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Obesogenic environment: origin and consequences

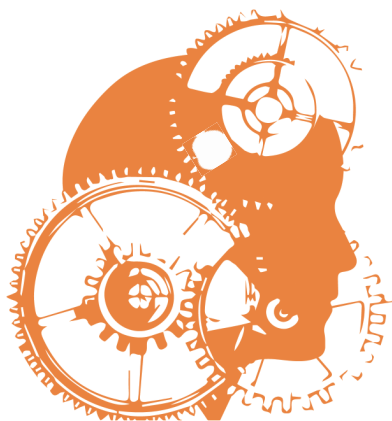
This month's edition highlights the extraordinary and relatively recent changes in food habits across the Western World which inevitably increase the risk of obesity and other disabilities for the majority of our populations. Three countries are highlighted – Australia, Germany and Norway – which have very different economies, indigenous foods and political processes for dealing with food chain regulations. Yet despite the discerning analyses of expert doctors and nutritionists with advice to policy makers, dramatic and unhealthy changes in food habits have occurred starting in the early 1980s. At that time I was personally just embarking on assessing the impact of different foods on energy balance and appetite control, while at the same time being called on by the UK government to help improve the efficiency and indeed, the economic opportunities of the food industry. I soon discovered that the food industry only had a crude idea using simple taste panels of how to make their foods more attractive - there was really little scientific understanding of how to increase food sales.

Now, as a result of brilliant analyses of the psychology of food choice, the food industries have developed a system for selling processed foods and drinks at all times of the day and night with people eating and drinking on the move and at all times of the day. Sophisticated marketing techniques include fundamental biological tricks involving the addition of poorly specified flavours which selectively trigger the brain pleasure centres and circumvent rational, considered food choices. These circumstances explain why the UK Chief Scientist's Foresight analysis of the obesity problem specified that weight gain in current circumstances was everybody's normal biological response to our food environment.

It is no wonder, therefore, that the latest 2015 global burden of disease analyses confirm previous analyses showing that inappropriate diets are the biggest cause of global disability. WHO experts have also just advocated using fiscal measures to tax, for example, sugar in the diet and to subsidise the purchase of vegetables and fruit. We are going to have to use major societally transforming measures if we are to develop an appropriate sustainable food system for the long term well-being of society.

W. Philip T. James

Past-President World Obesity Federation - UNITED KINGDOM



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September 2012 : G. Cannon; DS. Frozi & colleagues;
E. Jacoby; M. Chivico & collaborators; AS. Mojica,
W. Lizarazo and N.Vásquez (Latin-american F&V and
cuisine: life resource and cultural heritage)

October 2012 : DA. Greenaway; JA. Reeder & J. Gilbert;
T. Andreyeva; A. Hillier (Special WIC Program)

November 2012 : MB. Schulze; AJ. Cooper, NG. Forouhi;
C. Zhang & Colleagues; KR. Siegel and K.M. Venkat Narayan
(Fruit & vegetables and diabetes)

December 2012 : Lorelei DiSogra, S. Capacci ; L. Dorfman
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January 2013 : BE. Mikkelsen; TP. Pedersen & Colleagues;
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Dietary behaviours of young adults born into an obesogenic environment

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Young adulthood and obesogenic food environments

The genesis of the obesogenic environment dates back to the early 1980s. All the population has been affected by this food milieu but today's young adults (18 to 35 year-olds) have never experienced any other type of foodscape. We find their dietary habits shaped by the modern food environment with its abundance of offerings of foods prepared outside the home and ready access to ultra-processed foods. Larger portion sizes have been their social norm with no memory of a time when serving sizes were smaller. Of concern is that in countries such as Australia, Generation Y is becoming more overweight and obese at a younger age than their parents' generation did¹.

Consumption of food and beverage groups associated with promoting or preventing obesity

Among young adults internationally, there is a remarkable similarity in consumption of foods and beverages associated with weight gain and protection from weight gain. Many young adults drink sugar-sweetened beverages, which are implicated in weight gain. Burgers, fries, pizzas, hot dogs, pies, tacos, and fried chicken typically purchased from fast-food outlets heavily feature on the menus of young adults. Fast food consumption is not just restricted to the United States and the United Kingdom. For example, even in an Asian country, we find 44% of young Singaporeans eat these foods on a regular basis, and only one in ten avoids fast foods. By comparison, three in five 50 to 59-year-olds are non-consumers of fast foods².

When it comes to vegetables, we discover young adults are the worst consumers. Poor intake is a usual scenario across the USA, UK, Australia and many Western European countries like Germany, Italy, and France. Evidence to support the role of vegetable intake in prevention of weight gain is equivocal but ten-year follow-up of a cohort of young adults in the US, showed males eating more vegetables gained less weight³. In an intervention study to prevent incident obesity in overweight young adults, we showed that increased vegetable intake accounted for 20% of weight loss in intervention participants⁴. Whether vegetables prevent weight gain or not, they certainly have a role in the prevention of cardiovascular disease, stroke and all-cause mortality⁵.

