



The Power of Texture.

Tapioca starch for modern lifestyles.





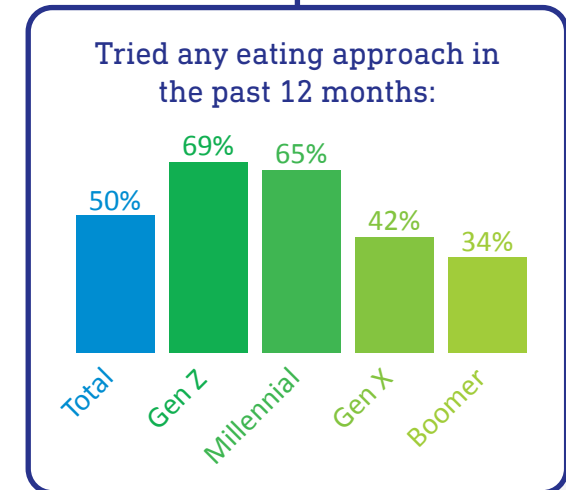
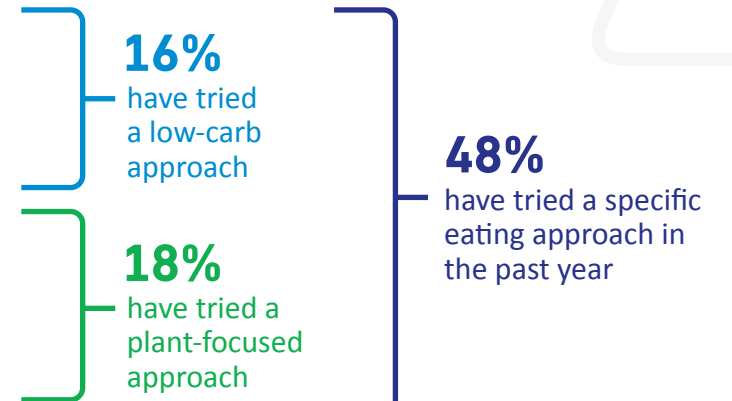
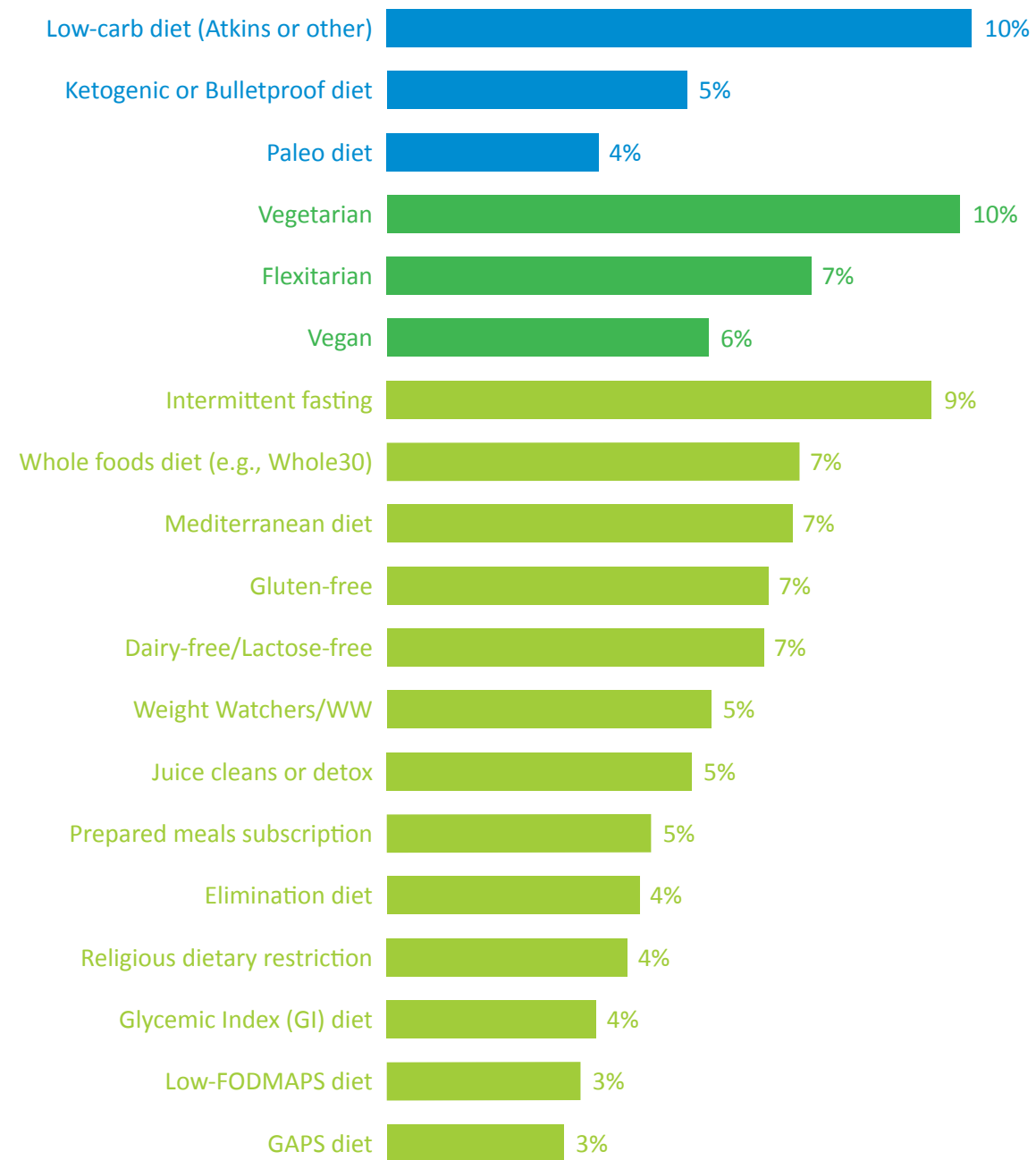
Personalized nutrition shaping taste & texture innovation.

