Will 1992 be a breakthrough for an International Nutrition Policy Strategy?

From the nutritional point of view, 1992 could be a landmark for the appreciation of nutrition and food as a priori of health and agricultural policy strategies to reach the goal of health for all in development programmes. The implementation of the Declaration and Plan of Action agreed upon at the First International Conference on Nutrition arranged in Rome in December by FAO and WHO is a challenge for all of us involved in the Food and Nutrition Sector. The conference was attended by delegates from more than 160 countries, most of them ministers, which together with representatives from 142 regional and international non-governmental organizations discussed how to take advantage of this unique opportunity to work together to solve the greatest challenge for mankind: to eradicate malnutrition and hunger and guarantee health for all.

Unfortunately despite the global representativeness at this meeting the conference was remarkably badly followed by the mass media. For those who read through the Declaration and Plan of Action carefully it is obvious that there is material enough to initiate mutual actions between national and international organizations both on governmental and non-governmental and private basis. It is based on a consensus after intensive and sometimes tough discussions where many interests had to be taken into account. The outcome is relatively well-balanced, depending on how you read it. It is not only a challenge for the politicians but also for the food industry and nutritionists to take action to implement the ICN Declaration and Plan of Action. In this issue of the Nutrition Newsletter we are also presenting the personal comments by the IDF observer (Dr Paul Sachet) as well as a summary of the theme paper which seems to be of greatest relevance for the IDF. Read it and take action. IDF could help to implement the plan of action in a positive direction. It is a challenge for us all.

From the reactions to the first issue of the Nutrition Newsletter it seems as though this publication may play a role as forum for individual views on nutritional matters. This gives opportunities for debate as well as reviews and reports from activities within various expert groups sometimes on controversial matters, as a supplement to the more official role of the Bulletin of IDF.

In this issue of the Nutrition Newsletter you will find reports and reviews on topics relevant for various groups involved in nutritional matters within IDF. In addition some reports and comments from actions in various member countries (Australia, Finland, New Zealand) are published which could stimulate actions within other member countries.

The future activities within the Nutrition Coordination Group have been discussed at the annual meeting in Munich 1992 and onwards within the Commissions C, F and Commission of Studies of IDF.

Revised terms of reference will be put forward to the IDF annual meeting in Minneapolis in 1993. Accordingly, it seems most relevant that the Nutrition Coordination Group should take over the responsibility for the Nutrition Newsletter from Group F38. It is also recommended that Group F38, as a result of analysis of the present work and responsibilities of various groups of experts in IDF, should be disbanded. The Nutrition Coordination Group's report to the Minneapolis meeting, slightly edited, is included here.

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Chairperson of Nutrition Coordination Group and Group F38
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INTERNATIONAL CONFERENCE ON NUTRITION

Rome 5/11 December 1992

The ICN Theme Papers “Major issues for nutrition strategies” (368 pages) and Final Report (Proceedings, World Declaration and Plan of Action for Nutrition) (50 pages) are available without charge from the ICN Secretariat, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy

Report by IDF observer Paul Sachet

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Last December in Rome FAO and WHO organized the International Conference on Nutrition. Delegates from 162 countries, including 139 ministers, representatives from 142 regional and international non-governmental organizations (NGOs) and 15 United Nations agencies attended the conference. I was honoured to be designated as representative of IDF.

The Conference called for a constructive dialogue with the food industry, consumers, health professionals, as well as governmental representatives and international organizations, urging everyone to seize this extraordinary opportunity to allow all people to realize their full human potential.

The International Conference on Nutrition is the first of its kind in which health and agriculture have joined together to address the nutritional security of all people, and as such, places nutrition in its rightful place in development policy.

In the World Declaration on Nutrition, the participants pledged to make all efforts to eliminate before the end of this decade;
- famine and famine-related deaths;
- starvation and nutritional deficiency diseases in communities affected by natural and man-made disasters;
- iodine and vitamin A deficiencies.

They also pledged to reduce substantially within this decade;
- starvation and widespread chronic hunger;
- under-nutrition, especially among children, women and the aged;
- other important micronutrient deficiencies, including iron;
- diet-related communicable and non-communicable diseases;
- social and other impediments to optimal breast feeding;
Inadequate sanitation and poor hygiene, including unsafe drinking water.

It rather sounds like a catalogue of wishful thinking.

Actions to be considered by governments in their efforts to improve nutrition are grouped under 8 action-oriented themes which allow each sector and actor to determine how they could best address nutritional problems taking into account the specific needs and conditions in each country.

For each action-oriented theme, I will try to focus on what could be relevant to the agri-business and specifically to dairying.

1 Incorporating nutritional objectives, considerations and components into development policies and programmes

In particular, the Conference stated that, in collaboration with all parties concerned, governments should develop education and communication programmes so as to achieve nutrition objectives through appropriate consumer choice based on enhanced awareness and knowledge.

We have the knowledge and expertise to contribute to this major goal of the Conference.

The Conference also encouraged the private sector, industry and non-governmental organizations to promote nutritional well-being by considering the impact of their activities on nutritional status.

Perhaps we can consider this statement as an official invitation to participate in the nutrition debate in each country.

2 Improving household food security

This theme deals with many proposals, as various as increasing employment opportunities, improving access to land and other natural resources, promoting better general and nutritional education.

3 Protecting consumers through improved food quality and safety

The Conference asked that food regulations should fully take into account the recommended international standards of the Codex Alimentarius Commission.

4 Preventing and managing infectious diseases

The Conference urged governments to adopt or strengthen measures to ensure that safe food and safe water supplies are readily available in sufficient quantities.

5(a) Caring for the socio-economically deprived and nutritionally vulnerable

This theme focuses on care within the family - including support during and after pregnancy, breast feeding, security, clothing and so on - and care facilities outside the family.

5(b) Promoting breast feeding

It must be interesting for the dairy industry to know that the Conference considers that all women should be enabled to breast feed their babies exclusively for 4-6 months and, while giving appropriate supplementary food, continue breast feeding for up to 2 years or beyond.

It means that all actions will be taken to give effect to the International code of Marketing of Breast-Milk Substitutes, as adopted by the 1981 World Health Assembly and - of possible interest for the dairy industry - that governments will have to take steps to counteract misinformation on infant feeding.

6 Preventing and controlling specific micronutrient deficiencies

This theme mainly addresses the issues of vitamin A, iodine and iron deficiencies.

7 Promoting appropriate diets and healthy lifestyles

This theme is of particular interest for the dairy industry as the western diet is designated as the culprit. Too much fat, and especially too much saturated fat.

But this can also be the opportunity for the dairy industry to participate, as requested by the Conference, in community-based nutrition education programmes or "to promote from an early age a knowledge of food and nutrition, food safety, food preparation, healthy diets and lifestyles in the curricula of schoolchildren, teachers, health professionals and the training of personnel involved in agricultural extension".

This is precisely the work of the various national dairy councils and the very theme of the "Utrecht Group's" workshop on nutrition and education (on 4 March 1993).

8 Assessing, analysing and monitoring nutrition situations

Once again, the dairy industry can be directly involved in the Plan of Action to promote, in close cooperation with governments, "the strengthening of research and training of manpower in nutrition, especially for food sciences, nutrition, biology, food technology, epidemiology, human and social sciences".

In practice, UN agencies have a special responsibility for follow-up. Governments as well as NGOs and the private sector are encouraged to participate in the process of the above Plan of Action at national level.

Some conclusions

Of course we totally agree with the determination of the Conference to eliminate hunger and to reduce all forms of malnutrition.

But, do we have reason to be optimistic about the achievement of this goal? I would say, probably "no". Why?

First: Because the United States rejected a move from France and several developed countries at the ICN to fix a time frame for Official Development Assistance to reach the accepted United Nations target of 07% of the GNP of developed countries. This, of course, can only slow the process.

Second: Because, it will be very difficult to set up, as suggested by the NGO committee in Rome, an NGO network to follow-up the implementation of programmes in the ICN Plan of Action. Most NGOs represented in Rome tried to draw a clear line between PINGOs (Public Interest NGO) and BINGOS (business and industry NGOs) which are considered as linked with big business interests. As a BINGO representative, IDF was hardly allowed to participate in the NGO discussions.
Third and last, but not least, the Conference called on the United Nations to "consider urgently" the issue of declaring an International Decade of Food and Nutrition, but it is unlikely that the UN will do so because even if several developing countries, including China, insisted on the need for a "food decade" as a logical follow-up to the International Conference on Nutrition, the European Community and the United States were opposed to the idea of a food decade. According to the majority of developed countries, such an exercise would add little towards achieving the goals of eliminating hunger the world over and would only add to the cost—particularly at a time when the United Nations is trying to economize and restructure the entire system.

There are many uncertainties and we cannot yet evaluate the future of this rather political meeting. But it seems important for the dairy industry and each of us, in each country, that IDF develop a dialogue with the ICN Focal Point and/or with FAO and WHO to have an active part in the implementation of the Plan of Action wherever and whenever possible. The full texts of the official Provisional Report of the Declaration and the Plan of Action are appended.

Promoting appropriate diets and healthy lifestyles
Theme paper No. 5

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SUMMARY (reproduced here)

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SUMMARY
Promoting better eating habits and positive health behaviour is one of the most challenging tasks in the overall effort to improve nutrition. Nutritional problems broadly fall into two categories: those due to insufficient intake relative to needs and infections, and those due to an excessive or unbalanced intake of food in particular dietary components. In both instances, improvements in nutritional well-being will depend on people having access to a variety of safe and affordable foods, understanding what constitutes an appropriate diet and knowing how to best meet their nutritional needs from available resources. Strategies to promote healthy diets, in addition to education, should include motivating people and creating opportunities for them to change their behaviour, taking into account economic factors, individual preferences, lifestyles and time constraints.

In terms of nutrition and its relation to health, the first concern of national authorities must be securing for all sectors of the population adequate supplies of good quality and safe food in order to prevent deficiencies of macro- and micronutrients. This is the highest nutritional priority in most developing countries, where nutritional deficiencies such as protein-energy malnutrition, anaemia, iodine deficiency disorders, and deficiencies of vitamin A and other micronutrients are among the most pressing public health and social problems. Some of these same deficiencies are also found among vulnerable groups in developed countries.

However, excessive and unbalanced intakes of food or certain dietary components, in association with changes in lifestyle, are related to a range of chronic non-communicable diseases such as coronary heart disease, cerebrovascular disease, various cancers, diabetes, dental caries, and osteoporosis. These are now among the main causes of morbidity and mortality in most developed countries, and they are emerging as significant public health problems in many developing countries. Modifications in diet and life-styles can be expected to reduce the incidence of these diseases. The functional and financial burden of these emerging diet-related diseases on the individual, on health services and on social security systems are considerable, and must be addressed.

Numerous economic, social, cultural and educational factors are inexorably linked to people's diets and lifestyles. Poverty and social inequity are the major underlying causes of many of these problems, but others are
due to unhealthy habits, ironically in pursuit of a better or more comfortable life. Although education and information play an important role, the way people eat and live is not always a matter of choice for vast segments of the world's population. An overall objective should be to improve the social, cultural, environmental and economic conditions that influence people's behaviour in relation to diet and other aspects of their lifestyle.

Current scientific evidence of the relationship between diet and health indicates that diets most clearly associated with a reduced risk of chronic diseases, including heart disease and some forms of cancer, are those that are moderate in energy, low in fat (especially saturated fat and cholesterol), contain adequate amounts of complex carbohydrates and dietary fibre, are moderate in salt content, and contain adequate amounts of essential vitamins and minerals. Diets rich in plant foods, including fruits, vegetables, legumes, and whole grain cereals, are associated with a lower incidence of coronary heart diseases and some cancers. Specifically diets rich in green and yellow vegetables, citrus fruits, and low in salt-pickled, smoked and salt-preserved foods, are related to a lower risk of cancer, including cancer of the colon, stomach, lung and oesophagus.

