



CASE STUDY

# The Evolution of Gluten-Free:

## *Opportunities to Make More Dough*

Consumer needs and desires have changed, but avenues to capitalize on trends are plenty.



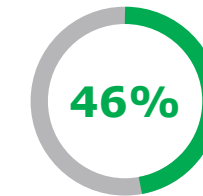




# The Goods on Still Going Gluten-Free

Serving your friends and family members gluten-rich bread and brownies between 2010 and 2019 might have been met with a gasp. In 2023, attitudes toward gluten have softened, but a significant portion of global consumers are still avoiding or eliminating gluten as part of their personal wellness lifestyles.

While only a small share of the population has Celiac disease (0.8 percent of Europeans and 1 percent globally<sup>1</sup>), the number of gluten avoiders is much higher. In fact, the global gluten-free market is estimated to be \$7.8 billion in 2023.<sup>2</sup> That's quite an audience that's already baked in.



**of U.S. gluten avoiders eliminate wheat/gluten as part of a healthy lifestyle.**

Source: Mintel, Keeping gluten-free relevant to mainstream consumer, 2022  
Mintel Patent insights: emerging trends in "gluten-free"

Source<sup>1</sup>: Mintel

Source<sup>2</sup>: Euromonitor, 2023



**11% of U.S. consumers are considered gluten avoiders.**

Source: Mintel, Keeping gluten-free relevant to mainstream consumer, 2022  
Mintel Patent insights: emerging trends in "gluten-free"



**Gen Z and Millennials in the U.S. are experimenting with a wide range of eating approaches (69% and 65%, respectively).**

Source: HW2021, The Hartman Group





# Room for Improvement: Creating Tastier, More Nutritious & Cleaner-Label Gluten-Free Food



Source<sup>3</sup>: Mintel, Keeping gluten-free relevant to mainstream consumer, 2022  
Mintel Patent insights: emerging trends in "gluten-free"

## Bringing Better Options to the Table



There are still significant opportunities to both attract new consumers to the gluten-free way of life and to gain loyalty from existing gluten avoiders. Making products taste great with the right textures, while also addressing highly sought-after attributes, such as quality nutrition, clean labels, and responsible sourcing, are key to developing the next generation of gluten-free food.

ADM is helping achieve these goals, with new sources of alternative flour through our vast library of wholesome ingredients coupled with our application and technical expertise.



# Wholesome Ingredients Portfolio

 **NutriStem™** *Fulfill your wholesome, plant-based food needs with nutritious, functional, and sustainable ingredients.*

Portfolio	Features & Benefits	Available Options
<b>Beans &amp; Pulses</b> Black Beans Chickpeas Green Lentil Navy Beans Pinto Beans Red Lentil Small Red Beans Yellow Pea	<ul style="list-style-type: none"><li>Broad portfolio of pre-gelatinized and unprocessed ingredients enabling functionality in a variety of applications</li><li>Unprocessed or minimally processed forms</li><li>Non-GMO &amp; available as organic</li><li>Wide range of added value options</li><li>Expertise in extrusion and sheeting</li></ul>	<ul style="list-style-type: none"><li>Non-GMO, Organic</li></ul> <b>Pregelised</b> <ul style="list-style-type: none"><li>Flours, Meal, Grits</li><li>Crisps</li><li>Whole</li></ul> <b>Raw-milled</b> <ul style="list-style-type: none"><li>Flour</li><li>Grit</li></ul>
<b>Ancient Grains &amp; Seeds</b> Amaranth Barley Buckwheat Millet Sorghum Quinoa Chia Flax Hemp Pumpkin Sunflower	<ul style="list-style-type: none"><li>Whole food ingredients that offer a variety of tastes, textures, and nutritional benefits</li><li>Reliable quality supply chain for hard-to-source niche ingredients to meet your quality standards</li><li>Wide range of added value options</li><li>Minimally processed—non-GMO, organic, gluten-free</li></ul>	<ul style="list-style-type: none"><li>Non-GMO, Organic</li><li>Pasteurized, Roasted, Flaked, Crisped, Puffed, Milled, Seasoned, Bulk</li></ul>
<b>Key Applications:</b> Snacks, Bakery, Savory, Alternative Meat		

