

FAQ

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Essential oils: Fragrant benefits with limitations

Rain, wind and cold – the wet and chilly months are the typical time of year for infections such as colds, coughs and hoarseness. Many consumers hope to relieve cold symptoms through the expectorant effects of essential oils, such as those derived from eucalyptus, peppermint or preparations containing camphor. These oils are available as ingredients in cold-relief baths, in solutions for inhalation or in balms for rubbing onto the chest. However, infants and young children in particular can react sensitively to even the smallest amounts of essential oils. In this context, poisoning cases have been reported in the past. The German Federal Institute for Risk Assessment (BfR) has compiled the following information on what should be considered when using products containing essential oils – particularly cold remedies or relaxation products for children – and what applies, for example, to fragrance or aromatic oils released into the air via aroma diffusers.

The focus here is on the use of essential oils in concentrated form. The natural occurrence of small amounts, particularly in herbs and spices, or in food produced from them, is outside the scope of the following collection of questions and answers on the subject of essential oils.

What are essential oils?

Essential oils consist of mixtures of volatile and fat-soluble natural plant constituents with characteristic odours and varying compositions. Unlike fatty oils (such as cooking oils), essential oils evaporate completely. The mixtures consist of various chemical compounds, most of which belong to the terpenes and phenylpropanes. Terpenes – which comprise several thousand chemical compounds – and phenylpropanes are natural, volatile hydrocarbons that occur widely in many plants, where they are the main component of essential oils. They give plants their fragrance and flavour, protect them against pests, and attract pollinators.

Where and for what purposes are essential oils used?

Essential oils have a wide range of uses. They are associated with a sense of well-being and healing properties.

As components of aromatic herbs and teas, some essential oils can, for example, stimulate the appetite and aid digestion. Essential oils are used in baths to relieve cold symptoms, as well as in sports ointments to stimulate blood circulation. For colds and flu-like infections, the use of preparations containing essential oils is often found to be soothing and to relieve symptoms, whilst peppermint oil is sometimes used as a rub for headaches.

Due to their aromatic scent, essential oils can be used as fragrance oils, for example for aromatherapy massages at wellness centres or for room fragrances.

Essential oils are also frequently used as ingredients in products such as herbal medicines. They are also a key component of culinary herbs and can be added to food for flavouring. Essential oils are generally used in highly diluted form, although undiluted oils are also available.

How do essential oils work?

Essential oils are absorbed into the body during inhalation via the mucous membranes of the upper respiratory tract and the lungs, through the skin when applied topically, and through the gastrointestinal tract when taken orally. The constituents of the essential oils thus enter the bloodstream and reach the various organs. In addition, they reach the olfactory nerves via the nose. Odours generate electrochemical signals here, which are transmitted to the brain as information. As the brain also regulates the production of various hormones via scents, essential oils may influence the immune system and general well-being.

The mechanisms involved are diverse and can result, for example, in antimicrobial or anti-inflammatory, expectorant or antispasmodic effects. For instance, some components of essential oils can penetrate bacterial cell walls, increasing their permeability and disrupting their functions. Examples include thymol, which occurs in thyme, and eugenol, a component of cloves and cinnamon. Menthol, which occurs in peppermint, activates cold receptors – among other things – thereby providing the familiar sensation of freshness; it can also relieve itching and has a mild analgesic effect when applied to the skin.

The constituents of essential oils are usually metabolised into water-soluble compounds and excreted via the kidneys, though some are also exhaled unchanged through the lungs with the breath.

What should be borne in mind when using essential oils?

Almost all essential oils should only be used in a highly diluted form; otherwise, there is a risk of skin irritation, breathing difficulties and other adverse effects. Allergic reactions to essential oils are also possible. Before use, it is advisable to test a small amount on a small area of skin.

Certain essential oils, such as those derived from citrus fruits, can cause so-called phototoxic reactions on the skin following exposure to sunlight, which may result in symptoms resembling sunburn. Sun exposure should therefore be avoided in such cases.

