



FOOD ADVERTISING, FOOD CHOICE AND OBESITY:



A survey of existing research

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EXECUTIVE summary

There has been an increasingly public debate in Europe about the rising level of obesity, and its cost on public services and society as a whole. Within this debate, claims have been made about food advertising's role in the rising levels of obesity. This report analyses the existing academic literature, including WHO materials available on the issue of food advertising, food choice and obesity. The key questions this work poses are:

1. What role does advertising play in food choice and diet?
2. To what extent do dietary variations influence the prevalence of obesity in different societies?

The answers to these two questions suggest that food choice, dietary habits and levels of obesity globally are multi-factorial. That is, the literature confirms that there are many factors operating in these two situations and they all interact and mutually influence each other.

The findings of this report suggest that diet, or the pattern of food choices and preferences that characterises different cultures in the world, vary depending on a large range of factors. The literature suggests that dietary patterns are well established before children are aware of advertising as anything more than an amusing sideshow on TV.

In this context, advertising has a relatively minor role to play in food choice. The literature confirms that food habits are established early in development by socialisation, the main agents being family and peers. The effect of food advertising depends on whether product categories are new or established. The research suggests that advertising is good at reinforcing purchasing for products people already want (existing categories they like), but is unable to persuade people to eat food they are not already interested in (existing or new categories of food). Within established categories of food products, advertising is used for promoting brand switching, and as such is specifically designed for this purpose. It is important to clearly differentiate and distinguish between food choice, which can be influenced by advertising, and patterns of food consumption, which are driven by large-scale social and historical influences on our accustomed diets.

Within the context of other influences, the research demonstrates that advertising remains a low influence on parental and family food choice and purchasing decisions. Children and adults are active consumers of advertising from an early age and they interpret critically what they see and hear rather than being passive recipients of advertising messages. Campaigns such as *Media Smart* (http://www.isba.org.uk/public_documents/Media_Smart_05_02.pdf) where responsible industry initiatives recognise that young children need to develop media competence including advertising literacy, recognise and acknowledge this vision of the active child.



The literature demonstrates that obesity is on the increase, and the WHO has identified it as a pandemic. The research suggests that the rates of increase are too rapid for a genetic explanation, and that obesity is a two-part equation – energy in and energy out. Broadly speaking, there has been a change in dietary patterns and a change in physical activity (with a more sedentary life style becoming common). Both of these changes influence the balance between intake of food and energy expenditure that is central to body weight issues. The literature overwhelmingly confirms the important role of cultural and environmental factors, as well as biological and inherited factors – both of which interact and influence body weight and the recognition of obesity as a problem in a particular society.

The conclusion of this report is that there is no evidence to show a direct causal relationship between food advertising and obesity levels. Some research has been conducted demonstrating that extended exposure to television (and therefore hours spent sitting, rather than undertaking more physically rigorous activities) may increase the chances of obesity. There is, however, no research that demonstrates a link between exposure to advertising for certain types of foods, and an increase in consumption of those foods amongst adults and children.

introduction

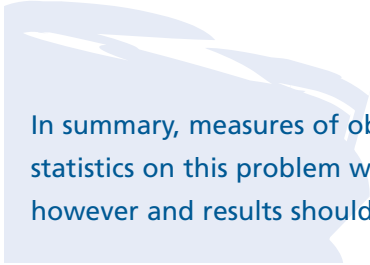
This review of the available literature on the food advertising, food choice, and obesity was proposed by AEF in the summer of 2002 and I undertook to conduct the work based on the existing academic literature, including World Health Organisation (WHO) material. I am grateful to AEF for providing me with this opportunity to explore this field and for their support with their own resources including books and articles. In order to investigate the complex pattern of relationships that exist between these three areas I shall start with the central topic – the issue of obesity. What is it, how is it defined, and what causes obesity?

obesity DEFINITIONS

The simplest definition of obesity is that it is the excessive accumulation of fat in the body. The cause of obesity is quite simple - fat accumulates when more calories are consumed than are expended. So this imbalance between calorie input and the corresponding expenditure of energy by exercise for example, result over time in an accumulation of fat as adipose tissue. In order to ascertain the prevalence of obesity worldwide it is necessary to have an agreed measure. So, how best to measure if a person is obese or not or, in more general terms, what is the definition of body weight in relation to health outcomes? There are several ways of doing this and probably the best known is the body mass index (BMI). The formula for BMI is the individual's weight (in kilograms) divided by the square of their height (in metres). Normal weights are in the range of BMIs from 18.5 to 25 and we can set cut-off points of >30 as obesity, with 30-35 as moderate obesity, severe obesity as in the range 35-40, with anything above 40 classified as very severe obesity (WHO Consultation on Obesity, 2000; p9).

However BMI does not distinguish between weight associated with muscle and weight associated with fat and differences in body proportions and the relationship between BMI and body fat content can affect the BMI range considered to be outside the defined obese categories. These differences can be associated with groups that differ on for example sporting activity (tall and lean high muscle footballers versus sedentary high body fat persons) and also in terms of groups that are culturally different and physically different (Caucasian Australians versus Polynesians for example). Actuarial tables used by life assurance firms that relate mortality rates of men and women of different weights and heights are also used as other measures of being overweight or obese. These tables report 'typical' weight ranges for individuals of different heights, genders and frame sizes.

Although there are different ways of measuring and classifying obesity in adults, it is more difficult to obtain valid indicators in children. However moves toward WHO approved measures is advancing and BMI measures with age-related reference curves are available for a number of countries for both adults and children. However BMI trends may actually have underestimated the scale of the growth in obesity problem. BMI fell slightly during the 1980s before rising steeply in the 1990s and this probably reflected an initial shift of body mass from muscle to fat, with the loss of muscle masking the increase in fat. Waist circumference, which measures abdominal fat, has increased much more rapidly than BMI over the same period, implying an even steeper obesity trend.



