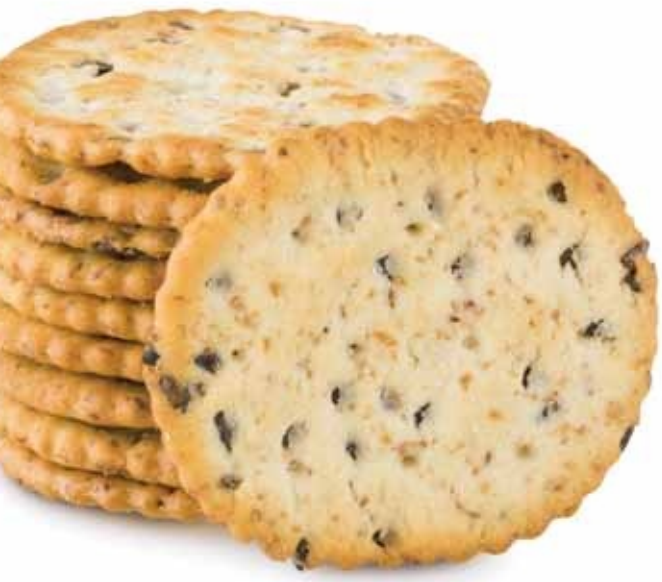
The rise in baked snack CRACKER INNOVATIONS

Rosemary and olive oil crostini. Cinnamon-sugared currant crisps. Garlic and herb beet thins. Honey graham squares. Lemon poppy seed biscuits. The possibilities are endless.



Crackers and similar low-moisture baked goods are trending in the snack food category. This comes at a time when nine in 10 consumers say they snack multiple times throughout the day, with many trying to be mindful snackers, meaning they are choosing better-for-you foods to make up these mini meals. Crackers are often part of the mix.

"As harried, on-the-go Americans increasingly turn to snacks to satisfy their cravings and replace sit-down meals, they are discovering that crackers can offer an exciting and healthy alternative to traditional salty snacks such as chips, popcorn and pretzels," says David Sprinkle, research director, Packaged Facts, Rockville, Md. "Smaller marketers are carving out space and grabbing market share by offering creative, artisanal products that satisfy their customers' needs for authenticity in the food they eat."

This is apparent in the new mix of crackers taking up residence not only in retailers' snack food aisle, but

also in other places throughout the store, including the deli, the grab-and-go department and the refrigerated snack pack and lunch kit case. Innovators are showing us that crackers can be carriers or accompaniments. They can be sweet or salty. And they can come in all sizes and shapes, from triangular to resemble a tortilla chip and used to scoop salsa, to a tubular breadstick for dipping or simply munching on the go.

"Today's crackers set out to satisfy the perpetual quest of serious snackers for explosive crunches and wild flavors right out of the box," says Mr. Sprinkle. "A key driver of category growth is the increasing ability of marketers to connect crackers with consumers' health and wellness concerns."

That's right, crackers can be designed to be mindful snacks. Formulators are exploring the use of all types of better-for-you ingredients. Sometimes it's whole grains and fiber. Other times it's one or more varied forms of protein, from whey and egg whites to peas and pulses.

Who needs wheat when ancient grains such as quinoa, millet and chia are available? Most of them are so much more than a flour base. They often contribute, flavor, color, texture and nutrition.

Need the crackers to be gluten-free? No problem. Crackers, as the name suggests, make a cracking noise when broken into pieces. This cracking is the result of the dough having a short texture. Short textures are achieved when there's minimal or no formation of the glutinous network that is so important in developing volume in other baked goods such as breads and cakes.

