Working Group Report

Future Foods for Wellbeing: An Expert Panel's View of the Next 25 Years

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1. Executive Summary

The Future Foods for Wellbeing (FFWB) Working Group reporting to the IGD Food Production Strategy Group conducted a programme of research to identify the impact that the emerging food group commonly referred to as functional foods, will have on health enhancement and maintenance over the next twenty five years.

The Working Group recruited an International Expert Panel who, through an electronic survey, identified six areas of activity where FFWB will have a significant impact and the main anticipated developments in these areas.

- **Economic**

  The development of a **two-tier food market** with cheap basic food on the one hand and foods with enhanced nutritional elements on the other.

- **Disease Prevention**

  A movement away **from treatment** of chronic degenerative disease **to the avoidance** of risk factors through diet resulting in longer active life spans.

- **Science and Technology**

  Applied research to discover new active compounds and the validation of their effects on identified biomarkers associated with disease.

- **New Product Development**

  New product development to produce foods incorporating these new active compounds to reduce health risk, evaluated through identified **biomarkers**.

- **Legislation and Regulation**

  The degree and speed of penetration of foods for wellbeing into the market will be controlled by the amount of **legislation and regulation introduced**

- **Education and Communication**

  The establishment of **communication and education programmes** to raise the level of awareness of foods for wellbeing to all individuals.

The developments in these areas of activity will be dependent on 36 'driving forces' identified in section 4.7 of this report.

2. Introduction

The Policy Issues Council of IGD created the Food Production Strategy Group (FPSG) in 2000 with a brief to identify food production issues that may affect the food chain and help to facilitate a more considered introduction of new technologies in the future.

Food and drinks have emerged over the last six years or so that bring a new dimension to the improvements of wellbeing by diet. Commonly referred to as functional foods, they are just part of an ever more complex jigsaw that recognises that many foodstuffs have a key role to play in health enhancement and maintenance. As a consequence, foods for wellbeing of which functional foods are a subset are an integral part of any future nutrition and health strategies.

The FPSG therefore set up the 'Future Foods for Wellbeing Working Group' with a brief to improve food chain knowledge about how food will have an impact on human health in the future and to produce a vision that anticipates opportunities and hurdles for Future Foods for Wellbeing (FFWB). In addition, the influences that the emerging science that underlies FFWB will have on the consumer, industry and government were also to be considered.

To produce this vision and to identify key future concerns the working group conducted an International Delphi Survey at the latter end of 2002. This research methodology (Appendix 1) was specifically developed for predicting future developments in many fields.

An International Expert Panel (Appendix 2) was recruited, with expertise about diverse aspects of food and health. Each was asked individually to predict developments in several key areas and then comment on the answers of other members of the group through three rounds of information gathering.

The aims of the survey were:

- To identify how future food purchases might be influenced by science.
- To highlight possible future directions in wellbeing food choice.
- To identify, prioritise and advise the IGD Policy Issues Council on the main influences on consumer response to foods for wellbeing.
- To examine and identify future food technologies and their potential impact on consumer response to wellbeing foods and consumer perception of the food industry in general.
- To consider policies and programmes to facilitate the widespread uptake of the technology created by science related to FFWB.
- To facilitate debate on the role of wellbeing foods in the 21st century.

Organisations represented on the Working Group were:

- Mike Buchanan — Marks & Spencer plc (Chairman)
- Jack Winkler — Food and Health Research
- Helen Conn — Forum Bioscience Holdings Ltd
- Fiona Angus — Leatherhead Food International
- Tanya Footman — IGD (Secretariat)

IGD would like to thank the Working Group members for their expertise, time and enthusiasm devoted to this research.

We would also like to express our gratitude to the late John Young who was the original chair of the group and whose commitment to this area of work stimulated the research and provided the initial direction to the group's work.

Thanks also go to The Expert Panel who participated in the survey, without whose opinions this report could not have been produced.

Dr Margaret Ashwell
Prof Janet Bainbridge
Dr Liam Breslin
Dr Judy Buttriss
Dr Clare Chapman
Prof Anthony Clayton
Dr Paul Clayton
Ms Carol Culhane
Dr Mark Lawrence
Mrs Dorothy Mackenzie
Prof Vincent Marks
Prof John Marsh
Prof Ian McConnel
Dr Noel Olsen
Mr Adrian Penrose
Dr Francoise Pestretsoff
Prof Keith Singletery
Prof Sean Strain
Dr Peter Wennstrom
Prof Christine Williams
Mr Simon Wright

The report represents their opinions of a rapidly changing field of science based on what is happening now and what they anticipate future developments to be.

3. Overview

This report on Future Foods for Wellbeing attempts to improve our understanding of how foods will impact on human health over the next 25 years. In order to do so it is important to understand the current situation and the pace of the changes that are taking place.

The developed world has experienced a rapid change from an industrial based, manual labour orientated society, eating minimally processed foods on a family basis to a highly mechanised, automated manufacturing base with high service requirements. Today individuals eat their own diets containing a high proportion of processed foods at times of their own convenience.

In parallel the pattern of human disease in these societies has also changed. The main cause of death was once infectious diseases, however, today degenerative diseases are more common, many associated with the global obesity epidemic.

It is ironic that as improved medical science, diet and lifestyle allow human life expectancy to rise, the same changes to our diet and lifestyle could mean that those extra years may be spent in ill health.

We are now beginning to understand how food is not just the cultural spine of our society, or merely a source of nutrients, but can also be a positive influence on our health or even a prophylactic treatment for disease. With this understanding comes the challenge for FFWB, to achieve increased public awareness that a healthy diet for the 21st century can include specific foods appropriate for an individuals lifestage, health status and genotype.

Also can the food industry demonstrate that individual foods eaten in normal amounts can significantly influence the occurrence of a disease or treat existing conditions as measured by biological markers of disease, namely biomarkers?

Even if the link between consumption of functional foods and disease reduction can be scientifically substantiated, will it be possible to impart the required level of awareness and knowledge to the general public, so that consumers can make informed and appropriate choices among FFWB?

At this time of rapid change in the field of FFWB, with the uncertainties surrounding claims, substantiation and legislation it is easy to only see the immediate problems and to miss the issues that will arise in the future and our opportunities to influence them. However on the 16th July 2003, the European Commission adopted a proposed Regulation on nutrition and health claims made on foods, including food supplements. This is in light of the technological innovations in the food sector and the demand from consumers and industry alike to set a new legislative framework on the use of health claims. The proposed EC regulation would allow health claims under strict conditions following independent scientific assessment and community authorisation.[1] This will ensure that consumers are not misled by claims that have not been properly substantiated.

Recent predictions anticipate that by 2030 over 50%[2] of the UK population will be obese, and by 2010[3] the incidence of type two diabetes in the population will reach three million. Consequently the N.H.S. will be crippled by the cost of treating these diseases and associated conditions. However the latest National Diet and Nutrition Survey (NDNS, 2003) results give some hope. There has been a significant decrease in the amount of energy derived from fat in the diet, from around 40% in 1986/7 to 35% in 2000/1. However the same survey shows that although some sections of society are improving their diet, other sections, including the unemployed and underemployed have worse diets and lower levels of micronutrient intakes than previously reported.