When the general policy objectives to improve nutrition have been determined, strategies and actions to reach them include:

- nutrition education and dietary guidance for the general public;
- training of professionals in health care, agriculture, extension, and related services;
- development of food-service guidelines;
- involvement of consumer groups and the food industry;
- ensuring food quality and safety;
- monitoring and evaluating national food and nutrition situations; and
- encouraging the availability of the variety of foods needed to meet consumer demand.

To encourage and promote overall health, official nutrition goals and dietary recommendations have been issued by government agencies in different countries and by various national and international panels of experts. Traditionally, recommended dietary allowances have focused on adequate and safe intakes to avoid deficiencies and to ensure that energy is adequate for the needs of nearly all adults, and for the growth development and activity of children. More recently, however, dietary recommendations and guidelines reflect growing concern about diet-related non-communicable diseases, and recommendations now frequently include recommendations for intake of those dietary components that are associated with risk of these diseases. These guidelines provide advice, appropriate for the populations concerned, on selecting a balanced diet that promotes health. Appropriate advice on food purchasing and preparation should be provided. The basic guidelines adopted in many developed countries are quite similar and they include the following principles:

- adjust energy intake to energy expenditure to maintain desirable body weight;
- avoid excessive fat intake and, especially, intake of saturated fat and cholesterol;
- increase intake of complex carbohydrates and dietary fibre and limit sugar intake to moderate levels;
- limit salt intake to a moderate level;
- limit alcohol intake.

In addition to qualitative dietary guidelines, quantitative nutrient goals have been proposed in some countries. The WHO Study Group (1990) has recommended population nutrient goals which provide upper and lower limits within which average intakes should fall for good health and nutrition. The group envisaged that the population nutrient goals would be useful as general planning tools to evaluate the adequacy of a given food supply and the effectiveness of social communication efforts.

The use and interpretation of food labelling plays an important role in education and information strategies for promoting healthy diets. The recommendations of the FAO/WHO Codex Alimentarius Commission, and legislation that has been approved in several countries on this basis, are designed to provide this basic information to consumers, while ensuring that foods are presented honestly by food manufacturers and vendors. Information provided on food labels needs to be supported by coexisting nutrition education programmes.

Evidence from a number of countries indicates that well-executed nutrition communication campaigns can change knowledge and attitudes and alter behaviour, resulting in improvements in nutritional status. Taken as a whole, the evidence from comparisons among and within developed countries supports the view that many chronic diseases can be prevented, or their onset at least considerably postponed, through changes in lifestyle and diet.

Many sectors play a major role in the promotion of healthy diets and lifestyles. The public sector, including health professionals, can work to educate the general public about diet, health and importance of physical exercise. The food industry plays an essential role by responding to consumer demand to produce and market the variety of foods that contribute to a healthy diet. Formal and non-formal education play a central role. Incorporating nutrition into education in general, within the context of local culture, is recommended. In addition to school systems, the health and agriculture sectors, public information channels, worker organizations and in education and promotion of nutrition and healthy lifestyles.

The mass media can make major contributions, and should work along side government and technical experts from the early planning stages of campaigns to promote nutrition and health. The private and commercial sector can cooperate by promoting scientifically sound information and advertising. The influences of consumer groups and community leaders on private sector and government actions sensitive to public opinion, are also important.

All recommendations to encourage and sustain appropriate diets and healthy lifestyles should be culturally acceptable and economically feasible. The quality of traditional foods should be emphasized, when appropriate. Promotion of dietary guidelines should be widely promoted through government, health services, schools, feeding programmes, the mass media, food industry, advertising and by consumer and community groups.

IV CONCLUSIONS AND RECOMMENDATIONS

Many actions can be carried out to promote and maintain healthy diets and lifestyles and they should be developed and applied both locally and nationally. Actions should be taken at the international level to provide policy guidance for adaptation and implementation in countries. For this purpose, coordinated efforts are necessary with a strong involvement of regional and global programmes and organizations, including FAO and WHO, and other United Nations and bilateral-aid agencies, as well as non-governmental organizations that are interested in health, nutrition
and human development; consumers; and the private sector, especially international and transnational food manufacturers and traders, and the advertising media. International and national policies, programmes and advice should be based on sound scientific evidence and judgement to ensure that activities are effective and can be sustained over time.

The essence of promoting better dietary habits and healthier lifestyles should be nutrition education of public at all levels, and of professionals who have the responsibility to carry out such education.

Actions to be taken may also need to be legislated and regulated at local and national level, but they will be more effective if they are voluntarily accepted and applied. This requires adequate promotion and information to have the general public demand and accept appropriate measures, to convince authorities and policy-makers, to influence investigators’ efforts and priorities, and to guide the actions of international organizations.

4.1 Conclusions from lessons learned

Several conclusions can be drawn from past experience:

1. Efforts to improve dietary patterns require close cooperation between government, and agriculture, health, education and trade agencies; consumers and consumer organizations; food producers, processors and marketers; and all levels of the educational system.

2. Government policies affecting food production, processing, distribution, and sales, are often based on considerations that do not include attention to healthy diets. As such, they may be an impediment to dietary change and health promotion.

3. Few health departments have an effective working relationship with such sectors as agriculture, food processing, policies for better education, trade, and finance that is required for the introduction of integrated policies that promote better food supplies and nutrition.

4. With few exceptions, low priority has been given to the non-dietary promotion of healthy lifestyles, such as physical activity, stress reduction, improvement of working conditions and the environment, combating alcohol abuse or, in many countries, the use of tobacco.

5. Social and economic policies that give high priority to agriculture, general and nutrition education, and access to health services, have a positive impact on food availability and control of undernutrition. Policies have an impact only if they are sustained over time, which often implies support by successive governments. Preventive measures should also be given priority in anticipation of the effects that dietary and lifestyle changes may have on the incidence of chronic diseases.

6. Major changes in dietary behaviour or lifestyles are often not given adequate attention by the medical profession. Indeed, the medical profession and health workers often lag behind public demand for health-promoting measures. Nevertheless, their knowledge, understanding and promotion of new concepts in healthy nutrition and behaviour provide an important stimulus for community change.

7. In some societies, populations with access to effective health care may be more inclined to rely on medical advice and less likely to initiate behavioural changes themselves. In contrast, the greater consumers’ sense of responsibility for their own health is, the faster the speed of behavioural change in relation to, for example, diet, smoking and exercise.

8. The most successful health-education campaigns are based on simple and easily understood measures which are integrated into school curricula, extension programmes, mass media, adult education, etc.

9. In developing countries, the need to formulate integrated policies for food and nutrition that are appropriate for preventing diet-related non-communicable diseases should receive high priority.

4.2 Messages to national governments

All governments should:

- ensure an adequate and safe supply of food that can be made available to all segments of the populations;
- recognize the relationship between the changes in a population’s diet and lifestyle that tend to be associated with economic development, and the impact these changes are likely to have on health and their consequences for overall development;
- recognize that it is desirable and possible to develop appropriate dietary guidelines in keeping with economic development that both maximizes health benefits and minimizes health risks;
- recognize that it is desirable and possible to encourage behaviour that has beneficial effects, such as promoting physical activity and discouraging smoking and alcohol abuse;
- develop or adjust food, agricultural, educational and intersectoral health policies based on nutrition and the pursuit of healthy lifestyles. They should be physiologically sound, politically viable, economically feasible, and culturally acceptable;
- promote the participation of non-governmental organizations and the community at large in generating and implementing these policies in order to influence favourably the production, processing and marketing of foods that are conducive to health, and to increase public awareness of the relationship between diet, lifestyles and health;
- recognize that the precise mechanisms by which the tasks of nutrition education and behaviour modification are approached will vary from country to country. However, in all cases decision-makers should:
  (a) give high priority and adequate resources to nutrition communication;
  (b) link nutrition interventions to other health and socio-economic development programmes;
  (c) concentrate on a limited number of areas where a major nutritional impact can be achieved;
  (d) enlist the help of universities, advertising agencies, the food-processing industry, and other groups having appropriate expertise;
  (e) ensure that nutrition communication is continued on a long-term basis, and that its effectiveness is regularly monitored.
Major issues for nutrition strategies 1992

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EUROPE AND NUTRITION: THE PAN EUROPEAN NUTRITION PROGRAMME

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The importance of nutritional aspects can no longer be ignored by the various branches of the dairy industry. In the course of a few years, nutrition has emerged as the major concern for the consumer, for the medical profession, and for the Health Department.

The Commission of the European Communities, in view of this development, has decided on an exceptional programme of nutritional promotion for dairy products, some aspects of which have been entrusted to the Centre for Research and Information on Nutrition and to the Milk Marketing Board of England and Wales (collection and processing of scientific data).

In this context, CERIN and the MMB agreed on a common approach based on three important facts:
- from the angle of nutrition, information is useful only if updated. Scientific knowledge is in a state of rapid flux and should be used immediately. It is often inadequate to refer to data merely a few months old.
- dairy products are not intrinsically good or bad. Their assets, their role, their importance, vary according to age, sex, eating habits, life style, genetics, etc. The debate in relation to dairy products for the benefit of the scientific community, the medical profession, the medical press and even the media will be anything but convincing if no due regard is paid to these various aspects.

Final Report of the Conference
Rome, December 1992

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L’EUROPE DE LA NUTRITION: “THE PAN EUROPEAN NUTRITION PROGRAMME”

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La promotion interprofessionnelle des produits laitiers ne peut plus ignorer le fait nutritionnel. En quelques années, la nutrition est en effet devenue une des préoccupations majeures des consommateurs, des médecins, des autorités sanitaires.

La Commission des Communautés Européennes, consciente de cette évolution, a fait le choix d’un programme exceptionnel de promotion nutritionnelle des produits laitiers dont une partie a été confiée au Centre de Recherche et d’Information Nutritionnelles et au Milk Marketing Board of England and Wales (collecte et exploitation des connaissances scientifiques).

Dans cette perspective, le CERIN et le MMB ont mis au point une approche commune, qui tient compte de trois réalités importantes:
- en matière de nutrition, une information n’est utile que si elle est à jour. Les connaissances scientifiques évoluent rapidement et doivent être immédiatement exploitées. Se référer à des données anciennes, même si elles ne datent que de quelques mois, est souvent inadéquat;
- un produit laitier n’est en soi ni bon, ni mauvais. Ses qualités, son rôle, son importance varient en fonction d’un certain nombre de facteurs comme le sexe, l’âge, les habitudes alimentaires, le style de vie, la génétique, etc. Le débat autour des produits laitiers à l’intention de la commu-
COLECTE DE L'INFORMATION
Le CERIN et le MMB ont constitué depuis plusieurs années des bases de données bibliographiques afin de réunir les résultats des recherches entreprises dans les domaines liés aux produits laitiers, et plus globalement à la santé et à l'alimentation.


Dans le cadre du programme communautaire, les forces respectives des 2 systèmes sont combinées de manière à offrir aux NDCs une seule source d'informations.

D’ores et déjà, le système "Nutrition Monitor" du MMB, complété par les données venant du CERIN est accessible en ligne à tous les NDCs européens.

ANALYSE DE L'INFORMATION
Réunir l’information n’est pas suffisant. La valeur des articles scientifiques les plus intéressants doit être évaluée en fonction du point de vue du secteur laitier. Leurs conclusions doivent être considérées par rapport aux vérités généralement admises afin de confirmer le bien-fondé de celles-ci, de les remettre en question ou même de les combattre.

Tant le CERIN que le MMB ont déjà pris des mesures dans ce sens :
- Avec sa propre équipe et l’aide d’un comité d’experts extérieurs, le CERIN conduit un vaste programme d’analyse de l’information destiné aux professionnels de santé.
- Ces analyses sont déjà diffusées en France, par différents canaux adaptés à chaque public : "Cholé-Doc", un bulletin d’information bimestriel sur les lipides pour les cardiologues et les lipidologues ; "Nutri-Doc", un bulletin d’information général bimestriel consacré à l’alimentation et destiné aux généralistes ; "Nutrinews", un bulletin mensuel de diététique destiné à la presse médicale et à la presse générale ; "Red Fax", un système d’information instantané par fax pour toutes les nouvelles scienti-
spective. The data base currently includes over 200 reviews of this nature. The team also produces critical reviews in a given research area describing the latest findings. In view of the value of this assessment work, access is limited to the dairy industry.

