**How is ice cream made?**

Ola’s vision is to deliver 100 million smiles every day, by encouraging people everywhere to share small moments of happiness, like listening to your favourite song, having a laugh, or eating an ice cream. We are global market leader and offer a wide range of products, varying from indulgent treats which are eaten once in a while, to lighter options that can be eaten more frequently. We set the highest standards on our ice cream manufacturing process, using high quality ingredients, smart formulation and new technologies to create innovative products that appeal to consumers. But did you know that ice cream is actually quite difficult to make? We would like to explain why and why Unilever is so good at it.

**Definition of ice cream**

There are 4 types of ice cream: water ice, sorbet, sherbet and ‘traditional’ ice cream. The primary ingredient of water ice is sugar and contains no fat or milk. Sorbet is made from fruit or juice mixed with sugar and contains some air but no milk or fat; sherbet is made from juice, sugar, milk, fat and air. Ice cream is made of the main components ice, air and fat.

**Complex to manufacture**

As you may imagine, these components are quite difficult to process. On top of that we have the matrix (like sugars, proteins etc) and the assembly process to turn all the above into a delicious ice cream.

<table>
<thead>
<tr>
<th>Ice cream microstructure</th>
<th>% contribution to total</th>
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<tbody>
<tr>
<td>Air</td>
<td>50</td>
</tr>
<tr>
<td>Ice</td>
<td>30</td>
</tr>
<tr>
<td>Matrix (sugars, milk proteins, unfrozen water)</td>
<td>15</td>
</tr>
<tr>
<td>Fat</td>
<td>5</td>
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</tbody>
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The microstructure governs the ice cream’s quality (whether it is creamy or icy) and stability (whether it melts more quickly or slowly). And the smaller the ingredients, the more texture can be given to the final product.
Ice cream manufacturing step by step

The way we manufacture ‘traditional’ ice cream today is still on the same basis as home-made, but then at very large scale and of course adhering to strict modern manufacturing standards.

1. The first step in making ice cream is mixing all the ingredients together.

2. The mix is then pasteurised, a process that kills any harmful bacteria through high temperature heating. The mix is also homogenised. This is a process that enables breaking down the fat droplets to make them smaller. In addition to the basic ingredients mentioned above, emulsifiers are also added in this phase to obtain a smoother texture and create a stable, homogeneous, smooth emulsion.

3. The mix is then rapidly cooled to a temperature of +5°C or under and left for some hours to let the fat cool and form into crystals. The speed and the extent of this process depend on the type of fat used. Fats with higher saturated content tend to crystallise faster and to a greater extent than less saturated fats.

4. The mix is then pumped through very cold cylinders (-30°C) with rotating blades, cooling the ice cream to -5°C. This process freezes some of the water in the ice cream whilst whipping air into it at the same time, giving the ice cream a soft creamier texture.

5. Then, depending on the product, coatings, inclusions, toppings and sauces are added to the semi-frozen mixture.

6. While still in semi liquid form, the mixture is removed from the freezer and dosed into packages.

7. Finally, the ice cream is rapidly cooled down to very low temperatures (-25°C). The speed of the process ensures that the ice crystals remain small, making sure that the ice cream is smooth and creamy.

8. The ice cream is then stored in our refrigerated factory warehouses. To ensure the stability of the quality of the ice cream through transport, we use a frozen transport fleet which maintains the ice cream at -20/-25°C during transport right to the customer/concessionaire. This means that consumers get the high quality product they know and expect from us.

Did you know that:

› The most complex ice cream to make is Cornetto?
› Our 3 largest ice cream factories are situated in Germany, Italy and in the US?
› We aim to reduce the environmental impact of our manufacturing operations (as incorporated in the Unilever Sustainable Living Plan) by:
  • Reducing GHG from manufacturing. Example of this is the initiative from Unilever Benelux to use sustainable energy in all its factories, including the Ben & Jerry’s factory in Hellendoorn, effective January 2011.
  • Reducing water use in our manufacturing process
  • Reducing waste from our manufacturing
  • Sourcing 100% of our agricultural raw materials sustainably by 2020. In 2011, Magnum launched 2 new variants that use cocoa beans from Rainforest Alliance certified farms.