The NDNS survey provides a snapshot of what is happening in the U.K. However, with the globalisation of food and diseases we need to look beyond a national or european basis and look at the forces of change on an international level.

In an attempt to answer some of these questions, the Working Group recruited an International Expert Panel (the Panel) from different fields to give their opinions through a Delphi Survey. This survey was directed in 'rounds' of opinion, collection and feedback. The opinion collection was achieved by conducting a series of surveys using questionnaires (Appendix 3 to 5). The results of each survey were presented to the group and the questionnaire used in the next round was built upon the result of the previous round as illustrated in the appendices.

As expected, there were differences of opinion, but essentially the Panel identified the key drivers determining the way that foods will influence human wellbeing over the next quarter century.

This report consisting of the combined opinions of the Panel members, attempts to predict what will happen in the future, by identifying the current and potential drivers that will shape what that future will look like. The effectiveness of many of these drivers will depend on developing and future technology to give them credibility and on legislation that will regulate their exposure and marketing to the public. If these two key areas can find common ground to make available a range of foods that will beneficially influence human wellbeing, it will still be up to the public to decide if the effort involved in changing diet and lifestyle is worth the benefits on offer.

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1 Draft Proposal for a Regulation of the European Parliament and the council on Nutrition and Health Claims Made on Foods. Commission of the European Communities

2 British Nutrition Foundation

3 British Hearth Foundation and Obesity UK

4. Areas of Activity and Driving Forces of Dietary Change to Foods for Wellbeing

The opinions expressed by the Panel identified the following six areas of activity where FFWB will have a significant impact in the next 25 years.

- Economic
- Disease Prevention
- Science and Technology
- New Product Development
- Legislation and Regulation
- Education and Communication

The following section explores what the Panel anticipate to be the areas of activity for FFWB and the driving forces that will provide momentum to the developments.

4.1 Economic

In the Panel's opinion the development of foods for wellbeing is being driven by both 'push and pull' factors. That is pressures that make dietary improvement seem a desirable option and opportunities that make it feasible.

The Panel agreed that the principal economic pressure was the rising **cost of health care** in virtually all countries, whether their systems are state funded or insurance based. "Prevention is better than cure" is a venerable cliché, but in the early 21st century cost constraints will turn it from a homily into a policy.

The shift from treatment to prevention will take many forms. The most relevant with regard to this research is the use of diet instead of drugs as a response to health problems. That includes using FFWB to provide specific health benefits. An early example, currently on the market, is the replacement of statins for cholesterol reduction with foods containing phytosterols, soy proteins and soluble fibre. Other such substitutions will undoubtedly follow.

The economic logic for this is clear in the eyes of the health care providers. Foods are not only cheaper than pharmaceuticals, but they are purchased by consumers rather than by the government or the insurer.

The other macro-economic development shaping FFWB, is the development of a **two-tier food market**; "an increased division between the money rich, time poor on the one hand and the under and unemployed on the other".

Increasing inequality will have significant implications for FFWB. Affluence creates a market place for foods offering health benefits. It can simultaneously limit the market to the more well off consumer who can afford these premium priced products.

This inequality, if continued into the future, will lead to the less well off eating a diet based on inexpensive foods, using lower quality ingredients, more processing additives and lacking in new active ingredients that benefit health. With this group already having disproportionately higher rates of diet related disease, increased consumption of these highly processed foods, with their associated higher fat, sugar and salt contents would increase this trend.

The less well off have most to benefit from the consumption of FFWB. However the benefits of FFWB will only be realised once the other social issues creating this inequality are resolved. It is envisaged that the different opportunities in these two sections of society will create tension between the commercial and the Public Health potential of FFWB.

4.2 Disease Prevention

In the Panel's ranking, the strongest single factor shaping the future development of FFWB is the global epidemic in **obesity**. With more than half the adults in a country being overweight, as is now common throughout the developed world, treatment through drugs or any other means becomes increasingly expensive. Thus prevention through diet is one of the principal options.

Tackling obesity involves many changes in our food patterns. For FFWB specifically, there is a double implication:

- the need to develop foods for weight management.
- the need to develop foods to address specific health problems associated with obesity, from cardiovascular disease to diabetes and gout.

The other major trend impelling FFWB is the declining birth rate resulting in an **older population**. This not only highlights the requirement for foods relevant to health problems common amongst the elderly, but also to the specific loss of capacities that occurs with age, for example, the decline in cognitive functioning, vision and bone mass.

The concept has however broadened, to optimising diet to different life stages, of which old age is only one, and it will broaden further as our understanding of genetic susceptibility to diet-related diseases increases. The strategic implication for FFWB appears to be the emerging opportunities for **specific foods for specific sub-groups**.

It is envisaged that the shift towards prevention involves a move away from reactive treatment by professionals to anticipatory **self-care** by individuals. This trend is already apparent, partly as a reaction against the limitations of orthodox medicine but also because of the increased feeling of wellbeing that an individual feels on taking control of their own health. It is envisaged that economic pressures will reinforce this, as labour costs are the largest component in any health care system, and diet change can be one of the easiest forms of self care.

FFWB are already available in the market and experiencing variable levels of success. For FFWB to reach their full potential they must not be thought of as foods for the ill, but as foods for the **promotion of wellbeing** - physical, mental and psychological. The Panel expects this trend to continue. That is why this report focuses on "foods for wellbeing".

4.3 Science and Technology

The continued rapid development of **nutrition science** and **food technology** is one of the strongest trends foreseen by the Panel. Greater understanding of nutritional fundamentals is accompanied by a greater capacity to turn that knowledge into products. These are the key pull factors, creating opportunities for new foods for wellbeing.

Part of the expansion of nutritional science involves an expansion in the number of food components relevant to health, beyond traditional nutrients. The study of these new "phytochemicals" and their beneficial effects will lead to the development of **new active ingredients** for incorporation into FFWB.

In parallel, the metabolic pathways that these components influence are being studied more intensively, leading to a more precise understanding of the mechanisms by which they affect health. The level of specific metabolites or the rates of reactions within these metabolic pathways may be used as **biomarkers** to indicate how the intake of active ingredients beneficially influences health. The identification and measurement of these biomarkers will allow clinical trials to substantiate the health benefits of foods at real intake levels in real populations.

The extensive research stimulated by the human genome project and associated mapping exercises is leading to an understanding of the two-way interaction between **diet and es genotype**. That is:

- How genes influence metabolic processes?
- How foods influence genetic expression?
- Why people vary in their susceptibility to diet related diseases?

The trend is already established and is foreseen to continue. As the 21st century progresses, nutritionists will be able to say with increasing precision which components, in which foods, have which effects, on which people and by which mechanisms.

