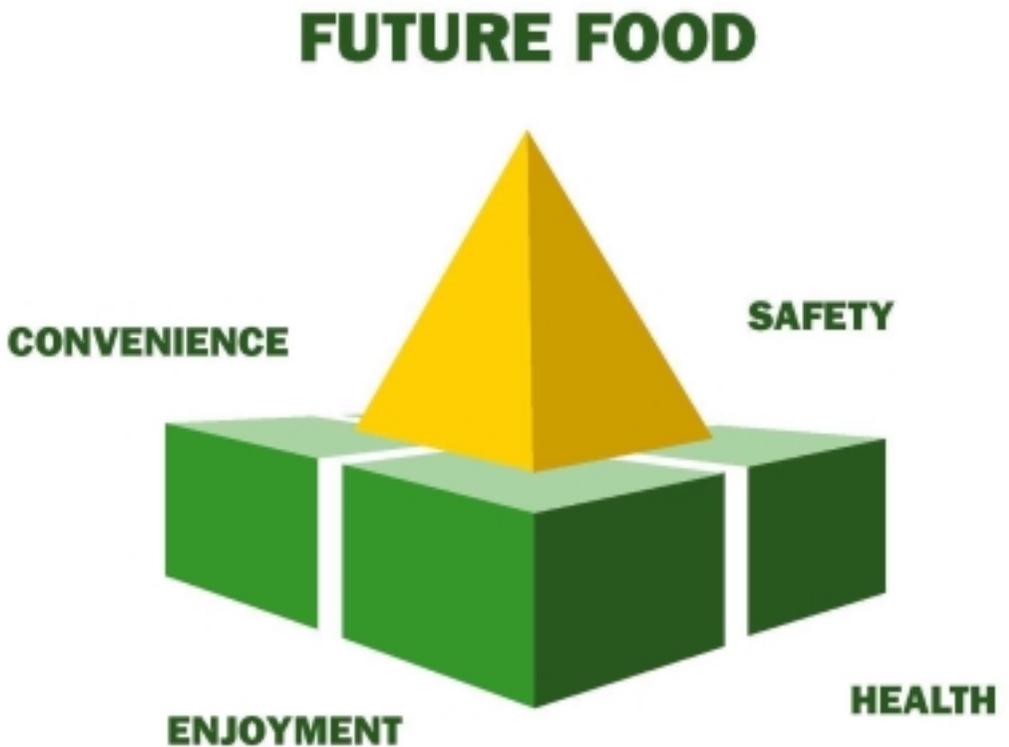


Developing & Marketing Future Foods

The Challenge of Communication



VTT SYMPOSIUM 203

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communication, functional food,
packaging, probiotics, nutrition,
microorganisms

Developing & Marketing Future Foods

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Edited by

Liisa Lähteenmäki, Kaisa Poutanen &

Paula Bergqvist

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puh. vaihde (09) 4561, faksi 456 4374

Statens tekniska forskningscentral (VTT), Bergsmansvägen 5, PB 2000, 02044 VTT
tel. växel (09) 4561, fax 456 4374

Technical Research Centre of Finland (VTT),
Vuorimiehentie 5, P.O.Box 2000, FIN-02044 VTT, Finland
phone internat. + 358 9 4561, fax + 358 9 456 4374

VTT Biotekniikka, Elintarvikkeet, Tietotie 2, PL 1500, 02044 VTT
puh. vaihde (09) 4561, faksi (09) 455 2103

VTT Bioteknik, Livsmedel, Datavägen 2, Box 1500, 02044 VTT
tel. växel (09) 4561, fax (09) 455 2103

VTT Biotechnology, Food Design, Tietotie 2, P.O. Box 1500, FIN-02044 VTT
phone internat. + 358 9 4561, fax + 3589 455 2103

PREFACE

To consumers food represents increasingly more than a source of energy: a source of pleasure, means to express values in life, means to take control over health. The benefits of future foods – functional, natural, novel – are to an increasing extent only noticeable to the consumer through efficient communication. Many of the product launches in food industry fail in their first steps, partly due to inadequate communication within the R&D, production and marketing chain, and from the industry to consumers.

The aim of this congress is to discuss the critical points and framework of communication during development and marketing of future foods, where the value-added is largely based on information. In market-oriented product development the consumer is both the starting-point and the final goal of the process, so much emphasis will be laid on mechanisms of consumer communication. For a successful innovation process, information process, information exchange and understanding is also crucial among scientists, product developers and marketing professionals. The congress attempts to assist in this learning process by featuring some of the main developments in food technology and in the design of functional foods.

The core of the congress programme is formed by presentations of invited experts, who all have sound experience in their special fields, and who have visions and ambitions for more efficient food development and marketing. The congress will also include an interactive workshop element, with the aim to produce a working document based on the opinions and shared experiences of the participants.

