# Future Foods Public Dialogue Concept

## Background

Technology, in relation to food, arouses strong feelings in some consumers and non-governmental groups, though others are are less concerned. The public is increasingly scrutinising the provenance and composition of food, whilst at the same time financial constraints impose restrictions on the choices available to them. In addition recent reports indicate that technological solutions to food production may be an essential component of our food security in the coming decades, while others postulate that a 'technological' approach to food is behind many of the health related problems we face.

The Responsible Nano Forum would like to explore directly with citizens some of the possible applications of technology, notably nanotechnology and biotechnology, in food and packaging and understand their views, preferences and concerns.

This project is not about 'selling' technology to the public, nor is it trying to advocate one particular perspective or another in this debate. It aims to present a thoughtful, rounded picture for discussion in such a way as to be interesting and engaging for the public.

To assist with the initial discussions about this process, the Forum has been offered assistance by the NanoPlat, a Framework 6 European dialogue initiative (www.nanoplat.org) which has also been exploring opinion former views on nanotechnology and food as part of the initiative.

## Project objectives

- To develop a compelling, yet reflective and rounded approach to presenting the use of technology in food in a consultative though engaging format
- Through a consultative development approach, to engage opinion formers to inform our understanding and communication of some of the potential applications of these technologies in actual products as they may appear on the shelves.
- To understand the views, preferences and concerns of citizens in relation to new technologies in food and packaging.
- To communicate these views widely and thus help ensure that these opinions can make a contribution to the development of technology in relation to food.

## The Concept:

There are four components to our proposed project:

### Collaborative project development

1. We develop, in consultation with experts in the field from science, government, business and ngos, an understanding of the specific applications of technology in food and packaging which may come to market in the next 10 years. The consultative element of this part of the project is a particularly important component.

2. Following this process we will create a number, perhaps 15-20, of possible applications in which a technological advance will have an impact on the type of food or packaging we consume or use. It may also consider other issues such as labelling, product information or transportation.

3. It will also result in the development of thoughtful, rounded information on each application, which may include the science behind the application, it's proposed benefit, how the particular technology is used and potential concerns or repercussions.

### Creative treatment

4. These are 'translated' into realistic mock-up photographs of potential products, as the public would see them on shelves. See attached examples which have been developed through our own and Nanoplat research and engagement with some UK stakeholders.

5. These will be accompanied by easy-to-understand written information on the product, produced through consultation with stakeholders as above, possibly under headings such as:
    - Product description
    - The technology component and how it is used
    - The intended benefit
    - Any potential concerns, consequences or risks of its use

The combination of the actual photos and the balanced information will then be incorporated into a format for presentation which will be the basis for a dialogue with the public.

### Implementation

6. These can and probably will be used three ways:
    - Embedded into the public website www.nanoandme.org, and used to stimulate a web-based dialogue, perhaps through a media relations programme or jointly with a particular publication, programme or initiative.
    - As the basis for a series of public meetings, working, we hope, with the Cafe Scientifique network and others.
    - Through partner ventures, eg supermarket initiatives, media promotion, science festivals

7. The project could be piloted in the UK and then extended Europe wide. We have a number of potential partners who are interested in running such an initiative should funding be found.

8. The findings of this dialogue will be prepared into a report and communicated widely on the web and in the mainstream media.

## Potential outcomes

The Responsible Nano Forum is not a salesman for any technology. We aim to be independent and inclusive in our approach to the issues which arise from their use.

However we do believe that there may be applications where some technologies may help provide assistance in finding solutions to some of society's pressing problems, or where it may be possible that technological solutions may be used unnecessarily. We seek to explore these issues based on evidence and with the involvement of the public and other stakeholders.

The potential outcomes of this project, should we achieve funding, could include:

- A clearer understanding on how technologies may be used in many areas of food, packaging and labelling in the next 10 years or so.
- A better understanding of the public's views, and potential acceptance or otherwise of these specific technological innovations.
- A better understanding of public views on some of the important social or ethical issues associated with technology and food.
- We believe this information will be useful to assist governments, businesses and scientists and so have the involvement of the public inform the direction of development of technology in relation to food.

