The crunch factor

AMETEK Brookfield takes a closer look at corn chips and shares the important role that moisture plays in their production and snack foods in general.

EVERY SNACK food has its own set of optimal conditions that will produce the perfect pretzel, crisp or chip. What is considered too much moisture for one might be the perfect amount for another. As a result, it is essential for producers of snack foods to monitor the moisture content of their products. Doing so not only improves the consistency and quality of their products but it can also reduce waste and help optimise production.

Back to corn chip basics

To make a corn chip or a tortilla chip, you start by cooking the corn in a lime/water mixture. Adding lime to the water improves water absorption and assists in the removal of the outer pericarp of the corn so that the final product is more crisp. It also helps increase shelf life by controlling microbial growth.

After cooking, the corn is then left to soak for several hours. Soaking helps disintegrate what remains of the outer hull of the corn and allows the moisture to reach the entire kernel and equilibrate the moisture level at 51-52 percent to produce the best corn chips. The water is later replaced by oil in the frying process, which decreases the moisture content and increases the crunch factor of the final product. After a good, long soak and a nice shower to remove excess lime and pericarp, the corn is sent to the mill where it is ground into masa dough. It is at this point that an initial moisture check is performed.

For the 'work in process test,' operators look for roughly 50 percent moisture in the dough. If the moisture reading is slightly higher or lower than desired, adjustments can be made to raise or lower the moisture level as needed. Once the masa is determined to have a moisture content within the desired range, it is ready for the extrusion process, wherein the dough is pushed through a die to form the shape of the chip. Different dies can be used to create differently shaped chips. A cutting tool slices the dough strips at the proper length and the chip continues its journey.

This is where a major difference between corn chips and tortilla chips comes into play. While tortilla chips are sent first to the oven and then to the fryer, corn chips are sent directly to the fryer. Tortilla chips are baked prior to frying in order to decrease the moisture content in the chip so that, when it is fried, there will be less water available to be replaced by oil, giving the tortilla chip a softer crunch compared to a corn chip. The more moisture available prior to frying, the longer the chips can be in the fryer, and the crunchier the final product will be.

Reflecting this distinction, corn chips typically have between 0.6 percent and 1.1 percent moisture, while tortilla chips have between 0.8 percent and 1.6 percent. In order to ensure these levels, moisture testing is performed every hour using a Computrac® MAX 4000XL from AMETEK Brookfield to ensure that every batch of chips meets high quality standards. In addition, the data from the Computrac® MAX 4000XL is used to calibrate a number of inline sensors used to provide real-time trend data to the operator and supplement the testing carried out in the quality lab.

After spending some time in the fryers, the corn chips are seasoned, salted, packaged and sent on their way to consumers. After all, how are we supposed to celebrate holidays like National Corn Chip Day (held every year on 29 January) without indulging in a handful or two of this tasty, crunchy treat? ■

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