ACNFP

Advisory Committee on Novel Foods and Processes

Annual Report 2001

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Advisory Committee on Novel Foods and Processes – Annual Report 2001

The Advisory Committee on Novel Foods and Processes (ACNFP)
is an independent body of experts whose remit is:

'to advise the central authorities responsible, in England, Scotland, Wales and Northern Ireland respectively on any matters relating to novel foods and novel food processes, including food irradiation, having regard where appropriate to the views of relevant expert bodies.'

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Annual Report 2001

FOOD STANDARDS AGENCY

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Foreword

I am pleased to present the 2001 annual report of the Advisory Committee on Novel Foods and Processes. 2001 was our first full year of operation under the Food Standards Agency. We welcome the opportunity to carry out our role for the Agency especially since we share the same core values of putting the safety of the consumer first, being open and accessible, and being an independent voice.

In November, we held on open meeting in Birmingham, which was attended by almost 30 organisations including industry and campaign groups. The event was welcomed by all participants as a positive mechanism for us to engage with stakeholders; it was welcomed by committee members as a means to enable us to provide information about the regulatory framework within which we operate and to explain the science base behind our decision making. The topics discussed in the meeting were openness, safety assessment of genetically modified foods and finally, cholesterol lowering products and other functional foods. There were several very useful suggestions made by attendees and we are currently looking at their implementation .The open meeting is one of several mechanisms which we use to engage with our stakeholders but we still have some way to go. Advance disclosure of all non-confidential information relating to submissions is now routine. I would like to encourage all interested parties to access this information which is on the ACNFP pages of new agency website (www.food.gov.uk/science/ouradvisors/novelfood/) and to bring any issues to the attention of the Committee. Likewise, we welcome any feedback on the three new information leaflets that we issued this year.

During 2001 the ACNFP also held its 50th meeting and details of the actual applications that we have dealt with, as well as a cumulative index, are included in this report; as are reports on several consultations that we have undertaken. It is appropriate to look to the future; it is now nearly 5 years since regulation 258/97 came into operation, hence, during the coming year we will participate in the coming quinquennial review of the regulation. We will also work with our European counterparts to encourage them to follow the good practices of openness and transparency adopted in the UK.

I am indebted to the hard working and very professional committee members who give their time and the benefit of their world class expertise, without them the committee would cease to function. My special thanks go to Professors Gasson, Sanders, Sewell, Rev.Prof Reiss and Mrs Russell whose terms of duty on the Committee came to an end in 2001. Finally, we all owe a tremendous debt of gratitude to the Secretariat for their work in ensuring efficient and effective conduct of Committee business. Without their support we would not be able to provide robust, independent advice.

Professor J.M Bainbridge O.B.E

Introduction

This is the thirteenth annual report of the work of the Advisory Committee on Novel Foods and Processes (ACNFP).

Details of the EC Regulations on Novel Foods and Novel Food Ingredients (258/97) can be found in the 1999 and 2000 Annual reports. The European Commission issued proposals on GM foods and feeds and this is reported in Section 5. In addition the Novel Food Regulation (258/97) Article 14 includes a requirement to review the operation of this regulation within 5 years of its implementation in May 1997. A discussion document is likely to be issued by the Commission for consultation in spring 2002.

The ACNFP received a number of applications in 2001, details of which are at sections 1, 2 and 3 of this report. The summary reports of applications discussed by the ACNFP in 2001 have been split into 3 sections; applications for a full safety assessment initially received by the UK Competent Authority; those received where another Member State has provided the initial opinion on a full application; and notifications received by the UK Competent Authority. Those topics discussed during 2001 that were continuations of previous work are indicated as such.

The Committee also discussed a number of more general issues during the year including the ACNFP's guidelines on human studies and taste trials, further information can be found at section 4.

Following on from previous initiatives towards increasing the openness of its work, the ACNFP held an open meeting in Birmingham, which was attended by representatives from 26 organisations including campaign groups and industry, further details can be found at section 6.

A cumulative index of topics considered in previous annual reports can be found at section 11. Copies of previous annual reports can be obtained from the Secretary to the Committee (See section 7). The Committee's last 4 annual reports, as well as other information can be found on its webpages at *www.food.gov.uk/science/ouradvisors/novelfood/*

1. Full applications submitted to the UK Competent Authority

1.1 DHA Gold

The ACNFP received an application from OmegaTech, seeking approval to market DHA Gold™, a DHA-rich oil.

DHA (docosahexaenoic acid) – rich oil is produced via an algal fermentation process using a microalga from the genus *Schizochytrium*. The production strain of microalga used for DHA Gold' has been developed using conventional improvement techniques of the wild type strain and no recombinant DNA technology was used.

DHA-Gold™ was identified as belonging to class 2.2 of the Novel Food Regulation, 258/97 ("complex novel food from a non-GM source", "the source of the novel food has no history of use in the community").

The Committee considered this application at their March meeting, additional data requested by the Committee was considered by post.

Members were content that the application dossier contained good product specification data and a detailed description of the production process. The product is manufactured using a standard method, which was shown to be both reliable and reproducible.

There were no nutritional concerns with this product, since it was demonstrated that all components of the extracted oil are themselves present to some degree in the human food chain. There is a general world-wide recommendation to increase the level of DHA in the diet, for example, in 1994, COMA (Committee on Medical Aspects of Food Policy) recommended that the adult population consume approximately 1.5g of long chain (EPA/DHA) n-3 polyunsaturated fatty acids per week. The Health Council of the Netherlands and the National Nutrition Council of Scandinavia have echoed this recommendation, amongst others.

Further information was sought regarding the compositional analysis of the oil. The Committee was concerned about the presence of components, particularly protein and carbohydrate, which potentially may elicit an allergenic response. The Company was able to provide evidence to answer the Committees queries in this area.

The Committee observed that the animal toxicology studies had been carried out using dried algae and not with the actual oil. Also, no confirmatory data in humans were provided. Therefore, the Committee requested that the Company carry out a human clinical trial to demonstrate that there are no adverse effects from humans consuming the oil. The Company agreed to this, and the results will be available early in 2002.

Since the oil is intended as a nutritional ingredient, the Committee stressed that any claim made on foods due to the inclusion of the oil must comply with the general criteria for making nutrient content claims and any health claims made will have to comply with the appropriate legislation in this area. The Committee also recommended that the Company advise food manufacturers regarding appropriate inclusion levels in particular foods and that final products should be labelled with the ingredient name and the prescribed nutritional labelling.

The Committee was satisfied by the evidence provided to date but considered that confirmatory data were required in humans to provide additional reassurance that DHA-Gold is safe for human consumption and that the oil should not be approved in Europe until such confirmatory data were provided.

At the time of going to press, the Committee have yet to review the human clinical data supplied by the applicant.

1.2 Trehalose – update

This application was described in the 2000 Annual Report[12]. The Commissions' draft decision authorising the placing on the market of Trehalose was considered at the Standing Committee for Foodstuffs in July 2001 and it was agreed to approve this application subject to the wording 'contains a source of glucose' appearing on the label of all products containing Treholose.

1.3 Echium oil – update

This application was described in the 2000 Annual Report[12]. The additional information requested, by the Committee, from John K King & Sons Ltd will be considered in 2002.

2. Applications submitted to other Member States.

2.1 Coagulated Potato Protein

The ACNFP was asked for its views on an application made to the Netherlands Competent Authorities (CA) for approval of coagulated potato proteins and hydrolysates thereof as food ingredients. The Netherlands (CA) had given this application a favourable Initial Opinion.

The Committee considered that consent should be given if certain conditions are met. Firstly, the company should show that the concentration process has not increased the allergenicity of the potato proteins. Secondly, quality assurance systems should be employed to ensure glycoalkaloid content and microbiological contamination levels are acceptable. Thirdly, sulphite levels should conform to European and National legislation and those manufactures using the product are informed of the sulphite content to enable them to conform to labelling legislation. Finally, the company should comply with EU/National legislation/Guidelines regarding enzymes used as processing aids in manufacturing the potato protein.

The Committee's opinion on this application was forwarded to the Commission in April 2001. A copy of this letter is at Appendix II.

2.2 Foodstuffs enriched with plant sterols

Following the approval of Unilever's yellow fat spread fortified with phytosterol esters, in 2001, a number of further applications under (EC) 258/97 were made to Member States for free phytosterols and stanols. Although the intended purpose, (reduction in LDL-cholesterol) was the same, these applications sought approval for a wide range of foodstuffs.

2.2.1 Phytosterol enriched foodstuffs

The ACNFP was asked to consider Initial Opinions for three applications made to the Finnish Competent Authority for a range of foodstuffs enriched with phytosterols.

Phytosterol enriched frankfurters, sausage, yoghurt and cheese

The Committee was asked to comment on the Finnish Initial Opinion for an application by Valio to enrich the above products with a range of phytosterols. In addition the applicant intended to further enrich the products with minerals (namely Ca, Mg and K) and also reduce the sodium content of the sausage products with Pansalt®. The Finnish Initial

Opinion was generally favourable but did not recommend the addition of Pansalt® to sausages and also recommended the applicant carry out a post market surveillance programme.

Members indicated concern and requested clarification on the long-term effects on absorption of fat-soluble vitamins and carotenoids and also whether the consumption patterns for the Finnish population were predictive for the UK population. The Committees' opinion was forwarded to the Commission in February 2001 together with a separate letter, detailing the Committees' concerns as to the increasing number of free and esterified phytosterol and phytostanol enriched products either on the market, or seeking approval. Copies of these letters are attached at Appendix III and Appendix IV.

Phytosterol enriched bakery products, grain-based snacks and gum arabic pastilles

The Committee was asked to comment on the Finnish Initial Opinion for an application by Oy Karl Fazer to enrich the above products with a range of phytosterols. In addition the applicant intended to further enrich the products with minerals (namely Ca, Mg and K). Although the Committee broadly agreed with the Finnish Initial Opinion, the UK Competent Authority formally objected to the application based on the concerns of members. These concerns were broadly similar to those described for the application for phytosterols enriched frankfurters, sausage, yoghurt and cheese. However in addition Committee members noted that the some of the products (notably grain-based snacks and gum arabic pastilles) were perceived to be potentially desirable to children whereas products fortified with such ingredients are not aimed at this section of the population. Members also wished their concerns that there were increasing numbers of these products being considered under (EC) 258/97 to be noted in the Committees' opinion, which was forwarded to the Commission in May 2001 (Appendix V).

A phytosterol enriched fat ingredient

The Committee was asked to comment on the Finnish Initial Opinion for an application by Teriaka Ltd for Diminicol®, a plant sterol enriched fat ingredient that would be used to replace its traditional counterpart in yoghurts, margarine, soft cheese and fruit milk drinks. The Finnish Initial Opinion deemed the ingredient as safe as similar plant sterol enriched products but did not support the marketing of the product. The UK Competent Authority broadly agreed with this opinion but raised a number of additional concerns with the application. The main concern, which is generic to all phytosterol enriched products, is that they could have a long term deleterious effect on the absorption of carotenoids, especially with the possibility of cumulative consumption of phytosterols due to the wide range of phytosterol enriched products that could become available. The Committee Members also found that the suggested labelling of the products containing the novel ingredient was unsatisfactory, that some of products to contain the ingredient

(yoghurts and fruit milk drinks) could be potentially desirable to children, and that there was the potential for allergenicity with the ingredients due to one of the phytosterol sources being peanuts. The Committee did not support the marketing of the Diminicol® product range until the above concerns were addressed. The UK Competent Authorities views on the Finnish initial opinion were forwarded on to the Commission on the 10th December 2001 (Appendix VI).

2.2.2 Phytosterol and phytostanol enriched foodstuffs

The ACNFP considered an opinion for an application made to the Belgian Competent Authority for a range of milk based products enriched with a mixture of phytosterols and phytostanols.

Phytosterol and phytostanol enriched milk based beverages with option of added fruit

The concerns raised by the ACNFP and other Member States about the potential over-consumption of plant sterol enriched foodstuffs were discussed at the Commissions' Novel Foods Working Group, who identified sufficient grounds for the issue to be referred to the Scientific Committee for Foods (SCF) for their consideration. In view of this, the opinion of the Belgian Competent Authority for the application by Novartis for phytosterol and phytostanol enriched milk based beverages was referred directly to the SCF in March 2001. Although the UK received a copy of the opinion, this did not offer an opportunity for UK comments. As this approach is not recognised in the Novel Food Regulation, comments were requested from the Committee on the application in the usual way and forwarded, with an explanation to the Commission.

The Committee formally objected to the application. In addition to issues raised in all other applications (see above), Members were of the opinion that milk based fruit products, particularly those with added fruit would be attractive to children, whereas products fortified with such ingredients were not aimed at this section of the population. In addition, there were insufficient toxicological data, clarification was required as to whether the material tested was the same as that to be marketed, and the literature cited was relatively old. Additional issues addressed by the Committee included a lack of information on their intended labelling. The Committees' opinion was forwarded to the Commission in June 2001 and is attached at Appendix VII.

2.3 Tahitian Noni Juice *(Morinda citrifolia)*

The Committee was asked to comment on the unfavourable Initial Opinion by the Belgian Competent Authority for the application by Morinda inc. for Tahitian noni juice.

Although the Committee was of the opinion that the product should not receive a favourable opinion, Members agreed with the company that the Belgian CA's insistence that further toxicological testing, at much higher doses, was not practical and could lead to potentially misleading results. However the Committee was concerned at the lack of allergenicity studies, and also agreed that further clarification was required on both the intended market, and daily consumption figures for the product, given that the toxicological data were based on relatively small volumes. The Committees opinion was forwarded to the Commission in December 2001 and a copy is attached at Appendix VIII.