In summary, measures of obesity are available and used extensively to obtain statistics on this problem worldwide. The measures are not without criticism however and results should be interpreted carefully.

obesity a MULTI-FACTORIAL problem

If we look at the causes of obesity then there is a general consensus that it is a multi-factorial problem. That is, there are many factors operating in these two situations and they all interact and mutually influence each other. There is absolutely no disagreement on that in the literature. It is important to emphasise that in multi-factorial situations the role of two or more factors can often be as a consequence of their interaction rather than a simple main effect of each taken separately. So for example any genetic contribution to obesity will likely interact with environmental ones to produce a possible effect. An apparently simple relationship can be caused by a combination of factors. So if one is looking for the predictors of obesity in young adulthood from childhood and parental obesity then parental obesity increases the risk that obesity will occur in adulthood in all children with 1 – 3 year olds at greatest risk.

As children grow older, the effect of parental obesity on the likelihood that obesity will persist decreases, whereas the effects of obesity present in the child increases. The risk of adult obesity for a 10 year old child with obese parents is still two-fold greater than the risk for a child with normal weight parents, regardless of the obesity weight of the child. The risk of persistent obesity in an obese child is 22-fold greater than the risk in a non-obese child, regardless of the parents' obesity status. There are genetic as well as environmental features operative in family situations and their interaction will contribute to the observed relationships between parental obesity and child obesity.

GENETICS

Looking at the genetic component of obesity then it is known that people differ on the extent to which they are able to put on and take off weight and we must recognise that this trait is inherited or to phrase it another way, that there is a heritability component in these individual differences. Those susceptible individuals who seem to have weight problems exist in countries differing widely in lifestyle and environmental conditions. Sims (1989) reported on what has been called the 'Vermont prisoner study'. Inmates of this prison were paid to gain weight. Presumably money is a sufficiently strong incentive for prisoners to co-operate and prison, being a total institution, provides a controlled environment for monitoring intake. Prisoners who had no family history of obesity were unable to gain enough weight to become overweight, even consuming up to 6,000 calories a day. Of course they gained some weight but quickly lost that weight when the study ended. On the other hand prisoners with a family history of obesity gained weight readily and did not lose it again right away.

Stunkard et al. (1990) found that twins were likely to be similar in body weight regardless of whether they were reared together or apart. The evidence for a genetic component is there and one writer would claim that "genetic factors are of overwhelming importance" (Cogan and Ernsberger, 1999). However a genetic contribution does not mean that one's fate is predetermined by one's genes and it is necessary for other factors to be in place before the genetic contribution is expressed. The WHO would consider "that the genes involved in weight gain increase the risk or susceptibility of an individual to the development of obesity when exposed to an adverse environment" (WHO Consultation on Obesity, 2000; p134). How much do genetics contribute to obesity? The way this question is answered depends on the concept of heritability which is an estimate, based on a statistical analysis of relevant data, that gives the proportion of influence provided by genes on a group of individual. It is **not** a figure that suggests x% of one's behaviour is determined before one is born and the previous comment about the interaction between environmental variables and any genetic contribution should be kept in mind. Nevertheless Bouchard (1995) claims that somewhere between 25-40% of the range of BMI indices in large samples can be attributed to heritability.

The genetic mechanisms that operate in obesity are changing with new advances in science but at the time of writing six genetic mutations that cause human obesity had been notified, all presenting in childhood. Single gene defects however as argued above account for a small fraction of human obesity – as predisposition seems to be caused by a complex interaction between at least 250 obesity-associated genes with perinatal factors possibly playing a role.

There are other biological circumstances that distinguish people's susceptibility to weight gain on grounds of both sex and ethnicity. After puberty both men and women show a marked increase in appetite for fat in response to physiological hormonal change, but this rise in fat appetite occurs much earlier and to a greater extent in girls (cited by WHO Consultation on Obesity, 2000; p138) and women also tend to channel extra energy into fat storage. Certain ethnic groups appear to have a propensity for developing obesity and its consequent complications when they are exposed to a more affluent lifestyle. This may be due to a

genetic predisposition. Among those mentioned (cited by WHO Consultation on Obesity, 2000; p138) are: Pima Indians of Arizona, Australian Aboriginals, and Overseas South Asians (Bangladeshi, Indian and Pakistan).

We can summarise by saying that biological factors play an important role in the development of obesity. There is evidence that one's genetic inheritance, sex, and ethnicity contribute significantly to the variability in obesity across populations.

PHYSICAL ACTIVITY

Turning now to output factors, exercise has an important role to play. There are a variety of activities where little or no physical activity occurs such as watching TV, reading, working at a computer, talking with friends on the phone, eating, and driving a car (without mentioning of course sleeping, which is biologically and psychologically an essential activity). Acculturation and modernisation will produce an increase in these and changes to technological societies will bring about a reduction in the sort of activity like walking and carrying that went with labour intensive jobs. In addition there is evidence of significant relationships between inactivity and eating so that fat intake increases from both adolescents (Lytle et al., 1995) and adults (Simoes et al., 1995). So changes in physical activity from the active to the sedentary will affect both food intake and food energy expenditure. Physical exercise can help the expenditure of energy but it also needs to be both regular and sustained.

There is an index of physical activity level (PAL) which expresses daily energy expenditure as a multiple of BMR (on the basis that individuals of different sizes have different energy requirements). This roughly translates into the following physical lifestyles given in Table 1:

TABLE 1. Lifestyles and associated physical activity levels.

Lifestyle	PAL
Sedentary	1.4
Limited activity	1.55 - 1.60
Physically active	> 1.75

PAL can be increased and Table 2 shows the associated activities and their duration in order to increase PAL from 1.55-1.60 to 1.75 or more. In order to avoid obesity, populations should remain physically active throughout life, at a PAL value of 1.75 or more.

TABLE 2. Duration, activity, and activity ratio (a multiple of BMR) for various different activities.