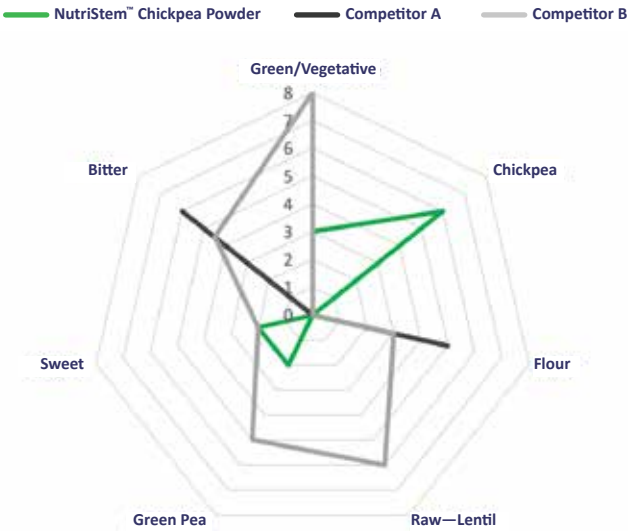
## Consumer Perceptions



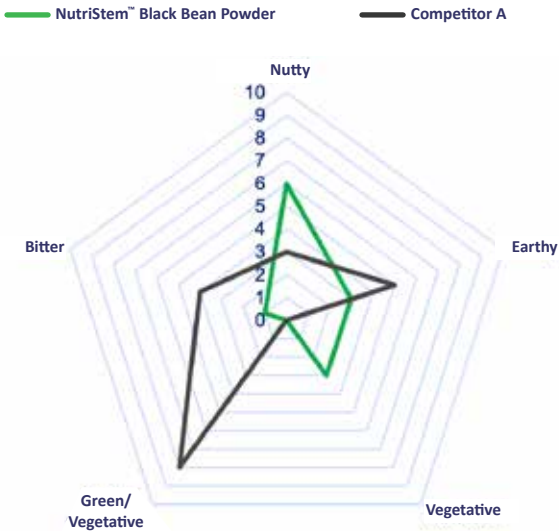
Source: ADM Outside Voice, 2023

Consumers often point to taste as being a barrier to adopting gluten-free eating habits. Our NutriStem™ chickpea powder and NutriStem™ black bean powder scored higher than competitor products in desirable taste.

### Chickpea Ingredient Comparison



### Black Bean Ingredient Comparison





# Nutrition Info & Formats

Consumers are looking to add more nutrient-dense foods to their diets. Ancient grains and seeds offer positive nutrition attributes and great taste and can provide texture and even color. Plus, they’re available in multiple formats to achieve the functionality needed for your gluten-free applications.

What’s more, when you work with ADM, you have access to our entire pantry of ingredients to add even more highly sought-after attributes to your products.

