Junk Food or ‘Junk Eating’?

Michael Gracey

Unity of First People of Australia, Perth, Australia

Introduction

Despite the widespread epidemic of overweight and obesity, little attention has been given until recently to the potential of ‘junk foods’ in its causation. This essay discusses the role of ‘junk food’ in nutrition-related disorders and some associated factors that affect this problem. It also considers whether ‘junk foods’ are intrinsically unhealthy, whether their pattern of consumption is contributory, and whether the term ‘junk eating’ is useful.

Dietary Patterns and Obesity

Junk food or junk eating and lowered exercise patterns have been linked to the steep rise in overweight and obesity, which has become ‘a public health crisis’, particularly in industrialized and industrializing countries, over recent decades [1, 2]. However, there is limited objective evidence of the potential contribution of ‘junk foods’ or ‘fast foods’ and/or mechanisms by which they may promote excessive weight gain.

Because obesity is considered elsewhere in this symposium, only a brief overview will be given. For example, rates of childhood, adolescent and adult overweight increased steeply in the USA from the late 1970s to early 1990s [3]. The situation in the United States is of such concern that the US Surgeon General has said ‘we’ve seen a generation of kids who grew up off the playground and on the PlayStation’ and ‘with obesity the fastest growing cause of disease and death in our nation … we need to have a consistent, uniform message that changes the culture of America as it relates to eating and physical activity’ [4]. By 1999–2002, 65% of US adults were overweight or obese (30% obese, 5% extremely obese); 31% of children were at risk of overweight (body mass index, BMI, for age ≥85th percentile) and 16% were overweight (BMI for age ≥95th percentile) [5]. The situation in western Europe is similar with
prevalence rates differing from country to country [1]. Overweight and obesity in children and adolescents are also increasingly prevalent in Australia. The 1995 National Nutrition Survey of almost 3,000 subjects aged 2–18 years showed that, overall, 15% of boys and 15.8% of girls were overweight and a further 4.5% of boys and 5.3% of girls were obese [6]. Of 11,247 randomly selected persons examined in 1999–2000, the overall (25 to 75+ years) prevalence of overweight in adults by BMI was 39% and by waist circumference was 25.5%; obesity rates were 20.8% by BMI and 30.5% by waist circumference. Therefore, the prevalence of adult overweight and obesity in both sexes was almost 60%; this was 2.5 times higher than in 1980 [7].

Junk Food

‘Junk food’ is well recognized by the mass media and information can be obtained publicly through the Internet. Some sites urge ‘junk food lovers of the world to unite’ and to learn more about this subject through enormously long lists of so-called ‘junk foods’, which are categorized; they request readers to add items to these already vast lists. Many mention brand names which will not be used here; categories include: (1) ‘fast foods’; (2) ‘soft’ (sweetened) drinks; (3) confectioneries and sweets, including chocolate-containing products; (4) biscuits (cookies) and cakes; (5) chips (‘crisps’ in some countries); (6) frozen dairy products, including ice creams and yogurts, and (7) breakfast items.

Are these all inevitably ‘junk’ or ‘rubbish’? For example: (a) what faster, yet nutritious, food could there be than an apple, pear or banana; (b) are the now widely recognized ‘fast foods’ invariably ‘junk’ (that is, ‘worthless’) unless they are consumed habitually and in excessive quantities; (c) should all sweets and confectioneries be banned – surely they are not inevitably hazardous to health if consumed in moderation; (d) the same comments could be made about biscuits and cakes; (e) fried potatoes, if not fried in very thin strips or wedges in deep oil, can be an acceptable component of a balanced diet; (f) although some frozen dairy products contain substantial amounts of fat, low-fat alternatives are widely available, and (g) the nutrient and energy density contents of breakfast cereals are very variable – many have added sugar and other ingredients of which the consumer may not be aware, while others can be a good source of nutrition, fiber in particular. On balance, these groups of foods should not automatically be labeled ‘junk’.

