FOOD PRODUCTION, HUMAN NUTRITION AND THE IMPACT OF HEALTH MESSAGES: A PUBLIC HEALTH PERSPECTIVE

C.A. SINDALL, J. WRIGHT and K. O'DEA

I. INTRODUCTION

In this paper we consider a number of emerging issues related to changes in the food supply, and the use of health messages in food marketing. Current moves to permit health claims and messages in food labelling and advertising can be expected to lead to further changes in food composition, as food producers seek to gain competitive advantage through promotion of health and nutrition product attributes. This may lead to improvements in the nutritional profiles of some products, and in some cases may provide useful nutrition information to consumers.

However, when viewed in context, these and related developments give cause for concern from a public health perspective. For example, we argue that concurrent moves to relax food standards related to vitamin and mineral fortification will in turn drive additional demands for health claims. At the same time, new technologies and scientific discoveries will bring many new products, including so called "functional foods", into the marketplace. These developments will also be accompanied, we suggest, by further demands for the right to make health claims.

Taken together these developments may result in what has been termed a "nutrition power race" between competing products and companies in the food industry. We question the impact this may have on public health.

Of particular concern is the potential for unanticipated and unintended health consequences or latent side effects arising from the potentially toxic synergistic/antagonistic impact of novel food products and highly fortified foods; and of the potential for consumer confusion likely to result from an expanded range of food products and a plethora of disparate health messages and claims, making the task of nutrition education even harder.

We therefore argue for a more cautionary approach on the part of governments, regulatory authorities and health agencies, pending the development of a more appropriate public policy framework than exists at present. We suggest some possible components for such a framework.

II. HEALTH MESSAGES

(a) What are they?

In this paper the term "health message" is used in a broad sense to mean messages which draw an association between food products, nutrients or their intake and the

Food and Nutrition Program, Deakin University, Carlton Vic 3053

consequences for health particularly with respect to risk reduction of a disease condition of consuming these foods/nutrients.. These messages may be provided by government health authorities, by non-government health agencies, or by the food industry.

The term in this usage is broader than that of "health claim"; however, "health claims" are themselves important health messages.

(b) Current Australian position

Currently the Australian Food Standards Code prohibits or limits these types of claims in the interests of avoiding consumer misunderstanding. Nutrition claims are permitted provided they are accompanied by a nutrition panel.

The review of the vitamin and mineral standard has resulted in considerable pressure by some sections of industry for Australia to permit a greater range of vitamin and mineral fortification. For these industry groups, such a move would need to be accompanied by permission to promote these products as a good source of those nutrients.

It is recognised by food authorities and interest groups that Australia's position on health claims requires review. This has been fuelled more recently by developments in the United States.

(c) United States

The US Nutrition Labelling and Education Act (NLEA) has attracted considerable attention in both industry and nutrition education circles of late as one the most comprehensive and far reaching efforts by government to set the ground rules for product labelling and health claims. The Act makes nutrition labelling mandatory for most packaged foods, allows for health claims to be made under precisely defined and specific conditions, and regulates the use of descriptors such as "lite".

(d) Deregulation of health messages - issues for concern

While moves to review the Australian position on health claims are welcomed, it is necessary to sound a note of caution in relation to any moves to deregulation.

Depending on their content, context and execution health messages and health claims can assist in providing information to consumers and reduce the consumer's search costs (Ippolito and Mathios 1991). However, health claims can also mislead or confuse (Scott and Worsley 1994; Miller 1991). They are likely to overemphasise the therapeutic role of a particular food and unlikely to convey the relationship of a single food to the total diet over time (see e.g. DAA 1991).

A plethora of competing health claims and a significant increase in the food products available (on top of the many thousand which are already found on the supermarket shelf) is unlikely to assist consumers to follow a prudent diet. This is likely to make the tasks of nutrition educators far harder (Gussow and Akabas 1993).