## NutriStem™ Ancient Grains & Seeds: Ingredients & Formats

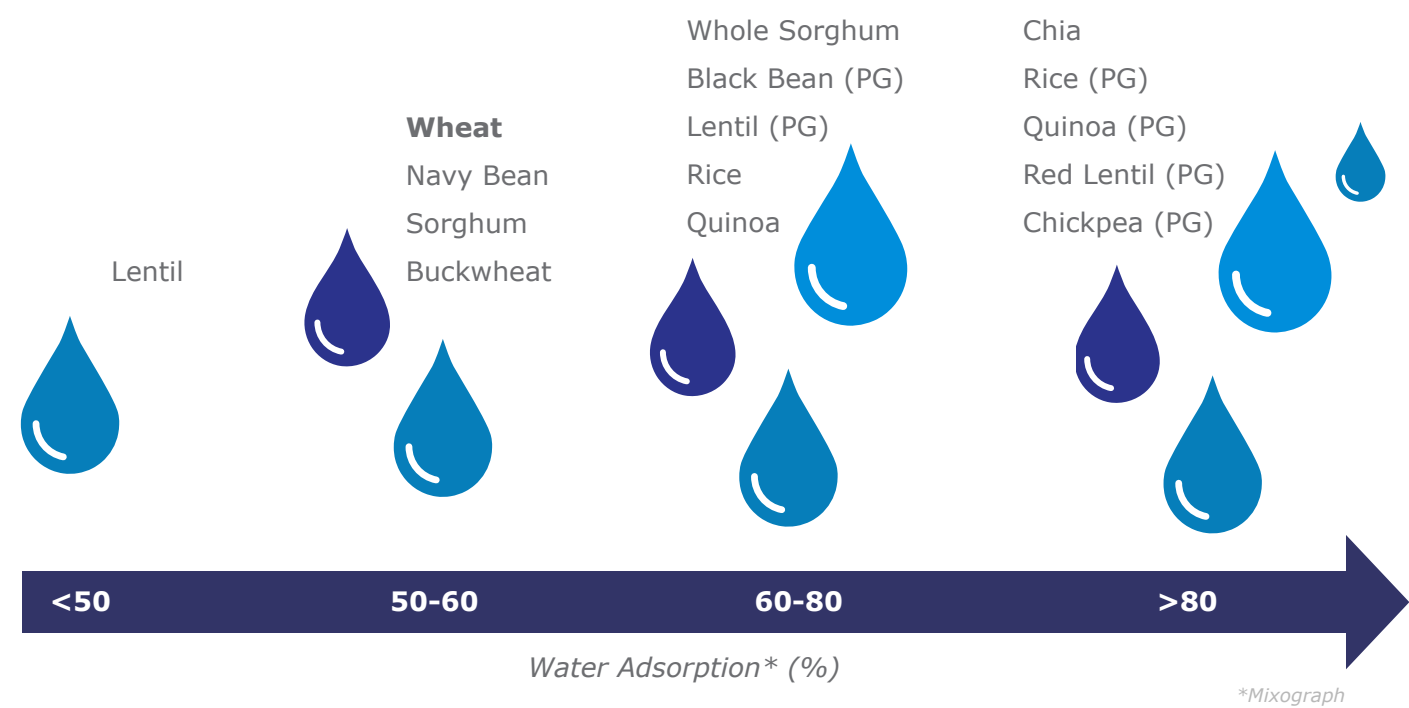
Products	Forms Available	Protein (g/100g)	Fat (g/100g)	Fiber (g/100g)
Amaranth	Conventional, organic, popped, puffed	14	7	7
Quinoa	White, black, red and tricolor, flour, crisp, flakes, organic	10	6	7
Chia	Black & white, powder, organic, pasteurized	17	31	34
Hemp	Hulled, organic, pasteurized	32	48	4
	Protein powder 33	30	11	31
	Protein powder 50	50	15	16
Buckwheat	Conventional, flour, grits, groats, kasha	13	4	10
Flax	Brown & yellow, pasteurized, milled, organic	18	42	27
Sorghum	Flour, crisp, popped, white, organic	11	3	7
Barley	Hulled, organic	12	12	17
Sunflower	Hulled seeds, pasteurized, roasted	24	43	23
Pumpkin	Hulled, raw, pasteurized, roasted, organic	30	49	6

