

*Nutrition
in the future*

Thinking the unthinkable

Professor Philip James

CAROLINE WALKER LECTURE 1997

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Fifteen years ago, Phil James emerged from the academic world into the full glare of the mass media, as the leading nutritionist in Britain prepared to speak out and say that as a nation we have a wonderful chance to improve our health by means of good food. In 1997 his almost incredible energy and tenacity in pursuing his beliefs paid off. It was he who produced the blueprint for a UK Food Standards Agency with powers to ensure that healthy food choices become increasingly easy choices, at the personal invitation of Tony Blair. This was followed in 1998 by a White Paper which barely altered the essentials of his proposals. This provides part of his theme for the Caroline Walker Lecture.

The Caroline Walker Trust is proud to have Philip James as its vice-president, and there are other links between him and Caroline Walker. She was secretary of the working party set up by Phil in 1980 whose so-called NACNE report caused a sensation when it was eventually published against the wishes of government and food manufacturers in 1983. Caroline made Phil famous (or infamous) in the book *The Food Scandal*, co-authored with Geoffrey Cannon.

Philip James somehow finds time to run the Rowett Research Institute in Aberdeen, conduct developments in UK food policy with the style of Sir Simon Rattle, and yet spend a lot of his thinking time on the world stage. Last year he was a leading member of the World Cancer Research Fund expert group whose massive report, *Food, Nutrition and the Prevention of Cancer*, recommends a global shift from animal-orientated to plant-based diets. He is driving a new initiative to reduce obesity worldwide. On the European stage he is deeply involved in the power politics of mad cow disease. He is committed to UN initiatives designed to transform world food and agriculture policy in the 21st century – and it is this combination of a global vision with his UK policy which makes this book so compelling.

The Caroline Walker Trust was set up in memory of the nutritionist and campaigner Caroline Walker, who died in 1988. The Trust's mission is the improvement of public health by means of good food – a cause which Caroline made important to everybody in this country. The Trust, which relies on charitable donations, exists to further her work through research and publications.

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INTRODUCTION

The request to deliver the Caroline Walker lecture is, of course, an honour but it also presents a vivid and very personal challenge. Caroline became a special friend when I recruited her to work with me in 1980 at the Dunn Nutrition Unit in Cambridge. I first involved her in helping my students where her formidable intellectual grasp and instant personal rapport with those in need saved me countless weeks of work. I then insinuated her as my secretary into a special weekend think tank on my proposition to the National Advisory Committee on Nutrition Education (NACNE). I had suggested to NACNE in the late 1970s that there was rather more to nutrition than changing the advice on infant formulae, encouraging a 'balanced diet' (whatever that meant) or producing translated leaflets on vitamin D supplements. This weekend think tank in effect took up the challenge to change people's minds about British food and how it related to health! In the difficult times Caroline would remind me of society's real needs in our market-driven world. By 1982 I was struggling to transform and reinvigorate the Rowett Research Institute in Aberdeen. For nearly four decades, this institution had led the national quest to produce meat, milk and butter so cheaply that even the poor children of Boyd Orr's working class could afford to buy and benefit from these 'priority' foods. Caroline, by then, was working elsewhere, challenging London's body politic and seeking novel ways to change our culture.

I, in turn, had the uncanny knack of visiting her by chance in her every crisis – the day after her first emergency surgery, the night of her gathering haemorrhagic shock after the second operation and, finally, the night of her death. My wife, Jean, and I nursed her through convalescences at the Rowett. I spoke at her wedding and funeral services. Finally her husband Geoffrey Cannon, her parents, and Jean and I buried her close to our home. We knew her innermost thoughts, gloried in her fascination with the world and witnessed her brilliant insights.

In this lecture, therefore, it seems in keeping with her spirit to take stock, to learn from the battles of the last 15 years but, more importantly, develop a new vision of where Britain now needs to go. My title is therefore suitably dangerous, in line with Caroline's approach. I hope I can go beyond the ephemeral and seek a new perspective for the next millennium.

HISTORICAL BACKGROUND

My perspective is inevitably coloured by what has happened to the British approach to food issues over the last 25 years. The early 1970s was a very frustrating period for people involved in policy-making and public health – people such as Gerry Morris, Geoffrey Rose and Gerry Shaper. Shaper was chairing a Royal College of Physicians working party on the dietary basis of heart disease,¹ having seen a very cautious Committee on the Medical Aspects of Food Policy (COMA) report on the same subject emerge in 1974.² The failure of the DHSS to take this Royal College report on board led to the formation of the Coronary Prevention Group.³ Meanwhile the Ministry of Agriculture, Fisheries and Food (MAFF), with at that time a primary responsibility to promote the welfare of the farming and food industries, was concerned with such issues as food labelling and the claims which manufacturers wanted to make to promote their products. Compositional standards and food safety in terms of additives and toxicants were also important for consumers, but it was only after the publication of the NACNE report⁴ that broader issues relating to dietary factors involved in the development of such problems as heart disease, high blood pressure and cancer were highlighted. These new concerns about saturated fat, salt and sugar were seen as threats by the food industry.

Following the publication of the NACNE report, I clearly lost favour in Britain during the 1980s. I worked in the European arm of the World Health Organization (WHO),⁵ and then in WHO Geneva circles where a whole array of issues in public health nutrition was considered.⁶ More recently there was difficulty with the obesity prevention report⁷ for England because dietary issues were considered much less important than physical activity by the food industry. This was followed by the joy of the Scottish Diet Report⁸ and its subsequent action plan.⁹ Although the latter won accolades in Scotland it was seen, even by Department of Health officials, to be far too radical in 1996 for England! Meanwhile, new NHS strategies for obesity in Scotland¹⁰ and the global need for obesity prevention policies¹¹ consumed my spare hours. But they linked surprisingly well with the emerging findings of the World Cancer Research Fund dietary report¹² which I helped to launch in London, Washington and Brussels.

Perhaps inevitably with these approaches to public health, the real explosion of effort has only come in the last six months, since the election of a Labour

government in the UK and the appointment of a minister for public health. I have been presented with the Food Standards Agency¹³ challenge (see below); a charge to help re-engineer the European food chain with nutritional priorities in the EURAGRI initiative; and now to tackle the BSE crisis on the EU's Scientific Steering Committee. All these present huge opportunities to establish new approaches to public health in classic areas of food safety. In two other areas, I feel as if we face even greater conceptual challenges for social organisation and policy: in Tessa Jowell's request to rethink school health policies¹⁴ and the UN's request to chair a commission on global nutrition and food needs.

NOW IS THE TIME FOR CHANGE

I sense, therefore, that we are at a time where – as never before – we need flair, energy, adaptive capacity and a sense of purpose to build a new future for this country – and potentially for others. It is a time of great change and opportunity in the food arena.

The experiences of the last three or four years have transformed popular concepts about food and health as a result of the BSE epidemic and the emergence of new variant Creutzfeld-Jakob disease (nvCJD). I was aware early on (in 1986) of the emerging epidemic of the cattle disease BSE when, as one of the directors of Agricultural Research Institutes, I was invited to discuss the veterinary epidemiological evidence. Since then we have seen, with the emergence of nvCJD, a complete collapse in public confidence in the government's capacity to protect them from unsafe food.

This has also affected the public perception of the integrity of British senior scientific advisers. European scientists and politicians also suspect that British scientists, as in many other countries, can be manipulated by politicians, civil servants and industry. In the UK, public concern about food safety was accentuated by the outbreak of *E. coli* O157 poisoning in Scotland; and faith in the system was further undermined by the supposed failure of MAFF to provide the Pennington enquiry into the outbreak with internal reports on the effectiveness of the Meat Hygiene Service.

THE BIRTH OF A FOOD STANDARDS AGENCY

The *E. coli* affair was the political crisis of confidence which led to Gavin Strang telephoning me at 5 pm on 6 March 1997. Strang had just walked out of a meeting with Tony Blair (then leader of the opposition) with instructions to find me and fix a plan for the establishment of a Food Standards Agency (FSA). I had previously been involved (through several other individuals and groups) in discussions with Gavin Strang (the shadow food minister). The first was when he was working on the Labour Party's manifesto promise to set up an FSA, and the second soon after Stephen Dorrell's announcement to the House of Commons that nvCJD should be considered as potentially linked to BSE. That major issue had led to what was almost a reflex agreement by Harriet Harman, then shadow health minister, and Tony Blair to re-emphasise their commitment to an FSA. Gavin Strang had then met us to consider what this might imply for MAFF. Clearly, with a further *E. coli* crisis in March, Tony Blair needed a definitive plan.

Only subsequently did I discover that I had been identified by another Labour figure, David Clark, who claims it was discussions with me that had led him to propose an FSA five years earlier – when he was shadow agriculture minister! So I was suddenly precipitated into the political maelstrom.

I agreed to take on the task and examine the most appropriate remit for the FSA. Immediately afterwards I was under intense pressure from the Scottish Office and Michael Forsyth, then Secretary of State for Scotland, not to become involved. Fortunately I had taken the precaution of faxing the chairman of the Rowett Board, James Provan, who (as Chief Whip of the European Tory Party and right-wing alliance of Euro-MPs) had more than a little influence. He was able to confirm that the Rowett Research Institute routinely took a position of advising any or all political parties.

NUTRITION IN PUBLIC HEALTH: HOW WE HAVE MISSED THE BIG PICTURE

It is my firm belief that in looking to the future, we need to recognise that we have totally underestimated the importance of nutrition in public health. Nutrition is of profound significance to society and we have hardly begun to consider the range of issues involved. This came home to me recently when I attended a British think tank on heart disease, and it became clear that several eminent medics still saw drug therapy as the way forward, rather than advocating preventive changes in diet and exercise. Similarly, high blood pressure tends to be neglected by narrowly focused clinicians. They will often concentrate on identifying the molecular basis for an individual's response to dietary factors, in order to explain why a particular individual succumbs to high blood pressure. Or else they simply dismiss the causal questions because they now have powerful drugs for treating the condition.

At the Chief Medical Officer's annual conference in 1997, I was reminded that one central and very important focus of resistance to the role of nutrition in public health is toxicology. Some toxicologists and other scientists mistakenly dismiss nutrition as a vague, soft science. They see it as an area where too many claims are made on the basis of too little data and where public education is the only way to influence dietary change: far too vague and unverifiable for them!

I believe that we need to overcome these prejudices about nutrition, and to do so in two particular ways. First, we need to promote rigorous nutrition research of the highest quality. We may do this best by concentrating on recruiting scientists and doctors from other fields into nutrition, as in the US, rather than depending on training a new cadre of nutritionists. This is what I have tried to do in my years at the Rowett. Recruitment from other disciplines helps to establish the tradition of rigour and intellectual analysis in nutrition. It also bridges the gap between nutrition and its related sciences.

