

Food Safety Regulation and Trust in Europe

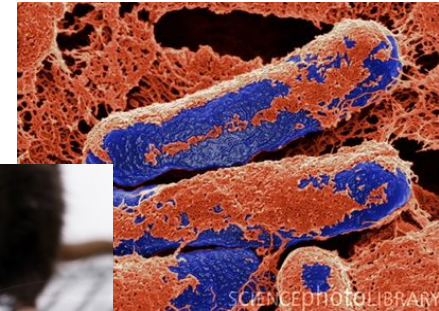
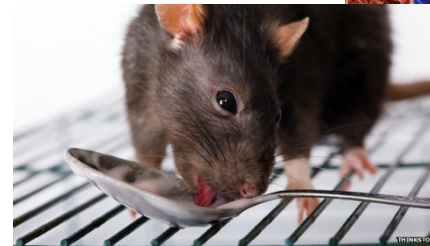
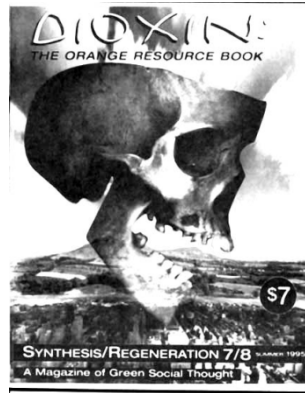
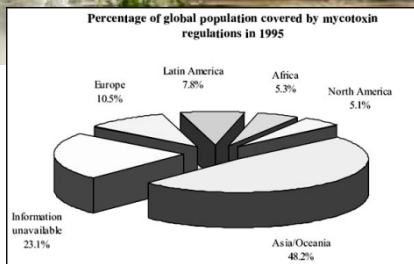
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Food and Society Group

Newcastle University



Food Safety – Is societal trust in regulation important?



Differences between expert and consumer/citizen perceptions of risk

- **Experts**

- Rely on ***technical risk assessments***
- Use scientific argumentation which infrequently takes account of ***socio-economic impacts***
- In theory, balance ***risk*** against ***benefits*** (but it is not always clear how socio-economic benefits, or even technical benefits, are assessed).



- **Public**

- Use their ***risk-benefit perceptions*** to make judgements about risks associated with food consumption
- ***Trust in regulators and food chain actors*** an important determinant of reactions to different food risks
- ***Emotional*** (or affective) responses are important



Frewer et al, (in press). Critical reviews in Food Science and Technology

The Importance of Trust

- Trust is essential for risk communication and regulation
 - Trust is needed
 - if information is incomplete
 - because large groups of the public will not process all available information
- People who distrust food safety risk messages are unlikely to believe or act upon the information.
 - This may have negative impacts on
 - Health
 - The environment
 - Agri-food trade
 - Economic factors (e.g. employment)



Trust Components

Credibility

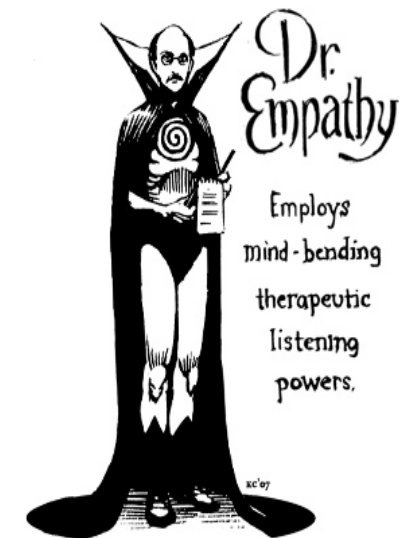
- The extent to which a source or institution is perceived to have the knowledge and expertise to assess, manage and communicate about a risk

Honesty

- The extent to which a source or institution conveys information about a risk in an open, truthful and transparent way

Care or empathy

- Care for the interests of the other party and that the source or institution shares the same values and concerns



Principles of Food Safety Risk Communication

- Openness
- Transparency
- Timeliness
- Responsiveness



All are essential to *establishing* and *maintaining* trust, and contribute to *rebuilding* trust when it is low