Foods outside the core food groups, so-called ultra-processed, or extra or discretionary foods, high in saturated fats and sugars, like confectionery, cookies, and cakes are making considerable contributions to energy intakes. In Australia, these foods account for more than one-third of energy intake and in Brazil, ultra-processed foods feature more frequently in young adults' diets.

Advent of a 'global dietary pattern' in young adulthood

During emerging adulthood (19 to 25 year-olds) dissociation from the peer-group pressure of adolescent years grows. The all-engulfing pressure dictating their food choices begins to lessen. Young adults are very much a part of a global society, and the interconnectedness of modern communication means highly persuasive, and youth-targeted food advertising has global reach. Overall dietary patterns of young adults within a country show variation but a universal picture of dietary patterns appears despite quite diverse national cuisines. In a sample of Japanese young women, four dietary patterns emerged. One was more traditional i.e. 'fish and vegetables' with a good nutritional profile, but a more Western pattern was also found labeled 'bread and confectioneries' that contained not only those foods but also sugar-sweetened beverages and cocoa. Findings from two different Brazilian studies indicate that young Brazilians have diets more closely resembling Americans' diet than do older Brazilians. Furthermore, pattern analysis shows diets ranging from 'healthy' and 'traditional Brazilian' to an 'energy-dense pattern' (including desserts, cookies, chocolates and fried potato among the typical foods) and a 'bar' pattern (including animal sourced foods, salty snacks and alcohol). Young adults in Northern Ireland, demonstrated 'social/drinker' (including alcohol, white bread, meat dishes), 'Western' (soft drinks, crisps and chips), 'sweet tooth' (including desserts and confectionery) and 'healthy' (fruit and vegetables and brown bread) patterns⁶. Thus, young adults in each country showed healthy and unhealthy patterns. Research as to why some young adults are more vulnerable to adoption of poor patterns in the obesogenic foodscape should continue. Social determinants, poor food literacy, lack of cooking skills, and food insecurity should be further studied.

Conclusion

It is clear that the social norm for diet in young adults reflects the main characteristics of an obesogenic food environment. Foods high in saturated fat, sugar and sodium and beverages sweetened with sugars are staples of their diets. Inadequate intakes of vegetables by all young adults prevail. In South America, Europe and Asia change from more traditional meal patterns to those typically encountered in the USA is occurring. Whether the dietary patterns of the current generation of young adults continue through their adult lives is yet to be answered.

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Ultraprocessed foods in Norway: an analysis of consumer purchase and expenditure

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Ultra-processed foods are contributing to the global obesity epidemic

The consumption of processed foods is one of the major factors contributing to the global obesity epidemic¹. A new framework for classifying food based on extent of industrial processing was introduced in 2009², and divides food and food products into:

- minimally processed (non-processed fruit, vegetables, legumes, meat, milk, eggs, grains, flours etc, and water);
- culinary ingredients (animal fats, plant oils, sugar, salt);
- processed (foods preserved through salting, drying, fermenting, tinning); or
- ultra-processed (mixed products such as ready-to-eat meals, snacks, and soft drinks).

Minimally processed foods and culinary ingredients are the basis for homemade meals and, together with processed foods, make up the basis of traditional diets. The increased consumption of ultra-processed products, however, is directly linked to obesity³. These products dominate diets in high-income countries and are penetrating markets of the poorest countries^{4,5}.

Study design: food sales data in Norway

This study assessed food sales data to identify the degree to which the Norwegian population is buying ultra-processed foods over less-processed food for preparing meals at home. We used data from food retail in Norway collected by Statistics Norway in September 2005 (n=150) and 2013 (n=170). Data consisted of 795,306 barcode scans of food item purchases, which provided information on type of food purchased, price paid, geographical region and retail type. The frequency of purchase and expenditure for each of the four food groups described above were analyzed.

Sweets, snacks and dessert are purchased more than five times as often as non-processed vegetables

We found that both in 2005 and 2013 ultra-processed products dominated food purchases and expenditure in Norway: 59 % of food items purchased and 49 % of food expenditure was ultra-processed foods. All minimally processed foods combined accounted for only 17 % of purchases and 33 % of expenditure on food.

Dividing food purchases into sub-groups showed that Norwegians spent less on and purchased less frequently minimally processed meat and poultry, fish and seafood, vegetables, potatoes, and fruit and berries compared to the respective processed and ultra-processed versions of these foods (figure 1).

Sweets, snacks and desserts were the most frequently purchased food items, accounting for 16 % of purchases in 2013. In comparison, minimally processed meat and poultry accounted for 2 % of purchases, and vegetables, roots and tubers accounted for 3 %. Only 2 % of

purchases were minimally processed fruit and berries.