Duration	Activity Ratio	Activity
1 hour	4-5	Brisk walk, canoeing, cycling (12 km/hr), gardening.
45 minutes	6-7	Cross-country hiking, cycling (15km/hr), skating, dancing.
30 minutes	10-12	Any vigorous activity e.g. football, running, rugby.

The World Health Organisation (WHO, op. cit.; p116) states categorically that moderate physical activity is “of profound significance” because the evidence suggests that there is a fundamental interaction between the level of physical activity and the proportion of dietary fat in determining whether energy balance can be sustained. People who sustain moderate or high levels of physical activity throughout life can tolerate diets with a high fat content (e.g. 35-40% of energy) whereas lower fat intakes (20-25% of energy) may be needed to minimise energy imbalance and weight gain in sedentary individuals and societies. But surely exercise whets the appetite and we eat more afterwards? Not necessarily, and Woo et al. (1982) found that obese women didn’t eat more after exercise, and so did not compensate for the higher energy expenditure produced by exercise by increasing their intake.

However people who use cars and motorised transport and have sedentary leisure pursuits and work in an automated environment may find it difficult to attain PAL levels up to and in excess of 1.75 simply by increasing their activity during ‘leisure time’. Since this includes many of the inhabitants of a modern city, one would have to instigate regimes of regular and active physical activity from an early age such as walking and cycling to work and school.

PUBLIC PERCEPTIONS OF EXERCISE

If we look at public attitudes toward physical activity then children seem to know that exercise is important. Proponnett (1997) interviewed 1600 children aged 8 – 15 in a pan-European study of France, Germany and the UK. The results showed that across the 4 countries 79% agree that exercise is just as important as the food you eat for staying healthy. The lowest was Germany where 67% agreed with this statement. 82% across the four countries disagreed with the statement ‘chocolate is OK to eat every day’. However implementation of activity regimes would have to take into account results from surveys from the EU where consumers:

- Perceived food as far more important for preventing weight gain than physical activity.
- Ranked nutrition as higher than physical activity as an important influence on health.
- Perceived smoking and stress as more important health influences than physical activity.
- 25% believed that unless physical activity resulted in weight loss they were not really benefiting from it.
- But were generally aware of what defines healthy eating and perceived this as an important influence in food choice.
- 69% of respondents felt no need to alter their diets, believing them to already be healthy enough.
- There was geographical variability however and Finns for example ranked physical activity as most the important influence on health where as Greeks ranked it seventh.

In countries where development and modernisation is a relatively recent phenomenon or has not yet occurred then energy conservation has historically been of prime concern especially during periods of food shortage. In addition, traditions of leisure will have emerged where rest and sedentary activity in cafes and bars are seen as one's right as a respite from physical labour and will persist as cultural and sub-cultural values when the dominant labour-intensive economy has all but gone. These are issues that should be considered when the possibility of implementing activity regimes is evaluated.

Summarising, although children are aware that exercise maintains health and that there is evidence exercise on a regular basis can promote health there are various cultural problems in implementing regimes of exercise.

PEER GROUP PRESSURE

The role of other people in the life of the child, in particular how children adopt values and attitudes from the culture in which they live and adopt role models in order to learn patterns of behaviour, includes peers i.e. other children of approximately the same age. Certainly it is generally accepted in developmental psychology that peers along with family have an important role to play in the primary socialisation of the child. A core concept in the child's emerging identity is the self – how we see ourselves, how we would like to be, and how we are. And there is no doubt that for adolescents – girls in particular – body image is an important factor in self-esteem. Studies have shown that a higher BMI in teenage girls is associated with lower global self-worth and reduced feelings of self-competence in such areas as physical appearance, close friendship, and behavioural conduct. But as in many other correlational studies we don't know whether children are obese because they are less-self-confident or whether a lack of self-confidence contributes to the development of obesity. It should be noted that although much work has been done in this area with adolescents, more research needs to be carried out with pre-adolescent children.

THE ROLE OF THE FAMILY

Families can function in various ways to encourage and hide obesity in children. For example, some obese children, particularly those from families where obesity is a common problem, show few psychosocial problems, since obesity is considered characteristic of their family. Fat parents create specific food environments for their children, since, in addition to their genetically transmitted predisposition to overweight, fat parents often raise their children in an environment where fatty food is easily available and its consumption is encouraged.

The demographic characteristics of the family have an important role to play in whether children are obese or not. In an important review of 144 published studies on the subject (Sobal and Stunkard, 1989) a pattern emerges where high socioeconomic status (SES) is negatively correlated with obesity in developed countries for women. However the reverse pattern is found in developing societies. For men, women, and children in developing societies there is a strong direct relationship between SES and obesity. Why? Sobal and Stunkard propose that the low prevalence of obesity in lower SES groups in developing societies could be a result of lack of food or even famine, coupled with high energy expenditure as a result of labour-intensive work patterns. Consequently the energy balance sheet is kept firmly in the red with little chance to accumulate a food 'income' with little expenditure of energy. With higher SES there is a greater opportunity to acquire food but there will also be cultural values favouring fat body shapes. "Obesity may be a sign of health and wealth in developing societies, the opposite of its meaning in developed countries" (op. cit., p266). The history of peoples until very recently is often the history of food shortages and famines as harvests fail and rains don't come. One is biologically predisposed to store and 'lay down' fat with great efficiency and in terms of the evolution of cultures it is not surprising that 'fatness' is a highly valued trait. Brown and Konner (1987) examined the information available from 58 traditional cultures and 81% of them considered 'plumpness' an ideal of feminine beauty. For example, in Nigeria pubescent daughters of the wealthy are sent to 'fattening huts' before marriage.