2.4 Gamma- Cyclodextrin

The ACNFP was asked to consider an Initial Opinion for an application made to the Italian Competent Authority for γ-cyclodextrin. Cyclodextrins are cyclic maltooligosaccharides, of which γ-cyclodextrin, consisting of eight glucose units arranged in a ring is the largest. The ability of γ-cyclodextrin to form complexes with a wide variety of organic molecules, together with a relatively high water solubility would make it a versatile food ingredient.

The Italian CA concluded that γ-cyclodextrin was an additive and should not be considered under the Novel Foods Regulation. Although the applicant was of the opinion that as the product did not fall within the scope of any existing Additives legislation, it should be considered a Novel Food, the Committee agreed with the Italian Initial Opinion. Members were concerned that consumption of large quantities of γ-cyclodextrin may have implications for diabetics, as γ-cyclodextrin could be a source of glucose. Members were also concerned that the extraction solvent used was not permitted for use in foodstuffs under the terms of the Extraction Solvent Directive (88/388/EC). Inclusion of this solvent (albeit in trace quantities) should be a consideration in any subsequent food additive application. The Committees opinion was forwarded to the Commission in December 2001 and is attached at Annex IX.

2.5 High Pressure Processing – Danone – update

This application was described in the 2000 Annual Report. The Commission's draft decision authorising the placing on the market of Danone's fruit based preparations, pasteurised using high pressure processing was considered at the Standing Committee for Foodstuffs in May 2001 and it was agreed to approve this application.

2.6 Novartis BT11 Sweet Maize – update

This application was described in the 2000 Annual Report. An opinion is still awaited from the European Commission Scientific Committee for Foods.

2.7 Monsanto GM Maize – update

It was incorrectly reported in the 2000 Annual report that the European Commission Scientific Committee for Foods had given a favourable opinion for GM maize line GA21 in October 2000. The objections raised to the initial assessment by a Member State will be considered by the SCF in early 2002.

2.8 GM *Radicchio Rosso*/Green hearted chicory – update

This application was described in the 1998 and 1999 Annual Reports. The applicant has asked for these applications to be put on hold and so the opinion from the European Commission Scientific Committee for Foods is suspended until further notice from the applicant.

2.9 Nangai Nuts – update

On the 8th March 2000 the Scientific Committee for Food published its opinion on this product, and requested further information to be submitted in respect of the concerns raised. This information was not provided and so a decision was taken on the 19 December 2000 by the Scientific Committee for Food to reject the application. To date no further information has been submitted to the Scientific Committee for Food and so this decision still stands.

3. Notifications

3.1 Monsanto GM Oilseed Rape – update

In 1995, Monsanto sought food safety approval for oil from glyphosate-tolerant GM oilseed rape under the UK voluntary scheme. Clearance was sought for oil from the genetically modified line GT73, and for oil from varieties derived from that line by conventional breeding.

The application is described in the 1995 Annual Report[7]. The Committee concluded that the oil was safe for use in food and compositionally comparable to oil from conventional oilseed rape varieties. As part of the approval, the company was requested to provide results of regular monitoring of the seed composition and fatty acid profile of the oil.

In 1999, the Committee considered monitoring data supplied by Monsanto, looking specifically at seed composition and the fatty acid profile of the oil. The Committee was content with the data provided.

More monitoring data was received from Monsanto in 2001, which Members considered at the 51st ACNFP meeting.

Members were content with these monitoring data and agreed that the information provided was sufficient to confirm the long-term stability of the quality and safety of the GM rape varieties.

3.2 Monsanto GM Cottonseeds – update

RRC 1445 – Herbicide tolerant (herbicide Roundup® – active ingredient glyphosate)

IPC 513 – Insect resistant (Bt)

The Committee first considered applications from Monsanto in relation to two GM cottonseed lines in 1997 (see 1997 Annual Report[9]). The applications were for opinions on the substantial equivalence of the processed oils derived from herbicide tolerant (RRC 1445) and insect resistant (IPC 513) cottonseed. The Committee considered additional data in 1998/9 (see 1998[10] and 1999[11] Annual Reports). Following consideration of these data, the Committee was not satisfied on a number of issues. Further information was requested from Monsanto regarding the presence of DNA and protein in refined cottonseed oil and additional molecular characterisation of the Bollgard® cotton event 513 (IPC 513). Also, the company was asked to address the statistically significant differences seen in some of the components of the unprocessed GM cottonseed compared with the controls.

The Company provided data to address most of the points raised by the Committee and, where this was not possible, an explanation and justification was given. The company also provided a more detailed molecular characterisation of the DNA flanking the inserts. This was performed using more sensitive and precise methods than were available at the time of the original application.

Members were content that their previous concerns had been addressed and that the data showed that there was no DNA or protein detectable in the final oil, using current methodology. As such, the Committee was content to give clearance to the oils. The Committee also agreed that the additional molecular data did not raise any further concerns regarding the safety assessment of the GM cottonseed oil.

A report on these two notifications will be prepared for consideration by the ACNFP in 2002.

3.3 High Pressure Processed Fruit Based Products

Following the successful application under the Novel Foods Regulation (EC) 258/97 by Danone, the Committee was asked to consider two applications for high pressure processed fruit based products. Discussions at the Novel Foods Working Group concluded that as a successful application had already been made, high pressure processing *per se* no longer fell within the scope of the regulation. However as it fell within the remit of the ACNFP to look at applications that use processes such as high pressure, they offered an opinion on both applications.

High Pressure Processed Fruit Based Products

The Committee commented on an application from Orchard House Foods for a range of fruit based products including Smoothies, Lemonade and Fruit Crushes. After requesting further information on maximum pH values, efficacy of microbial kill and a detailed HACCP plan, members agreed that the products were at least as safe as their non-pasteurised counterparts, subject to a number of stringent process conditions. A copy of the letter setting out these conditions is attached at Appendix X.

The Committee also considered an application for a similar range of products from ATA/Flow. Although the applicant was able to demonstrate microbial kill at a range of pressures, they were of the opinion that the process parameters should be set by individual food manufacturing companies on a product-by-product basis each tailored according to a specific HACCP plan. As there was no minimum pressure or process time specified Members were not able to offer a positive opinion for this application at this time.

3.4 Virgin Prune oil

The French Competent Authority evaluated a notification from Vidalou Farm to place virgin prune kernel oil on the market, and gave a favourable opinion. The ACNFP was asked to comment on this notification.

In the past, the ACNFP has considered information regarding passion fruit, cherry and apricot kernel oils (see 1991[3] and 1992[4] annual reports). In all cases, the predominant concern was the possible presence of hydrocyanic acid, which breaks down to form cyanide, in the final oil. The information provided in the notification indicated that the levels of this compound in the resultant product falls within the limits set by substantially equivalent oils currently on the market.

Members had no major concerns regarding this application provided that the prune kernels were monitored and aflatoxin levels remained within accepted limits, they also requested that the oil be labelled as being derived from prunes in order that those consumers with an allergy to prunes could avoid this product.

The Secretariat forwarded the Committee's comments to the European Commission and to the French Competent Authority in March 2001 and a copy of this letter can be found at Appendix XI.

4. Other issues considered by the ACNFP

4.1 T25 Maize update (Article 5)

In 1996, the Committee considered the safety of processed food products obtained from T25 maize, which had been modified to be tolerant to the herbicide glufosinate. These foods were assessed under the voluntary scheme, which was then in place.

In 2001, as part of Aventis' ongoing characterisation of the GM maize line, the ACNFP was provided with further molecular biology data. The data comprised sequence information of the surrounding flanking regions of the insert, and further sequence detail of the plasmid used for the T25 transformation event.

The Committee was asked to consider this new information at the 50th meeting and to discuss whether there were any new food safety issues that should be raised with the Company.

Members were satisfied that these further data did not have any implications for the safety of food products derived from the T25 maize line, and did not alter the initial safety assessment. Members noted however, that the conclusions drawn by the Company had been oversimplified and were misleading. Therefore, the Committee requested that they be provided with a more complete analysis.

Aventis responded to the Committees queries, and new data were considered at the 52nd and 53rd ACNFP meetings. The Committee was content that the points raised previously had been addressed and it was further satisfied that there were no food safety implications arising from these new data.

These further data were placed on the ACNFP pages of the website at: www.food.gov.uk/science/ouradvisors/novelfood/acnfppapers/

4.2 Monsanto Soya Beans 40-3-2

In November 2000 the Advisory Committee on Novel Foods and Processes considered a summary of data previously requested regarding the further analysis of the 3' end of the EPSPS insert which cannot be attributed to the wild type DNA. The Committee requested that further data be made available in order that it can conclude its discussions. These data were considered by the Committee in early 2002 and will be discussed in the Annual report for that year.

4.3 GM Enzyme – endoxylase from GM Aspergillus niger

The ACNFP was asked by the Committee on Toxicology of Chemicals in Food, Consumer Products and the Environment (COT), to provide advice on the genetic modification aspects of a submission seeking clearance for the use of an endoxylanse enzyme processing aid in breadmaking and other baked goods. The enzyme is derived from a genetically modified strain of *Aspergillus niger*. The ACNFP has previously provided advice on three other hemicelluase enzymes derived from genetically modified micro-organisms.

The Committee was reassured that this widely used organism, has a history of safe use, and has been modified by the addition of DNA from similar aspergillus strains and not novel DNA. The Committee was content with the application but raised the following areas as critical to the evaluation:

- the possibility that silent (inactive) DNA has inadvertently been switched on and consequently produced toxins would be detected in animal toxicological studies.

- laboratory data are necessary to show that there is no residual enzyme activity/allergenic problem in the final food.

- data on the genetic stability are required to support the claims made within the dossier.

This advice was forwarded to the COT.

4.4 Human Studies and Taste Trials

As described in the 2000 Annual Report[11] the ACNFP revised its guidelines on the conduct of taste trials of novel foods (including Genetically Modified (GM) Food using human volunteers and produced new guidance on the role of human studies in the pre-market safety assessment of novel foods.

The draft guidelines were sent out for consultation to a range of organisations, including consumer groups, religious organisations and industry between the 4 September and 28 November 2001. The Committee will review the responses received and make any necessary changes to the guidance documents.

Copies of the draft guidelines can be found at Appendix XII and XIII.

4.5 FoE report – The great food Gamble

The ACNFP discussed the report issued for Friends of the Earth, entitled "The Great Food Gamble". The ACNFP and Friends of the Earth have a common goal seeking to protect the health and safety of consumers and the Committee agreed with many of the points raised in the report. However, the Committee did not agree with the interpretation of some of the data presented.

A full copy of the ACNFP's response can be found at Appendix XIV.

5. Other activities

5.1 ACNFP Open Meeting

The ACNFP held their first open meeting on the 14th November in Birmingham.

The aim of the meeting was to give the general public the opportunity to meet with the Committee and to discuss some of the issues that fall within the remit of the ACNFP.

The meeting was chaired by Prof. Janet Bainbridge, and was divided in to three sections: Openness, The Safety Assessment of GM Foods and Cholesterol Lowering Products and other Functional Foods.

Various stakeholders, including members of the public, representatives of food manufacturing companies and pressure groups attended the meeting.

The audience raised many interesting and valid suggestions, including using publications, such as the FSA News, to publicise when a new application dossier is placed on the web site.

The overriding message from the meeting was that members of the public appreciated the openness of the Committee's work, and, generally, consumers are feeling more informed. It was felt however, that there was a need to maintain such provisions and to make as much information as possible available to the public in order that consumers can feel confident about the safety of the food they eat.

The minutes of this meeting are available on the ACNFP pages of the FSA website: ***www.food.gov.uk/multimedia/pdfs/acnfppmins.pdf.***

The Committee welcomed the opportunity to meet with various stakeholders, and found the open meeting to be a valuable exercise. The ACNFP intend to hold such a meeting on an annual basis.

5.2 ACNFP Factsheets

The ACNFP Secretariat issues a corporate brochure, including a number of factsheets on specific topics, outlining the work of the Committee, its membership and functions, to interested parties.

During 2001, Members were asked to approve four new factsheets covering the 2000 annual report, substantial equivalence, cholesterol lowering ingredients and the use of antibiotic resistance markers in GM plants.

Copies of these factsheets are available from the Secretariat, details are given on page 20.

5.3 R&D – G01 Programme: The safety of novel foods

The Committee considered three completed R&D reports, which had been funded as part of the G01: Safety of Novel Foods research programme. These projects were originally commissioned by the then MAFF and were managed from April 2000 by the Food Standards Agency.

Project G01001: Regulation and targeting of transgene expression in fruit crops (HRI – East Malling).

The aim of this project was to investigate the control of transgene expression. The project looked at ways to target the transgene insertion solely to the chloroplasts of plant cells. The project also addressed the use of tissue-specific promoters to enable the targeting of transgene expression to particular plant organs or tissues.

The work demonstrated the first example of plastid transformation of a fruit crop. Two tissue-specific promoters were isolated, one floral, the other from the root, which could be used to confer anti-fungal or anti-pest resistance to floral and root tissues. A comparison of leaf and root derived nuclear transformation events demonstrated that both single gene insertions and higher transgene expression levels are more likely to occur in root- than leaf-transformed plants. Plastid transformation offers the potential of avoiding the transmission of foreign genes via pollen from GM plants to other plant species. The research also identified a number of gene control regions that could potentially be targeted to produce disease resistant strawberries in the future. Work in this area is continuing under DEFRA's Horticultural research programme.

Project G01002: Causes of instability in transgenic plants (John Innes Centre).

This project aimed to gain an understanding of the prevalence and causes of transgene instability in oilseed rape (Brassica napus) and to establish whether extra material in addition to the transgene is introduced into transgenic plants. The project examined the structural integrity of introduced gene constructs, the frequency and effect of bacterial sequences unintentionally introduced during the transformation process, the effect of transgene copy number and the extent of methylation on transgene stability.

