Culinary Institute of America

Introduction & Ingredient Function

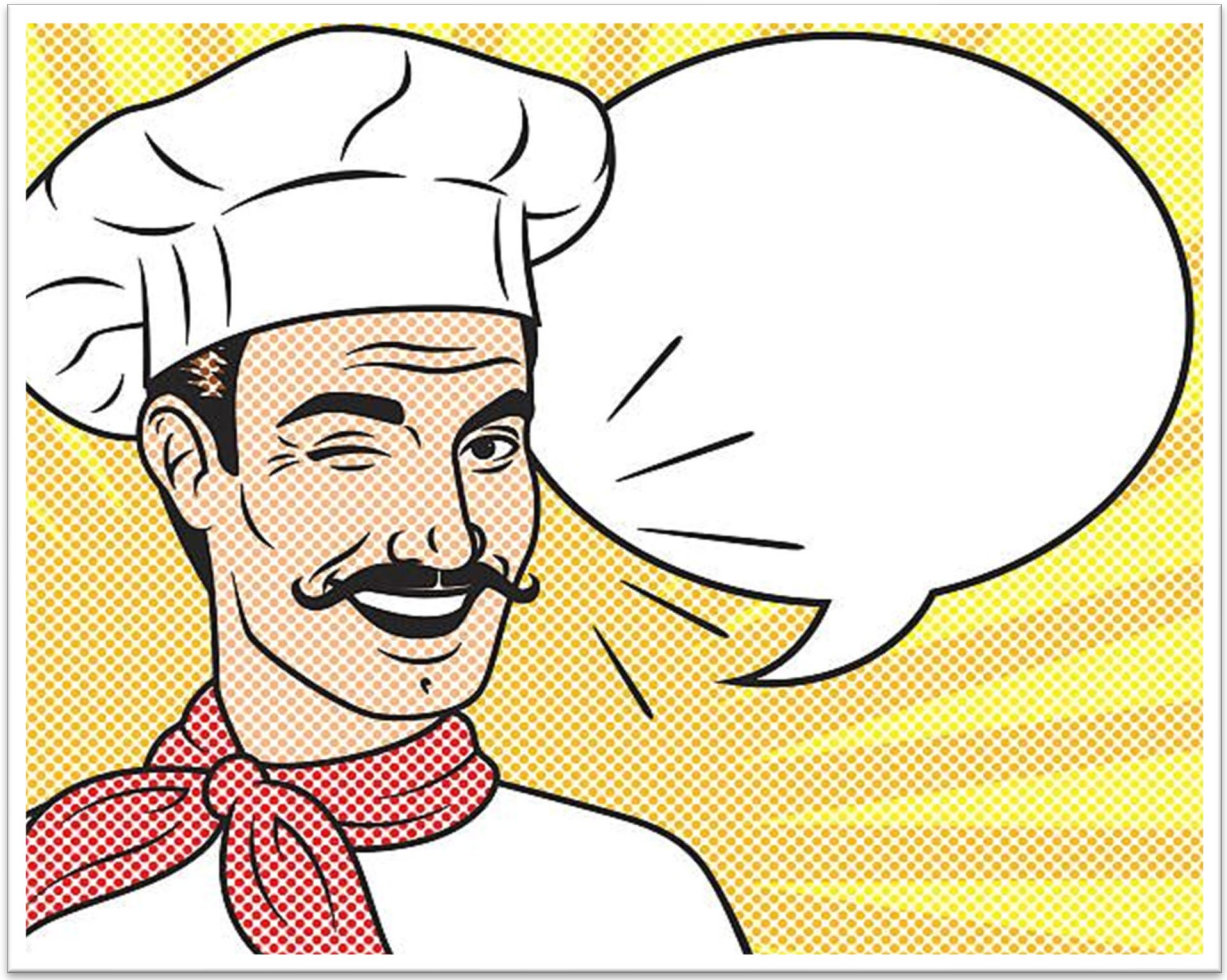
Day 1

Introduction: **Chef Egan**

- I'm an Associate Professor of Baking and Pastry Arts at CIA's New York campus. I teach Chocolates and Confections, Basic and Classical Cakes, Advanced Baking Principles and Baking and Pastry Techniques.
- I focus on process, repetition, and time management, helping students build confidence through hands-on learning.
- I trained at Drexel University and the CIA and worked in renowned kitchens including L'Atelier de Joël Robuchon, The Modern, and Blue Hill at Stone Barns.
- I am a Certified Master Baker (CMB) and Certified Hospitality Educator (CHE).

Icebreakers

- State your name.
- Where are coming from?
- What type of work you do?
- What is your deserted island food?



Learning Objectives

- Understand key baking ingredients and their primary function.
- Recognize and apply various mixing methods.
- Prepare a range of baked goods using standardized recipes with accuracy and consistency.