The parallel practical task is the conversion of the scientific understanding into healthier food products. It is envisaged that this will result in nutrition scientists increasingly becoming involved in trials to test whether the new products actually produce the benefits that they are initially designed for. If successful, the evidence will be used to **substantiate claims** for the new FFWB. The Panel expects the standards of proof required for claims to rise substantially over time.

4.4 New Product Development

For the majority of the Panel, the ultimate consequence of the pushes and the pulls, the economic pressures and the technical opportunities, will be the development of **new products** for wellbeing encompassing new foods and new dietary supplements.

Some members however, felt that "the development of functional foods will not be *sustained"*, and as such we could see a return to *"nutritional fundamentals for health"*.

For those who foresee the trend continuing, they anticipate the development of an increasing number of new health-oriented foods. These foods will contain active ingredients that most consumers have never heard of and cannot pronounce, promising benefits that they never previously associated with these particular foods, such as better eyesight, sharper memory, or more flexible joints.

Commercially, there will be a greater variety of products targeted at population sub-groups, designed to deliver very specific benefits. This will result in the creation of niche products and consequently there will be a vast increase in the number of niches.

There will be new "**delivery systems**" to provide consumers with the new active ingredients, such as the specialist thin gels recently introduced for breath fresheners, or nutritional patches analogous to the current nicotine patches. This rush of novelty and the multiplication of complexity will not be problem free. **New issues** will arise, requiring more regulation and expanded nutrition education, as discussed in subsequent sections.

In parallel with the validation of an expanding number of nutritional biomarkers, new technologies will be developed to measure them simply, cheaply and non-intrusively. Together, they will enable people to **monitor** their own nutritional status, to measure the consequences of their diet and to assess the specific effects of FFWB on their health.

4.5 Legislation and Regulation

The introduction of numerous new ingredients and foods, together with new technology, will stimulate **new national and international regulation**. Thus governments will have a significant role to play in controlling the pace of development of foods for wellbeing.

For the past 20 years, food law in many countries has focussed on the control of communication, particularly through **product claims and food labelling**. The Panel envisages that this will continue. Manufacturers of FFWB will need to communicate with consumers to inform them about the unusual new benefits of their products. As a result there will be a corresponding need to ensure that the information that they provide is accurate and that competitive exaggeration is averted. In addition, the promotional dimensions of the Internet, largely uncontrolled at present, will come under increasing regulation, despite the cost and complexity of doing so. Consequently, the requirements for evidence to substantiate claims will be increased and **new active ingredients** will have to be declared.

The Panel also anticipates that increasing public concern about the safety and efficacy of novel active ingredients will lead to regulation of their use, especially in fortified foods. FFWB could thus revive an old food adage, recently fallen into disuse, that is *"what's in the can is more important than what's on the can"*.

Entirely new forms of regulation will arise to address the food industry's applications of genetics. Concerns about human **genetic testing** are already prominent. Who has access to test results? For what purposes may the information be used? Additional issues will arise when genetic information is incorporated into new forms of personalised marketing for FFWB. Anxieties about the new genetics extend much wider than the food industry, however, so the general policy decisions governments make in this field will impact how new foods are manufactured and sold.

The Panel anticipates that **genetically modified crops** will be highly regulated, whatever policies individual countries finally adopt, whether prohibitions and segregation at one extreme or controls on intellectual property and competitive practices at the other. The degree of restrictions on the use of GM ingredients in processed products will also shape the future of FFWB.

The one area in which some members of the Panel see a diminution in regulation lies in the possible **liberalisation of agricultural trade**, involving some dismantling of protectionist domestic agricultural policies and the de-linking of subsidies to production. If this liberalisation takes place, the balance of worldwide food production would change.

The Panel was strongly divided on **government intervention** in the price mechanism through taxes and/or subsidies on foods. For some, these were seen as necessary instruments to guide healthy eating and to overcome the two-tier food market. For others, the political as well as economic consequences were too serious for any government to contemplate.

4.6 Education and Communication

Calls for **national nutrition education programmes** have been a ritual, but unfilled demand from almost all stakeholders, in all countries, for the past 30 years. In the 21st century, the Panel predicts that they will actually happen.

We also face the introduction of many new active ingredients bearing complicated names, that are unfamiliar to most consumers. Information will be necessary from both a commercial and public health perspective to educate consumers.

It is envisaged that greatly improved communication will be required for the following two developments:

- **Genetic testing**:

It is universally recognised that human genetic testing should be accompanied by counselling to enable consumers to accurately interpret and act on the results. For inherited susceptibilities to diet-related diseases, consumers will require guidance on which foods to avoid and which foods to eat, including specialist new foods for wellbeing. They will also require similar advice on the interpretation of biomarker measures.

- **The movement from treatment to prevention**

To ensure that the movement from treatment to prevention (from professional care to self-care) is effective, consumers will need to know what actions they should be taking, as will the health professionals who provide the counselling. Moreover, health care providers in both state and insurance funded systems, would have an interest in ensuring that they do, to help control costs. It is also envisaged that as consumers are alerted to inherited susceptibilities and individual dietary requirements, they may become more motivated to choose appropriate foods. In turn this could lead to increased educational requirements and perhaps the impetus to learn more.

It is also envisaged that education programmes will become more complex as there could be a demand for programmes to become sub-divided by target audiences, for different life stages, and health problems. They will also become **multi-tiered** for different levels of sophistication.

In turn education providers could become more varied too, with manufacturers continuing to promote products with health messages. However for novel FFWB there could be an increased demand to be drawn into sponsorship of educational programmes, including endorsements and partnerships with independent professional groups.

The Panel foresees that the **mass media** will continue as a key information source about new foods. However more unconventional, non-medical providers could emerge, aided by the Internet. Advocacy groups could expand their information role and it was anticipated that the retailers would too.

Interestingly, no members of the Panel envisaged that the **government** would play an expanded role in nutrition education.

4.7 Driving Forces

The earlier sections of this report (Section 4.1 to 4.6) contain the opinions of the Panel, gathered during rounds one and two of the Delphi Survey, pertaining to what they anticipate to be the areas of activity for FFWB and the driving forces that will provide momentum to the developments.

In round three of the survey, a list of the driving forces identified by the Panel was circulated and the Panel were instructed to assume that within each variable there would be strong developments over the next 25 years. They were then asked to score the variables one to five with a score of one deemed the least important and a score of 5 was deemed the most important in shaping the future of foods for wellbeing.

It should be emphasised that all of the driving issues in the list had previously been identified in the previous rounds as important to the development of FFWB. The results from round three of the survey attempts to rank the driving forces in order of relative importance against each other.

In addition to an overall averaged score that gave each driving force its ranking within the list the standard deviations of the scores were calculated to indicate where there was general agreement (a lower standard deviation) and where there was a difference in views (a higher standard deviation).

