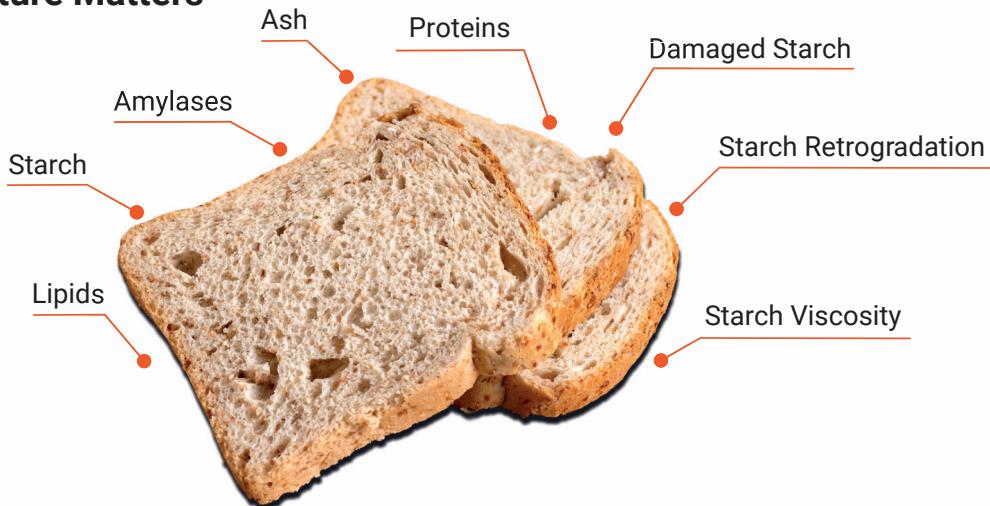


## Why Crumb Texture Matters



- Mouthfeel & Eating Experience:** Crumb texture defines how a product feels to eat. A soft, tender crumb is pleasant, while a dense or dry one is less enjoyable.

- Freshness & Moisture Retention:** A moist crumb is a key sign of freshness. It shows the product retained water and softness, slowing staling.

- Flavor Distribution:** Texture affects how flavors are released. A light, open crumb ensures balanced taste throughout.

- Durability & Handling:** A cohesive crumb withstands slicing, and storage. Fragile crumbs break apart easily.

- Product Structure & Quality:** Crumb texture shows how well the dough or batter was prepared and baked. A light, airy crumb indicates good gluten. A moist one shows proper leavening and mixing.

- Airiness & Volume:** A well-aerated crumb indicates proper fermentation, giving bread and cakes a soft, fluffy, balanced texture.

- Visual Appeal:** A uniform crumb looks high quality and signals proper baking.

- Cultural & Regional Expectations:** Different products have signature textures, defining authenticity and consumer trust.

- Versatility in Use:** Crumb structure determines how a product performs in use. Soft crumbs for sandwiches, firm ones for dipping or toasting.

## Key Flour Components Affecting Crumb Texture

Key Flour Components	Contribution to Crumb Texture	Mechanisms
Proteins	22%	Protein quantity and quality shape crumb structure; most products need strong gluten, others a softer network.
Starch Viscosity	20%	Proper gelatinization creates a soft, uniform crumb with good moisture retention; insufficient gelatinization causes a dense or uneven texture.
Amylase (Enzyme Activity)	20%	Proper enzymatic activity ensures steady gas production and a soft, open crumb, while excess weakens dough and makes it sticky.
Damaged Starch	18%	Releases sugars for fermentation, improving gas production and crumb lightness. In excess, it makes the dough sticky and reduces gas retention.
Lipids	10%	Improve crumb uniformity and elasticity by interacting with gluten. Insufficient lipids make the crumb less cohesive and more prone to collapse.
Ash Content (Minerals)	7%	Higher fiber disrupts gluten development, leading to a denser crumb with irregular holes, while low-ash flours produce finer, more delicate crumbs.
Starch Retrogradation	3%	Over time, it firms the crumb and reduces moisture, accelerating staling.

Consistent Impact Across Most Products

Impact Varies Significantly by Product Type

## How Flour Components Impact Crumb Texture of Different Products ?

Crumb Texture	Starch Viscosity	Starch Retrogradation	Damaged Starch	Proteins	Amylase (Enzymatic Activity)	Ash Content (Minerals)	Lipids
Flat Bread	3		3	3	3	1	1
Pan Bread	3		2	3	3	1	1
Baguette	2	3	2	3	2	1	1
Hamburger Bun	3		3	3	3	1	2
Pizza Crust	3		2	3	3	1	2
Sponge Cake	2		2	3	2	1	1
Croissant	2		2	3	2	1	2
Steam Bread	3		3	3	3	1	1

3: Strong Impact

2: Average Impact

1: Low Impact

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Connecting Flour Components With Bakery Product Excellence.

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## KPM Equipment for Monitoring These Key Flour Components



SpectraStar



Alveograph



Mixolab



SDmatic



Rheo F4