Final document of the consensus conference on genetically-modified foods

Layman panel

- Søs Marianne Ludvigsen, Rolfsvej 5B, DK-3000 Helsingør
- Alice Kristensen, Morelvænget 22, DK-5700 Svendborg
- Gitte Breum Rasmussen, Nørre Allé 46, DK-2600 Glostrup
- Anja Vindal Johansen, Olriksvej 24, DK-3000 Helsingør
- Marianne Poulsen, Tretommervej 93, DK-8240 Risskov
- Vibeke Madsen, Bspeciehsgade 7, 3.tv., DK-8200 Århus N
- Inger Lise Vinderslev, Søndervang 14, DK-8570 Trustrup
- Hans Bødker Sørensen, Skovtoftebakken 33, DK-2830 Virum
- Ole Riger-Kusk, Vingevej 34, DK-8830 Tjele
- Thomas Bay Estrup, Vesterport 8B, 2.tv., DK-8000 Århus C
- Torben Møldrup, Lindeallé 8, DK-8740 Brædstrup
- Lars E. Hansen, Skelagervej 170B, DK-8200 Århus N
- Erik Petersen, Skæring Hedevej 76, DK-8250 Egå
- Søren Johansen, Eriksholmsvej 8, DK-4390 Vipperød

Expert panel

- Claus H. Heinberg, assistant professor, Roskilde University, Department of Environment, Technology and Social Studies.
- Per Steen, head of research, Danish Institute of Agricultural Sciences, Department of Plant Biology.
- Bo Normander, M.Sc. (eng.), activist, NOAH gene technology.
- Arne Jensen, head of section, Risø National Laboratory, Plant Biology and Biogeochemistry Department
- Jan Pedersen, M.Sc. (agronomy), Danish Veterinary and Food Administration, Institute for Food Safety and Toxicology, Division of Biochemical and Molecular Toxicology, Biomolecular Section.
- Birger Linberg Møller, professor, Royal and Veterinary Agricultural University, Department of Plant Biology.
- Jan Søndergaard, president, Greenpeace Denmark.
- Helle Nayberg, M.Sc. (food science), National Forest and Nature Agency, Agriculture and Biotechnology Section.
- Karin Andresen, food and home economist, Danish Consumer Council.
- Knud Østergaard, head of International Secretariat, Danish Veterinary and Food Administration, Department of Food Legislation.
- Aksel Buchter-Larsen, head of patent department of Danisco Ingredients.
- Christian Coff, M.Sc. (agronomy), ph.d student at Center for Ethics & Law.
- Mette Meldgaard, political analyst, Danish Association of Organic Agriculture.

Introduction

There is absolutely no doubt that the production of genetically-modified foods affects nature's cycle. However, experts strongly disagree about the seriousness of the effect and whether or not the effect is hazardous. One viewpoint has it that the risk of damage is low - but that the damage, if it occurs, may have enormous impact.

The layman panel believes that authorisations for tests and production of genetically-modified organisms should be subjected to severe regulations for risk evaluation and requirements of efficient control.

The panel realises that the market for genetically-modified organisms is especially prone to becoming controlled by monopolistic companies. With a view to countering this trend, the panel recommends public regulation to offset any adverse effects of this aspect.

The panel supports the idea of a convention guaranteeing developing countries free access to utilising gene-technology patents. Furthermore, the panel suggests that companies should lose their right of use for unapplied patents.

Gene-technological research is to a wide extent concentrated in the private sector. Thus, the panel recommends that public funding for research in the field be increased with the objective of bringing the competence of the authority-granting and controlling authorities on a par with the manufacturers.

The panel underlines the importance of ensuring that consumers are still guaranteed the choice between genetically-modified and non-genetically-modified foods. In addition, the panel opines that dissemination of information is crucial and also recommends clear, comprehensible and informative declarations of contents.

The panel believes that it must be possible to hold manufacturers of genetically-modified foods responsible for health and environment effects. In practice, to place responsibility may prove problematic, and, consequently, the panel suggests that manufacturers contribute to a fund aimed at restoring any damage.