Developing & Marketing Future Foods The Challenge of Communication

7 – 9 June 2000

Hotel Scandic Kalastajatorppa, Helsinki, Finland

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Prof. Tiina Mattila-Sandholm, VTT, Finland

Prof. Kaisa Poutanen, VTT, Finland

PROGRAMME

WEDNESDAY, 7 JUNE

- 12.00 – 14.00 Registration, Scandic Hotel Kalastajatorppa
- 14.00 – 14.10 Opening
Prof. Juha Ahvenainen, VTT Biotechnology, Finland
- 14.10 – 15.00 Opening lecture: How to get the message across – the
challenge of communication
*Dr. Kirsti Lonka, University of Helsinki, Learning
Centre, Finland*

Session 1

New technologies – novel foods

Chairs: *Prof. Wim Jongen and Prof. Kaisa Poutanen*

- 15.00 – 15.30 Designer crops as future raw materials
Dr. Kristofer Vamling, Svalöf Weibull, Sweden
- 15.30 – 16.00 Coffee
- 16.00 – 16.30 Emerging technologies – a technology push
Prof. Thomas Ohlsson, SIK, Sweden
- 16.30 – 17.00 Intelligent and communicating food packaging
Dr. Maria Smolander, VTT, Finland
- 17.00 – 17.30 Consumer-oriented technology development
*Prof. Wim Jongen, Agricultural University of
Wageningen, the Netherlands*

THURSDAY, 8 JUNE

Session 2

Dynamics behind the future food market

Chairs: *Prof. Tim Lang and Dr. Liisa Lähteenmäki*

- 9.00 – 9.30 How to market functional food – without contravening European law?
Dr. Moritz Hagenmeyer, Westphal Voges Krohn, Germany
- 9.30 – 10.00 Consumer demands and consumer decision-making
Prof. Klaus Grunert, MAPP, Denmark
- 10.00 – 10.30 Coffee
- 10.30 – 11.00 Transparency, technology and consumer confidence
Prof. Tim Lang, Thames Valley University, United Kingdom
- 11.00 – 11.30 Evolving market for food and health products
Dr. Michael Heasman, New Nutrition Business, Finland
- 11.30 – 12.30 Lunch
- 12.30 – 14.00 Workshop 1
Moderator: *Prof. Kaisa Poutanen*

Session 3

Designing foods for health

Chairs: *Prof. Willem de Vos and Prof. Tiina Mattila-Sandholm*

- 14.00 – 14.30 The role of food industry in public health
Prof. Pirjo Pietinen, National Public Health Institute, Finland
- 14.30 – 15.00 The possibilities of modulating gut health
Prof. Seppo Salminen, University of Turku, Finland
- 15.00 – 15.30 Coffee
- 15.30 – 16.00 Development of multifunctional prebiotics
Prof. Glenn Gibson, University of Reading, United Kingdom

16.00 – 16.30 Improving the functionality of food microorganisms
*Prof. Willem de Vos, Agricultural University of
Wageningen, The Netherlands*

FRIDAY, 9 JUNE

Session 4

Communicating consumer benefits

Chairs: *Dr. Moritz Hagenmeyer and Dr. Michael Heasman*

9.00 – 10.00 Workshop 2
Moderator: *Dr. Michael Heasman*

10.00 – 10.30 Perception of health and taste as consumer benefits
Dr. Liisa Lähteenmäki, VTT, Finland

10.30 – 11.00 Making the marketing concept
Dr. Paul Coussement, Orafti, Belgium

11.00 – 11.30 Coffee

11.30 – 12.00 Marketing nutrition
Dr. Tiziana Castiglioni, Kellogg, France

12.00 – 12.30 Communication issues facing functional foods in
Europe
Ms. Carolyn Grant, Hill & Knowlton, United Kingdom

12.30 – 12.45 Closing
Prof. Kaisa Poutanen

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THE CHALLENGE OF COMMUNICATION

Kirsti Lonka

University of Helsinki, Learning Centre, Faculty of Medicine

P.O. Box 61

FIN-00014 University of Helsinki, Finland

tel. +358 9 191 26862, kirsti.lonka@helsinki.fi

During the past two decades, a constructivist approach to learning and knowledge has become dominant in health education. Learning is viewed as an active, constructive process rather than a passive, reproductive process. Students and patients are portrayed as intentional individuals whose thoughts, feelings, and ideas are supposed to be taken into account in instruction.

Paradoxical about giving advice is that it is *not possible* to give direct advice. Human mind is not a storehouse where one can transmit information, but rather, a factory which constructs inferences. These inferences are always based on previous knowledge and mental models about the domain in question. For instance, if a patient is told that she should not eat animal fat, she interprets this information on the basis of her previous knowledge: She may have a relative who has lived 90 years by eating butter every day. This everyday experience beats our scientific explanations. People's interpretations of the world as well as their attributions of themselves have important implications for the ways they process information. It is possible that many interactions fail, because we forget the fact that people are not only intellectual creatures, but have their emotional lives as well. Everyday experiences provide implicit theories which are more crucial than the things we are actually trying to tell.

However, it is possible to get the message through by linking formal knowledge with previous experiences. It follows that the main challenge of communication is *listening*. The dialogical process of listening starts with diagnosing what are the previous experiences, beliefs, and dispositions. Then we have to communicate the message by activating these previous beliefs, challenging them, and providing constructive feedback.

There is overwhelming evidence for a positive effect of communication skills training. Students as well as senior professionals can and do learn different communication skills by training. At the Faculty of Medicine at the University of Helsinki, there is a programme *Growing to be a Physician* aimed specifically at enhancing medical students' professional communication and thinking skills. The idea is to foster personal growth in medical students in order to help them to meet the new challenges of communication.

