

# House of Lords Science and Technology Committee: Nanotechnologies and Food Inquiry

Science and Technology Sub-Committee I  
House of Lords  
London  
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TO: Antony Willott, Clerk of Science and  
Technology Sub-Committee I

## Summary

1. Which? considers that nanotechnologies have the potential to offer consumers many benefits, including in the food area. However, we consider that there needs to be a more co-ordinated and strategic approach to ensure that nanotechnologies are developed safely and responsibly and are used to tackle some of the major challenges facing the food supply chain.
2. We are concerned that fundamental knowledge gaps and uncertainties are not being addressed with sufficient urgency. These include gaps in knowledge about what is on the market, being supplied to the food industry and what is being developed for the future; basic research to underpin meaningful risk assessment; regulatory requirements for pre-market authorisation and understanding of consumer attitudes to potential developments.
3. Our consumer research has highlighted a lack of public awareness of nanotechnologies, but suggests that people are interested in nanotechnology developments, including in the food sector, provided that they see real benefits and are assured of their safety and can make an informed choice. We have made a series of recommendations in relation to the areas highlighted in the call for evidence which are summarised below and explained in full in our evidence:



### State of the science and current use in the food sector:

- The lack of agreed definitions needs to be urgently resolved so that there is clarity over how to classify nanomaterials.
- A mandatory reporting scheme should be introduced for manufactured nanomaterials to enable a more accurate assessment of developments.
- The food industry needs to be more transparent about the status of developments.
- The government, particularly the Food Standards Agency (FSA), needs to more pro-actively engage with this issue in order to understand likely applications.
- There needs to be more effective engagement between regulators, the research councils and broader research community and the food industry in order to understand what is going on.
- This needs to be done in collaboration with other stakeholders, including consumer organisations, leading to a more defined and strategic 'roadmap' for nanotechnologies and food.
- International regulatory co-operation is also essential in order to understand what is happening in other parts of the world, particularly as many developments are taking place in Asia and the United States.

### Health and safety

- Efforts to ensure that research is undertaken to address key uncertainties need to be dramatically accelerated in order to enable effective risk assessment.
- Current knowledge should be drawn upon in order to make some general conclusions about which materials are likely to pose most risk and which may be of little concern in order to identify priority areas for action, restrictions and to direct future developments.



## Regulatory framework

- There must be clarity across all food legislation (eg. through clear guidance or updating of relevant legislation) that materials produced using nanotechnology are subject to mandatory independent pre-market assessment and approval (ie. by the European Food Safety Authority (EFSA)) and that materials that have already been approved in their conventional form need a separate assessment and approval if in nano form. This needs to be addressed as part of the current review of the EU novel foods regulation.
- There must be effective enforcement so that any products that are on the market which have not been approved are removed. This requires clear guidance to be given to local authorities by the FSA.
- There should be greater clarity about how broader consumer and other social issues are to be taken into account as part of the approval process.
- There needs to be effective monitoring by the FSA of the extent to which other non-food nanomaterials may be contaminating the food chain and any associated risks.

## Public engagement and effective communication

- More effective consumer engagement at the earliest opportunity is needed specifically focused around potential food developments so that it can be ensured that research priorities and regulatory approaches are in line with consumer expectations and address their concerns.
- Once there is a fuller understanding of the potential of nanotechnologies for food, greater consideration needs to be given to any social and ethical issues that may be raised and how these can be addressed.
- There should be a requirement that manufactured nanomaterials used in food products have to be labelled in the list of ingredients. The current EU discussions around the new food information regulations provide an opportunity to address this.
- Greater effort is needed across government to increase public awareness of nanotechnologies and the issues that they raise in a balanced way.



## Introduction

4. Which? welcomes this opportunity to submit evidence to the House of Lords Science and Technology Committee's Inquiry into Nanotechnologies and Food.
5. Nanotechnologies have the potential to offer consumers a wide range of benefits, including in the food sector, but we are concerned about the way that developments are being handled. There has been a failure to take a sufficiently strategic approach to the issue and ensure that advantage is taken of nanotechnologies so that they help to tackle the many challenges currently facing the food supply chain - from the need to encourage healthier eating and produce safe food to reducing the environmental impact of food production and consumption. Concerns have repeatedly been raised by leading expert bodies at national and EU level about the many uncertainties that hinder effective risk assessment of nanomaterials and about gaps in the current regulatory framework. However, we are concerned that these are not being addressed with sufficient urgency, to discriminate those applications that are likely to be beneficial and should be given greater priority, from those that could potentially put consumers at risk.
6. It is therefore very timely for the Committee to be reviewing this whole area and we hope that the Inquiry will lead to a more pro-active and joined up approach by government so that it can be ensured that consumers genuinely can take advantage of the benefits offered by nanotechnologies, while being able to make informed choices and be confident that they are not being put at unnecessary risk.

