Nanotechnology-enabled foods and food contact materials on the UK market

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In 2012 the Food Standards Agency (FSA) published an update on the use of nanotechnology-enabled foods and food contact materials on the UK market (<http://www.food.gov.uk>).

Nanotechnology and nanomaterials can be a natural part of food processing and conventional foods, and the characteristic properties of many foods rely on nanosized components (such as nanoemulsions and foams). These nanosized structures, which are formed from ordinary ingredients or components of food during processing, are one type of nanomaterial, sometimes referred to as 'soft' nanomaterials. Examples include homogenised milk, ricotta cheese and nanoemulsion formulations of food ingredients, such as co-enzyme Q10 in food supplements.

Perhaps of more interest to regulators, industry and consumers are 'hard' nanomaterials that are likely to be insoluble and persistent, and whose biological properties cannot be predicted. The Agency is focusing its attention on 'hard' nanomaterials that may intentionally be added to foods or food contact materials. The FSA is currently aware of the following nanomaterials that are permitted to be used in foods or food contact materials, provided they meet the requirements of the relevant legislation:

Nanomaterial	Related information
Fumed silica	One specific form of E551, silicon dioxide, is a food additive that is authorised for use as an anti-caking agent and a carrier. E551 (including fumed silica) has been approved for many years and it is commonly used in the preparation of a wide range of foods. However, there is no information on the extent of use of the specific 'fumed silica' form of this additive.
Nanoclay	The mineral montmorillonite (also called bentonite) has potential use in a variety of food packaging applications, such as in packaging for fruit juices and dairy products or bottles for beer and carbonated drinks, to provide a better barrier to gases and extend shelf-life. Plastic beer bottles that incorporate a layer of nanoclay are reported to be in use in other countries (for example in the USA) but not at present in the UK.
Nanosilver	Items such as re-useable food containers are available in the UK (via websites) and function to inhibit the growth of microorganisms.
Titanium nitride	Polymer composites incorporating titanium nitride have been developed to improve the rigidity and strength of food packaging objects. Titanium nitride was evaluated by the European Food Safety Authority in 2008 and was approved as an additive for use in some food contact plastics on 1 May 2011. The FSA is not aware of any commercial use of this additive.

The FSA will provide further information if made aware of any updates to this current position.

Applicants looking to develop nanotechnology-enabled foods or food contact materials can contact the FSA to gain regulatory advice, either in general or specific terms. Initial enquiries should be emailed to novelfoods@foodstandards.gsi.gov.uk.

The FSA routinely provides advice to industry and food business operators on regulatory aspects relating to novel foods. This can include foods or ingredients intentionally produced using nanotechnologies that will fall within the scope of the Novel Foods Regulation. Advice can be offered at any stage, from initial ideas and early product development through to near market, and is intended to prevent regulatory hurdles for applicants at later stages of risk assessment and authorisation.

The FSA also offers regulatory advice on food additives and food contact materials, including those produced using nanotechnologies.

The FSA is the UK body responsible for the assessment of novel foods. If a company wants authorisation to market food produced using nanotechnology the FSA is obliged to assess the food safety implications. The FSA will not assess the safety of using nanotechnology in the food chain unless it is asked to do so.

During any such safety assessment, the FSA will consult an independent advisory committee, the Advisory Committee on Novel Foods and Processes (ACNFP). The ACNFP comprises experts who advise the FSA on a wide range of new foods and food technologies.

The assessment of the food or food ingredient includes details of the composition, nutritional value, metabolism, intended use and levels of microbiological and chemical contaminants. Where appropriate, this might also include studies into the potential for toxic, nutritional and allergenic effects. Details of the manufacture of the food or food ingredient are also considered, because a novel food production process can render a food 'novel' if it alters the final composition of the food. The assessment of nanomaterials will follow the guidance issued by the European Food Safety Authority in May 2011.

As well as carrying out scientific safety assessment, the committee would also consider consumer concerns and ethical issues.

Any enquiries or information related to the use of nanomaterials in food can initially be submitted to novelfoods@foodstandards.gsi.gov.uk.

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