Drivers of distrust in regulation



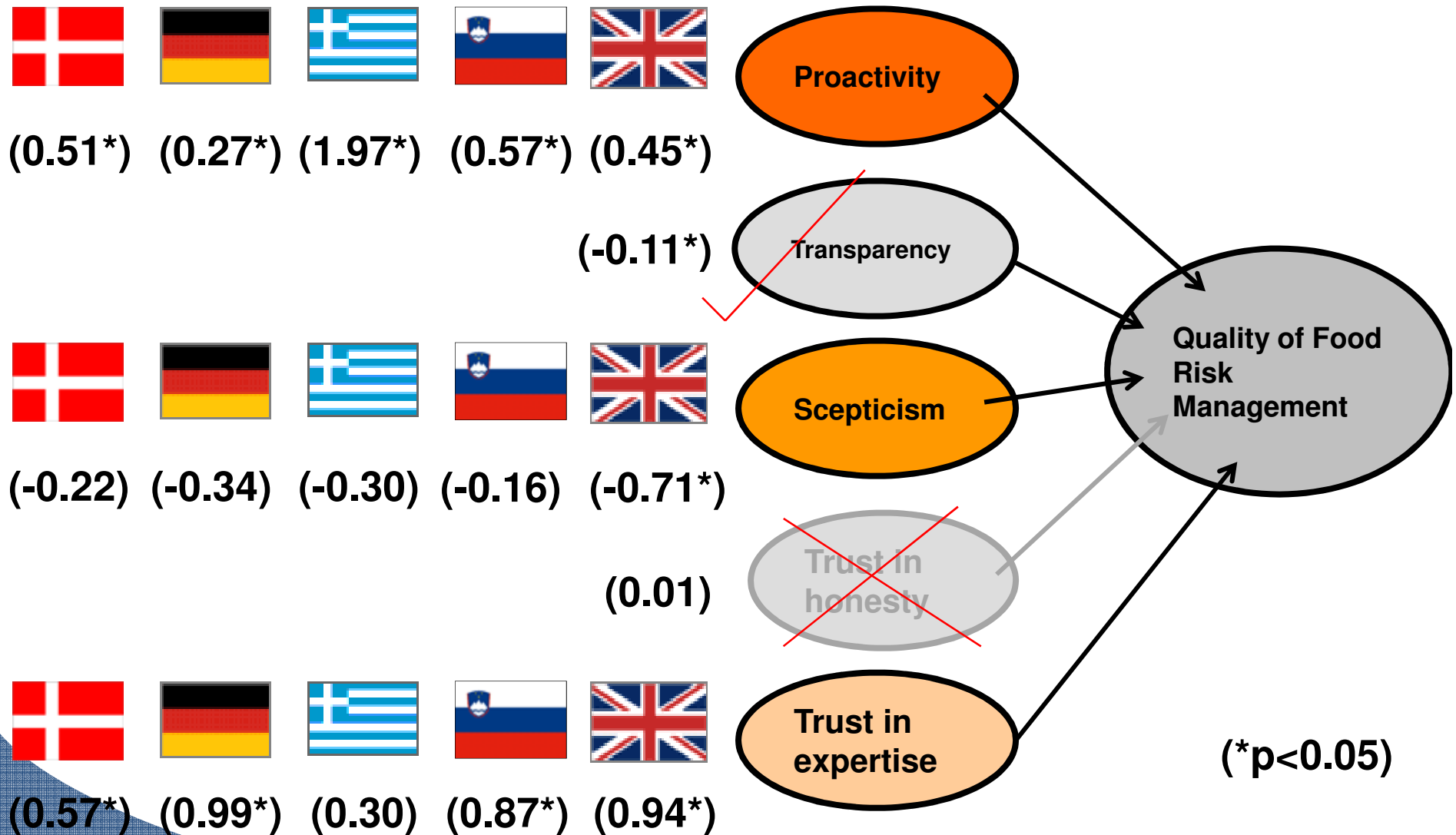
What *drives trust* in food risk management quality?

Results of a survey from 5 European countries



Van Kleef, E., Houghton, J. R., Krystallis, A., Pfenning, U., Rowe, G., Van Dijk, H., ... & Frewer, L. J. (2007). Consumer evaluations of food risk management quality in Europe. *Risk Analysis*, 27(6), 1565-1580.

What drives consumer trust in food risk management?