With social mobility in developing countries it is possible to find malnutrition and obesity coexisting in the same setting as Peña and Bacallao (2000) found recorded in Brazil in the distribution of anthropometric data including BMI indices. In industrialised and developed countries on the other hand obesity is a severely stigmatised condition among women but not with men. Women from girlhood through adolescence to adulthood are quite ready to accept the stigma although there is a critique that challenges assumptions of thinness in women (see for example, Cogan and Ernsberger, 1999), which is absent in boys. British longitudinal studies (Braddon et al., 1986) have shown that SES of origin is almost as strongly related to the prevalence of obesity and thinness as the adult's own SES, showing that the circumstances and values of life in the socio-economic class into which one is born may transmit pressures for thinness to adolescent girls during their socialisation. Striegel-Moore, Silberstein, and Rodin (1986) sum up succinctly: "The more a woman believes that what is fat is bad, that what is thin is beautiful, and beautiful is good, the more she will work toward thinness and be distressed about fatness" (cited in Sobal and Stunkard, op. cit., p268).

In summary there are various agents of socialisation that influence obesity. These include peer group pressure and both family patterns of consumption and socio-economic values and beliefs that different demographic family groups share.

diet

We have looked at obesity which is a pathological aspect of eating behaviour. Obesity however should be contextualised within diet which is an essential and normal part of human behaviour. The range of diets in the world and the structure and content of what is regarded as 'acceptable food' that can be eaten is vast, both historically and cross-culturally. The Southern Chinese regard dairy products such as cheese as uneatable but many Europeans would find snake and dog unacceptable constituents of their breakfast, lunch or dinner. Some cultures prefer to eat foods that are highly spiced and feed their children meat with, for the European palate, a ridiculous amount of chilli. Indeed it seems to be the case that any and all combinations of kinds of animals, fruits and vegetables have appeared in the diet of some groups of people at some time in history. This rich variety of foods is not static and unchanging but changes over time, often over a matter of decades rather than centuries. In the UK, the preference for that great British dish, *chicken tika massala*¹, is relatively recent.

EXAMPLES SET BY FAMILIES

The primary agent of socialisation for the young child is the family, irrespective of how the social arrangement of caretakers, children, blood or relatives by affiliation and so on is defined. Families are universal in human society although their structures and function have varied over history and still present us with a bewildering variety of forms and function across cultures. It is recognised by anthropologists, sociologists, and psychologists that the first place where the young person acquires his or her beliefs, knowledge, and attitudes is within the circle of the family. Families reflect cultural and sub-cultural constellations of values and these are transmitted by example, learning of principles or using various schedules of reinforcement to install habitual patterns of behaviour. Dietary patterns and habits, which are central to familial rituals involving eating and consumption; meeting others in social participation; or sharing leisure activities like watching TV - they are all an integral part of family.

1. *Chicken tika massala* is a relatively recent addition to British cuisine and is immensely popular because of Indian restaurants.

If we look at some of the survey research on dietary habits then Stratton (1997) analysed an extensive record of families discussing food. Attributions, that is the explanations people put forward around issues that concern them, were looked at and the results showed that of the nearly 7000 attributions people mentioned concerning food then 37% were issues about what to buy/plan/prepare/cook, 26% revolved around will eat/will not eat, 15% were to do with food being enjoyable/not enjoyable, and only 7% focussed on concerns with nutrition or health. In addition 20% emphasised the mother as a main influence but TV ads were only mentioned by 5% and 3% said 'on pack' information. Smith's (1997) survey showed that 75% of children have used a microwave; 45% have prepared their own meal; 38% do not eat the same as their parents; 32% say they prepare their own food at least once a week; and almost on third of families don't eat together most of the time.

TASTE PREFERENCES

Children start their dietary lives with just one source of food which in many cases is the milk of their mother. How do children acquire their preferences and make food choices? There is a paradox here because most infants possess two characteristics that should predict a **lack** of change and development. They are notoriously neophobic where food is concerned. That means they dislike novelty and what has given satisfaction in the past will be selected in the future. The rewards of ingesting milk should then suggest a diet of warm, sticky, sweet fluids that produce a sleepy satiety. As well as that there is evidence that certain preferences such as a liking for sugar is built in and that we tend to seek out sugared foods. Rozin claims (1982) that the presence of clearly defined likes and dislikes at birth is adaptive since sweet tasting foods generally signal a safe source of carbohydrate, whereas sour and bitter tastes may signal danger. In studies of acceptance, infants preferentially consumed sugar solutions to water (Desor et al., 1973) and even to formula. Steiner (1977, 1979) gave newborn infants sugar solutions and photographed their reactions.

The reaction to sweet tastes was one where the many of the facial muscles relaxed, a slight smile from the baby and there was often evidence of licking and sucking of the tongue. In contrast bitter and sour stimuli produced gaping or expulsive reactions in newborns. There is also good research evidence that infants prefer foods with a high energy density as these produce a strong feeling of satiety after eating and such effects are more adaptive than low satiety. The innate preference for sweetness may be the end result of evolutionary pressure to ensure detection and recognition of food sources that are likely to be high in calories. Rejection of bitterness and sourness may indicate a similar evolutionary pressure to avoid foods that are often inedible or even poisonous. So if children reject new foods and start off with a preference for sugared fluids and foods with a high energy density then how do we as adults end up with such a wide variety of foods and why do children adopt the dietary habits of their culture? Surely we should expect children to stay with the sweet foods that give them satiety and satisfaction? Fortunately from the point of view of gastronomy and for those who like and love food in all its different forms, children grow up as social animals and learn to change and adapt to cultural norms. From an early age children will model their food choices on the behaviour of the group (Birch, 1980) or on the behaviour of adults who consume other foods

(Harper and Sanders, 1975). Simple learning principles such as associative conditioning and modelling are enough to explain how the newly born infant with her reliance on a single food source and an adaptive preference for high energy and sweet sources can change after weaning to food consumption norms that are socially delivered by peers and family adults. But as well as that, pre-school children demonstrate an understanding of the cultural rules of diet. For example, Birch et al. (1984) tracked acceptance for foods across the day in adults and children aged three to four years, as well as detecting an awareness of the appropriateness of a variety of foods for breakfast as compared with dinner. In that study, children demonstrated significant shifts in liking across the day and were clearly able to categorise food items according to their appropriateness for either breakfast or dinner. Thus even at three years of age, children are following cultural rules regarding appropriateness of foods for particular meals. Young children are clearly able to recognise and implement culture-specific rules about foods.

