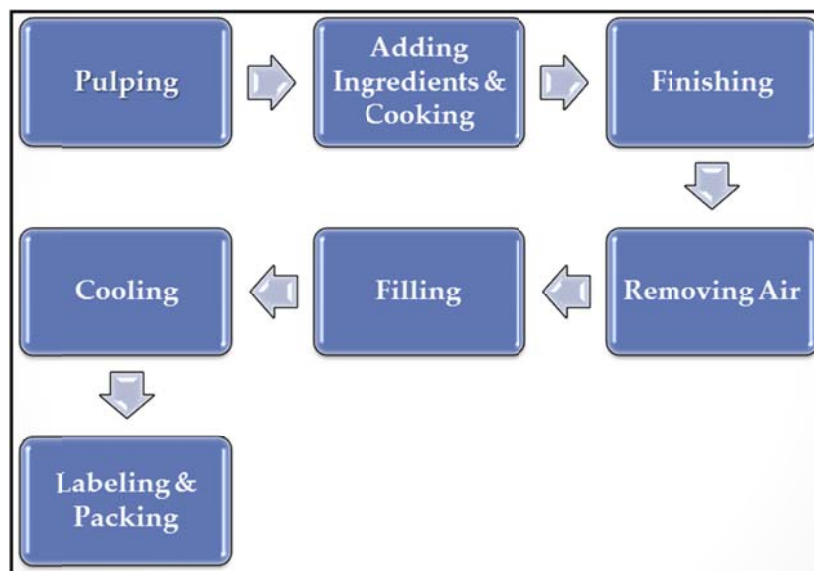


Tomato Ketchup Production in Industry

Tomato Ketchup is made of whole lot of stuff going inside it from vegetables to tomatoes and spices to preservatives. Salt (sodium chloride), sugar, spices, spice extracts, vinegar, acetic acid, onions, garlic and chillies, and pectin and alginates as stabilizers.



Tomato Ketchup Production Flow Chart



Industrial Tomato Ketchup Production Video

[embedyt] <https://www.youtube.com/watch?v=BfX9Q871P2Q>[/embedyt]

1. Pulping

The tomatoes are chopped and precooked, then pumped into pulping machines, or cyclones, which separate seeds, skins, and stems from the pulp. This pulp is filtered through screens and processed further into ketchup, and some is stored in a form of paste to use later in the year.



2. Adding Ingredients and Cooking

The pulp is pumped into cooking tanks or kettles and heated to boiling and kept at temperature above 80°C. Measured amounts of sweeteners, vinegar, salt, spices, and flavourings are added to the tomato pulp. To avoid evaporation of volatile oils they are not added early during the boiling with the spices, salt and sugar. Powders of onion or garlic are usually added which are procured from various firms which do the dehydration. The mixture is cooked for 30-

45 minutes and is circulated by rotating blades installed in the cookers or kettles. The temperature is carefully regulated to insure absorption of the ingredients without overcooking.



3. Finishing

Once the cooking is completed, the ketchup mixture passes through a finishing machine. Finishers are used to remove excess fiber and particles they do so by the help of screens, creating a smoother consistency. The ketchup is sometimes milled at higher temperatures and pressures to achieve a smoother consistency.



4. Removing Air (De-aeration)

The ketchup is de-aerated to prevent discoloration and growth of bacteria. Excess air may cause unattractive air pockets and impede the closure process.



5. Filling

To prevent contamination, the ketchup passes from the receiving tanks to the filling machines at a temperature not lower than 88°C. The containers are filled with the ketchup and immediately sealed to retain the freshness of the product. Ketchup containers are available in various sizes and shapes.



6. Cooling

The containers are cooled to prevent flavour loss through stack burning, which occurs when ketchup stays at high temperatures after cooking is complete. Containers of ketchup are cooled in cold air or cold water.



7. Labelling and Packing

Finally, the ketchup containers are labelled and coded with product information, including ingredients, date and location of manufacture, and shelf-life. The bottled ketchup may be inspected again before shipping. The entire process of ketchup manufacturing generally takes two to three hours.



Note:

How much Sodium and Sugar in Ketchup?

Sodium chloride which is the major source of sodium is used commonly as a food-flavouring condiment and sometimes as a food preservative. In tomato ketchup it is used as taste enhancer. The percentage of sodium chloride ranged from 1.84% to 2.58%. Similarly for sugars (sucrose) gives a natural taste and uniform texture to the product, in addition to thick density. The addition of sugar in ketchup is for balancing the taste of sourness of tomatoes. No limit or requirement has been set by the national standards. Sugar was found between 17.64% and 29.62%.

Viscosity Of Ketchup

Being a Non-Newtonian Fluid, its Viscosity is high and because of this only it's hard to pour out the bottle. Viscosity of ketchup ranges from 50,000-70,000 Centipoises.

Difference between Puree, Paste, Sauces and Ketchup

Purees and pastes are preserved generally only by physical means (e.g. heat), while sauces and ketchups are preserved by chemical means (e.g. salt, sugar, seasonings) in addition to physical means.

Purees and Pastes generally do not contain seasonings, though nowadays, versions of both with seasonings are available. However, these have to be declared on the product label. Purees and Pastes differ between themselves in their thickness, measured by the total soluble solids (TSS). While purees have a TSS ranging from 9 to 12%, pastes have a TSS percentage of 25-44.

The key difference between tomato sauce and ketchup too is the thickness or consistency. Tomato sauce has a TSS of 24–25%, while ketchup has a consistency of 28-30%. This is because Ketchup contains more spices and seasonings than the sauce. Sauces and ketchups do not have to declare seasonings and spices, as these have been traditionally an inherent part of the product.

References:

<https://foodscienceuniverse.com/2020/04/07/tomato-ketchup-production-process/>