

## DEFINITION

Pizza dough is typically a lean, yeast-leavened bread-type dough that is similar in formulation to French bread and Middle Eastern flat breads. Pizza crusts or shells may be categorised as thin or thick crust.

## HISTORY

Pizza dates back to 18th century Naples, when it was a garnished flat bread sold by roaming vendors to the poor in the streets. The biggest step towards its current popularity was the acceptance of tomatoes as a pizza topping by Neapolitans. The story is that pizza was endorsed by Queen Margheita in 1889, when baker Raffaele Esposito was summoned to bake for her and created Pizza Margherita – tomato, mozzarella cheese and basil – the colours of the Italian Flag. From then on, pizza popularity increased and it was first introduced to America in the late 1800s by Italian immigrants who began eating establishments. By the early 1950s pizza was an increasingly popular part of the American diet, with pizza production becoming commercial in 1949.

## INGREDIENTS

Crust formulations can vary depending on makeup equipment, thickness and desired eating properties. Commercial or wholesale pizza dough generally contains higher levels of fats to assist with the high-speed processing of the dough.

INGREDIENT	FUNCTION & SPECIFICATIONS (*Based on flour content.)
Flour	Important as gluten is the major strengthening ingredient in the dough and has a huge effect on the crust. For thin and crispy base, use biscuit-type flour with 9% protein content. For a breadly deep pan base use bread-making flour containing 11.5–12% protein. For thick base pizza a high protein content can result in an overly chewy texture. A high protein flour results in a tougher and more elastic dough; however, for hand forming or use of a press lower protein dough is easier to handle as it is weaker.
Yeast	The gluten structure of the flour traps the carbon dioxide given off by the activity of the yeast, resulting in the flour rising. Yeast is the primary source of leavening for pizza crust. When a dough is yeast leavened it should be brought from the mixer at 32–38°C, given a short rest period of 10–15 minutes and then processed. Yeast also adds flavour to the dough so over use can affect the smell and taste of the end product. Dough can be leavened chemically, usually for thin crusts as this gives crispy crust characteristics and eliminates the need for final proofing, although without yeast the flavour of the pizza can be bland.
Shortening or vegetable oil	Higher amounts used in thick crust. Insufficient shortening produces dough which is sticky and lacking desired flow characteristics for uniformity of shape and finished shells tend to absorb moisture from sauce and exhibit toughness.
Salt	In addition to flavouring, salt also strengthens gluten resulting in tighter and more elastic dough, as well as slowing the fermentation process. Thin crust 1–1.5%*, while in thick crusts 1.5–2%*.
Water	Dough absorption ranges from 55–60% for thin crust and 60–70% for thick crust. Excessive absorption produces sticky dough with poor machinability, while insufficient absorption creates dough which tears easily and tough crusts.
Sugar	As pizzas are not considered sweet foods, sugar is used at low levels of 1–5%* to provide fermentable carbohydrates for yeast activity with some residual sugar aiding crust colour development during baking. Optional ingredients include mould inhibitors, protease enzymes and reducing agents.

## PROCESSING

Mixing the dough develops the gluten and mixes air into the dough to aid fermentation.

If pizza dough is to be formed on a high speed production line then it should be soft and extensible as stiff dough will tear or shrink after forming. While dough for retail, such as at a pizzeria, is best made with less water to make it stiff so fermentation can soften it and make it suitable for sheeting.

If the dough is made for immediate processing on a production line or for retail then a dough temperature of 32–35°C is desirable as the dough is softer, which assists forming. However, if the dough is made and then refrigerated for use at a later date a lower dough temperature of 24–27°C is desirable to control fermentation and prevent over expansion on storage.

**Two methods of production are outlined below:**

**1. Wholesale production, where makeup/forming may be either of two procedures:**

### A) Sheeting and die cutting

The dough is extruded to approximately 13 mm thickness onto a makeup belt and then further reduced through series of sheetings to

4–6 mm for thin crusts and 6–10 mm for thick crusts. The sheet is then passed under a docking roller and subsequently a rotary cutting wheel to cut it to the desired size. The scrap is continuously collected and fed back through or added to future batches. After cutting, the dough shells are either conveyed to a proofer for 30–40 minutes prior to baking if a high volume bread like crust is desired or directed straight to the oven if they are a thinner type crust.

## **B) Pressing of preformed individual dough balls into a flat, round shape (stamping)**

In this process the dough is taken from the mixer and rested for a short time (5–10 minutes). It is then divided into desired unit weights. A light coating of vegetable oil is applied and the dough is proofed for 5–10 minutes. The dough is directed to a stamping station where they are stamped twice with a 60–90 second rest between the two presses. Dough which is pressed twice shrinks less and there is no need for reducing agents. The dough either goes straight to the oven or is given a short proof first (10–30 minutes) which produces a larger volume.

## **2. Retail production**

The dough is divided into smaller, individual pieces before it can be shaped by either a pressing or sheeting method. The more popular method for handling dough is the refrigerated dough method. The dough is mixed to clean up stage with a target temperature of 24–27°C and then taken straight to either an automated or manual bench for dividing and rounding. Dough pieces are lightly coated with salad oil to prevent crusting and placed on stackable trays allowing space between each dough piece. Trays are then cross stacked in fridge/retarder to allow air circulation rapid cooling and covered after 1.5 hours to prevent excessive moisture loss and crust formation. Following 12–72 hours the dough becomes conditioned due to the effects of yeast and fermentation by-products. The end dough will be soft, pliable and therefore easy to form by passing it through a sheeter 2–3 times, with a turn of 90° each time.

**Baking:** For baking a 'par-baked' or partially baked crust, the desired oven temperature is 190–205°C with both top and bottom heat. The baking time should be sufficiently long enough to ensure complete setting of the crust, as under baked crust will collapse upon cooling. A 30 cm diameter pizza shell, made from 370 g dough piece, will require 3.5 minutes at 196°C to par bake correctly.

For a complete pizza, only the bottom heat should be used set at 290–315°C with baking times averaging 6.5 minutes to bake 30 cm thin crust pizza. A thick crust pizza can be baked at 260–290°C for 15 minutes.

## **FREEZING PIZZAS**

The traditional method for freezing pizza is with a partially baked crust that is frozen first, then topped with cheese, sauce and par-cooked meats and then frozen again. The problem with this method is that the flavour is lost and the toppings have a tendency to fall off. A new method is to avoid double freezing the crust, by par baking the pizza as a unit. Pizzas go directly from the oven to cryogenic freezers (-45 to -62°C) and are frozen solid within minutes. This locks in the flavour of the pizza and avoids dehydration which can be caused by refrigeration.

## **REFERENCES**

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