Apparently, genetically modified foods offers no - or only very few - direct advantages at present. However, the panel cannot dismiss the notion that, in the long term, advantages will emerge in step with continued development of the technology.

In the panel's view, it is important to preserve the biodiversity of plants and animals and protect natural eco-systems. Ethical considerations of interference with individual plants or animals must be seen in an overall framework, taking into account the entire living nature and its integrity.

The panel recommends the establishment of a committee charged with ensuring an ethical evaluation of the authorisation process.

The panel recommends that ethical aspects be given the same priority as purely technical aspects in relation to applications for testing, production and marketing of genetically-modified foods.

Question 1
To what extent can production of genetically-modified foods alter nature's cycle?

How does production of genetically-modified foods agree with the principle of organic food production?
How do we ensure reversibility of unintended effects?
How do we protect original species?
Evaluation of the laymen

There can be no doubt that the production of genetically-modified foods alters nature's cycle. But experts strongly disagree on the degree of the effect - and whether or not it is hazardous.

The disagreement is not only rooted in science, it also stems from ideologic differences. The combination of scientific information and ideologic beliefs makes it difficult at this point in time to arrive at a valid conclusion.

One point of view has it that technology entails decisive, new and irreversible changes, while some scientists and stakeholders in the organic sector believe that we risk doing great, irreparable damage, leaving us few avenues of retreat.

Other scientists belittle the risk of real "catastrophes", basing their viewpoint on nature's ability to reject undesired genes and "repair" itself.

Supporters of genetic modification emphasise that the effects depend on which genes are inserted into a plant. And on how we use genetically-modified crops and products.

Today, organic and gene-technology farming methods are incompatible. But organic farmers do not completely reject the idea that gene-technology research could afford new opportunities which may be consistent with the organic standpoint.

The creation of new strains, both genetically-modified and non-genetically-modified organisms, always entails a risk of losing valuable genes forever. This is why several countries

are collecting both wild species and old strains.

Recommendations of the laymen
To offset the effects of irreversible actions, the panel recommends the establishment of gene and seed banks and the registration of all relevant data on cultivation sites and methods.

The panel also recommends that organic and genetically-modified food production methods be kept strictly separate until gene technology spurs new opportunities compatible with the organic standpoint.

Question 2
What environmental consequences do development and production of genetically-modified foods entail?

Including:
- unintended transfer to other organisms.
- development of resistance.
- unintended effects from marker/stop genes
- impact on soil conditions (micro fauna) including effects from residue and breakdown products both in the growth period and in the long run.
- effect of inserted toxins (e.g. Bt toxin).
- evaluation of future consumption of pesticides/herbicides in cultivation of genetically-modified crops.
- How can we ensure independent, competent and publicly accessible research, including risk evaluation of genetic modification of foods?

Evaluation of the laymen
Spreading occurs from genetically-modified crops to closely-related species in nature. This may mean the spreading of undesired characteristics to wild plants and crops required to be free of genetic modification.

Cultivation of genetically-modified crops necessitates the creation of retreats to reduce the risk of resistance-development.

Due to the small cultivation units in Denmark, the panel believes that to establish retreats in Denmark would prove difficult.

Certain marker and stop genes are based on substances such as antibiotics. Experts cannot

disprove that the use of such substances has undesired effects on nature and foods.

It is uncertain whether cultivation of genetically-modified crops may in time lead to an accumulation of undesired substances in soil. If this occurs, it may have an impact on future crops and nature's cycle.

In the course of the conference, it proved impossible to clarify the volume of toxins produced by genetically-modified crops.

If the volumes of toxins in genetically-modified plants exceed the volume of pesticides normally used in conventional farming, this would weaken the arguments for introducing genetically-modified crops into Danish farming.

Toxins probably also have an unintended effect on other useful organisms.

At this point in time, the transition to genetically-modified crops probably does not cause an overall reduction in the pesticide consumption.