Ranking of Driving Forces

Rank	Variable	Average Score	Standard Deviation
1	Continuing trend to obesity and associated diabetes	4.24	1.03
2	Food technology's ability to enhance the health qualities of foods, including new delivery systems	3.83	1.04
3	The regulatory structure which emerges to govern all forms of communication about Future Foods for Wellbeing	3.83	0.99
4	Future development of nutrition science	3.75	0.94
5	Positive attitudes of mass media towards 'healthy' foods	3.72	0.89
6	Discovery and incorporation of new, beneficial active ingredients into Future Foods for Wellbeing	3.67	1.14
7	Value placed on 'convenience' in the purchase of foods	3.61	1.29
8	Trend away from drug-based treatments towards prevention, including the role of diet	3.61	1.24
9	Regulations on the fortification of foods generally and the composition of Future Foods for Wellbeing	3.56	1.34
10	Education in awareness of nutrition by the public generally	3.56	0.98
11	Active promotion of Future Foods for Wellbeing by food retailers	3.56	3.98
12	Level of scientific evidence required to substantiate the efficacy of Future Foods for Wellbeing	3.56	1.10
13	Development of 'life stage' foods, especially for the elderly	3.50	1.04
14	The genetic modification of crops, especially to alter their nutritional profiles	3.50	0.99
15	Development of a two-tier food market, between affluent and poor, affecting access to Future Foods for Wellbeing	3.44	1.25
16	The 'health claims' that producers make about the effects/benefits of Future Foods for Wellbeing	3.39	0.92
17	Increase in health care costs	3.39	1.14
18	Trends towards increased self care including both self diagnosis and self treatment	3.39	1.33
19	Continued growth in eating outside the home	3.33	1.08
21	Activities of pressure groups for and against Future Foods for Wellbeing	3.22	1.17
22	Concerns about sustainability and the environmental impact of agriculture	3.18	1.13
23	Development of multi-tiered information programmes for people with different levels of interest in Future Foods for Wellbeing	3.12	1.11
24	The accreditation/endorsements of the Future Foods for Wellbeing by 'independent' institutions	3.06	1.06
25	Changing economic participation of women, changing proportions of time spent at work and at home	3.00	1.41
26	Industry education and sponsorship programmes on behalf of Future Foods for Wellbeing	3.00	1.28
27	Changes in healthcare delivery systems	2.94	1.26
28	Development of internet information about health and Future Foods for Wellbeing	2.94	0.80
29	Falling real cost of food	2.94	1.30
30	Increasing convergence of the pharmaceutical and food industries	2.83	1.38
31	Genetic testing and awareness of nutrition by the public generally	2.76	1.09
32	Future taxes on 'unhealthy' foods and/or subsidies for 'healthy' foods	2.72	1.41
33	Development of dietary supplements relative to Future Foods for Wellbeing	2.72	1.07
34	Continued expansion of the fast food industry	2.72	1.18
35	Liberalisation of agricultural trade between developed and developing worlds	2.53	0.87
36	The impact of climate change on what can be grown in different parts of the world	2.22	1.06

Source: FFWB Working Group

5. Summary

The intention of this report was to look beyond the current short term nutritional issues of the nation's diet and to look at the potential impact that foods could have on human wellbeing over the next twenty five years. The structure of the Delphi Survey that was used to compile this report, allowed the Panel to give their views as unattributed comments, permitting a degree of freedom of expression that can be suppressed in the presence of peers. Allowing for the different backgrounds and interests of the Panel, there has been good consensus on the areas of activity and the driving forces that will influence how foods will affect human wellbeing in the future. There is less agreement on what the outcome of these driving forces will be in the identified areas of activity.

The Panel has clearly identified the **continued trend of increasing obesity** as being the most significant influence on how foods will influence human wellbeing (Table 1: Ranked 1). Clearly, there are a number of factors contributing to the increase in obesity in developed societies, with food and lifestyle playing a significant role. The Panel has identified that in the future, in order to prevent the onset of such life limiting conditions as obesity, **individuals will have to take responsibility for their own health** (Table 1: Ranked 18).

The Panel also expressed a view that **regulation** could have an impact on decreasing the incidence of conditions such as diabetes through the imposition of taxation on unhealthy categories of food. It should be noted that although **the taxation of unhealthy food** was identified as one of the driving forces of FFWB (Table 1: Ranked 32), this was also the issue that caused the widest difference in views from the Panel.

For individuals to effectively contribute to their own healthcare they will have to have access to practical solutions for **self diagnosis, treatment and monitoring**. The Panel expects the industries of science & technology to provide these solutions by identifying **biomarkers and new delivery systems** (Table 1: Ranked 2). These biomarkers will facilitate **clinical trials** that identify new bioactive compounds (ranked number 6) and substantiate their beneficial effects through clinical trials (Table 1: Ranked 12), as well as providing the mechanism to **self test** for indicators of optimal health.

This move to **self care** was ranked in the middle (Table 1: Ranked 18) of the drivers in the table but had the fifth highest standard deviation indicating that there were a number of members of the Panel who did not think this would happen.

The research and development involved in the **identification of new active compounds** and their practical application into foods will involve additional cost. There will also be a cost involved in the provision of any self testing kits to assess the status of a biomarker for an individual. Unless this extra cost is in some way funded by the state, there is the potential for a **two tier food market**, with only the more affluent able to afford to optimise health through diet (Table 1: Ranked 15).

An element of the Panel that thought that there would be **a convergence of the food and pharmaceutical industries** (Table 1: Ranked 30), with the barrier between foods and medicine becoming blurred. This issue also had the third highest standard deviation, indicating that this was a minority view.

One factor that will affect the extent to which foods can contribute to human wellbeing will be the **regulatory structure** that emerges to govern all forms of communication about FFWB (Table 1: Ranked 3). It is anticipated that **legislation** will emerge that will cover the active ingredients that can be used and the levels at which they can be used (Table 1: Ranked 9) as well as the **health claims** that can be made (Table 1: Ranked 16).

Education and Communication will play a crucial role in the future development of FFWB. The potential development of these foods depends on having a customer demand led market, based on a public that has been made aware of the benefits of consuming them (Table 1: Ranked 10). This public awareness will be achieved partly by the promotion of FFWB by the manufacturers and retailers (Table 1: Ranked 11), but more importantly by the positive attitudes expressed through articles in the **mass media** (Table 1: Ranked 5).

An important element of public acceptance for FFWB will be how the nutrition establishment views them. The **scientific and technological developments** identifying biomarkers and facilitating meaningful clinical trials will play a key role in nutrition science developing to a stage where it accepts and promotes the beneficial health effects of FFWB (Table 1: Ranked 4).

Appendix

Appendix 1: The Delphi Survey

This section provides an overview of the Delphi research methodology and illustrates the steps involved in obtaining the information that has been used in this report to identify the driving forces of dietary change for foods for wellbeing in the next 25 years.

Definition

A Delphi Survey is an exercise in group communication among a Panel of geographically dispersed experts, which is directed in 'rounds' of opinion collection and feedback. Opinion collection is achieved by conducting a series of surveys using questionnaires. The results of each survey are presented to the group and the questionnaire used in the next round is built upon the result of the previous round.

