



Unigrains – In Brief

Nanomaterials in food

What is meant by nanomaterials?

Nanomaterials are materials (powders, aerosols, liquids, gels) containing free particles with a diameter below 100 nanometres (i.e. 10⁻⁷ metres). There are two types of application in the food sector:

- First, ingredients containing nanoparticles, used for their special properties (colouring, anti-caking, emulsifier, aromas, preservatives, etc.)
- Second, "smart" packaging, derived from nanotechnologies (for example, extending the shelf life). During prolonged contact with foodstuffs, nanoparticles can migrate into the food.

An example of a food ingredient containing nanoparticles is titanium dioxide, identified on labels by TiO₂ or E171. This is an opaque white powder, used as a colouring agent in confectionery, chocolate, ice creams, industrial pâtisserie, as well as in food additives, drugs and cosmetics (suntan lotions, toothpaste).

What are the challenges related to nanomaterials?

Use of nanomaterials is suspected of causing health problems due to their penetration into the body, through the digestive tract or the skin, and their accumulation in the vital organs. The effects of nanomaterial ingestion on the body, particularly long term, are still largely unknown. Assessment of these risks is very complex (and expensive) as it depends on the sensitivity of the individual and the characteristics of the nanoparticles, which change over time.

In January 2017, a study by INRA (French National Institute for Agronomic Research) concluded that a chronic exposure to E171 promoted the growth of pre-cancerous lesions in rats, without it being possible to reach any conclusion regarding its effect on humans. Following this publication, the *Agir pour l'environnement* association put on line on the website www.infonano.org a database which listed several hundred food products suspected of containing nanoparticles, in order to challenge the industrial giants.

Since December 2014, the European INCO rule obliges industrialists to label the presence of nanomaterials in their products, clearly showing the mention "nano". However, these regulations are not being obeyed, as has been demonstrated by inspections conducted by the DGCCRF (Directorate General for Competition Policy, Consumer Affairs and Fraud Control), which detected nanoparticles in 29 food products out of 74 analysed, only one correctly mentioning the presence of nanomaterials. At the end of January 2018, the consumer association UFC Que Choisir filed 9 complaints against food-processing companies for failure to comply with the regulations.

Since 1st January 2018, nanomaterials are covered by the European Novel Food rules. Industries that use them must therefore prove that these ingredients are harmless and obtain a licence to market them in Europe. In February 2018, France petitioned the European Commission to demand suspension of these licences covering food products containing titanium dioxide. The EFSA (European Food Safety Authority) is to rule on the subject by the summer.

On 23 March 2018, the French National Assembly adopted an amendment to the law on balance in the food sector, mentioning titanium dioxide as a food additive. If this law comes into force, the use of E171 will be suspended from 1st June 2018 until publication of the expert report by ANSES.



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Pending this, on 18 May 2018, the Government announced its wish to "*suspend before the end of the year the use of titanium dioxide as a food additive in France*". ANSES (the National Agency for Health and Safety) has launched expert work on the effects on health of the use of nanomaterials in food, the conclusions of which are expected in 2019.

How will they be replaced?

Against this background, ever increasing numbers of industrialists are announcing the withdrawal of titanium dioxide, and nanomaterials in general, from their ingredients. Prominent among these are confectioners Verquin (manufacturers of the Têtes brûlées sweets) and Carambar and Co (Malabar chewing gum), Picard, William Saurin, and the private label brands of Carrefour, Super U, Leclerc. Mars Chocolat France is planning to eliminate E171 completely by June 2020.

In order to replace titanium dioxide, the makers of ingredients are finalising alternatives such as calcium carbonate, rice starch or ingredients intended for precise applications such as coating. For example, during the last Vitafoods trade fair in Geneva, Seppic presented *Sepifilm Naturally Colored*, a new range of film-coating agents without titanium, aluminium or artificial colourings, meeting the increasing demand from consumers for natural products.

In addition, four information guides were published in June 2017 as part of the Marina project (Controlling Nanomaterial Risks, sponsored by the CTCPA - French technical center for the preservation of farm produce) in order to help industrialists assess the risks associated with nanoparticles and take the right decisions.

Unigrains' opinion

In the current background, consumer confidence is very precious, as they are increasingly sensitive as regards the contents of their plates. Increasing demand for natural products and simplicity is favouring the emergence of the Clean Label: consumers want to understand the content of the food they are eating and be sure that it is harmless. The use of food additives is therefore certain to be reduced drastically, whether this be under pressure from consumers or by the regulations.

As regards nanomaterials, the promises are plentiful but the risks/benefits ratio is still largely unknown. Industrialists are therefore keen to develop more natural and reassuring formulations, while waiting for our knowledge of these materials and their effects on health to progress.