

# THE SCIENCE OF PIZZA PIE

## Quick Fact: Why Is It Called Pie?

American Pizza is believed to have been invented in New York by an Italian immigrant named Gennaro Lombardi in 1907. He called his creation, "Tomato Pie."

## That Crust

The science starts with the chemical reaction that happens when yeast is mixed with flour, warm water and salt. The yeast will begin to break down the sugars in flour and give off carbon dioxide, causing the dough to rise!

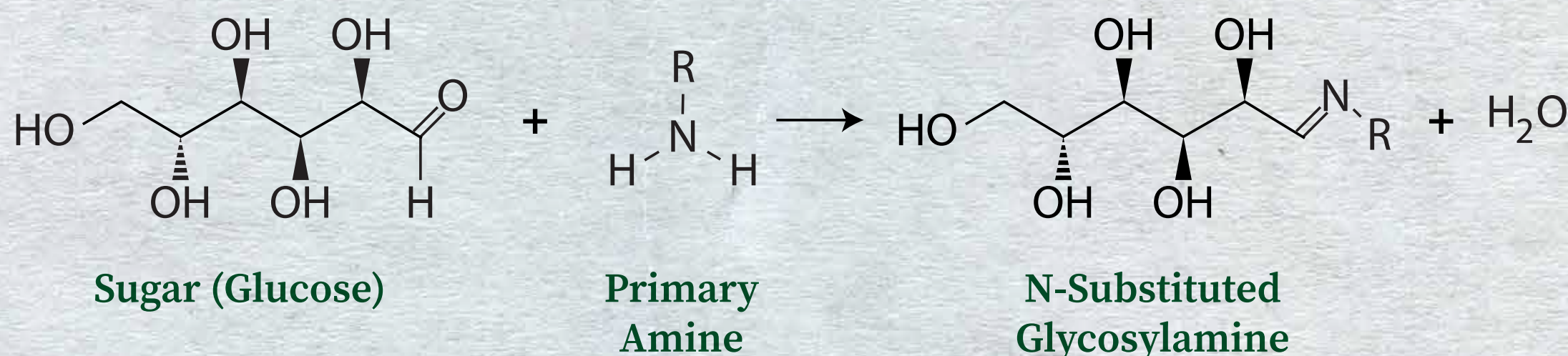
## Tomato Sauce: Umami Bomb

The tomato sauce used on pizza gives the pie a depth of flavor. Tomatoes are particularly tasty due to their naturally high glutamic acid content, resulting in a sweet-yet-savory, umami flavor

## The Maillard Reaction: Why Food Tastes So Good!

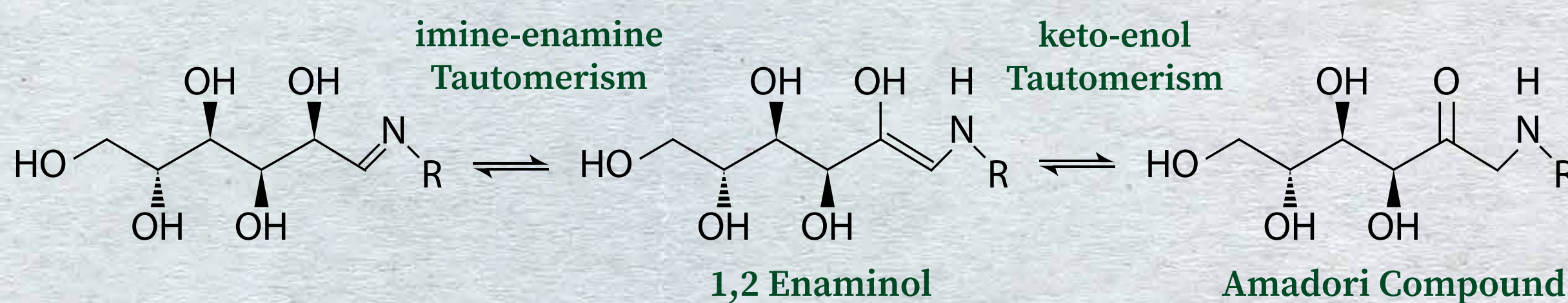
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The first step of the Maillard reaction is a sugar-amine condensation, where the carbonyl group of glucose reacts with an amine group from a protein or amino acid, forming an N-substituted glycosylamine and water.



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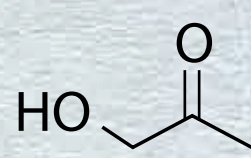
The second step of the Maillard reaction is the Amadori rearrangement, an isomerization reaction that occurs even at low temperatures (as low as 25°C). This reaction transforms the N-substituted glycosylamine into a ketosamine, known as the Amadori compound, which contains both a ketose (sugar with a ketone) and an amine.



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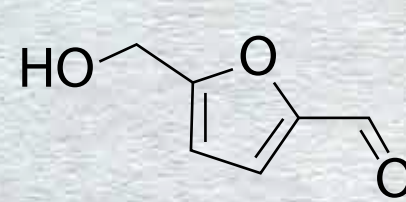
The Amadori compound can react to form various products, such as hydroxypropanone, which can undergo further reactions. The specific products formed depend on whether the mixture is alkaline or acidic, making the process complex.

Alkaline Conditions



Hydroxypropanone

Acidic Conditions



Hydroxymethylfurfural

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