III. CHANGES IN THE FOOD SUPPLY

(a) Technological Innovation

Calls for change to the regulation of health claims are occurring in the context of significant changes in the nature of the food supply.

Biotechnology may emerge as the most important scientific tool driving change. Other significant areas of changing technology are in microencapsulation, common membrane separation, novel ingredient substitutes, and new preparation and cooking methods particularly those which directed at saving time. (See e.g. Pan 1993) Food analogues are already available in the form of nonnutritive fats and sweeteners. Functional foods or "nutraceuticals" which are claimed to perform specific health roles, based on the presence of a particular "functional ingredient" are soon likely to appear in Australia. The range of vitamin and mineral fortified foods is likely to increase, as may the quantities of vitamins and minerals added to foods.

These developments will undoubtedly bring many compositional changes to the food system and will result in a wide array of new products for the consumer, adding to the many thousand already on the supermarket shelves.

(b) The Drive For Competitive Advantage

Many of the developments described above have been spurred by the findings of human nutrition research, by the adoption of population dietary guidelines by governments, and by the endorsement programs of health agencies such as the National Heart Foundation in Australia, and by the resultant increased consumer awareness of health effects of diet and desire for healthy foods.

The economic rewards for the food industry in meeting this growing segment of consumer demand are substantial. In pursuing differentiation strategies, firms will seek to increase or maintain (at least) their market shares through emphasising the nutritional attributes of their products, and by positioning strategically to be able to take advantage of favourable trends such as health authority dietary recommendations, or current regulatory policy. Caswell (1991) categorises this as a "domain offensive" strategy.

The benefits which can accrue through such a strategy are reflected in the experience of the multi-million dollar cereal industry in the United States which achieved growth of more than 10 per cent per year in the mid to late 1980s as health authorities placed increased emphasis on fibre intake, and the ban on health claims was suspended (Caswell 1991 p. 278).

It is only to be expected therefore that the demand by a highly competitive industry for the opportunity to communicate health messages in relation to their products, through labelling and the electronic and print media, is likely to intensify.

(c) Overview of the food industry: size and structure

Some of the macro level changes taking place in the food industry internationally have been identified by Goldberg (1991). The global agrifood business economy (comprising farming, farm supplies, processing, manufacturing, distribution, and chemical and

pharmaceutical interests) is growing rapidly. Change is being driven by global economic developments, new information and communications technology, biotechnology, demographic change, environmental and health concerns. Goldberg suggests that what was a US$250 million dollar industry worldwide in 1950 will have become a highly interconnected industry worth approximately US$10 trillion by 2028 - roughly equivalent to half of the world economy.

In Australia the agricultural and food processing industry is valued at more than $16 billion dollars. Food processing accounts for 20% of manufacturing turnover.

Australia exports approximately $9,755 million a year of unprocessed and processed food. Of this processed foods are make up $6,490 million. Within a decade exports of `highly processed' foods are estimated to reach over $7 billion in real terms.

(d) Food Advertising

Foodstuffs command a higher share of advertising expenditure than any other commodity. In 1993, of the total expenditure on advertising by the top 100 advertisers in Australia of around $1.5 billion, close to $500 million was spent on food and beverage (including alcohol) advertising. Of this amount, McDonald's spent $45 million, Kellogg's $36 million, PepsiCo $30 million, Goodman Fielder $18 million, the AMLC $12 million, and the Australian Dairy Corporation $11.5 million. Approximately $27 million was spent on snack food advertising (an $850 million market); $33 million on soft drinks (a $3.2 billion market) and $47 million on confectionery (a $1.6 billion market) advertising. Approximately $6 million was spent on bread (Advertising News, 8/4/94).

Expenditure on the promotion of vitamins and mineral supplements is also increasing. Vitamin manufacturers are anticipating further growth in the $250 million vitamin and supplements market (Australian Supermarket News 6/4/94).