In the context of the "Pan European Nutrition Programme", this analytical work on information will be expanded and made available in a suitable form to all NDCs.

DEVELOPMENT OF NUTRITIONAL MESSAGES OF A TYPE DIRECTLY USABLE BY NATIONAL DAIRY COUNCILS

Collecting information, assessing its scientific value and its value for the dairy industry; these steps are essential but do not go far enough. Experience in France and in the United Kingdom shows that it is no easy task to try and convince the medical profession, nutritionists, dieticians and the press people, in front of a strong adverse propaganda fuelled by economic interests or vis-à-vis media eager to exploit the sensational. Merely to present the true facts - as we perceive them - in a nice package does not work.

France and the UK have experimented with various approaches to consumers, directly and indirectly, but we cannot be sure that the most successful course followed in a given country will work successfully in another country also.

In each country, the selection of the appropriate communication system will vary according to local conditions, national guidelines on nutrition, the structure of the medical and related professions, the structure and rules of the medical press, the connections within the agri-food industry.

Therefore, the role of the CERIN and of the MMB in coordinating efforts should be to make available to the individual NDCs, basic information, critical analyses, an assessment of the value of data for the dairy industry, as well as careful guidance on what can be said and what cannot. In addition, they should make possible a dialogue with such NDCs on the best way to use the information and the means of communication.

Two meetings were held: one in London on February 3rd, 1993 and another in Paris on March 5th, 1993. The 12 countries of the EC were represented. The programme which will last 2 years is thus now on its way.

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CONCEPTION DE MESSAGES NUTRITIONNELS SOUS UNE FORME DIRECTEMENT UTILISABLE PAR LES NATIONAL DAIRY COUNCILS

Réunir l'information, déterminer sa valeur scientifique et sa valeur pour le secteur laitier est indispensable mais insuffisant. En France et au Royaume-Uni, l'expérience a montré que convaincre des médecins, des nutritionnistes, des diététiciens et des journalistes, face à une forte propagande adverse liée à des intérêts économiques ou face à des médias attirés par le sensationnel, n'est pas une tâche facile.

Se contenter de présenter la vérité - telle que nous la percevons - dans un bel emballage est inefficace.

La France et le Royaume-Uni ont expérimenté divers moyens de s'adresser aux consommateurs, tant directement qu'indirectement, mais nous ne pouvons pas être certains que la campagne la plus réussie dans un pays donné aura autant de succès dans un autre.

Dans chaque pays, le choix de tel ou tel système de communication dépendra de la situation locale, des directives nationales en matière d'alimentation, de la structure du corps médical et paramédical, de l'organisation et des pratiques de la presse médicale, des relations existant à l'intérieur du secteur agro-alimentaire.

La tâche du CERIN et du MMB consistera donc, en coordonnant les efforts, à mettre à la disposition des différents NDCs, une information de base, une analyse critique, une explication de l'importance de cette information pour le secteur laitier, un commentaire prudent de ce qui peut être dit et de ce qui ne peut l'être. Leur tâche consistera en outre à offrir à ces NDCs la possibilité de discuter avec eux de la meilleure manière d'utiliser l'information et les outils de communication.

Deux meetings, l'un à Londres, le 3 février 1993, et l'autre à Paris, le 5 mars 1993, ont réuni les 12 pays de la Communauté et ont permis de débuter ce programme qui se déroulera sur 2 ans.

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MILK LIPIDS IN THE DIET AND HEALTH

Subject F37

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IDF NEWS BRIEFING ON DIET AND HEALTH 1993
Follow-up on 1992

My reports for 1991 and 1992 mentioned the results of the Caerphilly Study - a prospective study in South Wales - which found an apparently protective effect of milk in relation to coronary heart disease (CHD). The authors of this study have now published their results on the relationship between nutrient intakes and CHD incidence over a 5-year period [1]. They found no significant relationship between intakes of any nutrient and the risk of a new CHD event. These results are consistent with those of several other prospective studies but the methodology for assessing nutrient intakes in the Caerphilly Study was much superior to those used in previously published studies. The authors end their discussion thus: "It seems reasonable to assume that if a nutrient is of relevance to the risk of a disease, those subjects with the highest intakes should subsequently have a higher incidence of the disease than subjects with the lowest intakes. The absence of such a relationship in the prospective studies of clear evidence of relevance of any nutrient to the subsequent risk of CHD is certainly challenging".

One implication of the above findings is that factors other than current or recent diet must be important in determining the risk for CHD. Barker's group in Southampton, UK, continues to produce publications supporting their hypothesis that the environment (including nutrition) of the pregnant woman and her newborn baby are important determinants of later disease. The latest work [2] reports that retarded intrauterine growth, reflected in low birthweight, is associated with increased accumulation of body fat around the abdomen later in life, which is now recognized as a risk factor for CHD. Other publications during the year have shown associations between increased risk of CHD and: poor dental hygiene [3]; high body iron stores [4]; presence of high levels of blood antibodies to specific bacteria [5] and raised concentrations of oxidized cholesterol in LDL [6].

Dietary guidelines, cholesterol screening and concerns about cholesterol lowering

The past year has been characterized by urgent debate about the desirability or otherwise of screening for blood cholesterol and even of lowering it, if it were found to be elevated. An important contribution to the debate was made by a Report of a sub-committee of the US National Heart, Lung and Blood Institute [7], which concluded that although there was a well-established association between high blood cholesterol and CHD risk in men, this association did not apply to women and that, in both sexes there was a clear association between blood cholesterol concentration in the region below about 4 mM and increased risk of death from a wide variety of causes. These included cancer and various non-cholesterol-related kinds. An editorial in the same issue of the journal in which this report was published [8] concluded: "We need now to pull back our national policies directed at identifying and treating high blood cholesterol in the primary prevention setting and put on hold well-meaning desires to intervene while we await convincing evidence that the net effects will be beneficial".

The editorial writer subsequently published a paper in early 1993 cautioning against screening for blood cholesterol in young people on the grounds that it may do more harm than good and that in any case it was not cost-effective [9]. These pronouncements are the more remarkable coming from the USA, a country that has been in the forefront of urging the need to identify everyone's blood cholesterol and put in place national programmes to reduce blood cholesterol. Moreover, the writer of the aforementioned editorial was a principal investigator in the MRFFIT study, although having rather negative findings, has nevertheless been influential in the campaign for lipid modification in the USA. Ravnkilde [10] has questioned the evidence for the health benefits of cholesterol lowering.

Several papers have been published, speculating about the causes of the rather mysterious finding of excess mortality due to suicides and other violent deaths as a result of cholesterol lowering. Numerous hypotheses have been put forward (for example [11]) but the true causes remain elusive.

Fatty acids and blood lipid concentrations

A publication arising from the influential "Nurse's Health Study" in the USA has revealed an association between the intake of trans fatty acids from industrial sources of partially hydrogenated fats and risk of CHD [12]. Another extremely important finding of this study was that there was no relationship between butter intake (even though butter provides some trans acids) and CHD risk. This study is regarded as reliable because of the large number of subjects studied, the relatively long period of follow-up and the care taken over the design and methodology for dietary assessment. However, in all epidemiological studies, it can only provide statistical associations, not evidence of cause. Several studies published during the year, however, have provided experimental evidence in human subjects that dietary trans fatty acids may be associated with higher LDL [13] and Lp(a) [14] concentrations and lower HDL [13] concentrations, all regarded as indicators of increased CHD risk.

An important concept of the role of interactions between different dietary fatty acids in influencing blood cholesterol has also been published [15]. These research workers have found that of the many saturated fatty acids, only lauric (12:0), myristic (14:0) and palmitic (16:0) acid have a cholesterol-raising effect, and then only when the level of dietary linoleic acid is below a certain threshold. In most diets, even in Western industrialized countries, the ratios of fatty acids are such that palmitic acid has little cholesterol-raising activity, and cholesterol-raising effects are due mainly to myristic acid.

Dietary fat and cancer

There has been much debate about the role of dietary fat in the development of various cancers, but most research has been directed towards breast and colon cancers. These are the main malignant diseases in Western countries. Evidence comes from epidemiology and from animal studies. Epidemiological comparisons between countries reveal strong associations between the level of fat in the diet and mortality from both types of cancer. Some authorities believe that this is mainly an effect of total energy intake rather than fat as such. Within countries, there is little evidence for a role for fat, especially from case-control studies. Prospective studies have given rather mixed results but a recent publication based on observations of 69,000 women followed for 8 years in The Nurse's Health Study has found no association whatsoever of intake of any fatty acids with risk of breast cancer [16]. This contrasts with the finding, from the same population group, of a positive association between
meat fat and risk of colon cancer. There was no such association between consumption of dairy fat and colon cancer [17].

New products: 'functional foods'

Many articles have appeared, mainly in trade journals, describing the concept of 'functional foods' (for example [18]). This concept, which appears to have originated in Japan, is that certain foods have the capacity to influence physiological processes in a way that may benefit health. Products based on this concept are being marketed vigorously in Japan. Many different aspects of health may be encompassed by these ideas including cholesterol lowering, protection from diarrhoea and other gastrointestinal disturbances, stimulation of immunity and protection against inflammation. Several writers in European magazines have urged European marketing personnel to take more interest in this concept. In many ways, the dairy industry can claim to have products under this umbrella, for example cultured products containing specific organisms to break down lactose or to control intestinal pathogens. New product concepts include those with reduced cholesterol or 'immune milks' containing antibodies against specific pathogens.

Whether or not these products are scientifically based (see 1992 report), we can expect pressures for development of these concepts and the industry will need to consider a strategy that will require close interactions between marketing, technical and scientific personnel [19,20].

European Commission Initiatives

Following on from an earlier initiative which resulted in a document entitled "Milk and Health", the European Commission has now awarded a contract, from December 1992 to November 1994, for the provision of a nutrition information service to Dairy Organizations in the 12 Member States. Collaborators in the contract are the MMB of England and Wales and CERIN in Paris. Under this contract, CERIN will be providing nutrition communications expertise for health professionals and MMB will provide a nutrition database: 'Nutrition Monitor'. The latter currently contains details of over 10 000 diet/health publications, many of which also contain critical reviews of the published work. This database is available on-line to subscribing organizations identified by the EC. All the information reviewed in this newsletter was obtained with the help of this database.

Literature

April 1993

ROLE OF CULTURED AND CULTURE-CONTAINING DAIRY PRODUCTS IN HEALTH

Brief review of literature 1992

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INTRODUCTION

The IDF Group F20 has decided to review annually the most recent literature which covers the topic of the group, as research on this subject is going on at a tremendous pace in many countries. In 1992, new scientific findings have been published again in a considerable number of papers which are reviewed briefly in this overview.

This review represents the state-of-the-art regarding the effects of cultured and culture-containing dairy products on human health. It indicates a significant progress in our knowledge on beneficial effects of this important group of food products. Nevertheless, it has to be considered that there is no final scientific evidence with regard to most of the beneficial effects discussed. It has to be realized that some of the published findings are still controversial, that to date only detail information is available on some of the aspects regarded, and that the interpretations to some of the findings might be a little over-emphasized.

In a separate, more detailed review the effect of cultured dairy products on lactose digestion is discussed by G. Schaafsma (NL) - an effect which may be considered as being based on substantial scientific evidence.

EFFECT ON CALCIUM ABSORPTION

In experiments conducted by Delisle et al. (1993) on the release of soluble and ionic calcium from dairy products during simulated gastrointestinal digestion, no significant differences could be seen between skim milk and yoghurt. Wynckel et al. (1991) measured the fractional intestinal absorption of calcium (FACa) in lactose-deficient and normal subjects; in both groups yoghurt increased FACa which indicates that yoghurt does not impair calcium absorption.