DESIGNER CROPS AS FUTURE RAW MATERIALS

Kristofer Vamling
Plant Science Sverige AB, c/o Svalöf Weibull AB
SE-268 81 Svalöv, Sweden
Sweden
tel. +46 418 667 257, kristofer.vamling@swseed.se

Food is something that we all have a relation to, occasionally only as essential nutrition, but more often as an important part of our social life. We design a menu to please and surprise our guests at home. We meet at the restaurant to select and enjoy the chef's designer cuisine. But will we ever accept designed raw material for our food?

The raw material that is used to generate our food should be "a product from nature". We also know that the food that we enjoy today is safe and nutritionally good. So, what's wrong with the food we have today?

The consumer will not ask for, or demand, designed crops as raw material for their food. Some consumers would accept designed crops if there is an obvious benefit and if there is a possibility of choice. But, what is a designed crop?

Today we have a variety of different vegetable oil qualities extracted from oilseed rape and its close relatives. Conventional plant breeding has created the quality of these oil-crops. Still we don't consider these crops as designed. Genetic engineering is a new tool for today's plant breeders to create new oil qualities and many other new characters in the crops of tomorrow. Will crops partly created through genetic engineering always be considered as designer crops?

The objectives for a plant breeder is a mixture between simple well known goals, such as higher yield, to more diffuse goals as to meet the market demands 15 years into the future. This is a difficult task even without the possibilities offered by genetic engineering.

If a trait introduced via genetic engineering should reach the market, it has to include several characters, such as "high added value", regulatory as well as public acceptance and being environmental beneficial. The plant breeders will not find these traits by themselves. Several new traits have been or will be defined in today's agriculture network. But many new valuable traits will be

tracked down and defined if visionary people from the food industry meet with similar people from the plant breeding industry.

EMERGING TECHNOLOGIES – A TECHNOLOGY PUSH

Thomas Ohlsson
SIK
Box 5401
S-402 29 Göteborg
Sweden
tel. +46 31 335 5600, TO@SIK.se

The food industry is a strongly market driven industry. Technological changes in production and processing technologies have been relatively slow in the last decades. However, the food industry in Scandinavia is facing increased competition from new international players also on the national market, especially in the growing market for added value, convenient foods that require more technology input into the products.

Thus a good reason to look into new technologies is to find methods that can develop unique and innovative products. The second reason for looking into new technologies is find methods that help to increase productivity and to improve product safety and quality.

This presentation will highlight the technological development in three major areas that I believe in the future will contribute to increase the speed of technological development in the food industry.

In the minimal processing area, new processing methods are developed that will give the products the shelf life required for distribution, while at the same time minimising the quality losses caused by the processing. Examples of such technologies are ultrahigh pressure processing, electric field pulse technologies and intensive energy surface treatment. These methods often called pasteurisation methods. In the minimal processing area rapid development is also taken place to find methods where food products and the packaging interact in order to maintain a safe product during the distribution and handling of the food throughout the food chain. Methods such as modified atmosphere packaging, active packaging and edible films will be reviewed.

We live in an information society. Many of the novel technologies offered by IT are still not used very much in the food industry. Computer simulation and animation programs are now coming out of age which means that they will be readily available for decision support, educational or design purposes. An

extensive range of novel sensors is available, that will provide opportunities to control product quality as well as many processing parameters.

The key to the technology push activity in the food area is to look into other technology and to transfer those over to the food industry. In the manufacturing industries, automation and mechanical handling with light robots have been successfully introduced. With increase need for flexibility to accommodate rapid changes between product varieties and varying production volumes, there is a need to improve the supervision of the production processes, which is facilitated by introducing automated methods. The transfer of the mechanical handling methods into the food industry will require that use of hygienic design based on clean room technology. It is my strong belief that any of these presented new technologies will play an important role in the food factory of the future.

INTELLIGENT AND COMMUNICATING FOOD PACKAGING

Maria Smolander, Eero Hurme and Raija Ahvenainen
VTT Biotechnology
P.O. Box 1500
02044 VTT
Finland
tel. +358 9 456 5836, maria.smolander@vtt.fi

Today the most important tasks of food packages are protection of the product and maintenance of the product quality. Packages are also functioning as a source of information of the packed contents and as a marketing aid. In the future, advances in packaging technology will enable food packages to perform new, more advanced tasks. The package can be actively improving the product quality, e.g., by removing oxygen from the package headspace or by inhibiting the growth of spoilage microorganisms. The package can also intelligently monitor and inform about the product quality.

Intelligent package is able to give information about the product quality directly, but also on the requirements of product quality; the package integrity and its headspace gases and the storage conditions of the package. Some intelligent packaging concepts, mainly time-temperature indicators, are already commercially available and their use increases constantly. New concepts of package leak indicators and product freshness indicators are patented and it can be expected that new commercially available products will be available in the near future. It can also be expected that the development of these intelligent packaging systems will benefit from the developments in biotechnology, electronics and sensor technology.

The development and testing of intelligent packaging concepts (package indicators) which give information on the microbial quality and safety of packaged food products is one of the focuses of the packaging research at VTT Biotechnology. Main effort has so far been in the development of chemical leak indicators. An O₂ indicator designed specifically for leak detection of modified atmosphere packages has been patented by VTT. In the development of direct freshness indicators based on reactions caused by volatile compounds, the research at VTT has mainly concentrated on hydrogen sulphide (H₂S), which is produced in considerable amounts during the ageing of packaged poultry during storage.