A vitamin manufacturer was recently reported to have developed a $3 million "consumer education" strategy, which includes literature on naturopathy distributed through 1500 health food stores, toll-free customer advice service, naturopaths on daytime television spots "educating the public about the benefits of a healthy lifestyle".(Bulletin 14/2/94)

IV. PUBLIC HEALTH PERSPECTIVE

(a) The need for caution

Clearly, there is a lot at stake in the issue of regulation of health messages. Experimentation with food and common usage over the centuries together with advances in nutritional science during the twentieth century have resulted in the identification of basic food groups and the quantity thereof that assist in maintaining a state of health. Nevertheless there is still much to be understood and the conventional wisdom is to advise consumers to include a wide variety of foods from these basic groups.

In recent years, the food industry has made a significant contribution to making healthier choices, easier choices for consumers through the introduction of new or modified products such as those lower in fat and sodium, and higher in fibre. Sectors of the industry

have also played a valuable role in consumer education. Nutrition education materials distributed by some firms equal and sometimes surpass those produced by health authorities.

Nevertheless, any decision to relax the prohibition on health messages must take into account the potential impact both on the consumer's ability to effectively process those messages and also on the composition of food products which will be offered to the consumer.

It is unclear whether extracting, copying or manufacturing specific components of foods identified as having putatively protective effects on health (e.g. antioxidant vitamins) and adding or incorporating them in processed foods will have the same effects as consumption of the basic food (e.g. Brussels sprouts, which clearly contain more nutrients and non nutritive components than these vitamins alone). Reliance on these processed or fortified foods to achieve a balanced diet leaves the consumer at risk in relation to many other essential nutrients for which recommended dietary allowances have yet to be developed. The matter is further complicated by questions of the bioavailability of nutrients and the synergistic/ antagonist relationships of various components of food.

Miller (1991) has expressed concern for the impact of a "nutrition power race", and has argued that "for most nutrients the current state of the art does not allow the monitoring of the population for the prevalence of nutrition toxicities, particularly those that may be more subtle that life and death". Given the fairly primitive state of nutritional monitoring and surveillance in Australia we share these concerns. The need for monitoring may not be seen as a priority for any individual marketer, whose product is known to be "safe"; monitoring is one of several requirements that will need to be addressed by government.

(b) Inappropriate consumer response

How consumers will respond behaviourally to these new foods is also unclear; there is some evidence to suggest that compensatory behaviours may be one response - i.e. consumers may choose to use the health benefit offered by one food to "trade off" against indulgence foods (Gussow and Akabas 1993)

(c) Consumer loss of control

From a broader sociocultural perspective, indications are that consumers are starting to find their food supply incomprehensible and out of their control (see e.g. Senhauer et al. 1991, p.166; Gussow and Akabas, 1993). Much of the meaning of food as part of social interaction is being lost. Gautier (1991), for example, has referred to the "destructurisation of the meal" - family meals are being replaced more and more by individual meals.

Fischler (1992) has argued that what he calls the "dietary cacophony" (which arises from the "increasing number of sources that offer prescriptions, information, directions for food selection and eating behaviour) is leading to a high level of anxiety about food, and a sense of loss of control, of normlessness, and even identity. He suggests that as we lose the cultural concept of "cuisine" we lose all guiding principles for what and how to eat.

V. HEALTH MESSAGES - A CASE STUDY

(a) Health messages and unintended consequences

In order to illustrate some of our concerns about health messages, health claims and food production we briefly examine as a case study the recent campaign by the AMLC to inform women of the benefits of lean red meat as a good source of iron. This message, and the food product promoted, is fully consistent with the dietary guidelines. There are in fact a number of health benefits for women associated with consumption of lean, red meat. As stated below we are also supportive in principle of generic nutrition education campaigns conducted by statutory marketing authorities.

We suggest however that this example illustrates some of the possible unintended consequences that can occur when the best intentioned messages are launched into the complex system that links mass communication, human response and the complex pathways of nutrition and health.