Rearrangement and duplication of the introduced DNA sequences was observed although this did not appear to effect transgene stability. Only a small number of single DNA insertions were observed. The extent of incorporation of non T-DNA appeared dependent on the plasmid used in the transformation. Transgene copy number did not appear to affect transgene stability, and any instability appeared to disappear in

subsequent generations suggesting that it may have arisen from tissue culture effects. The T-DNA also appeared to be un-methylated. The work has highlighted the importance of thorough molecular analysis of transgene lines prior to regulatory approval.

Project CSA 2915: The effect of background genotype on transgenes (John Innes Centre).

The main aim of the project was to assess the extent to which the background genotype of the host may effect the expression of introduced transgenes. Transgenic lines of oilseed rape were hybridised with related species, including weeds. The data collected was used to determine if the behaviour of the transgenes was consistent with those of resident genes and to estimate the impact of transgenes following hybridisation with sexually compatible weed and plant populations.

This project has provided useful information regarding unintentional crossing of GM plants with their wild-type relatives. It demonstrates that the fertility and virility of hybrid plants resulting from crosses with poorly compatible plants would be low, although where crosses are compatible, fertility of hybrids increases with subsequent generations. This research also discounted the possibility that there are 'safe' areas of the genome from where the transgenes would not pass on to subsequent generations of hybrid plants.

In an attempt to broaden the scope of this research programme, a call for proposals has recently been issued for projects to study the long, medium and short-term effects of probiotics.

6. Developments elsewhere

6.1 FSA Review of Scientific Committees

The FSA is reviewing all the Scientific Committees from which it seeks advice, including those that advise just the FSA (such as the ACNFP) and those that advise the FSA and the Department of Health (such as the COT). During 2001 there were three meetings of the review group.

The ACNFP Chairman Professor Janet Bainbridge was invited to attend the second meeting which was held on 27th September at which she expressed the views of the Members of the ACNFP regarding their work on the Committee and explained how the Committee handled issues such as openness, risk assessment, etc. These views along with those of other committee Chairs went towards the production of a draft report – FSA Report on the Review of Scientific Committees.

The first draft of this report was considered at the third meeting of the review group on 6 December 2001, and comments have been sought from a number of stakeholders. The final report is expected to be published in early 2002.

6.2 Completing the initial positive list of foodstuffs that can be irradiated and freely traded within the Community

As reported in the 1999 Annual Report[11], the European Council and the European Parliament published two EC Directives on foods and food ingredients treated with ionising radiation in the Official Journal of the European Communities. Directive 1999/2/EC established a harmonised regulatory framework and Directive 1999/3/EC established an initial positive list of foodstuffs that can be irradiated and freely traded across the EU. These Directives came into effect on 20 September 2000.

A requirement was introduced in Directive 1999/2/EC that the Commission should forward a proposal by 31 December 2000 to complete this positive list. Meanwhile, Member States are permitted to maintain existing national authorisations for irradiation of certain foodstuffs and can continue to apply existing national restrictions or bans. At present, only a single food category is listed on the EU wide positive list for irradiation treatment: 'dried aromatic herbs, spices and vegetable seasonings'. This is the same broad category of foods currently licensed to be irradiated in the UK.

In preparing for this proposal, the Commission invited comments from interested parties on its proposed strategy for drawing up the list. The comments received represented opposing views regarding the conditions for authorisation as laid down in the Directive (particularly technological need) and proposed benefit to consumers. Given the complexity of this issue, the Commission has concluded that a broader debate is required at this stage. To this end, the Commission published a Communication on this subject (2001/C 241/03) which is available on the Commission website at: *www.europa.eu.int/comm/food/fs/sfp/fi11_en.pdf*

6.3 Commission Proposals on GM food and feed and the traceability and labelling of foods and feed ingredients derived from GM organisms

The European Commission issued two proposals on 25 July 2001, one on GM food and feed and the other on GMOs and the traceability of food and feed products derived from them.

The proposed GM food and feed regulation would replace the existing approval procedures for GM foods, as contained in Regulation 258/97 and introduce for the first time rules for the approval of GM animal feed. The proposal would place the European Food Authority, rather than individual Member States, at the centre of the approval process.

This proposal includes labelling provisions that will require labelling of food and feed products derived from GMOs, regardless of the presence or absence of GM material in the final food or feed product. This will not include the labelling of foods produced with the use of GM enzymes nor processing aids, neither will it include products derived from animals that have been fed GM feed.

The proposal would allow a threshold for small traces of GM materials present accidentally in non-GM materials. This may include thresholds for GM material from varieties approved within Europe and for non-EU approved varieties that have undergone a safety assessment elsewhere.

The traceability proposal would create a harmonised system for tracing and identifying GMOs and food and feed products derived from GMOs at all stages of their placing on the market. Under this proposal, operators would be required to transmit specified information that a product consists of, contains or, in the case of food and feed, is produced from GMOs, to the next operator in the production and distribution chain. The operative provisions of the proposal would not come into force until the EU had established a system of unique codes for GMOs to aid identification. All operators would be required to keep records for 5 years of GMOs and food and feed products produced from GMOs that are supplied and received at each stage of the food chain. The Commission would develop technical guidance on sampling and testing to assist in the control and inspection by Member States. Negotiations on the proposals began in Brussels in September 2001.

6.4 R&D – G02 Programme: The Safety Assessment of Novel Foods

In November 2000 the Food Standards Agency hosted a workshop, attended by members of the ACNFP along with other experts, on the current status of technology and how it might be used in the safety assessment process. Following this workshop a three-year research program was set up and began in September 2001.

The aim of the programme is to explore the applicability and practicality of using a variety of existing and emerging techniques in genomics, proteomics and metabolic profiling to refine the current safety assessment procedures for GM foods to cover the next generation of GM plants. There are six projects in this programme:

Project G02001: Transcriptome, proteome and metabolome analysis to detect unintended effects in genetically modified potato. (Scottish Crop Research Institute)

Project G02002: Methods for the analysis of GM wheat and barley seed for unexpected consequences of the transgenic insertion. (John Innes Centre)

Project G02003: Comparison of the metabolome and proteome of GM and non-GM Wheat: Defining Substantial Equivalence. (Institute of Arable Crop Research (IACR), Long Ashton)

Project G02004: Development and comparison of molecular profiling methods for improved safety evaluation using GM Brassicas. (Institute of Food Research)

Project G02005: The application of metabolic profiling to the safety assessment of GM foods. (Royal Holloway, University of London)

Project G02006: Metabolome technology for the profiling of GM and conventionally bred plant materials. (University of Wales, Aberystwyth)

Further details of these projects are available on the Food Standards Agency website at: www.food.gov.uk/science/research/NovelFoodsResearch/

7. Contact Points

For further information about the general work of the Committee or about specific scientific points concerning individual submissions (which have been made or are being made) contact in the first instance:

Mrs Sue Hattersley
ACNFP Secretary
Room 526B
Aviation House
125 Kingsway
London
WC2B 6NH

Tel (switchboard): 020 7276 8000
Tel (Direct line): 020 7276 8565
Fax: 020 7276 8564

The FSA Website can be found at *http:\\www.food.gov.uk.*
Information can also be requested via e-mail at:
acnfp@foodstandards.gsi.gov.uk.

8. References

1. Advisory Committee on Novel Foods and Processes. *Annual Report 1989.* Department of Health and Ministry of Agriculture, Fisheries and Food, 1990. (Available from the ACNFP Secretariat).

2. Advisory Committee on Novel Foods and Processes. *Annual Report 1990.* Department of Health and Ministry of Agriculture, Fisheries and Food, 1991. (Available from the ACNFP Secretariat).

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10. Advisory Committee on Novel Foods and Processes. *Annual Report 1998.* Department of Health and Ministry of Agriculture, Fisheries and Food 1999. (Available from ACNFP Secretariat).

11. Advisory Committee on Novel Foods and Processes. *Annual Report 1999.* Department of Health and Ministry of Agriculture, Fisheries and Food 2000. (Available from the ACNFP Secretariat).

12. Advisory Committee on Novel Foods and Processes. *Annual Report 2000.* Food Standards Agency 2001 – FSA/0013/0301 (Available from the ACNFP Secretariat).

9. Glossary

Allele: one member of a pair or series of genes that occupy a specific position on a specific chromosome.

Allergen: a substance to which an individual is hypersensitive and which causes an allergic response.

Allergenicity: a potential or ability to illicit an allergic response.

Epoxy fatty acid: a fatty acid containing an epoxy group (an oxygen atom bound to two linked carbon atoms).

Genotype: the combination of alleles located on homologous chromosomes that determine a specific characteristic or trait.

Homologous: having the same morphology and linear sequence of gene loci as another chromosome.

Hydrolysis: decomposition of a chemical compound by reaction with water, such as the dissociation of a dissolved salt or the catalytic conversion of starch to glucose.

Ionising radiation: a form of radiation with sufficient energy to cause an atom to loose or gain one or more electrons leaving it electrically charged. A charged atom is referred to as an ion, hence the term ionising radiation.

Microalgae: unicellular photosynthetic aquatic plants.

Monosaccharide: any of several carbohydrates, such as tetroses, pentoses and hexoses that cannot be broken down to simpler sugars by hydrolysis. Also known as simple sugar.

Oligosaccharide: a carbohydrate that consists of a relatively small number of monosaccharides.

Pathogenic: causing disease.

Polyunsaturated: of or relating to long-chain carbon compounds, especially fatty acids, having two or more double bonds between carbon atoms. Foods containing polyunsaturated fatty acids help reduce blood cholesterol levels.

Transgenic: animals or plants that have had genes artificially introduced by genetic modification.

10. Appendix I

ACNFP – remit, membership and list of members' interests, code of conduct and interactions with other committees

Remit

The Advisory Committee on Novel Foods and Processes is an independent body of experts whose remit is:

> *"to advise the central authorities responsible, in England, Scotland, Wales and Northern Ireland respectively on any matters relating to novel foods and novel food processes including food irradiation, having regard where appropriate to the views of relevant expert bodies."*

Officials of the Food Standards Agency provide the Secretariat. As well as formal meetings, the Committee organises workshops on specific topics related to its remit.

The interactions between the ACNFP and other independent advisory committees are outlined in Figure 1.

Membership and Members' Interests

The membership of the Committee provides a wide range of expertise in fields of relevance in the assessment of novel foods and processes. A list of the membership during 2001, together with the names of the FSA assessors can be found overleaf.

In common with other independent advisory committees the ACNFP is publishing a list of its members' commercial interests. These have been divided into different categories relating to the type of interest:

Personal:-
a) direct employment or consultancy;
b) occasional commissions;
c) share holdings.

Non-personal:-
a) fellowships;
b) support which does not benefit the member directly e.g. studentships.

Details of the interests held by members during 2001 can be found on page 26.

A copy of the code of conduct for ACNFP members can be found on page 27.

MEMBERSHIP OF THE COMMITTEE DURING 2001

Chairman

Professor J Bainbridge OBE, BSc, PhD, Grad.Cert.Ed (Tech), FRSA, SOFHT.
Chief Executive of EPICC subsidiary of the University of Teesside, Middlesbrough.

Members

Professor M J Gasson BSc, PhD. (Molecular biologist)
Head, Department of Genetics and Microbiology, Institute of Food Research, Norwich.

Professor P Dale BSc, PhD, CBiol, MIBiol. (Molecular biologist/plant geneticist)
Research Group Leader, Genetic Modification and Biosafety Assessment, John Innes Centre, Norwich.

Professor J Dunwell BA, MA, PhD (Plant Biotechnologist)
Professor of Plant Biotechnology, School of Plant Sciences, University of Reading.

Dr J Fowler BVM&S, PhD, FATS, CBiol, FIBiol, FRCPath, FRCVS (Toxicologist)
Registered Toxicologist and Specialist of the Royal College of Veterinary Surgeons.

Dr J Heritage BA, DPhil, CBiol, MIBiol. (Microbiologist)
Senior Lecturer in Microbiology at the University of Leeds.

Dr C Meredith BA, MA, MSc, PhD (Toxicologist/Immunologist)
Head of Immunology at TNO BIBRA International Ltd, Surrey.

Reverend Professor M Reiss MA, PhD, FIBiol. (Ethicist)
Professor of Science Education and Head of Science and Technology at the University of London.

Mrs E Russell BSc.
Consumer Representative.

Professor I Rowland BSc, PhD. (Nutritionist/toxicologist)
Director, Northern Ireland Centre of Diet and Health at the University of Ulster; Coleraine.

Professor T A B Sanders BSc, PhD, DSc, RNutr, RPHNutr (Nutritionist)
Head of Department of Nutrition and Dietetics, Kings College, London.

Professor H Sewell MB, ChB, BDS, MSc, PhD, FRCP (L) (G), FRCPath, F.Med.Sci. (Immunologist)
Head of Immunology, Faculty of Medicine and Health Science, University Hospital Medical School, Nottingham.

Professor J Warner MB, ChB, DCH, MRCP, MD, FRCP, MRCPCH, FRCPCH. (Allegery Expert) Professor of Child Health at University of Southampton.

Professor H F Woods CBE, BSc, BM, BCh, DPhil, Hon.FFOM, FIFST, FFPM, FRCP (London & Edin). (Ex officio member, Chairman of COT)
Director of Clinical Sciences (South) at the University of Sheffield.