In addition to the development of new intelligent packaging concepts, VTT is also working on other aspects of this field. The suitability of the commercial time-temperature indicators for the quality evaluation of packaged fish products is studied in an ongoing project. VTT is also participating in an EU-project (ACTIPAK, FAIR CT98-4170) aiming at drafting recommendations for amendments in European regulations to allow the application of active and intelligent food packaging concepts and during the project e.g. safety, effectiveness and reliability of active and intelligent concepts are studied. Also the attitudes of consumers will be studied.

CONSUMER-ORIENTED TECHNOLOGY DEVELOPMENT

W.M.F. Jongen*, A.R. Linnemann, G. Meerdink and M.T.G. Meulenberg
Food Science Group
Wageningen University
P.O. Box 8129, 6700 EV Wageningen
the Netherlands*
e-mail: wim.jongen@ift.fdsci.wau.nl

The many changes in the market for new food products call for a repositioning of existing food production systems and raise the question whether the concepts currently used can survive the challenges of the future. What we see is that apart from market saturation, a number of other developments have a large influence on the situation on the market. Generally the consumer is better educated and more demanding. Also consumers are less predictable in their purchase behaviour, eat more outside homes and are more conscious about health related aspects. As a result there is a continuous need for new products and a more differentiated food product assortment. Related to this development product life cycles become shorter and efficiency and flexibility of food production systems become even more important.

Technological inventions, such as in the field of biotechnology, have to be translated into products, which are attractive to consumers. Vice versa, changing consumer values and habits will stimulate innovation in food production technologies in order to produce suitable new products. This interdependency between consumers' wants and needs on the one hand and technologies and research on the other hand has been recognised by many food companies, but is not implemented systematically yet and should receive more attention in the modelling of food product innovation.

Progress in the research of food product innovation should be made not only by further elaborating the specific technological issues but also by modelling the interdependency between technology and managerial (inclusive marketing) elements of food product innovation. Consumer perception and -preferences are the starting point of such a model of food product innovation. How are changes in consumer preferences and market economics translated into the necessary technological developments? In this paper a conceptual model for translation of consumer preferences and perceptions into desired technological developments based on a systems analysis will be discussed.

HOW TO MARKET FUNCTIONAL FOOD WITHOUT CONTRAVENING EUROPEAN LAW

Moritz Hagenmeyer
Westphal Voges Krohn
Rechtsanwälte
Esplanade 41
20354 Hamburg
Germany
tel. +49 40 356 100, wvk-lawyers-hamburg@t-online.de

1 INTRODUCTION

Of course it is possible to market functional food, i.e. to communicate such foodstuffs' specific advantages, without contravening European law. Manufacturers merely must observe the legal framework within which they may operate. Two main obstacles have to be avoided inter alia. One is the borderline between foodstuffs and drugs, which must not be overstepped (see below 3). The other is the general ban on illness-related advertising enacted in the European Food Labelling Directive 79/112/EEC, which needs to be adhered to (see below 4). Before addressing these two legal problems in detail, however, it should be ascertained what products can be defined as functional food.

2 FUNCTIONAL FOOD

There is no statutory definition of functional food in Europe. Which kind of products are classified as functional food varies from country to country. According to the European Commission's Concerted Action on Functional Food Science in Europe (FUFOSE) a foodstuff is functional, "*if it is satisfactorily demonstrated to affect beneficially one or more target functions in the body, beyond adequate nutritional effects, in a way that is relevant to either an improved state of health and well-being and/or reduction of risk of disease*". Whilst there have always been foodstuffs healthy by nature, the term functional food should be confined to such products, which have been specifically designed for health purposes by adding, modifying or removing one or more components.

3 BORDERLINE FOODSTUFFS/DRUGS

Only drugs are statutorily defined in the European Medicinal Products Directive 65/65/EEC as comprising "*any substance or combination of substances presented*

for treating or preventing disease in human beings"; but there is still no European statutory definition of a foodstuff. Whether a product is classified as food, is thus determined according to the rules of national law. This has the following effect on functional food: such products must conform with a country's perception of a foodstuff rather than a drug, in spite of the fact their regular consumption may prevent diseases. In order to be recognised as a foodstuff, functional food should therefore not be marketed with medical statements or claims which have the tendency to be associated with illness. Only if a substance falls within the category of foodstuffs, can the European rules on food labelling apply.

4 BAN ON ILLNESS RELATED ADVERTISING

It goes without saying that advertising claims on particular functional foodstuffs must be true and not misleading. Art. 2 of the European Food Labelling Directive goes even further. It also forbids to "*attribute to any foodstuff the property of preventing, treating or curing human disease, or refer to such properties*". The implementation of this provision into the national laws of the individual Member States is slightly different in each country. However, since European law takes priority over national law, any implementation which does not properly mirror the European rule must be regarded as legally invalid. As a consequence, advertising claims mentioning or even referring to the properties of functional food to reduce disease risks are bound to get in conflict with the general prohibition of disease preventing attributes in food labelling.