When a health message enters this system the outcome is not completely controllable. Many players will influence what occurs and how, including advertising agency staff, journalists etc. Oversimplification at some point will become inevitable. The context in which the message is received will also influence consumer response. For example, the background diet being consumed, the consumer's information environment - what else they are being told about related issues, and the sociocultural context in which the message is received will all contribute to the ultimate outcome of message exposure.

We are not arguing that these are only concerns in relation to private sector campaigns; many of these concerns are as relevant to health authority media campaigns.

(b) The beef provides iron campaign

Following market research conducted by the Dangar Research Group, the Australian Meat and Livestock Corporation commissioned CSIRO to produce a report on iron status and dietary iron intakes of Australians.

A Business Review Weekly (20/8/93) article by Neil Shoebridge tells the campaign story from a marketing perspective. Shoebridge reports that "seven out of ten adult Australian women do not get their recommended daily intake of iron" and an illustration in his article (taken from the campaign's television advertisement) is captioned: "Hammering home the message: Research found that 70% of adult women were iron-deficient". We see here an example of the oversimplification process at work as a message becomes subject to the work process of media personnel, for this is not what the CSIRO report actually said.

The report states that based on analysis of the 1983 Dietary Survey of Adults that around 70% of women in the 25 - 54 age group were below the RDI, with around 43% at <70% of RDI. 62% of women (all ages) were below the RDI, but that 35% had intakes <70% of RDI. The report argues that the use of the standard 70% of RDI as the "high risk" cut off point may lead to an underestimation of risk, given the way the iron RDI is calculated (Cobiac and Baghurst 1993).

Analysis of data from the VNS 1985, 1990 in the report shows estimated iron intake to have increased between 1985 and 1990. The report notes a "high proportion" of women

aged from 18 - 59 years having intakes less than the RDI. The numerical estimates however show the this figure to be around 40%, or 33% if the 60+ age group is included, and 9% at the <70% RDI across all ages (Cobiac and Baghurst 1993).

All of these estimates are based on self reported intake and therefore may be under estimated. Serum ferritin analysis (a much better indicator of iron status) indicated that only 8% of women had levels below 20µg/l ,a high cut-off for deficiency (Cobiac and Baghurst 1993).

The Shoebridge article also describes what happened when the campaign brief reached the advertising agency, Campaign Palace. In considering the research data the Campaign Palace noted that "tiredness is the biggest health problem women face". The agency decided to "create a commercial that linked tiredness to a lack of iron", in itself a dubious proposition. The agency created a powerful set of television images to talk to women about "tiredness" and iron consumption. The visual images played an important part in communicating the campaign message.

Shoebridge quotes the strategy and planning director at Campaign Palace: "Iron will give beef a real legitimacy in a dietary sense ... but simply telling women beef contains iron is not enough. They already know that. We had to show them why they need iron".

Prior to the launch of the ad, a two month public relations campaign was conducted. The CSIRO report was sent to 17,000 doctors and 1500 dietitians. The AMLC marketing manager is quoted as saying: "The ad was an extension of the public relations program. It was like a public health announcement to get women thinking about iron".

Dangar research showed that the $4 million campaign achieved an unprompted awareness score of 74%. Dangar reported that "it generated the strongest tracking results I've ever seen in such a short period".

The BRW article goes on to say that "research after the new commercial went to air unearthed a serious problem. More than half of the people surveyed thought they fell into the 30% of women whose diets do not lack iron".

Thus a follow up commercial was planned to try and convince this group that they too could be at risk.

(c) Potential adverse consequences of the campaign

Professor June Halliday, head of the Liver Unit at Queensland Institute of Medical Research, among others, publicly expressed concern that the campaign could be leading some women not to increase their red meat intake but to take iron supplements (Australian, 24/7/93). She noted that one in 300 Australians carry the gene for haemochromatosis, for whom an excessive iron intake could lead to liver cirrhosis, liver cancer and other disorders.