FSA Assessors

Mr N Tomlinson	Food Standards Agency
Mrs J Whinney	Food Standards Agency (Wales)
Ms E McDonald	Food Standards Agency (Scotland)
Mr G McCurdy	Food Standards Agency (Northern Ireland)

Membership of the committee during 2001

Member	Company	Interest	Company	Interest	
Professor J Bainbridge (CHAIRMAN)	None	None	Various	Departmental commissioned research and student placements	None
Professor M J Gasson (DEPUTY CHAIRMAN)	None	None	Various	Departmental commissioned research	None
Dr P Dale	John Innes Centre EU UNIDO UNEP OECD DEFRA	Employer Occasional Advisor Occasional Advisor Occasional Advisor Occasional Advisor Consultant	European Community FSA/EU/BBSRC/DEFRA Research US Department of State	Occasional Advisor Research – Seed Samples obtained from various companies Attendance on Voluntary Visitors Program	None
Professor J Dunwell	None	None	Syngenta Cropgen	Departmental commissioned research	None
Dr J Fowler	Syngenta	Minimal Shares	None	None	None
Dr J Heritage	None	None	None	None	None
Dr C Meredith	None	None	Various	Departmental commissioned research	None
Reverend Professor M Reiss	None	None	None	None	None
Professor I Rowland	Colloids Naturels International (CNI) Cerestar Abbey National Woolwich	Consultancy Consultancy Shareholder Shareholder	Various	Departmental commissioned research projects	None
Mrs E Russell	The Boots Company PLC	Shareholder	None	None	Husband Chief Executive of The Boots Company plc.
Professor T Sanders	Seven Seas Limited Aspartame Information Service Palatinet GMBH British Cheese Board	Consultancy Consultancy Consultancy Consultancy	Unilever Omega Tech McNeil Europe	Research Support Research Support Research Support	None
Professor H Sewell	None	None	None	None	None
Professor J O Warner	None	None	UBC Pharma Merck ILSI Europe	Research Research Editorial	None
Professor H F Woods	HSBC Halifax Bank Ipsen Pharmaceuticals	Shareholder Shareholder Lecture Fees	The University of Sheffield receives support from a wide range of national and international food and chemical companies	Trustee of the Harry Bottom Charitable Trust and Special Trustees for the former United Sheffield Hospitals	None

A CODE OF CONDUCT FOR MEMBERS OF THE ADVISORY COMMITTEE ON NOVEL FOODS AND PROCESS (ACNFP)

Public service values

The Members of the ACNFP must at all times

- observe the highest standards of impartiality, integrity and objectivity in relation to the advice they provide and the management of this Committee;

- be accountable, through the Board of the Food Standards Agency and Health Ministers, to Parliament and the public for its activities and for the standard of advice it provides.

The Board of the FSA and Health Ministers are answerable to Parliament for the policies and performance of this Committee, including the policy framework within which it operates.

Standards in Public Life

All Committee Members must

- follow the Seven Principles of Public Life set out by the Committee on Standards in Public Life (Annex 1);

- comply with this Code, and ensure they understand their duties, rights and responsibilities, and that they are familiar with the function and role of this Committee and any relevant statements of Government policy. If necessary members should consider undertaking relevant training to assist them in carrying out their role;

- not misuse information gained in the course of their public service for personal gain or for political purpose, nor seek to use the opportunity of public service to promote their private interests or those of connected persons, firms, businesses or other organisations; and

- not hold any paid or high profile unpaid posts in a political party, and not engage in specific political activities on matters directly affecting the work of this Committee. When engaging in other political activities, Committee members should be conscious of their public role and exercise proper discretion. These restrictions do not apply to MPs (in those cases where MPs are eligible to be appointed), to local councillors, or to Peers in relation to their conduct in the House of Lords.

Role of Committee members

Members have collective responsibility for the operation of this Committee. They must:

- engage fully in collective consideration of the issues, taking account of the full range of relevant factors, including any guidance issued by the Food Standards Agency or Health Ministers;

- in accordance with Government policy on openness, ensure that they adhere to the Code of Practice on Access to Government Information (including prompt responses to public requests for information); agree an Annual Report; and, where practicable and appropriate, provide suitable opportunities to open up the work of the Committee to public scrutiny;

- not divulge any information which is provided to the Committee in confidence;

- ensure that an appropriate response is provided to complaints and other correspondence, if necessary with reference to the sponsor department; and

- ensure that the Committee does not exceed its powers or functions.

Individual members should inform the Chairman (or the Secretariat on his or her behalf) if they are invited to speak in public in their capacity as a Committee member.

Communications between the Committee and the Board of the Food Standards Agency will generally be through the Chairman except where the Committee has agreed that an individual member should act on its behalf. Nevertheless, any member has the right of access to the Board of the FSA on any matter that he or she believes raises important issues relating to his or her duties as a Committee member. In such cases the agreement of the rest of the Committee should normally be sought.

Individual members can be removed from office by the Board of the FSA, if they fail to perform the duties required of them in line with the standards expected in public office.

The role of the Chairman

The Chairman has particular responsibility for providing effective leadership on the issues above. In addition, the Chairman is responsible for

- ensuring that the Committee meets at appropriate intervals, and that the minutes of meetings and any reports to the Board of the FSA accurately record the decisions taken and, where appropriate, the views of individual members;

- representing the views of the Committee to the general public; and

- ensuring that new members are briefed on appointment (and their training needs considered), and providing an assessment of their performance, on request, when members are considered for re-appointment to the Committee or for appointment to the board of some other public body.

Handling conflicts of interests

The purpose of these provisions is to avoid any danger of Committee members being influenced, or appearing to be influenced, by their private interests in the exercise of their public duties. All Members should declare any personal or business interest that may, or may be *perceived* (by a reasonable member of the public) to, influence their judgement. A guide to the types of interest that should be declared is at Annex 2.

(i) Declaration of Interests to the Secretariat

Members of the Committee should inform the Secretariat in writing of their current personal and non-personal interests, when they are appointed, including the principal position(s) held. Only the name of the organisation and the nature of the interest are required; the amount of any salary etc. need not be disclosed. Members are asked to inform the Secretariat at any time of any change of their personal interests and will be invited to complete a declaration form once a year. It is sufficient if changes in non-personal interests are reported in the annual declaration form following the change. (Non-personal interests involving less than £1,000 from a particular company in the previous year need not be declared to the Secretariat).

The register of interests should be kept up-to-date and be open to the public.

(ii) Declaration of Interest and Participation at Meetings

Members of the Committee are required to declare any direct interests relating to salaried employment or consultancies, or those of close family members[1], in matters under discussion at each meeting. Having fully explained the nature of their interest the Chairman will, having consulted the other members present, decide whether and to what extent the member should participate in the discussion and determination of the issue. If it is decided that the member should leave the meeting, the Chairman may first allow them to make a statement on the item under discussion.

Personal liability of Committee members

A Committee Member may be personally liable if he or she makes a fraudulent or negligent statement which results in a loss to a third party; or may commit a breach of confidence under common law or a criminal offence under insider dealing legislation, if he or she misuses information gained through their position. However, the Government has indicated that individual members who have acted honestly, reasonably, in good faith and without negligence will not have to meet out of their own personal resources any personal civil liability which is incurred in execution or purported execution of their Committee functions save where the person has acted recklessly. To this effect a formal statement of indemnity has been drawn up.

[1] Close family members include personal partners, parents, children, brothers, sisters and the personal partners of any of these.

THE SEVEN PRINCIPLES OF PUBLIC LIFE

Selflessness
Holders of public office should take decisions solely in terms of the public interest. They should not do so in order to gain financial or other material benefits for themselves, their family, or their friends.

Integrity
Holders of public office should not place themselves under any financial or other obligation to outside individuals or organisations that might influence them in the performance of their official duties.

Objectivity
In carrying out public business, including making public appointments, awarding contracts, or recommending individuals for rewards and benefits, holders of public office should make choices on merit.

Accountability
Holders of public office are accountable for their decisions and actions to the public and must submit themselves to whatever scrutiny is appropriate to their office.

Openness
Holders of public office should be as open as possible about all the decisions and actions that they take. They should give reasons for their decisions and restrict information only when the wider public interest clearly demands.

Honesty
Holders of public office have a duty to declare any private interests relating to their public duties and to take steps to resolve any conflicts arising in a way that protects the public interests.

Leadership
Holders of public office should promote and support these principles by leadership and example.

DIFFERENT TYPES OF INTEREST

The following is intended as a guide to the kinds of interests that should be declared. Where Members are uncertain as to whether an interest should be declared they should seek guidance from the Secretariat or, where it may concern a particular product which is to be considered at a meeting, from the Chairman at that meeting. **If Members have interests not specified in these notes but which they believe could be regarded as influencing their advice they should declare them**. However, neither the Members nor the Secretariat are under any obligation to search out links of which they might reasonably not be aware. For example, either through not being aware of all the interests of family members, or of not being aware of links between one company and another.

Personal Interests

A personal interest involves the Member personally. The main examples are:

- **Consultancies and/or direct employment** any consultancy, directorship, position in or work for the industry or other relevant bodies which attracts regular or occasional payments in cash or kind;

- **Fee-Paid Work:** any commissioned work for which the member is paid in cash or kind;

- Shareholdings: any shareholding or other beneficial interest in shares of industry. This does not include shareholdings through unit trusts or similar arrangements where the member has no influence on financial management;

- **Membership or Affiliation** to clubs or organisations with interests relevant to the work of the Committee.

Non-Personal Interests

A non-personal interest involves payment which benefits a department for which a member is responsible, but is not received by the member personally. The main examples are:

- **Fellowships:** the holding of a fellowship endowed by industry or other relevant body;

- **Support by Industry or other relevant bodies:** any payment, other support or sponsorship which does not convey any pecuniary or material benefit to a member personally, but which does benefit their position or department e.g.:

  (i) a grant for the running of a unit or department for which a member is responsible;

  (ii) a grant or fellowship or other payment to sponsor a post or a member of staff or a post graduate research programme in the unit for which a member is responsible (this does not include financial assistance for undergraduate students);

  (iii) the commissioning of research or other work by, or advice from, staff who work in a unit for which a member is responsible.

Members are under no obligation to seek out knowledge of work done for, or on behalf of, industry or other relevant bodies by departments for which they are responsible, if they would not normally expect to be informed. Where members are responsible for organisations which receive funds from a very large number of companies involved in that

industry, the Secretariat can agree with them a summary of non-personal interests rather than draw up a long list of companies.

- **Trusteeships:** any investment in industry held by a charity for which a member is a trustee. Where a member is a trustee of a charity with investments in industry, the Secretariat can agree with the member a general declaration to cover this interest rather than draw up a detailed portfolio.

DEFINITIONS

For the purposes of the ACNFP 'industry' means:

- Companies, partnerships or individuals who are involved with the production, manufacture, packaging, sale, advertising, or supply of food or food processes, subject to the Food Safety Act 1990;

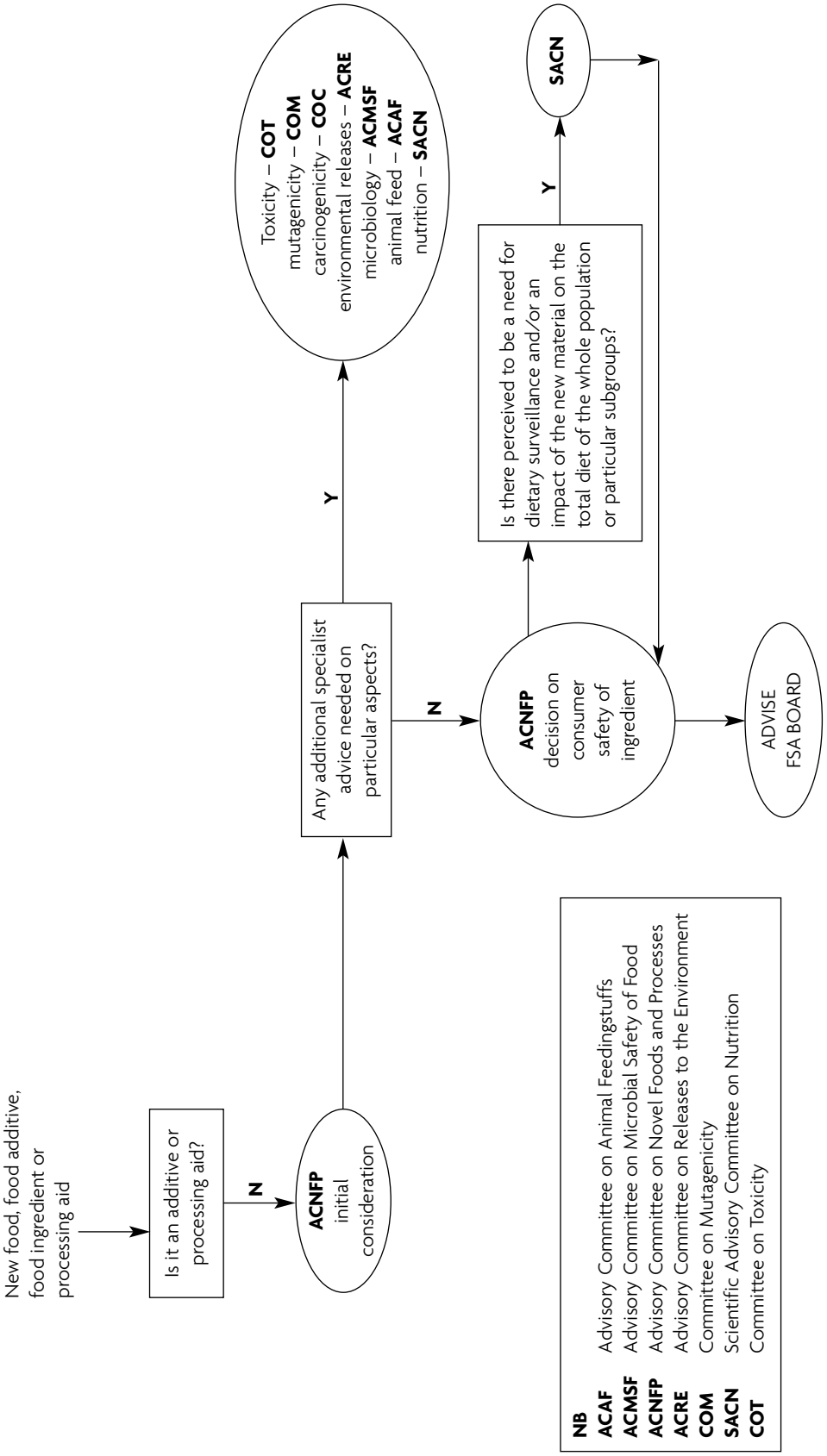
- Trade associations representing companies involved with such products;

- Companies, partnerships or individuals who are directly concerned with research, development or marketing of a food product which is being considered by the Committee.