Holistic wellness is a worldwide trend, with experts predicting the international wellness market will reach a massive \$7.0 trillion by 2025.¹ The annual growth rate for global wellness (9.9%) is more than double that of the global economy, illustrating just how invested we are in finding balanced ways to support our body, mind, and soul.

However, consumers do not believe in a miracle pill or approach, rather they adapt personalized measures to support their health. This is especially true when it comes to nutrition supporting modern lifestyles. Consumers are open to adapting trends and regimes from cultures around the globe that align with their physical needs as well as their social and environmental values.

Research shows that healthy eating, nutrition, and weight loss sectors gained traction amid the COVID-19 pandemic, surging by \$34 billion between 2019 and 2020.¹ Consumers are in hot pursuit for contemporary wellness solutions that support their lifestyle with clean label and nutrient dense foods and beverages. Part of this consumer led experimentation includes trialling popular lifestyle diets or eating approaches.

Specific eating approaches tried in the past year:²



Source: ¹Global Wellness Institute. Press Room. June 2022 globalwellnessinstitute.org
²Hartman Group Health and Wellness 2021

Staggering potential.

Spotlight: Tapioca Starch

The escalation in consumer motivation for proactive dietary solutions to manage weight, support immune function and aid physical performance has driven a sharp increase in product launches from this pandemic era. On the hunt for solutions that support overall wellbeing and nutrition goals, taste is still top of mind. Gone are the days of compromising eating experiences for health benefits — consumers are holding brands to higher standards.



This is where specialty solutions can serve as an answer to increase consumer appeal and deliver superior functionality and efficiencies to businesses. With a 19% CAGR between 2016 and 2021,³ tapioca starch is the fastest growing starch type among all new product launches, and for good reason:

+ Versatility: Tapioca starch is remarkably versatile, with the ability to act as a texturizer, water-binder, mouthfeel enhancer, emulsifier and increases process tolerances among many other benefits. It ticks multiple boxes for formulators, interested in improving quality and performance of their finished applications.

+ Broad Application: The top five use-case categories for tapioca starch in North America include snacks, bakery, prepared meals, pet food, and processed meats indicating a strong presence in some of the most high-growth, better-for-you categories in the industry.

+ Future Opportunity: The overall growth arc of plant-based, vegan, and flexitarian lifestyles promises the largest area of future opportunity. Meat and dairy alternatives are projected to see staggering growth (+8%) for new product launches by 2026. Both categories include successful formulations harnessing tapioca starch, giving producers a glimpse at plant-based innovations that will set the stage for the next decade.