Second, we need to be clearer in explaining the enormous importance of nutrition. We need to convince people that nutrition should become a central subject in public health; and that it should be included in medical school training in Britain – as is now happening in the US.

Northern Europe

Southern Europe

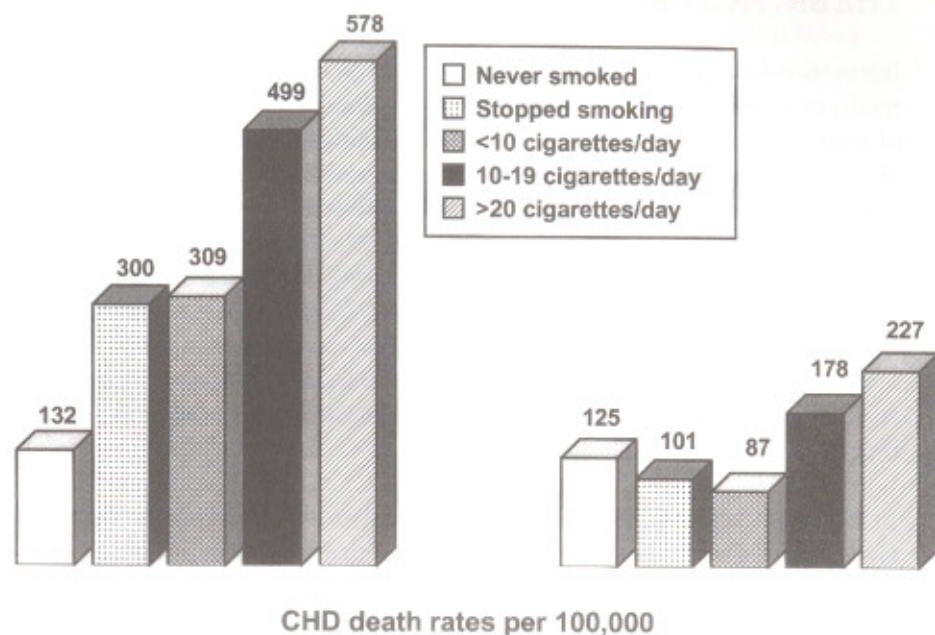


Figure 1 Cigarette smoking and heart disease. CHD mortality in southern Europe – where traditionally the diet has been lower in saturated fat – is lower than mortality in northern Europe.

UNDERESTIMATING NUTRITION: HEART DISEASE AND TOBACCO

I believe that a further factor has contributed to the under-estimation of the importance of nutrition: the focus on smoking. Of course, tobacco-related illness is a huge public health issue in its own right, and nobody could deny that. But it has provided policy-makers with a distraction from other, perhaps less visible risk factors.

Take coronary heart disease (CHD). There really is little doubt now that the staggeringly high incidence of CHD in northern Europe is nutritionally based.

We have rates which would astonish the rural Chinese. Huge 10- to 40-fold differences between Scottish and Chinese rates of CHD are present in *non-smokers*. This clearly suggests that it is not smoking in its own right which is responsible for the differences. In Japan and some other Asian countries, even the combination of high smoking rates and a high prevalence of hypertension does not lead to appreciable coronary atherosclerosis, stenosis and CHD. The Japanese still have a remarkably low rate of CHD. Such relationships are also clear in Europe: heart disease in northern European smokers is more than double that of southern European smokers whose diet tends to be lower in saturated fat (Figure 1).

It now seems clear that it's only when the prevailing diet is (through well-documented mechanisms) capable of disturbing blood fat levels and fatty acid metabolism that a major problem of CHD emerges. In other words, heart disease is overwhelmingly a dietary and nutritional problem.

Tobacco has rightly occupied the thinking of health policy-makers. But when it is presented as a major cause of CHD, it has also functioned as a distraction from the importance of the dietary aspects of health.

LEARNING LESSONS FROM THE GLOBAL PICTURE

One simple way of considering the potential impact of nutrition is to take a global perspective. I am privileged to have worked in the Third World, but for this lecture I will not dwell on the huge challenges including those of combating childhood malnutrition. But it is useful to consider the experience of adult chronic diseases in less wealthy countries in two respects.

First is the size of the problem. The sheer numbers of people affected by chronic illnesses such as coronary heart disease and cancers with a nutritional basis, even in countries which still have considerable malnutrition problems, is staggering (see Figures 2 to 4). Given the prevalence of obesity in Western Samoa, for example, half of the population is likely to have diabetes by the time they reach the age of 40 (Table 1). Inappropriate nutrition is therefore probably the biggest public health problem on the globe. AIDS, malaria and other infections are great scourges and can have devastating effects on society. But take a look at the overall

burden of disease: the WHO analysis for the 1997 World Health Assembly suggests that adult chronic diseases have become the major burden – and to this we have to add the classic problems not only of protein-energy malnutrition, vitamin A, iodine and iron deficiency, but the well-recognised enhanced effect of infections in those who are poorly fed.

The second reason for looking carefully at international data is that they can teach us something about nutrition nearer home. If Chinese data, for example, show a simple relationship between the graded but low blood cholesterol levels and the rising rates of the still infrequent CHD, this implies that there is no threshold below which blood cholesterol does not matter. In that case the standard WHO¹⁵ and British advice¹⁶ to reduce saturated fat intakes to 10% of energy is simply a pragmatic target – seen by many as what might in practice be achieved. The Chinese data imply that saturated fatty acid intakes should ideally be negligible. So the WHO and British target is without any real scientific basis.

Table 1 Obesity prevalence (BMI > 30) in a selection of western Pacific countries.

Country	Year	Ages (years)	Prevalence of obesity (%)	
			Men	Women
Australia	1989	25–64	11.5	13.2
China	1992	20–45	1.20	1.64
Japan	1993	20+	1.7	2.7
New Zealand	1989	18–64	10	13
Melanesia				
Papua New Guinea				
Coastal urban	1991	25–69	36.3	54.3
Coastal rural	1991	25–69	23.9	18.6
Highlands	1991	25–69	4.7	5.3
Micronesia				
Nauru	1987	25–69	64.8	70.3
Polynesia				
Samoa				
Urban	1991	25–69	58.4	76.8
Rural	1991	25–69	41.5	59.2

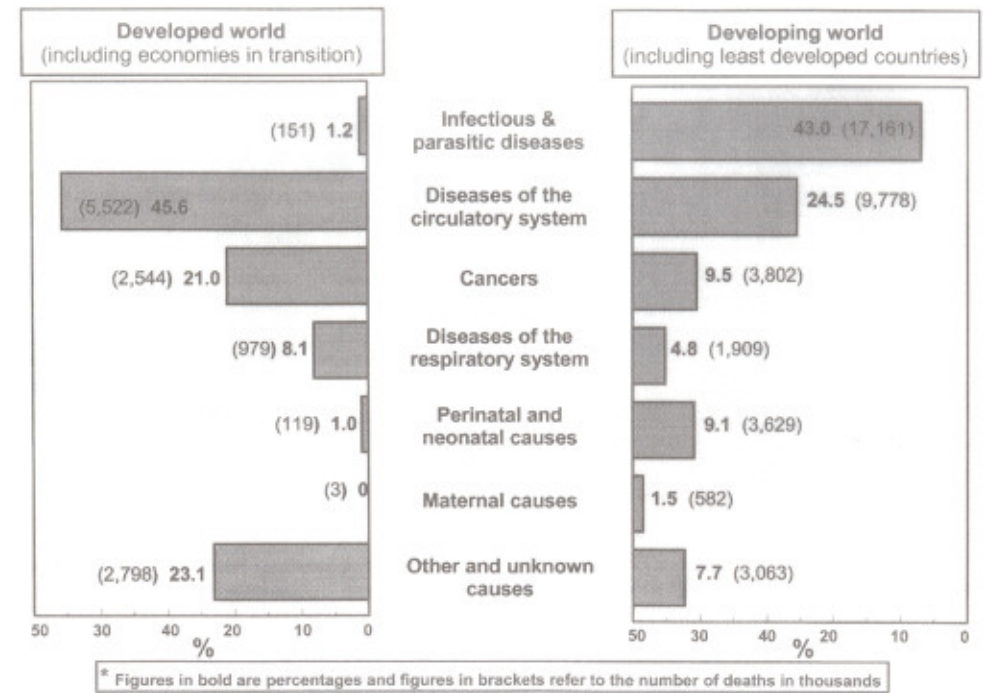


Figure 2 Causes of death – developed and developing world, 1996. WHO data show that diseases of the circulatory system – previously thought of as diseases of affluence – form the second largest cause of death even in the developing world. SOURCE: WORLD HEALTH ORGANIZATION (1997). THE WORLD HEALTH REPORT 1997: CONQUERING SUFFERING, ENRICHING HUMANITY. GENEVA: WORLD HEALTH ORGANIZATION.