Available in conventional & organic

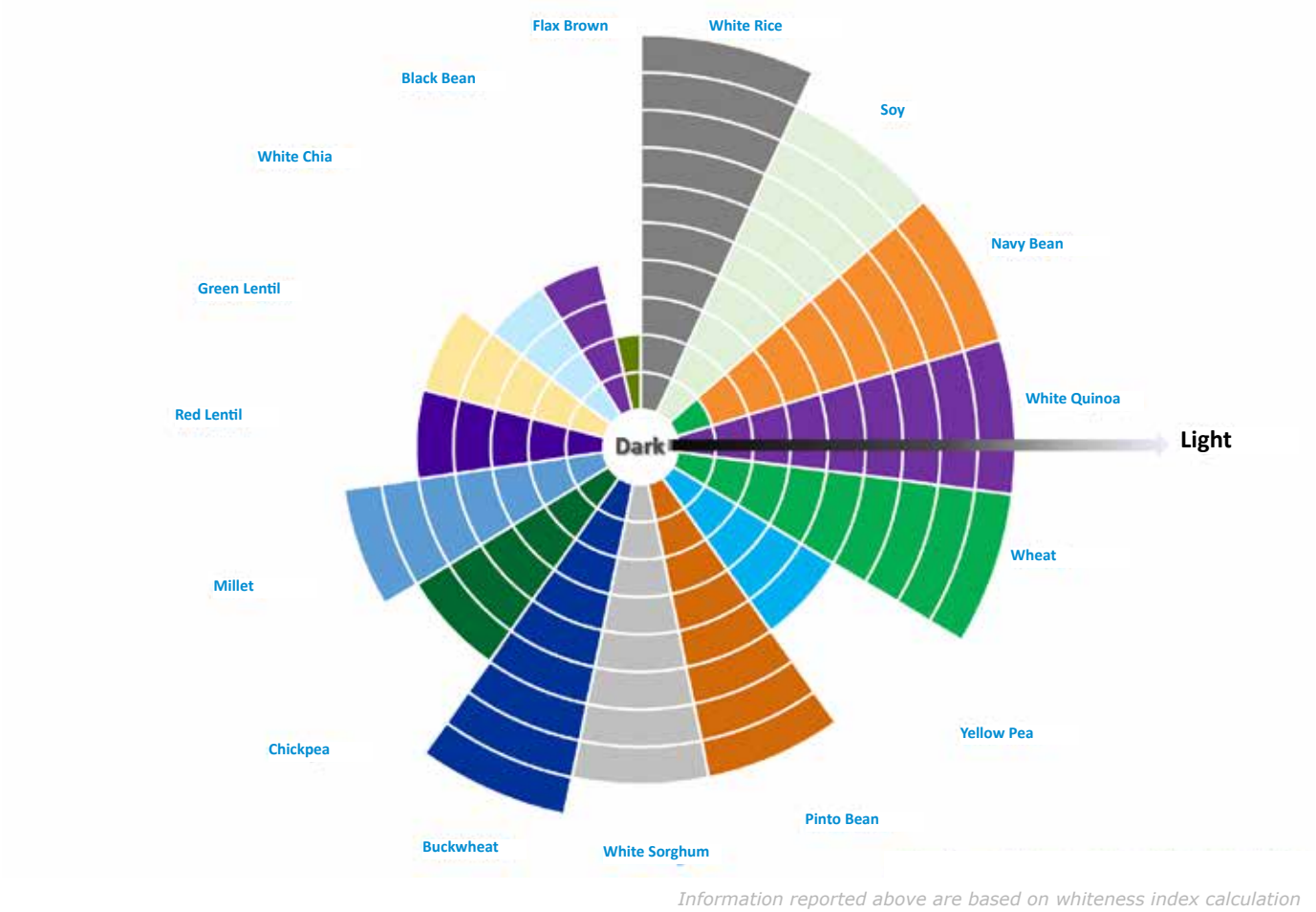




Water Adsorption of Alternative Flours for Application



Whiteness Index of Alternative Flours for Application



Sustainably Sourced Assurance

Consumers are increasingly seeking products that are not only good for them, but also good for the planet. By combining our smaller U.S. footprints with strategic responsible growing practices, ADM is helping meet this demand. From reduced water usage to improved seed yields, cover crops, atmospheric nitrogen fixing, traceability, and more, we, along with our farmer partners, are helping make land more productive with fewer inputs.