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Following are the images which have been created to support this application.

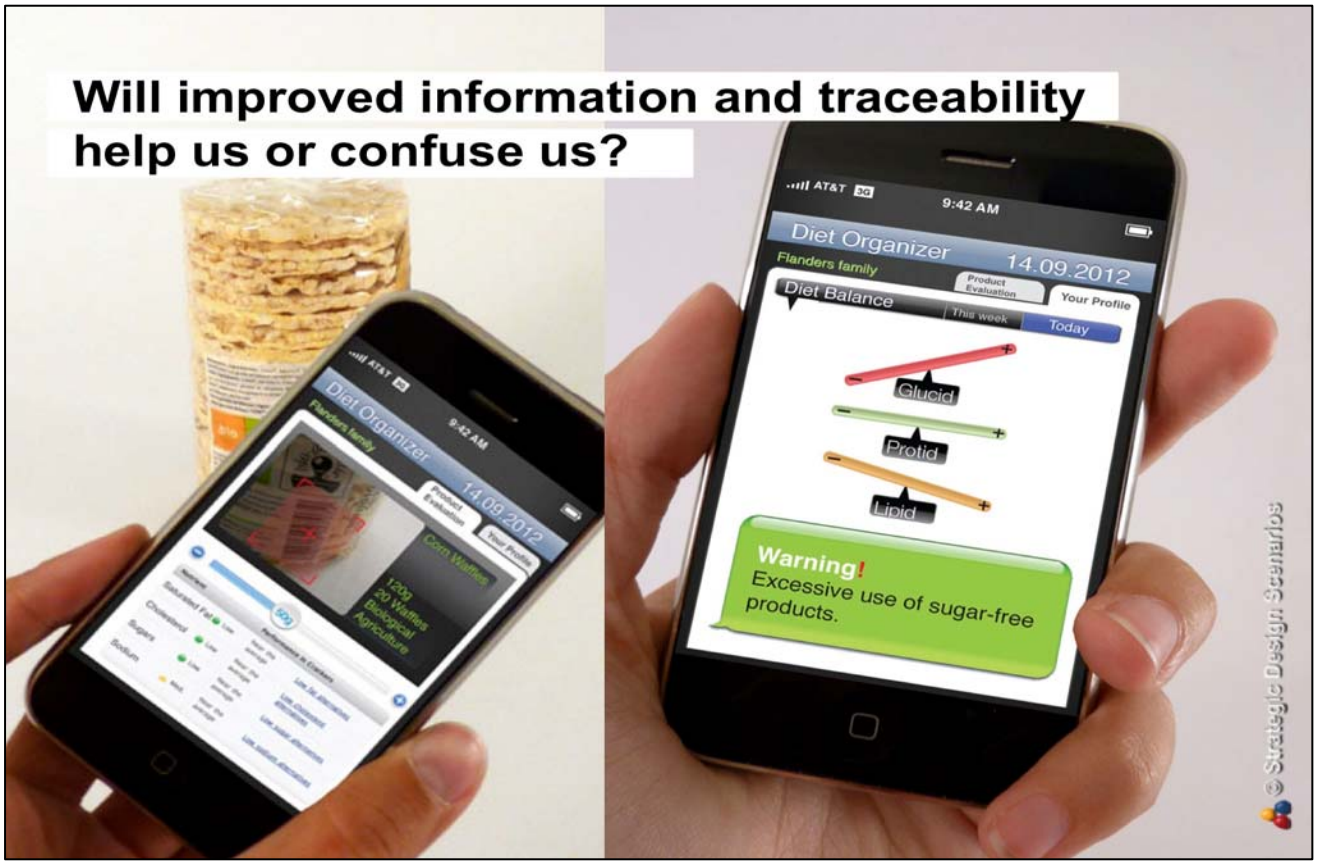
*If you would like to explore this idea with us in more depth, or would like further information on the proposed process, please contact Hilary Sutcliffe at the Responsible Nano Forum on + 44 (0) 207 520 9085 or email hilary@responsiblenanoforum.org*