However, to accept this argument and to change targets would require a transformation in our thinking, and mean targeting the most prominent cholesterol-inducing fatty acid, myristic. This in turn could mean we should consider the implications of doing without any milk fat. Some would go on to question the value of milk itself – that precious food shown by Corry Mann and Boyd Orr to promote selectively the longitudinal growth of short children in the 1920s and 1930s. This then raises other issues such as the contentious proposition that milk intakes, albeit low in fat, are needed to help provide the calcium for bone formation during childhood and for maintaining bone mass and preventing osteoporosis in the elderly. This is the standard fare of the nutritional world but

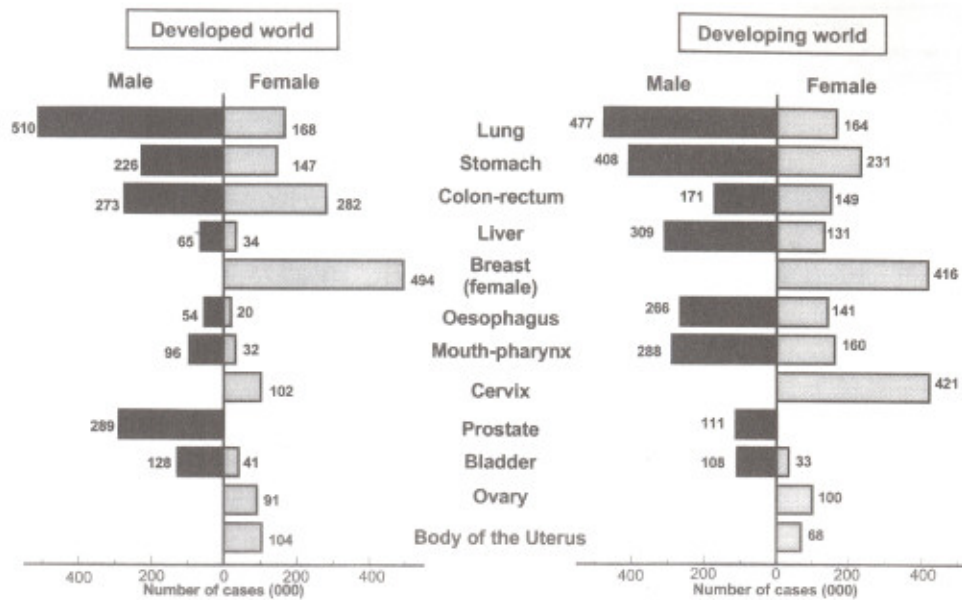
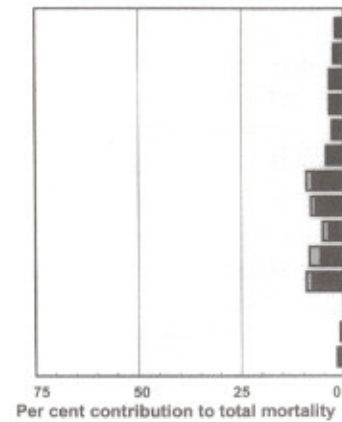


Figure 3 The incidence of cancer, 1996. The burden of other chronic diseases – including these cancers – is already heavy on the developing world. SOURCE: WORLD HEALTH ORGANIZATION (1997). *THE WORLD HEALTH REPORT 1997: CONQUERING SUFFERING, ENRICHING HUMANITY*. GENEVA: WORLD HEALTH ORGANIZATION.

poorly backed by data. A global perspective shows that sometimes a negligible milk consumption and calcium intakes well below those recommended in the West are compatible with bone growth; there is an inverse relationship between calcium intakes and bone fractures when one looks at different societies.

These general international relationships are very useful in forming a perspective on the validity of nutritional relationships (see below) and provide us with a policy perspective. To build a consensus amongst those involved in nutrition and public health is, however, more difficult if one is to use only the international setting for developing policy in Britain. This is because current thinking is dominated by the idea that the end point of decision-making is first the use of cohort studies and second the use of double-blind intervention therapeutic trials.

Contribution of nutritional deficiencies and infectious diseases to total mortality.



Contribution of nutrition-related chronic non-communicable diseases to total mortality.

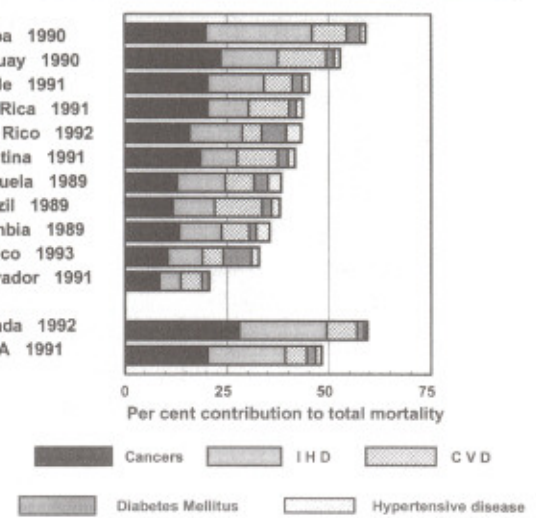


Figure 4 The contribution of nutritional deficiencies and nutrition-related chronic diseases to total mortality. These data show that the contribution of nutrition-related chronic diseases far outweighs that of nutritional deficiencies and infectious diseases in these central and southern American countries. SOURCE: SINHA, 1997. *SIXTH PUBLIC HEALTH FORUM, LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE*.

UNDERESTIMATING NUTRITION – INAPPROPRIATE RESEARCH

This heavy reliance on cohort studies – in which the health of a large group of people is followed over a long period – has undermined nutrition. I believe that the kind of cross-cultural analyses outlined above are invaluable in identifying dietary aspects of public health. As I have illustrated, comparisons between populations with completely different patterns of diet and disease can throw light on some causal relationships which might not be evident within single populations. So no link would show up in a cohort study. It is important, therefore, not to dismiss a proposed link between one aspect of diet and health if a large cohort study fails to demonstrate a relationship.

Cohort studies also have major flaws. They often fail to recognise the errors and imperfections of dietary measurement.¹⁷ They also face the intrinsic problem of substantial differences between individuals in their response to a standard diet. My body's response to a measured dose of saturated fats is not the same as your body's response (or it's very unlikely to be). If you monitor the diet of adults some five to ten years before they develop CHD, it is unusual to find saturated fat or any specific saturated fatty acid emerging as linked with the development of CHD. Willett's major US studies fail on this score¹⁸ as do Morris's British analyses¹⁹ and Campbell's Chinese studies.²⁰

A major causal pathway involves the stimulation of blood cholesterol levels by dietary myristic acid. Even a simple metabolic process shows a variability amounting to $\pm 12\%$. If four processes are involved – probably the minimum – the variance between people will be huge and (depending on the interacting processes) may mean that one individual has only half the final metabolic response of another. In other words, there are two-fold differences in the individual responsiveness of blood cholesterol levels to a standard myristic acid intake. It is this blood cholesterol level, rather than the observed intake of dietary saturated fat, which predicts the likelihood of subsequent CHD in an individual.

It is only once one is dealing with groups with very different saturated fatty acid intakes (e.g. the Scottish and the Chinese) that the real impact of saturated fats becomes apparent. If further factors (e.g. antioxidant intake) are also at work to modify the impact of high cholesterol levels, it is easy to see how fundamentally important causal links between diet and disease are obscured in cohort studies. Only when one has markers of a pathophysiological process (such as a true measure of the oxidised circulating lipoproteins containing the cholesterol with the potential for stimulating atheroma in a venal wall) can one then expect to improve our understanding of the links between dietary factors and health outcome.

We may then need to look at both cohort and cross-cultural studies using these markers to demonstrate the huge public health implications. This is not simply a public health issue: GPs and cardiologists in Aberdeen are still advising my staff that their cholesterol levels at 6–8 mmol/litre are only slightly raised and not worth bothering with – when the evidence for the riskiness at this high level is overwhelming.

OTHER REASONS TO TAKE NUTRITION SERIOUSLY

I have set out some reasons why we have underestimated the importance of nutrition – using coronary heart disease as a case study. It is worth reiterating some other reasons why nutrition is so important for public health in the UK.

Obesity: the growing problem

One major problem in Britain is obesity. Obesity is not only highly prevalent but escalating rapidly (see Table 2 and Figure 5). Obesity rates are at about 15% and doubling every five to seven years; overweight affects a further third of the population. So we already have half the adult population with weights in excess of the generous WHO levels for normality. Furthermore, the multiple complications of weight gain mean that obesity has a wide-ranging impact on public health as set out elsewhere.²¹ Since 80% of people with diabetes have the non-insulin-dependent form which is usually induced by weight gain (Figure 6), we now need to recognise that insulin resistance and non-insulin-dependent diabetes with all its complications, are almost completely preventable. Weight gain also induces high blood pressure and amplifies blood cholesterol levels as well as including a range of other complications. So it would be more accurate to say that it is weight gain (rather than obesity *per se*) that is a key British public health problem.

Table 2 Obesity prevalence (BMI > 30) in a selection of European countries. In 1995, 15% of men and 16.5% of women in England were classified as obese.

Country	Year	Ages (years)	Prevalence of obesity (%)	
			Men	Women
England	1995	16–64	15	16.5
Finland	1991/3	20–75	14	11
West Germany	1990	25–69	17	19
East Germany	1992	25–69	21	27
Netherlands	1995	18–64	10	13
Czech Republic	1988	20–65	16	20

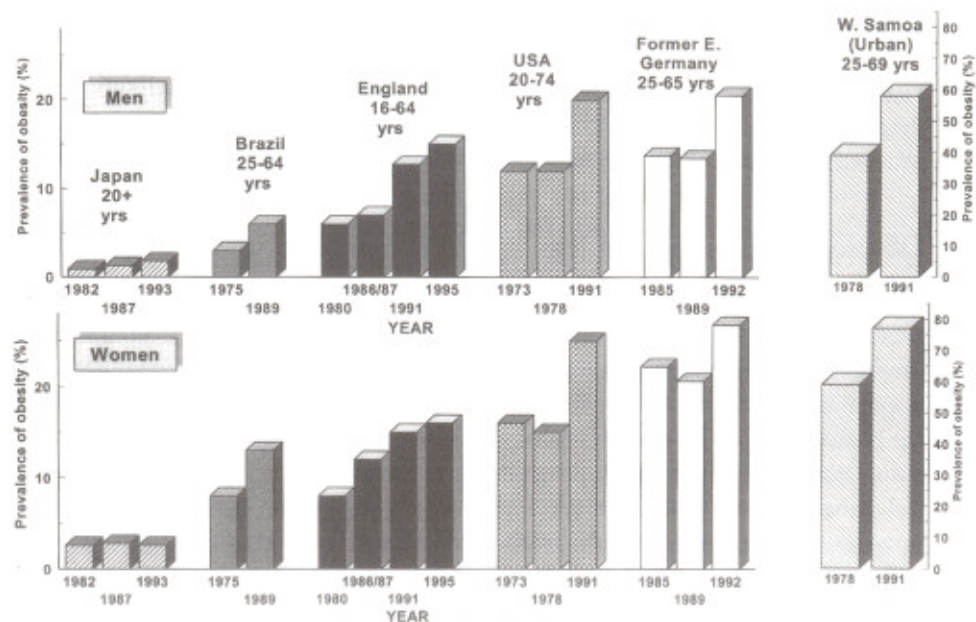


Figure 5 The growing epidemic of obesity. International data show the increasing prevalence of obesity in many countries since the 1970s.

The basis for this weight gain has been set out elsewhere.^{22, 23} It involves both dietary issues and the crucial impact of a societal reduction in physical activity (Figure 7).²⁴ There have been dramatic changes over the last 20 years in the physical activity of our children and adults. In children, activity levels have fallen progressively as they are now driven to school, have physical education limited by either the needs of the national curriculum or the sale of school playing fields. Their out-of-school activities and PE lessons we also now recognise as inappropriate, particularly for girls. A complete revolution in the role of schools is therefore needed to promote physical activity. In fact, it is clear that the educational process involving nursery, primary and secondary schools needs not only a total overhaul but a dramatic cultural shift. The role of training in food use, the provision of school meals, parental education through school-parent contract and the rethinking of the role of the school in society as a life-long learning centre organised in conjunction with Directors of Public Health, local authorities and local industries are of profound importance for the health of our children – tomorrow's adults.