## State of the science and its current use in the food sector

7. There is the potential for nanotechnologies to benefit food production in a variety of ways. Traditionally, many foods have relied on manipulation at the nanoscale in order to give them particular characteristics, although this was not explicitly seen as 'nanotechnology', for example, the manufacture of custard or mayonnaise. Advances in microscopic techniques have made it possible to deliberately manipulate materials at the nanoscale, enabling them to take on new properties that would not otherwise be possible.
8. It is, however, very difficult to gain a clear picture of the extent to which nanomaterials and nanotechnologies more generally are being used in food production - or the extent to which research is taking place into future



applications that will come to market and could be impacting on consumers in the next five, ten or twenty years. This information is essential if we are to have an informed and transparent debate about the role of nanotechnologies, ensure the adequacy of risk assessment, management and communication approaches and if it is to be ensured that nanotechnology applications take place in line with consumer expectations. The situation is also further complicated by the lack of any agreed international definitions as to what falls under nanotechnologies or should be considered a nanomaterial.

9. A few years ago, leading food companies were quoted in the trade press as taking an active interest in using nanotechnologies<sup>1</sup>. Kraft was, for example, quoted as looking at the potential of 'smart nano-filters' to limit allergic reactions and investigating 'smart packaging', while Nestle was also reported to be looking at the possibility of using nanotechnologies to customise and personalise food with precisely targeted delivery of nutritional and health benefits. However, the main food manufacturers now state that they currently are not using nanotechnologies, although some chemical companies are supplying nanomaterials and there are several 'nano' food supplement products available to buy over the internet. It is, therefore, essential that there is transparency across the entire supply chain.
10. Based on a recent overview produced by the Food Safety Authority of Ireland, the main areas of interest appear to be<sup>2</sup>:
  - sensory improvements (flavour or colour enhancement, texture modification);
  - increased absorption and targeted delivery of nutrients and bioactive compounds;
  - stabilisation of active ingredients such as nutraceuticals in food matrices;
  - packaging and product innovation to extend shelf-life;

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<sup>1</sup> A mini revolution, Food Manufacture, 1<sup>st</sup> September 2004

<sup>2</sup> The relevance for food safety of applications of nanotechnology in the food and feed industries, Food Safety Authority of Ireland, 2008.



- sensors to improve food safety; and
  - antimicrobials to kill pathogenic bacteria in food.
11. The types of nanomaterials likely to be used include:
- nanoparticles, such as silver and iron used in food supplements
  - nanofibres, such as globular proteins used as thickening agents
  - nanoemulsions and dispersions, such as oil in water to produce low fat products
  - nanoclays, such as clay composites used in packaging materials to extend shelf-life.
12. A recent review of nano food developments by Chaudhry et al<sup>3</sup> concluded that virtually all known applications are currently outside the UK and Europe, mainly in the USA, Australia, New Zealand, South Korea, Taiwan, China and Israel. Two exceptions were highlighted: a synthetic form of lycopene, found in tomatoes, produced by BASF in Germany; and a nano-micelle-based carrier system NovaSOL produced by Aquanova, also based in Germany.
13. The online Woodrow Wilson Center's Inventory of nano products<sup>4</sup> and the 'Nanoshop' web-site<sup>5</sup> include a range of nano products that are available to buy, including food supplements, food packaging materials and food containers. The lack of agreement over definitions makes it difficult to be clear what is definitely a nano product, but examples of products claiming to be 'nano' include:
- Solgar's Nutri-nano CoQ10 and Nutri-nano CoQ10 with Alpha Lipoic Acid<sup>6</sup> (from the UK) food supplements, part of 'the first-line of nutritional supplement to use nanotechnology to deliver unprecedented bioavailability'.