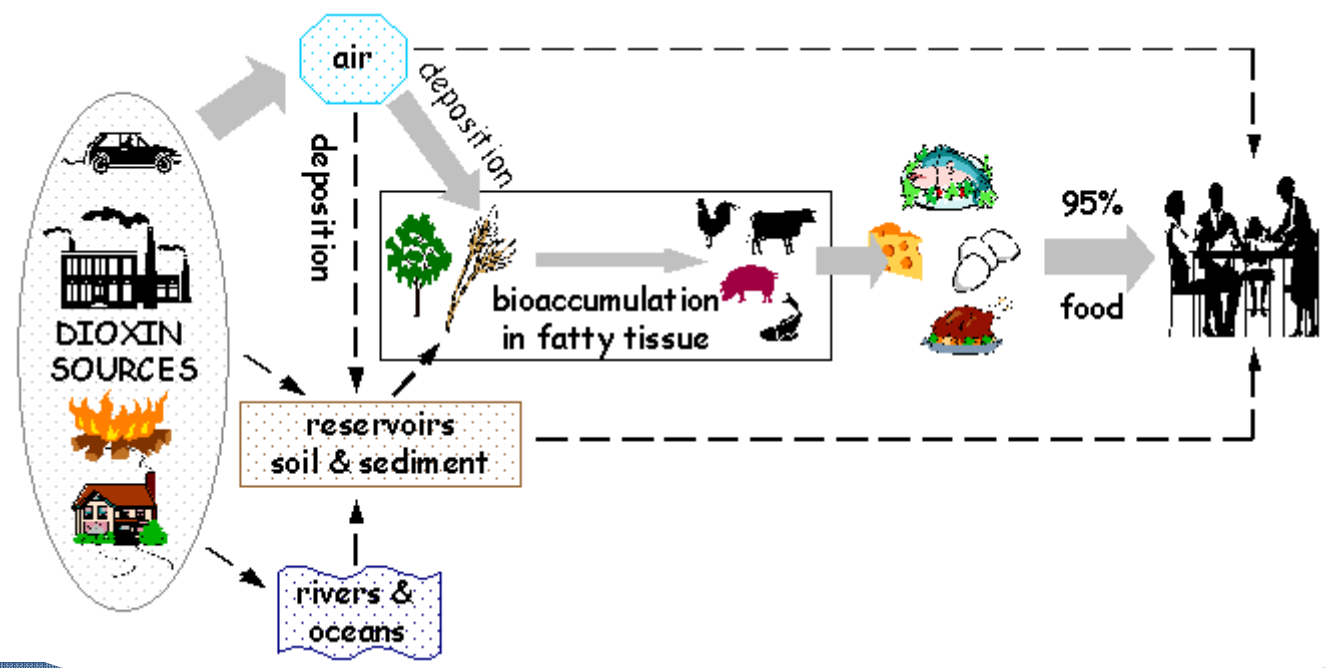


What drives trust in food risk management?

- **Factors of universal importance within the EU countries surveyed**
 - Evidence *of Pro-active efforts* to promote consumer protection
 - *Transparent* risk management
 - Trust in the *expertise* of food risk managers (*except Greece*)
- **Factors of local importance**
 - *Scepticism* regarding risk assessment and communication practices (UK)

Failing to disclose information in a timely manner

The case of dioxins



Recent dioxin-related food safety issues

- Belgium (poultry feed supply chain 1999)



- Ireland (pig feed supply chain 2008)



- Germany (animal feed supply chain 2011)



Harles und Jentzsch plant in northern Germany

The 1999 Dioxin controversy in Belgium

- Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin)
- Stable in environment and organisms, resists degradation and metabolism
- Accumulates in fatty tissues, not excreted, half-life in humans approximately 7 years
- Biomagnification = concentration increases up the food chain
- Destruction by incineration at a temperature above 850° C
- Human health effects
 - Exercise precaution by keeping exposures and TDI estimates to very low levels
 - Focus of research to reduce uncertainty

Events in Belgium (1999)

- **January 1999**
 - A storage tank of fat at the processing plant of *Verkest*, Belgian animal feed producer is contaminated with industrial oil containing dioxin
- **February 1999**

A animal producer *Da Brabender* notices nervous system problems in its mother hens and hatching failures in their eggs
- **March 1999**
 - *Da Brabender* send a feed sample to a Dutch laboratory for analysis. The ministry of agriculture is alerted
- **April 1999**
 - Lab results positive. Government takes discrete action to isolate the supply chain involving Verkest
- **May 1999**
 - tests reveal high levels of dioxin throughout the supply chain

29 May 1999: the story hits the news

Reactions?

- **May 1999**
 - Belgian government notifies EU and its member states. Public health minister orders removal of all domestic-produced poultry and eggs from shelves
- **1 June 1999**
 - Government halts wholesale of all poultry and egg products until inspected.
 - EU agriculture commissioner Franz Fischler announces legal action against Belgium for its tardy notification Belgian agriculture minister resigns
- **2 June 1999**
 - European Commission authorises ban on import of Belgian poultry products (extended to pork, beef and dairy on 4 June)
- **30 June 1999**
 - Domestic consumption of poultry slumped to 69% of June 1998 levels

Dioxins –Trust in regulation and consumer protection...

