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Research Institute of Organic Agriculture
Forschungsinstitut für biologischen Landbau
Institut de recherche de l'agriculture biologique

Nanotechnology and the Swiss organic food industry

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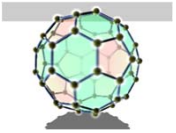
What is nanotechnology?

- Technology involving structures or particles at the nanometer scale.
- 1 Nanometer = 10^{-9} m = 1 billionth of a meter.
- Nano-particle: Frequently used definition: particle smaller than 100 nm.
- Note: there is no agreed definition of nano-particles.
- Nano-particles may have different properties than larger-sized particles of the same substance.



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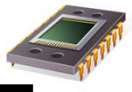
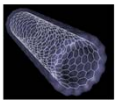
Natural or not?

- There are some naturally occurring nano-particles and nano-structures, but many are man-made.
- The materials of origin may be natural or synthetic.
- The manufacturing methods may be physical or chemical.







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Potential applications in the food sector

pesticides, fertilizers
processing equipment
veterinary medicine, vitamins
packaging materials
food additives





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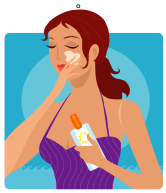
Potential applications in the non-food sector

cosmetics
textiles

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The «nano-organic debate»

- 2007: Soil Association: draft standard nanotechnology.
- 2008: discussions at BioFach, IFOAM World Congress (Modena) and BÖLW Fachtag.
- etc. …

- The subject has been discussed extensively **within the organic sector**. (see www.fibl.org/nanotechnology)

- But what does the **food industry** think?

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A survey in the Swiss organic food industry

- Survey among the companies licenced by Bio Suisse
- Web-based questionnaire, carried out in 2010
- 512 companies surveyed, 34 % responded

Remember:

- most of these companies are only «partially organic».
- The packaging and machine industry etc. were not asked, because they are not licenced.

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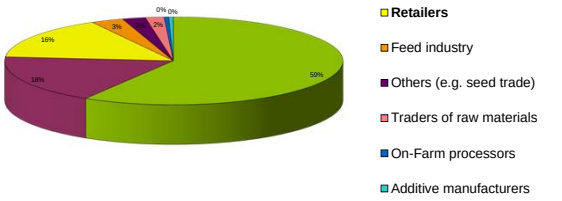
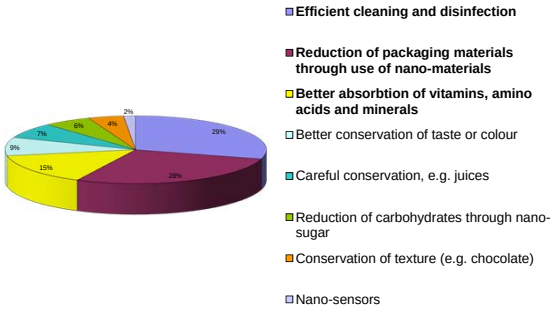
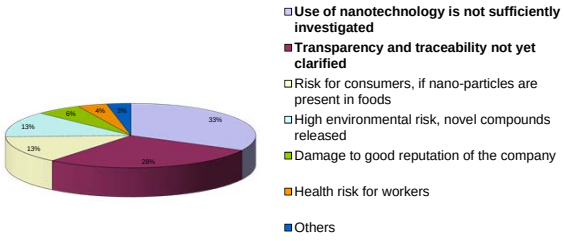
Business activity of participants



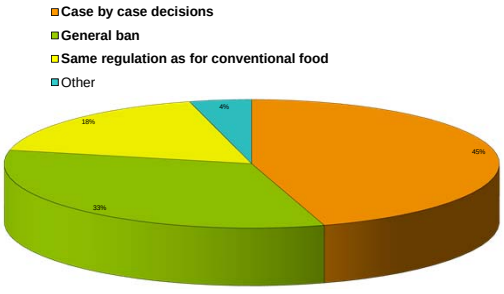
Potential benefits of nano-technology



Potential concerns about nanotechnology



How should nano-technology be regulated in organic food production?



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Main points of the survey

- For most companies participating in this survey, issues of nano-technology are not of high priority at the moment.
- Very few companies currently use nano-technology, but some plan to use nano-surface coatings or nano-packaging in the future.
- The main benefits are seen in packaging, disinfection and hygiene.
- The main concerns are about applications with direct food contact.
- Most companies think that nano-technology should be evaluated case by case.

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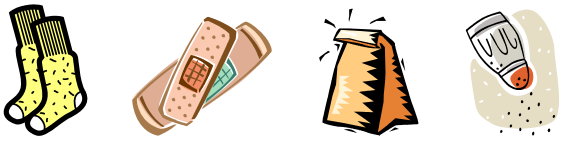
End of the survey.

Bonus material:

- **Two noteworthy cases**
- **Regulation of nanotechnology in organic farming**



Noteworthy case 1: Nano-silver

- Silver is used in the conventional food industry (E174), but not allowed in organic food production.
- Nano-silver has disinfectant properties.
- It is used in clothing, medicine and packaging, occasionally also in plant protection / fortification.
- It often ends up in waste water or soil, where it affects micro-organisms.
- FiBL therefore recommends to ban this substance from organic production.

Noteworthy case 2: Silicium dioxide

- Known as food / feed additive E 551, E 551a, E 551b, E 551c.
- Important anti-caking agent and processing aid.
- E 551a is partially a nano-particle, the other forms are not.
- E 551 & E 551b are allowed for organic processing by the EU Reg. 889/2008 and by the majority of private labels. They are banned by some private labels (e.g. Demeter).
- E 551a is not allowed for organic farming, therefore no problems with nano-particles.

Note: alternatives to E 551 would be welcome and should be tested.

Regulation of nanotechnology in organic production (1)

- The current regulation on organic farming already excludes most of the nano-products currently available due to the fact that:
  - they are synthetic, or
  - their use as food / feed additives is not authorized
- However, nano-products can be used in «near-food» areas, which are currently not covered by the regulation, such as
  - packaging
  - surfaces of furniture and machinery
  - etc.

Regulation of nanotechnology in organic production (2)

In our opinion …

- Any use resulting in the presence of nano-particles in organic food should be prohibited.
- «Near-food» applications such as packaging and surfaces should be evaluated case by case. „Positive lists“ or „negative lists “seem to be a good tool to regulate the use of nanotechnology in organic farming.

Thank you for your attention!

If you have questions:
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