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<sup>3</sup> Applications and implications of nanotechnologies for the food sector, Quasim Chaudhry et al, Food Additives and Contaminants, March 2008, 25(3):241-258

<sup>4</sup> [www.nanorechproject.org/inventories/consumer](http://www.nanorechproject.org/inventories/consumer)

<sup>5</sup> [www.nanoshop.com](http://www.nanoshop.com)

<sup>6</sup> [www.solgar.co.uk](http://www.solgar.co.uk)



- Canola Active oil by Shemen<sup>7</sup> (from Israel) 'an oil enriched with free phytosterols'.
  - Nano selenium rich tea<sup>8</sup> (from China).
  - Nano calcium and magnesium food supplement<sup>9</sup> (from the USA) 'a potent 100% available and absorbable ionic solution when dissolved in water'.
  - ASAP solution food supplement<sup>10</sup> (from the USA) 'an engineered silver nano particle mineral supplement' which is 'an immune system support'.
  - Nanocentials Slim Shake Chocolate by RBC Lifesciences<sup>11</sup> (from the USA) 'with a blend of high quality protein, fiber (sic), complex carbohydrate and the proprietary Cocoacusters or Vanillaclusters [this formula] provides a nutritious and low calorie meal that will help you lose those unwanted pounds once and for all'.
  - Skybright Natural Health Colloidal Silver Liquid<sup>12</sup> (from New Zealand) 'support the body's immune system and natural defences, for natural healing'.
14. EFSA recently approved the use of Titanium nitride as a food contact material for use in PET bottles<sup>13</sup>. It also issued an opinion on a silver hydrosol food supplement that it was unable to assess because the data was inadequate<sup>14</sup>.
15. Overall, it is therefore very difficult to gain a clear indication of what developments are already taking place and what we could see in the future.

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<sup>7</sup> [www.shemen.co.il](http://www.shemen.co.il)

<sup>8</sup> [www.369.com.cn](http://www.369.com.cn)

<sup>9</sup> [www.magi-i-cal.com](http://www.magi-i-cal.com)

<sup>10</sup> [www.asapsolution.com](http://www.asapsolution.com)

<sup>11</sup> [813312.rbclifesciences.com](http://813312.rbclifesciences.com)

<sup>12</sup> [www.skybright.co.nz](http://www.skybright.co.nz)

<sup>13</sup> 21st list of substances for food contact materials - Scientific Opinion of the Panel on food contact materials, enzymes, flavourings and processing aids (CEF) Question number: EFSA-Q-2005-151, EFSA-Q-2006-324, EFSA-Q-2006-323, European Food Safety Authority, 27 November 2008.

<sup>14</sup> Inability to assess the safety of a silver hydrosol added for nutritional purposes as a source of silver in food supplements and the bioavailability of silver from this source based on the supporting dossier - Scientific Statement of the Panel on Food Additives and Nutrient Sources added to Food (ANS), European Food Safety Authority, Question number: EFSA-Q-2005-169, 26 November 2008



Defra has trialled a voluntary reporting scheme for manufactured nanomaterials, but this has had a very limited response with just 11 submissions since it was launched in September 2006.

16. We therefore consider that the following actions are needed:

- The definitional issue needs to be urgently resolved so that there is clarity over how to classify nanomaterials.
- A mandatory reporting scheme should be introduced for manufactured nanomaterials to enable a more accurate assessment of what developments are taking place.
- The food industry needs to be more transparent about the status of developments, including the food supplement industry and suppliers across the food chain, such as ingredients and packaging material manufacturers.
- The government, particularly the Food Standards Agency, needs to more pro-actively engage with this issue in order to understand what applications are likely.
- In line with this, there needs to be better and more formalised engagement between regulators (eg. FSA, Department of Health and Defra), the research councils and broader research community and the food industry in order to understand what is going on.
- This needs to be done in collaboration with other stakeholders, including consumer organisations, leading to a more defined and strategic 'roadmap' of where food-related nanotechnology developments are currently going and where they should be going in order to meet the key food policy priorities around food safety, quality, nutrition and sustainability.
- International regulatory co-operation is also essential in order to understand what is happening in other parts of the world, particularly as many developments are taking place in Asia and the United States.