- Effective traceability enforced..
- Immediate recall of products
- Transparent communication about risks and risk management



Food technologies- the case of GM foods

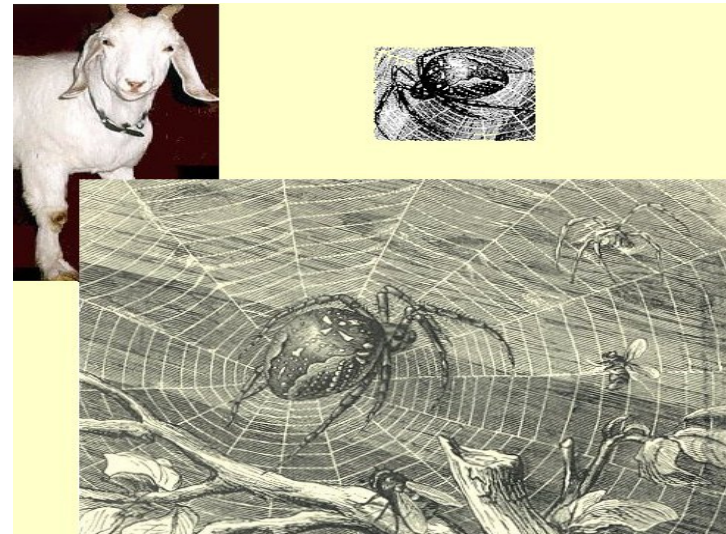
GM animals



The “Enviropig” – excretes less phosphate in faeces therefore better for the environment



Aquabounty Salmon



The goat that produces spider silk in its milk (used for fabrics)

Imagery - food-related GM plants on the internet



without with
“Browning” of fruit prevented

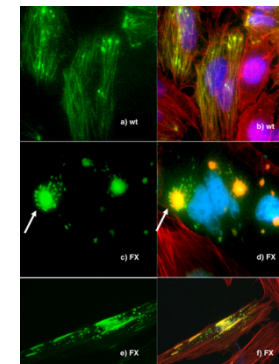


Dinner or candlelight?

Arabidopsis glows when stressed



GM maize is pesticide resistant



Consumer protests against GM crops (1998)

Unsegregated and untraceable soya



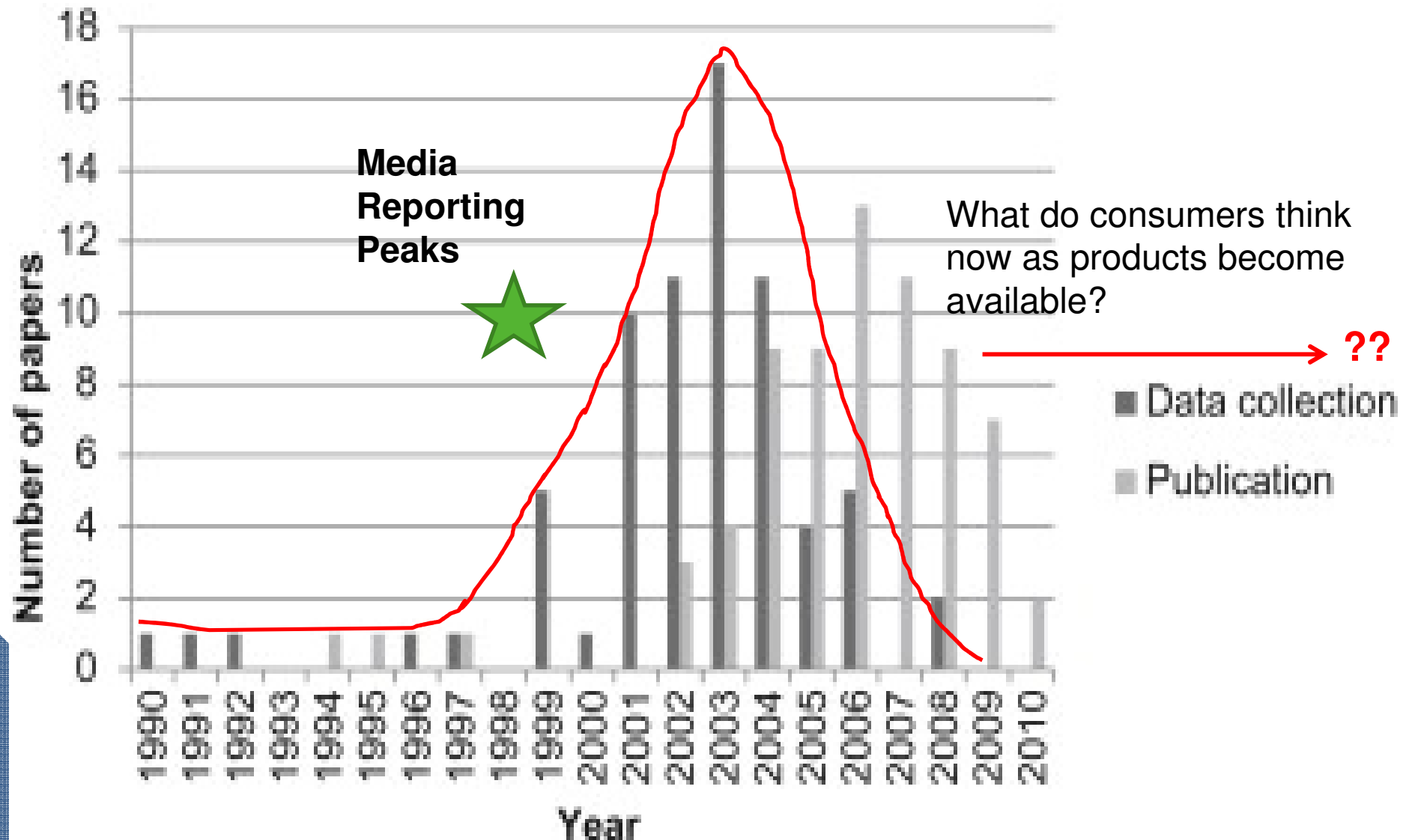
The case of genetically modified foods in Europe (1)