ADM is a leader in specialty starch solutions with a comprehensive portfolio of native, modified and resistant tapioca starches, all with the neutral flavoring and textural potential producers need to execute their product visions.



Q+A with Rhonda Witwer

*Technical Service Director for Food Starches
ADM Sweeteners & Texturizing Solutions*

Member of Carbohydrate Solutions Innovation and Commercialization team and resident tapioca starch subject matter expert, Ms. Witwer received her M.B.A. in Marketing from The Wharton School of the University of Pennsylvania and her B.S. in Chemistry from Butler University. She is a recognized scholar in resistant starch, which is extensively used in low-carbohydrate foods and foods formulated to help maintain healthy blood sugar levels. She has developed and managed numerous food ingredients in her 30-year career and is a long-time member of the Institute of Food Technologists.

Q: Why is texture so important to the eating and drinking experience?

A: Texture is an essential part of our drinking or eating experience. We have expectations built around texture. For instance, we expect potato chips to be crispy, but we also have an emotional connection with texture. Sometimes, we want the comfortable feeling of a familiar texture, and sometimes, we want surprises. Textures in food can be heart-warming and fun all at the same time.





**Q: Why is tapioca starch a superior solution for formulating lifestyle diet products?
What can tapioca starch provide that other ingredients can't?**

A: Personalization of foods and dietary patterns are significantly more important to consumers than they used to be. We no longer believe that the same foods are suitable for everyone under all circumstances – some people require particular features because of a physiological need or due to their own preferences and beliefs. This trend toward greater personalization will continue to grow as people understand the potential impact of their specific food choices on their health, performance, energy levels, the environment, and the planet.

Starch has been a foundational ingredient for the delivery of specific textures for decades. We often think of starch as a thickener, but starch also helps manage water in foods. Tapioca starch is ideal for use in lifestyle foods because of its unique attributes and benefits. It is used extensively in gluten-free foods because it contributes strong thickening properties that can help bind foods together in the absence of gluten. As a plant-based texturizer, it is popular in vegan foods because it contributes to the soft clingy texture in sauces, the rich and creamy functionality in vegan mayonnaise, the velvety mouthfeel of dairy alternatives, and the crunchy texture in grain-free pet foods. Resistant tapioca starch is also very popular in keto and low-carb foods, because it can replace the structure of flour with flour-like dietary fiber to significantly lower the “net” or glycemic carbohydrates.

Q: What is the biggest misconception about tapioca starch?

A: Many people do not yet fully understand that tapioca is a non-genetically modified tuber. It is not a grain – it is a root. In addition, genetically modified versions are not being commercially produced. All tapioca starch is non-GMO and non-grain.

Q: What segment or application has the most opportunity for tapioca starch?

A: Gluten-free remains one of the strongest applications for tapioca starch. Tapioca starches perform magnificently in gluten-free foods. Their bland, neutral flavor enables delicate flavors to shine through in meals and sauces. The clear, translucent color and soft, gel-like texture of tapioca starch make it a perfect texturizer in these applications.





Q: What future-forward innovations in this space are you most excited about?

A: Tapioca starch’s versatility allows specialty foods of all kinds to shine. I am particularly excited about the development of functional native tapioca starches, which help improve the texture of foods while maintaining a simple ingredient declaration.

In addition, the personalization of food will continue to grow stronger as people experiment with alternative food forms, tastes, and composition. Tapioca starch’s neutral flavor profile is a key success factor in premium, indulgent products, alternative products, and more innovative, convenient staple foods. As a foundational ingredient, its versatility stretches and expands with the development of new food segments and categories.

Q: What’s the best way to start to work with or experiment with tapioca starch in formulations? Are there any “watch-outs”?

A: Tapioca starch can substitute for many other commonly used starches, including corn starch, potato starch, and waxy corn starch. It is very easy to substitute in a wide variety of foods. Numerous ingredients are available to meet various processing conditions, whether that means high shear, low pH, elevated temperature, freeze-thaw conditions, clean label, extended cooking times, or long shelf life.