EFFECT ON CHOLESTEROL METABOLISM

The relationships among growth in the presence of bile, deconjugation of sodium taurocholate, and assimilation of cholesterol by 19 cultures of Lactobacillus acidophilus were examined by Walker and Gilliland (1993) in vitro experiments; maximum deconjugation activity was
achieved in the late exponential phase of growth which coincided with maximum assimilation of cholesterol; there was significant variation among cultures in their ability to grow in the presence of bile, deconjugate sodium taurocholate, and assimilate cholesterol.

Experiments with rats were conducted by
- Suzuki et al. (1991): In rats fed high-cholesterol diets, the addition of cultured milks inhibited the increase of serum cholesterol concentrations compared with skim milk; a *L. acidophilus* strain was found to be most effective.
- Nakajima et al. (1992): Serum cholesterol levels of rats fed ropy fermented milk containing a slime-forming *Lactococcus lactis* ssp. cremoris strain were the lowest compared with two other treatments (a non-slime-forming strain and acidified skim milk); the serum HDL cholesterol/total cholesterol ratio was the highest in this group.

The effect of different protein sources (soya, skim milk, casein) and lactic bacteria on plasma cholesterol was studied in growing rabbits by Greppi et al. (1992). Plasma cholesterol in rabbits fed casein achieved the highest levels compared with all other diets (it is well known that the cholesterol levels of rabbits, but not that of other experimental animals, is rapidly increased after feeding casein). When freeze-dried resting cells of *L. delbrueckii* ssp. bulgaricus and *Streptococcus salivarius* ssp. thermophilus were added the plasma cholesterol was slightly reduced with all types of proteins.

As it had been discovered that the intake of large amounts of milk fermented with certain *Pseudomonas* strains by African Maasai tribesmen actually lowered their serum cholesterol level, Stoll et al. (1991) examined the effect of milk fermented by *Pseudomonas fluorescens* on the level of plasma lipids in adult boars; plasma lipid levels (cholesterol, LDL-cholesterol) were significantly lower when the animals received the diets containing milk instead of the diet without milk, while HDL-cholesterol remained unaffected; however, fermentation of whole milk by *P. fluorescens* reduced the lipid-lowering effect.

In studies with volunteers, a yogurt product containing bifidobacteria with or without the addition of lactulose lead to a significant increase of the apolipoprotein A in blood serum; on the other hand, there did not occur any changes in the blood cholesterol values as well as in the HDL and LDL levels (Kleinbach-Sauter, 1992).

**ANTIBACTERIAL PROPERTIES**

In experiments conducted by Lidbeck et al. (1991), *L. acidophilus* milk was given to 14 colon cancer patients; the number of *Escherichia coli* decreased in five patients in the colonic microflora, and new colonization with *Klebsiella* sp. was observed in six patients; lactobacilli increased in 10 patients. In studies with voluntary subjects, where drinking yoghurt containing bifidobacteria with (0.5%) and without lactulose was applied, the number of clostridia in the faeces was significantly reduced (Kleinbach-Sauter, 1992).

Baba et al. (1992) observed in experiments with gnotobiotic chickens, that the adult microflora prevented *Salmonella typhimurium* colonization in the caecum more strongly than did the microflora of newly hatched chickens. Gnotobiotic chickens treated with a mixture of *E. coli* and *Lactobacillus* sp. suppressed *S. typhimurium* colonization most effectively, followed by *E. coli* alone and *Lactobacillus* sp. alone.

Klebnikoff et al. (1991) suggest that hydrogen peroxide generating lactobacilli may contribute to the control of the microbial flora of the vagina, as these H₂O₂ generating lactobacilli are absent from the vagina of most women with bacterial vaginitis. Hilton et al. (1992) observed a three-fold decrease in infections when patients with candidal vaginitis consumed yoghurt containing *L. acidophilus* (number of infections: 0.38 vs 2.54 per 6 months; candidal colonization: 0.84 vs 3.23 per 6 months).

**EFFECT ON GUT MICROFLORA**

A group of French researchers (Bohnik et al., 1992; Martheau et al., 1992; Pochart et al., 1992) concluded that the strains of *L. acidophilus* and bifidobacteria, which they had used in their experiments, when ingested with fermented milk were not able to colonize the intestinal tract but survive transit through the gastrointestinal tract and were detectable in large numbers in the faeces. Tomoda et al. (1991) confirmed that the number of bifidobacteria in the faeces increased after the administration of yoghurt containing bifidobacteria and/or lactulose; they observed that not only the number of the administered *Bifidobacterium* sp. was increased but also that of the original species; the number of the administered species was not more increased than that of the dominant original species.

On the other hand, Sarra et al. (1991) found in experiments with piglets, that stomach, ileum and caecum could be colonized with two strains of lactobacilli for a limited period of time (up to 144 h), a third strain colonized up to 48 h and then disappeared. A sufficient number of bacteria in the product is considered to be most important for colonization (Hoier, 1992).

The following results are reported from experiments with *L. casei* strain GG:

- After the administration of a whey drink fermented with *Lactobacillus* GG; these microorganisms could be detected in the faeces of elderly nursing-home residents (Ling et al., 1992).
- When normal healthy volunteers were given freeze-dried *Lactobacillus* GG, it could be detected in the faeces of all subjects only with the doses 10¹¹ and 10¹²; however, *Lactobacillus* GG did not appear to influence the total number of lactobacilli in faeces (Saxelin et al., 1991).
- Els et al. (1991) examined the attachment of *Lactobacillus* GG to a human colon carcinoma cell line; they observed medium to strong binding to this cell line, while *L. acidophilus* and *L. delbrueckii* ssp. bulgaricus showed no adhesion and four *Bifidobacterium* strains had no or very weak adhesion to the cell line.
- Chauviere et al. (1992) detected adhesion of a human *L. acidophilus* strain to human enterocyte-like Caco-2 cells. The same group of researchers (Coconnier et al., 1992) concluded that there might be a proteinaceous factor which promotes adhesion of poorly adhering human *L. casei* GG on human enterocyte and mucus-secreting cell lines in culture.

Tannock et al. (1992) examined the use of a plasmid as a DNA probe in the detection of a *L. fermentum* strain in porcine stomach contents, and they obtained a good agreement between the population sizes obtained by colony hybridization and the estimated levels calculated on the basis of plasmid profiling of colonies isolated at random from the total lactobacillus population.

Fuller (1991) describes four ways in which probiotics may be operating regarding their effect on the gut microbiology:
- production of antimicrobial substances: lactic acid, acetic acid, benzoic acid, hippuric acid, carbon dioxide, hydrogen peroxide, bacteriocins (Hunger, 1992),
- competition with pathogens for adhesion receptors at the gut wall,
- competition for nutrients,
- stimulation of immunity.

IMMUNE RESPONSE

Again, the results on the effect of cultured dairy products on the immune response are not quite uniform:

- De Simone et al. (1992) concluded from their experiments with mice that translocation of E. coli may be minimized by L. delbrueckii ssp. bulgaricus, a bacterium unable to translocate but endowed with immunomodulating properties.
- Kaila et al. (1992) reported that L. casei GG promotes recovery from rotavirus diarrhea via augmentation of the total immune response. A specific IgA response to rotavirus was suggested to be relevant in protecting against reinfections.
- According to Perdigon et al. (1991), a low oral dose of L. casei stimulates the secretion of IgA and prevents infection by S. typhimurium and E. coli in mice.
- When mice were infected by Klebsiella pneumoniae (Saucier et al., 1992) the postinfection survival was 0.7 days longer (4.2 vs 3.5 days) for animals receiving fermented milk than for the control group; fermentation is considered to be essential for the beneficial effects on the immune system and survival time, this effect no longer occurs after pasteurization of fermented milk.
- In experiments conducted by Molenaar and Goulet (1991), mice were fed with UHT milk fermented by one of the following bacteria: B. longum, L. acidophilus, L. delbrueckii ssp. bulgaricus, L. casei ssp. rhamnosus, L. helveticus, Lactococcus lactis ssp. cremoris, Lactococcus lactis ssp. lactis, S. salivarius ssp. thermophilus; no significant differences were observed in the serum IgG and IgA levels, nor in the bronchoalveolar IgG level; only mice fed milk fermented with L. delbrueckii ssp. bulgaricus showed a significant increase in their bronchoalveolar IgA level.
- Furukawa et al. (1991) showed in experiments with tumor-bearing mice that the oral administration of yoghurt and kefir had a positive effect on the recovery of the delayed-type hypersensitivity response after tumor inoculation for 1-6 days. The oral administration of the water-soluble fraction from kefir grains was effective in the recovery of the antibody production: the number of plaque-forming cells in the spleen of Lewis-bearing mice was nearly increased to normal levels (Furukawa et al., 1992).
- In experiments with piglets it was found (Namioka et al., 1991) that the treatment with peptidoglycan from B. thermophilum prevented the occurrence of post-weaning diarrhea. This effect was attributed to the elimination of E. coli from the small intestine due to the development of a local immunity by increasing numbers of IgA-bearing cells in the lamina propria after the administration of peptidoglycan.
- Among 120 strains of human-type bifidobacteria, Yasnin et al. (1992) found two strains of B. breve and one strain of B. longum which were able to induce the production of large quantities of IgA. The amount of faecal anti-helmtora-toxin IgA antibodies in mice treated with the B. breve strains was significantly higher than in the control animals.

ANTITUMOR PROPERTIES

Antitumor properties of culture containing dairy products are derived mainly from experimental findings that the activity of faecal bacterial enzymes is decreased which activate carcinogens by converting precarcinogens to proximal carcinogens. For example, a trend towards a decrease in faecal bile acids in the aqueous phase was observed by Lidbeck et al. (1991) in colon cancer patients after L. acidophilus supplementation. Yoghurt supplemented with L. casei strain GG taken at a dose of 10^10 to 10^11 cfu/day significantly decreased faecal beta-glucuronidase, glycocoholic acid hydrolase and nitroreductase activities as well as the daily output of p-cresol in urine, but did not alter faecal 8-glucosidase in female students (Ling, 1992); supplementation of Lactobacillus GG as fermented whey drink reduced faecal glycocoholic acid hydrolase, but had no significant effect on 8-glucosidase in the elderly (Ling et al., 1992). Dochév & Enikova (1992) observed in rat experiments that feeding fermented milk with three different starters substantially reduced DMH-induced tumorigenesis: from 71% of the animals in the control group to 50% in the experimental groups; the average number of tumors per animal was likewise lowered: from 1.8 to 0.8-1.0.

Feeding yoghurt had a suppressive effect on chemically induced gastric tumorigenesis in rats; the yoghurt-fed animals showed a significantly lower incidence of gastric tumors than the control group (50 vs 89%) (Morishita & Shiromizu, 1990).

Fujinawa et al. (1991) reported that the administration of a B. longum strain to gnotobiotic male mice which are associated with a combination of E. coli, Enterococcus faecalis and Clostridium perfringens, reduced the incidence of liver tumors; no significant changes were observed in faecal bacterial enzymes (beta-glucuronidase, nitroreductase and azoreductase) and faecal bacterial metabolites (phenols and indoles).

After the application of a freeze-dried L. casei preparation at a dose of 10^10 cfu/day, the 50% recurrence-free interval after transurethral resection of bladder tumor could be significantly extended in human subjects (350 vs 195 days in the control group) (Ao & Akaa, 1992).

ANTIMUTAGENIC PROPERTIES

In experiments conducted by Hosoda et al. (1992a, b), the antimutagenic effect of cultured milk using 71 and 76 strains of lactic acid bacteria, respectively, on the mutagenicity of two different substances was investigated in vitro. In both cases, a L. acidophilus strain showed the highest inhibition of about 80%. In one case, two strains of Lactococcus lactis ssp. lactis also exhibited high inhibition rates.

Miyaemoto et al. (1991) reported that isolates of S. lactis ssp. cremoris from a kefir product showed desmutagenic activities against a mutagenic compound when a strain of E. coli was used as an indicator; probably this compound is bound to bacterial cells.

OTHER EFFECTS

According to Isolauri et al. (1991), a Lactobacillus GG-fermented milk product is effective in promoting recovery from acute diarrhea in children.