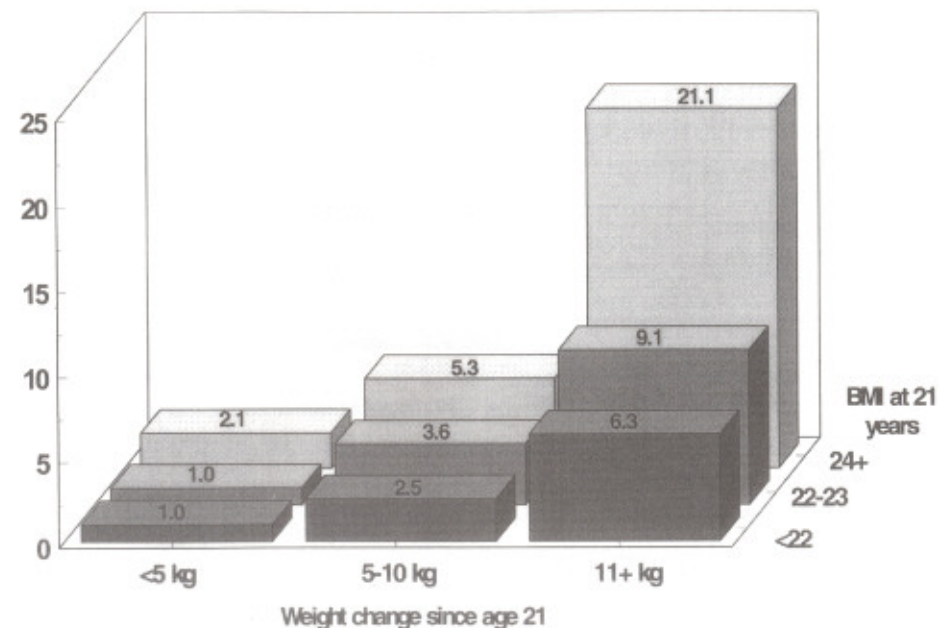


Figure 6 The risk of diabetes in relation to weight and weight change. Weight gain after the age of 21 – even in those not classified as obese – increases the risk of diabetes. SOURCE: CHEN ET AL. 1994. *DIABETES CARE* 17, 961.

For adults we also need to be highly creative, and recognise the need to shift our whole idea of how we organise ourselves. This means nutrition and public health reaching out into other fields. Pedestrian precincts, cycle tracks, building design, streets suitable for children's play and a transformation of ideas relating to activity in the work place are all important and need to be considered by nutritionists and those involved in public health.

Preventing three cancers out of four?

As if these problems were not enough, we now have newly emerging evidence that many of the common cancers in Britain may be preventable. There has been much public discussion of the supposed wrangling over the scientific analyses of the dietary basis of cancers. In practice, the UK Department of Health and the World Cancer Research Fund reports came to almost identical conclusions: that diets including large amounts of plant foods will cut cancer rates.²⁵

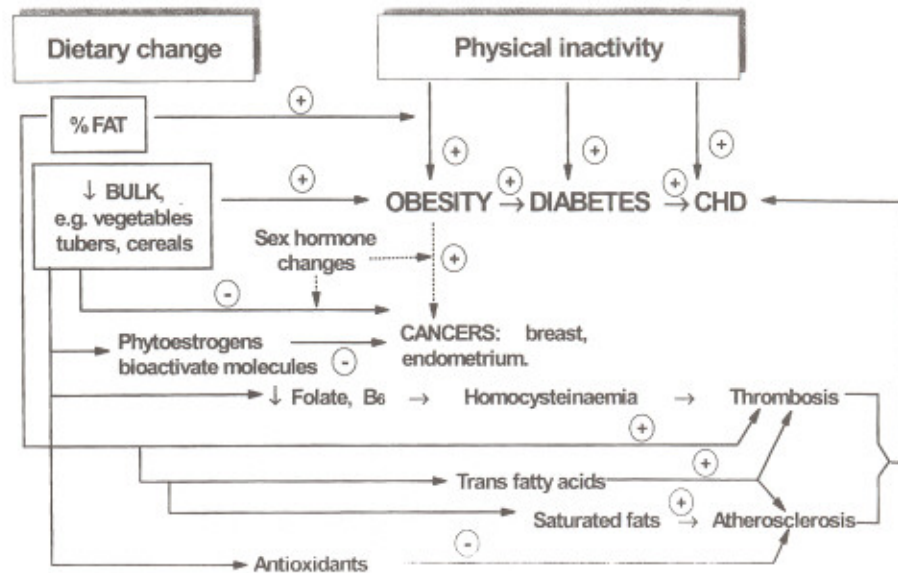


Figure 7 The interlinking of physical activity and dietary effects on obesity and the progression of disease with industrialisation. Many dietary factors – linked to declining physical activity levels – contribute to the growing obesity problem, leading to increases in other chronic conditions.

The very different cancer rates in different societies reflect the impact of environmental factors that stimulate cancer and those that protect against it. Furthermore, as we understand more about the molecular basis of how cancer develops, it is increasingly clear that dietary factors may not only alter the rate of cell damage – alkylation, oxidation or substitution of DNA bases – but that diet may also alter the rate of DNA repair. The net outcome of these dietary effects could have a substantial impact on the rate of cumulative gene damage. Over the next two or three decades, we will establish to what extent cumulative gene damage in specific loci of the chromosomes leads to our common cancers. But the overall epidemiological picture suggests to me that Doll and Peto's hypothesis²⁶ – that 25 to 75% of cancers relate to dietary factors – will be confirmed at the top end of their estimate.

I also consider our scientific approach to epidemiological analyses to be too limited. The emphasis on special cohort studies is even more a problem in cancer

than in coronary heart disease because there are as yet too few markers of the pathophysiological processes. As usual the current approaches tend to assume only limited differences between people in the response to a standard diet. Until, therefore, we have reliable markers of cancer development (as we have cholesterol measures in heart disease), cohort studies are likely to grossly underestimate the impact of diet on cancer.

The potential dimension of the dietary impact on cancer is illustrated by ecological studies – that is, studies of diet and cancer assessed across countries – neglected though these are by epidemiologists. The power of the European EPIC studies may not therefore be so much in the huge numbers of individuals monitored, but rather in the ability to discern simple metabolic responses in appropriately sampled groups from different countries with very different diets and cancer rates. Twenty years ago we did a structured sampling of 25 adults in four Scandinavian communities in rural and urban Finland and Denmark²⁷ – the first transnational metabolic epidemiological studies on colon cancer. These studies still give us more powerful analyses of value in policy assessments than many cohort studies because we are dealing with group averages and looking for major dietary differences and their impact in countries with very different cancer rates.

The health problems of ageing

Finally, for those of us getting on in years, we should consider the issue of ageing. Bruce Ames, with his characteristic originality, is now demonstrating how (in animals at least) some of the fundamental problems of ageing can be reversed dramatically.²⁸ His unpublished data suggest even more startling results and I expect we will soon be looking at these issues in humans where current evidence suggests that physical activity interacts powerfully with as yet unidentified dietary factors to limit the ageing process. In experiments the power to alter the lifespan of animals by limiting their protein or energy intake has been known for years. In humans we readily recognise the remarkable differences of life expectancy between different countries.²⁹ We might expect Third World diets to be healthier than Western diets, but we have only a modest understanding of the properties of an anti-ageing diet. These issues will become important over the next decade and I sense that a new dawn will break in terms of our understanding of neurological ageing, and its modulation by nutritional factors. At the end of this road lies the holy grail of a nutritional remedy or preventive for dementia.

The overall burden of nutritional disease

If one considers all the issues we can now conclude – along with Professor Martin Wiseman, head of the Department of Health Nutrition Unit – that half of all middle-aged British adults are suffering from a clinically evident nutritional problem – one which objectively impairs their current health, or requires treating with medicine. This is a completely different perspective on the role of nutrition – and it strongly suggests that inappropriate nutrition is the single most important public health problem facing the UK.

NUTRITION, PUBLIC HEALTH AND FOOD STANDARDS

If we're serious about nutrition, we have to be serious about the public's access to good-quality food. Since publication of my Food Standards Agency report, it is clear that many British scientists consider I should have concentrated solely on issues of food safety and not food standards. This reminded me of my previous involvement with the public's concern about food: my early experiences when I was an adviser to the Food Standards Committee in MAFF in the mid-1970s.

At that stage (and with Caroline's later help), I found myself looking back over decades of analyses of food standards presented in wonderful committee reports. These reports essentially detailed, time after time, how deregulation of foods inevitably led to big changes in the composition of foods – with cheap substitutes being used for the prized but expensive ingredients of meat, fish, milk or dairy cream. These changes in food composition seem to be a general feature of companies operating in a free market, so it is not just the small companies who pare down the content of premium ingredients. Poorer people, and the average uninformed consumer, were often taken in by these compositional ploys – which is why the integrity of ice creams, fish fingers or meat pies were at one time protected by minimum standards of cream, fish or meat content. The need for regulation to prevent the consumer being misled pervaded all our thinking.

In the 1970s we discovered an oddity relating to additives and colourings. Some foolish characters – Millstone, and later Cannon and Caroline Walker, if I remember correctly – were producing outrageous scares about the safety of additives, which were at that time scrutinised by a subcommittee of the Food

Standards Committee. The scaremongers were ignored. Then one or two colours were discovered to be of toxicological concern in rodent tests – so some of us on the committee found ourselves asking about the levels of colour needed for ham, salami, Smarties or a kipper. Food industry committee colleagues were, I think it is fair to say, amused by our enquiries – because they knew that consumer testing panels had shown highly statistically significant levels of approval for the intense colours they were using. We clearly needed educating, so a special demonstration of colours of varying intensity used in Smarties and Liquorice Allsorts was laid on for the committee. This set out to prove the value, for example, of having enough black colouring to give liquorice a shiny intensity which could not be construed as 'muddy'! We also had a demonstration of the yellow colouring of smoked haddock and the reddening of meat slices. The whole experience proved to be a turning point. Suddenly the committee members, including some of the food industrialists, asked *why* the liquorice had to be so intensely black or the Smarties so vibrantly red, green or yellow? Why should a sausage be so luridly red and the haddock practically glow in the dark, if this implied the need for 10–1000-fold increases in the use of food dyes? The whole exercise, therefore, backfired.