5 CONCLUSION

Clearly, the ban on illness related advertising contradicts the concept of communicating certain properties of functional foodstuffs. However, there are alternatives of promotion which do not necessarily have to contravene European law. These can be:

- a) specifying the peculiarities of a functional foodstuff's composition,
- b) highlighting the particular content of certain nutrients,
- c) positively advertising health benefits without mentioning diseases,
- d) explaining effects on body functions or organs without associating illnesses,
- e) promoting scientific information on disease risk reduction through means of communication unrelated to product advertising,

- f) supporting educational measures which make consumers aware of how they can benefit from the regular consumption of functional food or
- g) employing officially approved health-claims, permissible pursuant to national law.

Current European law certainly has to be changed in order to fully meet the needs of marketing functional food, as amongst others the European Confederation of the Food and Drink Industries (CIAA) has demanded. Consumers are as curious to obtain full information about health benefits of functional food, as manufacturers are interested in furnishing the required details about their products. Art. 2 of the Food Labelling Directive should thus be adapted to the special requirements of functional food, so that it becomes lawful to mention their disease risk reduction properties, too.

CONSUMER DEMANDS AND CONSUMER DECISION-MAKING

Klaus G. Grunert
The MAPP Centre, The Aarhus School of Business
Haslegaardsvvej 11
DK-Aarhus V
Denmark
tel. +45 89 48 64 39, klaus.grunert@mar.hha.dk

Consumer demand for food products can be analysed using four types of quality criteria: sensory pleasure, health, process, and convenience. Each of these criteria involves challenges for the development of future foods. *Sensory pleasure* is a typical experience quality, which means that consumers form expectations about them at the point of purchase, which may be confirmed or disconfirmed during consumption. In many product categories, like fresh meat, fresh fish, fruit and vegetables, current practice in food production and marketing makes it exceedingly difficult for consumers to form reliable quality expectations, and new forms of branding, together with an appropriate organisation of the value chain, could result in increased consumer satisfaction. *Health* is a credence quality, because consumers cannot usually feel the health effect of a food product. Marketing food products based on their health benefits is therefore a question of credible communication more than anything else. The same goes for *process* qualities like organic production, animal welfare, or GMO-free products. Consumer demands concerning these criteria are partly based on strongly held and deeply rooted attitudes, which in turn are related to beliefs which may be remote from the way food scientists view the world, but which nevertheless have a strong impact on consumer decision-making. Understanding these subjective consumer realities opens up new possibilities for product differentiation, but also shows which kind of products will not meet consumer acceptance in the short run. *Convenience* refers to a set of criteria which are of increasing importance for all kinds of consumer segments. Developing future foods with increased convenience has to take care of the trade-offs many consumers perceive between degree of processing and overall quality, and has to realise that convenience means vastly different things for different consumer segments.

TRANSPARENCY, TECHNOLOGY AND CONSUMER CONFIDENCE

Tim Lang
Centre for Food Policy
Thames Valley University
St Mary's Road
Ealing, London W5 5RF
United Kingdom
tim.lang@tvu.ac.uk

Food is inevitably a highly sensitive matter. Unlike cars or clothes or houses, we literally consume it. Food is therefore doubly charged with emotion. We both choose and ingest it. Psychologists and marketers of food have taught us about this emotional aspect of food for decades. Armies of advertisers and market researchers investigate every twist and turn of human sentiment with regard to food products. So why then did food become so delicate a political issue in the late 20th century? Did the marketers and psychologists get it wrong? Or was there a failure of communication?

In this paper, I will argue that the failure of communication argument is wrong. So is the argument that consumers are opposed to new technology. I argue that they are more discriminating. The clash over new foods such as genetic modification and functional foods is because there is a conflict of perspective not just a failure to communicate a message.

Throughout the 20th century, commercialisation of food added value off the land. First processors, then retailers and finally caterers made far more money from food than the creator of the primary product, the farmer/grower. Innovation has been driven more by the search for new markets than by human need or health. Both functional and GM foods are now caught on the horns of a dilemma. On the one hand vast investments have been made. On the other hand, these are worthless unless people consume the new products. The mediator of this conflict is not some message manipulator, but consumers themselves. And consumers cannot be lumped together. They are diverse but increasingly flexing their muscles. The challenge to the food sector is: does it listen to the new sceptical consumers or try to manipulate or side step them?

EVOLVING MARKET FOR FOOD AND HEALTH PRODUCTS

Michael Heasman
New Nutrition Business
67 Boston Manor Road
TW8 95Q, Brentford, Middlesex
United Kingdom
tel. +44 181 758 8414, michaelh@nutritiondigest.com

In the 1970s nutrition and health appear to have been a limited part of food advertising, but by the late 1980s and into the 1990s, it had become a significant theme. Today, developments, in ‘functional food’, is taking the communication of nutrition and health messages to new heights. The food industry’s marketing of food, nutrition and health is now taking place globally on an unprecedented scale. Narrow definitions of functional foods – such as those which try to pin the concept only to products making scientifically-validated health claims – are wholly inadequate to describe the breadth and scale of this revolution in nutrition science and nutrition marketing.

Although the functional food revolution is poised to sweep across the modern food economy, it presents difficult and complex issues for the food industry. In this presentation I consider the evolving market for food and health products marketed through the communication of ‘generic’ health claims, in comparison to those that set out to differentiate themselves through ‘product specific’ health claims, often sold at premium prices to traditional foodstuffs.