Common Baking Ingredients

Liquefiers and Stabilizers

Liquefiers *inhibit* structure

- Examples: water (and other liquids), fat, sugar

Stabilizers *promote* structure

- Examples: flour, eggs, chocolate, binding agents (cornstarch, gelatin, agar agar)

Understanding the difference between the two and categorizing ingredients → understanding pastry (and being able to fix/avoid mistakes)

Let’s Look at Some Liquefiers…

Fat

Enhances flavor, tenderness and mouthfeel

Types of Fats:

- **Saturated fats:** solid at room temp. (butter, lard, coconut oil)
- **Unsaturated fats:** liquid at room temp. (olive oil, vegetable oil, canola oil)
- **Trans fats:** artificially created through hydrogenation

Common fats:

- Butter
- Oil
- Lard
- Clarified butter
- Margarine
- Shortening

Functions of Fat

Tenderizes:
coats flour particles, inhibits gluten formation, creates a softer, more tender crumb (cakes, cookies)

Enhances flavor & texture:
adds a rich flavor; provides smooth, rich mouthfeel

Creates flakiness:
solid fats help create layers (croissants, pie crust)

Helps with leavening:
traps air when creamed with sugar (cookies)

Provides moisture & improves shelf-life:
retains moisture, slows staling

Sugar

- **Granulated sugar:** everyday standard for most baking
- **Brown sugar:** has molasses, adds moisture and rich flavor
- **Powdered sugar:** finer ground and contains 3-5% starch to keep from clumping
- **Liquid sugar:** honey, maple syrup, molasses, corn syrup, glucose syrup

Functions of Sugar

Adds sweetness: the main purpose – adds pleasant flavor

Adds moisture: helps keep baked goods soft and fresh

Aids in browning: through caramelization, makes crust golden & flavorful

Aids leavening: when creamed with fat, it traps air and helps rise

Stabilizes: helps stabilizes egg foams (meringues, soufflés)

Liquid

- An essential component of baking
- Accurate measurement is important: too much or too little can affect the outcome

Why use one over the other?

- **Water:** versatile and accessible
- **Milk:** contributes to a tender crumb; provides fat & protein
- **Buttermilk:** tangy flavor; is acidic therefore reacts with baking soda to create a soft texture
- **Cream:** high fat content; richness in flavor & texture

Functions of Liquids

Activates gluten: hydrates flour so gluten can develop

Activates leavening agents: helps baking powder, baking soda, yeast activate

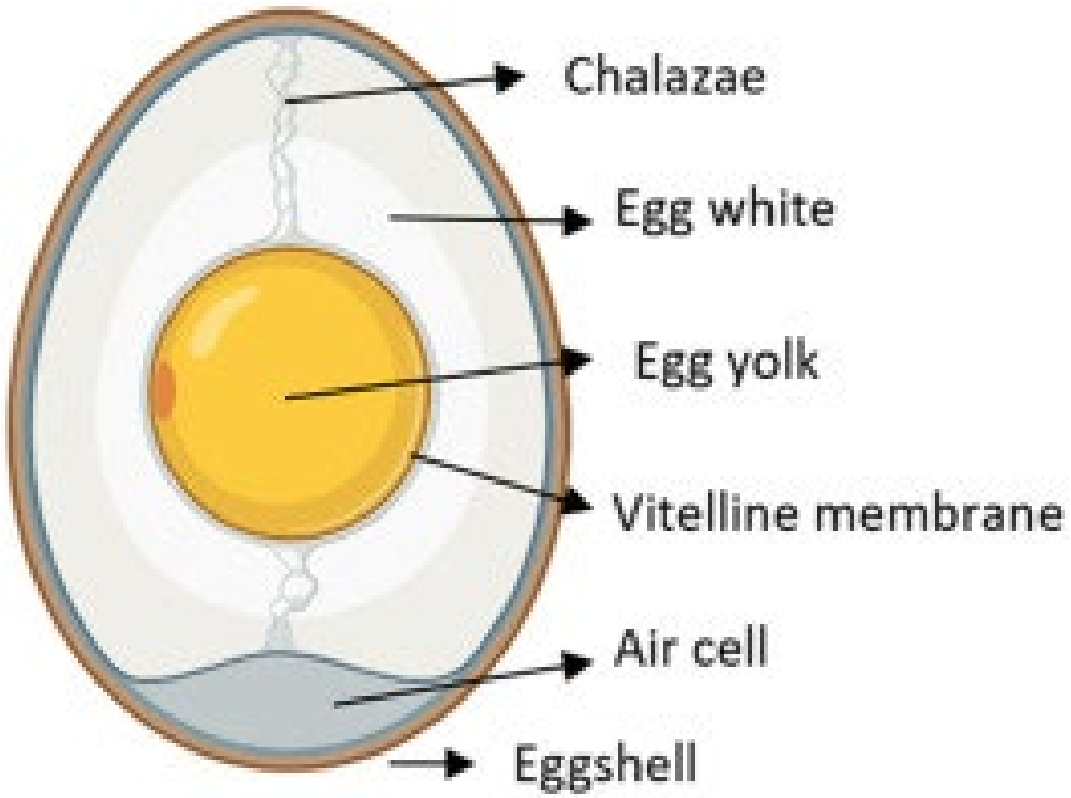
Creates steam: steam produced during baking helps baked goods ride and become fluffy