MAFF then set in train with the food industry a special survey of the amounts of colouring and other additives used by different companies reporting anonymously on the huge range of food products. Here we found 10–20-fold differences – for no justifiable purpose – in very similar products.

We also slowly learned in the Food Standards Committee about the complexities of food labelling. In theory, the public was being informed about the nature of different foods through their labels. But this required an amazingly astute knowledge of the subtle verbal changes in the product descriptions. Fruit juices and jams might contain pure oranges only; some orange juice; a component of orange; or simulated orange flavour and colour by the use of different chemicals. If you had time and brain power to spare, it was all there in the subtle use of words – such as 'orange juice drink', rather than 'orange juice' or 'orange drink'. So honour was satisfied – even though less than 5% of customers could understand the nomenclature.

Then we went to inspect factories – sea foods in Aberdeen and Grimsby, where Unilever was meticulously measuring out the required amount of fish for fish fingers and fish pies, but where other factories down the road were using a whole

variety of devices to reduce the actual fish content. This had dire consequences for the security of workers in reputable firms, who repeatedly told us we should insist on quality standards – to safeguard the public, and their jobs. We all learned at first hand that supposedly simple decisions on colours or additives, often made by technologists, marketeers or scientists, had much broader implications. We also understood that in Britain there were many small food companies who were desperately trying any means to maintain some, albeit low, profit margins.

DEREGULATION FOR A SIMPLER LIFE?

From the end of the 1970s MAFF became concerned – particularly as a new style of government emerged under Margaret Thatcher – to simplify food laws. I also found myself in sympathy with the idea of getting away from many food standards – why should we have to have so much fat in an ice cream? And why should the dairy industry's views dominate? By now the dairy industry had been transformed from Boyd Orr's cottage industry of small farmers (providing at that time an occasionally tuberculous and brucellosis-infected product) to seven massive Milk Marketing Boards with sophisticated quality standards being specified. The Boards had powerful lobbyists and a tight integration with MAFF to keep 'dairy' products as special high-quality products, uncontaminated by those awful vegetable fats now being imported from all over the world. Given these power blocs, and the old-fashioned nature of many of the food standards, and the ever-more strident consumer groups objecting to the limitation on food options, I found myself forced to accept the value of much more compositional freedom. After all, why did we insist that semi-skimmed milk must be 1.8% fat, when 1% milk was well accepted (to judge by its massive sales in the US)?

And so the flood gates opened, and today many foods can contain more or less anything, as long as it's labelled. During the later 1980s and 1990s I believe there has been a fundamental shift in thinking on the whole issue of food standards. We have come to accept that everything is down to consumer choice, but in addition we have delegated to the supermarkets the role of guardians of the quality of our food (see later). I am convinced it is time to have a stock-take of food standards – like we did in those demonstrations of food colourings in the 1970s – and food composition in general.

THE REMIT OF THE FOOD STANDARDS AGENCY

My report on the Food Standards Agency³⁰ did not set out the 50-year experience of issues about food composition and consumer protection. Partly, I think, that was because I had failed to come to a coherent view of what we should do now in terms of compositional standards. Nutrition and the overlapping additional issue of food labelling were for me relatively straightforward so I spent my time thinking about three other categories: microbiological or infectious processes; chemical toxicity; and novel foods and processes, for example genetically modified foods.

In my report I did not even hint at some of the broader issues, nor did I readily accept at that stage that nutrition and labelling were different from the other three areas I proposed be covered by the Agency. To be healthy, the public needs to choose a suitable range of foods with a high nutritional quality. Clearly this is different from ensuring that these foods are uncontaminated by chemicals, viral, bacterial or other toxins or by prions, parasites or microbes. To some people, only the second task is the province of government, with strict regulations, minimum standards and rigorous policing being required. Nutritional questions and labelling are much more complex. Surely they did not require enforcement other than in terms of misleading claims? On this basis, several eminent scientific groups favoured a restriction in the remit of the PSA. The food industry and later the farming industry also wanted a non-nutritional remit. Consumer groups, however, were adamant that nutrition should be included.

Why these differing views? For the Royal Society, it was the scientific distinction between the avoidance of hazards and the vaguer issues of nutrition and public health. The latter was seen as a distraction from the need to concentrate on coping with the complexities of BSE and *E. coli*. The food industry, while concentrating on the same arguments, in practice feared that a Food Standards Agency would be forming a view of what good nutrition meant, and then playing a very active role in ensuring that people began to eat very differently. This would be a distinct threat to some companies who depend on the profits generated from selling sugary or fatty foods and drinks. The more effective any healthy eating campaign becomes, the greater their fears. Therefore any suggestion of restricting access to consumers – for instance, by specifying the nature of foods to be served in school canteens or tuck shops – was the first element of a more rigid and therefore illiberal policy.

Table 3 Nutrition and the Food Standards Agency: Proposed Separation of Roles Between the Commission and the Executive

<i>Type of Hazard:</i>	<i>Microbiological/ Chemical</i>	<i>Nutritional</i>
Policy Doctrine:	'Avoidance of hazard'	Consumer choice
Proposed Role for the Commission:	Policy development	Policy development
Proposed Role for the Executive:	Monitoring levels of contamination Co-ordinating and auditing effective enforcement systems – environmental health and trading standards Responsible for Meat Hygiene Service Food Import Monitoring Educating the food industry and consumers about food safety	Monitoring consumption patterns – food surveys Co-ordinating and auditing effective enforcement systems – trading standards (labelling, claims and compositional issues) Educating the food industry and consumers about food safety

AN UNNECESSARY CONFLICT

Once more, therefore, we are threatened with an unnecessary conflict between public health and industry – one which I had hoped we could avoid. If one discusses these issues with major food companies who have a portfolio of products, they are not at all threatened by these developments. They anticipate consumer needs by incorporating modern nutritional concepts into their new food product formulations and recognise that their long-term industrial welfare depends on providing excellent high-quality food which benefits the consumer. Recently I was a member of the DTI Food Technology Foresight group chaired by Professor Peter Lillford of Unilever. He presented our analysis of the prospects for the British food industries. He concluded that healthy food would be a principal long-term driver, whether we were thinking of British sales or our export markets. In short, foods with a high nutritional quality are the key to our industrial success and to our long-term export potential. What then should we now do?

Nutritional issues in relation to public health obviously affect several major food companies in Britain. And they have power. During the last government, four company chairmen telephoned John Major's office; precipitated the return from

holiday of Baroness Cumberledge; and demanded that her civil servants be sent from the room to allow unbridled discussions about the puritanical nature of the COMA report on heart disease. Please note, the report had nothing to do with me! But this episode suggests that some captains of the British food industry have a very limited view of their opportunities.

This is an issue for the British food industry and is of great concern. Thus, for example, in the DTI Foresight group's analyses of this industrial sector, it soon became apparent that there are only one or two companies in Britain capable of doing really creative research in food technology. Medium-sized companies with an annual turnover of around £100 million have scientists who can interpret and handle issues relating to food safety and other legislation. But the remaining 85% of the British food industry consists of small companies, who struggle to cope with sophisticated measurements of food quality and to make the necessary profits to invest in new developments and scientific expertise. This can be done: two excellent examples can be found close to the Rowett in Aberdeen. The late Stuart Macphie developed a highly successful food technology company located in architectural splendour in a minute hamlet in Aberdeenshire. He used a whole gamut of technical innovations to allow superb-quality ingredients consistent with modern nutritional needs to be developed for the food industry both here and abroad. The emphasis on quality attracted so many overseas customers that it is little wonder that his family received a Queen's award for export. The other example is Maitland Mackie's small enterprise which anticipated the rapid growth of the semi-skimmed milk market and then reaped the benefits of processing surplus milk fat to corner the market in high-quality luxury ice creams.

INNOVATION IN INDUSTRY

Thus we are not inevitably dealing with a technologically primitive industry. I am told that the British food industry can be described as a cottage industry grown large over the last 50 years where the culture is still profoundly market-driven. The exasperation of a prominent British scientist with experience of research in the food industry and government is worrying. When he goes round the world as a key representative for a transnational company, the first question at top board meetings in US and German companies is 'What is new?' In Britain he is assailed by the anxious question 'How were sales last week?' If this is a fair reflection of the

truth, then we as scientists and policy-makers should be rethinking how to invigorate the smaller food units of Britain with creative and nutritionally appropriate innovation – this is in all our interests.

Nevertheless with the re-emergence of nutrition as an extremely sensitive political issue, it must now, whatever the merits of the case for excluding it from the remit, become part of the Agency. That is the Agency's purpose – to have issues of extreme industrial or political interest dealt with dispassionately and openly with public health an overriding priority. Table 3 sets out how the FSA might cope with these different issues.

THE PROBLEM WITH 'CONSUMER CHOICE'

How then should we improve public health? The straight answer in a free society, people tell me, is through something called 'education', this being linked to 'consumer choice'. 'Choice' was the Conservative mantra of the 1980s and early 1990s – an instant justification for a deregulated market. This concept was also promoted by consumer organisations who felt that limited access to particular commodities was an infringement of personal liberty. So let us follow that line of argument and start with the young.

We now know that children's diets are influenced by advertising which is geared to selling specially designed foods and drinks to this age group.³¹ Sales from pocket money alone for confectionery, soft drinks and snacks to children amount to £1 million per day or £300 million per annum which has engendered a grossly inappropriate diet.³² This, however, is the inevitable result of choice. We allow 5- to 10-year old children at primary school to exercise their individual decision-making at lunch time – a feature which nobody seems to comment on. In practice these vulnerable children, without advice or supervision, have to grapple with the food maze at the lunch counter where they are offered foods which are selected to ensure a high volume of sales with a maximum profits. My discussions with education experts suggests that the age at which children can make a truly informed choice is uncertain but probably emerges in their teens. So our present system has children who are far too young exposed to the jungle of the free market. During classroom breaks, they have access to tuck shops or vending machines which sell 'junk' foods and soft drinks. The prices are geared not only to the needs of the companies for appropriately rising profits, but also to bring funds

into the school. How we in Britain can have opted out of an elementary understanding of the social learning needs of children at this vulnerable age is beyond me. Actually, I consider it a disgrace. So 'choice' is not necessarily the recipe for major health gains in our society's children.