Oral administration of B. pseudolongum isolated from the faecal material of mice and the bifidogenic factor Neosugar (a mixture of fructo-oligosaccharides) signifi-
cantly reduced plasma ammonia levels in animals (Rao and Koo, 1992) what may be considered as a benefic effect. A similar effect was observed in experiments with healthy persons conducted by Tomoda et al. (1991): the ammonia content in the faeces decreased more after the administration of bifidobacteria- and/or lactulose-containing yoghurt than after that of plain yoghurt.

Furushiro et al. (1990) observed that oral administration of an extract from L. casei produced a significant decrease of systolic blood pressure in spontaneously hypertensive rats; the long-term administration of the extract suppressed the development of hypertension in growing rats. Polysaccharide-glycoprotein complexes (molecular weight 180 000) were found to be the most effective antihypertensive compounds (Sawada et al., 1990).

**LITERATURE**


LACTOSE INTOLERANCE AND CONSUMPTION OF CULTURED DAIRY PRODUCTS – A REVIEW

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INTRODUCTION

Primary adult lactase deficiency (lactase non-persistence) refers to the normal age-related decrease of the capacity to digest lactose. It is prevalent in the majority of the world's adult population [1] as assessed by the classical lactose tolerance test, and leads to malabsorption of lactose when levels of tolerance are exceeded. This intolerance is associated with development of clinical signs, including diarrhoea, bloating, flatulence, abdominal pain and gaseousness. These symptoms result from bacterial fermentation of undigested lactose in the large intestine leading to the production of hydrogen and organic acids, increasing the osmolality of the intestinal fluid.

Several studies, as reviewed by the IDF [2], have demonstrated that lactase non-persistent individuals can tolerate fermented milk, for example yogurt, much better than milk. This explains why in areas of the world where lactose intolerance is common, adults consume substantial quantities of cultured dairy products and seldom ingest milk.

The improved tolerance of (unheated) yogurt vs milk can be explained by several factors. These are:
- lower lactose content of yogurt
- improvement of lactose digestion by microbial β-D galactosidase activity in the intestine, originating from the microbial culture and surviving passage through the stomach
- slow release effect of yogurt on the passage of lactose from the stomach to the intestine
- inhibition of fermentation in the large intestine by substances present in the yogurt.

An important problem in this area of research is that most studies assess or evaluate signs of carbohydrate intolerance by measuring the concentration of hydrogen in the expired air (hydrogen breath test). Although no doubt exists that carbohydrate intolerance is associated with increased fermentative activity in the large intestine and increased hydrogen production, individuals may differ with respect to the fermentation pattern (methane/hydrogen ratio). Moreover it should be realized that the hydrogen expiration is an indirect measure of lactose digestion, not necessarily reflecting true digestion. Another point of concern in this field of research is that symptoms of intolerance are subjective. Therefore, ideally studies should be placebo-controlled.

It is the aim of this paper to review recent studies on lactose digestion and yogurt consumption, keeping these latter points in mind.

Recent experiments in man have further confirmed the improvement of lactose tolerance when this sugar is consumed with yogurt. So Marteau et al. [3] found that the excess hydrogen excretion (area under the curve) after ingestion of yogurt, heated yogurt or milk (18 g lactose) by lactase-deficient volunteers was 103, 191 and 349, respectively. This indicates that microbial lactase in yogurt is not the only factor that contributes to improved lactose tolerance, since the area under the curve was also significantly reduced in the case of heat-treated yogurt. It appeared that oral-caecal transit time was longer with yogurt (either pasteurized or natural) than with milk. Using an intestinal perfusion technique the investigators recovered less lactose from the terminal ileum after yogurt than after heated yogurt and approximately 1/5 of the lactase activity in yogurt reached the terminal ileum. It was concluded that 90% of the lactose in yogurt is digested in the small intestine of lactase-deficient subjects. Their results suggest that both lactase activity in yogurt and a slow oral-caecal transit are responsible for this excellent absorption.

Onwuata et al. [4] compared the hydrogen excretion by lactose intolerant subjects after the intake of 18 g lactose with yogurt, sweet acidophilus milk, a lactase tablet or whole milk, or of 5 g lactose with lactose hydrolyzed milk. The lowest hydrogen excretion was observed with yogurt and the lactose hydrolyzed milk, but the investigators noticed less symptoms of lactose intolerance after yogurt ingestion than after ingestion of lactose hydrolyzed milk. A good correlation was observed between symptoms (flatulence, diarrhoea and cramps) and hydrogen excretion.

Similarly, Rosada et al. [5] found a severely reduced breath hydrogen response after the intake of two varieties of unmodified yogurt as compared to milk. The response to low fat yogurt appeared intermediate, but intolerance symptoms were equally reduced. Ingestion of lactose hydrolyzed yogurt did not further decrease the breath hydrogen response as compared to unmodified yogurt.

Lin et al. [6] tested the breath hydrogen response in lactase-deficient subjects after the intake of 400 ml unfermented milk (20 g lactose) containing either the yogurt culture (10 exp 8 or 10 exp 7 cfu/ml) or the acidophilus culture (10 exp 8 or 10 exp 7 cfu/ml). With the yogurt culture in the higher concentration, the breath hydrogen excretion was dramatically reduced and symptoms of intolerance were eliminated. Intermediate values were recorded with the lower concentration of the yogurt culture. Only one strain of L. acidophilus, which demonstrated bile resistance and intermediate β-galactosidase activity was capable of decreasing the breath hydrogen excretion, if given at the higher dose level.

Mayer et al. [7] found a substantially higher lactase activity in the small intestine of rats fed unpasteurized yogurt as compared to pasteurized yogurt or milk.

Martini et al. [8] investigated the survival of the yogurt microbial lactase in the GI-tract. They found that survival depended on gastrointestinal transit, pH and viability of the culture. They also found that consumption of a meal with yogurt does not inhibit and may slightly improve lactose digestion, although β-galactosidase from yogurt was not able to assist in the digestion of additional lactose.

A very interesting study was reported by de Vrese et al. [9]. They measured blood galactose levels in mini pigs after ingestion of either fresh or heat-treated suspensions of mechanically disintegrated kefir grains containing lactose but no free galactose. Active β-galactosidase caused
CONCLUSIONS

On the basis of existing data regarding lactose digestion and yoghurt consumption the following conclusions can be drawn:

1. Lactose intolerance symptoms and breath hydrogen excretion are substantially reduced after the intake of unheated yoghurt as compared to milk.
2. The increased lactose intolerance is associated with an improved lactose digestion.
3. The improved lactose digestion is attributable to the activity in the small intestine of the microbial β-galactosidase from the yoghurt culture, to an increased gastro-caecal transit time and to a decreased concentration of lactose in yoghurt.
4. Other strains of lactobacilli possessing β-galactosidase activity may exert beneficial effects on lactose digestion in lactase-deficient subjects, but this seems to depend on the survival of the β-galactosidase in the GI-tract as well as on the resistance of the enzyme to bile.

LITERATURE


SALTY FOODS INCREASE CALCIUM REQUIREMENTS AND ARE A POTENTIAL RISK FACTOR FOR OSTEOPOOROSIS

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ABSTRACT

The dietary consumption of sodium chloride influences calcium metabolism and bone because consumption of sodium chloride causes an obligatory increase in urinary calcium excretion. Thus calcium requirement is higher on a high salt intake than on a low salt intake. For this reason sodium balance will be maintained less easily by a given intake of dairy products on a high salt intake than on a low salt intake. High salt intakes will generate negative calcium balance and cause bone loss when adaptive increases in calcium fail to offset salt-mediated calcitria. On the other hand, limiting dietary salt can usefully improve the calcium economy of the body. Today many adolescents and adults in Western societies consume diets which supply too much salt and too little calcium. A study in young women shows that salt-mediated urinary calcium wasting occurs even when dietary calcium is insufficient to maintain zero calcium balance. A study in elderly women shows that raising salt from 70 to 170 mmol/24 h increases urinary calcium and raises parathyroid hormone-mediated bone turnover. It is suggested that high salt intake might invoke greater attention as a risk factor for osteoporosis; high consumption of salty foods can be detrimental to the attainment of optimal peak bone mass in youth and can exacerbate osteoporotic bone loss in later life. Thus moderate salt restriction (< 100 mmol NaCl/day) is advocated as a worthwhile and cheap health measure to improve bone health in the community.

INTRODUCTION

Salt reduction is commonly advocated because of the effects of salt on blood pressure yet the clinical consequences of high dietary intakes of sodium chloride on calcium metabolism and bone may be as important. The renal handling of calcium is closely linked to that of sodium. Dietary salt restriction can improve the calcium economy of the body importantly since less calcium is required to maintain calcium balance on low salt intakes than on high salt intakes. On the other hand a high intake of sodium chloride can serve as an important risk factor for osteoporosis by causing a negative calcium balance and promoting parathyroid-mediated bone loss [1-4].

Consumption of common salt induces an obligatory increase in urinary calcium excretion which raises the dietary need for calcium [1-3]. Loss of urinary calcium lowers the ionized calcium concentration of the blood and stimulates parathyroid hormone secretion [4, 5] to restore normocalcaemia by increasing the input of calcium from
glomerular filtrate, from the gut (via synthesis of 1,25-dihydroxyvitamin D) and from bone (Figure 1). Bone mass will not be adversely affected if calcium absorption from food increases to match obligatory sodium-mediated urinary calcium loss (Figure 2). However, high salt intakes will lead to bone loss if alimentary calcium absorption does not rise sufficiently to fully offset salt-mediated increases in the urinary excretion of calcium. This situation occurs if the dietary intake of calcium is too low to supply sufficient calcium [3-6] or if renal synthesis of 1,25(OH)2D is defective so that adaptive increases in 1,25-dihydroxyvitamin D-mediated intestinal calcium absorption do not occur [7]. High dietary salt intakes generate osteoporosis in animals [3, 4]. To date few human studies of bone change in response to salt have been undertaken. However, salt restriction coupled with calcium supplementation has been shown to slow bone loss in women [8, 9].

**SALT SUPPLEMENTATION CAUSES URINARY CALCIUM LOSS IN YOUNG WOMEN EVEN WHEN CALCIUM INTAKE IS TOO LOW TO MAINTAIN POSITIVE CALCIUM BALANCE**

We studied the effects of moderate salt restriction and moderate salt supplementation on urinary sodium and calcium excretion in healthy 21-year-old women consuming both low (200 mg Ca/day) and high (1500 mg Ca/day) dietary intakes of calcium [1]. A dietary intake of 200 mg

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**Figure 2: Skeletal consequences of salt-mediated calciuria.**
Table 1: Effects of moderate salt restriction and moderate salt supplementation on urinary sodium, calcium and hydroxyproline excretion in young women consuming different dietary levels of calcium

<table>
<thead>
<tr>
<th></th>
<th>Low calcium diet (200 mg/day)</th>
<th>High calcium diet (1500 mg/day)</th>
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<tbody>
<tr>
<td></td>
<td>70 mmol NaCl</td>
<td>170 mmol NaCl</td>
</tr>
<tr>
<td>Urinary sodium (mmol/24h)</td>
<td>62 ± 7</td>
<td>166 ± 16**</td>
</tr>
<tr>
<td>Urinary calcium (mmol/24h)</td>
<td>2.93 ± 0.49</td>
<td>3.91 ± 0.37*</td>
</tr>
<tr>
<td>Hydroxyproline (µmol/24h)</td>
<td>213 ± 12</td>
<td>243 ± 14</td>
</tr>
</tbody>
</table>

Results are means ± SE; n = 9; *p < 0.05, **p < 0.005 (salt response).