# Appendix
# Future Foods Imagery

- The information presented here was developed through the European Commission FP6 NanoPlat project. (www.nanoplat.org).
- The issues associated with nanotechnologies and food were debated through the project's deliberative forum and initial images produced by Strategic Design Scenarios of Brussels.
- This innovative envisioning technique was pioneered by SDS and is highly effective in the development of scenarios and engagement.
- The Responsible Nano Forum took these forward with further research and discussion with food researchers and the following images were prepared. These do not just involve nanotechnologies, but also biotechnology and information technology.
- The supporting information will form the basis for the discussions. That currently shown is incomplete.
- The first phase of our proposed programme is to consult widely with opinion formers in government, research, business and ngos to understand better the applications and the science and the issues associated with each scenario. There will perhaps be two or three more iterations of these photos as part of the Wellcome Trust proposal.


| Caption: **Will improved sensing technologies increase safety in the food chain?** | | |
|---|---|---|
| Picture: Contamination sensor | | Comments |
| **The technology** | Nano enabled sensors using ? can detect bacteria such as salmonella (and e coli??) in foods | |
| **The effect** | Early warning on contamination of food products | |
| **Available** | Hand held electronic sensors available for supermarkets to check produce now. Sensors as shown 5 years? | |
| **Potential impacts** | Reduction in food poisoning due to salmonella? E coli??? | |
| **Questions** | How reliable is it, What if it doesn't work if fitted wrong for example?<br>What if the contamination is on another part of the food?<br>Does tech in sensor migrate to food?<br>If so, would that migrate to body and if so what would it do? | |
| **Desirability?** | | |


| Caption: **Will improved sensing technologies help certify food quality?** | | |
|---|---|---|
| Picture: **Organic sensor** | | Comments |
| **The technology** | ? biological and nano sensors? | |
| **The effect** | Potential use to detect small quantities of substances. Eg pesticides to check contamination of organics | |
| **Available** | Unclear - possibly 5-10 years. Unclear if available as seen for consumer use | |
| **Potential impacts** | Give public more control and understanding about what they buy<br><br>Ensure clarity of information in areas claimed<br><br>Raise questions about organic produce as even now they can't be 100% organic in many cases | |
| **Questions** | What does this do to our view of organic?<br><br>Does the sensor technology have any possibility of contaminating the product? | |
| **Desirability?** | | |




| Caption: **Will improved information and traceability help us or confuse us?** | | |
|---|---|---|
| Picture: Iphone app | | Comments |
| **The technology** | Nano gold and silver wires provide extra sensing capacity in bar codes. This allows huge amounts of information to be held on product labels | |
| **The effect** | Allows large amounts of data - eg traceability information, nutritional information, allied to personalised understanding of nutritional needs, eg personalised genetic info etc | |
| **Available** | Unclear | |
| **Potential impacts** | Assists with provision of information to public on ingredients, impacts, link to personalised information<br>Improved accountability to customers, traceability and info on products<br>Allows better, more easily presented information on products as labels get more detailed and confusing<br>Unclear worker safety and lifecycle implications for gold and silver nanowires. | |
| **Questions** | Do we really want all this information? How could it help us? Would it be a huge breakthrough in accountability or just more info to give us a headache? | |
| **Desirability?** | | |


| Caption: **Does it do what it says on the pack?** | | |
|---|---|---|
| Picture: | | Stakeholder Comments |
| **The technology** | Nano sized 'phytosterols' taken into the body to prevent cholesterol being taken from digestive system into blood stream. | |
| **The effect** | Potentially reduction in absorption of cholesterol from food | |
| **Available** | Now. Canola Active Oil | |
| **Potential impacts** | Potential to reduce cholesterol in people, preventing heart attacks and strokes?? | |
| **Questions** | Do it work? How do we know?<br>Side effects of increased uptake of 'phytosterols' in this form unclear? Difference to use with food and pill form? | |
| **Desirability?** | | |