New Scientist (2/4/94) recently reviewed concerns of a number of scientists about iron intake levels: several researchers noted that it appears the proportion of the population who absorb more than normal amounts of iron may be higher than previously thought. Others expressed some concern over possible links between excessive iron intake, oxidative damage, cancer and heart disease risk. New Scientist noted that both the British Department of Health and the FDA in the United States are reviewing policy on iron fortification.

Whether or not the New Scientist article itself contains an accurate representation of

the debate, the fact is that within six months of the launch of a very powerful campaign, research sounding a note of caution in regard to iron intake was starting to appear in the popular scientific press, and will no doubt have begun to find its way into the popular media. This will undoubtedly confuse consumers further.

In addition it is important to note that the AMLC are not alone in promoting the benefits of iron in the diet. Not only are many breakfast cereals now fortified with iron, but, as noted above promotion of vitamin and mineral supplements - including iron in increasing substantially.

We have no real way of knowing at the time of writing whether the AMLC campaign will ultimately contribute more to meat sales, to increased vitamin sales, or to breakfast cereal sales or to all three; or to what extent it will contribute to women assuming that "tiredness" is the result of not eating correctly; or to whether people who are "tired" will finish up taking what may prove to be toxic doses of iron through a combination of meat, breakfast cereals and excessive supplements. If the latter were to occur, each industry group could argue quite legitimately that they had acted responsibly in relation to their own product. At this stage monitoring the impact of a campaign such as the "meat provides iron" from a public health perspective is nobody's responsibility.

In relation to advertising campaigns which make use of health messages, Freimuth (1988) has raised a number of "important questions for the public health community" based on an analysis of the impact of the Kellogg/NCI All-Bran advertising campaign in the mid 80s in the USA. These questions include:

o Is it possible to substantiate all of the health claims that will be made by the food industry?

o How will conflicting evidence about the same product be handled?

o Would the already competitive food industry exaggerate nutritional claims and run the risk of desensitising the public to all health information?

o What will be the ultimate outcome of manufacturers loading their products with added nutrients to gain [a] competitive edge?

These are questions for which we do not have the answers, but which we believe need to be raised.

VI. CONTROLLING THE UNINTENDED CONSEQUENCES

(a) The need for regulation

The costs of diet-related disorders are borne by the whole community in any society, but particularly so in Australia because of our universal health care scheme. The personal costs are also high. If the health of the Australian community is to improve, consumers need to acquire the knowledge and understanding necessary to enable them to choose a healthy diet. The complexities of food products in today's market militate against that. Trends to the greater consumption of foods prepared outside the home also make that task more difficult.

The market in foodstuffs cannot therefore be relied upon to provide consumers with sufficient and appropriate information for them to make informed purchasing decisions. The market is also unable to operate freely of externalities in relation to food choice and

consumption, such as the impact on Australia's health budget.

We suggest that appropriate regulatory intervention can help to ensure that the market environment is suitably geared for the selection of foods for a nutritious daily diet. Advertising and labelling regulation can indirectly support national nutrition goals by influencing product composition and the provision of information. An appropriate regulatory framework, linked to a sophisticated monitoring and surveillance system, could ensure the impact and effects of health messages are properly monitored.

Human nutrition is a complex subject which cannot be taught through 30 second television advertisements or a label on a food product - as is borne out by the AMLC case study above. However as Ippolito and Mathios have shown, the use of these media can have a place in reinforcing and furthering educational efforts taking place through other channels.(Ippolito and Mathios 1991) This suggests that the use of advertisements or health claims on labels may have a place within a more comprehensive nutrition education framework. We suggest some elements for such a framework below.

(b) Labelling

Research in Australia shows that shoppers do read ingredient and other information on food labels. Because of their proximate relationship to the decision to purchase, labels have the potential to make an important contribution to the nutritional knowledge of the purchaser. Consumers can apply knowledge obtained through other channels to labelling information or may use labelling information to compare the attributes of various products. Obviously, an effective format is essential. Some standardisation is necessary so that the consumer can compare products.