'Other relevant bodies' refers to organisations with a specific interest in food issues, such as charitable organisations or lobby groups.

In this Code 'the Secretariat' means the Secretariat of the ACNFP.

Figure 1: Relationship of ACNFP with other expert committees involved in the assessment of food safety



APPENDIX II

Mr A Klepsch
European Commission
DG III
Rue de la Loi 200
B-1049 Brussels
Belgium

5 April 2001 Reference: NFU 259

Dear Mr Klepsch

Application under EC Regulation 258/97 – Coagulated Potato Proteins and Hydrolysates thereof

The Competent Food Assessment Body for the UK Competent Authority, the Advisory Committee on Novel Foods and Processes (ACNFP), has considered the initial assessment report produced by the Netherlands Competent Authority on the marketing of Coagulated potato protein and hydrolysates thereof. The UK Competent Authority would be content for consent to be granted if the following conditions are met:

i. There should be some form of quality assurance employed to ensure that the glycoalkaloid content and microbiological contamination of the potatoes before they are processed are monitored and maintained within safe levels.

ii. Similarly the manufacturing process itself should be monitored to ensure that the glycoalkaloids in the potato are not concentrated during the process.

iii. The company will need to demonstrate that the processing undergone by the potato proteins has not increased their allergenicity. There is a small risk that the concentration process may increase the risk of allergic reactions in subjects with sensitivity to potato or latex (cross reactivity between some individuals with these allergies). This could be investigated using sera from latex or potato sensitive individuals using western blotting. In addition any products containing these ingredients should be labelled to the effect that the product contains potato so that people with allergies to potato and latex can avoid those products.

iv. The company must ensure that the sulphite level is in accordance with European and National legislation. For example, in the UK, coagulated potato protein would fall under the EC Miscellaneous Food Additives Regulations. The level stated (324mp/kg protein) by the company would exceed the maximum limit stated for sulphite in a food additive (200mg/kg).

v. Manufacturers using the coagulated potato protein in food production must be informed of the sulphite content to enable them to conform to any labelling legislation concerning sulphite in the final food product.

vi. The company must comply with EU/National legislation/Guidelines regarding enzymes used as processing aids in the manufacture of potato protein hydrolysates.

Yours sincerely

Sue Hattersley
ACNFP Secretary

APPENDIX III

Mr Klepsch
European Commission
DG-Sanco
Rue de la Loi 200
B-1049, Brussels
Belgium

5th February 2001 Reference: NFU 232

Plantsterol enriched frankfurthers, sausage yoghurt and cheese.

Dear Mr Klepsch

The Advisory Committee for Novel Foods and Processes (ACNFP) considered the above application from Valio at a meeting on the 25th January 2001. The Committee was unable to agree with the initial opinion of the Finnish Competent Authority as they were not in receipt of a copy of the full application dossier from Valio. The ACNFP Secretariat have tried on a number of occasions to obtain the dossier, and when a copy arrives we will forward it to Committee members who will then consider the application further. There were a number of areas where the Committee needed detailed information before it could fully evaluate the application including:

1. Possible effects on the absorption (not blood level) of fat soluble vitamins and carotenoids over the longer term

2. Whether patterns of consumption described for the Finnish population would be predictive for the UK population.

The Committee did however comment on the number of applications for foodstuffs containing phytosterols and their esters being considered under (EC) 258/97. These comments are listed in the accompanying letter.

Yours sincerely

Dr Chris Jones
Higher Scientific Officer
Novel Foods Division

APPENDIX IV

Mr Klepsch
European Commission
DG-Sanco
Rue de la Loi 200
B-1049
Brussels
Belgium

12th February 2001 Reference: NFU 232

Phytosterol and Phytostanol Enriched Foodstuffs

Dear Mr Klepsch

Whilst considering the application for Phytosterol enriched frankfurthers, sausage, yoghurt and cheese by Valio of Finland under the Novel Foods Regulation (EC 258/97), the Advisory Committee for Novel Foods and Processes (ACNFP), the assessment body for novel foods in the UK, expressed concerns at the increasing number of both free and esterified, phytosterol and phytostanol enriched products either on the market, or currently being considered by Competent Authorities.

The Committee is mindful of the potential cumulative effect of the consumption of these foodstuffs on the absorption of fat soluble vitamins and carotenoids, and has raised this issue in the past, for this reason I would be grateful if it could be raised at the next Competent Authority meeting on the 12th March 2001. One particular area of concern is that of informing the consumer about the recommended number of servings of any of these products (which all act in a similar manner), given that products from different manufacturers will have different trade names or ingredient names.

Yours sincerely

Dr Chris Jones
Novel Foods Division

APPENDIX V

Mr Klepsch
European Commission
DG-Sanco
Rue De La Loi 200
B1049
Brussels

8th May 2001 Reference: NFU 233

Plantsterol enriched bakery products, grain-based snacks and gum arabic pastilles.

Dear Mr Klepsch

The Advisory Committee for Novel Foods and Processes (ACNFP) considered the above application from Oy Karl Fazer by post as no meeting was scheduled within the designated 60 day period. The Committee broadly agreed with the initial opinion of the Finnish Competent Authority, however there were several concerns raised by members. These are listed below:

1. Some of the plantsterol enriched products (grain-based snacks and gum arabic pastilles) were perceived to be potentially desirable to children, and members were concerned that even if they were marketed at premium price with an indication of the target population (middle aged people), there might still be consumption by children.

2. There was the possibility of effects on the absorption (not blood level) of fat-soluble vitamins and carotenoids over the longer term.

3. It was not clear whether patterns of consumption described in the application would be predictive for the UK population.

4. In view of the number of applications for foodstuffs containing phytosterols and their esters being considered under (EC) 258/97, concerns have already been raised by the Committee concerning the potential for the cumulative consumption of plantsterols from a range of different products. In view of this, members were concerned by the comment made in the application about possible effects of raised levels of plant sterols causing a hormone imbalance, and that this may compromise the efficacy of orally administered hormones.

The Committee does not support the marketing of these products until these factors have been addressed, and therefore formally objects to this application.

Yours sincerely

Dr Chris Jones
Higher Scientific Officer
Novel Foods Division

APPENDIX VI

Mr A Klepsch
European Commission
DG-Sanco
Rue de la Loi 200
B-1049
Brussels
Belgium

10 December 2001 Reference: NFU 360

Initial opinion from the Finnish CA on the application to place the Plant sterol enriched fat ingredient Diminicol® on the novel food market.

Dear Mr Klepsch

The UK Competent Authority (UK CA) sought comments from the Advisory Committee on Novel Foods and Processes (ACNFP) on the initial opinion from Finland under the 60-day rule of the Novel Food Regulation (EC) 258/97. Several concerns were raised as listed below:

1. The product is microcrystalline plant sterols/stanols, and not sterol/stanol esters. Consequently this material cannot be assumed to be substantially equivalent to plant sterol/stanol esters which have already been subject to toxicological testing.

2. Concerns were raised as to the allergenic potential of the Diminicol products due to one of the sources of the phytosterols being peanuts. The company should confirm that the processing of the vegetable oil derived plant sterols (phytosterols) removes all traces of protein, and thereby ensuring that any possible allergenicity of the source materials is removed.

3. The suggested labelling of the products containing the Diminicol ingredients was not satisfactory. The labelling should state clearly and specifically that these products are not nutritionally appropriate for pregnant or lactating mothers and young children.

4. Some of the plant sterol enriched products (yoghurts and fruit milk drinks) were perceived to be potentially desirable to children, and there was concern that even if they were marketed at premium price with an indication of the target population (middle aged people), there may still be consumption by children.

5. Data should be provided on the possibility of effects on the absorption (not blood level) of fat-soluble vitamins and carotenoids over the longer term. Similar concerns have been raised previously with other phytosterol/ester products. In addition effects on carotenoids such as lutein may have implications for deteriorating vision in the elderly.

6. In view of the number of applications for foodstuffs containing phytosterols and their esters being considered under (EC) 258/97, concerns have already been raised by the UK Competent Authority concerning the potential for the cumulative consumption of plant sterols from a range of different products. In view of this, there was concern that with the addition of a number of products containing plant sterols onto the market the potential for over consumption of plant sterols would be increased further.

The UK Competent Authority broadly agreed with the initial opinion of the Finnish Competent Authority and therefore does not support the marketing of these products until the concerns listed above have been addressed, and therefore formally objects to this application.

Yours sincerely

Sue Hattersley
Novel Foods Division

APPENDIX VII

Mr Klepsch
European Commission
DG-Sanco
Rue De La Loi 200
B1049
Brussels

20th June 2001 Reference: NFU 231

Reducol: Plantsterol enriched milk-based products

Dear Mr Klepsch

The Advisory Committee for Novel Foods and Processes (ACNFP) considered the above application from Novartis by post as no meeting was scheduled within the designated 60 day period. The Committee broadly agreed with the initial opinion of the Belgian Competent Authority, however there were several concerns raised by members. These are listed below:

5. Reducol in milk based products containing added fruit was perceived to be a product that would be potentially desirable to children. Members were concerned that even if they were marketed at premium price with an indication of the target population (middle aged people), there might still be consumption by children.

6. The toxicological part of the dossier was not sufficient lacking certain types of study including two generation studies, the scientific literature referenced was in many cases quite old, and no points of comparison are made between Reducol and the products tested.

7. There was the possibility of effects on the absorption (not blood level) of fat-soluble vitamins and carotenoids over the longer term.

8. It was not clear whether patterns of consumption described in the application would be predictive for the UK population.

9. In view of the number of applications for foodstuffs containing plantsterols and their esters being considered under (EC) 258/97, concerns have already been raised by the Committee concerning the potential for the cumulative consumption of plantsterols from a range of different products. In view of this, and the possible effects of raised levels of plant sterols causing a hormone imbalance, thereby compromising the efficacy of orally administered hormones.

10. No information has been included on labelling to protect the potential risk groups and to highlight the dander of over consumption.

The Committee does not support the marketing of this product until these factors have been addressed, and therefore formally objects to this application.

Yours sincerely

Dr Chris Jones
Higher Scientific Officer
Novel Foods Division

APPENDIX VIII

Mr A Klepsch
European Commission
DG-Sanco
Rue de la Loi 200
B-1049
Brussels
Belgium

10 December 2001 Reference: NFU 146

Tahitian Noni Juice *(Morinda citrifolia)*

Dear Mr Klepsch

The UK Competent Authority (CA) sought comments from the Advisory Committee on Novel Foods and Processes on the Initial Opinion from the Belgian Competent Authority on the Morinda application under the Novel Food Regulation (EC) 258/97. The UK CA generally agreed with the negative Initial Opinion of the Belgian CA, however the UK raised a number of issues. These are listed below:

1. The UK CA disagreed with the opinion expressed by the Belgian CA that further toxicological tests at much higher doses are required. They agreed with some of the points made by the company concerning the practical difficulties of conducting animal feeding studies with high doses of an individual food ingredient. This was because of the difficulty in interpreting whether any adverse effects observed at high doses were due to nutritional imbalance or the effects of Noni juice.

2. The UK CA agreed with the Belgian CA that further clarification was required on the intended market for this product since it is unclear which sector of the population the product is aimed at, and how much would be consumed.

3. The UK CA was also concerned that the allergy studies were not sufficiently detailed.

The UK CA does not support the marketing of this product until these factors have been addressed, they therefore agree with the Belgian CA that this product should be given a negative opinion pending further information from the applicant, but it does not see a need for additional toxicological studies in animals.

Yours sincerely

Sue Hattersley
ACNFP Secretariat

APPENDIX IX

Mr Klepsch
European Commission
DG-Sanco
Rue De La Loi 200
B1049
Brussels

7th December 2001 Reference: NFU 329

Gamma-cyclodextrin

Dear Mr Klepsch

The UK Competent Authority sought comments from the Advisory Committee on Novel Foods and Processes (ACNFP) on the Italian Initial Opinion for the application under the Novel Foods Regulation (EC) 258/97 by Bioresco for the above product at a meeting on the 15th November 2001.

The UK CA agreed with the draft initial opinion of the Italian Competent Authority that according to (EC) 258/97 the product is likely to fall within the scope of the Food Additive Framework Directive (89/107/EEC) and should not be considered as a novel food. The UK CA considers that the Standing Committee for Foodstuffs should confirm whether the product is a novel food or an additive. The Committee concluded that the final status of γ-cyclodextrin may have to be decided by the Commission Legal Services.

The UK CA also noted that the residual extraction solvent present albeit in low quantities (5ppm) in the final product was not permitted for use in foodstuffs under the terms of the Extraction Solvent Directive (88/388/EC), irrespective of the safety data that was provided for the final product. Inclusion of this solvent could be considered in any subsequent food additive application.

The UK CA were also concerned that consumption of large quantities of γ-cyclodextrin may have implications for diabetics.

Yours sincerely

Mrs Sue Hattersley
ACNFP Secretary

APPENDIX X

Mike Cockerill
Orchard House Foods
Fleming Road
Corby
Northants
NN17 2SW

13th September 2001 Ref NFU 271

Re: Request for a Scientific Opinion on High Pressure Processed Fruit Based Products

Dear Mr Cockerill

The Competent Food Assessment body for the UK Competent Authority, the Advisory Committee for Novel Foods and Processes (ACNFP) has considered the scientific data provided by Orchard House for High Pressure Processed (HPP) Fruit based products.