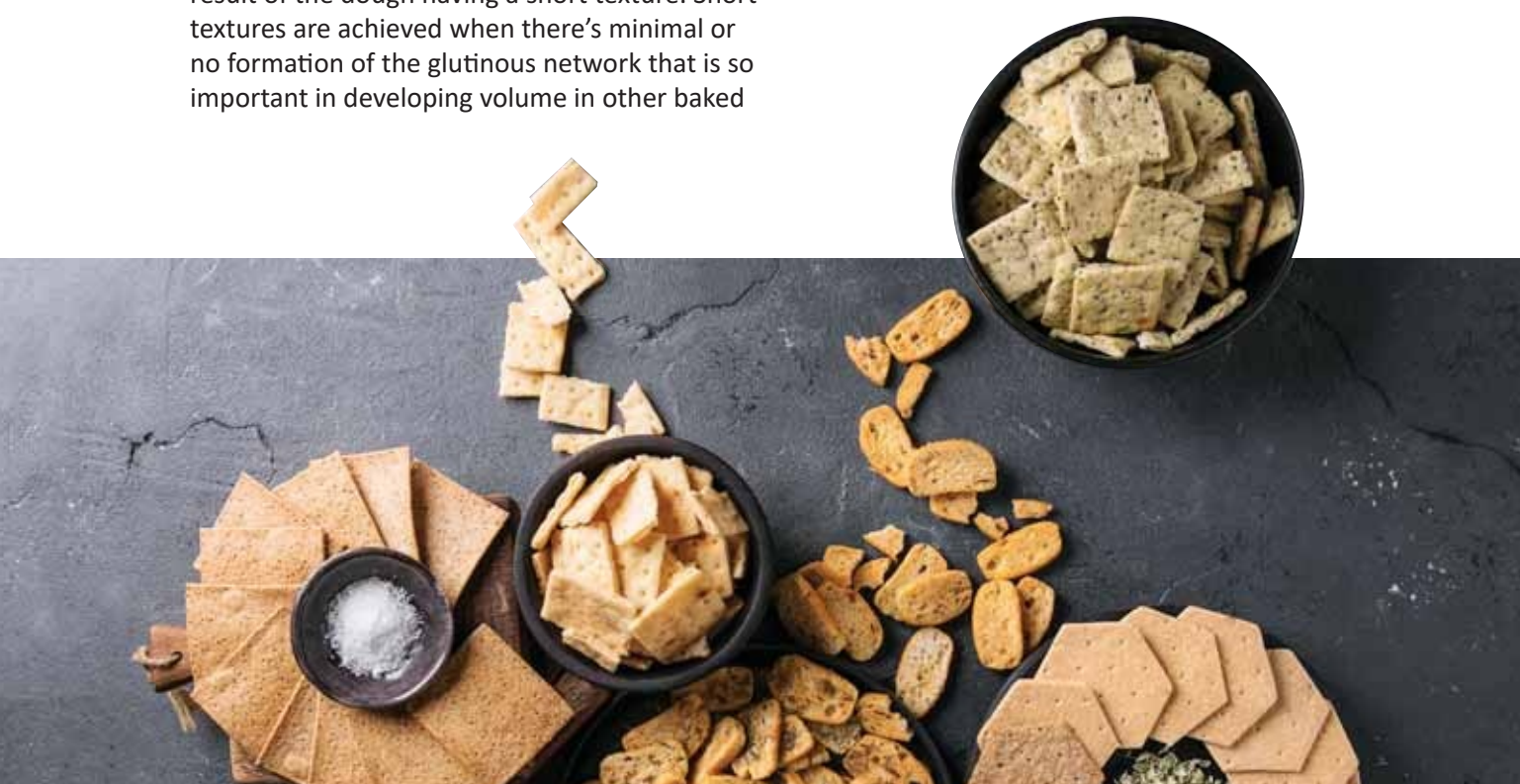
"Families with children and younger consumers are driving the market for such healthy snacks crackers," says Mr. Sprinkle. "Ingredient substitutions such as the use of specific vegetables in formulations, such as sweet potato and spinach are popular. Bean formulations are also gaining traction, with chickpea-based snacks the fastest growing subcategory for pulse-based snacks."

Chefs even want in on the action, with many baking up house-made crisps, flatbreads and toasts—culinary terms for crackers—to serve alongside their other specialties.

"Whether used as a platform or a garnish, signature crackers speak to care and craftsmanship, adding flavor, texture, value and cheffy appeal to cheese plates and charcuterie, dips, small plates, salads and even desserts," says Mr. Sprinkle. "That they're relatively easy to make belies the big impression they make with foodies and snackers. They fit in at a variety of concepts, from all-day cafes to farm-to-table destinations.

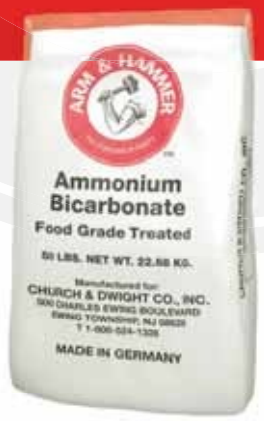
"Crackers are a neutral starting point for a variety of flavors, finishes, shapes and influences," concludes Mr. Sprinkle.

Now's the time to get creative.



AMMONIUM BICARBONATE

is the leavener of choice for crackers



What is ammonium bicarbonate?

