

HOW TO USE

KERNZA®

*A Technical Guide for
Bringing Kernza to Consumers*

CONSUMER PACKAGED GOODS (CPG)

Today's consumers are increasingly driven by sustainability, the pursuit of nutritional benefits (especially protein), and the excitement of new flavor experiences. Kernza® delivers on all these trends and more, offering CPG brands a way to innovate while meeting growing market demand for better-for-you and better-for-the-planet products.

Unique Benefits of Kernza

Kernza is a perennial grain with a distinctive, nutty flavor. Whole grain Kernza contains 17–20 g of protein per 100 g and 19–29 g of total dietary fiber per 100 g.¹ Available in flour, rolled, puffed, and whole grain forms, Kernza brings flavor, nutrition, and versatility to baking mixes, pastas, cookies, hot cereals, and grain mixes.

Beyond nutrition, Kernza also supports sustainability goals. As a perennial crop, it regrows year after year without the need for replanting. Its deep root system — which can reach over 10 feet into the ground — helps improve soil health, conserve water, and sequester carbon. For companies seeking to deliver innovative, sustainable products, Kernza is a compelling and impactful choice.



Photo credit: Perennial Pantry

Where to Use Kernza

Early innovators have seen success with products built around the unique characteristics of Kernza and with products that incorporate it into existing recipes.



Flour

When using Kernza flour, a good starting point is to treat it like whole wheat flour, then adjust based on your specific formulation needs. Substitute Kernza flour for 15–45% of wheat flour in a variety of products. Stone-milled whole grain Kernza* in particular is a great fit for health-conscious consumers who care about nutrition since the flour retains both the endosperm and bran of the seed. Stone millers report a nutmeg or cinnamon aroma from Kernza milling. Suggested uses:

- ▶ Baked goods
- ▶ Baking mixes (cookies, pancakes, waffles)
- ▶ Cookies
- ▶ Crackers
- ▶ Scones

Rolled Kernza

Similar to rolled wheat berries with a firmer texture than rolled oats. Adds fiber, protein, and is easy to mix into recipes as a dry good. Combine with other grains in:

- ▶ Muesli
- ▶ Granola
- ▶ Oatmeal

Puffed Kernza

Similar to puffed wheat and creates amazing flavor. Puffed Kernza made an appearance at Expo West in 2025. Applications:

- ▶ Granola
- ▶ Cereal and puffed cereal
- ▶ Puffed Kernza crispies
- ▶ Chocolate with crispy Kernza puffs

Whole Grain

Reminiscent of wheat berries, farro, and rye berries.

- ▶ Par-cooked grain mixes

A New Direction

Research on extruded Kernza shows promising applications when mixed with pea starch.

*Kernza flour is often stone-milled. For a 12-month shelf life, store stone-milled Kernza flour in a dry, cool place in an airtight container. The freezer is the best, and you can keep it in its paper bag packaging. A refrigerator is not ideal because it can pull out too much moisture. ~ 2

The Flavor of Kernza

Kernza has a nutty flavor that pairs especially well with butter, and toasting it brings out even more of its natural richness. Kernza flour creates distinct tastes that come to life in baked goods.

Compared to wheat flour, Kernza offers a more complex, deeper flavor profile. It's darker in color, slightly sweeter, and carries a mild bitterness — not unpleasant, but similar to the balanced bitterness often associated with chocolate. In terms of flavor, Kernza is closer to rye than to traditional wheat, making it especially well-suited for pairing with sweet or rich ingredients.

The flavor of Kernza goes well with chocolate and warm spices such as cinnamon, nutmeg, and cardamom.

The cooked whole grain is more neutral tasting than the flour, closer to whole grain wheat berries.

Tasting notes described by product developers:

- ▶ *Nutty*
- ▶ *Brown sugar*
- ▶ *Toasted*
- ▶ *Sweet*
- ▶ *Raisin bran*
- ▶ *Cinnamon*

Nutritional Benefits

Kernza delivers the kind of nutritional perks today's consumers are looking for. It's a smart, wholesome ingredient choice for anyone wanting to eat with purpose.

▶ **Protein**

Whole grain Kernza contains 17–20 g of protein per 100 g.¹

▶ **Fiber**

Whole grain Kernza contains 19–29 g of total dietary fiber per 100 g, including 5–6 g of soluble fiber and 14–24 g of insoluble fiber.¹

▶ **Vitamins and Minerals**

Kernza contains important vitamins and minerals: 100 grams of whole grain Kernza provides 120–150 mg of calcium, 500–580 mg of potassium, 0.3–0.35 mg of vitamin B1 (thiamin), 150–160 mg of magnesium, 480–510 mg of phosphorus, and 3.7–5.3 mg of zinc.¹

Getting Started with Whole Grain, Flaked, or Puffed Kernza

These three ingredient forms are very easy to integrate. Pair whole grain Kernza with other grains in ready-to-heat, healthy whole grain mixes. Incorporate flaked or puffed Kernza with other dry goods ingredients into granolas, hot cereals, and bars.