Now let us move on to adolescents and adults. It is usually taken as a consumer right to have 'free choice' of items from an ever more extensive array. In food terms, this means access to any supermarket chain. Given the spectacular success of the supermarket chains, it is clear that we have a new and wonderful world of endless opportunity and total individual freedom – rather than ghastly restrictions imposed by a 'nanny state', and a welcome relief from the old-fashioned specification of 'standard foods', i.e. foods with a specified minimum content of meat, dairy cream or fat. This must surely be a setting where, as sophisticated consumers, we can exercise our individual freedom. We must be nearing the ultimate tolerant society where people 'grow' as individuals, making their own decisions about the emphasis they seek to place on their long-term health – mustn't we? I am sure there are many who would see this as the ideal goal – but the theory of free choice has its problems.

TEN DRAWBACKS OF TODAY'S FOOD LABELLING

Table 4 sets out ten problems associated with food labelling. First is the issue of the time needed to make informed choices about everything in life. It could well be argued that this is indeed the least controversial and the most 'open' system, with which everybody will feel comfortable. However, this system requires not only that we have the time to access the plethora of information presented through increasingly varied informational sources, but that we will also have the time and ability to interpret it. It seems unlikely.

Second, I would question the assumption that public access to information regarding, for example, the manipulation of the fish content in fish cakes, fish fingers and other fish products, would serve as a deterrent to bad practice.

For a long time we have had voluntary food labelling but no universally accepted format. How can anyone possibly make appropriate judgements if only a selection of foods is labelled with the key nutrients of relevance to health?

Table 4 Drawbacks in use of food labelling as the essence of choice in a free-market economy

1. **Time:** The time involved in sifting significance of information on 20,000 items per supermarket.
2. **Limited:** The number of items labelled under voluntary schemes is limited.
3. **Conflict:** Multiple nutritional issues demand need for complex judgements.
4. **Discriminatory:** Information system, unlike RDA system for requirements, not geared to covering whole range of intelligence within the population.
5. **Irrelevant:** Technical display incompatible with individual's biological need so current information in practice of minor significance.
6. **Misleading:** Food and health claims technically usually accurate but often misleading.
7. **Inconsistent:** Different supermarket display systems based on different assumptions with value judgements not independently verified.
8. **Hard to integrate:** Major problems involved in integrating scores of items contributing to a weekly food basket.
9. **Hard to follow:** No ready linkage with perceptions of food needs for health.
10. **Divisive:** Extensive selection only available for people with car access to supermarkets and resources to cook appropriately.

The third problem is the consumer's capacity to integrate several conflicting features of a food's nutritional content: what if it's low in fat but high in salt? In practice current labels are often incomprehensible as most unpublished analyses of supermarkets, by the food industry and MAFF have repeatedly revealed. A full appreciation of the nutritional properties of a ready-to-eat meal might require an understanding of the integrated significance of 30 nutrients displayed on the package. Amongst these 30 nutrients, perhaps five will be unusually high or low; two of these might give cause for concern, e.g. a high sodium and a low iron content; and two more may be particularly beneficial, such as a high folic acid and zinc content; a fifth item could be very confusing, for example the information that the tocopherol content of the meal is pre-dominantly in the gamma form. Nutritional quality and content needs to be monitored, but it seems ludicrous to expect everybody to cope with this complex analysis.

The fourth issue is the need to devise a scheme which can be understood by the vast majority of the population – i.e. not just those who sit on government committees, or in the higher echelons of consumer organisations. We spend years

ensuring that our RDAs or RNIs are statistically appropriate so that we can ensure that we deal with 98% of the population's nutritional needs. Why, then, do we not consider that we have to have a food labelling system which could be understood by 98% of the British population? I am confused by our lack of logical consistency. Of course the RNIs can be used by sophisticated government planners, or by dietitians to plan menus for prisons, old people's homes or the armed forces combat rations. But the new approach to the deregulated food market is presumably meant, at least in theory, to allow the ordinary person to cope. Not everyone possesses a formidable intelligence or an encyclopaedic knowledge of nutrition.

The fifth issue relates to the technical question of how a consumer can interpret the information on a label. Try to use food labels to follow the COMA committee's advice: it soon becomes impossible to cope. This is illustrated by the advice to limit fat to 35% of your food energy intake. To do this requires:

- prior knowledge of one's basal metabolic rate
- prior knowledge of one's physical activity pattern, together with its energetic significance, expressed in kilocalories
- converting the stated grams of fat per 100 grams of a product into, for example, a 60-gram portion
- multiplying by 9 to give the fat content equivalent in kilocalories.

The result of this calculation then needs to be added to all the other items in a meal before being converted into a proportion of the total energy for that particular meal. We then have to assume that the meal and not the week's food is a reasonable basic unit.

Finally, free choice may be fine for people with transport and access to a range of shops, and who have the money, knowledge and facilities to choose and cook high-quality ingredients or prepared meals. In reality, many in Britain today lack several or all of these privileges. In addition, practical cooking skills are being marginalised in the school curriculum. Children no longer learn by example – especially if they live in a home where take-away and pre-cooked meals are frequently used by overstretched working mothers. The likely conclusion to this trend is that we will end up like many sections of American society where home cooking is a thing of the past, and the traditional kitchen has been replaced by simple reheating equipment.

WE NEED A NEW APPROACH

These and the other issues listed in Table 4 are important. I believe that together they refute our whole approach to the idea that food labelling should be seen as the ultimate tool by which the public can cope. How then can we develop a new system? I believe that we need a new approach involving consumers, government, independent scientists and the food and retailing industries. When I was chairman of the Coronary Prevention Group (CPG) we developed a completely new format for food labelling based on the concept of considering each food in terms of its significance for health. This at one time was seen to conflict with the age-old dictum that there is no such thing as a good or bad food – only a good or bad diet. Fortunately we now have the food industry on our side – at least in terms of good foods, i.e. functional foods on which they would like to make health claims. Strangely enough, even though there are now good foods, there are still no bad foods. So I would now advocate the development of a new system whereby we classify foods using the CPG format, concentrating on the principal health issues and using the special energy system which automatically overcomes the huge problem of variation in individual need. This is dealt with in more detail elsewhere.³³ To these classic approaches we need to add, I believe, new concepts. We must develop a labelling system which when simplified in a health claim automatically means that all other nutritional components of the food are present in appropriate proportions. In other words, we need to develop a health-based simple system of nutritional labelling which goes even further than the CPG scheme which Caroline helped to formulate. Only then can we begin to develop a system that actually has significance and practical relevance to the consumer.

WORKING WITH INDUSTRY

On my arrival at the Rowett in the early 1980s, I was bemused to find a large institute working, as part of public policy, hand in glove with the farming industry and exclusively for their benefit. This institute, with a government budget in today's terms of £10 million a year, was then one of 34 agricultural institutes throughout England, Wales and Scotland whose sole task was to help produce

cheap meat, milk and other foods to cope with the energy, protein and other nutritional needs of the human population. It is no wonder therefore that British farming is very high tech, often linked to major feed, seed, fertiliser and machinery industries and well ahead of most countries in terms of 'efficiency'. What we have seen since the war is a massive government subsidy of the agricultural and food industries and the mushrooming of huge national and international businesses. These are now self-sustainable without subsidy and have huge financial and political clout.

A GLOBAL EXPLOSION

On a global basis, there is now an agri-food business³⁴ which is increasingly accused of seeking to exploit new markets in the same way that the tobacco industry does. Indeed, many of the principal international food companies have been bought by US tobacco firms, since the food components give them access to US Congress lobbying previously denied to tobacco interests. Getting into the food industry also allows them to diversify into other areas of consumer choice and behaviour, which allow them to pursue similar marketing strategies.³⁵ As the US and UK soft drink industries, fried meat and hamburger firms, sugar and confectionery industries compete overseas, they are already contributing the destruction of the Mediterranean diet in Europe, and now amplify the threat to the very essence of the Asian and African diets. So successful is their impact in China that we are witnessing there the most astonishing explosion in obesity, hypertension and diabetes ever induced by the Western diet.³⁶

These changes are global; but international companies do not heed and are not accountable to national governments complying with the World Trade Organization's rules on the free movement of goods. Nor do they recognise their detrimental impact on the health and the health economics of many societies. We therefore need a new strategy which matches public health concerns with the simple economic approaches to a free market economy. This means that we need to rethink the whole nature of public health, and how to develop appropriate institutions and mechanisms to promote governmental action to prevent the exclusive reliance of policy-makers on the free market.

ACHIEVING CHANGE IN A FREE MARKET SOCIETY

I do not believe any of us have really thought through an appropriate way of handling public health issues given our current approach to the role of government. Nearly all of us seem convinced that 'free choice' requires better 'education' so that the consumer can make an 'informed choice'. This implies that government action should be minimal and simply facilitatory. Any suggestion for coherent public health policies immediately leads to charges of excessive regulation, the imposition of a 'Nanny state' backed by new legislation and insensitive bureaucrats. It's so pervasive that one has only to mention the principle of 'choice' in an argument and the assembled company becomes effectively brain-dead – having instantly accepted the value of 'choice' as an argument which overrides all others.

The concept of choice may be theoretically appropriate for food products of infinite variety – but I have shown above that in its practical application, the concept is hopelessly flawed. Should we not question choice but simply improve the application? No. I believe it is time to move on to challenge the concept of choice and show how stereotypical our thinking is on this subject.

We need to look for a new approach – and find a way where government, the food industry and public interest groups can work together to help people to transform their diets. Such a transformation has been possible in Finland. It will require a new view of food labelling; revisiting the issue of compositional standards for some foods; an end to misleading claims; a new vision of food education; and novel strategies for joining together the public and private sector. We also need to transform doctors' understanding of nutrition and develop a new public health system, not only for the UK, but for Europe and the world.

This new approach should be good news for the food industry. Food companies must seize the day and recognise the opportunities which arise from change. Dietary change is essential to improve Britain's health. Such changes should not only be good for public health, but – if the food industry can adapt – good for business. The challenge is to engage the major food companies as allies rather than as obstacles to public health.

CONCLUSIONS

I have been privileged to work on nutritional issues of public health importance for over 30 years in the Third World, the US and Britain. Never has the challenge been greater – now that nutrition has reappeared as an issue of fundamental societal importance. We need therefore to refine our thinking – in social, educational, trade, town planning policies and in institutional structures – before we can begin to reformulate a public health policy. So I look forward to the next 10 years of enormous intellectual and practical challenges here in Britain, certainly in Europe and – ever more pressingly – on a global basis.