Due to the differences in modifications, it’s important to properly match the most suitable tapioca starch for the processing conditions that food will undergo. There are reasons why ADM offers a robust portfolio of native, functional native, pre-gelatinized, and modified tapioca starches – there’s one for every application!

Harnessing the power of ADM's tapioca starch for lifestyle diets.

As tapioca starch gains visibility, it's crucial to understand that not all varieties meet the high standards in terms of quality, transparency, and reliability set by ADM.

As with all ingredients in our texturants portfolio, tapioca starch has been carefully sourced to meet the needs of our producers while delivering the texture and taste experiences consumers demand.



Clean Taste

ADM tapioca starch is known for its clean taste. This is a major benefit in applications where tapioca starch is needed for its thickening power or to create an authentic mouthfeel but other additional taste elements would disrupt the flavor profile already in place. With tapioca starch, you can easily tweak existing formulations of delicate flavors without introducing off-notes.



Ideal Texture

Tapioca starch is part of the ADM Texture Solutions pantry. Its innately soft, gel-like mouthfeel comes from amylose, a crystallizable form of starch also present in larger amounts of corn starch. The lower amylose content here is the perfect middle ground: You can achieve spot-on, consumer-preferred textures for a slew of applications, including sauces, dairy alternatives, plant-based meat alternatives, and soups.

Depending on the type of tapioca starch used, producers can achieve texture-driven results ranging from a slight thickening of a gravy or creamy pasta sauce to giving seafood alternatives like faux crab the firm and elastic texture necessary to meet customer expectations.



Label Friendly

All of our tapioca starches are non-GMO, grain-free, and gluten-free — perfect for adding to unique and specialty market products appealing to consumers with a keen interest in labeling. This lets you create the exact texture and mouthfeel you need while ensuring you can still be transparent about your ingredients and their origins, staying aligned with increasing consumer affinity for clarity, candor, and familiarity.



Clear, Translucent Color

Tapioca starch is as neutral in color as it is in taste. This allows the ingredient to be incorporated in a variety of applications without altering the color of the base sauce, plant-based dairy or mindful snacks.

More applications, more benefits.