Health and safety



17. We are also concerned that there remains too limited an understanding of the risks that could be posed by some manufactured nanomaterials. Despite relatively early warnings from the Royal Society and Royal Academy and Engineering back in 2004<sup>15</sup> that some nanomaterials may pose different risks to materials in their bulk form, many uncertainties still remain.
18. While some nanomaterials may be of little concern, recent opinions by the EU's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)<sup>16</sup> and the European Food Safety Authority's (EFSA's) Scientific Committee<sup>17</sup> have again highlighted a number of uncertainties that need to be addressed. As well as highlighting the lack of information available to enable the potential exposure to engineered nanomaterials (ENMs) to be assessed, EFSA highlighted some fundamental gaps in knowledge around toxicokinetics (the absorption, distribution, metabolism and excretion of substances in the body) and toxicology.
19. The breadth of the uncertainties were summarised in EFSA's overall conclusions: *'Current uncertainties for risk assessment of nanotechnologies and their possible applications in the food and feed area arise due to presently limited information in several areas. Specific uncertainties apply to the difficulty to characterize, detect and measure engineered nanomaterials (ENMs) in food/feed and biological matrices and the limited information available in relation to aspects of toxicokinetics and toxicology, including optimal methods for testing ENMs. There is limited knowledge of (likely) exposure from possible applications and products in the food and feed area and of environmental impacts of such applications and products. The current usage levels of ENMs in the food and feed area is unknown'*.
20. The lack of knowledge is fundamental. For example, the understanding of the potential toxicity after consuming manufactured (or engineered) nanomaterials has only been studied for a very limited number of materials and only a few studies have compared the toxicity of the nano and conventional form of the same chemical species. EFSA, therefore, concluded that the data are insufficient to draw general conclusions. It stressed the importance of a case by case approach to risk assessment, but emphasised

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<sup>15</sup> Nanoscience and nanotechnologies: opportunities and uncertainties, The Royal Society and The Royal Academy of Engineering, 2004.

<sup>16</sup> Risk assessment of products of nanotechnologies, Scientific Committee on Emerging and Newly Identified Health Risks, 19<sup>th</sup> January 2009.

<sup>17</sup> The potential risks arising from nanoscience and nanotechnologies on food and feed safety, Scientific Opinion of the Scientific Committee, European Food Safety Authority (Question No EFSA=Q-2007-124), 10 February 2009.



that under the current circumstances any individual risk assessment is likely to be subject to a high degree of uncertainty - and that this would remain the case until there was more data on, and more experience with, testing of engineered nanomaterials.

21. Defra over-sees the UK's Research Co-ordination Group on nanotechnologies and has published and set out a series of research priorities,<sup>18</sup> but we are concerned that these gaps in understanding are not being addressed with sufficient urgency. This is compounded by the failure by government to get to grips with what is actually on the market, either in terms of specific food and applications or other non-food developments that could have implications for the food supply chain.
22. We therefore consider that the following action is needed:
  - Efforts to ensure that research is undertaken to address key uncertainties needs to be dramatically accelerated in order to enable effective risk assessment. Leading scientific bodies are repeatedly producing lists of key knowledge gaps and uncertainties - the most recent coming from research the SCENIHR and EFSA committees.
  - As part of this, current knowledge should be drawn upon in order to make some general conclusions about which materials are likely to pose most risk and which may be of little concern in order to identify priority areas for action and to direct future developments, including identifying where any restrictions need to be placed.

### Regulatory framework

23. Under the Food Safety Act 1990 and the EU's regulation on food law<sup>19</sup>, there is a general requirement that food should be safe. The issue in relation to nanomaterials used in food production is how this can be ensured in practice given the uncertainties highlighted above.

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<sup>18</sup> Characterising the Potential Risks posed by Engineered Nanoparticles: A Second UK Government Research Report, HM Government 2007.

<sup>19</sup> Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.



24. Many food applications that are relevant to the use of nanotechnology are subject to specific EU legislation that requires a pre-market authorisation, including a risk assessment by EFSA (eg. food additives, food contact materials and food supplements). The recent review of the food improvement agents package of legislation which included food additives, flavourings and enzymes, for example, was used to clarify that an additive produced in nano form was considered a new material compared to its bulk form and therefore required specific approval<sup>20</sup>.
25. It is essential that there is clarity over how nanomaterials are to be dealt with. This is difficult without agreed definitions as to what is classed as a nanomaterial. However, it is essential that consumers are not exposed to risks from nanomaterials while the debate over definitions is resolved.
26. One specific gap has been in relation to novel foods. The novel foods regulation is currently being reviewed and considered by the European Parliament and Council. The European Commission proposed that products produced using nanotechnologies (as well as any other 'new production process') should fall under the definition of a 'novel food' and therefore require pre-market approval, but only if it gives rise to '*significant changes in the composition or structure of the food which affect its nutritional value, metabolism or level of undesirable substances*<sup>21</sup>.' We are concerned that this is too limited as it relies on a company making an assessment as to the relevance of any changes before a product would be subject to an independent risk assessment. The Regulation should therefore be clear that if a product is produced using nanotechnology - and does not fall under any specific food regulations as outlined above - it should be considered a novel food and require a pre-market assessment by EFSA and EU authorisation before it can go on the market.
27. The general food law regulation (EC 178/2002) acknowledges in Article 6 that as well as risk assessment, risk analysis should also take account of 'other factors legitimate to the matter under consideration and the precautionary principle'. Nanotechnologies are likely to raise a wide range of issues some of which will go beyond safety aspects. It is essential that these broader social and ethical issues are understood and are taken into account as part of authorisation processes. This is also consistent with the