Particularly in people with a predisposition to allergies, people with asthma, pregnant and breastfeeding women, children and infants, the use of essential oils should be kept to a minimum and carried out with caution.

Products containing essential oils should always be kept out of the reach of children. Bottles with child-resistant caps enhance safety, whilst dropper dispensers help to ensure that the correct dilution is achieved.

Furthermore, drops intended for inhalation must not be confused with those intended for ingestion. If essential oils are accidentally swallowed, gastrointestinal complaints, convulsions or breathing difficulties may occur, and in severe cases, kidney damage can result. If liquid essential oils enter the airways, this can cause pneumonia.

What should be borne in mind when using essential oils on babies and young children?

Infants and young children are much more sensitive to essential oils than adults. Here too, essential oils should only be used in highly diluted form. Certain potent compounds, such as camphor or menthol, are generally unsuitable for infants and young children. Even the smallest amounts (e. g. a few drops or vapours) entering the mouth or nose of infants and young children can cause life-threatening laryngeal spasms and respiratory arrest. Furthermore, they can cause skin and mucous membrane irritation, vomiting, movement disorders or convulsions. Therefore, if the use of essential oils is necessary, only products specifically labelled for use on infants and young children should be used.

If in doubt, it is advisable to consult a healthcare professional. The dosage instructions and directions for use should be followed, and the products should not be applied to the face.

Which essential oils are children particularly sensitive to?

Particular caution is required when using camphor, eucalyptus oil and peppermint oil (menthol) on children under three years old. These essential oils are considered particularly problematic as they can, amongst other things, cause life-threatening respiratory problems and seizures.

Have there already been poisoning cases caused by essential oils?

The BfR is aware of poisoning cases involving essential oils. German Poison Centres also receive enquiries concerning this issue. In children, the trigger is often the accidental intake of inhalants or fragrance oils. In some cases, inhalation products are given orally because caregivers mistake them for oral drops.

What should be done in the event of improper use of essential oils or signs of poisoning?

If a child shows acute symptoms such as breathing difficulties, convulsions or changes in consciousness after exposure to essential oils, the emergency medical services should be contacted immediately. As first aid measure, rinsing with water following skin contact and giving fluids (water or tea) to dilute the substance following accidental ingestion may help. A poison centre can provide advice by telephone. If a child has ingested camphor, they should

always be taken to a paediatric hospital for observation, as life-threatening respiratory problems and seizures may occur even some time later.

What applies to essential oils in cosmetic products?

According to the European Cosmetics Regulation (EC) No 1223/2009, cosmetic products are intended solely for external use (including the oral cavity) on the human body – for the purpose of cleansing, perfuming, changing appearance, protecting or correcting body odour. Products that have or claim to have a therapeutic effect are not cosmetics. This also applies to products intended to act internally, i.e. in the lungs, the nasopharyngeal cavity or the gastrointestinal tract. Essential oils are mainly added to cosmetics as fragrances. Due to their strong scent, even the smallest amounts are often sufficient; essential oils are therefore usually highly diluted in cosmetic products.

Has the BfR conducted an assessment of essential oils?

The BfR's Commission for Cosmetics has recommended guidance concentrations for the use of specific essential oils in cosmetic products. According to these recommendations, leave-on products should contain no more than 1 % eucalyptus oil, camphor, menthol, or methyl salicylate. For rinse-off products, the recommended concentrations are 5 % for camphor, 4 % for menthol, and 2.5 % for methyl salicylate.

The European Committee for Cosmetics and Consumer Health has published a [Guidance on essential oils in cosmetic products](#).

Further information on flavourings and flavouring substances, including information relating to essential oils, is available on the BfR website:

BfR information: '**Flavourings and flavouring substances**'
<https://www.bfr.bund.de/en/food-safety/assessment-of-substance-risks-in-foods/flavouring-substances-and-flavourings/>

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