It is argued that far from ‘functional food’ being something new, science is enabling companies to give traditional foodstuffs a new lease of market life through the communication of ‘health benefits’. Today whole ranges of traditional foodstuffs are being actively and newly promoted for their health benefits. This includes soy, tomatoes, juice drinks, oats, rye, whole grains, red wine, peanuts and other nuts, a host of dairy products, essential fatty acids, a range of vitamins and minerals, and a variety of fruits and vegetables. The scale of activity opens up new public health possibilities for the promotion of good health through diet, which have yet to be seized. The impact of functional food in providing new healthy choices can be no better illustrated than by studying the dairy shelves of supermarkets in countries like the Netherlands or Finland, that have been transformed by ‘functional food’ (and increasingly ‘organic’) options. ‘Probiotic’ products will be used to illustrate how, through successful marketing communications, new food markets can be created that produce incremental sales.

The marketing communication of the 'generic' health effects of traditional foodstuffs is giving powerful force to the idea that one-day; "all foods will be functional". The rapid advance of nutrition science has revealed that many foods have health-promoting properties, so progressively undermining the potential of premium-priced products carrying product and/or ingredient-specific health claims. These trends are likely to result in supermarket shelves increasingly filled with, for example, products bearing scientifically-proven cholesterol-lowering or heart-health claims (which is already happening), but all priced just like any other everyday food in their category. How then is the consumer expected to react to products such as Benecol (being marketed internationally for their cholesterol-lowering properties) or Novartis' Aviva range (launched in Switzerland and the UK at the end of 1999) which also bear such claims, but are priced at significant premiums?

The essence of these developments is that one of the key strategies of many companies - to achieve strong differentiation of their products by communicating disease-related health claims - is being rapidly eroded in value. And the widely-held belief that technology - in the sense of advances in nutrition science - is going to provide differentiation is coming apart under the twin pressures of generic health claims and the rapid diffusion of the technology (such as cholesterol-lowering soy-based ingredients) to a large number of companies. Product-specific differentiation on the basis of technical fixes of single 'risk factors', such as how many percentage points a product may or may not lower cholesterol, is looking like a strategy doomed to failure in the long-term. The implications of trends such as these for future developments in the communication of functional food will be considered.

THE ROLE OF FOOD INDUSTRY IN PUBLIC HEALTH

Pirjo Pietinen
National Public Health Institute
Mannerheimintie 166
00300 Helsinki
Finland
tel. +358 9 4744 8200, pirjo.pietinen@ktl.fi

Two strategies in disease prevention, the population approach and the high risk approach were debated for a long time. In the population approach the aim is to achieve changes in the whole population e.g. in serum cholesterol and blood pressure values, and in the high risk approach to focus is to treat persons who already have high serum cholesterol or high blood pressure. It has been shown that the population approach is more effective than the high risk approach and that their combination is the most effective way to prevent chronic diseases.

Changes in diet and the decline in coronary heart disease have been remarkable in Finland during the past 30 years. The main strategy has been the population approach which has meant e.g. involving the food industry to develop ordinary, healthier alternatives to food items used every day. Low-fat dairy products became available in the 1970s as well as oil-based margarines. Systematic work to lower the salt content of bread, meat products, cheeses etc. has been done. In addition, decrees to allow labelling of low-salt products has increased their availability. However, reduction in the salt content of all ordinary foods has had the greatest contribution to the decrease in salt intake in the population.

The food industry has currently high hopes on functional foods. There are a few success stories in our country, e.g. xylitol products, lactobacillus GG products, and the cholesterol-lowering margarine Benecol®. Xylitol products have already shown their public health importance. However, the public health importance of future functional foods still remains a question mark. The healthier the food industry can make ordinary, low-cost products, the greater the public health benefit. As long as white bread is the cheapest bread it is difficult to increase dietary fiber intake in the whole population, not just the health conscious and those who can afford a healthy diet.

THE POSSIBILITIES OF MODULATING GUT HEALTH

Arthur C. Ouwehand and Seppo Salminen
University of Turku
Department of Biochemistry and Food Chemistry
Turku, Finland

The intestine is one of the metabolically most active organs of our body. The normal function is therefore of great importance to our health. The intestinal microflora is a major factor affecting the gut health. Disturbances in the composition and activity of the intestinal microflora are associated with diseases such as different types of diarrhoea, inflammatory bowel disease, and colon cancer. Modulating the gut function and intestinal microflora is likely to have health effects beyond the intestine.

Functional foods provide a means of improving and maintaining gut health, by influencing the physiology and function. Such foods should have demonstrated beneficial effects on target functions in the gut; e.g. the intestinal microflora, beyond providing adequate nutrition. These effects should be assessed in well-planned human studies using hypothesis based relevant biomarkers. In addition to efficacy also the safety to target populations has to be well documented.

The two main approaches for modulating the intestinal function by targeting microflora are foods containing probiotics and prebiotics. In the former, usually, live micro-organisms are introduced in the intestine which may direct or indirect affect the endogenous microflora. While in the latter substrates enter the intestine which will affect the number or activity of certain beneficial groups of the endogenous microflora. These methods have been shown to reduce the symptoms of lactose intolerance, shorten the duration of rotavirus diarrhoea and improve allergy symptoms.

Treatment or prevention of a disease with current functional foods may not be possible. However, reducing the risk for the development of a disease may be a more practical approach. The reduction of this risk has, of course, to be scientifically proven.

