

The green laboratory

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There is a lot of discussion about sustainability. First and foremost, people think of products and their environmental compatibility, and more recently also their climate compatibility and the minimisation of their legacies – in other words, waste. But is that all? We have taken a closer look at one area and want to go into detail on the basis of this. It's about research and development, where it all begins.

Manufacturing companies consist of a network of different stakeholders. It starts with the top management and the goal of making a profit. In the chain from the product idea, through development, production, advertising and sales, many employees act to realise the goal.

In start-ups, the company founder is usually the one who has the initial idea, whereas in established companies, it is more likely that an order is directed to the development department or that the development department wants to convince marketing and sales of its own idea. The creation of products involves compromises and sometimes conflicts. They too must be taken into account when considering sustainability.

New idea or optimisation

Ideas can be of different natures. Rarely, in fact, are completely new developments in cosmetics, more often the improvement of existing products, simplification of compositions or rationalisation in manufacturing.

The occasion for a new development can be the discovery or hype about a new active ingredient. Here the question arises: Should the new one be introduced? Marketing says yes, but development may say no, because the spectrum of action of the new all-rounder is already fully covered by active substances already in use.

The situation is typical for rediscovered vegetable oils or antioxidants. So what to do? Follow the hype, with the certainty that the new active ingredient will be caught up by the next hype after a short time?

The time span in cosmetics is about 2-3 years to bring the product profitably to the woman – with a lot of advertising and superlatives. However, superlatives usually do not correspond to factual reality. If, however, it can be assumed that the hype will be resounding because factual-scientific reasons speak for a clear improvement in effect and treatment, the development department will jump on the bandwagon and provide the marketing department

with transparent, fact-based documentation with which the potential buyers can be convinced. That sounds like sustainability.

Planning

The next step is to check the new active ingredient for sustainable availability and ecological compatibility. In addition: Is it available in sufficiently good quality and are undesirable side effects excluded during later use?

After these questions have been answered, consideration is given to what the product should look like in which the new active ingredient is incorporated. The overall balance – including the life cycle of this product – is assessed for sustainability. These are typical tasks of the development department.

Checklist

In the planning of the new product, it is decided, for example, that physiological substances are used to support sustainability or that others, for example animal raw materials, are excluded (topic: factory farming, animal welfare). In detail, however, there are many more points of view. Here are a few examples:

- Exclusion of preservatives of the European Cosmetics Regulation and comparable natural substances if a product containing water is designed. This eliminates the burden on the microbiome of the skin and ultimately also on the waste water.
- Exclusion of non-biodegradable emulsifiers, silicones, mineral oils and complexing agents, which also affect the skin balance and disrupt in the sewage treatment plants.
- When selecting ingredients, allergenic representatives are excluded, corresponding components of essential oils are declared separately if necessary. However, this is not enough. In addition, care must be taken that no substances are used that only later

form allergens on the skin through radiation and atmospheric oxygen.

- Increasing the availability of active ingredients by using physiological penetration enhancers – such as liposomes and phosphatidylcholine-based nano-dispersions. They enable dose reductions of active ingredients and thus also a conservation of resources.
- The selection of regional raw materials such as fatty vegetable oils reduces climate-damaging transport over long distances and, for example, the expansion of monocultures into tropical rainforests.
- In this context, the assessment of the fatty acid composition of fatty skin care oils is of great importance. Essential fatty acids and secondary components such as phytosterols, isoflavonoids and vitamins are decisive for the lasting care effect. The corresponding optimisation naturally results in a reduction of the dosages and, if necessary, even a reduction of the frequency of use.
- The work of the development laboratories also includes testing packaging materials and their compatibility with the respective product compositions. The materials should be as recyclable as possible. However, the use of recycled plastics for new cosmetic products is currently not recommended, as contamination by pollutants from other products is not uncommon. Analytics can only find the pollutants they are looking for.

In the future, the question will have to be asked more and more whether it does not make sense to forego application convenience and again focus more on water-free products, in which approx. 90 percent of the excipients of the water-containing products and about two thirds of the product volume and thus also the packaging material can be saved. This is much closer to compatibility with the skin microbiome. It also solves the problem of short shelf lives, which ultimately meets the wishes of the trade and storage.

Research

Scientific research takes up a lot of space in the development department when it comes to holistic sustainability. These are part of a continuous sales policy that excludes short-term sales, i.e. focusing on quantities and waste. This is in keeping with the now growing pro-

portion of environmentally conscious consumers.

Internal resources

Of course, the sustainable use of resources such as water, energy, material input and disposal plays a role in the development laboratories. But it is not decisive for the overall balance. Because these things, including digitalisation and the largely paperless process, are a matter of course in an economically and ecologically working laboratory operation and are constantly optimised.

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