Ca (5 mmol Ca) daily is inadequate to maintain positive calcium balance in women of this age, whereas a diet supplying 1500 mg Ca/day (37.5 mmol Ca) provides ample dietary calcium for their needs. Yet we found that raising salt intake from 70 to 170 mmol/day on both these calcium intakes raised urinary calcium by the same amount (Table 1). We concluded supplementary dietary salt causes negative calcium balance on low calcium diets. Low calcium intakes in adolescence are now perceived to be a risk factor for bone health. The skeletal demand for calcium during growth is high. It is feared that an inadequate dietary supply of calcium in adolescence may lead to acquisition of suboptimal peak bone mass and be instrumental in generating osteoporosis in later life [10]. Matkovic & Heaney [11] have pointed out that there is a positive relationship between calcium intake and body retention of calcium in teenagers and has calculated threshold requirements for optimal calcium retention. In developed countries most dietary calcium (two-thirds on average) is derived from dairy products. It is worth noting that less benefit will be derived from a given intake of dairy products on a high salt intake than on a low salt intake, because of salt-mediated urinary calcium wastage. Weight-conscious teenagers frequently avoid eating dairy products because they perceive these to be fattening. These teenagers may compound their dietary deficits of calcium by consuming high salt intakes. For example children like fast foods and these often have a high sodium content. Many adolescents in New Zealand today are consuming large amounts of sodium chloride and too little calcium [12]; we suggest these high salt intakes may jeopardize their peak bone mass. We advocate lower salt intakes for this age group.

VARYING SALT INTAKE ALSO AFFECTS BONE METABOLISM IN THE ELDERLY

Salt consumption also causes urinary calcium-wasting and affects bone turnover in men and women of all ages [9, 13, 14]. This is a worry because there is widespread concern that many adults in Western societies consume too much salt and too little calcium. Although some individuals excrete more calcium for a given sodium load than others [15], the magnitude of the effect is such that on average urinary calcium increases by about 1 mmol for every teaspoonful of salt (100 mmol NaCl) consumed [1, 9]. Moreover this will have large effects on the dietary calcium requirement because we usually absorb only about one-third of the calcium we eat. For example, on a dietary NaCl intake of 170 mmol/day, a person with normal calcium absorption and a urinary calcium excretion of 4 mmol Ca/day will require 14 mmol Ca daily to maintain Ca balance, whereas they will excrete only 3 mmol Ca/day in their urine on a desirable salt intake of 70 mmol/day and will maintain calcium balance on a dietary intake of 11 mmol Ca/day. A person with poor alimentary calcium absorption (1 standard deviation below the norm) and a urinary calcium loss of 4 mmol daily needs to consume 22.5 mmol Ca daily to maintain balance on a salt intake of 170 mmol/day, but they will need only 17 mmol Ca daily in the diet to compensate for a 3 mmol urinary Ca loss on a salt intake of 70 mmol/day. Thus it seems likely many more individuals in our community could achieve calcium balance by cutting back their salt intake. This should help to maintain strong bones.

An uncompensated calcium loss of 1 mmol per day will dissolve 1% of the skeleton annually (10% per decade). Inadequate dietary consumption of calcium is known to be skeletally damaging and dietary calcium supplements are widely used to conserve bone in the elderly [16-18]. However, little attention is given to salt intake as a hazard for bone health. This is a pity because most dietary salt is added during food processing [19]. Sodium intake can be readily reduced by purchasing low-salt products, by adding less salt to cooking, by ceasing to add salt to food eaten at the table, and by avoiding particularly salty foods; this salt restriction will usefully lower the amount of dietary calcium needed daily to maintain calcium balance. In New Zealand four of every five people currently consume too much salt and the average daily excretion of sodium is 140 mmol in women and 170 mmol in men. Reducing the average sodium intake to a desirable level of 70 mmol per day would lower urinary calcium excretion by about a third and cut the dietary calcium requirement needed to maintain balance importantly [1].

We have shown [20] that raising salt intake from 70 to 170 mmol/day on a constant calcium intake of 850 mg/day raised urinary calcium by 27% and stimulated parathyroid activity and bone breakdown in a group of elderly women aged 67 ± 0.5 years (SE); without significantly increasing plasma 1,25(OH)2D3 or alimentary calcium absorption (Figure 3). The rise in hydroxyproline excretion provides evidence of bone breakdown in this study. Our results support the view that moderate supplements of salt will favour negative calcium balance in women with a propensity to osteoporosis and impaired 1,25(OH)2D3 production [7]. Because calcium requirements will always be lower with low salt intakes than with high salt intakes, we suggest that decreasing salt intake should benefit the skeletons of women susceptible to osteoporosis from lack of calcium.

In summary we believe that high salt intakes may impair accrual of bone in youth and exacerbate loss of bone in later life. Although successful long-term adaptation to high salt intakes probably occurs in young people this requires a compensatory increase in the absorption of calcium from food. If the dietary supply of calcium is inadequate this adaptation cannot occur. Bone will be resorbed to compensate for sodium-mediated calcifia when alimentary calcium absorption fails to offset urinary losses of cal-
Figure 3: Salt-mediated calcuiarca causes bone breakdown in elderly women.

LITERATURE


UK ACTIVITIES (PAST AND CURRENT/FUTURE) CONCERNING THE CALCIUM AND HEALTH ISSUE

Dr J. Buttriss
National Dairy Council, London W1M 0AP, United Kingdom

The following lists cover a wide range of projects carried out by the National Dairy Council (for England and Wales) to promote the calcium content of milk. Some of the projects are specific to calcium, whereas others have a broader nutrition message.

Some of the activities are marked with an asterisk. This is to indicate that a more detailed description of the activity and its associated publicity is given at the end of the document.

### PAST (1986-1992)

<table>
<thead>
<tr>
<th>HEALTH PROFESSIONALS</th>
<th>Associated media activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication/activity</td>
<td></td>
</tr>
<tr>
<td>* Calcium and Health (Fact File 1). Reference review, editor JB.</td>
<td>Press launch and associated activity</td>
</tr>
<tr>
<td>Vitamine, Minerals and Health (Fact File 3). Reference review, author JB.</td>
<td>Press launch and associated activity</td>
</tr>
<tr>
<td>* Slide set and script - Catch up on Calcium</td>
<td></td>
</tr>
<tr>
<td>Nutrition and Elderly People (Fact File 9) - covers calcium and health. Editor JB.</td>
<td>Associated media activity</td>
</tr>
<tr>
<td>* Quarterly Review - includes reviews of recent calcium papers, circulated to over 12,000 health professionals.</td>
<td></td>
</tr>
<tr>
<td>Presentations to health professional audiences on calcium and health.</td>
<td></td>
</tr>
<tr>
<td>Participation in workshop on calcium and bone health - Holland.</td>
<td>Articles for professional journals on calcium and bone health, e.g. Nutrition and Foodscience</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONSUMERS</th>
<th>Associated media activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication/activities</td>
<td></td>
</tr>
<tr>
<td>* Consumer booklet on calcium and health</td>
<td>Associated activity, including radio interviews, provision of feature material for journalists</td>
</tr>
<tr>
<td>* Presentation on Calcium and Diet at National Osteoporosis Society Conference. Exhibition stand at NOS conferences; supporting the NOS activities in a general way.</td>
<td></td>
</tr>
<tr>
<td>* TV and press advertising, highlighting milk as a source of calcium.</td>
<td></td>
</tr>
</tbody>
</table>

### CURRENT/FUTURE ACTIVITIES

(Projects underway or planned for 1993)

<table>
<thead>
<tr>
<th>HEALTH PROFESSIONALS</th>
<th>Associated media activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication/activities</td>
<td></td>
</tr>
<tr>
<td>* Calcium and Health (Fact File 1) - total revision (JB as editor)</td>
<td>Press launch planned 1993</td>
</tr>
<tr>
<td>* Continuation of review articles in Quarterly Review</td>
<td></td>
</tr>
<tr>
<td>New Fact File on Maternal and Child Health (will cover calcium issue) - late 1993</td>
<td></td>
</tr>
<tr>
<td>Participation in a workshop in Holland on Calcium and Colon Cancer - late 1993</td>
<td></td>
</tr>
</tbody>
</table>
### NDC to contribute to International Dairy Federation document on dairy industry calcium and health initiatives. The purpose of the document will be to help other countries initiate projects. JB represents UK on the committee producing the document.

| Part sponsorship of pack for schoolchildren (aged 5-7 years) on bone health. | Launch planned for 1993 |
| Produce new Update Fact Sheet on calcium and health issues for health professionals. |  |
| Section for Nutrifax (nutrition manual for health visitors) on Women’s Health issues. |  |
| Pack on Nutrition and Elderly - practical issues for health professionals - based on a forth-coming government COMA report. | Associated publicity at the launch in 1993 |

### CONSUMERS

| Publication/activities | Associated media activity |
| * Revision of booklet on Calcium for the public. |  |
| Activities with children re nutrition, which will include calcium and bone health. | Extensive publicity planned |

### Media

As well as media activity directly associated with the above publications and activities, and their dissemination, we suggest that consideration is given to a press event or media activity on publication of the results of the various studies. I suggest that budget is allowed for this; £5000 would be sufficient. However, as this stage of the project is still a long way off, we are unable to commit funds to this, although it is highly likely that when the time comes we shall have no financial difficulty in supporting and helping organize the media activity.

### Research

A small number of research projects have been funded in recent years, mainly through the dairy industry’s Nutritional Consultative Panel on which the NDC is represented by Dr Judy Buttriss. A particularly pertinent example of this is the funding of Dr Michael Thomas, a surgeon from the Hammersmith Hospital, London, to investigate calcium and colon cancer.

### PUBLICITY DETAILS

#### Calcium Fact File (Calcium and Health)

This publication was launched in 1986 with a press launch and extensive media activity such as a syndicated radio tape on the calcium issue and a series of radio interviews.

The publication has recently been extensively revised and redrafted and is shortly to be published. It is anticipated that attempts will be made to ensure that the relaunch will again be accompanied by extensive media coverage.

#### Consumer booklet on calcium

It is our usual policy that each Fact File is accompanied by a leaflet for the public on the same topic. The Fact File on calcium, Calcium and Health, is no exception to this. The consumer booklet is called Our Daily Calcium. This too has been revised recently to bring in the recently published UK Dietary Reference Values.

### Catch-up on calcium

Following the original production of the booklets for professionals and the public on calcium, we received a number of requests for us to give talks on calcium to women’s groups and groups of health professionals. Nutrition staff levels at the NDC prevent us from touring the country giving talks, so instead we produced a slide set plus script which is now used widely. The provision of a script means that a non-nutritionist can give the talk.

### Quarterly Review

This publication for health professionals, produced four times a year contains summaries of recent papers on wide range of nutrition topics - not just those pertinent to dairy products. It has, however, been used as a vehicle for relating new findings on calcium and health to health professionals.

### National Osteoporosis Society

This charity is very active in the UK. Over the years we have had a limited involvement in a few of its activities, for example we have taken stands at conferences, I have spoken on nutritional issues at a conference, we have acted as part sponsors of relevant publication (a forthcoming schools pack and a previous nutrition/recipe booklet).

### Press advertising

Advertising, especially press advertising has often been used to emphasize the importance of milk as a source of calcium.
NUTRITION GUIDELINES FOR THE DAIRY INDUSTRY IN AUSTRALIA

Australian Dairy Corporation
1601 Malvern Road, Glen Iris, Victoria 3146, Australia

In early 1990 the Australian Dairy Corporation (ADC) and the Conference of Australian Milk Authorities (CAMA) established a joint Health and Nutrition Advisory Group. The purpose of the group was to assist CAMA, individual state milk authorities and the ADC in optimizing individual and joint efforts on health and nutrition promotion activities pertaining to milk and milk products.

Since its commencement the Advisory Group has developed a coordinated approach to a number of health and nutrition issues such as the role of calcium for good health, prevention of Osteoporosis and the positive contribution of milk and milk products to the diet.

In order that CAMA, the individual state milk authorities, and the ADC communicate to the consumer on health and nutrition issues in a consistent manner, a Nutrition Communication Guidelines document has been prepared by the Advisory Group.

It is the intention of the Group that the Nutrition Communication Guidelines be made available to organizations in all sectors of the dairy industry as a reference tool in the preparation of any health and nutrition communications to retailers or consumers.