The panel believes that research in the area is primarily focused on the private sector. One reason for this is the lack of independent research funding.

Recommendations of the laymen

Before a genetically-modified organism is introduced, thorough consideration should be given to whether transfers may occur to other organisms and what consequences this may have. We must ensure that cultivation of genetically-modified crops does not impede other cultivation methods.

The development of resistance should be followed carefully when it comes to cultivation of genetically-modified crops. For example, it is urgent to stop the spreading of Bt toxin.

We must prevent the use of stop and marker genes based on undesired substances such as antibiotics.

Requirements must be made to monitor cultivation for a period, 7 years for example. After this period, an evaluation should be made to determine whether cultivation of the genetically-modified crop is still acceptable.

Spraying plans must be developed indicating the lowest dose of pesticides necessary for cultivation of genetically-modified crops.

Sufficient financial means must be set aside to ensure continued independent research in the area.

Question 3
How does the consumption of genetically-modified foods affect the human organism?

Including:
- effect on immune system.
- development of resistance to antibiotics.
- effect on fertility (e.g. impact from stop genes).
- the body's absorption of toxins (e.g. Bt toxin).
- development of new diseases.

Evaluation of the laymen
A possible health risk may be related to the consumption of genetically-modified foods, but it is difficult to assess whether the risk is higher than that related to other new foods.

The most likely risks would be:
- toxic effects
- allergic reactions
- changes in nutrient value
- effect of genes resistant to antibiotics

Experts do not believe that the consumption of genetically-modified foods presently impacts on fertility or the immune system.

No information is available to clarify whether genetically-modified foods may engender new diseases.

Recommendations of the laymen
The panel finds that a high safety margin is necessary through risk evaluations of genetically-modified foods. Therefore, we recommend that evaluations are made case by case, where a separate decision is made for each case as to which data, analyses and animal testing, including feeding tests, are relevant.

Question 4
How do we prevent a monopolistic market where few companies control certainty of supply,

supply, pricing and quality of genetically-modified foods as well as the use of gene technology in food production?

How do patents affect these conditions?
To what extent is research in genetically-modified foods carried out with special emphasis on developing countries' domestic production?
How do we ensure that the needs of developing countries are considered?
What is the utility value of genetic modification in food production for the global food supply?
Evaluation of the laymen

Today, there are few, but huge suppliers of genetically-modified organisms. These companies often supply the pesticide to which a genetically-modified organism may be resistant. Finally, the monopolistic aspect is magnified as the same company is often also holding the patent for any stop genes. This neutralises market mechanisms for pricing, certainty of supply and supply. Patents may increase the concentration of these monopolies.

As it stands today, industrialised countries only research to a limited extent in genetically-modified foods targeted at improving the domestic production of developing countries. This type of research is primarily publicly funded.

The panel assesses that the existing food deficiency in certain areas is primarily caused by distribution problems. Thus, an increase in food production would not alone solve the problem. However, it cannot be ruled out that, in the long term, some food supply problems will arise which could be remedied by means of genetically-modified crops.

Recommendations of the laymen
Public regulation is necessary to counter the formation of monopolies. Since the commercial use of stop genes is an essential aspect of forming monopolies, the panel recommends that this type of application be banned.

To prevent patents from aiding in forming monopolies, the panel suggests that their duration be limited to 5 years. The panel also suggests that companies lose the right of use for unapplied patents.

Provided that no better alternatives exist, gene technology can be developed especially for use in the developing countries. Development must be rooted in the needs of developing countries and local conditions, so that the use of genetically-modified organisms will not eclipse traditional cultivation methods and increase developing countries' dependency on industrialised countries. In relation to use of gene technology, the panel proposes that the principle of no-charge be used (developing countries will not be required to pay fees for use of

gene technology) and that a convention be adopted to make patents available without charge to developing countries. The panel recommends an increase of public funding especially targeted at research in the developing countries' needs.