Impact of Junk Food Consumption on Body Weight

In many ‘Westernized’ countries ‘fast foods’ are recognized as items that are purchased for immediate consumption at the point of sale or elsewhere soon afterwards. This is equivalent to ‘takeaways’ or ‘junk’ foods. Until recently little
attention was given to the possible effects of consumption of such foods on
nenutrition or health. A study of more than 6,000 children and adolescents aged
4–19 years in the USA, who participated in the nationally representative
Continuing Survey of Food Intake from 1994 to 1996 and the Supplemental
Children’s Survey in 1998, examined associations between ‘fast food’
consumption and measures of dietary intake quality. This study employed
between-subject comparisons involving the entire cohort and within-subject
comparisons using data from 2,080 subjects who consumed fast food on one but
not both survey days [8]. On a typical day 30% of subjects reported consuming
‘fast food’. This was prevalent for both genders, all racial and ethnic groups, and
in all regions of the USA. After controlling for socioeconomic status and
demographic variables, ‘fast food’ consumption was independently associated
with being male, of older age, coming from higher income households, being of
non-Hispanic race/ethnicity, and living in southern parts of the USA. Children
who ate ‘fast food’, compared with those who did not, consumed more dietary
energy, more energy-dense food, more total dietary fat, more total dietary
carbohydrates, more added sugars, more sugar-sweetened beverages, less milk,
and fewer fruits and non-starchy vegetables. The authors linked these factors to
‘an adverse effect on dietary quality in ways that plausibly could increase risk for
obesity’ [8]. A recent study showed that adolescents over-consumed ‘junk food’
regardless of their body mass, although this phenomenon was more pronounced
in overweight subjects and they were less likely to adjust their intakes so as not
to exceed their usual intakes than were lean subjects [9].

Not all investigators agree with these findings. For example, a study of
obese and non-obese adolescents found that total energy intake from high-
calorie, low-nutrient-dense (HC) foods was higher in the non-obese subjects
[10]. After adjusting for under-reporting, the percentage of dietary energy
provided by the HC foods was similar in both groups, except for ice cream
which was significantly greater in the non-obese group. Despite this study
involving only 22 non-obese and 21 obese subjects and using cross-sectional
methodology, the authors conclude that obese adolescent Americans do not
consume more dietary energy from HC foods than do their non-obese peers.
Contentiously, they suggested that their findings did not support the
widespread notion that obese adolescents consume more ‘junk food’ than non-
obese adolescents; they commented that health professionals should
appreciate that excess dietary energy can come from many other sources in
their foods and drinks [10]. Whatever the role of fast foods in obesity, it should
be noted that their consumption has trebled in the past two decades [11].

‘Junk’ Drinking Patterns

More attention should be given to the contribution to dietary energy intake
from drinks in the diets of infants, children and adolescents and their influence
on overweight and obesity. There has been a dramatic increase by almost 500% in per capita soft drink consumption in the USA over the past 50 years [12]. The American Academy of Pediatrics (AAP) has recognized that the prevalence of US children being overweight has doubled in the past 20 years and, according to their policy statement on ‘Soft Drinks in Schools’, overweight is the commonest pediatric medical problem in that country [13]. That statement associates the following with high intakes of sweetened drinks: (a) overweight/obesity; (b) displacement of milk consumption causing calcium deficiency and risks of osteoporosis and fractures, and (c) dental caries and risk of erosion of dental enamel; dental damage is exacerbated by the acidic nature of many soft drinks (pH range is often 2–3). It is not widely recognized that each 360 ml of a soft-drink contains about 10 teaspoonfuls of sugar and 628 kJ of dietary energy. In an analysis of more than 12,000 nationally representative American 11- to 18-year-olds, soft drink consumption more than doubled in females and almost trebled in males from the mid-1960s to the mid-1990s [14]. A study of more than 1,800 nationally representative 2- to 18-year-olds in the USA showed that dietary energy intake was positively associated with consumption of non-diet soft drinks. The mean adjusted energy intake was 7,659 kJ/day for children who drank an average of about 270 ml of sweetened drinks daily. Those in the highest category of soft drink consumption drank less milk and fruit juice than those in the category who drank the least amount of sweetened drinks [15]. Among more than 500 ethnically diverse children (median age 11.7 years), for each single daily serving of sugar-sweetened drink consumed, both BMI and the frequency of obesity were increased after adjustment for appropriate variables; daily consumption of a single can of soft drink may increase a child’s risk of developing obesity by 60% [16].

