

LITTORALICIOUS

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# Banana Bread — The Science

## WHY THIS RECIPE WORKS

### Banana Ripeness = Starch → Sugar

A green banana is ~80% starch. As it ripens, amylase enzymes break long starch chains into simple sugars — sucrose, glucose, fructose. A black-spotted banana has converted most starch to sugar.

**Result:** Sweeter bread with less added sugar. Softer texture. Underripe = starchy, gummy bread. There is no substitute for ripeness.

Source: Ali Bouzari, *Ingredient* (2016)

### Melted vs Creamed Butter

Creamed butter traps air pockets = lighter, cakier texture. Melted butter distributes fat evenly through batter = denser, moister crumb with no air pockets.

**Result:** For banana bread, moist > light. Melted butter creates the fudgy, dense texture you want. Creaming makes it drier and more cake-like.

Source: Stella Parks, *BraveTart*

### Yogurt Acidity

Lactic acid in yogurt does three things: (1) tenderizes gluten for softer crumb, (2) reacts with baking soda for additional CO<sub>2</sub> lift, (3) adds tang that balances sweetness.

**Result:** More tender, better rise, more complex flavor. Sour cream works too (richer, more fat).

Source: Harold McGee, *On Food and Cooking*

### Baking Soda Chemistry

Sodium bicarbonate reacts with acids (yogurt, banana) to produce CO<sub>2</sub> gas. Reaction starts immediately upon mixing. Most CO<sub>2</sub> produced in first 10-15 minutes.

**Result:** Mix, pan, oven — fast. Batter sitting on counter = CO<sub>2</sub> escaping = flat bread. Soda also browns the crust (raises pH, accelerates Maillard).

Source: ChefSteps

### Minimal Mixing

Gluten (protein network) develops with mechanical agitation. In quick breads, you want minimal gluten — just enough to hold structure, not enough to make it chewy.

**Result:** Overmix = tough, dense bread with tunnels. Fold gently, stop when you still see flour streaks. They'll hydrate in the oven.

Source: Rose Levy Beranbaum, *The Cake Bible*

### Why 95°C Internal Temp

At 95°C (203°F), starches are fully gelatinized and proteins are set. Below this = gummy, underbaked center. Above = drying out.

**Result:** Instant-read thermometer is more reliable than toothpick test. Insert into center, pull at exactly 95°C.

Source: Modernist Cuisine

## ELEVATION SCIENCE

TECHNIQUE	WHAT HAPPENS	WHY IT WORKS
Brown butter	Milk solids undergo Maillard reaction at ~120°C	Creates 100s of new flavor compounds: nutty, caramelized, toasty. Adds depth without adding ingredients.
Roast bananas	25% moisture evaporates. Sugars caramelize.	Concentrated banana flavor. Less water = no gummy layer. Caramelization adds complexity.
White miso	Glutamates enhance taste receptor sensitivity	Umami amplifies sweetness perception. 30g adds depth without detectable "miso" flavor. Salt in miso also suppresses bitter notes.
Espresso powder	Volatile aromatics complement banana compounds	Deepens, rounds flavor. No coffee taste at 1 tsp — just "more banana."

## FROZEN BATTER SYSTEM

Make complete batter → freeze in lined pan → pop out block → vacuum seal. **Keeps 6-8 weeks.**

### Best Quality (thaw first)

1. Thaw in fridge overnight or counter 2-3 hrs
2. Room temp 30 min
3. Bake immediately 175°C, 55-65 min

### Fast (from frozen) — 90-95% quality

1. Bake from frozen 165°C, 70-80 min

**Why thaw wins:** Even heat = consistent crumb. Soda reactivates fully. Higher temp = better Maillard crust.

**Why frozen works:** Lower temp prevents outside setting before center cooks. Trade-off: paler crust.

## DRY KIT SYSTEM

Pre-mix dry ingredients (NO soda). Add fresh soda day-of. **Keeps 3-6 months.**

### The Kit

240g flour + 4g salt + 2g cinnamon + 150g brown sugar + 50g white sugar

### Day-Of

1. Mash 400g bananas + 115g melted butter
2. Add dry kit, whisk
3. Add 2 eggs, 10g vanilla, 60g yogurt
4. **Add 6g baking soda LAST**, fold briefly
5. Bake immediately

**Why no soda in kit:** Soda degrades with humidity. Sugar is hygroscopic (absorbs moisture). Separate = full potency.

**Test old soda:** Drop in vinegar. Should fizz vigorously.

## TROUBLESHOOTING

PROBLEM	CAUSE	FIX
Dense, heavy	Overmixed / too much flour	Fold gently. Weigh flour — don't scoop.
Sunk middle	Underbaked / old soda	Check at 55 min with thermometer. Test soda.
Gummy layer	Excess moisture	Drain banana liquid. Or roast bananas first.
Didn't rise	Dead soda / batter sat too long	Fresh soda. Bake immediately after mixing.
Pale top	Oven too low	Verify with oven thermometer.