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Pegasus-the pros and cons of genetically modified animals

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objectives of the PEGASUS project (1)

- To identify current and future ***technical developments*** in the area of genetic modification applied to animals and the importance for the (future) competitiveness of the European animal production
- To identify ***consumer perceptions*** associated with genetic modification in animals (both aquatic and terrestrial species) and derived food products by integrating national and European data
- To provide insight into the economic dimensions of using genetically modified (GM) animals in the food production chain (***feed industry, breeding industry, primary sector, processing industry***)
- To produce an overview of the ***risks and benefits*** associated with including GM animals, products in the food chain, from the point of view of the ***life sciences***

Key objectives of the PEGASUS project (2)

- To collate the documented ***ethical concerns*** raised by various stakeholder groups, academics and commentators
- To ***identify policy gaps*** and ***recommend the policy options*** to be considered
- To provide an integrated analysis of public concerns and preferences for the ***strategic development and application*** of genetic modification applied to animals, including the food derived from them
- To identify ***future European research*** needs regarding GM animals, specifically identifying areas within the agrifood sector

The partnership

- Coordinator- Wageningen University - Department of Marketing and Consumer Behaviour (Netherlands)
- Economic Research Institute LEI (Netherlands)
- University of Parma UNIPRI (Italy)
- Institute of Food Safety RIKILT (Netherlands)
- French National Institute for Agricultural Research NRA (France)
- University of Bergen UiB (Norway)
- King's College of London KCL (UK)
- University of Nottingham UNOTT (UK)
- AgroBioInstitute ABIBG (Bulgaria)
- Agri Biotech Foundation ABF (INDIA)
- PERSEUS bvba PERSEUS (Belgium)
- Institute of Food Research IFR (UK)

Consumer risk perception

- The **psychology of risk perception** drives public risk attitudes and technology acceptance
  - *An **involuntary risk** over which people have no control is more threatening than one people choose to take*
  - *Potentially **catastrophic risks** concern people most*
  - ***Unnatural (technological)** risks are more threatening than natural ones*

"Technological" food risks

- Unnatural
- Uncontrollable by those exposed to them
- Unknown long-term risks (both individuals and science)
- Food is a special cause of concern (taken into the body)


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TODAY!
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EPA: DON'T TEST Gene-Altered Corn On Us
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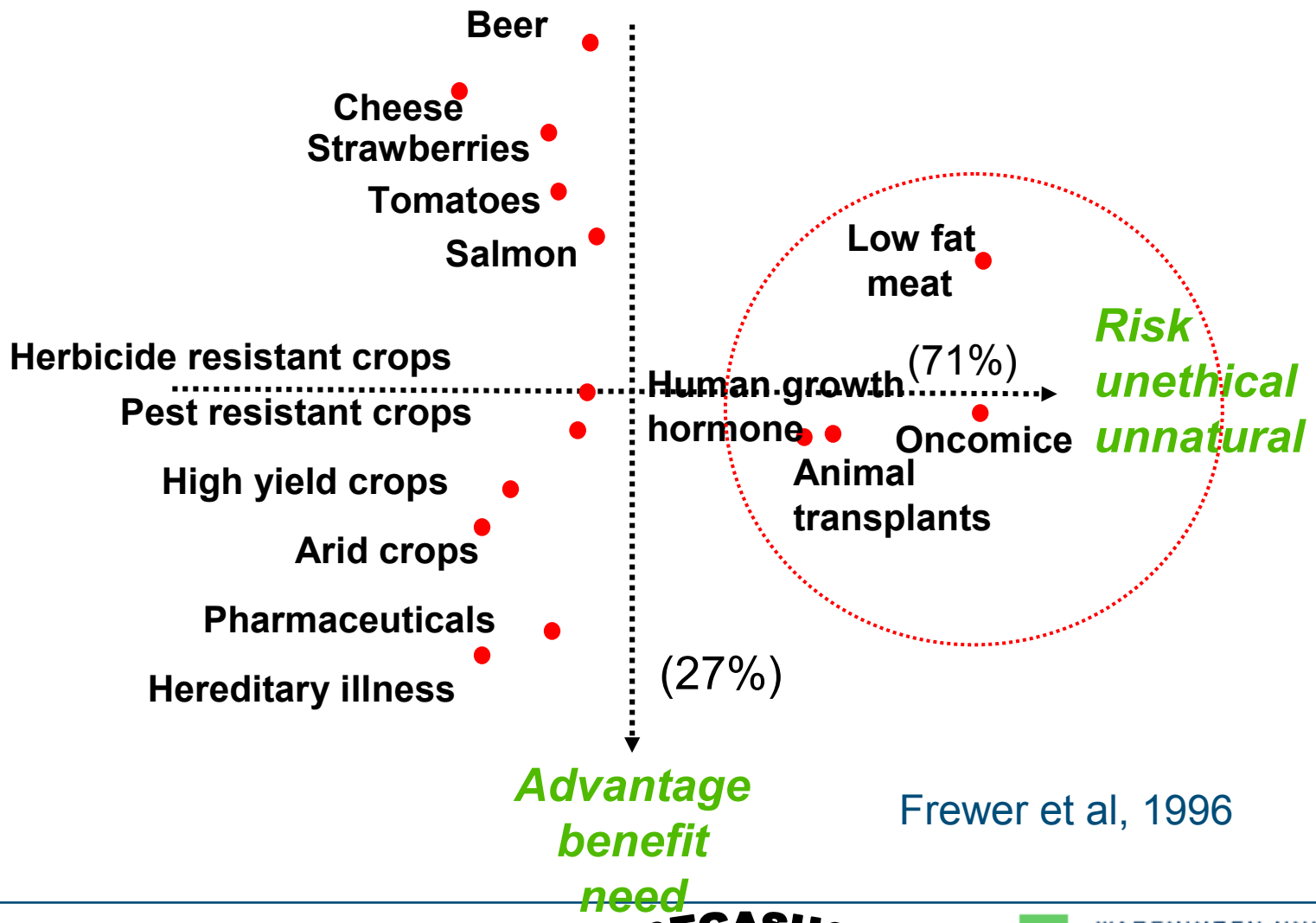
Specific Applications of Genetic Modification