# A Taste of Our Solutions for Gluten-Free Manufacturing Challenges

## Prevent Tearing, Powdery Mouthfeel, Bitterness, Aftertaste, and Aromatic Off Notes

High-quality ingredients that are neutral in flavor, such as tapioca starch and sorghum flour, create consumer-preferred crispy flatbreads and buns with a soft center. Taste modulators, flavor enhancers, and other techniques can be employed to correct off notes, including toasting white sorghum to replicate the taste of wheat flour.

## Turning Dry Breads Into Mouth-Watering Masterpieces

A dry texture is usually an undesirable feature in bread that, unfortunately, can be all too common. Our humectant portfolio combats this issue by improving moisture retention throughout shelf life. Sweetening solutions, like our reduced sugar glucose syrup, also aid in this regard while reducing total sugars in the formulation at the same time.

**No matter the challenge, ADM can help.**





# Gluten-Free Vegan Brownie

Gluten-free and vegan, without compromise! These brownies are not only delicious but also packed with fiber, providing highly sought-after attributes. The tapioca starch and sorghum help deliver the taste and texture customers expect in baked goods.



## Concept Highlights

- Gluten-free
- Vegan
- High fiber

## ADM Featured Ingredients

- Modified Tapioca Starch 6224
- Fibersol®-2
- Coconut Oil
- Sorghum Flour
- Brown Rice Flour
- Black Bean Powder
- Cocoa Powder
- Vanilla Extract

## Case Study

# Challenge

Consumers want better-for-you bakery options to enjoy throughout the day that they can feel good about—combining purposeful indulgence with great texture and delicious taste.

## Insight

The increase in consumers turning to a more flexitarian lifestyle—consuming both plant-based, animal-based, and other protein sources—can be attributed to the search for more dietary diversity, as well as environmental and animal welfare concerns.

*Source: A Year of Innovation in Cakes & Sweet Bakery; Mintel, October 2019*





## Gluten-Free Thin Pizza Crust

Inspired by the flavorful Neapolitan pizzas of Italy, our thin crust has a delicious taste that appeals to consumers seeking permissive indulgence. Functionally, this crust controls water migration and offers freeze/thaw stability while delivering a crispiness during baking for an irresistible, familiar texture.



### Concept Highlights

Gluten-free
Non-GMO

### ADM Featured Ingredients

Modified Tapioca Starch 6224
Brown Rice Flour
Sorghum Flour
Interesterified Soybean Oil
Flaxseed

## Case Study

# Challenge

Delicious gluten-free pizza crust that doesn't impart bitter flavors from the use of common ancient grains or create the texture challenges that occur during the freeze/thaw process.

## Insight

While gluten-free bakery products are perceived as healthier, taste and indulgence are still the main areas of improvement from the consumer's point of view.

*Source: Gluten-free bakery: a new era of innovation; Mintel, October 2018*







# Why ADM?

## **A Legacy of Expertise**

With over 100 years of experience, ADM provides the performance, reliability, and industry know-how to give you the service and speed to market you need to succeed. Many of our gluten-free proteins offer the appeal of plant protein with a neutral flavor that delivers a taste consumers love. Plus, we're equipped with the technical ingenuity and deep understanding of ingredients to help select the ideal gluten-free protein to solve your challenges and deliver consumer-desired texture and taste enhancement.

## **Sustainable Supply**

ADM's partnership with carefully selected growers provides the highest quality ingredients and consistency from field to market. Transparent and traceable, you can rest assured that when you work with ADM, you'll have the right ingredients to help you produce clean-label and delicious goods that today's mindful—and taste-driven—consumers will love.

To learn more, visit [adm.com/GlutenFree](https://adm.com/GlutenFree)