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<sup>20</sup> [http://ec.europa.eu/food/food/chemicalsafety/additives/prop\\_leg\\_en.htm](http://ec.europa.eu/food/food/chemicalsafety/additives/prop_leg_en.htm)

<sup>21</sup> Proposal for a Regulation of the European parliament and of the Council on novel foods, COM (2007) 872 final, 14.1.2008 - proposed Article 3.



FSA's role of protecting public health and 'other consumer interests in relation to food'<sup>22</sup>.

28. The call for evidence seeks views on the role that voluntary self-regulation may play in this area. Given that food is generally a highly regulated area compared to other products in view of the potential widespread health consequences if it is unsafe, we consider that it would be a backward step to rely on a voluntary approach to control the issues raised by manufactured nanomaterials. This is a highly competitive area and is also an area where there is a great deal of uncertainty. Our experience from working with a range of other stakeholders as part of an initiative to develop a Responsible Nano Code<sup>23</sup> is that it is only likely to be possible to reach agreement on broad principles, rather than on the specific measures that are needed in order to ensure the safe and responsible development of nanomaterials. This has also been reinforced by the poor response to Defra's voluntary reporting scheme.
29. In relation to inter-governmental co-operation, the Organisation for Economic Co-operation and Development (OECD) has established a Working Party on Nanotechnology and a Working Party on Manufactured Nanomaterials looking at health and safety aspects. The International Standards Organisation (ISO) is also undertaking several pieces of work and has been leading on efforts towards standardisation of definitions. The relevant international standards body for food regulation is the Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) Codex Alimentarius Commission. While it is essential that there is international co-operation on this issue, experience from the development of standards for other emerging technologies has been that these bodies can take many years to reach agreement on standards - and often come after products have been on sale for many years. It is therefore important that the UK and EU actively participate and take a leadership role in these discussions, but waiting for international consensus could put consumers at risk.
30. There is a more specific initiative to ensure regulatory co-operation between the US and EU as part of the Trans-atlantic Economic Council established by the previous US administration and the German Presidency of the EU<sup>24</sup>. This work is important to ensure that there is a common approach

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<sup>22</sup> Food Standards Act 1999

<sup>23</sup> <http://www.responsiblenanocode.org/>

<sup>24</sup> Framework for advancing transatlantic economic integration between the European Union and the United States of America, April 2007.



to the regulation of this technology, avoiding any potential trade disputes and ensuring that consumer protection is not undermined.

31. As well as addressing the concerns raised above specifically in relation to the review of the novel foods regulation, we consider that the following issues need to be addressed:
- It should be ensured that there is clarity across all food legislation (eg. through clear guidance or updating of relevant legislation), that materials produced using nanotechnology are subject to mandatory independent pre-market assessment and approval (ie. by EFSA) and that materials that have already been approved in their conventional form need a separate assessment and approval if in nano form.
  - Effective enforcement should be ensured so that any products that are on the market which have not been approved are removed. This requires clear guidance to be given to local authorities by the FSA, including over how to deal with products available over the internet.
  - There is a need for clarity over how broader consumer and other social issues are to be taken into account as part of the approval process, in line with the recognition that 'other legitimate factors' play a role and need to be taken into account by risk managers in the EU's general food law regulation.
  - There should be effective monitoring by the FSA of the extent to which other non-food nanomaterials may be contaminating the food chain and any associated risks.
32. In addition, as highlighted above, in relation to current uses and health and safety aspects:
- Regulation needs to ensure that there are robust definitions in place that cover all potential food applications that may be considered to exhibit different properties because they are manufactured using nanotechnology.
  - Regulation is needed to ensure that manufactured nanomaterials have to be reported to the regulatory authority (ie. Defra or FSA).
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## Public engagement and consumer information