Based on the data provided for a typical example of each product range, the ACNFP is content to offer a positive Scientific Opinion that the following types of products are at least as safe as their non-pasteurised counterpart:

Citrus Juices with some water	e.g. Lemonade
Fruit Juices and purees	e.g. Summerfruit Crush
Fruit Juices, purees and yoghurt	e.g. Raspberry Smoothie

The ACNFP is of the opinion that as a successful application under the (EC) 258/97 for HPP Fruit Based Products was made by Danone in 2000, High Pressure Processing per se is no longer a considered a novel process. However any future use of HPP that used different operating conditions, or treated substantially different foodstuffs from those described in the Danone application must be able to demonstrate adequate kill of pathogenic bacteria, and have measures in place that prevent the germination of Clostridium botulinum spores.

The data you provided satisfies these criteria and also conforms to the recommendations of the Report for the Safe use of Vacuum Packed Foodstuffs by the UK Advisory Committee on the Microbiological Safety of Food (ACMSF) in 1992 and amended in 1995.

However, in addition to chill temperatures (5°C or below), which should be maintained throughout the chill chain the following criteria should be employed at all times for each product type:

High Pressure Stage 5000bar (500Mpa) bar / 60 seconds.
Maximum product pH of 4.2 (normal product pH 2.0 – 3.5).
Maximum shelf life of 21 days.

The HACCP plan supplied to the Committee should be used for all products.

These criteria are to be used in addition to the surface treatments currently being employed for your unprocessed products.

Yours sincerely

Sue Hattersley
ACNFP Secretary
Novel Foods Division

APPENDIX XI

Dr Nicole Zylbermann
DGCCRF – Bureau C2
Teledoc 051
59 boulevard Vincent Auriol
F – 75703
PARIS
Cedex 13
FRANCE

21 March 2001 Reference: NFU 127

Dear Dr Zylbermann

Notification under article 5 of the placement on the market of Virgin Prune Kernel Oil

Having taken expert advice from the Advisory Committee on Novel Foods and Processes, the UK competent authority wishes the following comments to be noted in relation to the notification that you have received regarding the marketing of Virgin Prune Kernel Oil.

1. It was felt that a monitoring program is required to ensure that any aflatoxin contamination of the oil does not exceed levels currently set by the EU.

2. Since the product is derived from prunes, any food containing the oil needs to be labelled as such. This is to inform consumers, who may have an allergy to plums or prunes, so that they are able to avoid such products.

Yours sincerely

Ruth Dadswell
Higher Scientific Officer
Cc Andreas Klepsch, EC

APPENDIX XII

ADVISORY COMMITTEE ON NOVEL FOODS AND PROCESSES

GUIDELINES ON THE CONDUCT OF TASTE TRIALS INVOLVING NOVEL FOODS OR FOODS PRODUCED BY NOVEL PROCESSES

INTRODUCTION

1. The Advisory Committee on Novel Foods and Processes (ACNFP) is an independent Committee of experts that advises the central authorities responsible, in England, Scotland, Wales and Northern Ireland respectively on any matters relating to novel foods and novel food processes, having regard to the views of relevant expert bodies where appropriate.

2. In 1991, the ACNFP issued Guidelines (1) on the assessment of novel foods and processes, to assist those wishing to develop and/or market such foods in the UK. Included in those Guidelines is a brief section on human studies, such as taste trials and marketing and acceptability trials.

3. In 1992, the ACNFP published general guidance relating to ethical, as well as safety, criteria for the conduct of taste trials on novel foods or foods produced by novel processes (2).

4. The ACNFP guidelines on the assessment of novel foods and processes (1) were superseded by the EC Novel Foods Regulation (3) which came into force in May 1997 with accompanying guidelines on the provision of information, including that relating to previous human exposure to the novel food or its source (4). Additional guidelines on novel foods and novel food ingredients legislation were produced by the Ministry of Agriculture, Fisheries and Food/Department of Health (5). However, none of these address the issues of taste trials or human studies per se and, therefore, the need for such guidance remains.

5. The Committee is preparing guidelines on the use of human studies in the pre-market safety assessment of novel foods (6). These focus on the circumstances in which such studies might be appropriate and the issues that need to be considered when conducting human studies on novel foods. In view of these, and given that the existing guidelines on taste trials (2) were produced some time prior to the Novel Foods Regulation, it was considered prudent to reconsider and update them at this time.

6. The Committee wishes to stress that these guidelines relate solely to taste trials, and not to exercises related to preliminary marketing/monitored sales, nor to studies designed to assess safety (which are addressed elsewhere (6)). The guidelines are intended for use by those developing novel foods.

General Guidance

7. The ACNFP is of the opinion that, in general, there is no need for protocols for taste trials to be referred to it for consideration provided that certain conditions are met:

   (i) Those carrying out the trial are satisfied, after taking suitable professional advice, that it poses no hazard to human health;

   (ii) The protocol for the taste trial had been referred to, and cleared by, a local Ethics Committee (see paragraph 9);

   (iii) Appropriate records are kept (see paragraph 12);

   (iv) If the trial could involve the release of genetically modified organisms into the environment, the appropriate notification and clearance procedures are followed (see paragraph 13).

Assessment of Risk to Human Health

8. In considering whether to proceed with a taste trial, it is necessary to carry out a risk assessment, taking into account the likely levels of intake from a taste trial and the extent of information on the safety of the product. Where there is limited information on the safety of the product, taste trials should not proceed. It is recommended that all individuals with a history of allergic disease in general should be excluded from taste trials.

Local Ethics Committees

9. Irrespective of the guidance obtained from this document, any relevant legal requirements relating to the performance of studies on human subjects should be adhered to. Detailed guidance on the legal and ethical considerations of studies in human subjects is available elsewhere (7, 8, 9, 10, 11). One of the prime requirements relates to the need for all research involving healthy volunteers to be approved by an Ethics Committee. Such Committees exist within major industrial

companies or, alternatively, organisations can refer their research to the local or regional Ethics Committees that already exist at many Universities and Medical Schools for assessment. However, it is recognised that these Ethics Committees produce their own guidance on what products should and should not be referred to them for consideration and such guidance must be borne in mind in any such referral.

10. Such Committees should be able to draw on sufficient technical competence and informed judgment to be able to assess the consequences of participation in the trial, in the context of the welfare of the subject and the objectives of the investigation. However, the Committees also need to accommodate respected lay opinion so as to provide effective representation of community, as well as scientific interests. If pre-existing ethics committees do not wish to consider a particular trial, those intending to perform the trial should set up a suitable Committee with representation as outlined above.

11. Other important issues include the method of recruitment of volunteers and the need for full informed written consent. A copy of the explanatory information to be given to volunteers should be submitted to the ethics committee, which should be satisfied that the information is adequate and in a form that would be understood readily by the volunteers. The information supplied to volunteers must include details of any known adverse reactions to the novel food/ingredient.

Records

12. Records should be kept on the conduct of, and results from, taste trials and should include the names and particulars of the individuals involved, including their health status, and also details of the novel food involved in the trial. These records should be retained for 30 years. Any adverse effects reported by the volunteers should be recorded and followed up for a suitable period, with medical investigation if necessary.

Release to the Environment

13. (I) If the production of the novel food has taken place in the UK and involves the contained use of a (live) genetically modified organism, then the centre will have been notified to the Health and Safety Executive (HSE) under The Genetically Modified Organisms (Contained Use) Regulations 2000.

    (ii) If the novel food contains (live) genetically modified organisms (GMOs) then, under The Genetically Modified Organisms (Contained Use) Regulations 2000, any contained use, including taste trials, must be undertaken in premises that have been notified to HSE. Individual activities such as taste trials will only

need to be notified to HSE if, for GM plants and animals, the GMO is more harmful to humans than the non-modified organism. For GM micro-organisms, the individual activity only requires notification if the GMM is likely to cause adverse effects on humans or the environment. Consequently, it is highly unlikely that individual taste trials would require notification, although the requirement for the premises to be notified must be complied with.

(iii) The Genetically Modified Organisms (Deliberate Release) Regulations 1992 as amended in 1996 and 1997, together with Part VI of the Environmental Protection Act 1990, implement EC Directive on the Deliberate Release into the Environment of Genetically Modified Organisms (90/220/EEC). They require specific consent for release from the Secretary of State for the Environment in England (or the devolved authorities in Scotland and Wales). Taste trials involving the release of genetically modified organisms will require such consent.

(iv) The contact point for contained use of genetically modified organisms is:

Health and Safety Executive (HSE)
Health Directorate
Room 6.19 Rose Court
2 Southwark Bridge
London SE1 9HS

The contact point for releases of genetically modified organisms to the environment is:

Dr P Burrows
Department of the Environment, Food and Rural Affairs (DEFRA)
GM Policy and Regulatory Unit
Room 3/G9 Ashdown House
123 Victoria Street
London SW1E 6DE

Other Points

14. The Committee has indicated that where the above conditions are met there is no need, on a routine basis, for protocols for taste trials to be referred to it consideration. However, the Committee is willing to give advice in individual instances, particularly those involving difficult or complex issues.

15. Those seeking further information, or wishing to obtain advice from the Committee should, in the first instance, contact Mrs Sue Hattersley at:

    Food Standards Agency
    Room 526B
    Aviation House
    London
    WC2B 6NH

References

1. Department of Health "Guidelines on the Assessment of Novel Foods and Processes". Report on Health and Social Subjects No. 38. HMSO, London, 1991.

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4. Commission of the European Communities. "Commission Recommendation of 29 July 1997 concerning the scientific aspects and the presentation of information necessary to support applications for the placing on the market of novel foods and novel food ingredients and the preparation of initial assessment reports under Regulation (EC) No. 258/97 of the European Parliament and of the Council. C(97) 2634 final. Official Journal of the European Communities Vol. 40 L253/1- 46, 16 September 1997. (Also available on: www.europa.eu.int/eur-lex/en/lif/dat/1997/en-397XO618.html).

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10. Royal College of Physicians "Guidelines on the Practice of Ethics Committees in Medical Research involving Human Subjects." Second Edition. The Royal College of Physicians of London, January 1990.

11. The Association of the British Pharmaceutical Industry. "Guidelines for Ethical Approval of Human Pharmacology Studies Carried out by Pharmaceutical Companies", 7 November 1990.

APPENDIX XIII

ADVISORY COMMITTEE ON NOVEL FOODS AND PROCESSES

CONSIDERATION OF THE USE OF HUMAN STUDIES IN THE PRE-MARKET SAFETY ASSESSMENT OF NOVEL FOODS

INTRODUCTION

1. This paper briefly reviews the role of human studies in the pre-market safety assessment of novel foods and focuses on the circumstances in which such studies might be appropriate and the issues that need to be considered when conducting human studies on novel foods. It should be noted that such studies are performed to support other safety studies and not to investigate potential toxicity.

Definition of Novel Foods

2. The EC Novel Foods Regulation defines a 'novel' food as a food or food ingredient which has not previously been used for human consumption to a significant degree within the European Community. Amongst the foods covered by this definition are low calorie fat replacers, GM foods and an increasing range of dietary products such as some functional foods. All foods that are deemed novel are required to undergo a rigorous pre-market safety assessment.

Safety Assessment of Novel Foods

3. Safety assessments of novel foods should be carried out on a case-by-case basis, including, where appropriate, the results of conventional animal toxicological studies. In such studies the test compound is normally fed to animals at a range of doses, some several orders of magnitude greater than expected human exposure. However, foods are intended to be consumed by humans at levels that approach the maximum dose that could be used in animal studies and therefore for many novel foods such studies may not be feasible (ACNFP, 1999). In such circumstances risks should be characterised as completely as possible by comparison with closely related existing food products e.g. consideration of the key nutrients and toxicants. This approach is termed 'substantial equivalence'. Where a novel food can be demonstrated to be substantially equivalent to a conventional counterpart it is considered to be safe

and no further safety assessment is required. This concept is based on the assumption that since individual ingredients have an extensive history of consumption a new combination of such ingredients will be equally safe.

4. Where a novel food is substantially equivalent except for a few clearly defined differences, the safety implications of these differences need to be fully assessed. However, when a novel food is not substantially equivalent, either because the differences cannot be defined or because there is no existing conventional counterpart, while this does not mean that the food is not safe, a detailed data package is required to facilitate a rigorous pre-market safety assessment.

ACNFP Decision tree

5. In 1990 the UK Advisory Committee on Novel Foods and Processes (ACNFP) developed a decision tree (DH, 1991a) to indicate the types of data that were likely to be required for assessing the safety of individual novel foods. This tree, which was reviewed and extended in 1994 (ACNFP, 1995), includes 15 possible information categories, one of which refers to "Human Studies".

6. The ACNFP, in addressing the role of human studies in the safety assessment of novel foods, acknowledged that, 'There is a wide diversity of studies that may need to be performed in humans on novel foods or products derived from novel foods, including the tasting of a new variety of an existing food organism, large scale acceptability and marketing trials and tests for intolerance or allergenicity. These studies in humans are to confirm acceptability and tolerability, not to investigate potential toxicity.' (DH, 1991a) Such studies can be considered under the following study types:

   (i) Tasting/palatability;

   (ii) Single dose/short term repeated dose studies for digestibility and tolerance;

   (iii) Allergenicity, including observations of any allergic reactions in occupationally exposed personnel;

   (iv) Acceptability/marketing trials; and

   (v) Post-marketing surveillance.

7. Tasting/palatability and acceptability/marketing trials do not constitute safety assessment studies and are therefore outside the scope of this paper (the Committee has published guidelines on the conduct of taste trials involving novel foods elsewhere (ACNFP, 1992) which are due to be updated in the near future). Clearly, post-marketing surveillance studies, with the intention of providing further public reassurance of the safety of novel foods, also fall outside the

scope of this paper. The post-marketing surveillance of novel foods is currently being considered by the ACNFP.