- **Consumer values** such as concern about the integrity of nature, and **trust in the regulatory system** were an important part of societal and consumer acceptance
- Developing communication about **substantial equivalence** did not address consumer concerns
- **Control over consumption** of GM foods was important to European consumers, necessitating the labelling of GM foods and implementation of **effective traceability systems**

The case of genetically modified foods in Europe (2)

- The negative public reaction to GM foods was *less* to do with risk, and *more* to do with consumer choice and provision of relevant information
- *Marketing issue*, not an *ideological* issue (“*who wants what products and why?*”)
- *Opaque* risk analysis systems and decision-making practices were not helpful in reassuring the public
- The absence of 1st generation products with tangible and desirable *consumer benefits*

Date of publication of papers contributing data to the meta-analysis



Results

- ***Plant-related or “general” applications*** were more **acceptable** than *animal-related* applications.
- **Pharmaceutical production** more acceptable than **food applications**
- Risk perceptions (associated with both plants and animals) were greater in **Europe** than **North America** and **Asia**.
- Benefit perceptions were greater in **North America** and **Asia** than **Europe**.
- Moral concerns higher in **North America** and **Asia** compared to **Europe**
- ***Risk and benefit perceptions*** increased with time **everywhere**
- Potential to continue to ***map changes*** in perceptions and attitude of data added to the data base
- ***Trust in regulators*** important, but measured in a range of different ways

Frewer, L. J., van der Lans, I. A., Fischer, A. R., Reinders, M. J., Menozzi, D., Zhang, X., & Zimmermann, K. L. (2013). Public perceptions of agri-food applications of genetic modification—a systematic review and meta-analysis. *Trends in Food Science & Technology*, 30(2), 142-152.

Instrumental and accidental introduction of food risks

- ***Instrumental introduction*** can be considered in terms of whether it resulted in unintended consequences
 - communication about mitigation measures and related research activities
 - communication about uncertainties and what is being done to reduce these ***in real time***



BSE



“Horsegate”



Issues

- Fraud and standards
- A food chain (beef post BSE) where these are expected to be applied rigorously
- Public concern
 - (Illegal) economic gain
 - Criminal activity
 - Not focused on food safety
 - The issue of Bute



“Food integrity “

Consumer research work package

Objectives

To understand Chinese consumer perceptions and attitudes towards “authentic” European products

- Whiskey
- Infant formula
- Olive oil
- Prosciutto ham



(Overall coordination by FERA,
consumer WP lead by UNEW)



Melamine in milk- the infant formula scandal in China (July 2008)

- Estimated 300,000 victims
- Six infants dying from kidney stones and other kidney damage
- Estimated 54,000 babies being hospitalised
- Criminal prosecutions occurred
 - Two people executed, another given a suspended death penalty, three receiving life imprisonment, two receiving 15-year jail terms, and seven local government officials, as well as the Director of the Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) being fired or forced to resign.
 - October 2008, similar adulteration with melamine discovered in eggs and possibly other food, traced to melamine being added to animal feed
 - In 2012, Jiang Weisuo, 44, the man who first alerted authorities murdered in Xi'an city