For whole grain and flakes, note the small size of the grain compared to wheat or oats.

Getting Started with Kernza Flour

While similar to wheat in some ways, Kernza flour performs somewhat differently than wheat flour. Consider these practical tips, notes, and recommendations on what to expect.

For a deep dive on technical baking standards from early Kernza product developers, consult the Other Resources section.

Kernza is NOT gluten free. Pure Kernza has less than 10% wet gluten, compared to 30–45% in strong hard red wheat flours and 19–22% in soft wheat flours.² For this reason, it's a good idea to blend Kernza flour with wheat flour for many applications.

Kernza flour contains 17–20% protein, but its protein composition differs from that of wheat flour. It does NOT contain enough of the right types of gluten to substitute 1:1 for whole wheat flour. In terms of functionality, Kernza behaves more like rye flour, with larger bran particles, though its flavor is entirely distinct from rye.

The texture of Kernza flour can vary depending on the supplier and milling process, ranging from coarse to more finely milled, like pastry flour. Its high bran content influences both dough behavior and flavor. Kernza flour also imparts a darker color to most baked goods, similar to whole wheat. For optimal flavor and performance, Kernza pairs well when blended with distinctive wheat varieties, such as pastry flour or high-protein wheat.

How to Use Kernza Flour

Kernza flour can be used in many applications where whole wheat flour is typically used. It performs especially well in baking soda-leavened products such as soda breads, cakes, and cookies. For best results in many formulations, Kernza should be blended with wheat flour to optimize structure and performance.

- ▶ It's excellent at up to 30% in sourdough bread and in sourdough starter.
- ▶ For other applications, it can be mixed with a high protein, single variety flour.
 - A blend of 43% Kernza flour and 57% Bolles wheat flour worked well for brioche, gougères, croissants, and pizza crust.³
- ▶ 30% Kernza flour and 70% soft white wheat flour blended together is a good way to substitute for whole wheat pastry flour.⁴
- ▶ For cookies, you will need to increase the liquid for higher percentages of Kernza flour.
- ▶ The flavor of Kernza goes well when combined with sugar and fat.

Recommended Inclusion Percentages

(% Kernza flour as a % of total recipe's flour)

- ▶ Flatbreads: 1–30%
- ▶ Sourdough Bread: 1–30%
- ▶ Crackers: 1–75%
- ▶ Pasta: 1–35%
- ▶ Cookies, Graham Crackers: 1–50%
- ▶ Scones and Banana Bread: 1–100%
- ▶ Tortillas: 1–25%
- ▶ Pastries: 1–25%

Equipment Note

Whole grain Kernza dough tends to be high-hydration and sticky due to its high bran-to-starch ratio. The abundant bran content absorbs significant amounts of water.



Photo credit: Perennial Pantry

Product Development and Sourcing Considerations

Kernza has an amazing environmental story as well as a traceable supply chain. Research shows the roots can reduce nitrate levels in soil water by over 99% compared to corn and 96% compared to soybeans, bringing nitrate concentrations far below the EPA's safe drinking water threshold. This also protects rural wells and downstream waterways.⁵

Community Connection: Choosing Kernza products helps build a new market to support farmers.

Legal Note

As with any CPG product, be sure allergens are properly labeled (e.g., Kernza contains gluten) and that all claims follow prescribed guidelines.

Check with your Kernza supplier for up-to-date Kernza trademark labeling requirements.

Sourcing

Kernza is part of an emerging perennial grain supply chain. While some inventory is available on demand, new plantings take 12 months to mature, not accounting for farmer onboarding. Have a discussion with suppliers about desired quantity and then plan a product launch to match available quantities and timelines (seasonal or specialty release versus national release, etc.). Lead times may fluctuate, so plan flexibility into your timelines.

There's also a powerful story to tell around the types of land management used to grow Kernza.

- ▶ Many target consumers are interested in Organic and Regenerative Organic Certified choices.
- ▶ Non-organic Kernza still has an exceptional environmental story compared to annual wheat, corn, or soybeans. Kernza reduces tillage, boosts water quality, enhances soil health, and has carbon storage benefits. It also requires fewer inputs from a fertilizer perspective. See the Kernza Environmental Benefits guide on [Kernza.org](https://kernza.org) for peer-reviewed research supporting these benefits.
- ▶ Kernza is a good fit for non-GMO labeling and, in many cases, glyphosate-free preferences.