The term ‘sugar’ conventionally means mono- and disaccharides. The National Dietary Guidelines usually identify ‘added sugars’ as those that are eaten separately at the table or used as ingredients in processed or prepared foods, such as cakes, biscuits, soft drinks or ice cream. In the USA consumption of added sugars has increased steadily from 1970 [17]. The largest source of added sugars (one third) in that country comes from non-diet soft drinks [17]. Johnson and Frary [17] reviewed evidence linking increasing sugar consumption to several disorders including dental caries, dyslipidemias, overweight/obesity, compromised bone health, and generally impaired diet quality. They remind us of the risks associated with the long-term use of baby feeding bottles containing fermentable sugars; the habitual use of pacifiers (or ‘dummies’) smeared with honey or jam to quieten babies or help them to sleep has reemerged as a very serious risk to pediatric dental health in some places, including Australia. Increasing sugar consumption has been identified as a threat to dental health in China, India, Vietnam, Thailand and other Southeast Asian countries, particularly because of the recent rise in the consumption of sugar-containing carbonated beverages [18].
A Possible ‘Doomsday Scenario’

Type-2 (non-insulin-dependent) diabetes mellitus (NIDDM) and other related ‘lifestyle diseases’ such as overweight, obesity, increased cardiovascular disease risk, and chronic renal disease and failure, are epidemic in many parts of the industrialized world and cause millions of deaths annually [19]. Prevention and control of these major non-communicable diseases present a huge challenge which Zimmet [19] likens to a ‘Doomsday scenario’. To develop cost- and health-effective programs will require mobilization of government agencies, lobbying of politicians, collaboration with international agencies such as the World Health Organization, the United Nations’ Development Program, the United Nations’ Children’s Fund and the World Bank, and will require education and involvement of communities and populations at large, as well as active participation and advocacy by a range of health professionals [19].

These are becoming global health problems of immense proportions; this is exemplified by dramatic rises in the prevalence of these degenerative, chronic diseases in rapidly urbanizing populations such as in the Pacific and Indian Ocean regions and in Asia [20]. Environmental influences including rapid changes in dietary consumption patterns, the introduction of Westernized diets (including ‘junk foods’) and more sedentary lifestyles are important and may be compounded by a genetic predisposition in some ethnic groups. A significant accompanying factor in this process was colorfully labeled by Koestler [21] almost 30 years ago as ‘Coca-colonization’. This is why NIDDM is now so prevalent in transitional populations such as indigenous North Americans, Native Canadians, New Zealand Maoris, and urbanized New Guineans and Nauruans [20, 22–24].

This situation is not confined to cities, other urban areas or country towns. In Australia, for example, changes over recent decades from the traditional, active hunter-gatherer lifestyle of Aborigines have rapidly introduced ‘Westernized’ dietary patterns, including ‘junk foods’ and fatty and salty, energy-dense foods to their community food stores and at roadhouses in isolated areas, and there have been significant declines in physical exercise, even in very remote areas and in isolated, small communities in ‘the outback’. This has been termed ‘surrogate urbanization’; it is associated with energy-dense, high-fat, high (refined)-carbohydrate, high-salt diets that are accompanied by very heavy consumption of sweetened soft drinks [25]. This predominantly ‘junk eating and drinking’ pattern contrasts with their traditional hunter-gatherer diets that were low in energy density, high in micronutrients, high in carbohydrates with a low glycemic index (such as starch-rich foods), low in highly refined carbohydrates, such as simple sugars (monosaccharides and disaccharides), extremely low in salt and low in fat but with a higher proportion of polyunsaturated fats and less saturated fat, a protective factor against the development of cardiovascular disease; they also
had plentiful natural ‘bush tucker’ – native fruits, nuts and vegetables, and hunted for wild animals [26]. These people now have among the world's highest rates of NIDDM and very high rates of associated ‘lifestyle diseases’ including overweight, obesity and cardiovascular disease; in many Aboriginal communities one third or more of the adults have diabetes [27]. Australian Aborigines are now developing diabetes and cardiovascular risk factors in childhood and adolescence [28, 29].