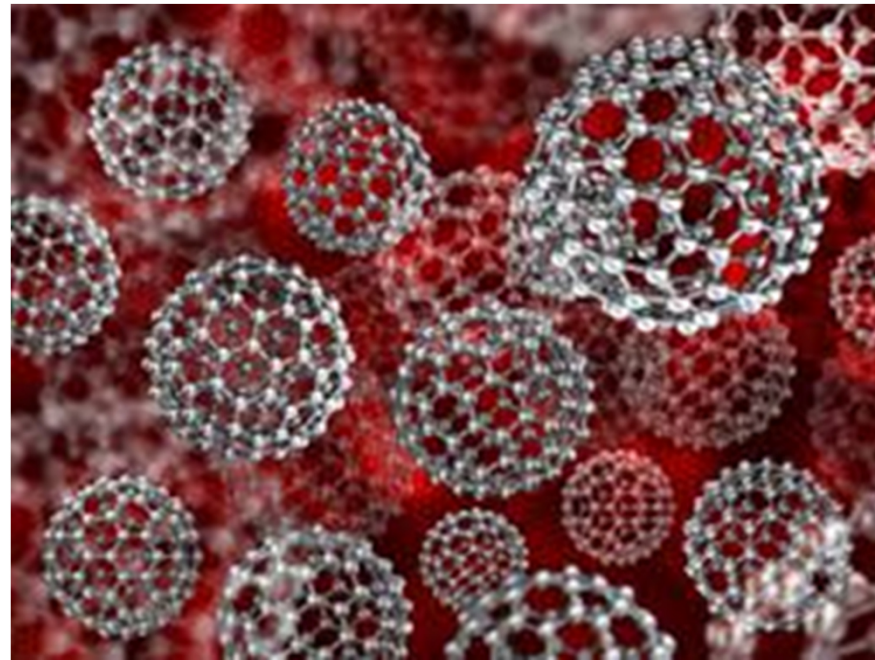
Preliminary pilot focus results

- Chinese students in Newcastle
 - Chinese citizens prepared to pay extremely high amounts for authentic European products
 - “£800 excess baggage for importing infant formula”
 - Trust in Chinese production extremely low



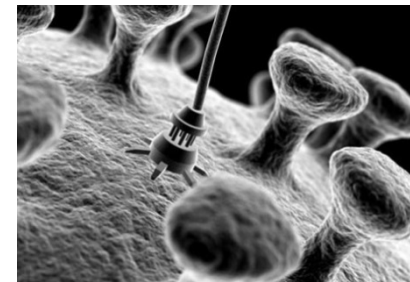
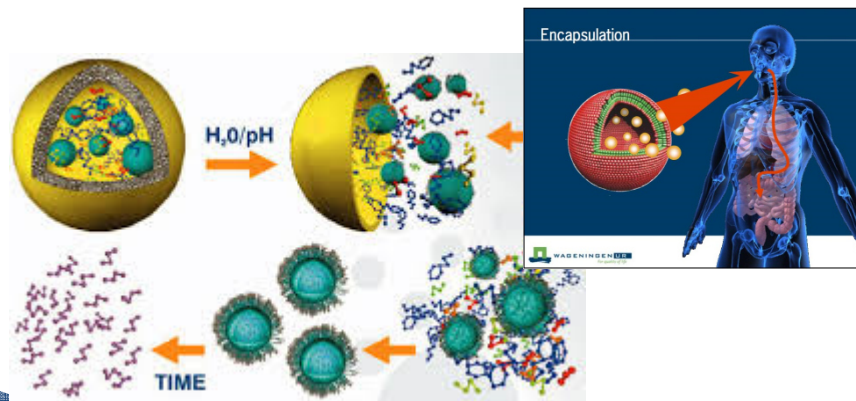
- Future research
 - Stakeholder analysis
 - Focus groups and survey (n=3000) in three Chinese cities

Societal Acceptance of Nanotechnology



Will consumers reject products of nanotechnology?

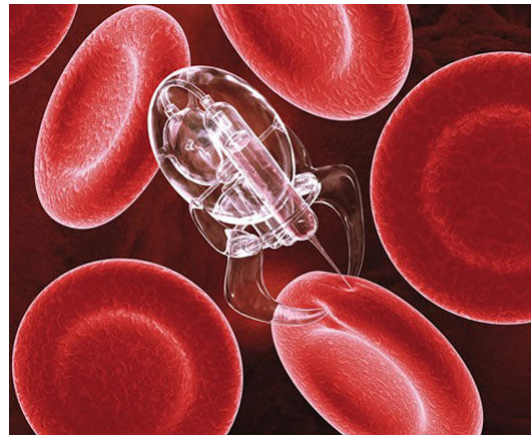
What do nanotechnology experts think?