Baked Goods



Bars & Snacks



Dairy & Dairy Alts



Processed Meat
& Meat Alts



Soups, Sauces
& Dressings



Specialized
Nutrition





Case Study: Creamy Vegan Mayonnaise

Challenge

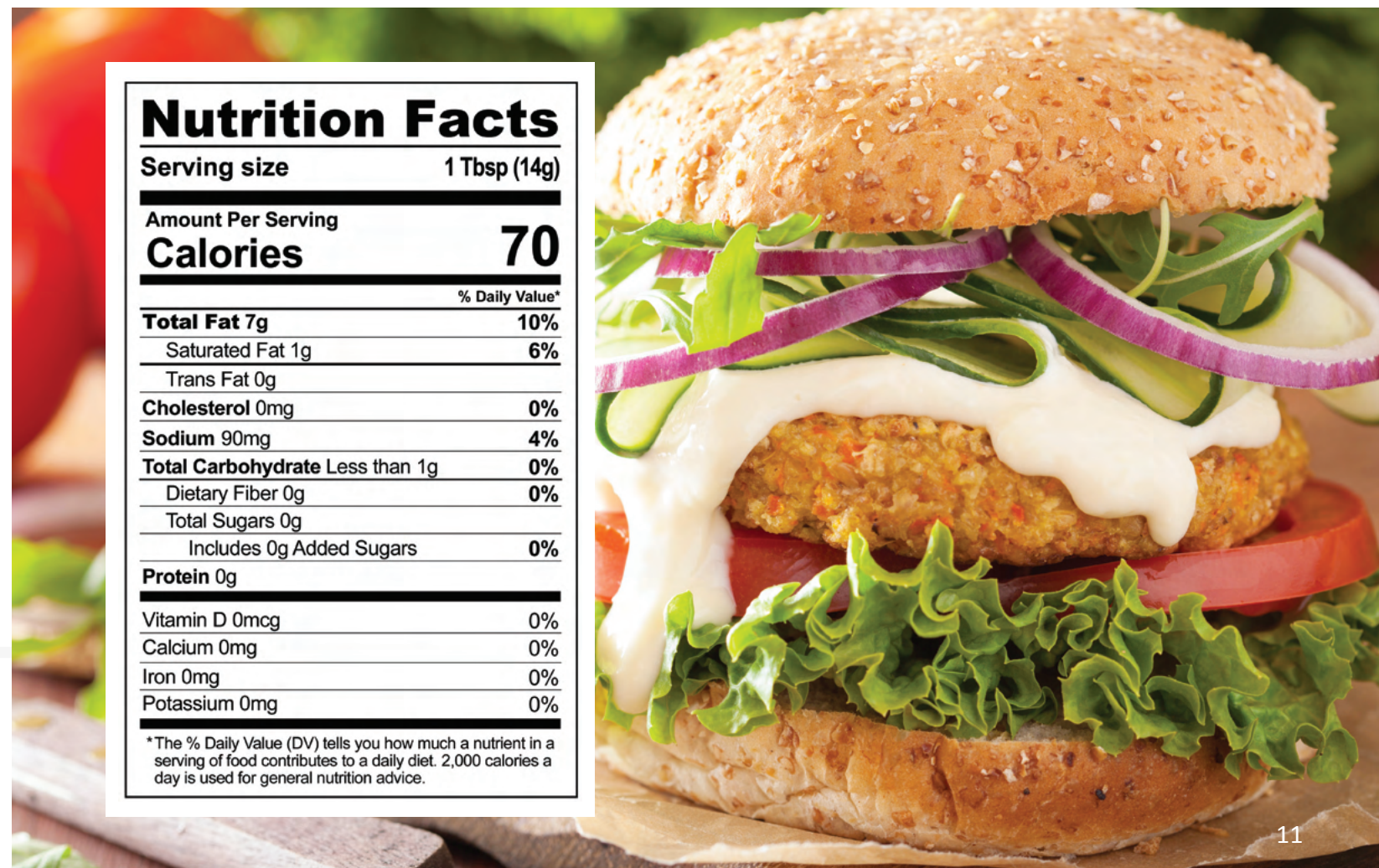
To create a vegan mayonnaise that emulates the taste and texture of traditional egg-based mayo but without the egg — a major hurdle since egg is traditionally used to achieve the mouthfeel, viscosity, taste, and color of classic mayonnaise.

Solution

ADM was able to mimic the experience of traditional mayonnaise using a strictly vegan formulation with the use of proprietary plant proteins and natural flavorings to perfect a creamy, sweet-meets-savory eating experience, and delicate tapioca starch allows the other ingredients' innate color and taste properties shine while delivering the ideal texture.

Key Ingredients

- + ADM Max Modified Tapioca Starch
- + ProFam® Soy Protein Isolate
- + Arcon® S Soy Protein Concentrate
- + RBD Soy Oil
- + Natural Flavor



Nutrition Facts	
Serving size	1 Tbsp (14g)
Amount Per Serving	
Calories	70
	<small>% Daily Value*</small>
Total Fat 7g	10%
Saturated Fat 1g	6%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 90mg	4%
Total Carbohydrate Less than 1g	0%
Dietary Fiber 0g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 0mg	0%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.