Question 5
How do we ensure independent, competent granting of authorisation and control of genetically-modified foods for:
- testing?
- production and cultivation in both the short and the long term?

Evaluation of the laymen
The layman panel believes that Denmark has processed so few applications for authorisations that it is impossible to evaluate whether the existing procedures for authorisation, supervision and control are sufficient. The panel finds no reason at present for questioning the independence of the procedure.

The layman panel sees no current problems in having companies' in-house control vis-à-vis the authorities rest solely on trust between the parties. However, this relationship must constantly be monitored to ascertain any changes, should the trust no longer exist.

Recommendations of the laymen
To ensure independent, competent authorisation and control, the public authorities granting the authority must be given sufficient resources, and their independence vis-à-vis other stakeholders must be safeguarded to maintain their objectivity.

The layman panel supports the new EU directive, where both manufacturers and authorities must conduct risk evaluations, before testing, production and cultivation can be authorised.

Companies' in-house control will remain reliable as long as it is accessible and transparent to the stakeholders entitled to be heard.

The companies are charged a fee to cover their achievement of an authorisation. The layman panel recommends that the revenue be used for independent research in fields given high priority by society but low priority by private companies.

Question 6
How do we ensure consumers sufficient general information on genetically-modified foods?

How can we use simple and clear labelling and other types of information to ensure that consumers can see how, why and to what extent individual foods were modified genetically?

Evaluation of the laymen
The laymen believe that consumers want impartial information on genetically-modified foods.

The layman panel also assesses that thorough labelling of genetically-modified foods is necessary.

Consumer requirements and legislation for labelling differ. Denmark follows the EU regulations, which only focus on whether genetic modification can be ascertained in a product, while consumer requirements also call for information on the production process. In fact, consumers wish to know whether gene technology has ever been applied at all.

Recommendations of the laymen
The layman panel recommends that funds be made available to allow authorities and interest groups to disseminate detailed and professional information on genetically-modified foods. The information could for instance be channelled through:
- informative campaigns
- leaflets in easily comprehensible language
- application of up-to-date IT
- adult education
- public debates

The layman panel recommends that the EU legislation on supplementary national requirements for labelling be used. Thus, consumers should be ensured clear, comprehensible and informative declarations of contents, including information as to how gene technology was applied in the production of a product and to what extent.

<b<="" b="" style="color: rgb(0, 0, 0); font-family: Verdana, Arial, Helvetica, sans-serif; font-size: 10.6666669845581px; font-style: normal; font-variant: normal; font-weight: normal; letter-spacing: normal; line-height: normal; orphans: auto; text-align: start; text-indent: 0px; text-transform: none; white-space: normal; widows: 1; word-spacing: 0px; -webkit-text-stroke-width: 0px;">
What should be the content of Danish/EU legislation on genetically-modified foods in relation to:
- responsibility?

- control?
- violations?
- sanctions?
- liability for damages?

Which overall principles should apply when Denmark institutes legal proceedings and implements sanctions for violations of the rules for research, development, production and marketing of genetically-modified foods?

Which legal guarantees and possibilities for damages should consumers and society be ensured in terms of inappropriate long-term effects on humans and the environment?

Evaluation of the laymen

The panel opines that the experts questioned share a basic satisfaction with the valid rules and regulations, provided that the draft directive (90/220/EØF) is adopted with its current contents.

It is crucial to ensure that legislation always reflects the latest knowledge in the area.

Legislation must constantly be improved. It seems, for instance, that provisions were not made for matters of damages and sanctions relating to unintended effects of genetically-modified organisms. In addition, no decisions have been made on the ethical aspects.

Recommendations of the laymen

We should ensure that, at any time, production of genetically-modified foods takes into account the existing knowledge of risks. The public should have access to this knowledge.

If valid legislation and granted authorities are violated, authorisation must be withdrawn. An authorisation should apply for a maximum of 7 years and should then be reconsidered.