Frewer et al, 1996

Emerging food technologies

- Consumers make trade-offs between **risk**, **benefit** and **cost** (including **ethical** costs)
- Consumer decisions are made on a case-by-case basis related to specific perceptions of risk and benefit
- New technologies – consumer attitudes “not starting from zero”

Consumers & Experts: A Perceptual Divide

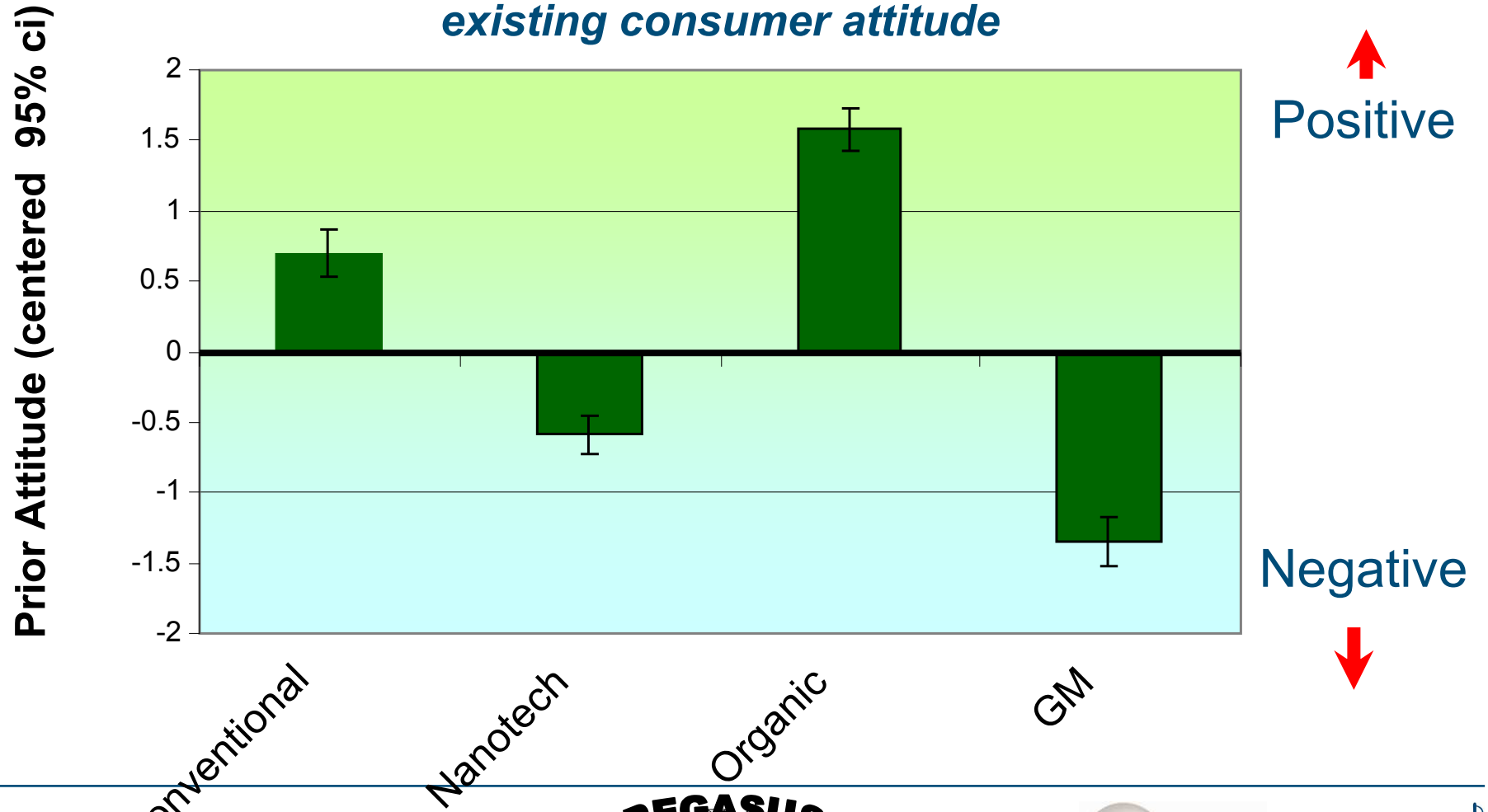
Consumers		Experts
Poor quality of information	Consumer Awareness	Consumers not willing to seek information
Continuing problems	FRM Efforts	Adequate FRM and happy consumers
Less acceptance of economic interests	FRM Priorities	More acceptance of economic interests
Emphasise consumer protection	Responsibility	Emphasise state and industry
Positive view	Media	Negative view - create public anxiety
Not acknowledged by all institutions	Uncertainty	Inherent in science

Krystallis et al, 2007, Health, Risk & Society

Risk-Experiment: Prior Attitudes

Four technologies selected based on

existing consumer attitude



Examples of GM animals at an advanced stage of development

Animal	Trait	Application	Region
Cow	Production of human lactoferrin in milk	Functional foods	EU, USA, New Zealand
Goat	Production of spider silk analogue Goat (Biosteel ®) in milk	Substrate for nanoscale fibres for non-food (medical, electronics)	Canada, USA
River carp	Enhanced growth (growth hormone)	Food (aquaculture)	China
Swine (Enviropig ™)	Improved dietary phosphate utilization (phytase)	Food (Livestock production)	Canada
Goat	Production of antithrombin (Atryn ®) in milk	Bio-pharmaceutical	USA, EU
Tilapia	Enhanced growth (growth hormone)	Food (aquaculture)C	Cuba