| Caption: **Could ‘nutraceuticals’ replace a balanced diet?** | | |
|---|---|---|
| Picture: Shakes | | Comments |
| **The technology** | Nanotechnologies potentially enable better uptake of nutrients through improved encapsulation systems.<br><br>Nano enabled enhancement of flavours may also allow these products to be more palatable than current versions.<br><br>Individual nutritional supplements better absorbed into the body through delivery at the nano scale, improving effectiveness. | |
| **The effect** | Products delivering more complete nutritional requirements are available and are more effective and palatable than current ‘complete food’ supplements or products?<br><br>Individual nutritional components - eg vitamins, minerals are able to be isolated and delivered better into the body. | |
| **Available** | Currently improved absorption supplements are available.<br>‘Complete food’ concepts possible, not yet marketed? | |
| **Potential impacts** | Availability of ‘functional foods’ which deliver nutrients more effectively. | |
| **Questions** | Do these products actually work?<br><br>Are they necessary? Would they prevent some people from eating proper balanced diets?<br><br>Has there been testing for efficacy and side effects of consuming these products? Is information on this available?<br><br>Does the nature of the ingredients at the nano scale have any change of properties and therefore change of risk profile? | |
| **Desirability?** | | |


| Caption: **Foods as medicines?** | | |
|---|---|---|
| Picture: Tomatoes | | Comments |
| **The technology** | Increase in potential health giving components of food currently available through plant breeding.<br><br>Also nanotechnologies isolate alleged health-giving compounds in foods and increase them, purporting to increase health benefits.<br><br>Genetic modification of foods potentially possible to increase health-giving compounds | |
| **The effect** | Increase uptake of particular health-giving component of food to promote health benefit. Eg supposed cancer prevention aspects of tomatoes through increased lycopene | |
| **Available** | Breeding and nanotechnology applications currently available, believed not used in UK food currently. Genetic modification 5 years? | |
| **Potential impacts** | Potential for improved health through eating such foods - eg reduction in certain cancers in this case | |
| **Questions** | Do these things actually work? What is the evidence?<br><br>Is it better simply to eat a more balanced diet?<br><br>What is the impact on the body from increased levels of single components of foods? | |
| **Desirability?** | | |


| Caption: **When is high tech food fairer or better?** | | |
|---|---|---|
| Picture: Fair living rice | | Comments |
| **The technology** | Genetic modification of rice to improve efficiency of photosynthesis - the conversion of energy from the sun which the plant uses to grow. Modification aims also to improve water use and nitrogen uptake. | |
| **The effect** | Photosynthesis improved, water use improved and use of nitrogen improved | |
| **Available** | 10 years (see http://c4rice.irri.org/) | |
| **Potential impacts** | Each plant produces 50% more rice leading to reductions in requirement for water and pesticides. Proposed products help increase yield and productivity of one of the world’s most important crops, benefiting developing world farmers and consumers of rice in all countries. | |
| **Questions** | How safe is the technology in terms of stability, gene transfer to other plants, impact on human health & environment<br><br>Who will own and market the technology and how will it reach those who most need it?<br>Who will pay for it to reach them? | |
| **Desirability?** | | |

| Caption: **Do we want 'everlasting freshness'?** | | |
|---|---|---|
| Picture: 3 Year Sandwich | | Comment |
| **The technology?** | To check. Nano silver, chemical preservatives, irradiation? | |
| **The effect?** | Sandwich can stay fresh and edible for years. | |
| **Available?** | Now in theory. 7 year sandwich produced for military rations.<br>Availability to the public - not known | |
| **Potential impacts?** | Potential food waste reduction<br>Lifecycle impact of chemicals or preservatives? | |
| **Questions?** | What would it taste like? Would that have an impact in its desirability<br>What would the uses be? Do we really want one?<br>Does it seem different from existing canned or long-life foods or not? | |
| **Desirability?** | | |