SUPERFOODS AND SHELF LIFE: CAROLINA CRAFT

Carolina Innovative Food Ingredients, Inc.

DEHYDRATED SWEET POTATO INGREDIENTS
According to a recent report by Bloomberg, in 2016 Americans ate twice as many sweet potatoes as they did in 2002, a number that includes both consumption as a vegetable and as an ingredient in processed foods. Demand is also increasing abroad, as American farmers have planted the largest crop since 1965 to support exports to Europe and other markets.

Industry observers attribute this explosion in popularity to the sweet potato’s new status as a superfood, a nutrient-dense food that appeals to consumers who want to improve their diets. Chefs also told Bloomberg that the culinary world has attained a better grasp on how to cook with sweet potatoes, both in traditional items like fries and in more adventurous applications like Mexican cuisine.

The sweet potato’s growing status as a superfood thus means that opportunity is ripe for integrating this popular vegetable into your applications, like baked goods and pastries. Sweet potato flour ingredients, like Carolina Innovative Food Ingredients’ Carolina Craft, offer a gluten-free, nutrient-dense alternative flour for snacks, baked goods, and other applications. As a flour designed for health-focused consumers, Carolina Craft offers the baking industry a great way to better target consumers who may have cut back on wheat bread and other baked goods in recent years.

Aside from its superfood status, recent testing suggests that Carolina Craft may also have benefits for shelf life in baked goods. The remainder of this white paper reports the results of this testing and its implications for baking and snack brands.
Shelf Life Testing

For the purpose of testing the effects of Carolina Craft on shelf life, formulators selected a traditional yeast-raised bread formula made with whole grains. They baked the following loaves:

- Loaf One: standard whole wheat loaf
- Loaf Two: 2.1% Carolina Craft
- Loaf Three: 3.2% Carolina Craft
- Loaf Four: 4.4% Carolina Craft
- Loaf Five: 7.2% Carolina Craft

Sensory analysis concluded that of these loaves, Loaf Three was most desirable, as the added Carolina Craft flour had little to no impact on the appearance, texture, and volume of the bread as compared to the control loaf. Loaves Four and Five were significantly denser and had lower volume. Although this does not rule out higher levels of Carolina Craft in bread products—other factors in the formula could be adjusted to compensate for the decreased wheat flour—it does suggest that brands wishing to maintain continuity with an existing product should consider Carolina Craft at the 3.2% usage rate.

After baking, each loaf was cooled and sealed in a plastic bag to be held at ambient temperature and relative humidity (~70 degrees F/40% RH, typical of a supermarket). All four loaves were stored under identical conditions to test relative shelf life, measured in the number of days until visible degradation (e.g. mold growth, discoloration) appeared on the loaves. The results were as follows:

<table>
<thead>
<tr>
<th>Concentration of Carolina Craft (CC)</th>
<th>Days without mold growth</th>
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</thead>
<tbody>
<tr>
<td>0% CC</td>
<td>12 days</td>
</tr>
<tr>
<td>2.1% CC</td>
<td>12 days</td>
</tr>
<tr>
<td>3.2% CC</td>
<td>15 days</td>
</tr>
<tr>
<td>4.4% CC</td>
<td>15 days</td>
</tr>
<tr>
<td>7.2% CC</td>
<td>15 days</td>
</tr>
</tbody>
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These findings suggest that Carolina Craft, at the proper usage rate, may extend the shelf life of baked goods, offering consumers a better experience and helping brands avoid food waste. While confident of these results, CIFI would recommend formulators conduct confirmation testing of shelf life extension using their particular baking and storage process. In particular, brands that need to maintain maximum continuity in an existing product could incorporate Carolina Craft at the 3.2% usage rate, allowing them to obtain its superfood and shelf-life benefits without sacrificing the flavor and appearance of their existing product. Other brands can consider higher usage rates in products specifically designed to focus on delivering the benefits of sweet potatoes. Look to CIFI as your partner for this new ingredient enabling on-trend, quality products that can help strengthen your product portfolio.