Ammonium bicarbonate, also known as baker's ammonia, was one of the first chemical leavening agents used by bakers. It remains popular in the production of low-moisture baked goods, namely crackers and similar products. In chemical terms, it is the bicarbonate salt of the ammonium ion. Other common chemical leaveners rely on either sodium or potassium instead of ammonium.

What makes ammonium bicarbonate special?

Unlike sodium or potassium bicarbonate, this leavening agent decomposes completely when heated, producing carbon dioxide, ammonia and water. The reaction is rapid when temperatures reach about 140°F and therefore the expansion of the dough takes place during the initial stages of baking. Further, pound-for-pound, ammonium bicarbonate produces more leavening gas than any other bicarbonate, making it very economically effective. There's more. Ammonium bicarbonate leaves no chemical residue in finished baked goods. It all breaks down and releases into the atmosphere as gas in the form of ammonia, water and carbon dioxide.

Are there any limitations with ammonium bicarbonate?

It does produce a telltale ammonia smell. This is why use is limited to baked goods with less than 5% finished product moisture content. Any higher and the ammonia will not have time to evaporate.

Is it declared in the ingredient legend?

Because ammonium bicarbonate decomposes through heating, with all components released as gases, it may be considered a processing aid. Labelling requirements should be discussed with your regulatory group.

Can it be used in organic crackers?

Yes. Products labeled "organic" may contain a maximum of 5% non-organic certified ingredients as identified on the National List of Allowed Substances from the National Organic Program. Ammonium bicarbonate is on that list.

AMMONIUM BICARBONATE APPLICATIONS AND FUNCTIONS

product	function
Sprayed butter crackers	Controls color
Milk or graham crackers	Controls spread and thickness, hastens bake-out, darkens color
Semi-sweet products, such as tea biscuits	Controls spread, height and top grain
Rotary molded cookie products, such as plain, sugar, base cakes, marshmallow, cream-filled sandwiches, etc.	Controls spread, height and top grain
Wire-cut cookie products, such as chocolate chip, molasses, etc.	Controls spread, darkens color
Bars (chewy type)	Controls spread, darkens color
Eclairs and puff shells	Very open, large cell structure
Pretzels (hard, crispy types)	Improves texture

how bicarbonates leaven

BAKED GOODS

THE BICARBONATE EXPERTS™

How does sodium bicarbonate leaven baked goods?

Sodium bicarbonate releases carbon dioxide gas when reacted with acid and heat in the presence of water. The bubbles cause batter and dough to rise, resulting in lighter baked goods. The sodium is retained in the baked good as a sodium salt.

$HX + NaHCO_3 \rightarrow NaX + H_20 + CO_2$

(acid salt) (sodium bicarbonate) (heat and water) (sodium salt) (water) (carbon dioxide)

How does potassium bicarbonate compare?

Potassium bicarbonate reacts very similarly to sodium bicarbonate, releasing carbon dioxide gas into the system with the baked good retaining the potassium. Potassium bicarbonate also has a similar pH to sodium bicarbonate, but requires more of the product to react completely with the acid salts.

$HX + KHCO_3 \rightarrow KX + H_20 + CO_2$

(acid salt) (potassium bicarbonate) (heat and water) (potassium salt) (water) (carbon dioxide)

Is the same true of ammonium bicarbonate?

No. When ammonium bicarbonate breaks down, it releases carbon dioxide and ammonia gases. At ambient temperature, ammonium bicarbonate will decompose slightly in a batter. With the addition of heat, it rapidly breaks down, even without the addition of an acid or a water source.

$NH_4HCO_3 \rightarrow NH_3 + H_20 + CO_2$

(ammonium bicarbonate) (heat) (ammonia) (water) (carbon dioxide)

Can ammonium bicarbonate be used in all the same places as the other two bicarbonates?

No. Ammonium bicarbonate works best in cookies, crackers and low-moisture products, as these products have a porous cellular structure that allows gases to escape quickly. The special leavening action of ammonium bicarbonate contributes to several desirable characteristics in such small, porous baked goods. For example, in cookies there's increased spread of the batter. In some applications, ammonium bicarbonate assists with brown color development. It is often used in conjunction with a slower-acting leavening agent for a two-stage release of gases, as this helps with the development of uniform height and shape. In high-moisture products such as cakes and muffins, the ammonia gas does not escape completely and the taste and odor of ammonia remains.

Sodium, Potassium & Ammonium Bicarbonate Supply

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