Methodology

This research technique is used to assess the direction of long term trends with an emphasis on science and technology and bypasses the problems of group dynamics through anonymity and controlled feedback. It recognises judgement as legitimate in generating forecasts and makes the best of less than perfect information. It also overcomes the disadvantages of conventional committee procedures and can be effective even when used in small groups

1. Formation of The Survey Team

A working Group on Future Foods for Wellbeing was formed under the auspices of the IGD/PIC Food Production Strategy Group. Members were recruited based on their expertise and their experience in working in the field of FFWB.

2. Selection of the Expert International Panel

A list of knowledgeable specialists was collated and from this list the Working Group members drew the Panel. A list of participants is documented in Appendix 1.

3. Development of First Round Questionnaire

The first round questionnaire (Appendix 3) was drafted based on the group vision for FFWB. This round identified what the major issues and influences were on the future development of foods for wellbeing.

Identifying the:

- Areas of general agreement
- Strongly held individual views
- Some directly opposed views

4. Analysis of Responses

The analysis of the responses formed the basis for the formation of the second round questionnaire. (Appendix 4)

5. Preparation of Second Round Questionnaire

This round allowed for controlled feedback of the issues raised by the Panel and requested opinions on the issues raised.

6. Analysis of Responses

The analysis of the responses from rounds one and two formed the basis for the identification of variables for round three. (Appendix 5)

7. Preparation of Third Round Ranking Exercise

Thirty six variables, which were perceived to have a major influence on the future of foods for wellbeing over the next 25 years, were identified. In round three the Panel were asked to assume that these would be strong developments over the next 25 years in each of the variables listed and to assess the relative importance of each variable in shaping the future of foods for wellbeing.

8. Analysis of Responses

The results of round three (Appendix 6) enabled the group to rank the relative importance of each variable against another. These variables, which are the driving forces of dietary change for foods for wellbeing in the next 25 years, were grouped into six areas of activity.

Appendix 2: The International Expert Panel

The International Expert Panel

Names	Background	Country
Dr Margaret Ashwell	Science	UK
Prof Janet Bainbridge	Academic	UK
Dr Liam Breslin	Academic	Belgium
Dr Judy Buttriss	Science	UK
Dr Clare Chapman	Industry	UK
Prof Anthony Clayton	Academic	Jamaica
Dr Paul Clayton	Academic	UK
Ms Carol Culhane	Industry	Canada
Dr Mark Lawrence	Academic Industry	Australia
Mrs Dorothy Mackenzie	Academic/Science	UK
Prof Vincent Marks	Academic/Science	UK
Prof John Marsh	Agriculture/Economics	UK
Prof Ian McConnel	Agriculture	UK
Dr Noel Olsen	Public Health	UK
Mr Adrian Penrose (on behalf of MRC)	Academic/Science	UK
Dr Francoise Pestretsoff	Industry	France
Prof Keith Singletery	Academic/Science	USA
Prof Sean Strain	Academic	UK
Dr Peter Wennstrom	Industry	Sweden
Prof Christine Williams	Academic/Science	UK
Mr Simon Wright	Industry	UK

Source: FFWB Working Group

Appendix 3: Delphi Questionnaire - Round 1

Listed below are eleven headings under which influences on the future development of foods for wellbeing may be grouped.

Please briefly describe the factors that you believe will be important under each heading. But do not feel obliged to put an answer in each category. Leave a section blank, if you feel that is appropriate for any reason.

We have provided an open category at the end. If factors that you believe are important do not fit under any of our suggested headings, please add appropriate headings of your own in this concluding section, and list the factors there.

Under each heading, we have given a few illustrative examples. They are for guidance only, to provide a general idea of factors we had in mind, and to stimulate thinking. Do not feel bound by them. Write as much or as little as you like.

After each heading, we have provided a small amount of space to indicate the place for your answers. If you are replying by e-mail, this space will automatically expand to accommodate your response, however long it is. If you replying on a hard copy by fax or mail, do not feel restricted to the limited space we provided. Add as many continuation sheets, as you need to express your views.

1. Social

(For example, demographic changes, social and ethnic groups, international and local mobility, work-leisure balance, eating and shopping patterns, etc, etc.)

2. Economic

(For example, growth and development rates, income distribution, economic activity of women, industrial concentration, the international division of labour, trade agreements, etc, etc.)

3. Science /Medicine

(For example, basic research in the underlying life sciences, in clinical fields, development of new clinical practices etc, etc.)

4. Technology

(For example, the discovery of new active ingredients, pharmacogenetics, fortification techniques, food safety, food processing, food packaging, logistics, information technology, the Internet, etc, etc.)

5. Government

(For example, food-related legislation, enforcement procedures, food-related welfare, direct food provision, dietary guidelines, nutrition education, etc, etc —- PLUS —- many broad policies in areas listed above and below, such as the economy and education.)

6. Healthcare

(For example, training health professionals, health service development, public health / prevention programmes, applied nutrition, obesity initiatives, biomarkers, gene-disease relationships, genetic testing, gene therapies, self care, etc, etc.)

7. Education/Training

(For example, initiatives directed at the general public, like "food" education in schools, post-school learning for adults, industry-provided Information, self-directed learning, information through the media, initiatives intended for food specialists, like university level subjects, professional training, continuous professional development, etc, etc.)

8. Agriculture /Fishing

(For example, genetic modification of plants and animals, extinction of species, "fortification-in-the-field", animal nutrition, fish stocks, organic production, functional crops, international food trade, local sourcing, etc, etc.)

9. Manufacturing

(For example, new ingredients, new products, "traditional" products, new delivery systems, supplements, pharmafoods, waste recovery, market segmentation, foods for the poor, supply chain structure, food and pharmaceutical industry relations, etc, etc.)

10.Retailing

(For example, technology-assisted shopping, home shopping, access to food, local markets, costs, margins and prices, etc, etc.)

11.Communication

(For example, marketing, advertising and public relations, claims and labelling, media role, consumer organisations' role, market research, consumer surveys, etc, etc.)

12.Other Categories?

(Add other headings here if you feel they are appropriate. Then, list relevant factors under them.)

Appendix 4: Delphi Questionnaire - Round 2

Listed below are **ten headings** under which the influences on the future development of foods for wellbeing from Round 1 have been grouped.

At the end of each summary, we have left a "**Comments**" section where you can record your responses. This section can be expanded to accommodate however much you want to say. In this second round, we would ask you to provide a considered rather than spontaneous response. But, again, write as much or as little as you want. There is no need to reply to every idea or question raised in the summaries. Just record what you think is most significant and why.

1. Social

Continuing demographic changes will result in a declining birth rate and an increase in the average age, creating an increase in the number of single person households. This shift, plus changing work patterns is likely to lead to an increase in demand for single/smaller portion convenience food and eating out with a parallel decline in food preparation and cooking skills.

Eating alone will not be restricted to single person households as the custom of eating as a family gives way to family members eating different foods at different times.