Concern has been expressed that compulsory nutrition labelling is an inefficient form of nutrition education. Many consumers are unable to read labels effectively (Scott and Worsley 1994). Nevertheless Caswell (1992) has suggested that compulsory labelling can play a significant "third party role"; this implies that in the interest of attracting purchasers from the population segment who do read labels, most manufacturers will create or reformulate products to show an attractive nutritional profile to this market segment. Compulsory and standardised nutritional labelling can thus help bring healthier products to all consumers, regardless of whether they read labels. An additional simplified system of identifying products lower in fat and higher in fibre (eg a traffic light system) may be useful to consumers who use simple heuristics to make choices. Compulsory labelling combined with such a system might obviate the need for product endorsement schemes which link specific foods with specific diseases.

(c) Generic advertising and promotion of the dietary guidelines

As we have seen above, expenditure on food advertising by the food industry is substantial. Public health authorities cannot hope to match these advertising budgets , with the danger that commercial activities may overwhelm the food and nutrition policy efforts of government.

If compulsory nutrition labelling were in place, and health claims restricted, (and descriptors tightly defined) food processors and manufacturers may see value in cooperative

(industry and government) generic, population wide nutrition education. Such an approach is proposed in the national Food and Nutrition Policy. This ultimately would help lead informed consumers towards products that were more nutritionally desirable as they became more aware of how to interpret product labels; and might also help alleviate the mistrust and fear of the food supply arising from the consumers sense of "losing control" (which may increase as a wider range of novel foods comes onto the market).

There is a perceived legitimacy in an independent third party being involved in the promotion of the nutritional attributes of a foodstuff. The use of co-operative public health promotion is particularly appropriate for food groups that cover a broad variety of foods such as vegetables or fruits. In some States in Australia we already see examples of health authorities working with the fruit and vegetable industry in generic promotion of nutritional attributes of these foods.

(d) Developing co-operative approaches

Many of the concerns expressed above would be alleviated if consumers had a higher level of nutritional knowledge and awareness than is the case at present. Fundamental concepts such as energy balance are still poorly understood, and only a minority of consumers have heard of the dietary guidelines (Baghurst et al. 1993). While nutritional knowledge and skills must clearly be part of education for all Australians through the school system, there is a need for a more comprehensive community wide approach to nutrition education.

We suggest that perhaps the food industry could contribute - financially and in-kind - to such a program, with the proviso that, based on certain indicators, limited health claims similar to the US system could be allowed once an agreed level of baseline knowledge was achieved. This might provide an incentive for many creative and co-operative schemes to provide nutrition education throughout the food system; and for the food industry to use its vast resources, reach and knowledge of consumer behaviour to help ensure that the job was done well.

Once health claims were permitted, a small levy on food advertising might provide a source of funding for on going public nutrition education programs, with tax concessions provided to those commercial advertisements carrying appropriate messages. Permission to use health claims might also be linked to a level of commitment in providing additional, more detailed nutrition education materials - at the point of sale for example. A similar suggestion has recently been made by Binns (1994).

VII. CONCLUSION

Australia has a high quality, safe, varied and abundant food supply capable of meeting all our nutritional needs. Food is also relatively inexpensive by comparison with many western countries. We believe that in the confusion of competing messages there is a danger that the consumer will lose sight of this fact, together with the importance of the overall benefits of eating (and enjoying) a wide variety of basic foods, and of how to shop for and

prepare these foods. For this reason also we take the view that fortification of foods is appropriate only in those circumstances where the public health need is such that it should be mandatory. Deregulation of both fortification and health messages may give rise to a "nutrition power race" the health consequences of which are unpredictable.

Thus we argue for a more cautious and conservative approach, developed gradually within an appropriate regulatory and policy framework, which would allow for collaboration between food industry interests and health educators in the interest of public health. This will require ensuring that the approach of the National Food Authority and the implementation of the National Food and Nutrition Policy are synchronised and complementary.

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