Dissolves ingredients: helps combine dry ingredients like sugar and salt smoothly

Adds moisture: keeps cakes, muffins, and breads from being dry

Influences texture & flavor: milk vs. water - affect flavor, richness, and color

Eggs



Versatile ingredient essential to many applications in baking

Parts of eggs:

- **Yolk:** Fat and nutrient, adds richness – biding agent
- **White (albumen):** Mostly protein, helps with structure and leavening
- **Shell:** Protective layer

Functions of Eggs – so many!

Structure & binding: proteins help to set and hold the ingredients/shape of baked goods as they cook

Leavening: traps air during mixing and expands when heated; helps rising

Moisture: adds liquid to batter, contributes to moisture & tenderness

Emulsifying: yolks contain lecithin, helps mix fat & water-based ingredients smoothly

Color, flavor, & fat: adds richness, a golden color, enhances taste

Gloss & shine: egg wash brushed on dough to give shiny, golden-brown finish

Let's Look at Some Stabilizers...

Flour

- Master stabilizer; recipe calculations are based on flour as 100%, every other ingredient calculated as a % of the flour amount.
- When flour is mixed with water, proteins form gluten, the structure-building network in baked goods.

The main proteins:

- **Glutenin:** provides elasticity of the dough
- **Gliadin:** provides extensibility and viscosity of the dough

Common Types of Flour

- **All-purpose flour:** most common
- **Cake flour:** lower protein content (provides soft and tender texture with less gluten development)
- **Bread flour:** higher protein content (provides more gluten development and chewy texture)
- **Whole wheat flour:** made from the entire kernel (provides more fiber and a nuttier flavor)

What's the Difference Between Flours?

What's the difference between...?

Cake flour

Bread flour

What's the difference between...?

All-purpose flour

Pastry flour

Functions of Flour

Provides structure: gluten forms a network that holds baked goods together

Affects textures: type of flour influences whether the final product is chewy, soft, dense or light

Thickens mixtures: used in sauces, custards, and fillings

Helps with absorption: soaks up liquids, balancing moisture in batters & doughs

Let's Look at Some Leavening Agents...

Leavening Agents

Chemical

- Baking powder and baking soda

Mechanical

- Creaming method, egg foams, lamination

Biological (Organic)

- Commercial yeast and sourdough

Chemical Leavening

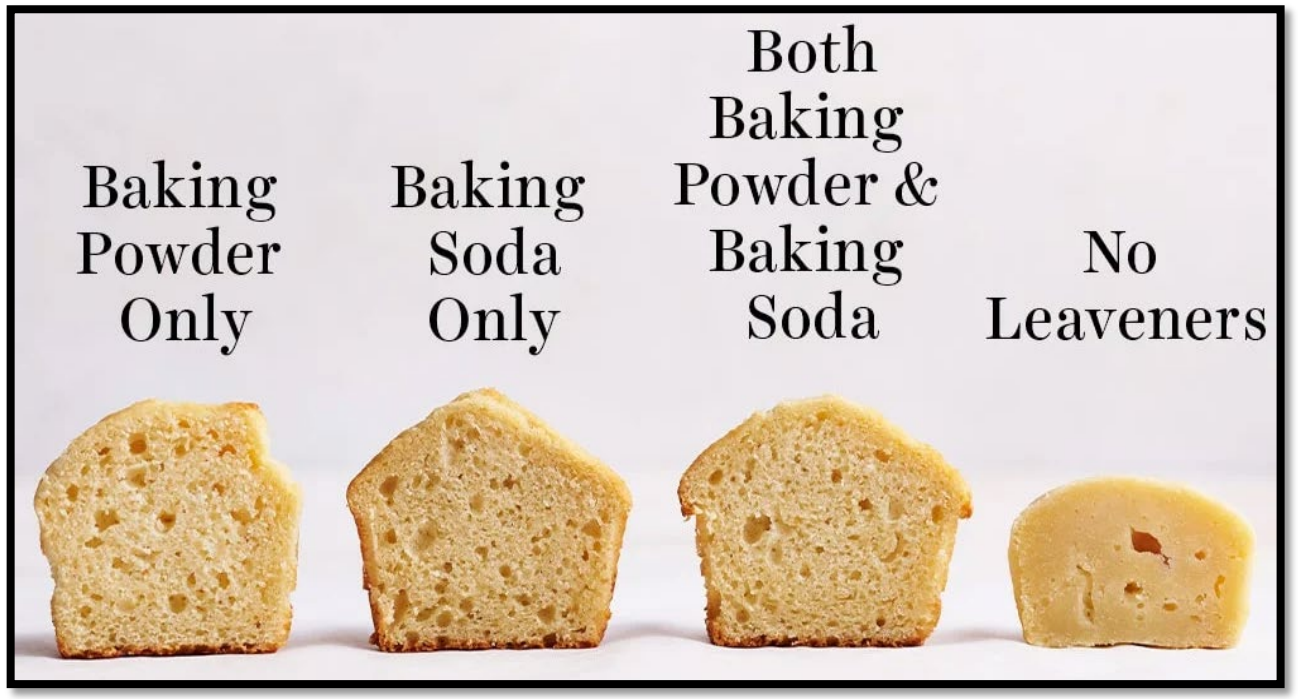
Chemical leavening agents releases gas (usually carbon dioxide) that makes the doughs or batters rise, creating light and airy textures.

