

Oral Health Foundation | Fact sheets

# Mouthwash



**Oral Health  
Foundation**

Better oral health for all

# Mouthwashes

Mouthwashes are an interesting category of product whose uses may vary from the purely cosmetic (reduction or masking of unpleasant mouth odours) to the therapeutic (control of oral infections).

The majority of mouthwashes available to the general public have an intermediary role, assisting in oral hygiene, promoting fresh breath and reducing the incidence of dental caries (cavities) and periodontal disease. The social function (breath freshness) was recognised in antiquity, when chewing of honey, spices or scented cashews were used to freshen the breath.

The social aspect remains important, but there is a growing interest in disease prevention, which is reflected in the formulation of mouthwashes.

## Functions of Mouthwashes

### Oral Hygiene

The mechanical action of rinsing the mouth with a liquid helps to remove food debris and stale saliva. This cleaning action is enhanced by the presence of substances such as surfactants that help to detach and solubilise organic materials. The cleaning action of mouthwashes is limited and less effective than the use of a toothbrush and dentifrice. The presence of antibacterial substances in the product will help reduce the bacterial population in the oral cavity.

### Oral Odours

Offensive mouth odours (bad breath, halitosis) are socially unacceptable but very common. Most individuals exhibit some degree of unpleasant mouth odours on first awaking. The common causes of these odours include stagnant saliva, stale food remnants (particularly strong-smelling foods such as garlic and onion) and odoriferous compounds produced by the action of oral bacteria on food and saliva. The improved oral hygiene resulting from use of a mouthwash will reduce breath odours by removing the materials attacked by bacteria and also by removing the offending smelly bacterial metabolites. Antibacterial agents in a mouthwash will also reduce odours by controlling the growth of the bacteria.

Some odours may arise from other causes, such as smoking. In such situations the main role of a mouthwash is to disguise the unpleasant odour with a pleasant masking odour, such as mint or cinnamon. The use of these attractive flavourings will also mask any other odours, which linger despite the mechanical and antibacterial actions of a mouthwash.

Mouth odours can also arise from underlying organic disease. A highly flavoured mouthwash may disguise these odours but will not cure the causative disease and it is essential that medical advice be sought for such conditions.

## Caries and Gum Disorders

Even in the normal individual a sticky, mucous layer called plaque gradually forms on the teeth. Plaque is largely composed of bacteria plus saliva-derived proteins and bacterial polysaccharides. Bacterial metabolism of sugars produces acids, which attack the tooth enamel and cause caries (cavities). Toxins produced by the plaque may also be a factor in the development of gum disorders. Calcification of the plaque leads to the formation of tartar (calculus). Antibacterial agents that are effective against oral bacteria will help to prevent plaque development and reduce the incidence of caries and gum disorders.

An alternative approach to caries prevention, which is suitable for mouthwashes, is the use of fluoride salts. The fluoride exchanges with the hydroxyl groups in hydroxyapatite, the main constituent of tooth enamel, forming fluorapatite. The fluorapatite is more resistant to attack by acids than the original hydroxyapatite.

## Other Functions

Therapeutic mouthwashes intended to alleviate or cure oral diseases are medicinal products and hence will not be discussed in this document.

Symptomatic relief of mouth or throat irritation and soreness is also more properly the function of a medicinal product. However, astringent substances present in mouthwashes may give some temporary relief of irritation by precipitating a protective film of proteins over the irritated mucous membranes. This protein-precipitating action may also help to reduce the oral bacterial population.

## Ingredients

Successful development of an effective mouthwash is dependent on the skilful choice of ingredients. Consumer acceptability is an important aspect of mouthwash formulation, especially in relation to taste preferences, which must be taken into account during development. Ingredients must also be safe for oral use, compatible with other ingredients and the final product must be stable during storage and in use. The main ingredient types used in mouthwash products are:

### Flavours

Flavours are used to mask lingering mouth odours and to produce a pleasant, fresh taste after use of the product. Some flavours may in addition have antibacterial properties. Consumer preferences are of prime importance in the choice of flavours, mint and cinnamon being particularly popular. The mouthwash is generally sweetened, usually with saccharin.

### Alcohol

Alcohol (ethanol) has a number of functions in a mouthwash, increasing the impact of the flavour, enhancing the fresh taste, solubilising other ingredients (especially flavours), assisting in the cleansing action and adding to antibacterial activity.

## Surfactants

Surface-active agents also have several functions in a mouthwash formulation. They aid in the cleaning action, solubilise other ingredients (particularly flavours) by emulsification, and may have some antibacterial effect. The type and amount of surfactant used must be chosen with care. Non-ionic surfactants may decrease the activity of some antibacterial and many surfactants are bitter tasting. Examples of suitable surfactants include the polyoxyethylene fatty acid esters.

## Humectants

Humectants such as glycerine and sorbitol may be added to mouthwash formulations to provide 'body', to prevent drying out around the opening of the container, and to provide sweetness.

## Water

Water is a basic ingredient of mouthwashes. It acts as a vehicle for other ingredients and provides the volume of liquid needed for the efficient use of the product, especially for the mechanical cleaning action. Some products are sold as concentrates requiring further dilution with water before use.

## Antibacterial agents

Special care is needed in the choice of antibacterial agents for use in mouthwashes. They must be effective against the oral bacteria responsible for the production of unpleasant odours and for plaque formation but should not encourage overgrowth of undesirable organisms such as candida albicans. They must also be safe for oral use, be compatible with other ingredients, and not seriously affect flavour. Antibacterial, which have been used in mouthwashes, include chlorahexidine and cetylpyridinium chloride.

## Astringents

The protein-precipitating action of astringents is utilised in some mouthwash preparations to soothe irritated mucous membranes.

This same action may also provide some antibacterial activity. Zinc salts, especially zinc chloride, are astringent substances commonly used in mouthwash.

## Fluoride

Fluoride, in the form of salts such as sodium fluoride, may be added to mouthwash products for its anti-caries effects.

## Colours

Colours may be added to mouthwash formulations to produce an attractive appearance.

## Manufacture

Mouthwash manufacture increases the solubility of poorly water-soluble components such as flavours followed by thorough mixing to achieve a homogeneous product. Filtration may be used to produce a 'sparkling' clear solution.

## Further Reading

*Harry's Cosmeticology, 7th Edition, edited by J.B. Wilkinson and R.J. Moore, and published 1982 by Longman Scientific and Technical.*

*Cosmetic Science and Technology Series, Vol 6 Oral Hygiene Products and Practice, by M. Pader, published 1988 by Marcel Dekker, Inc.*

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## Need further advice?

The Dental Helpline is the Oral Health Foundation's own confidential advice service. Qualified dental professionals are available to answer your questions personally from 9am – 5pm, Monday to Friday.

The Oral Health Foundation is an independent, UK based charity dedicated to promoting the benefits of good oral health to the public throughout the world. The Oral Health Foundation promotes three key messages:

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- Brush your teeth last thing at night and at least one other time during the day, with a fluoride toothpaste.
- Cut down on how often you have sugary snacks and drinks.
- Visit your dentist regularly, as often as they recommend.

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