



What are nanomaterials?

Nanomaterials are objects with one or more dimensions, or surface structures, on the nano-scale. The nano-scale ranges from approximately 1-100 nanometres - with one nanometre being one billionth of a metre. The properties of matter change at the nano-scale and nanomaterials can therefore behave quite differently to bulk particles of the same substance. They also have a greater surface area relative to volume. This makes them much more chemically reactive - and potentially toxic - than larger particles.

Nanomaterials are in the Australian food chain

Nanomaterials are now in the Australian food chain. They are in foods and supplements. They are used as edible coatings on fresh fruits and in packaging for a variety of foods. They are used as coatings on products such as cutting boards, cutlery, kitchen surfaces, appliances, baby bottles and plastic storage containers.¹ Foods that may contain nanomaterials include:

Cream Cheese	Cookies	Doughnuts	Coffee creamer	Chocolate syrup
Chocolate	Pudding	Mayonnaise	Mints	Chewing gum
Popcorn	Salad dressing	Oils	Yoghurt	Cereal
Lollies	Crackers	Pasta	Sports drinks	Other beverages

Nanomaterials are used in food and packaging for various reasons²:

- As trickle and flow aids (i.e. to stop clumping)
- To give foods longer shelf lives
- To add flavour
- To whiten foods
- To detect when food is going off
- As anti-microbials to prevent food spoilage



Health concerns with nanomaterials in food and food contact products

Nanomaterials are generally more chemically reactive than larger particles of the same chemicals and are much more likely to be taken up into our cells and tissues than larger particles.³

Numerous studies have shown that nanoparticles can be absorbed through the intestine and often accumulate in the liver, kidney, spleen, lung and brain.⁴

Nanoparticles have been associated with immune dysfunction and colon cancer and there is evidence that nanoparticles may remain in the body for extended periods.⁵

There is a growing body of peer reviewed work indicating potentially serious health concerns with some nanomaterials.⁶ For example, the European Chemical Agency (ECHA) is reviewing the use of nano titanium dioxide in the EU because of concerns it may be harmful to the environment and human health.⁷ Nano titanium dioxide is commonly used on lollies, gum and doughnuts and the most exposed age group is 2-4 year olds.⁸



The number of food and food contact products containing nanomaterials is expanding rapidly

France's mandatory nanomaterial register revealed that over 500,000 tons of nanomaterials and 3400 different nanomaterial based products were used in France alone in 2012. This far exceeds previous estimates and suggests that the extent of nanotechnology use in food and food contact materials in Australia has been severely underestimated.⁹

In the absence of a similar mandatory register or labelling in Australia, it is impossible to identify all the food or food contact products containing nanomaterials in Australia.

Our regulators are failing to live up to their promises and their legal obligations

In 2004 the UK Royal Society called for a moratorium on the use of nanomaterials in consumer products until their safety could be properly assessed.

Food Standards Australia New Zealand (FSANZ) has said that if there are nanomaterials in food, they will have to be assessed under FSANZ legislation. What they didn't say is that they aren't going to look. They have not surveyed importers and retailers and have done no testing in order to determine if nanomaterials are in Australian foods.¹⁰



What needs to happen?

Friends of the Earth is calling for:

- a moratorium on new releases of nanomaterials and products containing nanomaterials, pending a full safety assessment;
- a public register of all nanomaterials and all products containing nanomaterials produced, imported and sold or used in Australia.

Find out more

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¹ Friends of the Earth (2014) *Way too little: Our government's failure to regulate nanomaterials in food and agriculture* ch. 3-4.

² *Ibid.*

³ *Ibid.*, ch. 7

⁴ *Ibid*

⁵ *Ibid*

⁶ *Ibid.*, pp. 18-19

⁷ ECHA (2013) Justification document for the selection of a CoRAP substance - Titanium Dioxide, <http://echa.europa.eu/documents/10162/37e258fd-f57a-4957-b978-4f18fe593938>

⁸ Friends of the Earth (2014), p19

⁹ Nanotechnology Industries Association (2013) France publishes results from the first round of its mandatory nano reporting scheme, <http://www.nanotechia.org/news/news-articles/france-publishes-results-first-round-its-mandatory-nano-reporting-scheme>

¹⁰ Tager, J. (2014) *Regulatory Failure or Institutional Corruption: The case of Food Standards Australia New Zealand and the 'regulation' of nanomaterials in food*, <http://emergingtech.foe.org.au/regulatory-failure-or-institutional-corruption-the-case-of-food-standards-australia-new-zealand-and-the-regulation-of-nanomaterials-in-food/>