

Questionable "free from" advertising

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Regardless of the industry, a lot is promised in advertising that does not necessarily correspond to reality. In the cosmetics and food industries, advertising often focuses on emphasising ingredients. For some time now, however, advertising has also been focussing on components that are not contained in a product. What should we make of these claims?

The "without" advertising appeals to groups of buyers who reject or cannot tolerate certain substances. In addition, it draws attention to substances that consumers may not have dealt with before or whose properties they are not even aware of due to a lack of interest and specialised knowledge. As with all advertising, the aim is to stand out from the competition and thereby increase sales. The classic is products without preservatives.

Without preservatives

Now, preservatives are not inherently disadvantageous or harmful. A good wine, for example, preserves itself through the "stimulant" alcohol. Alcohol is also used in skin care products, where it has no negative effect in low concentrations, i.e. it does not have a drying effect.

However, if you look at Annex V of Regulation (EC) No. 1223/2009 (Cosmetics Regulation), which lists all preservatives authorised for use in cosmetics, you will not find alcohol. Instead, the list contains substances with a considerable allergenic potential. This is the main reason why they are listed. So these are the substances that are being advertised as "preservative-free". So far so good.

However, it is not good if the advertising is extended to care products that do not require any preservatives due to their composition. This applies to pure vegetable oils, massage oils, oleogels aka lipogels, essential oils, powders and other water-free products. Preservatives are often specified in this context, such as "without parabens". This presents information that has no significance for the product and its properties because it is self-evident. The olive oil used in the kitchen is also not preserved.

If the same claim "without parabens" is made for a water-containing oil-in-water emulsion and other preservatives of the KVO are used, this is also not okay. This is because consumers are misled into believing that the allergy risk is now posed by comparable substances. Or an "antioxidant" is used whose "side effect"

is a paraben-like preservative – example: Hydroxyacetophenone (INCI).

Extracts

There are still preparations that contain aqueous, preserved components, usually extracts, which preserve the entire product with their "carry-over" effect, which is declared "without preservatives". Another not uncommon variant can be found in online shops for cosmetics and medical products, where "without" is claimed but the hidden or not shown INCI states "with". You would think that such outliers would be quickly discovered by the testing authorities responsible for cosmetics. However, this is not the case: in their spot checks, the authorities mainly measure the bacterial load, assess the hygienic packaging and, if necessary, search for currently banned substances, such as heavy metal content. Or they check whether the permissible concentrations of a substance declared in the INCI, such as salicylic acid (2%), have been exceeded and whether there are corresponding warnings (not for children under 3 years of age).

Fragrances

The last-mentioned salicylic acid is an example of how a business model can be developed from an undoubtedly possible salicylic acid intolerance in consumers by offering preparations that guarantee an absolute absence of salicylic acid.

As traces of salicylic acid in vegetable oils and extracts cannot be ruled out, the "without" statement is very convenient for those affected. Others, on the other hand, who have only heard about it and do not know the background, do not want to take any risks. However, most ingredients and products do not contain salicylic acid and there is a lack of data on where and at what concentration traces are actually relevant. The situation is different with fragrances that contain esters of salicylic acid such as amyl, benzyl, methyl salicylate and salicylaldehyde (INCI), a precursor of salicylic

acid. These components must be declared in accordance with Annex III of Regulation (EC) No. 1223/2009.

Auxiliary materials

In addition to preservatives, additives are used for oxidation stability, physical stabilisation of emulsions, facilitating spreadability and improving consistency, feel and sensory properties. They may have properties that are not physiologically and/or ecologically desirable. They are often referred to when they are not in the formulation and therefore not in the INCI.

- **Complexing agents** inactivate oxidative heavy metal traces in cosmetics. As far as citrates or phosphates are concerned, which are biodegradable or physiological, "without" information makes little sense. The situation is different with the explicit naming of non-physiological representatives that are difficult to degrade such as EDTA, which indirectly influence oxidoreductases of the epidermis and the skin microbiome.
- **Emulsifiers** can irritate, wash out skin barrier components and may not be biodegradable in the epidermis. With the exception of degradation, these properties are directly dependent on the size of the respective critical micelle formation concentration (CMC). The CMC of the highly irritating sodium lauryl sulphate (INCI) is e.g. 7.2×10^{-3} mol/l (at 25 °C), that of sodium laureth-3 sulphate (INCI) 0.70×10^{-3} mol/l and that of hydrogenated phosphatidylcholine (PC-H) about 4.6×10^{-10} mol/l. PC-H is physiological and a component of cell membranes, forms lamellar structures together with lipids in water-containing creams, does not irritate and does not show any wash-out effect. These creams are described as "without (conventional) emulsifiers".
- **Polyethylene glycols (PEGs)** are difficult to break down, non-physiological and form irritating peroxides with atmospheric oxygen unless they are combined with mostly synthetic antioxidants (e.g. butylated hydroxytoluene, BHT [INCI]). They are used as consistency agents, emulsifiers and film formers, are abundant in cosmetics and are therefore often found in "without" or "free from" advertising.
- In addition to biodegradable polysaccharides such as starch, cellulose, xanthan gum and their derivatives,

film formers and consistency agents are all made of acrylate polymers, which have been discussed in connection with microplastics. However, their hydrophilic form dissolved in water distinguishes them fundamentally from solid, lipophilic microplastics. Although acrylates are only broken down slowly, their ester structure means that they are broken down much faster by microorganisms and chemical-physical influences than solid microplastic beads made of polyethylene (PE) or polypropylene (PP). There is no adsorption of harmful substances. A "without microplastics" claim in relation to these compounds therefore does not appear justified at present.

- Like fragrances, **colourants** in cosmetics continue to decline. The "without" advertising refers to non-physiological, synthetic representatives, such as the azo colourants listed in Annex IV of Regulation (EC) No. 1223/2009, which are also used in food, although it is known that they can be broken down into carcinogenic aromatic amines by azoreductases in the liver, intestinal bacteria and exogenous microorganisms.
- **Amines**, which were used in the past to neutralise anionic emulsifiers, have largely been replaced by alkalis ("sodium", "potassium" [INCI]). Amines such as triethanolamine and especially its impurity diethanolamine can react with nitrogen oxides in the air or nitrite-releasing ingredients to form carcinogenic nitrosamines. This is a good example of how "amine-free" advertising has ultimately led to elimination.

Active ingredients

Even among the active ingredients, there are substances that should be replaced as they are not biodegradable. These mostly include long-chain compounds.

- **Paraffins and mineral oil-based waxes:** They are used in skin moisturising creams and medicinal ointments as they radically reduce transepidermal water loss and improve the topical absorption of drugs through their occlusive effect. The "without mineral oils" or "without paraffins" product descriptions result from their non-physiological properties, which

also include the inhibition of the skin's own regeneration.

- **Silicones:** Chemically, these are silicones, siloxanes and polysiloxanes. They are not biodegradable. Long-chain compounds among them are similar to paraffins. This is the reason for the "without silicones" advertising.
- An interesting example from the recent past is "without **aluminium chlorohydrate**" in deodorants and antiperspirant products, in which aluminium sulphates and potassium aluminium sulphates (INCI) were used as substitutes. This is a gross misleading of consumers, as the aluminium content was the decisive criterion for the side effects postulated at the time and later refuted.

Animal testing

Here, too, there is always the advert "without **animal testing**". Apart from the binding REACH Regulation (Chemicals Act), animal testing of cosmetics has been banned throughout the EU since 2004. Since 2009, individual cosmetic ingredients may no longer be tested on animals. The last exceptions were banned in 2013. However, products can claim to be "free from **animal ingredients**".

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