33. Which? conducted a survey in October 2008 which found that only 45 per cent of people had heard of nanotechnology.<sup>25</sup> This was a slight increase from our last survey in November 2007 when 37 per cent were aware,<sup>26</sup> but even those who had heard about it were unclear what it is. Respondents were asked what first thing they think of when they hear the term 'nanotechnology' and around half (52 per cent) couldn't come up with anything at all. Around one in five (22 per cent) made mentions relating to size and slightly fewer (18 per cent) mentioned electronics, science or technology. Awareness was higher among men than women (53 per cent compared to 37 per cent) and those over 65 were likely to be less aware (37 per cent). When asked where they thought nanotechnology is currently being used to produce consumer products, just 3 per cent mentioned food - and only 6 per cent when prompted with a list of possible applications.
34. In November 2007, we commissioned a citizens' panel in order to understand consumer attitudes towards nanotechnologies<sup>27</sup>. This looked at food applications as well as medicines, cosmetics and other consumer products. A summary of the findings and the full report conducted by Opinion Leader are enclosed.
35. The Panel was made up of fourteen people, broadly representative of the population. They met over three days and heard evidence from a range of experts. Although fourteen people is a small number, we felt that it was appropriate to use this type of deliberative technique over other research methods given the complexity of the issue and lack of consumer awareness.

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<sup>25</sup> October 2008 face to face survey of 977 adults aged 16+ representative of adults in the UK.

<sup>26</sup> November 2007 face to face survey of 2,091 adults aged 16+ representative of adults in the UK.

<sup>27</sup> Opinion Leader Research conducted a Citizens' Panel on behalf of Which? with 14 members of the public. Panellists were selected broadly to reflect the general public and sat for three days from 29th November - 1st December 2007. The venue was Birmingham University and panellists were recruited from Birmingham and the wider West Midlands area. Expert witnesses were called upon to explain nanotechnologies, the overall benefits and issues, applications in particular areas (including benefits and issues) and the policies and controls in place. The Panel was overseen by a steering group, with a range of expertise and interests, who advised on the approach, agenda and selection of witnesses.



36. The Panel indicated that people are unlikely to have blanket opposition to the use of nanotechnologies for food products. Some people were positive about possible developments, such as intelligent packaging, although others were slightly more wary of getting into areas they considered to be unnatural. Overall, people expect there to be effective regulation in place. They also wanted to know where manufactured nanomaterials are being used and called for labelling. However, the panellists recognised that this would only be useful if backed up by broader information about nanotechnologies that would make the information on the label meaningful.
37. It is also likely that many food companies will want to make claims about the benefits the use of nanomaterials offer. This is already the case in relation to the nano products that can be found on the internet. It is, therefore, essential that these claims can be independently substantiated and that enforcement action is taken over misleading claims.
38. Lessons from the introduction of other new technologies, most notably the introduction of genetically modified (GM) foods, has been that it is essential to engage the public at the outset and ensure that there is a two way exchange, leading to the development and use of the technology in a socially acceptable way that brings genuine consumer benefits. Although this has been widely acknowledged as necessary in relation to nanotechnologies by the government and various engagement activities have been organised and overseen by a Nanotechnology Engagement Group, we are concerned that these have been too limited. Part of the problem is that until the government has a better understanding of what the use of nanotechnologies in the food area is really going to mean for consumers, it is difficult to have a meaningful debate. Most of the engagement exercises to date have been quite general and while giving a general insight into how consumers expect new technologies to be regulated, they have not explored likely reactions to different developments so that the public's views can help to shape the research and regulatory agendas.
39. We therefore consider that the following actions are needed:
- More effective consumer engagement at the earliest opportunity specifically focused around potential food developments by the FSA so that it can be ensured that research priorities and regulatory approaches are in line with consumer expectations and address their concerns.



- Once there is a fuller understanding of the potential of nanotechnologies for food, greater consideration needs to be given to any social and ethical issues that may be raised and whether these can be addressed or whether some applications are inappropriate as a result.
- There should be a requirement that manufactured nanomaterials used in food products have to be labelled in the list of ingredients. The current EU discussions around the new food information regulations provide an opportunity to address this<sup>28</sup>.
- Greater effort is needed across government to increase awareness of nanotechnologies and the issues that they raise in a balanced way.

**Which?**  
March 2009

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<sup>28</sup> Proposal for a Regulation of the European Parliament and of the Council on the provision of food information to consumers, COM(2008) 40 final, 30.1.2008