Guidelines accompanying the EC Novel Foods Regulation

8. Following the introduction of the Novel Foods Regulation, the European Commission (CEC, 1997) published a detailed set of guidelines setting out the type of information that would be expected to support an application for approval of a novel food to ensure that all member states follow a similar approach to the safety assessment of novel foods. These guidelines draw upon the structured approach developed by the ACNFP and require a detailed data package to facilitate a rigorous safety assessment. Not all the data requirements will be relevant to every novel food submitted and the appropriateness of human studies as part of this overall data package should be assessed on a case by case basis.

When are Human Studies Justified?

9. A comprehensive framework for the safety assessment of novel foods already exists but, given the wide variety of foods and food ingredients that are potentially covered by the Novel Foods Regulation, it is not possible to draw up a comprehensive list of foods/ingredients for which data from human studies would be required. However, there are certain circumstances when such testing is likely to be particularly appropriate and it is hoped that the following may serve as a guide for when human studies are applicable.

Safety Considerations

10. If substantial equivalence to a conventional counterpart can not be established the toxicological assessment, which will include a systematic review of the relevant existing information, may identify potential concerns. For example, in the safety assessment of novel fats it is important to address health outcomes known to be associated with dietary fats, such as possible thrombogenic potential. Given that such a novel food is likely to be consumed by individuals at risk for coronary heart disease (CHD) and thus susceptible to any potential thrombogenic activity, participants at moderately increased risk of CHD e.g. middle-aged, overweight, need to be investigated. The safety assessment of novel dietary fibres will also need to address issues such as digestibility in the human gut and effects on normal gut flora, which may be difficult to predict using data from *in vitro* and animal studies.

Nutritional Considerations

11. The overall safety assessment must consider the nutritional implications of the novel food both at expected and high intakes, taking into account the effects of storage, further processing and cooking. If substantial equivalence cannot be established (see para. 4) and the novel food is anticipated to have an important role in the diet, while appropriate preliminary assessments should be made in

animal models to establish some aspects of nutritional quality, a full nutritional assessment needs to be carried out in humans. Nutritional, including metabolic, outcome measures should be relevant to the objective of the study (for example, the effect of fat replacers on the absorption of fat soluble vitamins) and to the anticipated consumer groups (for example, particular attention should be paid to the nutritional requirements of specific population groups, including infants and children, pregnant and lactating women, and the elderly).

Allergenic Considerations

12. It is not always possible to make a full assessment of allergenic potential of a novel food without challenge testing in humans. As a general principle if the novel food is similar to or derived from a conventional counterpart associated with food allergy, sera from individuals with confirmed allergies to that conventional food can be used for specific in vitro immunological tests. If such tests are negative, skin prick tests and oral challenges of such individuals may be carried out (CEC, 1997).

13. If there are no similarities with conventional foods with associated allergies, a number of other factors can serve as indicators of possible allergenicity e.g. sequence homology of the novel protein with known allergenic proteins. Additional evidence might include reports of workers' sensitisations. However, while it is realised that the current assessment of the allergenic activity of novel foods is problematic, human studies should only be carried out to confirm the lack of allergenicity in those novel foods that are considered potentially allergenic but have proved negative in subsequent in *vitro*/*in vivo* immunological tests as opposed to a general screen for allergenicity.

ISSUES TO BE CONSIDERED IN THE CONDUCT OF HUMAN STUDIES ON NOVEL FOODS

Ethics of Human Studies

14. As well as the need for clearly defined, scientific justification for conducting human studies on novel foods (see para. 19), careful consideration must be given to the ethical aspects of such studies. This latter aspect is of particular importance when there is no direct benefit to the participating subject i.e. non-therapeutic research, which encompasses research on novel foods, as opposed to therapeutic research[2]. The rights, safety and well being of participants taking part in human studies are protected by the principles laid down in the Declaration of Helsinki (WMA, 1964). One of the important principles established by this code is the need to assess possible risk (see para. 16) compared to potential benefit. In such instances where there is no direct benefit to the participant, benefits to the population at large should be considered. The following discussion on the ethical aspects of human research is only a guide to those intending to carry out research on novel foods. The issues are addressed in greater detail elsewhere (RCP, 1986; DHSS, 1982, COE, 1990. BPS, 1998) and anyone intending to conduct such studies should refer to these guidelines. For example, the Council of Europe has set out 16 principles on the ethics of research in humans (COE, 1990), which address the need for inter alia respect for the individual, informed consent, an appreciation of the benefit relative to the risk involved, and ethic review procedures.

15. All human studies on novel foods must receive approval of an Ethics Committee. Such committees exist in hospitals, universities and industrial companies. The UK Government has produced guidelines advising on the structure and function of local research ethics committees (DH, 1991b). The Royal College of Physicians has published Guidelines on the Practice of Ethics Committees in Medical Research involving Human Subjects (RCP, 1990). As a minimum such ethics committees will need to know:

    (i) has the scientific merit of the proposal been properly assessed?

    (ii) how will the health of the research participants be affected?

    (iii) are there possible hazards and, if so, adequate facilities to deal with them?

    (iv) what degree of discomfort or distress is foreseen?

[2] Therapeutic research encompasses both treatment and prevention of disease, offering direct and possibly immediate benefit to the participant; in non-therapeutic research such benefits are either long delayed or unlikely.

(v) is the investigation adequately supervised and is the supervisor responsible for the project adequately qualified and experienced?

(vi) what monetary or other inducements are being offered researchers, participants or anyone else involved?

(vii) are there proper procedures for obtaining consent from the participants or where necessary their parents or guardians?

(viii) has an appropriate information sheet for the participants been prepared?

Assessing the risks to human health

16. Before conducting human studies on novel foods a risk assessment must be performed to determine whether these studies would pose a risk to human health. **It is important to stress that these studies in humans are to support other safety studies, not to investigate potential toxicity.** In this context therefore, risk means the risk of causing physical disturbance, discomfort or pain, or psychological disturbance to the participant, as opposed to the risk of serious harm, which no ethics committee would approve in any case. Whilst judgements will have to be made as to what is an acceptable level of risk in each case, in general the risks to those participating in human studies should be minimal i.e. studies that cause more than minimal anxiety, distress and lowering of self-esteem should be avoided. It is also recommended that all individuals with a history of allergic disease in general should be excluded from such studies. However, it may be appropriate to include them at a later stage but only after suitable screening for cross-reactivities etc.

Informed consent

17. No research may be carried out without the informed, free, express and specific consent of all the participants in the study. Furthermore, such consent may be freely withdrawn at any phase of the research, and the subject undergoing the research should be informed, before being included in it, of their right to withdraw their consent. Therefore, those conducting the study have a duty to explain, in language that is understandable to the lay person, the nature and the purpose of the study and to inform volunteers of possible risks and inconveniences involved in participating in the study. Participants should be clear about what is expected of them during the study e.g. there may be restrictions on the type of food they can eat or they may be asked to refrain from consuming alcohol. Any procedures that may be performed during the study e.g. taking blood samples, should also be clearly explained. The Royal College of Physicians guidelines (RCP, 1990) recommend that such information be given in written form, for example as a Subject Information Sheet (see para. 15). Participants in the study should be assured of confidentiality.

18. Children should not be the subject of research that might equally well be carried out in adults. However, if studies on novel foods are deemed necessary in children (para. 15), as well as the child's consent, parental consent must also be obtained in all cases, even when a child is competent to consent.

Study Design and Protocol

19. There must be a clearly defined question or hypothesis accompanied by scientific justification for conducting human studies on novel foods. Such studies should be designed, conducted, analysed and reported according to sound scientific principles to achieve their objectives. The objectives should be clearly and explicitly stated at the outset and each part should be defined in a written protocol before the study starts. The following principles are discussed in greater detail elsewhere (DH, 1996).

    (i) The objective(s) of the study, on the basis of effects that may be expected to occur as predicted from the pre-clinical data, should be clearly and explicitly stated at the outset of the study.

    (ii) The appropriate study design should be chosen to achieve the study objective(s) effectively. Control or reference groups are used to allow for the effect of natural variability in the outcome measures, as proper randomisation (see paragraph 19iii) will ensure similar natural variability between control and treatment groups. In parallel trials groups of participants fed either the novel food (treatment group) or its conventional counterpart (control group) are compared to detect potential differences in the selected outcomes. Cross-over trials, where groups receive both the novel food and the conventional counterpart at random, are used to reduce natural variability of the outcome measures even further by eliminating inter -individual variability as participants act as their own controls for treatment comparisons. While this design reduces the number of participants required to achieve a specific statistical power, a carry-over effect of the treatment i.e. a residual influence of the novel food in the subsequent period when the participant receives the conventional counterpart can compromise the study. In such cases a parallel study may be more appropriate.

    (iii) The protocol should specify methods to minimise bias. Random allocation to comparative groups will ensure that factors, which are known to be associated with the outcomes, as well as those which are not known, are distributed without bias between the groups being compared. Blinding is an effective way of minimising bias. A trial where the subject is unaware of the treatment assignment is referred to as a single blind study. When the clinical investigator is also unaware of treatment assignment the study is double blind.

(iv) Outcome measures should be defined based on the study objective(s). The outcome measures chosen should be assessed for their accuracy, precision, reproducibility, reliability, validity, feasibility and cost, and they should be relevant. Baseline measurements are essential and routine clinical observation and monitoring and regular clinical chemistry measurements should be maintained throughout the study even when it is not anticipated that these parameters will be altered by the novel food. Arrangements for dealing with abnormalities detected during the study should be in place from the outset

(v) The sample size should be based on the consideration of differences between comparative groups in outcome measures regarded as clinically significant, and the anticipated variability in these outcome measures within each group. In some studies larger numbers of participants are needed to ensure adequate statistical power. Procedures to calculate sample sizes are presented elsewhere (Campbell et al, 1995).

(vi) At the outset of the trial there should be defined selection criteria taking into account pre-clinical knowledge. If the investigation can be performed in healthy adult volunteers it should be. However, there may be instances when studies on special sub-groups of the population are required e.g. participants with a particular disease that may benefit or be adversely affected by the consumption of the novel food, for example people with increased risk of coronary heart disease and foods intended to lower blood cholesterol levels. In such instances the ethical considerations of conducting studies in populations such as these will be different to that for healthy adults. With regards to research in children the British Paediatric Association have published ethical guidelines (BPA, 1992).

(vii) All human studies on novel foods should be conducted in accordance with the principles of Good Clinical Practice (GCP). GCP is an international ethical and scientific quality standard for designing, conducting, recording and reporting studies that involve human participants. The clinical investigator must be scientifically and professionally competent and aware of the principles of the study. There should be adequate resources of time, staff and data recording equipment, and safeguards for confidentiality. Further investigations should also be in accord with the principles of Good Laboratory Practice (GLP) to ensure that laboratory staff are appropriately qualified and that the equipment is reliable. A quality assurance scheme that monitors the laboratory analysis can provide further reassurance of the adequacy of the study.

(viii) The study protocol should have a specified analysis plan that is appropriate for the objectives and design of the study taking into account the specific hypotheses to be tested, the analytical methods of the outcome measures, and approaches to common problems including protocol violations.

(ix) All results should be analysed and adequately documented and be publicly available. The study report should include results presented as absolute numbers. The statistical power of the study should be stated as well as the confidence limits of any differences observed.

CONCLUSIONS

20. Human testing may form an important part of the safety assessment of certain novel foods but the need to conduct such studies should be considered on a case by case basis. There must be sound scientific justification for conducting such studies and the permission of a suitable ethics committee must be obtained. In general human studies on novel foods should be carried out on healthy adult volunteers and should be conducted in accordance with the principles of Good Clinical and Laboratory Practice.

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APPENDIX XIV

ACNFP RESPONSE TO THE FRIENDS OF THE EARTH REPORT: THE GREAT FOOD GAMBLE.

1. The ACNFP has seen the report issued for Friends of the Earth, entitled " The Great Food Gamble". The ACNFP and Friends of the Earth have a common goal seeking to protect the health and safety of consumers and we agree with many of the points raised in the report. However, we do not agree with the interpretation of some of the data presented. These particular issues are discussed in more detail below.

2. The Advisory Committee on Novel Foods and Processes (ACNFP) is the independent body, appointed by the Food Standards Agency (FSA), to carry out the assessment of novel foods in the UK. Committee Members are appointed to ensure that a wide range of relevant scientific expertise and knowledge is represented on the Committee. There are also two lay Members: a consumer representative and an ethicist. Members do not represent any organisations or commercial interests and Members have to declare any interests they have in the food or biotechnology industry. Appointments are made under the Nolan rules, which set out procedures to be adopted when appointing members to public bodies.

Chapter 2: The Challenge of GM crops

The issues raised in this chapter by the Friends of the Earth report included:

- Concerns over the survival of Agrobacterium tumefaciens in GM plants and that genetic modification is a random, haphazard process.
- The use of the CaMV 35s promoter.
- Possibility of unexpected effects, and their detection.
- The use of Antibiotic Resistance Markers (ARMs)

3. **Concerns over the survival of Agrobacterium tumefaciens in GM plants and genetic modification is a random, haphazard process.** The report suggests that genetic modification of crops is a random, haphazard process and therefore raises concerns over its safety. The question arises as to whether it is more or less hazardous than conventional breeding. It can be argued that the production of GM crops is more precise due to:

- the greater definition of inserted material, in terms of the DNA sequence and knowledge of insertion site, and that;

- GM plants receiving much greater levels of testing than conventionally produced varieties.

The important point is that the focus should be on the products per se and their risk rather than on the technology used to produce them.

