

SET YOUR PRODUCTS APART WITH INNOVATIVE TEXTURES

**SNACKS THAT SNAP,
SHATTER, CRUNCH
AND SATISFY**

SENSORY EXPERIENCE™



Ingredion

idea labs®

IDEAS TO SOLUTIONS



SNACKING FUN MEANS BUSINESS

SIXTY PERCENT OF CONSUMERS SAY THEY OFTEN SNACK FOR ENJOYMENT, NOT HUNGER¹

Overall, snack consumption is on the rise with more than half of consumers (51%) reporting that they eat snacks at least twice a day and more than a third of consumers say they're snacking more frequently than they were two years ago.²

Taste, texture and many other things make a snack satisfying, but "crunch" is a critical component.³ In salty snacks, for example, consumers seek multi-textural experiences, including different levels of crunch in one product.³ No matter what snack attributes your consumer craves, there's a world of opportunity waiting to be discovered with innovative textures.

PROFITABLE SNACK PRODUCTS START HERE

The experts of Ingredion can help you create the unique textural experience your consumers are looking for in snacks. These range from tender and delicate crispy textures, to snapping or shattering crunchy textures.

Start with a core of proven baked snack texturizers for your sheeted cracker and fabricated chip texture needs.

Process flow

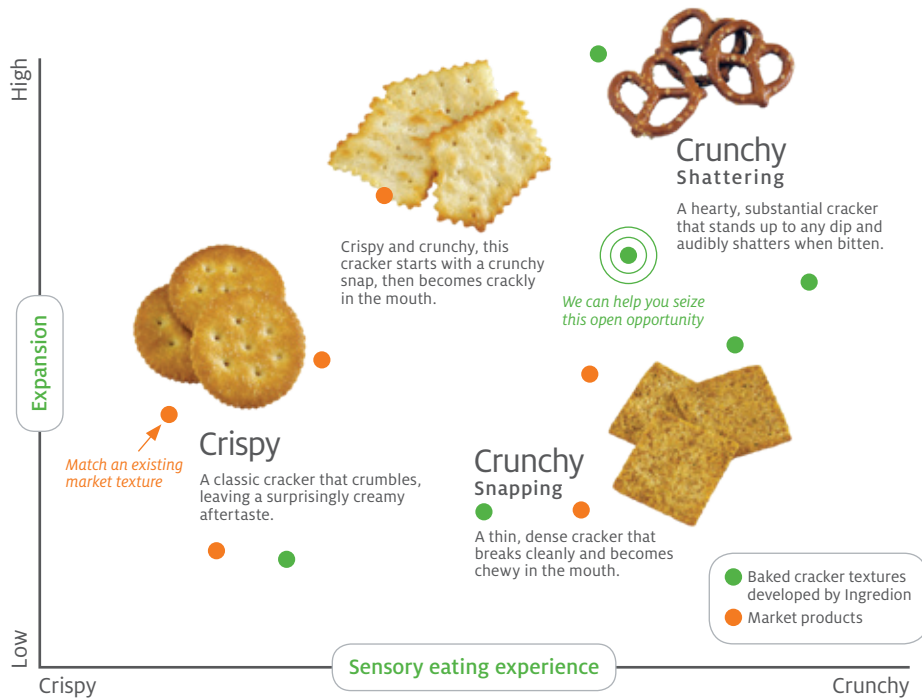
Specialty texturizers can add functionality throughout the process, leading to a better end product.



Ingredients	Base/label	Hardness	Expansion	Particle size	Hydration time	Sheeting
PRECISA® Crisp 151	Modified tapioca starch	High	High	Fine-medium	Medium	Excellent
PRECISA® Crisp 320	Corn starch	High-medium	High	Large	Delayed	Excellent
PRECISA® Crisp 330	Corn starch	High-medium	High-medium	Fine	Fast	Excellent
PRECISA® Crisp 31	Corn starch	High-medium	Medium	Medium	Medium	Excellent
PRECISA® Crisp 150	Modified tapioca starch	High-medium	Medium-low	Medium-fine	Medium	Good
PRECISA® Crisp 930	Corn starch Sago starch	Medium	Medium-low	Medium-fine	Medium	Good, soft
PENPURE® 85D	Potato starch	Low	High	Medium-fine	Medium	Excellent

When you work with Ingredion, you also can choose from our broader portfolio of specialty texturizers to ensure that your formulation benefits from the right starch or combination of ingredients.

