

Press Notice

Blocked until Friday, 23 January 2009, 11.00 a.m.

Results of the TA-SWISS study "Nanotechnology in the food sector"

More attractive, fresher, healthier – thanks to nano-packaging and nano-additives?

Bern, 23 January 2009. **Nanotechnology is moving into the food industry, in the form of additives or in packaging materials. A study by the Centre for Technology Assessment TA-SWISS provides an overview of nanomaterials already used in the food sector. The study assesses these products in respect of environmental issues and sustainability, showing the direction that future developments might take and where there is a need for caution.**

More than in any other sector, the question that arises with food is: what is nano, and what effect is it likely to have? Because what we eat goes into our bodies, at least there should not be anything in it that is potentially harmful to the organism. As the TA-SWISS study shows, there are only a few food products with nano-scale additives that are available in Swiss shops. These are well tried and tested, and are regarded as harmless. Nevertheless, products that contain nano-scale additives which are banned in Switzerland and may pose a risk to health can also be bought over the Internet from other countries. Today, nanotechnology in the food industry is virtually insignificant in terms of environmentally sound and health-promoting nutrition, and even in the future it is only likely to play a relatively subordinate role in making nutrition more sustainable.

Nanotechnology is already commonly used in food packaging, an area that is regarded as having considerable potential for innovation. Such packaging brings the hope of improved keeping quality for foods, and less waste. The study also shows that the legal provisions for food products and packaging materials are not sufficiently geared to the challenges of nanotechnology. Action is also needed from manufacturers, processors and dealers: transparency and an active information policy are called for.

Extend shelf life and improve the eco balance with food packaging

Packaging films and PET bottles with synthetic nanocomponents are available on the Swiss market. Nanomaterials improve the barrier properties against gases, water vapour and flavourings, and also improve the mechanical and thermal properties or UV protection. Nanotechnologically optimised PET bottles have a more beneficial CO₂ balance: according to a life-cycle analysis, published for the first time in the TA-SWISS study, savings of some 10,000 tonnes of climate-damaging emissions could be achieved in Switzerland alone; in manufacture, transport and recycling, nano-PET bottles generate about one-third fewer greenhouse gases than aluminium and about 60 per cent fewer than disposable glass bottles. Nano-PET bottles are therefore just as good as reusable glass bottles.

Do nanoparticles from packaging get into food?

Whether nanoparticles can pass from packaging into food is primarily dependent on how the nano-layer was applied. Transfer cannot be ruled out where the nanomaterials come into direct contact with

the food. In this case, therefore, the missing proof that the product is harmless still has to be produced. This also applies to so-called "antimicrobial-action food packaging": a coating layer with germicidal nano-silver particles causes food to perish less quickly. These materials are not yet available in Switzerland, but could be bought on the Internet from other countries.

Nano-scale additives in food

Today, there are only a few food products in Switzerland that are fortified with nano-scale additives. These include an anti-caking agent, which stops condiments going lumpy. It consists of silicic acid (silicon dioxide or E 551), which when comminuted produces a powdery material containing nano-scale particles. Synthetic nanocomponents are also used for so-called encapsulation, for example to enclose carotenoids or vitamins to make them water soluble, keep longer or better absorbed by the body. Such additives have been tested for use in foods, and are regarded as harmless.

Who is interested in nanofood?

The TA-SWISS study concludes that people with certain "nutritional styles" could actually be open minded about food containing additives produced by nanotechnology. Even more so if we assume that nanofoods might be easier to manage and/or could have added health benefits. In developing countries, such additives could help to combat malnutrition; for example, by fortifying basic foods with iron, zinc, vitamin A or folic acid. It must, however, be taken into account that such products must also be affordable and accessible to the demographic groups that need them.

Gaps in legal regulation and labelling requirement

Swiss food legislation is based on the so-called "positive principle". This means that only additives which appear on the positive list and are allocated an E-number can be used. They have to meet a series of requirements, in particular evidence that a food cannot be manufactured without the additive concerned, and that the quantity used cannot be harmful to consumers' health. Nanoparticles could also fall into this category, and must accordingly be tested using the above criteria. The general rule is: If an additive that is currently on the positive list is used, it does not have to be retested – not even if it is now added in a nano-scale form. Because it is now known that the same material as a nanoparticle often behaves differently than when it is used on a macro-scale, this provision does not go far enough in respect of nano-scale additives.

According to the food labelling ordinance (LKV), all ingredients of any food product must be listed. There is no obligation to refer specifically to particle size.

Nevertheless, citizens want nanoparticles to be labelled, especially in the food industry; that was shown in a participative procedure conducted by TA-SWISS in 2006.

Recommendations of the TA-SWISS study

Regulation: The existing legislation on foods and chemicals should be adapted to meet the demands of nanotechnology.

Transparency: Manufacturers should establish an active information policy to help ease the sense of mistrust among the population. Manufacturers, processors and dealers of foods and food packaging with nano-components could, for instance, increasingly follow industry-specific Codes of Conduct. Consumers want to be able to find out for themselves what a product contains, and to use this as a basis for their purchase decision. It should at least be obligatory for manufacturers to inform the food authorities if they put products into circulation that contain nanomaterials.

Declaration: In view of the international flows of goods, a global, or at least a Europe-wide regulation would be preferable to Switzerland acting on its own. Specific labelling would respond to the need for transparency, and would simplify the traceability of the relevant foods and governmental monitoring of foods; non-specific labelling, however, such as "contains nanoparticles", seems less helpful for these purposes.

The existing systems for **traceability** in food production should be checked for their applicability to nanomaterials. Only then is it possible to take products off the market quickly should subsequent findings indicate potential dangers.

The **precautionary principle** should be expressly embodied into food legislation, as it is in the Swiss Federal law on the protection of the environment. Only on this basis can the Swiss food authorities initiate risk management measures.

Human and eco-toxicology risk research must be promoted. The effects of nanoparticles must be tested over the whole life cycle of a product, from manufacture to disposal.

Information on the project: www.ta-swiss.ch/e/them_nano_nafo.html

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Abstract: Dinner is served! Nanotechnology in the kitchen and in the shopping basket. Abstract of the TA-SWISS study "Nanotechnology in the food sector". TA 53A/2009
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Centre for Technology Assessment TA-SWISS

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