From my observations of food consumption patterns in the People's Republic of China over the past 25 years, particularly among children and other young people in cities and large towns, I am struck by the dramatic change from a total absence of Westernized dietary influences in the late 1970s to a galloping proliferation of international ‘fast food’ and ‘junk food’ outlets in the early 21st century. The nutritional and other health-related consequences of this change are yet to be seen. As Diamond [22] has said, the prevalence of NIDDM is ‘exploding’ in many populations, perhaps because of ‘the genetic and evolutionary consequences of geographical differences in food history’ and altering dietary and other lifestyle patterns; ‘junk foods’ and ‘junk eating’ are very significant contributory factors in this scenario.

Other Issues

Television viewing and other sedentary pursuits like computer games affect patterns of ‘junk food eating’ among today's youngsters. TV viewing tends to replace their fruit and vegetable consumption by foods and drinks advertised on TV [30]. It also encourages food snacking, junk food consumption and excessive consumption of foods in general, and inactivity. These are now prevalent in urbanized societies and are linked to much greater risks of being overweight [25, 31–33]. In some places TV advertising of ‘fast foods’ is legally restricted during children's popular viewing times, even up to 9 o’clock at night. Most ‘junk foods’ have extremely high energy density; among regular consumers of these products this would tend to promote weight gain and obesity [34]. Humans tend to consume a similar bulk of food regardless of its energy density because of inadequate recognition of its high-energy density and subsequent downregulation of intake to maintain energy balance [34–36]. This may help explain why frequent and habitual consumption of inappropriately excessive amounts of energy-dense foods, that is ‘junk eating’ habits, as well as the composition of junk foods themselves contribute to overweight and obesity [9]. Thus, the frequent consumption of palatable, energy-dense ‘fast foods’ of enormous portion size, with highly refined starch and with added sugars, for example in sweetened drinks [9], strengthens the proposal that ‘junk eating’ patterns as well as ‘junk foods’ contribute to overweight and/or obesity and their consequences in millions of people.
Yet the news may not all be bad. According to the Associated Press, a major international ‘fast food’ chain has been prompted by obesity lawsuits in the USA to launch diet-conscious meals with salads and bottled water and has started to provide information to customers about how to choose meals to decrease their fat, calorie and carbohydrate consumption. This has begun in Australia. A series of essays about food and its producers, eating patterns, obesity and other nutrition-related disorders, the food industry, food policy and the roles of governments, the media and individuals was published in The Economist in December 2003 [37]. There is now a documentary movie, ‘Super Size Me’, showing the risks of doubling energy intake by grossly excessive and continual consumption of high-energy-density junk food. These developments point to a need for better cooperation between various sectors to better understand and help reduce this very serious international health burden.

References

Junk Food


Discussion

Dr. Steenhout: At the end of your presentation, you mentioned the new regulation that Great Britain wants to introduce to ban TV advertisement for children. We should consider that our civilization is evolving, and in fact now, at least in my personal opinion, we are relying a little bit too much on the decisions made by politics, states, law, instead of trying to educate people to have their own responsibility and to try also to develop their own ethics and their own ways. This is certainly something on which we
Dr. Gracey: You made some very good points and I agree with them. I think probably the most important point is the complexity of the problem and where the responsibility lies.

Dr. Caroli: I really appreciated your presentation. I gave a presentation at the European Meeting on Obesity last May in Prague about television and childhood obesity. I had to study the topic a little bit more deeply and I saw that there is a gradient of prevalence of obesity from the north of Europe to the Mediterranean countries. Sweden, Norway, the Scandinavian countries, have very strict laws on advertising directed at children during children's programs, while in Italy, Spain and Greece there is just self-regulation by the industry. I have to admit that in Italy the situation is particular, but we have a more than 30% obesity rate as compared to less than 20% in Scandinavian countries. The reason why the English Government decided to change the law is because they have a 27% obesity prevalence in childhood and so they decided to reduce the advertising to children. There was a very interesting study by Borsanowsky a few years ago on the effect of food advertising on children aged between 2 and 6 years. He saw that even 30 seconds of advertising can affect the choice of food in children of this age, and the effect is double if the same advertising is shown twice. So I think that in order to increase the fruit and vegetable intake of our children we should just learn from advertising. Fruit and vegetables must be presented to children in a positive way, and just not give up, because if they are pushed in a positive way, smiling, they don't care if you say that their food is good for their health, they don't care at all. Parents are really interested in that, and you have just to say that they are good as the advertising says that all this food is absolutely perfect, especially for getting everything in your life. But I do agree that we should have a very strong law at the European level to adjust advertising for the better health of our children.