BAKED CRACKER TEXTURE MAP



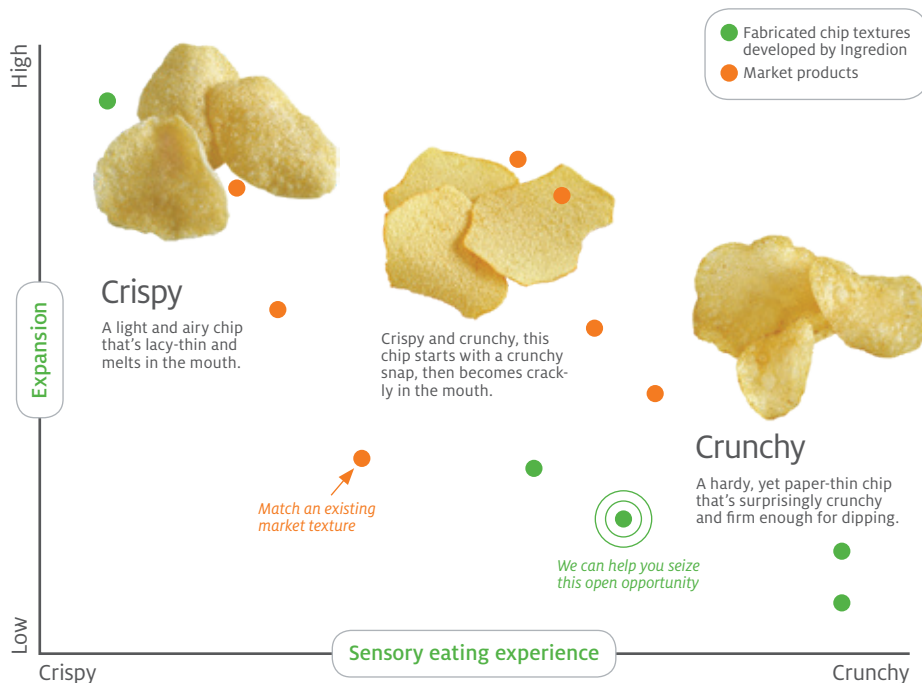
A SOLUTION UNIQUELY YOURS

Our experts will help you navigate the complex process of reaching your texture target, which involves formulation, processing conditions, moisture level adjustments and selecting the right texturizer. Your solution will be customized and multi-faceted. Here are just a few of the possibilities:

- **Create a target texture** by a different formulation and process
- **Save time in production** (no fermentation time or additional drying time needed)
- **Produce a tender cracker** without fermentation
- **Fabricate a crisp and crunchy product** without frying
- **Deliver an uncompromising, satisfying texture** in low-fat formulations
- **Boost nutritional content** while achieving the desired texture

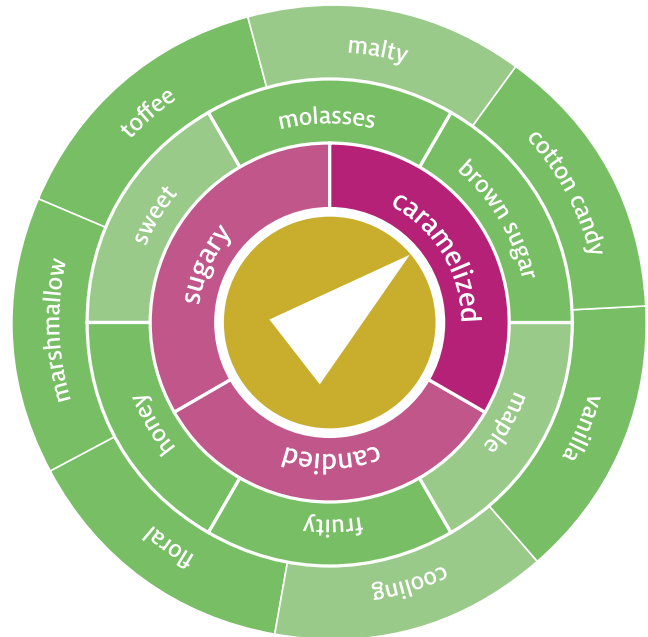
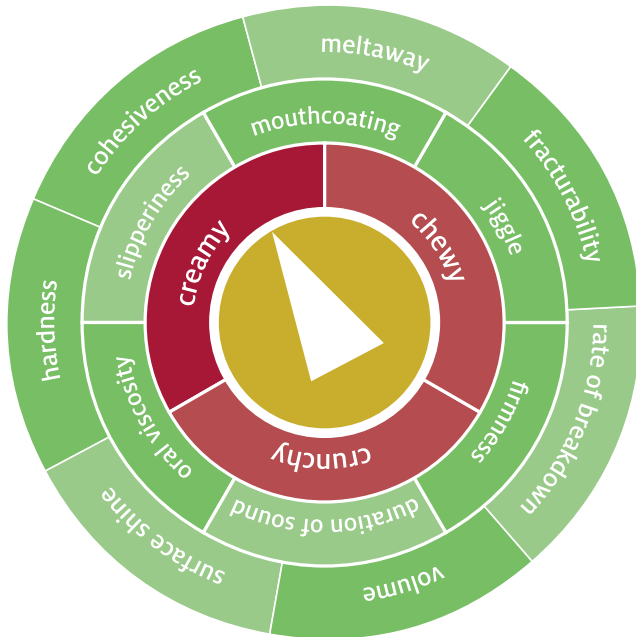
Leveraging our texture, formulation and processing expertise (as illustrated on the texture maps), we can help you match an existing market texture or achieve an exciting new one.