HOW DO TASTES CHANGE? In developed societies there are several key factors that have influenced changes. There is a change in family life with mothers increasingly working and the traditional role of the father as breadwinner and provider is challenged. Often the economics of the family set demands on income that cannot be met unless the mother or both parents work, either part-time or full-time. There is an effect on all patterns of behaviour and values within the household including food purchase and eating habits. The well-known transmitters of cultural values such as television and media in general promote foods that require less preparation and take up less valuable time and also advocate a greater consideration of healthy eating. As the British diet has changed social trend statistics show that people are actually eating less sweet products. We eat more rice, breakfast cereals, poultry and fruit, and less fat and red meat. These are the key ingredients in the guidelines for eating more healthily (Lang, 1997; p52). Between the years 1965 and 1992 we have seen a 138% increase in rice and a 76% decrease in butter; a 126% increase in the consumption of poultry and a 27% decrease in total fats (op.cit., Table 4.3).

When it comes to children's diets then although some writers in this area have claimed that "the food industry of the 1990s is faced with well-informed adult consumers raising knowledgeable children" (e.g. Jardine and Philpott, 1997; p76), this nutritional awareness is not being translated into dietary action. Although absolute fat intakes are decreasing, overall energy intakes have been falling slightly faster and the result is a steady increase in the percentage of dietary energy derived from fat with average UK diets providing about 40% of energy from fat, a figure that is excessive according to most dietary guidelines around the world. Although concerns about weight act as a considerable motivator to reduce fat intake (and the extent to which eating disorders in adolescents and even schoolchildren derive from a consequent obsession with weight and obsessional dieting is symptomatic of this), the food industry has a crucial role to play in promoting a range of reduced-fat alternatives.

THE ROLE OF PERSONALITY IN FOOD CHOICE

Steptoe et al. (1998) have looked at the effects of life stress on food choice. Changes in food choice are stimulated by increased stress, but indirectly as a result of mood change. A threshold of distress may then exist below which no alteration of food choice will be triggered. According to a study by MacDiarmid and Hetherington (1995), self-confessed chocolate addicts did consume more chocolate, and were more depressed, guilty and less relaxed before eating chocolate than the control group. However, they remained guilty and no less depressed after eating chocolate, suggesting that mood did not improve after consumption. Food choice may be altered as a matter of convenience, without any particular conscious preference for different types of food. When people are preoccupied with work or other stressful events, they may consume more fast or convenience foods, which are typically high in fat. If people eat what comes to hand and choose foods that require little or no preparation, it is likely this will lead to a bias towards high energy/high fat foods rather than other products.

To summarise at this point, we have looked at the various factors that impact on diet. Children acquire dietary preferences from an early age, well before they understand what advertising is all about. The family is the first major socialisation agent and when families talk about food, advertising and nutritional aspects are rarely mentioned.

WHAT CAN BE DONE?

I have identified some of the factors in the multi-factorial mix of variables and sources of influence on the basic balance sheet between input and output that determines whether people become overweight and eventually obese. Some of these are important – others less so. Some can be changed, but others can't. So although one's genetic history might seem to have a major role to play in whether one becomes obese and although the various cultural and environmental factors that have changed irrevocably to produce what has been called an 'obesogenic' environment². One can do little with one's genetic endowment and it would be difficult if not impossible to socially engineer society to change its obesogenicity. It might be possible to alter the situation by changing diet and encouraging physical activity and indeed this would tackle the issue head on as we have seen that these two are the core parts of the balance between energy input and expenditure.

2. A general global description of a cultural and environmental 'style' that is conducive toward an imbalance in energy input/output and can promote obesity. It refers to an environment in which fertility rates are falling, life expectancy is growing, social structures (including marriage) are changing the family dramatically and urban development is growing, children have fewer safe places to play, there is declining agriculture, an increase working mothers and less home-cooked food. All of these taken together are conducive to the development of obesity globally. This environment, it is claimed, is conducive to sedentary lifestyles and altered dietary habits.

Evidence from the Netherlands is that it is one of the few European countries with a relatively minor obesity problem. It is estimated that in the Netherlands just one in 12 people are obese. Statistics show 45% of urban journeys are made by car whereas the equivalent figure for England is 62%. The Dutch walk more than the English and they use the bicycle for 30% of journeys compared to less than 10% in England. The indication from this is therefore clear – a change in life style, predominantly everyday physical activity, will go a long way in reducing the problem of obesity.

CHANGING ATTITUDES AND BELIEFS TOWARD FOODS

Most cognitive studies suggest that behaviour is based on an elaborate and rational decision-making process of the subjective costs and benefits of the outcomes of different courses of action. This is similar to many economic models of choice, although real-life rational behaviour is bounded within a limited set of factors that are considered and estimates and judgements are often biased. Overall, individuals are more likely to form a preference for, choose and consume a particular food if they believe (all other things being equal) that consumption of that food will lead to particular outcomes or have particular attributes which they value positively, if they believe that people whose views they value think they should engage in the behaviour, and if they feel that the action is easily brought under their control.

Conner (1993) found the major factors distinguishing heavy snackers from infrequent snackers were attitudes and beliefs. In particular, heavy snackers held more positive attitudes towards consuming snack foods, and these attitudes were supported by a greater belief in the positive taste of snack foods and their value for money. Normative beliefs³ and control beliefs⁴ appeared to play only a minor role in determining intention and actual consumption of snack foods. Unfortunately it is difficult to effect behavioural change with children and for example school nutrition campaigns, or rewarding children's promises to eat nutritious food, can increase children's knowledge of what foods they should eat and result in declarations of intent to choose nutritious foods, but have little or no impact on which foods they actually eat.