Taken together these social changes are likely to exacerbate the trends towards increased overweight and obesity in individuals, with all their related health problems.

To compensate for this, individuals who have the income and education will create a demand for health maintenance programmes and products, including self medication, self diagnosis and high quality lifestyle and functional foods.

There will be a similar demand for "ethical" products, which embrace topics such as animal welfare, local markets, provenance and traceability.

Questions raised include:

- *What is the future for home prepared food?* : Will fast and ready prepared food become the norm or will there be a rejection of processed food and a move back to "slow" foods?

- *Are life stage foods the way forward?* : Will parents concern for children's health and the increasing age of the population lead to foods developed to deliver health benefits to particular sectors of society?

- *Is society prepared to face the consequences of obesity?* : Is obesity and it's consequences being ignored because it is "too difficult" to tackle?

- *Will we have a two-tier health society?* : Will individuals with the income and education to make a choice, choose to focus on optimal health and private health care, whilst those without consume "value" foods, with the state treating chronic degenerative illness.

Comments:

2. Economic

The economic activity of women is seen as a major influence. There is considerable interest in the extent to which women will work in the future and the effect that this will have on who buys and prepares the food. The numbers of women in the workforce will also have an effect on the type of food that they demand and the amount of food eaten out of the home.

International trade is highlighted as a significant area of activity. In particular, the likely emergence of developing countries in global food production as well as the effect of subsidies and tariff barriers on global food movement.

The cost of food is also a major area of debate, both in terms of international trade issues but also in relation to the proportion of disposable income we are likely to spend on food in the future. Changing economic patterns will be reflected by the food choices made by society's haves and have-nots. Questions raised included:

- *What will be the influence of women in the work place?* : Will the number of working women continue to increase, leading to a demand for domestic services in the home or will increasing numbers of women choose not to work but to stay at home and look after their children.

- *Where will food be eaten?* : Will there will be further polarisation in terms of food eaten out of the home, with an increasing gap between those who have jobs and eat out a lot and those who do not work and so eat out little (i.e. the elderly and unemployed).

- *Where will food be produced?* : Will developing countries become major food producers and exporters. Will international market liberalisation result in the cost of food rising or falling as a percentage of disposable income.

- *What factors will contribute to the cost of food?* : Will the cost of food support increased requirements for regulation ethical trading and corporate social responsibility?

- *Who will bear the cost of ill health?* : The National Health Service is forecast to come under increasing financial pressure as a result of a population with an increased age profile, spiralling levels of diet-related diseases and an increase in stress-related illnesses from longer and longer working hours. How will the treatment needed be funded?

Comments:

3. Science and Medicine

There is considerable interest in the evolution of nutrition science and the way and extent to which it will develop in the future. This includes its future acceptance by scientists, as well as the consumer. The discovery of biomarkers and application of this science is also seen as important.

The development of the field of genetics is seen as key, both in terms of the human genome and genotyping and its likely application in personalised advice and individual testing. There is also interest in the use of genetic engineering to produce crops with health benefits.

The future focus of medicine was highlighted and the extent to which it will shift emphasis from a treatment-based system to one focusing on preventive medicine which encompasses a body and mind perspective. The increasing importance of individual responsibility for his/her own health in the future was identified.

The drivers of these changes are thought to be multifactorial, including the growing strength of the consumer culture, which is already shaping the food and pharmaceutical markets. Society is undergoing significant demographic change with an increased life expectancy and falling birth rate. This is likely to result in increasing demand for foods to maintain health in old age and economic pressure to move to a preventative based health care model as governments predict spiralling healthcare costs.

There is general agreement that science will produce new findings on the health benefits of foods and genetics will allow personalised healthcare advice to be given to individuals rather than population groups. There is also a consensus on likely shift towards preventative medicine. Questions asked include:

- *How will nutrition science develop?* : Will our understanding of the role of diet and individual food components increase and how quickly will this knowledge be reflected in food products and eating habits. Some believe that improvement to the protocols used for clinical studies and the level of scientific substantiation of health claims must be achieved before more definitive findings can be produced and accepted by consumers. Others believe that these improvements will not happen resulting in a loss of credibility for foods with health benefits and the devaluation of nutrition as a scientific discipline.

- *What impact will functional foods have?* : Will genomics allow functional foods to be tailored to individual requirements? Will functional foods be used in complex combinations to address preventative health issues? Will an understanding of the importance of lifelong nutrition lead to a decline in interest of functional foods? Will foods ever be regarded as medicines?

Comments:

4. Technology and Manufacturing

No area of the first round produced a greater range of responses or stronger differences about the likely direction of future developments.

In some areas, there was widespread agreement. Waste management will become more important, particularly in minimising waste in the first place, not just in subsequent processing. There were also many predictions of increased use of biodiagnostic techniques for diet-related problems, both by health professionals and increasingly as a form of self-care and self-monitoring.

There was a range of views on what would influence foods in the direction of wellbeing. Would traditional food technology, packaging, information technology in many forms, genetics, the pharmaceutical industry, and even changes in developing countries shaping those in the developed world be the most influential factors. How these technological options would be applied, and whether they would be taken up or resisted produced radically different opinions. Among the principal questions were:

- Fortification: will there be more of it, seeking to deliver new active ingredients, or less of it, because other technologies will increase bioavailability or allow, "fortification-in-the-field"?

- Packaging: will there be more sophisticated forms of packaging to allow new delivery systems for healthy ingredients or will packaging diminish because it will be increasingly taxed for environmental reasons?

- Genetics: will the food industry follow the model of pharmacogenetics, in tailoring foods to individual genetic profiles, or will there be a reaction against the potential social controls which could arise from genetic testing?

- GM crops: will nutritionally modified plants gradually come to be seen as a source of beneficial active ingredients or will the possible risks of the technology lead to its rejection?

- Industry: would the pharmaceutical industry gradually invade the traditional territory of the food industry, would the centre for health care shift to food retail establishment, or would the two industries gradually merge into one another?

- Developing World: would presently underdeveloped countries be the locations where many new technologies were adopted, in an attempt to move forward quickly, or would technical limits mean they remained traditional producers, including for export to the developed world?

- Labelling: will this continue to be a major focus of policy, have demands for more information reached their natural limit, or will technology develop a multi-tiered information system about food products.

- Strategy: will technology be used to develop new foods or reformulate traditional ones?

- Adoption: will the many new technological options be taken up or will resistance to new technology in food increase?

Comments:

5. Government

There was general agreement that government must take a precautionary approach to food legislation that in turn will result in increased regulation. Government will seek to tighten control in the areas of food composition, labelling, fortification, novel products, traceability and contaminants. It was felt that harmonisation with the E.U. would result in more proscriptive regulation.

The government was seen as the determining body in defining the food/drug interface, with regulation of the levels of evidence required for health claims and the wording of health claims controlling the pace that functional foods will develop.