DEVELOPMENT OF MULTI-FUNCTIONAL PREBIOTICS

Glenn R Gibson
Food Microbial Sciences Unit
Department of Food Science and Technology
The University of Reading, Whiteknights, Reading
United Kingdom
tel. +44 118 935 7223, g.r.gibson@reading.ac.uk

A prebiotic is a non digestible food component that enters the large intestine and has a selective metabolism therein. Because of their purported health promoting properties, bifidobacteria and lactobacilli are the most frequent target organisms. In Europe, most success with prebiotics has been gained through the use of fructooligosaccharides, galactooligosaccharides and lactulose. Whilst ongoing studies will further elucidate the prebiotic effect of other dietary carbohydrates, it may be rational to design oligosaccharides that have enhanced functionality. This may be achieved through biotechnological procedures such as reverse enzyme technology and/or polysaccharide hydrolysis. Some desirable properties in new prebiotics may include:

Anti-adhesive capabilities: An oligosaccharide which acts as a prebiotic may also incorporate anti-adhesive activities. There exists potential for developing prebiotics which incorporate a pathogen receptor monosaccharide or oligosaccharide sequence. These molecules would thereby act as 'decoys' for gut pathogens but at the same time stimulate the usual target genera for prebiotics *Anti-attenuative properties:* The prebiotic concept may be extrapolated further by considering an attenuation of virulence in certain food-borne pathogens. For example, the plant derived carbohydrate cellobiose is able to repress the pathogenicity of *Listeria monocytogenes* through down regulation of its virulence factors.

Synbiotics: With synbiotics, a probiotic would be incorporated into a dietary vehicle with an appropriate prebiotic. This should enhance probiotic survival by providing a selective substrate for its growth.

Encapsulation of probiotics with prebiotics: A further approach whereby probiotics could be targeted towards gut delivery would be to protect them through coating procedures. The encapsulation material could reasonably be a prebiotic material.

Other aspects of improving prebiotic functionality may be the generation of low dosage forms, targeting of a wide variety of food forms and development of oligomers that act at the bacterial species level.

IMPROVING THE FUNCTIONALITY OF FOOD MICROORGANISMS

Willem M. de Vos

Wageningen Centre for Food Sciences and Laboratory of Microbiology

Wageningen University

The Netherlands

www.foodsciences.nl – www.spb.wau.nl/micr

Many industrial food fermentations are initiated by starter cultures of lactic acid bacteria, yeasts or fungi that result in the production of safe, enjoyable, and healthy foods. Driven by technological developments and consumer interests, there is continuing interest in improving the functionality of these food microorganisms in the fermentation process, in the fermented foods, and following consumption. Notably, the latter activity of food microorganisms in the gastrointestinal (GI) tract is receiving considerable attention since it may result in health benefits and hence link the food and pharma fields. Complementary to activities aimed at selecting specific probiotic microorganisms, the functionality of established food microorganisms can be improved using a variety of genetic approaches based on natural gene transfer, genetic modification, and genomics. These improvements will result in strains with new combinations of existing properties or completely novel traits that have been designed in a rational way, can be easily traced, and tested for efficacy. This contribution aims to provide an overview of the current strategies for improving lactic acid bacteria and other food microorganisms that (i) have an increased GI-tract survival, competitiveness or production capacity of desired metabolites, (ii) can be used as delivery systems for therapeutic molecules that affect the immune system such as protein and peptide antigens, oligo- or polysaccharides, or cytokines, or (iii) overproduce vitamins, antioxidants or other metabolites that have established or presumed health-promoting effects. In addition, the application potential of the improved food microorganisms in fermented and other foods will be discussed.

PERCEPTION OF HEALTH AND TASTE AS CONSUMER BENEFITS

Liisa Lähteenmäki
VTT Biotechnology
P.O. Box 1500
FIN-02044 VTT
Finland
tel. 358 9 456 5965, liisa.lahteenmaki@vtt.fi

Pleasant taste and good for health are among the most frequently mentioned reasons behind food choices. Taste or sensory characteristics of food products in general can be directly perceived by consumers, and therefore liking for the product is a very strong motivator in repeated food choices. Our natural way of talking about food is judging whether we like the food or not and what sensory characteristics are related to our liking. Whether foods are good for our health or not has to be conveyed through information. Nutrient content cannot be directly identified through senses, instead we need knowledge about different foods and furthermore ability to evaluate nutritional quality of food combinations. Nutritionally balanced diet promises us lower risk of developing chronic diseases and better chances of maintaining our health. However, this reward is not guaranteed and is somewhere in the distant future.

New foods with special health related claims offer us new kind of health messages about food. The products promise targeted positive functions in the body, such as balancing stomach functions, lowering cholesterol level or maintaining arousal level. The effects of these products can rarely be perceived directly, but some of them can be measured with biochemical measures; however they are typically available on infrequent occasions. In most health effects therefore consumers have to rely on the information about the product and its effects. One of the crucial questions in the success of future health foods is that how consumers' trust can be created and maintained. Consumers may want more open information about the evidence behind health claims. If health claims are based on solid scientific knowledge consumers have a right to know about the possible uncertainties attached to the best scientific knowledge at the time.

Good taste and healthiness are not opposite characteristics in food products. Health effects can give additional value to food products but they cannot overcome consumers' low pleasantness judgements. With a vast number of alternatives available on store shelves consumers will find the foods they like also among the products that have special health effects. Health claims attached to foods are seen as positive factors in general, however the positiveness depends

on the type of product it is added to and on how the information has been formulated. If health effects are designed to products with an earlier negative health image this may confuse consumers. We need more information about consumers' perceptions of different types of health claims if they are joined with various food products.