3. Normative beliefs are those that significant others hold and that influence the individual to a greater or lesser extent.

4. Control beliefs are beliefs about the extent to which the intended behaviour is under the control of the individual concerned.

A recent FSA Consumer Survey in 2001 (www.foodstandards.gov.uk) established that four out of ten consumers claimed to be eating more healthily in 2001 with small positive shifts in number of people cutting down on fatty foods and those eating more fish, fruit, vegetables and salad. Awareness of the healthy eating message 'five portions of fruit/vegetables a day' increased significantly in 2001 (from 43% in 2000 to 49% in 2001), although there is some confusion on what constitutes a portion:

- 80% of women are responsible for all or most household shopping
- 95% of consumers buy majority of food from supermarkets
- 56% eat convenience foods regularly
- 49% regularly use takeaway outlets (fish and chip shops, Chinese etc.)
- 38% regularly use fast food outlets (McDonald's, KFC)
- 36% regularly use restaurants.

This picture is predictable from the demographic movements described before with shifts and changes in work patterns generating styles of food consumptions that require less investment in time which is costly. It is worth repeating at this point Stratton's finding that family discussions were dominated by the logistics of planning and organising food consumption within the family (including the pleasure of foods) whereas nutritional aspects only were considered by 7% of the sample.

Some **FAQS** about **OBESITY**

IS FITNESS OR DIET MORE IMPORTANT FOR OVERALL HEALTH?

Although there are two major sets of variables – input and output – in the balance of energy, the multivariate nature of their contributions to aspects of health, including obesity, means that it is difficult to identify them as separate sources of influence. For example, the genetic contribution will interact with both and some people will be able to eat a lot and stay thin. At the moment it's not possible to provide a certain answer although it's important to recognise that regular exercise is vital for general health as well as preventing the laying down of excess adipose tissue.

WHAT MAKES PEOPLE BUY DIFFERENT FOODS?

Nutritional aspects are not that significant as a 'driver' for purchase according to survey research. However the consumer market is constantly changing and information on segmentation means that emergent sections of the population could establish themselves not only as a growing sector but also as opinion formers. But as most if not all foods are classified as 'fast moving consumer goods' (fmcg) then the generally accepted facts of this sector are operative. So sales are responsive to price changes and generally speaking this elasticity is greater than the amount of money spent on advertising and marketing. In addition the site is the supermarket and families are often seen as the unit that constitutes 'the consumer' with a relatively fixed repertoire of product choices. The main drivers then are which brand prompts and established brand values are operative at point of choice. Families know what product categories need replenishing – their consumption choices are often limited to brand selection.

DO WE BUY FOOD FOR EMOTIONAL OR PRACTICAL REASONS?

Both! Food, like most material aspects of consumption, is not just bought to satisfy basic wants and needs. All our food has an expressive or symbolic side as well as a functional or utilitarian aspect. Food and diet is a deep and intrinsic part of human culture and it would be inappropriate to expect otherwise. It is not possible and inappropriate to draw generalisations about which foods tap emotional needs and which food we use to replenish our basic physiological needs.

SUMMARY

Before turning now to the role of advertising in food choice, it is important to summarise the findings reported above on obesity. Obesity is primarily caused by the imbalance between energy input and energy expenditure. It is a multifactorial problem and we have identified a genetic component as well as emphasising the importance of physical activity, peer group pressure, the role of the family, habits and examples set by families, taste preferences, and the role of personality in food choice. We talked about the obesogenic environment and indeed the whole pattern of food choice in a non-pathological context needs to be located with a cultural milieu where a whole host of different factors are operative and they need to be described in detail. So for example a recent analysis of food patterns in Europe provides a good case study. Here it was argued that consumers' attitude towards food is changing. This is due to several factors such as:

- The ageing of the population – by 2020 25% of Europe's population will be over 60 (Social Portrait of Europe, Eurostat 1996)
- Busier lifestyles
- Smaller households
- More working women
- Food becoming less a financial burden
- Increasing travelling.

As a result of which:

- Eating habits are increasingly more individual not family based
- There is a growing demand for convenience
- Consumers are increasingly aware of their diet
- Eating-out and ethnic food are rising tendencies.

Although the total energy intake did rise throughout Europe from 1975 – 1995, since 1990-1992 most countries experienced the beginning of a decrease in energy intake as demonstrated by the FAO Food Balance Sheet data. Factors that may have played a role in this decrease include:

- Changes in physical activity
- Composition of the population
- Food choice behaviour
- Composition of food products.

Fat intake has risen whilst carbohydrate intake has decreased. Although it would be a good idea to have guidelines about healthy eating and lifestyles they need to be simple targets well explained to have maximum impact on European health. Most Europeans currently do not feel that they need to change either their diet or their lifestyle. Specific guidelines however are not recommended as they:

- Do not provide for individual nutritional needs
- Are not substantiated scientifically, given the complexity of the relationship between genetics, diet and health
- Do not accommodate the extremely diverse eating patterns of Europeans
- May encourage unhealthy attitudes and obsessions towards food
- May have significant economic consequences
- Are perceived by the consumer as unnecessarily interventionist
- Have not had the desired effect in many Member states

Instead the solution is to educate and liberate the consumer. Education provides the consumer with a basic understanding; information ensures that the consumer is accurately informed, and freedom of choice allows consumers to make positive healthy decisions. Broad recommendations emphasising key messages are practical and accessible; they transcend cultural barriers; they promote positive approach to health; and can build on EU-wide experience in health promotion.