Dr. Gracey: You made some very good comments and perhaps I should just make one supplementary comment. Although I am not an expert on Europe for obvious reasons, I understand that there is a great diversity in the prevalence rates of obesity in children in different parts of Europe, even in different parts of the same country, even in Italy I believe, for example, so that any regulations or public health measures that are used to try to improve the situation have to be tailor-made for local conditions. Although the European Union is now one of the largest political groupings in the world, as an outsider I feel that a one size fits all approach would not work. Am I right?

Dr. Caroli: You said that the law must be adjusted for local situations?

Dr. Gracey: I think so, yes.

Dr. Caroli: You are probably right. We need a strong background, similar in all the countries, because the same advertisement that is prohibited in Greece, for example, is still allowed in Poland. We must have some general rules to follow in all Europe and then adjust for single and particular national problems.

Dr. Gracey: That was what I expected. So you need guidelines and principles to follow.

Dr. Caroli: No we don't need guidelines, we need law, because in Italy we don't care about guidelines.

Dr. Verloove: So perhaps we need sets of regulations which we can be adapted for each nation.

Dr. Sinaasappel: May I play the devil's advocate, that is we have what we ask for. In other words it is not only the industry that is offering this stuffs, but also society. The children of our community or ourselves are also in some way asking for these products, we like them, we use them. The question is how we can change that?

Dr. Gracey: I don't have an answer.
Dr. Verloove: Do you have any suggestions yourself?

Dr. Sinaasappel: I think education at home was already mentioned. But it is not only a question of the children, it is also a question of the parents. The parents are very much used to a lifestyle which is very convenient for them, and we probably have to start there to change it.

Dr. Exl-Preysch: I would like to make two comments and a suggestion regarding the previous question. Concerning the teeth, in Switzerland, for instance, we have a fantastic system for educating children on how to clean their teeth already in kindergarten. This system has been able to decrease caries in these children to zero. Those who go through this education system just clean their teeth every time they eat something, and I don't think they are eating less sweets and drinking less soda drinks than the other children. I think the most important thing is to educate children on how and when to clean their teeth. I was astonished that we haven't heard anything about portion sizes. There is fantastic literature on the development of portion sizes, especially in the United States, and I think this is very impressive. Very recently a study came out in the United States in which students received lunches of various portion sizes over several weeks. What was eaten for the rest of the day was studied and two things were realized: first of all, for the rest of the day the students ate the same amount of food regardless of how much they had eaten for lunch, and on average those who had the biggest portions were getting 400 kg cal/day more than the others. So portion size is really something everybody has to think about: restaurants, food industry, everybody. Finally regarding the education topics that were just raised, and knowing that therapy in obese children is almost useless, everybody here and everybody concerned with children, we all have to come up with educational programs for children starting in kindergarten, and there are some around, Nutrikid for instance. A change must be brought about in the eating habits of the children. It is fascinating to see that later on the children educate their parents because they go home and say 'no mother that is not for me'. So this is where I think we really should put the emphasis and not on difficult to understand recommendations.

Dr. Gracey: I would like to comment on those last two issues that you raised, it is extremely important. I did not mention portion sizes not because I was not aware of their importance, it is obviously important in terms of caloric intake and overall dietary consumption patterns, and I agree with you entirely. I would also like to mention the recently produced film called ‘Super Size Me’, which came from the United States and I hope that many of you in this room have seen it. The film is about an experiment that a young man in the United States did on himself. He fed himself in fast food chains in various parts of the United States, for 30 days he ate nothing but fast food, and when he was offered a super size of whatever he was ordering he accepted, and he did this with great graphic detail about what he was eating, and he had a gastroenterologist looking after him, a cardiologist and a general practitioner. In the space of 30 days this man gained 11 kg or 25 lbs in weight, he developed a firm fatty liver, his liver function tests were drastic, and his gastroenterologist said that if this was alcohol-induced he would probably die within a fairly short space of time, and he was warned off the diet, he lost his energy, he lost his sex drive, as his girlfriend said anyway. It was an artificial uncontrolled experiment on an individual who was trying to make a point, but I think the point was made graphically, and the film I believe is well worth seeing. Anybody who is interested in diet, nutrition and related conditions, I would really recommend seeing it, not to make any more money for Michael Moore, I am sure he has made lots and lots of money, but perhaps not enough money to keep off the lawyers from McDonalds. Did you want to make another comment?