The following is a summary only of the 19 page document which has been distributed throughout the dairy industry as a reference for the preparation of all educational and promotional material.

Copies of the complete guidelines are available on request from Australian Dairy Corporation, 1601 Malvern Road, Glen Iris, Victoria 3146, Australia.

BACKGROUND

A Corporate Nutrition Policy is defined as a guide to corporate action in food production, packaging and promotion which explicitly takes into account the relationship between diet and health by providing clear guidance for corporate action in response to the public need and demand for food consistent with the Dietary Guidelines. (Better Health Program)

The Australian dairy industry is responsible for the production, packaging, distribution, marketing and promotion of a $4.5 billion industry. As a supplier of food it is charged with the dynamic role of being a responsible food industry in its own right, as well as playing part in the implementation of the national, intersectoral Food and Nutrition Policy.

The Commonwealth Department of Community Services and Health (now the CDHHCS) states that "Adequate nutrition for all Australians can only be achieved through a unified approach by all sectors of government...in co-operation with professional groups in the community, the food industry and consumer organizations".

The National Food and Nutrition Policy statement reiterates this need for co-ordinated effort between "health, education, primary industry and manufacturing industry sectors, public, private and non-government agencies...different spheres of government and the Australian consumer".

OBJECTIVES

The Dairy Industry Nutrition Communication Guidelines will:

- Provide up-to-date and relevant recommendations on dairy food, diet and health.
- Provide consistent recommendations on dairy food, diet and health.
- Encompass both information and education strategies.
- Enable and encourage a unified approach to food and nutrition communication by state and national dairy organizations.
- Assist to ensure that food and nutrition labelling, marketing and promotional information is factual, truthful and relevant.
- Ensure food and nutrition messages and methods of communication are constantly evaluated.

Nutritional Data

- All food and nutrition communication for the general public should reflect the Australian Dietary Guidelines and the Five Food Group Plan, however the taste and satisfaction requirement of consumers will also be considered. As some diet therapy is not reflected in the Australian Dietary Guidelines other dietary advice may, at times, need to be taken into consideration in the preparation of specific targeted communication.
- The reference for all nutritional data will be 'The Composition of Australian Foods' from the Commonwealth Department of Community Services and Health to be the reference for mean national data.
- As new Commonwealth data are released, they should be incorporated into all communications.

General food quantities

- Consumer-friendly quantities, as opposed to weighed food quantities, should be utilized in all communications.

NUTRITION COMMUNICATIONS SUMMARY

Milk and dairy foods are part of a balanced diet

- Milk and dairy foods are one of the basic five food groups and hence form an essential part of a nutritionally adequate diet.
- The recently revised (June 1992) Australian Dietary Guidelines encourage use to: "Eat foods containing calcium. This is particularly important for girls and women".
- The wide range of dairy foods available allow all dietary needs, tastes and preferences to be satisfied.

Osteoporosis

- Calcium is an essential nutrient for bone health. The best dietary sources of calcium are milk, yogurt, cheese and ice cream.
- Post-menopausal calcium requirements can be met by increasing dairy consumption by 1-2 serves daily to 4 serves.
- Dietary calcium and exercise alone do not prevent bone loss - only HRT can minimize bone loss at menopause.
Cardiovascular disease
- Dairy product should not be eliminated from a low fat, cholesterol-lowering diet as there is a wide range of reduced fat, sodium and cholesterol dairy foods to choose from.

Milk allergy
- Cow's milk protein allergy (CMA) has a true prevalence of between 1 and 3%.
- Milk allergy is predominantly a disease of infancy and early childhood.
- Most children grow out of their CMA by school age.

Lactose intolerance
- Lactose intolerance is estimated to affect around 10% of the Australian population.
- Most lactose intolerance sufferers have a certain tolerance level and, therefore can have some dairy foods in their diet.

Dental health
- A well balanced diet which includes plenty of dairy foods throughout life is an important factor in ensuring good dental health.
- Calcium phosphate peptide which is naturally present in milk, yogurt and cheese helps to prevent dental decay.

Pregnancy
- Particular nutritional needs during pregnancy include increased protein, calcium, iron and folate.
- Increased calcium requirements apply to the third trimester, however an increase in dairy foods to four serves daily throughout the entire pregnancy is recommended.
- Calcium, and a large proportion of protein, requirements during lactation can be met by maintaining an increased dairy consumption of 4 serves of dairy food per day.

Menopause
- Pre-menopausal women should be encouraged to eat adequate amounts of calcium rich foods to ensure maximization of peak bone mass.
- All women should receive advice about hormone replacement therapy (HRT) preferably prior to menopause. HRT may be necessary to minimize bone loss at menopause.
- Dietary calcium and exercise alone may not be sufficient to prevent bone loss.
- The particular nutritional needs of menopausal women include an increased requirement of calcium and a decreased requirement of fat.
- Calcium requirements can be met by 4 serves of dairy food per day.
- Calcium supplements are unnecessary.

Babies and infants
- Breast milk is the ideal food or 'gold standard' for babies and should remain the primary milk supply until 12 months of age.
- If mothers elect not to breastfeed, infant formula is recommended, with a humanized formula (Enfamil, S26 or Nan) being preferable.
- Solids should not be introduced until 4-6 months.
- Cow's milk may be given to children from 6-9 months of age mixed with solids in the form of desserts, on cereals, and via processed dairy foods such as cheese or yogurt. Up until 9 months of age, cow's milk should be boiled.

- If there is a history of cow's milk protein allergy in the family, introduction of cow's milk products should be delayed until 9 months or later.

Toddlers
- Low and reduced fat milks are not suitable for children under 5 years of age due to the inadequate energy, fat and vitamin A levels of these milks.
- From 2 years of age, reduced fat milks may be consumed in the form of family desserts etc., however they should not be the main milk drink, except under medical/dietetic advice.
Several recommendations by experts and authorities relating to national nutrition have been published in Finland. Particular emphasis has been laid on the type and quantity of fat, but these recommendations are also concerned with other factors such as energy, fibre, cholesterol in the food, salt and calcium. Where fat and calcium are concerned, dairy products have also been covered.


• The daily diet should include 6-7 dl of milk products and 30 g of cheese, preferably low fat and non-fat types. The milk can be replaced with soured milk or plain yogurt. The amount of cheese can be increased as long as the fat content is low.

The recommended amount of calcium is 95 mg/1 MJ (400 mg per 1000 kcal). It has been shown that the calcium balance can often be achieved with even less. It is possible in Finland to get as much as double the requisite amount of calcium; however, it does not appear that these large amounts of calcium have any harmful effects. Women and the elderly must get enough calcium to avoid osteoporosis.


• The combination of fatty acids in milk must be changed by developing nutritional awareness.
• The overall pricing policy should favour milk products with a high protein content.

The consumption of milk and cheese should remain at the current level but consumers should change to products with a lower fat content. The food processing industry should develop low-fat products and the retailer should pay attention to this range. The low-fat products must be cheaper than the products with high fat content.


• Breast milk or breast milk substitute for infants up to 12 months of age. Gradual introduction of milk products at the age of 10-12 months by giving small quantities of soured milk products. 5-6 dl of milk or milk products per day from 12 months onwards. Low-fat and non-fat milk products favoured. Low-fat milk recommended for 1-2-year-olds.

Toddlers should have 5-6 dl of milk or milk products per day and 15-20 g of low-fat cheese. The recommended milk products are non-fat, low-fat and 1%-milk, non-fat and low-fat curdled milk, plain yogurt, "kevyttiili" (soured low-fat milk), curd and non-fat milk powder.

4 Circular by the Ministry of Health Y 79/1981

• Milk as a drink with meals (low-fat milk, curdled milk, water); those allergic to milk should drink whatever they have been prescribed.


• At mealtimes, low-fat or non-fat drinks are recommended, such as milk or curdled milk and water, or whatever is prescribed to those on a specific diet. If the pupil cannot drink milk or curdled milk, he or she should be given some cheese.

Calcium recommendation for school meals: 95 mg/1 MJ and 400 mg/1000 kcal

6 Meal guide for vocational institutions. National Board of Vocational Education

• Low-fat or non-fat milk and curdled milk products are served with meals. The dairy milk produce recommendation is 5-6 dl.

Calcium recommendation: 440 mg/1000 kcal

7 Nutritional recommendation and application of recommendation for the National Defence Forces. Permanent regulation 1988

• The daily amount of milk and milk products 800 g.

Non-fat or low-fat milk, curdled milk, "kevyttiili", plain yogurt or curd. Non-fat milk powder to be used in the preparation of food and low-fat cream in coffee.

Daily amount of cheese 30 g; alternating with a variety of cheeses.

8 Nutrition recommendations for sportsmen and women. The Ministry of Health, Helsinki 1990

• The daily use of milk products is recommended. Low-fat and non-fat products are preferred.

Calcium recommendation: 400 mg/1000 kcal

9 Recommendations for hospital meals. Ministry of Health's Instruction No. 1/1985

• Calcium recommendation: 1.1 g/9 MJ

Larger amounts recommended than for the healthy population because the amount of protein in the food increases the secretion of calcium in the urine. If the patient cannot use milk products, the recommended

Recommended amounts of calcium:

<table>
<thead>
<tr>
<th>Age</th>
<th>Calcium (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months</td>
<td>360</td>
</tr>
<tr>
<td>6-12 months</td>
<td>540</td>
</tr>
<tr>
<td>1-2 year</td>
<td>600</td>
</tr>
<tr>
<td>4-6 years</td>
<td>600</td>
</tr>
</tbody>
</table>

Calcium recommendation: 400 mg/1000 kcal
amount of calcium must be ensured by calcium products.

If given advice, low-fat products should take precedence: non-fat or low-fat milk, non-fat or low-fat curdled milk, "kevytvili", plain yogurt, curd and low-fat cheese (maximum fat content 23% of the weight).

The daily amount of liquid milk products should be 5-6 dl. If the patient cannot take these, he or she will be given as an alternative 50-60 g of cheese (10 g of cheese is an equivalent of 1 dl of milk). Non-fat milk powder can be used in the preparation of food.

- Basic diet for children
  Calcium recommendation: 0.5 g/1000 kcal (4.2 MJ)
  Vitamin D is necessary for the absorption of calcium.
  The recommended amount of milk and liquid milk products are:
  
  | 5.5-8 MJ | 6 dl/day |
  | 9-12 MJ  | 8 dl/day |

- Vegetarian diet
  Milk products are used to complement the lack of protein in vegetables. It is difficult to achieve the recommended level of calcium without any milk products. Low-fat products are preferred and they are used as in the basic hospital diet. In addition, 100 g of cottage cheese or curd are used daily to ensure sufficient protein.

  The use of milk products with a higher fat content is justified if the energy total would otherwise be insufficient.

10 Diet and quality of life for the elderly. 
Publications by the Ministry of Social Affairs and Health 12/1992

- The recommended amount of calcium for men is 600 mg and for women 800 mg per 24 h.

  In Finland the average supply of calcium is well up to the recommendation above. However, elderly people whose energy supply is low may suffer from calcium deficiency. Elderly people who do not take any milk products are particularly at risk. They must use products containing calcium to ensure the necessary amount of calcium.

- To ensure sufficient calcium in the elderly, a daily amount of 5-6 dl liquid milk products is recommended. In addition, a few slices of cheese will guarantee a sufficient supply of calcium.

  Milk products can be a significant source of hidden fats. Non-fat and low-fat products should be chosen to keep the fat intake moderate.

11 Staff restaurant recommendation. The recommendation by the Ministry of Health as regards meals during working hours

- Milk or soured milk products, water, heavily diluted fruit juice, non-alcoholic home-brewed beer, etc. as drinks with meals. Preferably non-fat or low-fat milk products to keep fat intake low.

12 Consensus meeting on 24-26 April 1989 relating to cholesterol levels in blood and coronary disease

- Heart-friendly diet:
  - non-fat milk and low-fat milk products, low-fat cheese.