The **ROLE** of advertising

Advertising is the communications arm of commerce and most food advertising that the public is aware of consists of promotional material that is directed to consumers. Advertising has a role to play in consumption, and as most of the choice and purchase of foods occurs in supermarkets as part of a family consumer activity we need to know how families decide.

FAMILY DECISION MAKING ON FOODS

Families shop in supermarkets but are the decisions made there? Marketers have argued that family decision making is based on two sets of processes. The first is the repertoire or portfolio of choices that are brought into the supermarket and the main considerations here will be need and cost. The other set of processes is based on which brand to choose within a particular category and it is here that advertising and promotional activity has a major role to play, in persuading the consumer to switch from brand X to brand Y or to stay with brand Y as one's favoured brand. The role of the child or children here is to contribute to the process by persuading mum for example to choose a brand that he or she prefers. The extent to which advertising influences purchase of individual brands or has some sort of generic effect requires a more extensive discussion on the role of advertising and we shall now turn to this.

ADVERTISING TO CHILDREN – HOW MUCH IS OUT THERE?

This issue reflects two sources of data. One is how much children see, and the other is what they see when they view TV. Let's look at the first.

The source is a recent general article on advertising to children (Kunkel, 2001) and Dale Kunkel is explaining how these figures are arrived at. Children's exposure to television advertising has been measured by computing the average number of hours a child viewed during the year (weekly estimate x 52) by the average number of commercials broadcast per hour on television. On this basis children viewed an average of 20,000 commercials a year in the late 1970s (Adler et al., 1977). This figure had grown to 30,000 commercials for products per year in the late 1980s (Condry et al., 1988) and the latest published estimate in the early 1990s was 40,000 TV ads each year (Kunkel and Gantz, 1992). By 2002 one would anticipate, if growth has continued, that the 1992 figure is an underestimate (Comstock and Scharrer, 1999). So children (and the United States is assumed in the article) are quite possibly viewing up to 50,000 TV commercials every year. But this data assumes a model of media effects where a passive recipient is simply on the receiving end of so much 'stuff' and it has been largely superseded by a vision of media being actively consumed, 'read' or interpreted, and in general, a vision of people who actively process and select and filter out what they see and what they hear. It is well-known that people, including children, do not just sit and watch TV but talk, walk around, and time-share with various other activities like reading, or doing homework.

Turning now to what children see, analyses of the content of advertising to children and particularly what is advertised have been done over the years and the content of food advertising has been examined over this period. Indeed one of the first studies (Cuozzo, 1971) looked at food advertising and the latest (Gamble and Cotugna, 1999) examines the history of the issue and reports on some recent research. Gamble and Cotugna compare their findings with other studies that have been conducted in the United States since 1972 and conclude that "the types of products advertised [to children] have remained constant over 25 years" (op. cit., p264; text in square brackets is added). Breakfast cereals are the most advertised food and this has remained constant since 1972⁵. The next most advertised products were convenience foods (canned dessert, frozen dinner, 'drive-ins'), a change from 1994 when the 2nd most advertised products were cookies, candy, gum, popcorn, and snacks. They note that there have been a negligible number of TV commercials for fruit and vegetables over these years.

There are several methodological problems in any research of this type where data on media content is gathered and analysed. Firstly there is the question of where to look. Most research in this area has identified Saturday mornings and the after-school time as the places to look as the programmes shown are often aimed at children of different ages. But more children in absolute terms will actually be watching (as part of a family audience) during prime time in early evening and although the demographics of the Saturday morning audience is heavily

weighted towards children the absolute numbers of children watching then is less than say early Saturday evening. Since the argument that is used by researchers who gather this sort of information frequently appeals to public health issues, one would expect there are more children who are potentially 'at risk' from watching food advertising during prime time than are at risk on Saturday mornings simply because there are more 'susceptible minds' being targeted. The second methodological problem is concerned with sampling and how to obtain a workable sample of TV commercials that is representative of all the TV commercials children might see. I have found evidence (Young, 1990) that there are wide seasonal variations in the content of advertising to children and in the content of after-school advertising at different times of the year and this should be apparent to even the most casual of television viewers. So toy advertising dominates before Christmas for obvious reasons and it is arguable whether the after-school period at different times of the year is solely devoted to children's products. The important point is not that this was found at a particular time in UK television advertising but rather that there is evidence that time of year is an important sampling dimension. I have looked at the evidence in detail elsewhere (Young, 1990, 1996) and many of the papers that are cited as providing evidence on what's advertised on children's TV rely on inadequate sampling strategies. An 'adequate' sampling strategy should take into account possible geographical variations within a country as well as weekly and seasonal variations.

Given these caveats on the data that has emerged, the latest source (Gamble and Cotugna, op. cit.) does provide some interesting information. They sampled four broadcast channels (ABC, CBS, FOX, and Nickelodeon⁶) between 7am and 11am on a Saturday morning in mid-January 1996. This sampling procedure is by no means representative of 'what's on for kids' as I have argued above. The picture that emerges is as follows, where each occurrence of a commercial is the datum⁷: Out of the 353 commercials identified, 63%⁸ were for food. In addition there were 33 public service announcements (PSAs) and "8 were nutrition related, mainly focusing on healthy snacking tips or the 5 A Day⁹ campaign" (p263). What's in the foods? 56% were for breads, cereals, rice and pasta. Fast-food restaurants were next in popularity (28%). The third major group was classified as 'fats, oils, and sugars' and is a designated category used by the United States Department of Agriculture (USDA) if the primary ingredient by weight is either fat or sugar – there were 15% of these. Table 3 provides this information in more detail.

