilled or deionized water.
2. Homogenize the sample for at least one minute with the hand held homogenizer or blender.
3. Immerse the rinsed and calibrated pH electrode into the sample and vigorously stir the electrode in the sample.
4. If using the F240 model press the Read Key and wait until the reading is stabilized or the auto eye stops flashing.
5. Record this pH reading as the tortilla pH.

pH Electrode Storage

When not using the pH electrode it should be stored in its soaker bottle containing electrode storage solution. First, slide the cap onto the electrode, then the o-ring, then insert the electrode into the bottle and firmly tighten the cap. PH 4 buffer solution may also be used to store the electrode.



Chem-Mex Ind., Inc.

4587 FIRESTONE BOULEVARD
SOUTHGATE, CALIFORNIA 90280

Phone 1-323-563-0573

Fax 1-323-563-0388

www.chem-mex.com