13 Osteoporosis consensus meeting. The Academy of Finland, 30 March-1 April 1992

- Measures for the prevention of osteoporosis in the population means ensuring a sufficient supply of calcium and vitamin D and taking enough exercise. The preventative procedures must be started in childhood and be continued throughout life.

  The nutrition recommended for the population prevents all chronic diseases including osteoporosis. Normally the Finnish diet contains sufficient ingredients for bone construction. The child care clinics take care of the additional supply of vitamin D for young children. Later, sufficient calcium from food must be ensured to guard against osteoporosis, particularly during the fast growth period of adolescence, pregnancy, breast-feeding and after the menopause. Particular attention must be paid to those who do not use any milk products. Long-term institutionalized patients need additional amounts of vitamin D.

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### Contribution of milk and dairy products to total food energy and some nutrients in Finland 1989 (%)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Milk and liquid milk</th>
<th>Cream</th>
<th>Cheese</th>
<th>Butter &amp; dairy spreads</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption per g/head/day</td>
<td>598</td>
<td>14</td>
<td>34</td>
<td>24</td>
<td>%</td>
</tr>
<tr>
<td>Energy</td>
<td>11</td>
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<td>4</td>
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<tr>
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DAIRY CALCIUM AND DIET - NUTRITION EDUCATION

1 Milk and dairy foods part of a balanced diet
   Milk and dairy foods are one of the 6 food groups in the
   recommended daily Finnish diet.
   In March 1992, the Medical Association gave out a
   consent statement about the prevention of osteoporosis.
   This encourages us to "Eat foods rich in calcium..."
   Milk and dairy foods provide over 80% of our daily
   calcium.
   Calcium is an essential nutrient for bone health. This is
   very important particularly for girls and women.

2 Purpose of the Information campaign
   To inform consumers, especially women and girls, of
   the importance of dairy products for their daily intake of cal-
   cium. This aim is best achieved via health professionals.
   Main target groups of this information are schoolgirls
   and women under 50 years. These consumers have
   decreased their milk consumption.

3 Activities
   Information campaign and material was planned by a
   group of specialists, representing medical, educational,
   general healthcare and informational points of view.

Material
   (1) Booklet for health educators on the recent research
   about calcium and osteoporosis.
   (2) Videotape for television educational short programme.
   This was published by state authorities, 2 min.
   (3) Videotape for training of nurses, 10 min.
   (4) Consumer leaflets:
       "Milk and misunderstandings"  
       "Calcium and exercise give you healthy bones"
       "Teeth and calcium"
       "Check your diet" - card
       "Do you get enough calcium?" - checking card
   These leaflets are intended to be handed out to con-
   sumers by health educators.

Valio, Dairy co-operative company, has produced a
poster with pictures of dairy products and their calcium
contents for schools.
All this material is distributed through media and pro-
fessional associations. It is delivered by orders.
Evaluation of this message about calcium and the
importance of dairy products was carried out among both
consumers and health-nutrition educators in 1988 and will
be repeated in 1993.

THE INTERACTION BETWEEN SCIENTISTS AND
MARKETING PEOPLE ON NUTRITION MATTERS

Bo Forsling
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This discussion starts from the assumption that there
are specific, yet interactive, roles to be played by the two
groups of specialists, the scientist being responsible for the
"input" of the best possible knowledge of the issue, the
marketing person handling the "output" through the choice
and the translation to a communication directed towards
the market.

1 The task of the marketing people in the dairy
   industry
   No doubt, their main task is to use all available knowl-
   edge to communicate facts and claims which are
   favourable to the consumption of dairy products in a man-
   ner which does not undermine, and ideally enhances, the
   credibility of the industry.

2 The importance of nutrition in the marketing of
   dairy products
   Nutrition is now a very important aspect of marketing
dairy products, given the arguments for or against such
products, which are being made continually.
   Nutrition is also important to the dairy industry from
other, non-marketing aspects but they are not discussed
here.

3 The working methods of the scientific world
   Nutrition scientists tend to be very careful with respect
to adopting new scientific findings.

These scientists often join "groups of experts" where
consensus standpoints are decided and which when taken
are difficult to change. These standpoints also tend to be
formulated very carefully.
This means a time delay in relation to the most recent
scientific research. The members tend to get less
amenable to opposing evidence to established "facts".

4 Other actors on the nutrition scene
   There are other powerful actors communicating nutri-
tion messages which affect dairy products directly or indi-
rectly. The media and the competitors are such actors and
their messages are often extremely simplified and must be
so in order to be very effective. This is a reality that the
marketers must react to.

5 The quality of communication
   Nutrition matters are often very complicated. The infor-
   mation produced by scientists is seldom available in a form
easily understood by consumers or other non-specialists in
nutrition.
   There is a difficulty here. The nutrition scientists formu-
late so carefully and comprehensively - and they are
expected to do so - that the messages must then be simpli-
fied in order to be of use for mass communication.
   The marketers cannot act in the same way. They have
to use the techniques and the requirements of mass com-
unication, that is, simplifications, clarity, focus etc.
It appears to be difficult to be a good communicator to a mass audience at the same time as functioning properly and completely as a scientist. On the other hand, it is difficult to be a good marketer if you have to match the pace and exactness of the scientists. There are far harsher time constraints imposed on the marketers.

6 The perspective of time
The marketing person in the dairy industry must keep two time perspectives in mind
- the budget year
- the long-term perspective
Nutrition must be considered and planned according to the same time frames
- in the short term through adopting standpoints or undertaking activities which on one hand will have a positive impact on the consumers attitude to dairy products, but on the other hand will not make the industry lose its long-term image of confidence.
- in the long run such activities and standpoints must be formulated in a way that are not undermining credibility, but possibly are enhancing it. This is in line with every responsible person's interest.

7 Conclusion
Those responsible for marketing in the dairy industry must work in close collaboration with competent and serious nutrition experts regarding all nutrition matters of importance to the industry.

The role of the scientist is to build a platform of facts, with expert advice on how to interpret the findings of research. These experts put up markers - "so far but no further!"

Inside these borders the role of the marketing people is to choose the appropriate elements of research findings to support the interest of their industry and to do it in such a way that it does not impair its long-term credibility.

Now the marketers have moved into a decision-making mode, using the scientific findings, including those most recently to hand, of nutrition experts to address a particular situation in the market place. They have to ensure that the language used and the choice of media are suitable for the focused segment of the population they are addressing.

However, as well as having an input/output information feedback from scientists to marketers, there must also be a feedback channel to the scientific fraternity. Thus ensuring that the boundaries of permissible information are not being broken and that marketing standpoints and activities continue to be adopted and formulated in balanced manner.

Comments
The indirect approach via opinion leaders should be combined with direct marketing, that is, building up a network of ambassadors who take an active part in the debate and who balance the nutrition messages to the public. This is a strategy used by most European countries today.

4 January 1993

NUTRITION COORDINATION GROUP
Progress report

MEETING
The Nutrition Coordination Group met in Zeist (Netherlands) in association with other nutrition meetings. L. Hambraeus (SE), Chairman, E. Renner (DE), G.-J. Schaufsma (NL) and L. Björck, President of Commission F attended, together with R. Tanaka (JIP) and R. Fondén (SE) as observers.

TERMS OF REFERENCE AND METHOD OF WORKING
The Nutrition Coordination Group has taken note of the discussion at its previous meeting (Munich, 30 August 1992) and at the sessions of Commissions C and F and the Commission of Studies in Munich in August/September 1992. The difference of approach between those concerned with nutrition science and those concerned with marketing was not bridged on that occasion, apparently. The group took note with interest of the suggestion for a method of working put forward by the chairman of Group C1 - International Promotion and Marketing and suggested that these ideas should be exposed to a wider audience and comment invited. The suggestion is included in Nutrition Newsletter No 2. To some extent, of course, conflict between the differing objectives of the two areas of interest is inevitable, the marketer being especially interested in positive messages, the scientist demanding to discuss the negative ones also in order to understand the full picture.

The group suggested that the expectation of what it could achieve had, perhaps, been set too high at the previous year's annual meeting. The dairy industry recognizes the nutritional properties of milk and milk products as of crucial interest and is looking for a great deal from the work. Nevertheless progress cannot be expected if, for example, groups of experts meetings are not attended. However, successful meetings need adequate prior preparation and an interesting scientific programme. The availability of funds to support participation in the work (drafting reports, attending meetings) remains an important issue, especially in relation to experts not directly employed by the dairy industry as is the case for many nutrition specialists. IDF might contemplate, for groups such as those concerned with nutrition, establishing a budget for each group to spend in support of its work. The group chairman would be responsible for control and for consulting the expert members in the use of the money.

The Utrecht Group is recognized as successful in the field for a variety of reasons - providing a scientific programme, availability of financial support, confidentiality of meetings, substantial central organization. IDF's method of working through groups of experts can provide useful consensus in the development of reports but it is cumbersome and does not leave IDF free to respond to a sudden crisis for any of its members. The Nutrition Coordination Group re-emphasizes the value of inviting an expert to review a particular topic (rapporteur) but notes that rap-
Porteurs' submissions are not always treated with the same esteem at IDF annual sessions as reports submitted by groups of experts. A rapporteur cannot, of course, be expected to reflect all dimensions of IDF members' views or of a subject, if broad, but consultation of the membership should remedy any such deficiencies.

The Nutrition Coordination Group has also considered the First World Congress of Dairy Products in Human Health and Nutrition to be held in Madrid (and competing with the IDF nutrition meetings in 1993). On reflection, it appears an opportunity missed that IDF declined to associate itself with this congress although the reasons for doing so were valid at the time. The group looks forward to a second congress, provided the first is successful, and suggests that IDF should be prepared to cooperate from the start.

The FAO/WHO International Conference on Nutrition (ICN) in Rome in December 1992 has revealed the value of IDF's status with the UN agencies, even if the first results were disappointing. The Nutrition Coordination Group urges further efforts to maintain these contacts. It notes that ICN Secretariat has recently informed the IDF Secretariat of its interest in support from the dairy industry with respect to milk production and ensuring hygienic quality. However, the group considers that the nutritional aspects should also not be ignored, suggesting further contact with WHO, and especially UNICEF, in this regard.

The ICN received eight "theme papers" of which several were of interest to IDF. These papers were not discussed as such at the Rome meeting in December 1992. Whereas the World Declaration on Nutrition and the Plan of Action for Nutrition had been discussed minutely and represented a consensus view. All interests had been considered, the outcome is a relatively well-balanced statement, depending on how it is read, and IDF should seek to develop the positive aspects.

**Changes in terms of Reference**

The group agreed to put forward the changes to the terms of reference, the tasks of coordination and advising IDF on nutrition matters being the primary ones. After editorial changes the terms of reference would thus read:

The NCG should:

- identify new topics within the field of nutritional science of interest to the dairy industry and help to provide suitable resource expert advice for IDF, using existing groups, as well as suitable rapporteurs outside IDF;
- give advice on IDF collaboration with UN agencies, for example WHO and other international organizations in the field;
- advise IDF on matters relating to nutrition messages to the dairy industry based on established knowledge;
- arrange nutrition weeks at regular intervals, suggest topics for the nutrition programmes, initiate and edit the IDF Nutrition Newsletter.
- support chairpersons to activate members of groups dealing with nutritional matters when needed;

**Nutrition Week 1994**

The following proposal was agreed to be forwarded to the Commission of Studies:

(a) date: 6-8 June 1994
(b) place: Finland
(c) meetings of IDF nutrition groups
(d) theme: nutritional properties of proteins, in coordination with the Utrecht Group to avoid duplication and ensure that the two programmes are complementary
(e) associated events: if possible, Utrecht Group's spring meeting and if suitable, a follow-up event to the IDF Protein Definition Symposium (Minneapolis)
(f) visit of professional interest: the hosts should be asked if a technical visit could be arranged conveniently
(g) papers presented and a brief report of the "week" should be published as Nutrition Newsletter No 3

**Group F38 Nutrition Information and Education**

Having re-examined the present work and responsibilities of the various groups of experts, together with its own functions, the Nutrition Coordination Group suggests that Group F38 should be disbanded.