6. NBC was not sampled as it had eliminated Saturday morning children's programming in the early 1990s

7. This would suggest that heavy advertising of the same brand and even the same ad is counted several times

8. All percentages in the text are rounded to the nearest integer

9. A reference to a 'healthy eating' initiative of at least 5 pieces of fruit or vegetables a day

TABLE 3. Percentages and types of food commercials (US; 1996; after Gamble & Cotugna, 1999)

Food Group	Food Item	% of total
Fats, oils & sugars	Candy	3.9
	Soft drinks	0.4
	Chocolate syrup and powder	3.1
	Chips, nacho chips, cheese curls	1.3
	Cakes/cookies/pastries	5.8
Subtotal		14.5
Bread, cereal, rice, and pasta	High-sugar cereals (> 20% sugar by weight)	34.5
	Low-sugar cereals (< 20% sugar by weight)	1.8
	Canned and packaged pasta	6.6
	Waffles	0.4
	Cheese and crackers	5.8
	Peanut butter and crackers	4.0
	Pop-tarts	1.3
Subtotal		54.4
Milk, cheese, and yogurt	Milk	0.4
	Cheese	0.4
Sub-total		0.8
Fast food restaurants	Pepperoni pizza	1.8
	Stuffed crust pizza	1.8
	Lunch/dinner meals (McDonalds, Burger King, Taco Bell)	23.9
	Subtotal	
Fruit and vegetables		2.7
Total		99.9

WATCHING TV AND THE EFFECTS ON FOOD CONSUMPTION

There is a major distinction between what children watch and what effects this viewing has on them. In a classic study, Bolton (1983) was concerned about the influence of television food advertising on the child's diet. Although there is experimental evidence for an immediate, short-term effect from various studies cited above, the question of the existence of a long-term effect is still open. Bolton identified the key constructs underlying children's dietary behaviour and their relationships. For example, the extent to which the child has been exposed to food commercials, the kind of supervision and behaviour of the parents and the prevailing patterns of diet and other characteristics of the child all have a role to play in influencing the eventual diet of the child and the nutritional status of that diet. These variables were operationalised using questionnaires and diaries on diet and television viewing and a selection of households were given them to keep. The sample was made up of 262 children aged from two to 11 years. Using multivariate statistical analysis, Bolton found that children's exposure to television

food advertising significantly increased the number of their snacks and that such viewing had a subsequent and independent effect on the child's dietary efficiency and caloric intake.

The effect was small however and Bolton concludes that "it is unlikely that effects of this magnitude could seriously affect their nutritional and physical well-being" (op. cit., p.194).

Robinson (1999) used two groups of 9-year-olds in the USA. One was a control and the other was exposed to a classroom curriculum intervention over 6 months designed to reduce television, videotape, and video game use. There were no statistically significant differences between groups for changes in high-fat food intake, moderate-to-vigorous physical activity, and cardiorespiratory fitness but some significant changes in various measures of adiposity.

Andersen et al. (1998) used the results from the Third National Health and Nutrition Examination Survey in the USA – a data set based on over 4000 children collected between 1988 and 1994 - and established that children who watch 4 or more hours of television per day had significantly greater body fat and BMI than those who watched less than 2 hours per day, although there is no evidence that other variables were controlled for. But Crespo et al. (2001) examined the relationship between obesity and television watching in the United States using the same secondary data. It was found that television watching was positively associated with obesity among girls, even after controlling for age, race/ethnicity, family income, weekly physical activity, and energy intake.

Gortmaker et al. (1996) examined the relationship between the prevalence of overweight and hours of television viewed using secondary data on 10-15-year-olds from a USA data base. Multivariate analysis adjusted for previous overweight, baseline maternal overweight, socioeconomic status, household structure, ethnicity, and maternal and child aptitude test scores and it was found that over 60% of overweight incidence in this population can be linked to excess television viewing time.

Turning now to studies which claim a direct relationship between watching food advertising and food choice, Hitchings and Moynihan (1998) were interested in the relationship between the foods recalled as having been seen on TV ads and the foods consumed (measured by self-report food diaries). Forty-four children aged 9-11 years were sampled and there was a significant correlation between the two measures. The authors claim that the "results support the hypothesis that television advertisements influence food choice" (op. cit.; p511).

In a considered piece, Robinson (1998) examines the issue of whether television causes childhood obesity. He argues that cross-sectional studies have established a consistent and small correlation between adiposity and television viewing among children but this does not establish the direction of causality. In order for this to be established, precedence must be established as a necessary (although not sufficient) condition. In other words if television viewing is a true risk factor for childhood obesity then television viewing should predict future obesity. Of the two prospective studies cited by Robinson (Dietz et al., 1985; Robinson et al., 1993), one made a weak but significant prediction and the other didn't. In order to establish

that television viewing is a necessary **and** sufficient condition for childhood obesity one needs experimental studies where manipulation of the risk factor changes the outcome. At the moment then the best explanation is that the relationship between television viewing and body fatness is caused by both reduced energy expenditure from displacement of energy intake, and increased dietary intake. Both sides of the equation might play a role.

Coon et al. (2001) surveyed 91 parent-child pairs in the US. The children were aged 9 to 11 years and they measured the extent to which children ate with the TV on and their consumption of food types using multiple regression controlling for socio-economic status and other covariates. Children from high television families derived less of their total energy from carbohydrate and consumed twice as much caffeine as children from low television families. In addition there was evidence that the dietary patterns of children from families where television viewing is a normal part of meal routines could include fewer fruit and vegetables and more pizzas, snack foods, and sodas than the dietary patterns of children from families in which television viewing and eating are separate activities.

In summary, there are several papers that look at the role of television, and by implication advertising on television, on food related behaviours. However television viewing, viewing of advertisements, family life-style, sedentary habits, and dietary habits and preferences are often confounded in these studies and it is not possible to make claims that watching food advertising per se has a direct effect on food choice.

CONCLUSION

After a careful and thorough examination of the published literature on the role of advertising in obesity, we can conclude that there is no evidence for a direct causal relationship between food advertising and obesity levels. Some research has been conducted demonstrating that extended exposure to television may increase the chances of obesity. There is, however, no research that demonstrates a link between exposure to advertising for certain types of foods, and an increase in consumption of those foods amongst adults and children.

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