

the Fact Sheet

from the Consumer Information Service

Oral Care – Facts about toothpaste

The idea of keeping teeth looking clean and feeling healthy has been common for many centuries. The way of doing this however has changed over time.

Early types of toothpastes commonly used ingredients such as honey and oil along with other pleasant tasting ingredients. These early toothpaste formulas were often harmful to teeth and gums.

One of the earlier commonly used methods for cleaning teeth was with tooth powder. Tooth powder was stored in jars or tins and was quite awkward to use. The toothbrush had to be dipped into the wetted powder prior to using, often resulting in wastage.

Also common in the first part of the 20th Century was brushing with dry Baking Soda and salt. The taste of this mixture was not very appealing to most people.

Colgate® toothpaste

- The Colgate Company was established by William Colgate in 1806. In 1877 the world's first dental "cream" was manufactured by Colgate and was originally sold in jars.
- In 1890 the company introduced its first collapsible tube. The dental "cream" or tooth "paste" could be conveniently stored and measured for use.
- Colgate Dental Cream quickly became the world's most famous toothpaste.
- Modern toothpastes in the Colgate-Palmolive range contain scientifically formulated ingredients that gently clean and strengthen tooth enamel against acid attack.
- Toothpaste is normally used for three reasons:

- It gives your mouth a fresh and clean feeling.
- It can deliver therapeutic agents to your mouth such as fluoride and calcium.
- It helps your toothbrush clean your teeth, as toothpaste provides a polishing action which removes plaque and stains from tooth enamel.

Keep your teeth and gums healthy

Except for the common cold, tooth decay (also known as caries or cavities) has long been the most widespread human condition.

Over time, plaque and tartar on the teeth can lead to serious problems such as tooth decay and gum disease. Caring for your teeth each day by brushing and flossing correctly is the best way of preventing dental problems. Regular dental visits can also prevent minor problems from becoming major ones. Don't wait until you have pain before visiting your dentist.

Pellicle, plaque and tartar

Brushing every day removes soft food deposits which gather around the gums, between the teeth and in defective places. It also increases blood circulation in the gums and other oral tissues.

Pellicle consists of protein from **saliva** which is absorbed onto the enamel surface of the tooth. Pellicle is the surface upon which dental plaque forms. It is the part of the tooth that stains when exposed to such things as colourings, tobacco and caffeine.

Plaque is a soft, sticky and invisible coating that forms in your mouth by bacteria and saliva, even while you sleep. Beware of sticky and starchy

the Fact Sheet

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Oral Care – Facts about toothpaste

foods that stay in your mouth for long periods of time, such as sucking on hard sweets or sipping sugary drinks, because they give the plaque even more time to produce the acids that cause tooth decay.

Although enamel is the hardest substance in the human body, after many acid attacks it can finally break down, forming a hole or "cavity". Decay usually starts on the chewing surfaces of your back molar teeth (top and bottom rows).

To avoid plaque build up it is important to thoroughly clean your teeth and gums by brushing and flossing at least twice a day. For healthy teeth and gums also remember to eat a balanced diet and snack wisely.

Tartar: (or dental calculus) is a crusty mineral deposit (mainly calcium phosphate crystals) that forms along and under the gumline. If plaque is not properly removed every day, it can thicken and harden into tartar. Once tartar has formed it can only be removed by a dental professional by scraping.

Tartar has an undesirable appearance (it is often yellowish in colour) and it also irritates the gums, contributes to further plaque formation and interferes with normal oral hygiene by making brushing less effective.

Ingredients in toothpaste

Colgate-Palmolive manufactures a wide range of toothpastes with different flavours, colours, and some with special ingredients. Our toothpaste range is constantly adapting to consumer needs.

All Colgate toothpaste varieties have their ingredients listed on the box. Most toothpastes contain the following:

Polishing agent or abrasive – Dicalcium Phosphate Dihydrate, Silica: Toothbrush bristles alone do not break the pellicle film or release it from the enamel surface. Abrasive particles help penetrate and remove stained pellicle. This ingredient can also remove light stains on the tooth surface.

Colgate uses mild abrasives which are gentle and smooth to ensure that they do not wear away the enamel.

Solvent – Water: Water is needed to help mix the other ingredients together and make the toothpaste the correct consistency.

Humectant – Glycerin, Sorbitol: The humectant or the moisturiser has many roles in toothpaste: it helps the other ingredients mix together; it stops the toothpaste from drying out if the cap is left off; it prevents microbiological growth; and it adds sweetness to the taste of the toothpaste.

Surfactant – Sodium Lauryl Sulphate: Sodium Lauryl Sulphate is a mild, safe detergent and foaming agent. It produces a foam during brushing which helps carry the toothpaste into all the crevices of the teeth. Plaque and food particles are loosened and can then be brushed away.