FABRICATED CHIP TEXTURE MAP



DIAL-IN® Technology

TAKE THE SHORTEST PATH TO THE PERFECT TEXTURE AND SWEETNESS



- 1 set your goals
- 2 gather insights
- 3 set sensory targets
- 4 understand your process
- 5 formulate product

Your perfect snack product texture starts with our proprietary DIAL-IN® Texture Technology, a rapid robust, data-driven approach that enables us to help you:

- Build back texture when ingredients are reduced or removed for label claims or to optimize costs
- Ensure great texture when nutrition ingredients, such as proteins and fibers, are added
- Match benchmark consumer-preferred textures
- Create a signature texture for a new product
- Develop a continuum of new products with unique, appealing textures

Ingredient capabilities inform every step of the process. We invite you to learn about our TEXICON® texture language, which translates the consumer eating experiences into the technical language of formulation. Ask about our T-REX® automated rheology lab, where we screen texture solutions 10 times faster than traditional methods.

BALANCING TEXTURE WITH SWEETNESS

At the same time, we'll help you reduce sugar while maintaining product functionality in your product, using our DIAL-IN® Sweetness Technology. As with texture, our consumer insights, sensory evaluation, application expertise and processing knowledge come together — so you achieve the right sweetness profile, balanced with texture — all with less trial and error for faster time to market.

Together, let's discover profitable new frontiers in snacks.

TAP INTO OUR FULL RANGE OF CAPABILITIES — RIGHT HERE AND AROUND THE WORLD

Look to Ingredion for ingredient solutions that deliver exceptional performance and market-leading innovation. Our geographic footprint and diverse organization give us the capability to help you on a global scale and the agility to meet your needs in all of your local markets.

Improve texture

Achieve the perfect food texture in a fraction of the time with our robust, data-driven, consumer-centric DIAL-IN® Texture Technology.

Reduce sugar

Leverage our formulation expertise and broad sweetener and texturizer portfolio to get the perfect balance of taste and texture.

Optimize sensory

Translate consumer sensory preferences into finely tuned sensory attributes in your finished products.

Perfecting formulations

Achieve maximum product appeal while realizing the benefits of cost-optimization throughout the formulation process.

DIAL-IN® Technology

Benefit from a robust data-driven approach to quickly achieve optimal sweetness and texture.

TEXICON® language

Translate the consumer experience of texture into precise, measurable, scientific terms that help you quickly target and achieve the perfect texture in your products.

T-REX® technology

Accelerate texture characterization and new functional systems with advanced robotic technology that works 10 times faster than when using traditional methods.

Engage the texture experts of Ingredion for your next formulation challenge.

ingredion.us/snacks | 1-800-713-0208

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Sources:

1. State of the Snack Industry, SymphonyIRI Group, 2012
2. The Snacking Occasion Consumer Trend Report, Technomic, Inc., 2014
3. Voice of the Consumer: Texture and Salty Snacks, conducted by The Cornell Group for Ingredion, March 2014

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