REFERENCES

- ¹ Royal College of Physicians of London, British Cardiac Society (1976). Prevention of Coronary Heart Disease. *Journal of the Royal College of Physicians* 10; 213-275.
- ² Department of Health and Social Security (1974). *Report on Health and Social Subjects No. 7. Diet and Coronary Heart Disease*. London: HMSO.
- ³ Health Education Council (1984). *Coronary Heart Disease Prevention: Plans for Action*. London: Pitman.
- ⁴ National Advisory Committee on Nutrition Education (NACNE) (1983). *A discussion paper on proposals for nutritional guidelines for health education in Britain*. London: Health Education Council.
- ⁵ James, W.P.T. (1988). *Healthy Nutrition*. WHO Regional Publications, European Series No. 24. Copenhagen: WHO.
- ⁶ World Health Organization Study Group (1990). *Diet, Nutrition, and the Prevention of Chronic Disease*. Technical Report Series No. 797. Geneva: WHO.
- ⁷ The Nutritional and Physical Activity Task Forces (1994). *Obesity: Reversing the Increasing Problem of Obesity in England*. London: Department of Health.
- ⁸ Working Party to the Chief Medical Officer for Scotland. (1993). *The Scottish Diet*. Edinburgh: Scottish Office.
- ⁹ Scottish Office (1996). *Eating for Health: a Diet Action Plan for Scotland*. Edinburgh: Scottish Office.

- ¹⁰ Scottish Intercollegiate Guidelines Network (1996). *Obesity in Scotland: Integrating Prevention with Weight Management*. Edinburgh: SIGN.
- ¹¹ World Health Organization (1998). *Obesity: Preventing and Managing the Global Epidemic. Report of a WHO Consultation on Obesity*. Geneva: WHO.
- ¹² World Cancer Research Fund (1997). *Food, Nutrition and the Prevention of Cancer: a Global Perspective*. Washington: WCRF and AICR.
- ¹³ Ministry of Agriculture, Fisheries and Food (1998). *The Food Standards Agency: a Force for Change*. London: The Stationery Office.
- ¹⁴ James, W.P.T. and McColl, K.A. (1997). *Healthy English Schoolchildren: a new approach to physical activity and food*. Unpublished report to the Minister for Public Health.
- ¹⁵ James, W.P.T. (1988). *Healthy Nutrition. WHO Regional Publications, European Series, No. 24*. Copenhagen: WHO.
- ¹⁶ Department of Health (1994). *Nutritional Aspects of Cardiovascular Disease*. Report on Health and Social Subjects No. 46. London: HMSO.
- ¹⁷ Plummer, M. and Clayton, D. (1993). Measurement error in dietary assessment: an investigation using covariance structure models. *Statistics in Medicine* **12**: 925-935; 937-948.
- ¹⁸ Willet, W.C. (1997). Dietary fats and non-communicable diseases. In Shetty, P.S. and McPherson, K. (eds). *Diet, Nutrition and Chronic Disease: Lessons from Contrasting Worlds*. Chichester: John Wiley & Sons.
- ¹⁹ Morris, J.N.G., Marr, J.W. and Clayton, D.G. (1997). Diet and heart: a postscript. *British Medical Journal* **2**: 1307-1314.
- ²⁰ Chen, J., Campbell, T.C., Li, J. and Peto, R. (1990). *Diet, Lifestyle and Mortality, A Study of the Characteristics of 65 Chinese Counties*. Oxford: Oxford University Press.
- ²¹ James, W.P.T. (1995). A public health approach to the problem of obesity. *International Journal of Obesity* **19** (suppl 3): s37-s45.
- ²² The Nutrition and Physical Activity Task Forces (1994). *Obesity: Reversing the Increasing Problem of Obesity in England*. London: Department of Health.
- ²³ World Health Organization (1998). *Obesity: Preventing and Managing the Global Epidemic. Report of a WHO consultation on obesity*. Geneva: WHO.
- ²⁴ Prentice, A.M., Jebb, S.A. (1995). Obesity in Britain: gluttony or sloth? *British Medical Journal* **311**: 437-439.

- ²⁵ World Cancer Research Fund (1997). *Food, Nutrition and the Prevention of Cancer: a Global Perspective*. Washington: WCRF and AICR.
- ²⁶ Doll, R. and Peto, R. (1981). The causes of cancer. *Journal of the National Cancer Institute* **66**: 1191-1308.
- ²⁷ James, W.P.T., Bingham, S. and Cole, T.J. (1981). Epidemiologic assessment of dietary intake. *Nutrition and Cancer* **2**: 203-212.
- ²⁸ Ames, B.N., Shigenaga, M.K. and Hagen, T.M. (1993). Oxidants, antioxidants and the degenerative diseases of aging. *Proceedings of the National Academy of Science USA* **90**: 7915-7922.
- ²⁹ UNICEF (1996). *The State of the World's Children*. Oxford: Oxford University Press.
- ³⁰ James, W.P.T. (1997). *A Food Standards Agency: An interim proposal by Professor Philip James*.
- ³¹ Dibb, S. and Castell, A. (1995). *Easy to Swallow, Hard to Stomach. The Results of a Survey of Food Advertising on Television*. London: London National Food Alliance.
- ³² Gardner Merchant (1996). *School Meals Survey: What are our Children Eating?* Kenley: Gardner Merchant.
- ³³ Coronary Prevention Group (1992). *Just Read the Label. Understanding Nutrition Information in Numeric, Verbal and Graphic Formats*. London: HMSO.
- ³⁴ McMichael, P.D. (ed) (1994). *The Global Restructuring of Agro-Food Systems*. Ithaca: Cornell University Press.
- ³⁵ Lang, T. (1997). The public health impact of globalisation of food trade. In Shetty, P.S. and McPherson, K. (eds). *Diet, Nutrition and Chronic Disease: Lessons from Contrasting Worlds*. Chichester: John Wiley & Sons.
- ³⁶ Chen (1997). Status of diet-related non-communicable diseases in China. In Shetty, P.S. and McPherson, K. (eds). *Diet, Nutrition and Chronic Disease: Lessons from contrasting worlds*. Chichester: John Wiley & Sons.

APPENDIX I

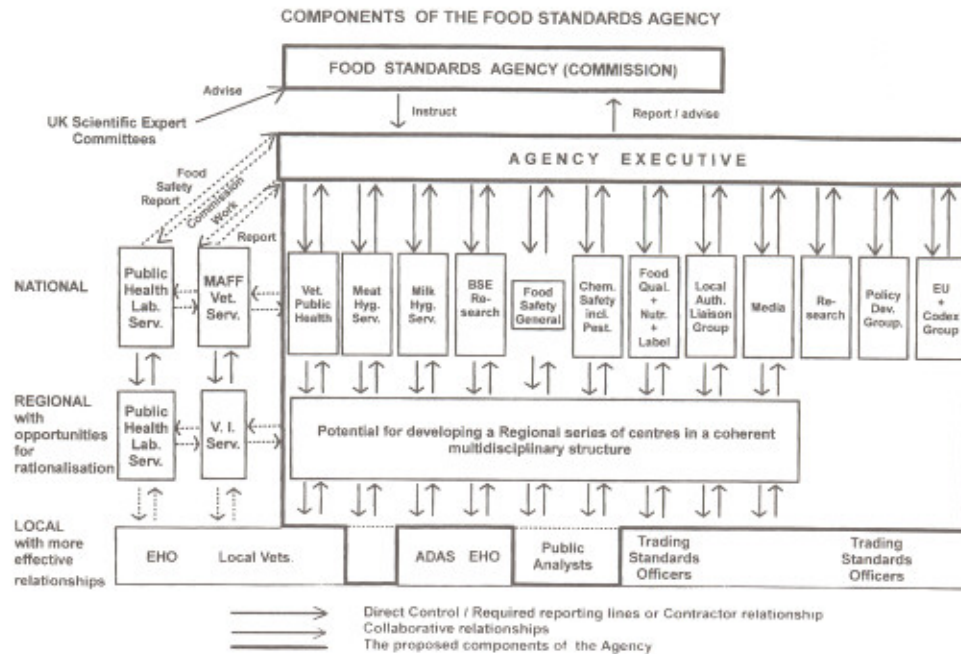
Interim Proposal for a Food Standards Agency by Professor Philip James

Executive Summary

1. The request on 7 March 1997 to propose the function and structure of a Food Standards Agency (FSA) led to an analysis of the basis of current problems, an assessment of overseas initiatives and UK proposals, and to widespread consultation throughout the UK. This report should be viewed as an interim consultative document which highlights the remit and the processes needed for establishing the Agency with the required urgency. One fundamental aim should be to re-establish within three years public confidence in the national mechanisms for handling problems concerning food; to have a major impact on food-borne infections and other aspects of food safety will take longer. The formation of the Agency will provide an opportunity for the UK to propose new arrangements for handling food issues in the European Union.
2. Many national surveys reveal that the public has lost confidence in the safety of British food. Secrecy characterises decision-making and inappropriate political and industrial interests are perceived to determine decisions on food safety to the detriment of public health and consumer interests. This conflict of public and vested interests in Whitehall is amplified by the apparent lack of co-ordination between, for example, veterinarians and medical experts and the failure to overcome institutional barriers at many levels throughout the food chain. The fragmented nature of the system and its complex financial and regulatory management systems also limit rational preventive action. Experience abroad and in the UK demonstrates that consumer education and information do not reduce public anxiety and distrust unless there is also effective and clear structural change to improve food safety. The escalating rates of food-borne infection bear witness to the unsatisfactory state of current food safety measures.
3. The new Agency should be established as a Non-Departmental Public Body (NDPB) with Executive Powers and with a structure which is based loosely on

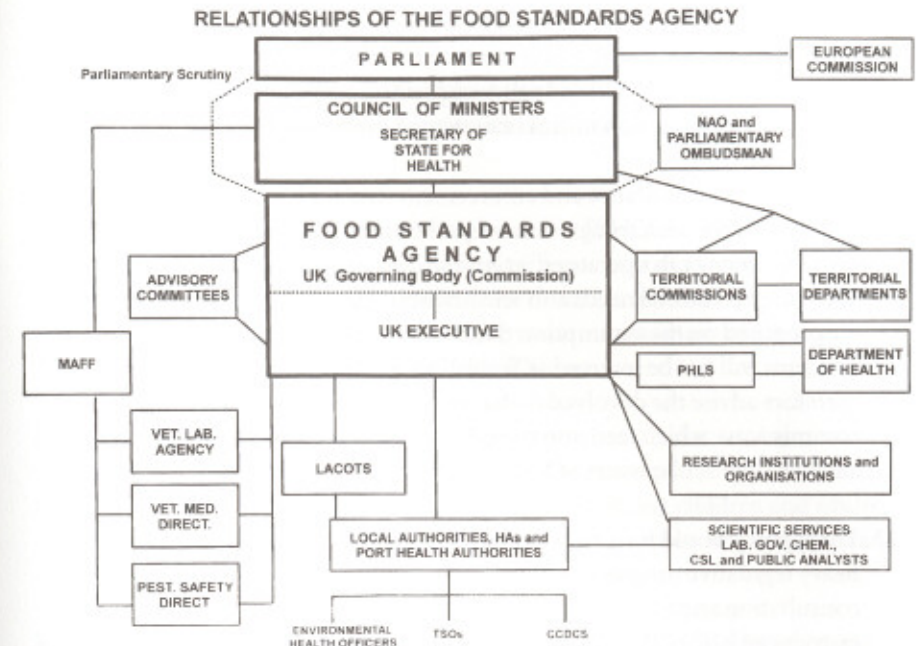
the proven effectiveness and public trust in the Health and Safety Commission/ Executive (HSC/E). The HSC/E approach needs developing further and an FSA should have more consumer and other public interest involvement within its structure, a different mechanism of reporting which is responsive to constitutional changes and a different role in ministerial negotiations in the EU. It should also operate more directly in relation to Parliament.