MAKING THE MARKETING CONCEPT

Paul Coussement
Sales & Marketing, Regulatory Affairs
ORAFIT
Aandorenstraat 1, B-3300 Tienen
Belgium
tel.+32 16 801 243, Paul_Coussement@raftir.be

The real challenge in Functional Foods is to work out a marketing concept that appeals to the consumer, and make the product sell. This is true regardless of the scientific data that are available to support the health claim.

Defining the marketing concept is a matter of combining science, marketing, food technology and regulatory aspects in the right way.

To do this successfully, it is necessary to understand the language of the consumer. Then, the concept needs to be developed according to some essential marketing criteria.

In our recent consumer research, we have focused on how the new consumer thinks about gut health. We found out that he is aware of the existence and the importance of gut microflora. He believes that foods can influence his own flora.

At the same time, our research has tested several ways to communicate about these aspects. The consumer's reaction towards the different concept presentations was sometimes surprising.

The consumer accepts that natural ingredients can help his gut flora. He expects to find such active ingredients in common everyday foods and also in diet supplements. Not every consumer makes a link between such foods and the relief of constipation.

Finally, we have condensed the 'prebiotic' message about inulin and oligofructose into a number of simple messages. The best of these were selected for further product positioning of a new communication concept around gut health, that could equally serve as a basis for other functional food marketing concepts.

MARKETING NUTRITION

Tiziana Castiglioni
Kellogg Co.
Talbot Road
Manchester M16 0PU
United Kingdom
tiziana.castiglioni@kellogg.com

Nutrition is at the very heart of Kellogg's business strategy, a strategic pillar upon which the company has built its image, credibility and portfolio offering. It is at the core of Kellogg's heritage and a major driver in the phenomenal growth the company has achieved to become the global company it is today. W.K. Kellogg pioneered in nutrition long before it became an everyday word. This is clearly reflected in the Kellogg Founder's statement and now company mission "We are a company of dedicated people making quality products for a healthier world".

The meaning of this statement is particularly powerful now, because of its exceptional significance and relevance to the consumer of today. Modern consumers demand high quality foods that are also tasty, nutritious, convenient and healthy. We see trend toward sensible and more natural eating that are consistently growing and strengthening, as our increasing life-span has made all of us more health conscious and longing for better quality, simpler and more fulfilling lives.

However, we must also be aware that there is a constant dissonance between what consumer state as "desired action" versus their "actual action": although consumer talk about the importance of health and nutrition they are nor yet prepared to compromise on taste, flavour, texture or convenience, overall not prepared to trade off the pleasure of eating. The only way to reduce this dissonance is by understanding their needs, providing the right foods and communicating nutrition in a way which is engaging, easy to understand and fun. Kellogg was the first cereal maker to provide the public with a restored cereal in 1938, whose vitamin content was also increased in 1943. In Kellogg there is a list of very successful stories marketing nutrition all over the globe and a few examples will be illustrated.

COMMUNICATION ISSUES FACING FUNCTIONAL FOODS IN EUROPE

Carolyn Grant
Hill & Knowlton
International Public Relations Counsel
5 Theobalds Road
London WC1X 8SH
United Kingdom
tel. +44 171 413 3000, ryosco@hillandknowlton.com

Organising the right communication plan when dealing with Functional Foods is one of the most important aspects of the marketing mix. Get this wrong, and the whole product's potential success can fail. There are plenty of examples where this has happened within the food industry. Carolyn Grant is the Managing Director of Hill and Knowlton's UK Food Division, and has over 16 years experience in the world of food communication. She works on a large number of blue chip clients, including Kellogg's and Benecol, and has established a specialist functional food sub-division within her group. The lecture talk will cover: what to do, and what not to do; some key learnings from existing clients; who are the key influencers, and how to influence them; what to do first, and how to measure results. The plethora of issues facing the Functional Foods market in Europe is also discussed, as well as some ways to overcome them.

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Phone internat. +358 9 4561
Fax +358 9 456 4374

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Title Developing & Marketing Future Foods The Challenge of Communication			
Abstract <p>To consumers food represents increasingly more than a source of energy: a source of pleasure, means to express values in life, means to take control over health. The benefits of future foods – functional, natural, novel – are to an increasing extent only noticeable to the consumer through efficient communication. Many of the product launches in food industry fail in their first steps, partly due to inadequate communication within the R&D, production and marketing chain, and from the industry to consumers.</p> <p>The aim of this congress is to discuss the critical points and framework of communication during development and marketing of future foods, where the value-added is largely based on information. In market-oriented product development the consumer is both the starting-point and the final goal of the process, so much emphasis will be laid on mechanisms of consumer communication. For a successful innovation process, information process, information exchange and understanding is also crucial among scientists, product developers and marketing professionals. The congress attempts to assist in this learning process by featuring some of the main developments in food technology and in the design of functional foods.</p> <p>The core of the congress programme is formed by presentations of invited experts, who all have sound experience in their special fields, and who have visions and ambitions for more efficient food development and marketing. The congress will also include an interactive workshop element, with the aim to produce a working document based on the opinions and shared experiences of the participants.</p>			
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