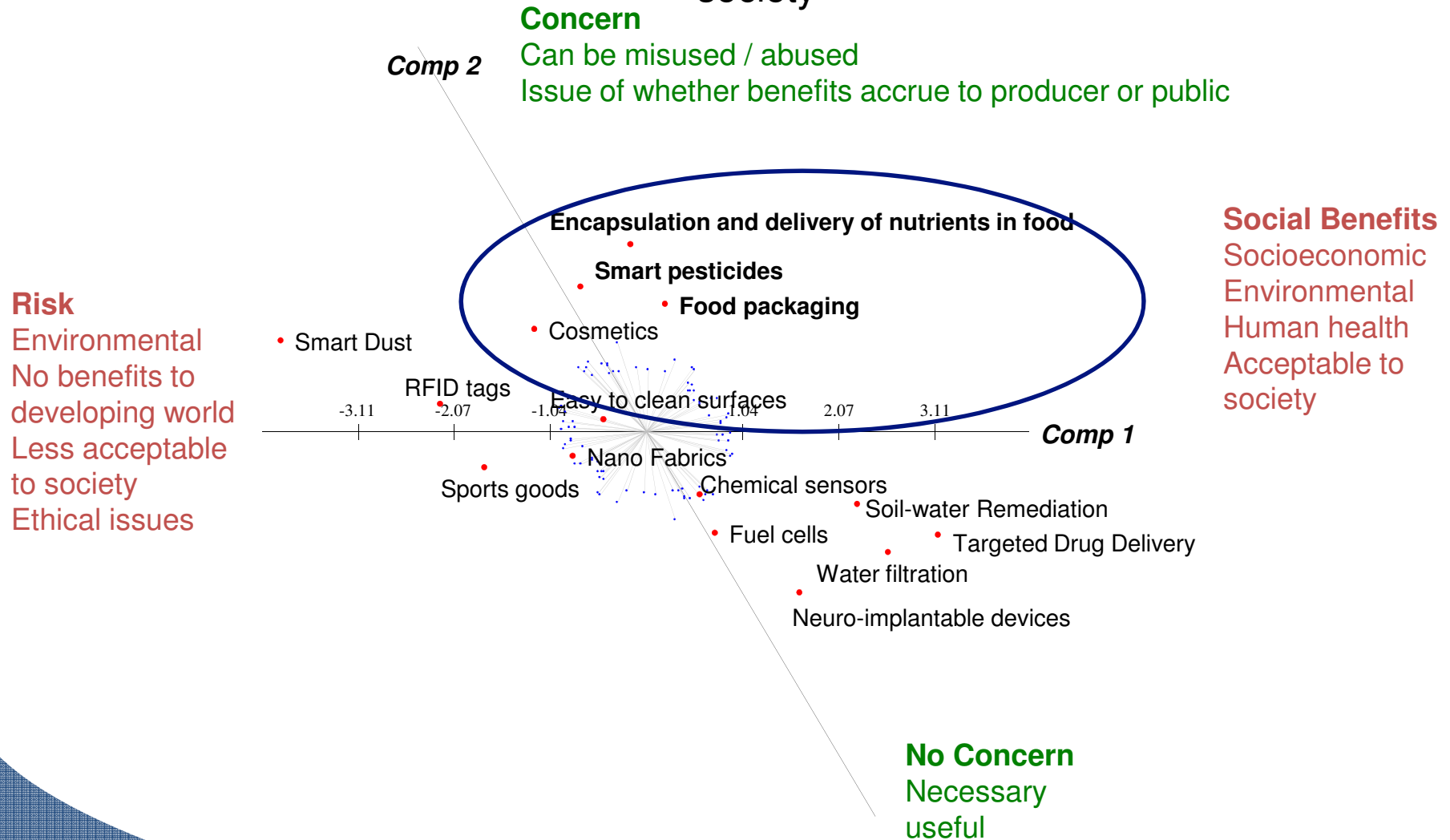
Applications of Nanotechnology

- Targeted drug delivery
- Neuroimplantable devices
- Encapsulation and delivery of nutrients in food
- Food packaging
- Smart pesticides
- Water filtration
- Soil and water remediation
- Fuel cells
- Chemical sensors
- “Smart Dust” for military use
- Cosmetics
- Nanofabrication
- Sports goods
- Easy to clean surfaces e.g. self cleaning windows
- Inexpensive RFID tags

Expert assumptions about which
nanotechnology applications will be
accepted by society