4. The Agency's funding should be the primary responsibility of health ministers. In principle, all funding for food safety and standards work should be channelled through the new Agency, even if local authorities and other bodies, such as the Public Health Laboratory Service (PHLS), conduct work in conjunction with or on behalf of the Agency.
5. The Agency should report to Parliament through health ministers, with the Secretary of State for Health immediately taking the lead. Other ministers, such as the Minister of Agriculture, however, will retain a substantial and legitimate interest in this policy area. A ministerial council could be considered an unorthodox but appropriate reporting mechanism for the established Agency with the Secretary of State for Health taking the lead.
6. The Agency should have a remit to assure public health in all matters of national food policy including the microbiological, chemical and nutritional aspects of food, and novel foods and processes, such as genetic modification. Its remit should also cover food standards and labelling. The role of the Agency will include developing policy, proposing and drafting legislation and responsibility for public education and information. It should have powers of access for auditing, surveillance and enforcement 'from the plough to the plate'. It should work closely with local authorities to produce a new cohesive organisation with a national, regional and local structure (Figure 1).
7. The Agency should be responsible for food law enforcement. This should involve co-ordinating, monitoring, setting standards for and auditing of local authority food law enforcement activities. The Agency should also have enforcement powers and employ additional staff to assist local authorities if needed. The Agency should develop an effective regional presence to support local authorities in the surveillance and enforcement process.



Appendix 1 Figure 1

8. The Agency will need to take over all those aspects of MAFF activities which relate to food standards and safety including policy-making, expert scientific assessment, technical negotiation with the EU, food research, public education and food surveillance. The analogous aspects of DoH activity, including those on public health and medical aspects of food policy, should also be incorporated into the Agency. A number of other bodies and agencies should be retained as presently constituted but should report to the new Agency for relevant parts of their work (Figure 2). It is assumed that, with the appointment of a new Minister of Public Health, the present reporting structure of the Department of Health (DoH) would change so that the Chief Medical Officer of Health (CMO) is automatically involved in all aspects of public health. The food role of the Health Education Authority (HEA) overlaps with the Agency's remit.



Appendix 1 Figure 2

9. The Agency should be structured with a commission of about ten members appointed by the Prime Minister or ministerial council. The Commission should include people with a background in industry, for their expertise and knowledge, but public and consumer interests should be in the majority. The commission should include representatives of Scotland, Wales and Northern Ireland. The chairman should initially be full time, with the other paid commission members working at least 3-4 days each month in the early phase of the Agency's development.
10. The formation of the Agency's executive and its effective functioning depend on having high-quality administrative and scientific staff as well as a chief executive. The civil servants transferred from government departments would need to be employed by the Agency and acquire rapidly a culture where

public health and consumer interests clearly dominate whilst proper account is taken of economic and business interests. Industries critically affected by consumer confidence in food produced and manufactured in the UK will benefit by operating in a more coherent and predictable climate.

11. The different surveillance and enforcement structures in the constituent parts of the UK have been recognised and preliminary proposals developed so that the UK Agency can operate effectively throughout the UK whilst taking account of territorial needs and sensitivities. Special territorial arrangements are proposed on the assumption that, in the event of devolution, food concerns will not be reserved as Westminster powers. The commission would therefore advise the devolved parliaments as it does Westminster. Separate commissions, which feed into the UK commission, should be created to advise on particular issues of Scottish, Welsh or Northern Irish significance.
12. The Agency would have to be established by statute. Given the probably heavy legislative programme in the next Parliamentary session, the need for consultation and for further analysis, it is unlikely that legislation could be introduced before 1998/99. It is therefore suggested that a cabinet committee be formed to take the proposals forward. As an interim measure, elements of the Agency, including the Commission, could be formed rapidly albeit in an advisory capacity. Great care is needed to ensure that food safety is not compromised by the transitional arrangements. The Chairman and the developing structures will need to command public confidence. To portray its focus effectively the Agency might best be called 'The Food and Health Commission'.
13. The costs arising from current food-related diseases are extremely high. The present proposals concern the reorganisation of a large number of public bodies into a more cohesive multi-dimensional structure. International experience suggests that the direct costs of introducing effective food safety measures are small.

APPENDIX II

Obesity – Preventing and Managing the Global Epidemic. World Health Organization Consultation on Obesity

Executive summary

An expert consultation on obesity was convened by WHO in Geneva from 3 to 5 June 1997 with the aim of reviewing current epidemiological information on obesity, and drawing up recommendations for developing public health policies and programmes for improving the prevention and management of obesity which is emerging as a global public health problem.

The specific objectives of the consultation were:

1. To review global prevalence and trends of obesity among children and adults; factors contributing to the problem of obesity; and associated consequences of obesity, such as chronic non-communicable diseases;
2. To examine health and economic consequences of obesity and their impact on development;
3. To develop recommendations to assist countries in developing comprehensive public health policies and strategies for improving the prevention and management of obesity;
4. To identify the issues which need further research.

The consultation immediately recognized that overweight and obesity represent a rapidly growing threat to the health of populations and an increasing numbers of countries worldwide. It recognized obesity as a disease, which is prevalent in both developing and developed countries and affects children and adults alike. Indeed, overweight and obesity are now so common that they are replacing the more traditional public health concerns such as undernutrition and infectious diseases as some of the most significant contributors to ill health.

The consultation noted that a coherent system for classifying overweight and obesity in adults is now available and should be adopted internationally. This is based on the Body Mass Index (BMI), calculated as the weight in kilograms divided by the square of the height in metres, with $BMI \geq 25$ denoting 'overweight' and $BMI \geq 30$ denoting 'obesity'. The health burden of obesity would be more easily predicted if the hazards of accumulating intra-abdominal fat were also documented by simple measures such as waist circumference or waist/hip ratio. New criteria and methods for documenting obesity in children are now being developed, and the particular susceptibility of some ethnic groups to weight gain and abdominal fat accumulation is being explored. Many dietary, lifestyle and possibly ethnic factors may also prove to be important in determining the magnitude of the metabolic and mechanical complications associated with obesity. They include non-insulin-dependent diabetes mellitus, cardiovascular diseases, cancers, gastrointestinal diseases and arthritis which are major medical conditions that have hitherto been considered as unrelated to overweight and obesity.

The consultation concluded that the fundamental causes of the obesity epidemic are sedentary lifestyles and high-fat, energy-dense diets. The rising epidemic reflects the profound changes in society and in the behavioural patterns of communities although some individuals may become obese, partly because they have a genetic or other biological predisposition to gain weight more readily when they are exposed to an unfavourable environment. Identifying environmental and behavioural factors that contribute to weight gain is particularly difficult. There are two principal factors which tend to overwhelm an individual's normal subconscious adjustments in food intake and metabolism that occur as part of a biological capacity to maintain energy balance. These are a fall in spontaneous and work-related physical activity, and a readiness to overconsume high-fat, energy-dense foods.

Because of the interaction of these two principal factors, people who sustain moderately high levels of physical activity throughout life may be able to tolerate high-fat diets, e.g. fat constituting between 30 to 40% of total energy intake. However, the widespread decline in physical activity in most societies, combined with rising fat intake, are associated with rapidly rising rates of obesity. These observations, together with physiological studies, suggest that lower fat intakes – around 20–25% of energy – are needed to minimize energy imbalance and weight

gain in relatively sedentary individuals and societies. Other factors, for example, dietary energy density and behavioural aspects of eating, may also contribute to the obesity epidemic, but they need to be evaluated further.

To limit the impact of obesity on individuals, the consultation called for the development of both preventive and therapeutic strategies. A systematic assessment and management approach is proposed based on evidence available from scientific studies and clinical trials, with primary care playing a central role. Therapeutic interventions among overweight and obese individuals, where support to patients is critical to achieving success, include dietary change, alterations in physical activity, and behaviour modification. These are long-term therapies that emphasize weight management, rather than relying on short-term extreme weight reduction. Strategies for supporting patients depend on individual health care systems. High-risk patients may benefit from carefully monitored drug therapy as part of a comprehensive management scheme, thereby limiting to extreme cases only the need for new forms of gastrointestinal surgery to slow or reverse life-threatening conditions.

The consultation concluded that global epidemic projections for the next decade are so serious that public health action is urgently required. Analyses show that merely concentrating on children and adults who have a high BMI and associated health problems will not stem the escalating numbers of people entering the medically defined categories of ill health. It is thus essential to develop new preventive public health strategies which affect the entire society. Without societal changes, a substantial and steadily rising proportion of adults will succumb to the medical complications of obesity; indeed, the medical burden of obesity already threatens to overwhelm health services. The spectrum of problems seen in both developing and developed countries is having so negative an impact that obesity should be regarded as today's principal neglected public health problem.

The consultation's report is divided into five sections. Section A examines the definition and classification of obesity and presents up-to-date regional data on the prevalence of and secular trends in obesity. Section B considers the true costs of obesity both in terms of physical and mental ill health, and the human and financial resources being diverted to deal with it. Section C examines the etiological factors implicated in weight gain and obesity. While most of the

information about risk factors comes from studies in developed countries, findings have worldwide relevance for predicting the impact in developing countries. Section D lays the foundation for a comprehensive strategy for preventing and managing of obesity through health care services and public health policy. Section E presents the consultation's conclusions and recommendations.

Source: *Obesity, Preventing and Managing the Global Epidemic*. Report of a WHO Consultation on Obesity, Geneva 3–5 June 1997. WHO/NUT/NCD/98.1. Full report to be published as part of the WHO Technical Series in late 1998.

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