Dr. Exl-Preysch: I think we really should also mention that in an interview Moore himself said it was not McDonalds finally, it was the fact that he took 5,000 cal/day and he could have easily done that in a 4-star restaurant. The difference is that it would
have been quite a bit more expensive and certainly much more pleasant, but the effect would have been exactly the same. In addition, it seems that he 'organized' his weight gain in such a way that he had to succeed. Scientifically spoken, it was almost impossible that he gained so much weight in such a short time in a commercial way!

**Dr. Gracey:** I was going to come to the amount of calories that he was consuming and that was excessive, I agree completely, but it is just a very instructive film. Now your second point about teaching young children I believe is extremely important. I am working with Aboriginal people who live under miserable conditions, they no longer hunt and gather their food from berries, nuts and hunt for wallabies and kangaroos and snakes and goannas and so forth. Their food is brought in from hundreds or thousands of kilometers away. They have fatty fried salty foods; they consume enormous amounts of calories; they drink these 2-liter containers of a certain company's sweetened drink, I won't mention the company's name, and their children are turning into obese, hypertensive, diabetic teenagers from being underweight youngsters at the age of 8–10 years, and we are adopting the same approach with these children. I work through Aboriginal people and they have their own languages and ways of communicating, but we get the message to the family and to the community through the children. The children go back to the family and the community and say to the mothers or the fathers and the young men, you shouldn't eat that, that is dangerous, that will give you that sugar disease and then you go blind and you lose your feet or you get kidney disease, and this has a very powerful impact. So children actually can be agents of change in that sort of community setting, and that is where I believe that people who work in public health as I do, rather than in a hospital setting, have a great opportunity to get the message through the children to the rest of their community. It is very difficult, patient and hard work; it takes months and months to get these messages across.

**Dr. Verloove:** Yesterday when we were talking about similar subjects, someone called me a dreamer. Do you have any comment on this kind of thing Dr. Benninga? Do you think it is possible to change behavior?

**Dr. Benninga:** If you put in the effort then hopefully they do. But as I said yesterday they gave a lot of information which advocated adding fibers to the diets of high socioeconomic class families in the US, and they didn't have success.

**Dr. Verloove:** That is a nice opening to a question I have. Is it possible to change the way of thinking in such a way that you could, for example, add fibers to a hamburger? Accept the fact that people want to eat a hamburger but then change the hamburger so that it doesn't have these side effects? One aspect of it is portion size of course but another aspect is content like fluoride to water or fibers to hamburger or whatever.

**Dr. Gracey:** I don't see any reason why not. If the choice is there and you can convince the manufacturer or the person who is preparing the hamburger to change from a low-fiber flour to a rye flour or some other flour with more fiber or a whole-wheat flour, then you can do so, but you have to work with the industry in order to achieve that objective.

**Dr. Aggett:** In a way what you are suggesting is something that is running through people's mind in terms of so-called functional foods; creating foods in which added value can be derived by manipulating a particular ingredient. This is very well developed in many areas and explored. It is a highly focused area. What you described is a challenge that we are actually facing in the UK as a part of an issue arising from that review in the newspaper mentioned by Dr. Gracey, and what is happening in the UK now is part of the same initiative in public health. They want to have red, green and amber labels on foods, so a red food one would eat sparingly, green plenty, and amber somewhere in-between, so sometimes it is good, sometimes it is bad. The present debate, as I picked up on the television last night, is that someone is saying well, what if we have high-fiber bun, a nice thick juicy fatty piece of meat and a lump of lettuce,
how are we going to give that a red, green or amber label. And there are going to be lots of people running around arguing, debating this. So it has been appreciated to a certain extent that there must be some real way of doing a risk-benefit analysis of these foods. Instinctively one would feel that a high-fiber bun would probably not compensate for 50% of calories coming from saturated fat as may be the case, but the initiative in terms of foods more generally is now developing to this concept of nutritional profiling where the risk-benefit analysis is being applied to products by trying to synthesize and interpolate from compositional data something about the food. It has yet to be tested whether or not that is going to work. People have actually started doing it but now appreciate that it is one of these things that is far more easily said that done.