The trend of increasing obesity in the population with the ill health associated with it will increase the cost of health care. It is thought that this increase in cost will result in a greater emphasis by the government on preventing ill health rather than treating it.

There was a suggestion that government funding for scientific research would continue to fall with the expectation that increased funds would come from the E.U. and industry.

The government was seen as having a key role in the prevention of obesity and promotion of a healthy diet and lifestyle on a continuous basis for all age groups.

Questions raised included:

- *What is the government policy on the acceptable level of contaminants in foods?* : With increasing levels of detection of contaminants, will any detectable level be acceptable?

- *Will the government embrace fortification and functional foods as a solution to preventative, optimal health care?* : What are the barriers to fortification and functional actives being accepted?

- *What incentives can the government offer to make a healthy diet and lifestyle more attractive and accessible?* : Are tax incentives and food composition regulation the way forward?

- *Will the government regulate pharmaco-nutrition therapists?* : With nutrition science being integrated into more national core medical curriculum, will the government impose minimum qualification levels for therapists practising or advertising their services?

Comments:

6. Healthcare

The main issue to be raised within this section was the move from the treatment of disease to the prediction and prevention of disease, with increasing focus on self care. Obesity and bone health will remain public health issues.

Economic factors were seen as major drivers in this sector. With Government striving to reduce the burden of healthcare putting greater emphasis on primary care to drive a more preventative and holistic approach to health. Prevention could thus be used as a measure of assessing efficacy of individual GP's and Primary Health authority spending. There was some disagreement in the role of government. Is the Government a driver of change or as some, could it inhibit change, with the EU introduction of legislation on nutritional supplements quoted as an example of this.

There were views that the discovery and measurement of more biomarkers would mean a move away from traditional clinical trials, speeding up the process of establishing the health benefits of functional foods. Gene testing and gene therapy work will become more established.

The benefits of gene testing were seen as controversial as it could lead to the identification of 'undesirable' individuals who may find it difficult to obtain adequate insurance cover. Among the principle questions were:

- *Who will be responsible for giving healthcare advice?*: It was felt that there would not be enough qualified Dietitians and Nutritionists and thus more training of other health professionals such as paramedics and pharmacists would be necessary. The role for the food industry to provide specialist advisors was identified. It was also felt that contradictions in health care advice on food and nutrition would remain.

  Controversy exists in the perceived status of health professionals versus non-health professionals in giving advice. Food industry was seen to play a more active role in healthcare, however there was some controversy as to whether consumers will trust their advice in the future. It was suggested that consumers could potentially expose the food industry as having a similar moral outlook as the tobacco companies.

- *Where will the consumer receive healthcare advice and counselling?*: Accessibility of healthcare was seen as key, with a shift away from the GP surgery to more accessible locations such as the community pharmacy or the local supermarket. The Internet was also highlighted as a source of information and specialised advice.

- *What advice will the consumer be expecting?*: There will be a focus on self-care with consumers' actively self-diagnosing and using food as a delivery mechanism for disease treatment. This will lead to the 'medicalisation' of the diet.

Comments:

7. Education/Training

There was widespread agreement that consumers would participate in self-directed 'lifelong learning' to address the life cycle changes and needs. Other issues around education and training focussed on the following areas.

- *How and where will consumers to be educated?*: Members of the Panel reported that consumers would have access to diverse resource platforms. Increasing use of the Internet, software packages and distant learning programmes will facilitate the regular updating of information to reflect a quick changing environment.

  However some controversy existed in the fact that web based services could be detrimental to the credibility of health professionals whereas other believed that key players providing information should have a recognised qualification, to ensure consistency in the information provided.

  Future television cookery programmes were seen to have more emphasis on science as the precise role of functional ingredients is identified.

  Accessibility to this information will be at home or at the supermarket, through in store learning facilities or food industry initiatives.

- *Who should be targeted?*: There was agreement that there should be access to different tiers of information to suit the requirements of the different life stages from childhood to retirement, and academic abilities form the poorly educated to health professionals.

  The need to ensure that nutrition and food play an integral part of the school curriculum was identified. With children spending more time in school due to increasing parental working hours, the influence of school on children's diet was recognised. Branded resources at schools were also seen as a factor affecting purchasing behaviour and brand loyalty.

- *Who should be the educators be?*: There was controversy in the role of government in driving health education together with partnerships being forged between industry, education and health leading to the formation of Macdonald's University or KFC hospitals.

Comments:

8. Agriculture and Fisheries

Responses in this area concentrated on four principal themes: the role of genetics in future agriculture, the environment and sustainability, the future of fish as a food, and changes in agricultural policies around the world. But within each of these thematic areas there were substantial divergences about the course of future developments.

However, one area that is the subject of much current discussion was only once mentioned by the Panel —- the impact of climate change. This is an issue members might wish to consider afresh in this second round.

Genetics: the issues raised here concerned not only possible genetic modifications to plants and animals, but also the way genetic testing of individuals for health problems will feed back into agriculture, targeting production for identified vulnerabilities.

Understandably, the focus within this group was more on genetic modifications designed to alter the nutritional properties of plants and animals, rather than on the agronomic GM issues common in public debates. And there was equal emphasis on animal genetics as well as plants. The principal focus would be on the inclusion or strengthening of active ingredients that would be beneficial to health, either consumed directly or incorporated in manufactured foods. The reduction of allergens in foods was another target for future modifications.

But there consensus ended. There were radically different views on the adoption of GM technology —- ranging from the view that it was unlikely for the foreseeable future to the idea that it would become routine in the same period.

Sustainability: there was consensus that environmental concerns would lead to greater emphasis on sustainable production. But views differed on whether this would mean more organic food. Some anticipated strong growth in organics, others felt that sustainability would not translate directly into organics.

Fish: there was general agreement that fish provided from the sea would fall as fish stocks declined. Some felt this would stimulate supply from fish farms. But others felt that pollution issues and the declining nutritional quality of farmed fish would limit its growth. People would simply eat less fish in future. The nutrients traditionally provided from fish would increasingly come from supplements.

Agricultural Policy: the reform of the EU Common Agricultural Policy was widely predicted. But beyond that two different scenarios were sketched out. First, there would be an increasing internationalisation of production and supply, facilitated by more liberal trade regulations. This would lead to a shrinking in UK agriculture. Alternatively, concerns about sustainability would lead to greater emphasis on local sourcing and closer links between domestic primary producers and processors.

Comments:

9. Retail

It is thought that retailers will continue to compete for customers on the basis of convenience of access, quality and value of products. The Internet is increasingly seen as a realistic choice for the regular purchase of bulk items with a supplemental visit to stores for impulse purchased treats. However, there were also views that this type of Internet shopping is restricted to those with access and the means of electronic payment.

There were also differing views on the quality of foods that would be offered by retailers. Some considered that the quality of foods would increase with more premium ranges offered, targeted at delivering health benefits. Others thought that a two-tier food offer would develop with premium foods at one-end and value foods at the other.

Retailers were seen as having a key role in the communication of health messages and product information. New technology such as radio frequency tags could provide product specific nutritional and compositional information.

