



Back to School Edition -Toaster Pastries

Did You Know? 🧑‍🍳🔍

Homemade toaster pastries are a delicious twist on centuries-old hand pies! Once a humble way to preserve fruit in flaky dough, they've evolved into a creative canvas for bakers. Unlike store-bought versions, homemade pastries burst with real ingredients—think tangy lemon curd, spiced apple butter, or savory cheese and herbs. Their revival in the 2010s was fueled by nostalgia and a craving for artisanal flair. Today, they're brunch favorites and bakery showstoppers. Join us to roll, fill, and frost your own toaster treats—no foil packet required!

🔍 Understanding Pastry Dough: A Delicious Science

When we think of **wheat flour**, our minds often go to breads and cakes—products where gluten formation is either encouraged or carefully limited. In these baked goods, **moisture activates gluten and starch**, forming a cohesive dough that's strengthened through cooking. **Pastries**, however, play by a different set of rules.

📦 The Pastry Principle: Fat First

Pastry doughs aim to **coat and separate flour particles with fat**, using just enough water to bring the dough together. This technique limits gluten development and creates the signature **crumbly or flaky texture**. During baking, only about **half of the starch granules gelate**, resulting in a tender, crisp product.

🔑 Key Ingredients & Their Roles

Flour

- Provides structure and flakiness.
- Ideal protein content: ~11% for controlled gluten development.
- **Bread flour** (high protein) suits stretchy doughs like phyllo.
- **Pastry flour** (low protein) is best for crumbly textures.

Fat

- Adds flavor and defines texture.
- **Crumbly pastries** use fats worked into flour.
- **Flaky pastries** need fats that are malleable at room temp (butter, lard, shortening).
- Fat consistency depends on its **solid-to-liquid ratio**:
 - Best flakiness: **15–25% solids** at room temp.
 - For butter, this sweet spot is **58–68°F**—hence the need for **cold butter, tools, and chilling steps**.

Water

- Used sparingly to bind flour particles.
- Excess water = excess gluten = tough pastry.

🥧 Types of Pastries

Pastries fall into three main categories:

1. **Crumbly** – Small, irregular particles (e.g., short pastries)
2. **Flaky** – Thin, irregular flakes (e.g., pie crusts)
3. **Laminated** – Large, thin layers (e.g., puff pastry, croissants)

🔑 Making Flaky Pastry: The Pie Crust Method

1. **Fat is added all at once** to flour.
2. Use fingers or a food processor to break it into **pea-sized chunks**.
3. Add a **small amount of cold water**—just enough to form a dough.
4. Chill the dough to redistribute moisture and re-solidify fat.
5. Roll out the dough, flattening fat into thin sheets.
6. During baking, **steam and trapped air** lift the layers, creating flakiness.

🔍 Baking Science

Pastry doughs contain **minimal water**, so not all starch gelates. Instead, baking:

- Partially gelates starch
- Dries the gluten network
- Produces a **crunchy, golden crust**

High oven temperatures are key—if the dough heats too slowly, fat melts before starch sets, ruining the structure. For moist fillings, an **egg wash** helps seal the crust and preserve crispiness.

The Sweet Science of Jam: Preserving Fruit Through Time

A Brief History of Jam

Humans have been preserving fruit for centuries, long before refrigeration. One of the earliest methods? **Immersing fruit in honey**—a natural preservative. But the real magic began when people discovered that **cooking fruit with sugar** transformed its texture into something thick and spoonable.

The introduction of **cane sugar** was a game-changer. Unlike honey, sugar adds no extra moisture or flavor, making it ideal for preserving. Still, jams and jellies didn't become widespread until the **1800s**, when sugar became affordable enough for everyday use.

How Jam Works: Sugar, Pectin, and Acid

At its core, jam is a **gel**—a semi-solid structure where water is trapped in a network of molecules. Here's how it all comes together:

The Role of Pectin

Pectin is a **natural carbohydrate** found in the cell walls of fruits. When fruit is **cut and heated**, pectin is released into the mixture. But there's a catch: once dissolved, pectin molecules become **negatively charged** and repel each other, preventing gel formation.

The Jam-Maker's Toolkit

To coax pectin into forming a gel, cooks rely on three key strategies:

1. **Add Sugar**

Sugar binds water molecules, pulling them away from pectin and allowing the chains to move closer together.

2. **Boil the Mixture**

Boiling evaporates excess water, concentrating the pectin and sugar.

3. **Add Acid (like lemon juice)**

Acid lowers the pH, neutralizing the negative charges on pectin so the molecules can bond and form a gel.

When Jam Doesn't Set

Sometimes, your jam stays runny. Why?

- **Not enough pectin** (some fruits are naturally low)
- **Too little acid**
- **Overcooking**, which can break down pectin

Fixing It

You can often rescue a runny batch by:

- Adding **commercial pectin**
- Boosting acidity with **lemon juice or cream of tartar**
- Reboiling briefly to reset the gel structure

Sweet Stats

- Typical jam contains **66% sugar** by weight.
- The fruit-to-sugar ratio is usually **45:55**.
- This high sugar content not only sweetens but also **preserves** by making water unavailable to microbes.

Source:

1. *On Food And Cooking: The Science and Lore of the Kitchen* by Harold McGee



October 17 -Boards & Bites: Crafting Holiday Charcuterie

Join us at the LSU AgCenter Test Kitchen! Explore delicious recipes and discover the science behind the art of cooking.

When: Friday evenings from 5:00 pm to 8:30 pm

Dates:

- February 28 - King Cake
- April 25 – Chips and Salsa
- June 27- Ice Cream Cake
- August 22 – Toaster Pastries
- **October 17 - Charcuterie Board**
- December 12

Cost: Varies by event

Location: LSU AgCenter Test Kitchen, 39 Forestry Ln., Animal and Food Sciences Laboratories, Baton Rouge, LA.



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