4. The use of the CaMV 35s promoter
   The safety of the cauliflower mosaic virus (CaMV) 35s promoter and *Agrobacterium* is considered as part of the safety assessment of individual products, where such technology has been used in the genetic modification process. *Agrobacterium tumefaciens* is widespread in nature and for centuries has naturally infected and transformed plants. Throughout this time, plant material from these infected, genetically transformed plants have been eaten: no ill effects have been reported. Similarly, the cauliflower mosaic virus is found worldwide in temperate regions and is common in commercial crops of cabbage, Brussels sprouts, and cauliflower. Although some have questioned the safety of the CaMV 35s promoter, this hypothesis is not supported by the majority of research in this area, which has been published in peer-reviewed journals.

5. The cauliflower mosaic virus promoter is termed constitutive, which means it is expressed in a non-tissue specific fashion throughout the plant. However, there can be variation in tissue expression between independently transformed plants carrying this promoter. This variation is generally believed to derive from position effects, where the expression of a transgene can be influenced by the adjacent endogenous plant genetic material. Genes associated with this promoter will follow the same pattern of expression. The risk assessment takes into consideration both the pattern of expression and level of the novel proteins.

6. Possibility of unexpected effects, and their detection.
   When conferring a specific-target trait (intended effect) to a plant by the insertion of defined DNA sequences, additional traits could, in some cases, be acquired or existing traits could be lost or modified (unintended effects). Unintended effects may be deleterious, beneficial, or neutral with respect to the health of the plant or the safety of foods derived form the plant. The assessment for safety of a GM food must address both intentional and unintentional effects that may occur as a result of the particular genetic modification.

7. The issue of unintended effects is considered in both the draft Codex guidelines[3] and the 2000 FAO/WHO joint report[4] for the safety of GM foods. Unintended effects resulting from genetic modification include alterations to the physical properties (phenotype) of an organism, such as changes in growth or environmental tolerances. Such effects are readily apparent in the commercial development phase following the initial transformation and, where necessary, is eliminated by appropriate selection procedures (such as consecutive back-crossing). GM plants are further reviewed in the two year plant variety national listing tests that new conventionally produced varieties undergo to establish that their traits are distinctive, uniform and stable. Any varieties that do not satisfy these requirements cannot be grown commercially. The safety implications of any other unintended effects, such as alterations in the levels of key nutrients or natural toxicants, where appropriate are, assessed by evaluation of nutritional toxicological and compositional data.

8. Present approaches to assess possible unintended effects are based, in part, on the analysis of specific components (targeted approach). The 2000 FAO/WHO expert consultation was satisfied with the approval used to assess the safety of GM foods that have been approved for commercial use. However, as pointed out in this report, '...some aspects of the steps in the safety assessment process could be refined to keep abreast of developments in genetic modification technology. New methodologies, such as profiling techniques, offer the means of providing a more detailed analytical comparison (ibid.).' This will be especially important for more complex genetic modifications perhaps involving multiple traits. However, these methods are not yet fully developed and validated and will have certain limitations.

9. The Food Standards Agency funds an on-going research programme that addresses the safety of GM foods. It has recently launched a major three-year programme, to examine the use of a variety of existing and emerging techniques, to further refine the current safety assessment procedures for GM foods for the next generation of GM plants.

[3] Codex Ad Hoc Intergovernmental Task Force on foods derived from biotechnology (At Step 5 of the Elaboration Procedure), guidelines for the conduct of food safety assessment of foods derived from recombinant DNA plants, are made available at http://www.codexalimentarius.net/Reports.htm

[4] the 2000 FAO/WHO joint report[10] – Safety aspects of genetically modified foods of plant origin

10. **The use of Antibiotic Resistance Markers (ARMs).**
    It is recognised that there are concerns associated with the use of antibiotic resistance markers (ARMs) in genetically modified food crops. The ACNFP has published two reports[5] addressing a number of these issues. The Committee concluded that researchers should be encouraged to develop and use alternatives to ARMS or improve methods to excise those used. The Committee's conclusions were endorsed in the 1999 Chief Medical Officer's report on the Health Implications of Genetically Modified Foods.

11. The recent codex draft guidelines on safety of GM foods, encourages the use of alternatives to ARMs and the phasing out of markers for resistance to clinically used antibiotics in widely used foods. Furthermore, Article 4 (2) of the new Directive 2001/18/EC[6], which replaces 90/220/EEC on the deliberate release into the environment of genetically modified organisms, lays down the requirement to ensure that particular consideration is given to GMOs which contain genes expressing resistance to antibiotics in use for medical or veterinary treatment. It stipulates that the use of antibiotic resistance markers in GMOs, to be placed on the market, which may have adverse effects on human health and the environment, should be phased out by the 31 December 2004.

Chapter 3: Substantial Equivalence

The issues raised in this chapter by the Friends of the Earth report included:

- The use of the concept of substantial equivalence.
- Confusion with defining and interpreting substantial equivalence.
- Recognises limitations of conventional toxicology studies.

12. **The use of the concept of substantial equivalence.**
    The Royal Society of Canada (RSC) published a report in January 2001, 'Elements of Precaution: Recommendations for Regulation of Food Biotechnology in Canada'. This was widely interpreted as the RSC criticising the concept of substantial equivalence. However, on a deeper examination of the report, it can be seen that the RSC supports the use of substantial equivalence on the basis that it is used to structure the safety assessment and that rigorous scientific analysis is used to determine whether the modified organism poses no more risk to health or the environment than its conventional counterpart.

[5] 1994 Report on the Use of Antibiotic Resistance Markers in Genetically Modified Food Organisms and in 1996 (The Use of Antibiotic Resistance Markers in Genetically Modified Plants for Human Food – Clarification of Principles for Decision-Making)
[6] Official journal of the European Communities (OJ) L106/1 17.4.2001

13. The FAO/WHO expert consultation considered the concept of substantial equivalence as part of its review on the current safety assessment procedure for GM foods in May 2000 and recognised 'that there were presently no alternative strategies that would provide a better assurance of safety for genetically modified foods than the appropriate use of the concept of substantial equivalence' and that 'substantial equivalence should be seen as a key step in the safety assessment process'. The ACNFP fully supports that view.

14. The Food Standards Agency Board, at its meeting in June 2000, reviewed the safety of GM foods. The Board was satisfied that the current safety assessment procedures for GM foods, using the concept of substantial equivalence, are sufficiently robust and rigorous to ensure that approved GM foods are as safe as their non-GM counterparts.

15. **Confusion with defining and interpreting substantial equivalence.** The application of the substantial equivalence concept is not a safety assessment in itself: it does not characterise the hazard, rather it is used to structure the safety assessment of a genetically modified food relative to its conventional counterpart, whereby the identification of the similarities and differences between the genetically modified food and a comparator with a history of safe food use guides the safety assessment process. It is important to stress that safety is not determined solely on the basis of a consideration of compositional changes.

16. A further misunderstanding may arise with regards the use of the term 'substantial equivalence' in relation to notifications made under article 5 of the EC Novel Foods Regulation. This is a simplified procedure under which a company can notify the European Commission that they intend to place a highly refined food ingredient on the market. Such notification are supported by a scientific opinion from a Member State that the ingredient is substantially equivalent to existing foods or food ingredients as regard their composition, nutritional value, metabolism, intended use and the level of undesirable substances contained therein. The ACNFP have considered which types of food ingredients derived from GMOs they would, in the future, provide opinions to support notifications under article 5 of the Novel Food Regulation. They recommended that such opinions should only be provided for highly refined and processed products derived from GM sources that do not contain any novel genetic material. Any new product containing novel DNA or Protein has to go through the full assessment procedure. Other Member States and the Commission endorsed this approach.

17. **Recognises limitations of conventional toxicology studies.**
The FAO/WHO expert consultation 2000 report, notes that the practical problems of obtaining meaningful information from animal-based toxicology studies on the safety of whole foods have been well recognised for many years (see OECD 1996[7]). Foods are complex mixtures of compounds, which have a wide variation in their composition and nutritional value. They can only be fed to animals at low multiples of the amounts that might be present in the human diet. Identifying potential adverse effects and relating these to the food and not other factors can therefore be extremely difficult for a number of reasons. In practice, very few foods consumed today have been subject to studies on animals. However, they are generally accepted as safe to eat.

18. The report concludes that the utility of such animal-based tests has to be considered on a case-by-case basis and that, in specific cases, animal testing may be useful. The ACNFP considers each GM food individually and will consider the need for animal test data in consideration of the overall toxicological profile of the GM food in question. Full details are outlined in an ACNFP paper on the toxicological issues relevant to the safety assessment of novel foods. This information is available on the FSA web site at: *www.foodstandards.gov.uk/maff/archive/food/novel/toxrev.htm* or from the ACNFP Secretariat.

Chapter 4: Establishing the safety of GM foods

The issues raised in this chapter by the Friends of the Earth report included:

- Allergenicity.
- Lack of published data.

19. **Allergenicity.**
As explained above the assessment for safety of a GM food must address both intentional and unintentional effects (see response to chapter 2) that may occur as a result of the genetic modification process involved.

20. Predicting the potential allergenicity of novel proteins is an important part of the safety assessment of any novel foods. There is a range of assessments which can be used to determine whether a protein is likely to be allergenic or not. The 2001 FAO/WHO report[8] concluded that a stepwise, case-by-case approach should be applied to the evaluation of the allergenicity of food derived from

[7] OECD (1996): Food Safety Evaluation. Report Workshop held in Oxford UK, Sept. 12-15, 1994. ISBN 92-64-14867-1

[8] 2001 FAO/WHO report: 'Evaluation of Allergenicity of GM Foods'. Regarding the approach to use for the prediction of allergenicity of GM foods

biotechnology. This approach focuses on the source of the gene, the sequence homology of the newly introduced protein to known allergens, the immunochemical binding of the newly introduced protein with IgE from the blood serum of individuals with known allergies to the transferred genetic material, and the physicochemical properties of the newly introduced protein (molecular weight, sequence homology, heat and processing stability), effect of pH and/or gastric juices (digestive stability), and prevalence in foods. The FSA funds an on-going research programme that addresses the problems associated with detecting potential allergens.

21. The 2000 FAO/WHO report states that the ability to change nutrient levels in crop plants through plant breeding, including the use of recombinant DNA techniques, has the potential to result in broad changes in at least two ways: (1) the intended modification in plant constituents could change the overall nutrient profile of the plant product and this change could affect nutritional status of the individual, (2) in addition, unexpected alterations in nutrients could also affect nutrient profiles of the product and nutritional status of people. Although the genetically modified plant components may be assessed as safe individually, it will be important to determine if the overall nutrient profile of a GM food has been changed and if dietary intake patterns are altered by the introduction of foods from GM plants. The introduction of a significant nutritional change in a food may require post-market assessment to determine whether the overall diet has been altered and to what degree, before an assessment of the impact on nutritional status can be made.

22. Where additional assurance of safety is sought, analytical methods traditionally applied in the evaluation of food constituents such as total protein, fat, ash, fibre and micronutrients may need to be augmented with additional analyses to identify unexpected effects and altered nutrient profiles and bioavailability which may impact on dietary intake and health.

23. **Lack of published data.**
In line with the FSA's policy of openness and transparency the ACNFP makes public all non-confidential information submitted to it as part of an application to market a novel, including GM, food in the UK. The data are made available electronically at the beginning of the evaluation process on the ACNFP web page at:

www.foodstandards.gov.uk/committees/acnfp/newapp.htm.

This offers anyone the opportunity to evaluate the supporting data in the dossier and to submit comments that the ACNFP can take into account as part of its deliberations. The Committee's draft conclusions are also offered for comment before being finalised. This means that the public has the opportunity to contribute to the safety assessment process. Prior to December 1999 when the openness

policy was adopted all application dossiers were made available in the British Library. All ACNFP reports have been made public and Annual reports have been published for over 10 years.

24. The Government set up the Agriculture and Environment Biotechnology Commission to advise Government on the ethical and social implications arising from biotechnology developments and their public acceptability and this forum allows for a wider public debate. In addition, all FSA board meetings are held in public and minutes and papers are on the FSA website.

Chapter 5: The US's GM guinea pigs

The main issue raised in this chapter by the Friends of the Earth report:

- The lack of labelling of GM foods in the US means that any adverse health effects cannot be linked to GM food exposure.

25. Whilst the ACNFP cannot comment on the US legislative position regarding labelling, the Committee is aware that U.S. Food and Drug Administration (FDA) commissioned the U. S. Center for Disease Control[9] to investigate reports of human illnesses potentially associated with the Cry9C protein in StarLink corn. The report concluded that although the participants in the research may have experienced allergic reactions, it was impossible to confirm, on this basis of this study, that any reported illness was associated with the consumption of corn products containing the Cry9c protein. The ACNFP attaches considerable importance to evaluating the allergic potential of genetically modified foods before they entered the human food chain.

26. The Chief Medical Officer and Chief Scientific Advisor recommended that some system of population health surveillance, in relation to consumption of GM and other novel foods, be established in their report (Health implications of Genetically Modified Foods, 1999). The ACNFP has considered the question of post market monitoring of GM foods and held a number of open meetings to consider how such monitoring might be conducted. Observers from various organisations, including Greenpeace and Consumers Association attended these ACNFP meetings. A feasibility study on post market monitoring is underway.

[9] the U. S. Center for Disease Control "Investigation of Human Health Effects Associated with Potential Exposure to Genetically Modified Corn" 2000

Conclusion

27. The ACNFP agrees with many of the points raised in the report issued by Friends of the Earth. However, there are some areas where the ACNFP disagrees with the interpretation of the data presented and has set out the basis of its position. The Committee shares the goal of Friends of the Earth of seeking to protect the health and safety of consumers. The Committee is satisfied that current safety assessment procedures allow for a robust and rigorous evaluation of the safety of GM foods. The Committee acknowledges that in order to meet the safety assessment challenges that will be posed by the future GM developments, further research will be needed to refine and further develop the techniques used. The Committee is aware that the Food Standards Agency is funding work in this area and welcomes this initiative.

11. Cumulative index