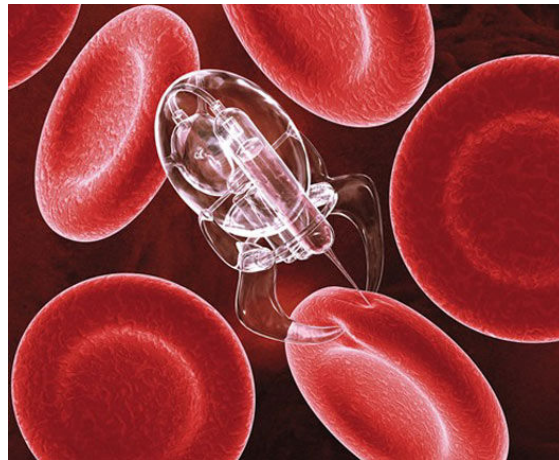


Expert assumptions about which nanotechnology applications will be accepted by society



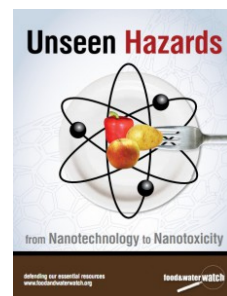
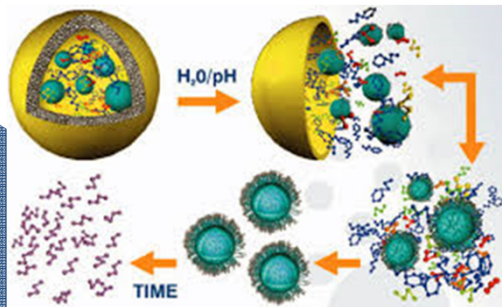
Gupta, N., Fischer, A. R., van der Lans, I. A., & Frewer, L. J. (2012). Factors influencing societal response of nanotechnology: an expert stakeholder analysis. *Journal of Nanoparticle Research*, 14(5), 1-15.

Consumer views about which nanotechnology applications will be accepted by society



Comparative analysis

- Consumers are more **positive towards agrifood nanotechnology applications** than experts think they are
- **Acceptability** will depend on **labelling** and **informed choice**
- **Failure to inform consumers will fuel rejection**
- **Effective communication** (including addressing issues of risk/benefit uncertainty) is important



Changing trust in regulation?

- **Technological innovation applied to food production *per se* is not societally unacceptable.**
 - *(Perceived) characteristics of specific technologies, or their application, may potentially be drivers of societal negativity*
- **It is too early in the implementation trajectory for societal negativity associated with specific applications of nanotechnology to have arisen**
 - *Consumers are not familiar with either the technology or its application, or*
- **Learnings from the application of GM food technologies have been implemented in the case regulation of, and communication about, nanotechnology**
 - *Which can subsequently be applied to agrifood applications of synthetic biology*

Future research needs

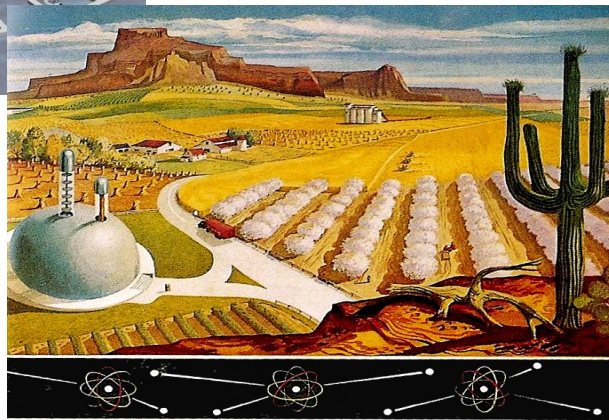


How trustworthy is the regulatory framework associated with technologies focused on solutions to delivering sustainable and safe agrifood production

Insect proteins?

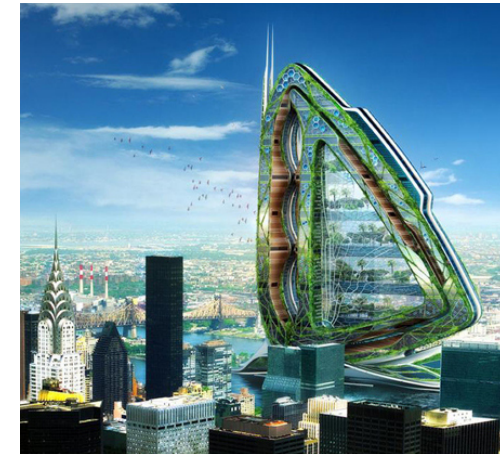


Precision agriculture?



Deserts Will Bloom Through Atomic Power

Rethinking the landscape?



Thank you

Questions or comments?