Binders and thickeners – Hydrated Silica, Cellulose Gum, Carrageenan: Binders and thickeners prevent the other solid and liquid ingredients separating. This is important as often toothpastes are kept for a long time and consumers expect the toothpaste to look like new, even if it is a couple of months old. These agents therefore hold all the ingredients together to form the perfect consistency for squeezing out onto a toothbrush.

the Fact Sheet

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Oral Care – Facts about toothpaste

Flavour – Spearmint, Peppermint, Menthol, Sodium Bicarbonate: The flavour used in toothpaste gives it a clean, fresh taste and aftertaste. Menthol, spearmint and peppermint are used in Colgate toothpastes.

Colgate Baking Soda & Peroxide toothpaste also uses Sodium Bicarbonate as flavouring.

Fluoride – Sodium Monofluorophosphate, Sodium Fluoride: Fluoride actually gets into the hard enamel shell of your teeth, strengthening it against acid attack. Brushing your teeth regularly will clear away the food that encourages plaque to form, but brushing with a fluoride toothpaste will ensure that the enamel that protects your teeth remains hard and strong. Colgate started using fluoride in toothpaste formulas in 1968. It is recommended that children and adults of all ages, in fluoridated water areas and in non-fluoridated, should use a toothpaste that contains fluoride.

Fluoride protects against decay in four ways:

1. *As teeth are developing* fluoride becomes part of the tooth enamel, toughening teeth against attack by the acid in plaque.
2. *Once teeth are fully grown* fluoride gets into the outer layers of tooth enamel and makes them extra tough and decay resistant. This happens whenever fluoride comes into direct contact with your teeth (e.g. when you brush with a fluoride toothpaste or when your dentist gives you a fluoride treatment).
3. *Fluoride can help repair a tooth* where there are early signs of decay. It acts with minerals in your saliva to restore and harden the enamel. Unfortunately, once the enamel has been badly damaged, decay is inevitable and the help of a dentist is required.

4. *Fluoride slows the growth rate of plaque* helping to reduce the negative effects of any sticky film on your teeth.

Artificial sweetener – Sodium Saccharin:

Without adding sodium saccharin, toothpaste would have a bitter taste. Colgate uses sodium saccharin rather than natural sugar because it does not contribute to the production of decay causing acids.

Colour: An artificial colouring agent can be added to toothpaste to give it a more appealing appearance. The colours Colgate uses in toothpaste are approved by the Food and Drug Administration.

Colour-free toothpastes in the Colgate range include Total, Tartar Control, Advanced Whitening plus Tartar Control and Great Regular Flavour.

There is also a 'sparkle' in our "Sparkling Mint Gel" toothpastes in the form of titanium dioxide coated mica, which gives the glittering effect. It is completely safe.

Toothpaste manufacture

- All raw materials are analysed by Quality Control in our manufacturing plants. This ensures all ingredients meet the required high purity standard.
- All ingredients except the polishing agent, flavour and surfactant are mixed and heated in a big stainless steel bowl called a 'kettle'.
- After heating and stirring and while still hot, the ingredients in the kettle are pumped into a larger vessel called a 'DOPP' mixer.
- An airtight vacuum is applied to the DOPP throughout the rest of the mixing process to

the Fact Sheet

from the Consumer Information Service

Oral Care – Facts about toothpaste

prevent bubbles in the finished paste. A DOPP holds one tonne of toothpaste.

- The polishing agent is then added and mixed in well, followed by the flavour. The DOPP contents need to have cooled down before the flavour is added, because if it is too hot the vacuum pumps will take out any evaporated flavour. The surfactant is then added last because once added, it is more difficult to remove any entrapped air from the cream.
- Mixing continues until the toothpaste is smooth and creamy. A sample of each batch is taken to the laboratory for testing. The chemists check for the correct fluoride level and flavour.
- The toothpaste tubes are formed and heat sealed along the side at the manufacturing site. Tubes are then capped by machine with the opposite end left open for filling.
- The tubes are vacuumed and filled with toothpaste. The open end is crimped shut and batch stamped.
- The line operators act as inspectors to ensure that the toothpaste is up to standard; the correct weight is going into the tubes; that the tubes are strong enough; that the date code is legible and that the colour and print quality of tubes and cartons are acceptable.

Other points

- Colgate upright pump dispensers are also filled by machine. The pump filling machine is more complicated as it assembles the pump components as well as filling the pumps with toothpaste.
- Samples from the toothpaste production are labelled and kept on file for one year to check that the quality is not changing with time.
- Every day a different variant of toothpaste is made depending on the sales demands by consumers.

Packaging

Each toothpaste “lay down tube” has three main layers: an inner layer of polyethylene plastic, a metallic foil layer to prevent flavour loss and an outer layer of thermo plastic material that can be printed on. Colgate stopped making aluminium tubes in 1984.

The disk or “shoulder” near the cap is also made from polyethylene. The cap is made from polypropylene plastic and since 1986 has been designed to also be flipped open (not just unscrewed).

All toothpaste boxes contain recycled material and are recyclable. Box ends are glued closed so that they are tamper resistant.

Colgate began manufacturing toothpaste in “pumps” in 1984. The body and head of the pump is made from polypropylene with some smaller components made from low density polyethylene. Colgate only manufactures selected toothpastes in pump packs.