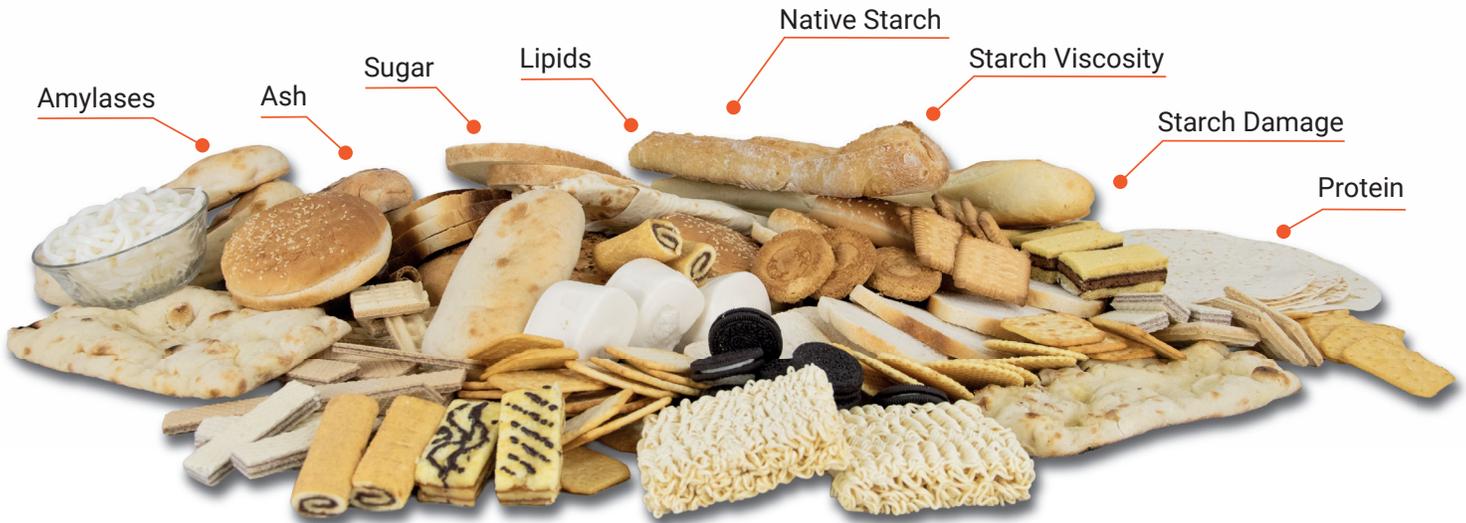


## Why Color Matters



• **Indicator of Doneness:** Too light suggests underbaking; too dark may mean overbaking or burning.

• **Aesthetic Appeal:** A uniform, appealing color makes products more attractive and appetizing.

• **Flavor Development:** A well-baked crust enhances both taste and texture.

• **Texture and Crispiness:** Soft, pale baked goods may feel doughy, while overly dark ones can be too dry.

• **Consumer Expectations & Quality Control:** Any deviation in color across batches may indicate issues with baking time, temperature, or ingredient ratios.

## Key Flour Components Affecting Color

| Key Flour Components         | Contribution to Color | Mechanisms   |
|------------------------------|-----------------------|--|
| Damaged Starch               | 22%                   | Absorbs more water, hydrolyzes easily, releasing sugars that enhance even browning.  |
| Amylase (Enzymatic Activity) | 18%                   | Converts damaged starch into sugars, fueling Maillard reaction and caramelization.   |
| Starch Viscosity             | 15%                   | More accessible to amylase, intensifying browning.   |
| Proteins                     | 15%                   | Higher levels deepen crust color via Maillard reactions; lower protein yields a lighter crust.   |
| Ash Content (Minerals)       | 10%                   | Higher ash darkens products; low-ash flour ensures a lighter, uniform color.   |
| Sugars                       | 10%                   | Caramelize and fuel the Maillard reaction, creating a golden-brown crust. Increased enzymatic activity boosts sugar availability, intensifying browning. |
| Starch (Native)              | 7%                    | Starch contributes to the white color of some products.  |
| Lipids                       | 3%                    | Aid in heat distribution, ensuring even browning.  |

 Consistent Impact Across Most Products

 Impact Varies Significantly by Product Type

## How Flour Components impact Color of Different Products ?

| Color          | Starch (Native) | Starch Viscosity | Starch Damage | Proteins | Amylase (Enzymatic Activity) | Ash Content (Minerals) | Sugars | Lipids |
|----------------|-----------------|------------------|---------------|----------|------------------------------|------------------------|--------|--------|
| Noodles        | 2               | 3                | 3             | 2        | 2                            | 2                      |        |        |
| Flat Bread     |                 | 3                | 3             | 2        |                              | 1                      |        | 1      |
| Cracker        | 1               |                  | 3             | 2        | 3                            | 2                      |        | 1      |
| Pan Bread      |                 | 3                | 3             | 2        | 3                            | 1                      | 2      | 1      |
| Wafer          | 1               | 1                | 3             | 2        | 3                            | 1                      | 2      |        |
| Wheat Tortilla | 2               | 2                | 3             | 2        | 3                            | 2                      |        |        |
| Baguette       |                 | 3                | 3             | 2        | 3                            | 1                      |        |        |
| Hamburger Bun  | 1               | 3                | 3             | 2        | 3                            | 1                      | 2      | 1      |
| Pizza Crust    |                 | 2                | 3             | 2        | 3                            | 1                      | 3      |        |
| Sponge Cake    | 1               |                  | 3             | 2        |                              | 1                      | 3      | 1      |
| Biscuit        | 1               |                  | 3             | 2        | 3                            | 2                      | 3      | 1      |
| Croissant      |                 | 3                | 3             | 2        | 3                            | 1                      | 3      |        |
| Stream Bread   | 3               | 3                | 3             | 2        | 3                            | 2                      |        |        |

3: Strong Impact

2: Average Impact

1: Low Impact

Explore the Back to Flour Series  
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