- **Baking soda**: requires an acid (like vinegar or buttermilk) to activate and release gas
- **Baking powder**: contains an acid (cream of tartar) and a base (baking soda)
  - *Double acting:* reacts once when mixed with liquids, another time when exposed to heat

Chemical Leavening FAQ

Why use both?
When a recipe calls for both baking soda and baking powder, baking soda is usually added to neutralize an acid in the recipe and not to leaven.

Are they interchangeable?
No! Baking soda is up to 8x stronger and requires an acid to activate!



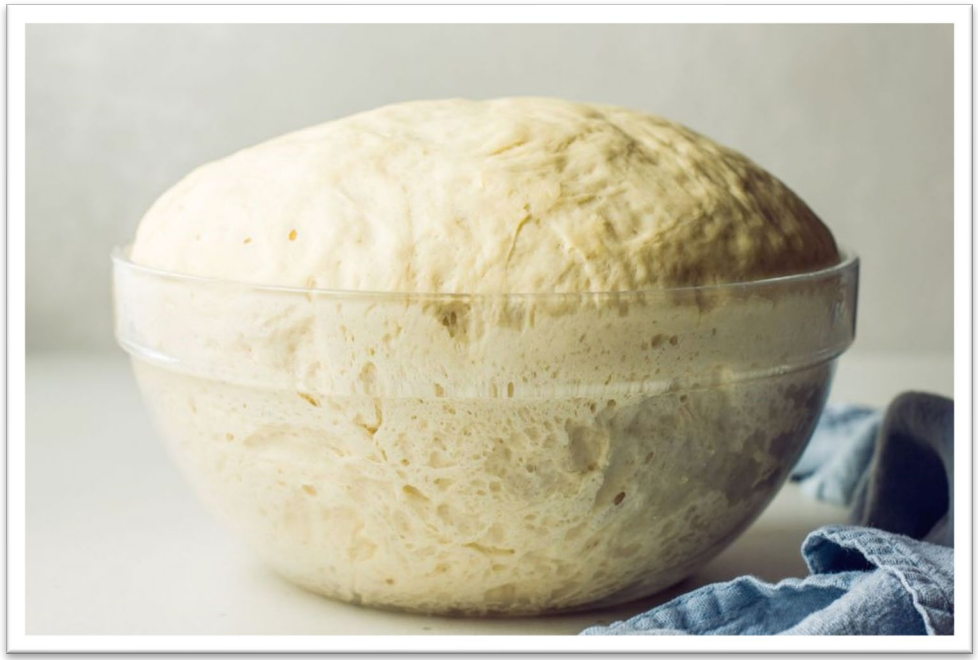
Mechanical Leavening

Air and moisture is incorporated during mixing, expands when heated.

Examples:

- Creaming
- Foaming
- Lamination
- Precooked (Pate a Choux)

Biological (Organic) Leavening



Yeast: living organism, leavening agent

- Feeds on sugar, produces alcohol and CO2, causes dough to rise
- Trapped gasses expand when baked
- Salt enhances flavor, controls yeast activity (but too much kills yeast)

Temperature

- Inactive below 40˚F
- Dead above 140˚F
- Best around 75-85˚F

Daily Plan: **Day 1**

Chef Demos

- Pâte à Choux
- Pastry Cream
- Chocolate Chip Cookies
- Crème Brûlée
- Crème Anglaise

Production Assignments

- Team 1: Pâte à Choux
- Team 2: Pastry Cream
- Team 3: Reverse Chocolate Chip Cookies
- Team 4: Crème Brûlée

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Any Questions?