Case Study: Freeze Thaw, Sugar-Free BBQ Sauce

Challenge

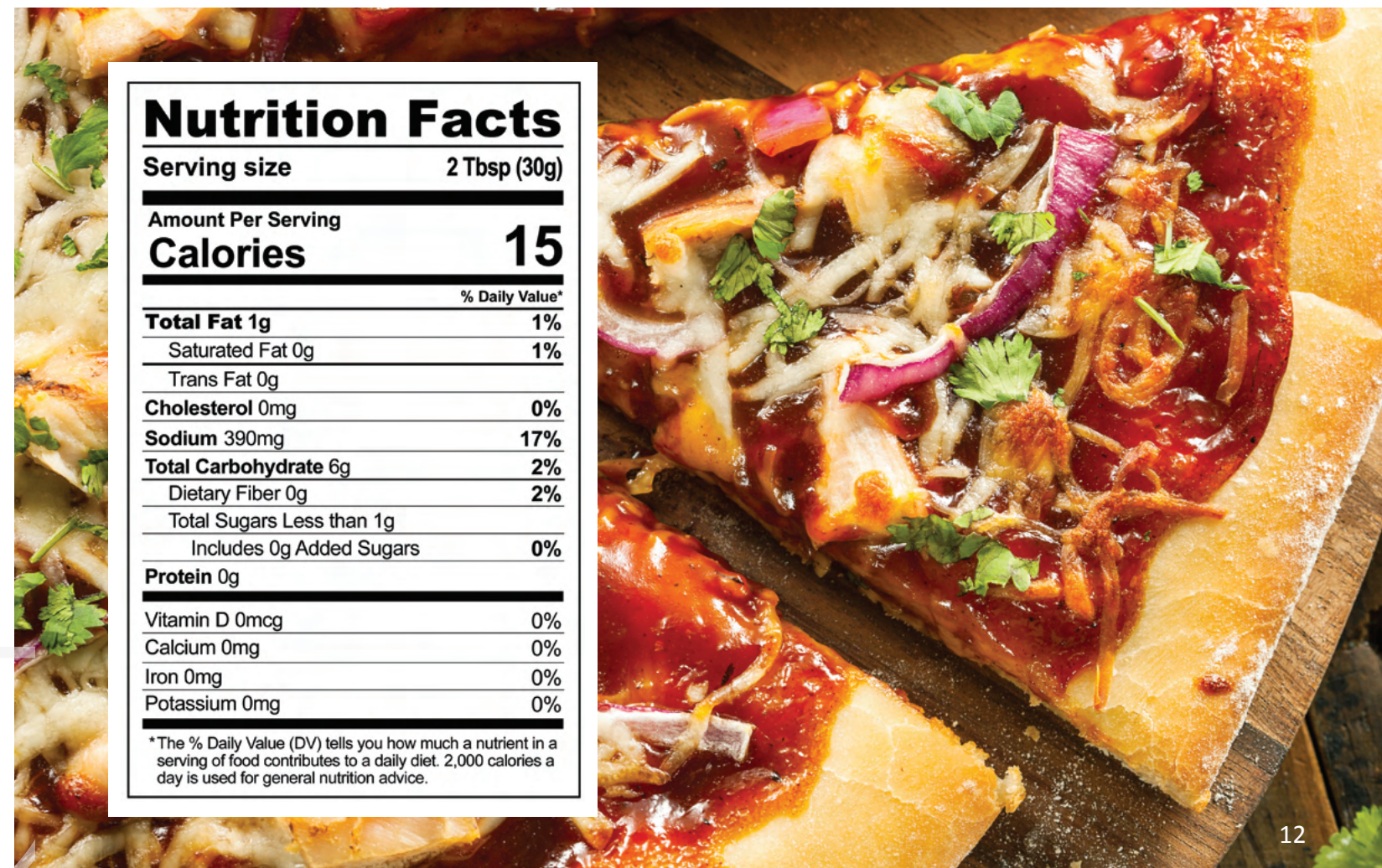
To recreate the texture and taste of a Hickory Smoked BBQ with ingredients that support a healthy, keto-friendly lifestyle while still meeting consumer expectations for moisture, mouthfeel, and viscosity all in a convenient frozen sauce puck for ready-to-go meals.

Solution

This Sweet n' Smoky Sugar-Free BBQ sauce will delight consumers searching for cook-out ready flavor without added sugars. It is easily thawed in the microwave or stovetop to deliver full-bodied, rich flavor. All that and just 15 calories per serving — an 80% calorie reduction versus sugar-laden sauces.

Key Ingredients

- + ADM Max Modified Tapioca Starch
- + SweetRight® Edge Stevia Leaf Extract
- + SweetRight® Erythritol
- + RBD Soy Oil
- + Natural Flavor



Nutrition Facts

Serving size 2 Tbsp (30g)

Amount Per Serving
Calories 15

% Daily Value*

Total Fat 1g	1%
Saturated Fat 0g	1%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 390mg	17%
Total Carbohydrate 6g	2%
Dietary Fiber 0g	2%
Total Sugars Less than 1g	
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 0mg	0%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.



Ready to Solve Your Challenges?

No matter the reason or the latest lifestyle adaptation, consumers want quality nutrition and great taste in every bite. ADM has the dynamic market research, proprietary technology and advanced expertise to deliver timely solutions. Partner with our team of specialists today to create innovations sure to excite and delight dietary-conscious consumers.

Request a technical consultation today.

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