Price

Kernza is currently priced higher than conventional grains, reflecting its early stage of commercial development. However, costs are expected to come down as breeding efforts improve yields and supply chains mature. For the latest pricing information, please contact Kernza suppliers directly.

Strategies for working with a premium ingredient:

- ▶ Choose a product that's well-suited to a target consumer who values the nutrition and powerful environmental story of Kernza.
- ▶ Find an inclusion percentage where you can get these sales-driving benefits and still be within an acceptable price range for target customers. A 15–25% Kernza inclusion is very meaningful for protein and fiber.
- ▶ Consider product formulations that minimize COGS (cost of goods sold) while maximizing the grain's contributions to taste, nutrition, and uniqueness. Develop recipes with flexible Kernza inclusion percentages to maximize adaptability.
- ▶ Ensure your marketing materials justify the higher price. Work with retailers on point-of-sale materials. For a starting point, see the Kernza branding kit on [Kernza.org](https://kernza.org). Include both short messages and longer-form stories about why Kernza matters.
- ▶ Direct-to-consumer models could help minimize costs.

Consider these two successful product approaches using Kernza:

▶ *Low-inclusion model with high impact*



Incorporate a small percentage of Kernza into a high-volume SKU to maximize environmental impact. Even modest amounts can support many acres of perennial agriculture. The Perennial Percent label helps tell this powerful story. **Learn more at:** kernza.org/perennial-percent.

▶ *High-inclusion model for broad benefits*

Use a high percentage of Kernza to showcase its distinctive nutty flavor, nutritional value, and sustainability — all in one product.

Kernza Supplier Sourcing Information

Please speak directly with your supplier for information about pricing and the ingredient forms they carry (raw grain, flakes, flour). Visit Kernza.org to locate a list of suppliers.

Credit to Contributors

We extend our sincere gratitude to the individuals who helped make this guide possible.

- Missi Blue, Sturdiwheat
- Christopher Abbott, Perennial Pantry
- Christine “Montana” Rasmussen, River Rock Kitchen and Baking Company
- Joe Kaplan, experienced Kernza product developer, formerly at Perennial Pantry
- Dan Rusoff, Chef/Owner, Bread Enthusiast
- Beth Dooley, author of The Perennial Kitchen and other cookbooks, and Endowed Chair at the Minnesota Institute for Sustainable Agriculture at the University of Minnesota
- Chris Nye, Executive Chef, Soigne Hospitality Group
- Keaton Hale, Miller, Farmer Direct

Other Resources

- ▶ **Kernza Perennial Grain 2024 Annual Supply Report: Insights into US Kernza Planting, Harvest, and Management Data**; Hana Fancher (2025), Kernza Supply Review, The Land Institute.
A new report is completed each year and available on Kernza.org.
- ▶ **AURI (2022): Kernza Perennial Grain Value Chain Development in Central Minnesota**; Agricultural Utilization Research Institute. To obtain a copy, contact reports@auri.org. Appendices A, B, C, J, and P have great detail on baking uses and technical analyses of Kernza flour.
- ▶ **“Malting Kernza Perennial Grain: Assessing Characteristics, Quality, and Flavor of Kernza Malt”**; Joe Kaplan and Christopher Abbott (2023). Chapters 6 and 7 have detailed flour analysis and functional experiments.
Available at: <https://perennial-pantry.com/pages/kernza%C2%AE-malting-research>
- ▶ **Joe Kaplan**, one of the leading and most experienced Kernza product developers, is willing to discuss his experiences. jmkaplan9590@gmail.com
- ▶ **The Perfect Loaf: Kernza Sourdough Bread Recipe**, Maurizio Leo (2025).
Available at: <https://www.theperfectloaf.com/kernza-sourdough-bread-recipe/>
- ▶ **Dr. George Annor**, Associate Professor in the Department of Food Science and Nutrition at the University of Minnesota is willing to discuss his research on functional uses of Kernza.
Learn more at: <https://fscn.cfans.umn.edu/people/george-annor>

¹ Great Plains Analytical Laboratory tests of 2024 harvested grain from 24 fields across three regions. g = grams and mg = milligrams.

² Perennial Pantry malting report, p. 49.

³ Perennial Pantry malting report, p. 58-60.

⁴ Perennial Pantry malting report, p. 46-47.

⁵ Jungers et al., 2019; Reilly et al., 2022