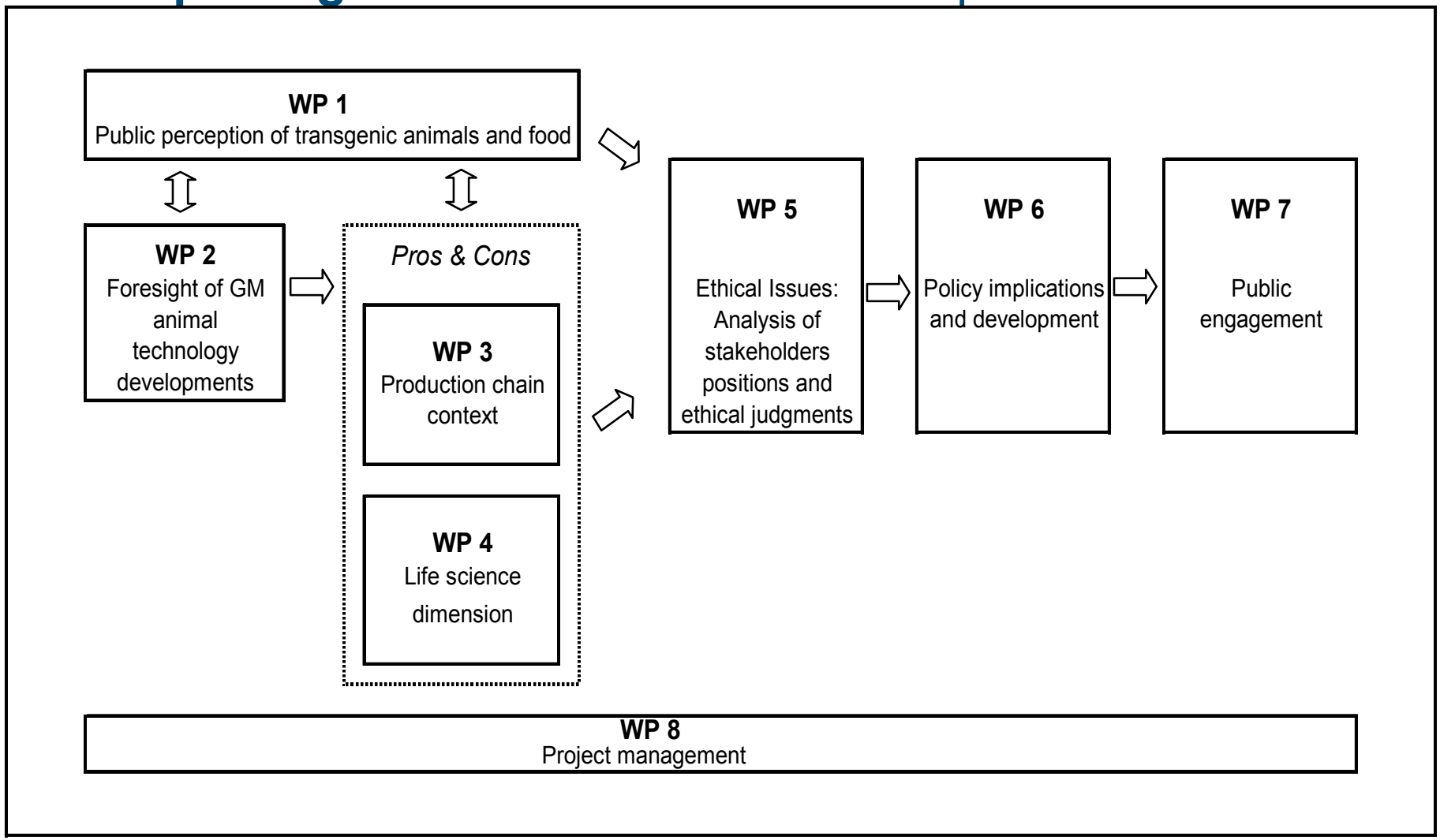
The proposed activities

- An extensive literature already exists regarding public perceptions of GM animals applied to food production.
- Similarly, extensive research literature relating to technological advances, potential economic impact, and ethical concerns, also exists.
- Needs to be translated into concrete policy support
- Policy recommendations need to be developed from expertise from both the social and life sciences

The proposed activities

- “Mapping” current public perception and technological literature regarding GM food animals (Meta analysis)
- Desk research and expert consultation will be employed to study the socio-economic, ethical and technical aspects, including perceived pros and cons
- Stakeholder consultations and meetings with policy makers will be employed to enable further feedback on the outcomes of these investigations to be provided, and to further refine the recommendations for EU policy makers.
- Two public participation events will be conducted to demonstrate the utility of public engagement on policy development

Work packages and their interrelationships



Policy support

- Information directly relevant to predicting potential policy impact associated with GM animals will be delivered
  - ***Future competitiveness of European animal production***
  - Implications for society
  - Future ***research needs*** relevant to Framework programmes
  - Provide evaluative tools, and policy support for animal production industries in Europe to optimise use of genomic technologies in animal production
  - Effectiveness of public consultation mechanisms assessed

Thank you!

Any questions?