Dr. Gracey: What you said is very sensible, and again I come back to the complexities of altering what is in the diet, what people know about what is in the diet and how to perhaps change their attitudes and their behavior. After this film ‘Super Size Me’ was produced and went around the world, there was a lot of pressure on McDonalds in particular to change their products and the way they marketed their products in McDonalds outlets, and McDonalds started to introduce salads as a response, saying here we are, we are now giving salads as a healthy alternative. But what happened was that they are adding so much salad dressing to the salads that the salads in fact contain more fat and more calories than what people had been consuming previously.

Dr. Aggett: I think the basic answer, and it is probably relating to some comments I think Dr. Leathwood made, that intrinsically some of us try to understand food. To teach and educate people about food rather than nutrients is a real challenge and I think what Dr. Gracey has just illustrated is a very good example of that.

Dr. Waterland: I just wanted to follow-up on your previous comment about children acting as agents of change in this whole issue. I think it is good if we can teach children to try to influence their parents about healthy eating and that sort of thing, but I really have echo Dr. Steenhout’s comment that fundamentally the responsibility comes down to the parents. It made me think of a recent innovation in the United States which is diet dog food. When I think that my dog is fat I just give him less food, but the pet food industry is trying to convince us that you have to provide your dog with a proper balance of nutrients to help him lose weight. This is analogous to the idea of banning junk food advertisements for children. It seems kind of silly when really it is the parents who are buying the stuff, and if the parents aren't bringing the stuff home the kids don't have access to it. So I think that is really where we need to focus.

Dr. Leathwood: I think we must not forget the historical perspective. The vast changes in the agriculture industry that have occurred 70 years were at least partially influenced by fear of famine. Even in the 1950's, Europe was not able to produce enough food for the population, so agricultural policy was aimed at increasing production. In consequence, a few years later there was over-production, with ‘beef mountains’ and ‘butter mountains’. In relation to income, food today is generally cheaper than it used to be and more easily available, so the time cost and the money cost of obtaining food is lower. In consequence, it is easier to eat more and value food less.

This leads directly to my next point. The expression ‘junk food’ expresses something about the food and can also be used to express something about the people who eat it. There is sometimes a veiled implication that people who eat ‘junk’ food are ‘junk’ people. So some criticisms of junk foods may be a form of social posturing.

Lastly, I would like to comment on the point that advertising is often presumed to be spectacularly efficient while nutritional education seems to be remarkably inefficient in changing people’s behavior. Should we not treat this as an opportunity and develop programmes where advertisers and nutritionists work together?
Dr. Gracey: I do agree that the term ‘junk’ used in relation to food or dietary habits does have a pejorative connotation. We do have to be careful about that particularly as it tends to be the less fortunate strata in the society that are affected most by junk food, partly because it is relatively cheap and it is quick, it is convenient and it is tasty because it is salty and fatty.

Dr. Kleinman: I actually have some comments rather than a question. The first has to do with what was brought up about going to a very good restaurant in Paris and being able to eat the same amount of calories. That is absolutely true; the problem with that line of reasoning is that by and large the restaurants that serve haute cuisine are extremely expensive and if one wants to eat more food in those restaurants one spends even more money. The restaurants that most of us eat at will give you a lot of food for very little money, and that is the point of the documentary movie ‘Super Size Me’, that for a few more cents you can go from a 350-ml beverage to a 470-ml beverage or from a 470-ml beverage to a 710-ml beverage. That comes back to Dr. Leathwood's comment; this really is a very complex and integrated system of rewards. Food by and large is very cheap now in the developed world. Portion sizes are often enormous, and it is not difficult to eat an extra 400 or 600 cal/day beyond what is expended.