The panel believes that it must be possible to hold manufacturers of genetically-modified foods responsible for any damage to the environment or health. In practice, however, it will be difficult to determine who bears the responsibility. To avoid futile actions for damages, a charge should be levied on all manufacturers and compiled into a fund or similar construction to cover any damage.

The panel recommends that legislation be prepared committing any and all manufacturers and dealers to be able to explain the origin of a product. Documentation on paper, especially, should state whether and why gene technology has been applied in connection with

production or processing.

As to the ethical dimension, refer to question 9.

Question 8
What do consumers gain from genetically-modified foods?

How do we ensure that, in future, consumers can select between products, thus being able to select non-genetically-modified foods?
Evaluation of the laymen

Today, the supply of genetically-modified foods in Denmark is so limited that it is difficult to make a qualified evaluation of what advantages genetically-modified foods offer to consumers. Apparently, no - or only quite few - direct advantages exist at present. However, the panel does not reject the idea that, in the long run, advantages will emerge in step with the technological development.

However, the panel foresees potential problems in relation to ensuring consumers a real choice between genetically-modified and non-genetically-modified foods in the future. For example, the panel identifies a problem in genetically-modified and non-genetically-modified crops being mixed in connection with harvesting.

Recommendations of the laymen
The panel recommends that research, development and information efforts be made to guarantee that consumers will still have real access to non-genetically-modified foods.

Question 9
Which values and ethical considerations should form the basis for research, development and production of genetically-modified foods comprising:
- animals?
- plants?
- micro-organisms?

Is it acceptable from an ethical viewpoint to patent genetic modification of plants and animals?
Is it acceptable from an ethical viewpoint that genes are inserted into plants and animals, rendering them infertile?
Evaluation of the laymen

The panel believes that it is crucial to uphold animal and plant biodiversity and to protect natural eco-systems. Considerations of interference in individual plants or animals must be viewed in an overall ethical framework, taking into account all of living nature and its integrity. Genetic modification of animals gives rise to special ethical considerations. In addition, the panel is concerned about human interference in the reproductive ability of animals and plants.

Interference in animal and plant hereditary factors is so pivotal that, prior to any political decision and technical authorisation, a thorough ethical evaluation must be made of the objective, necessity and utilisation value of applying gene technology.

Without such evaluations, political decisions risk being made without due attention to consumer attitudes and actual desires.

In the eyes of the panel, the challenge is to create a fair balance between protection and development.

Recommendations of the laymen - refer to question 10.

Question 10
How can ethical aspects be included in authorisation and control procedures for genetic modification of animals, plants and micro-organisms for foods?

Which weight should ethical aspects carry in authorisation and control procedures in relation to risk evaluation?
What or which organisation will represent ethical aspects. And how do we ensure consumer influence?
How do we ensure continued and wide ethical debate?
What ethical divergence exists between principles of organic food production and food production applying genetic modification?
Evaluation of the laymen

At this point, the ethical aspects have not actually been incorporated into existing authorisation and control procedures.

The panel opines that ethical aspects are not given sufficient weight compared to purely technical arguments.

In the eyes of the panel, a broad and continued ethical debate has not yet been launched.

Recommendations of the laymen

The panel recommends that ethics is given the same weight as the technical aspects of an application for testing, production and marketing of genetically-modified organisms for foods. The ethical evaluations should be included at every level of the authorisation procedure. Companies should be required to motivate applications on the basis of utilisation argument. Once the application has been processed by the relevant authorities, it is forwarded with both technical and ethical aspects for hearing with relevant interest groups.

The panel also recommends the establishment of a council on gene ethics. The council should handle the following tasks:

participate actively in authorities' evaluation and authorisation of applications for genetic modification in aspects related to food-ethics.
launch proceedings to ensure a dialogue between different interest groups, consumers and manufacturers.
The panel recommends that an ongoing ethical debate be ensured through campaigns and constant information targeted at the population. Individual consumers must be granted access to information which may form the basis for decision-making in any aspect of genetic modification.

An ethical debate on genetically-modified foods should be a part of a broad food-policy debate.