Sorghum Nixtamalization Whitepaper

The intent of this whitepaper is to highlight the flavor, functionality, versatility and nutritional benefit of sorghum in replacement of or synergy with traditional corn-based products to add value to existing SKUs and brands.

Nixtamalized Sorghum Concepts:

Nixtamalization is a traditional process most often associated with corn, where it is the foundation for creating corn tortillas. Like corn, sorghum can also be nixtamalized—a process that enhances sorghum's already impressive nutrient profile[1,2]. By applying heat and an alkaline substance (calcium hydroxide), the grain's starches are softened and transformed, allowing them to form what is known as "masa." Masa, essentially a pliable paste, can be shaped and pressed to create a variety of dishes across cultures and cuisines. When pressed and heated, masa forms tortillas; it can also be shaped and filled to create pupusas, tamales or serve as a base for arepas and sopes.

Nixtamalized Sorghum Recipe:

A simple formulation ratio for sorghum nixtamalization is 4:1 water to whole grain sorghum, with 0.05% calcium hydroxide by total weight of the water and sorghum mixture.

Ingredients:

1,500 grams Water
350 grams Whole Grain Sorghum
9.25 grams Calcium Hydroxide
3 grams Salt
Water, warm, as needed

Instructions:

1. Place the water and sorghum into a saucepot over high heat.

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[1]A.H. Cabrera-Ramírez, et al, Effect of the nixtamalization process on the protein bioaccessibility of white and red sorghum flours during in vitro gastrointestinal digestion, Food Research International, Volume 134, 2020, 109234, ISSN 0963-9969, https://doi.org/10.1016/j.foodres.2020.109234.

[2]Marcela Gaytán-Martínez,et al, Effect of nixtamalization process on the content and composition of phenolic compounds and antioxidant activity of two sorghums varieties, Journal of Cereal Science, Volume 77, 2017, Pages 1-8, ISSN 0733-5210, https://doi.org/10.1016/j.jcs.2017.06.014.

2. Once the water reaches a boil, add the calcium hydroxide and allow to boil, covered, for 40 minutes.
3. Remove from heat and put in a container to soak in the refrigerator.
4. After 12 to 18 hours, rinse the sorghum to remove any excess lime (calcium hydroxide) and rub the grains between your fingers or palms to remove the husk of the sorghum, not all of the husks need to be removed.
5. Grind the soaked and husked sorghum in a food processor, adding the salt and water, 1 tablespoon at a time, as needed until a slightly tacky “play-doh” texture is achieved.
6. Turn out onto a clean surface and knead by hand to ensure a homogenous masa, adding more water as needed to reach a smooth, pliable texture.

For Tortillas:

Form the masa into golf ball sized balls, press out with a tortilla press, and heat in a skillet over high heat, toasting evenly on both sides.

For Chips:

Cut sorghum tortillas into wedges and fry in neutral-flavored oil at 350°F until crispy.

Sensory Attributes

Visual: Sorghum’s many colors also allow it to be nixtamalized and made into a rainbow of applications from white to red, burgundy and black.

Aroma/ Flavor/ Taste: Nixtamalized sorghum offers a milder, nuttier flavor in comparison to traditional nixtamalized corn, making it perfect for traditional corn or flour tortilla applications..

Texture: Nixtamalized sorghum has a texture similar to nixtamalized corn, with comparable functionality and versatility.

Sensory Conclusion: Nixtamalized sorghum provides unique and nuanced sensory attributes while maintaining comparable versatility and functionality to nixtamalized corn. Additionally, it offers greater nutrient density and bioavailability.

This opens possibilities for using nixtamalized sorghum as a complete substitute for or in combination with corn in new and innovative product lines.

Other Considerations

Sorghum's many forms allow for quick and simple adoption and application in packaged goods on a basis of need, whether it be: nutrient profile, sensory or sustainability. From whole grain to pearled, popped, puffed or cut grain; sorghum has applications from breakfast to snacking. Sorghum can function as a new tool for building out new and innovative brands and line extensions.

The Sorghum Checkoff team is dedicated to supporting your product development needs, please contact Lanier Dabruzzi (lanier@sorghumcheckoff.com) with any requests or questions.