Views were expressed that current healthy eating ranges offered by suppliers were more marketing led than a response to high quality market research on the requirements of consumers. These views were countered by those that thought that with the exception of weight loss, there was no real demand from customers for these foods. Questions raised included:

- *Are food stores the best place to communicate healthy eating messages?* : Are our food purchases so impulse driven that the health messages have to be at the point of purchase?

- *Are food trends going to be towards totally prepared convenience or fresh?* : There appears to be a conflict in customers demand for fully prepared convenience foods and fresh unprocessed authentic foods. Are they different consumers?

- *Will fast foods reinvent themselves as healthy?* : Will fast foods with lower levels of fat sugar and salt and increased fruit and vegetables replace the current offer?

Comments:

10. Communication

Today's consumer is inundated with vast amounts of technical and often, seemingly, conflicting information.

There is distrust of nutritional health messages by organisations representing consumers and frustration by industry at the lack of a joined up method of communicating nutritional health benefits.

There is a general desire for all nutrition advice to be based on good scientific knowledge and evidence wherever it comes from. Substantiation of health claims will be key to this with fast tracking of clinical trials and subsequent dissemination of information over the Internet with an emphasis on the quality of information and credibility of its source. This requirement for accountability in the manufacturing and retailing sectors should be matched in organisations representing consumers and the media.

The communication of substantiated messages from credible sources will allow the rational targeting of different consumer groups, with consumer specific foods, with consumer specific information. The information will be provided as low level on-pack information with more detailed back up data for those who want or need it. Questions raised included:

- *Can health claims be effectively communicated?* : Will the difficulty of marketing, advertising and making claims that the customer can understand, restrict the potential for functional foods?

- *Can we prevent unhealthy eating and promote healthy eating through communication?* : Do we need additional incentives to get the public to act?

- *Should all routes of health message communication be covered by regulation or external monitoring?*

Comments:

Appendix 5: Delphi Questionnaire - Round 3

Assume there will be strong developments over the next 25 years in each of the variables listed below. Then assess the relative importance of each variable in shaping the Future of Foods for Wellbeing.

Circle/underline only **ONE** number next to each variable to indicate its significance:

- **A score of 1** = less important variable
- **A score of 5** = most important variable

Delphi Questionnaire - Round 3

Variable	Importance				
• Concerns about **sustainability** and the environmental impact of agriculture	1	2	3	4	5
• The **'health claims'** that producers make about the effects/benefits of Future Foods for Wellbeing	1	2	3	4	5
• Future **taxes** on 'unhealthy' foods and/or **subsidies** for 'healthy' foods	1	2	3	4	5
• **Food technology's** ability to enhance the health qualities of foods, including new delivery systems.	1	2	3	4	5
• Value placed on **'convenience'** in the purchase of foods	1	2	3	4	5
• Changing **economic participation of women**, changing proportions of time spent at work and at home	1	2	3	4	5
• **Industry education and sponsorship** programmes on behalf of Future Foods for Wellbeing	1	2	3	4	5
• The impact of **climate change** on what can be grown in different parts of the world	1	2	3	4	5
• Liberalisation of **agricultural trade** between developed and developing worlds	1	2	3	4	5
• Education in awareness of **nutrition** by the public generally	1	2	3	4	5
• **Genetic testing** and awareness of nutrition by the public generally	1	2	3	4	5
• Increase in **health care costs**	1	2	3	4	5
• Development of **'life stage'** foods, especially for the elderly	1	2	3	4	5
• Active promotion of Future Foods for Wellbeing by **food retailers**	1	2	3	4	5
• The regulatory structure which emerges to govern all forms of **communication** about Future Foods for Wellbeing	1	2	3	4	5
• Changes in **healthcare** delivery systems	1	2	3	4	5

Cont'd.../

Delphi Questionnaire - Round 3

Variable	Importance				
• The **accreditation/endorsements** of the Future Foods for Wellbeing by 'independent' institutions	1	2	3	4	5
• Activities of **pressure groups** for and against Future Foods for Wellbeing	1	2	3	4	5
• Future development of **nutrition science**	1	2	3	4	5
• The **genetic modification of crops**, especially to alter their nutritional profiles	1	2	3	4	5
• Development of **internet** information about health and Future Foods for Wellbeing	1	2	3	4	5
• Increasing convergence of the **pharmaceutical and food industries**	1	2	3	4	5
• Availability of **information and advice** about diet and Future Foods for Wellbeing in unconventional, non-medical settings, including food retailers	1	2	3	4	5
• Continuing trend to **obesity** and associated **diabetes**	1	2	3	4	5
• Continued growth in **eating outside** the home	1	2	3	4	5
• Trend away from drug-based treatments towards **prevention**, including the role of diet	1	2	3	4	5
• Level of **scientific evidence** required to substantiate the efficacy of Future Foods for Wellbeing	1	2	3	4	5
• Development of **dietary supplements** relative to Future Foods for Wellbeing	1	2	3	4	5
• Development of a **two-tier food market**, between affluent and poor, affecting access to Future Foods for Wellbeing	1	2	3	4	5
• Positive attitudes of mass **media towards** 'healthy' foods	1	2	3	4	5
• Regulations on the **fortification** of foods generally and the composition of Future Foods for Wellbeing	1	2	3	4	5
• Continued expansion of the **fast food** industry	1	2	3	4	5
• Trends towards increased **self care** including both self diagnosis and self treatment	1	2	3	4	5
• Discovery and incorporation of new, beneficial **active ingredients** into Future Foods for Wellbeing	1	2	3	4	5
• Falling **real cost of food**	1	2	3	4	5
• Development of **multi-tiered information** programmes for people with different levels of interest in Future Foods for Wellbeing	1	2	3	4	5

Source: FFWB Working Group

Further comments:

Thank you!

Who Are We?

We aim to be the leading source of information, research and education for the food & grocery industry. We are unique in that we are the only organisation in the world that has members from all parts of the food and grocery market, including retailers, caterers, wholesalers, distributors, manufacturers and farmers.

From this unique position we are experts on the grocery supply chain and also have a good understanding of shoppers. We have no vested interests and we do not lobby. We bring the whole industry together to address issues and examine strategies for the future.

What Do We Do?

We are a one-stop shop for information, research and education for the food and grocery industry. At IGD we are passionate about this industry and work hard to bring people together to improve mutual understanding.

Our main activities are:

- **Producing business reports**. Analysing developments and forecasting trends in the food and grocery industry
- **Running educational programmes**. We run a variety of training courses and our conference programme is renowned throughout the industry
- **Keeping close to the shopper**. We conduct regular consumer research to understand the big issues that concern consumers
- **Bringing people together**. We develop practical 'best practice guidelines' that also benefit the consumer
- **Providing free information**. Fact sheets and industry best practice guides are now available on-line free of charge and our information unit is there to provide answers to queries (the information unit service is only free of charge to members of IGD)

For more information please visit our website: www.igd.com

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