Between 2005 and 2013, food sales changed marginally, but in favor of minimally processed foods and in disfavor of ultra-processed foods. The largest relative increases in purchases and food expenditure were found for minimally processed fruit and vegetables, and for ready-to eat/heat meals. Sales of sweet ultra-processed products decreased slightly (- 1% point). The changes towards a less processed food purchase pattern was considerably more expressed in the capital city, Oslo, than in the rest of the country.

Increases in sales of fruit and vegetables related to higher health awareness

Ultra-processed foods account for 60 % of purchases and 50 % of food expenditure in Norway, based on the data analyzed in this study. Sweet ultra-processed products alone accounted for every third food item purchase and more than a fifth of food expenditure.

The high share of ultra-processed products in the Norwegian diet is in line with findings from studies in other high-income countries⁶. If nutrient profiles of such diets in Norway are similar to those in Canada, for example, a reduction in the consumption of ultra-processed foods is necessary for the prevention of obesity and noncommunicable diseases. Of special concern is the high intake of sugar.

The reduction in share of food sales for ultra-processed products, and increased sales of fresh fruit and vegetables are in line with documented increases in health awareness among Norwegian consumers⁷.

Norwegian food and health policies rely on dietary recommendations, labelling, encouraging food reformulation, and food industry self-regulation of marketing⁸. This study recommends stronger focus on policies aiming at reducing intake of ultra-processed products and facilitating access (including economic) to less-processed foods.

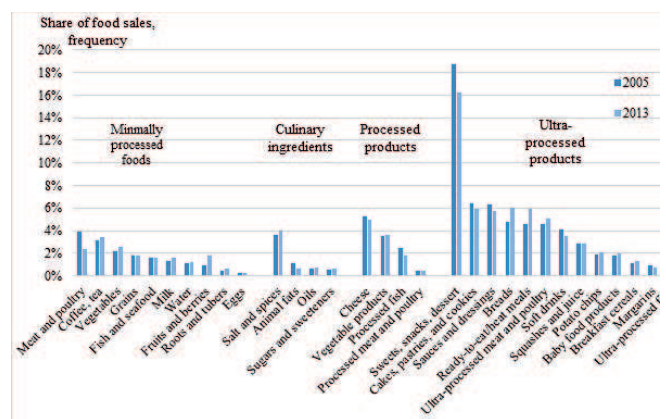


Figure 1: Food sales: share of frequency of purchase for food groups in September 2005 and September 2013

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The economic and intangible burden of obesity in Germany

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Unhealthy eating and resulting obesity are well-known and highly discussed threats to health that have increased to problematic extents in high income countries during the last decades. For years the WHO has pointed to the dangers of chronic non-communicable diseases that are caused by obesity¹. To underpin the urgency for preventive action against obesity in Germany, Tobias Effertz and colleagues from the University of Hamburg and the “Techniker Krankenkasse”, Germany’s biggest health insurance company within the statutory health insurance system, calculated the costs and consequences of obesity in Germany with claims data from the German statutory health insurance in a recent new study². For their study they analyzed a sample of 146,000 subjects including 31,032 obese persons being observed for 4.5 years with regard to health costs, employment and other economically relevant parameters.

Measuring and quantifying the cost and consequences of obesity in Germany

In Germany currently more than half of the adult population is overweight with 24% even being obese according to the Robert-Koch-Institute in Berlin. Effertz and colleagues’ cost assessment study has a threefold focus and is thus very comprehensive: first it aims to calculate the annual economic costs due to obesity, which comprise of costs in the German health sector and productivity losses for individuals and society. Second, the authors focused on intangible impairments due to obesity that were most often not considered in past studies, namely “pain and suffering” of obese subjects in addition to costs. Third, there is important information to be derived for policy makers and the public on whether obese subjects “pay their way” in the German social security system, i.e. whether paid social insurance premiums exceed the costs for obese people or not. To address this question, the total net costs of an obese individual were calculated from a lifecycle perspective. In the past industry advocates e.g. the tobacco industry claimed that persons with risky life-styles yield a death benefit for society, since they receive fewer pension payments due to their higher mortality. The study aimed at critically verifying this claim.

Resulting tangible and intangible consequences of obesity

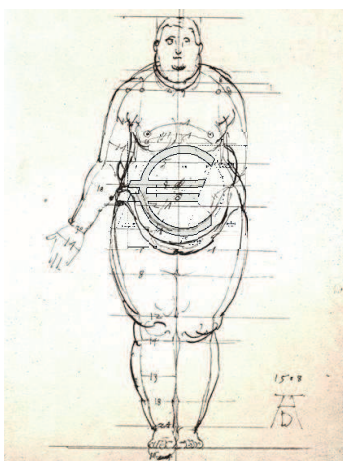
The results of the new German study are alarming: In total the annual costs of obesity in Germany sum up to 63 bn. € each year with 29.39 bn. € direct costs in the health sector and 33.65 bn. € of productivity losses like unemployment and mortality.

In relation to the total budget of Germany’s statutory health insurance, 13.65% of all costs could be avoided if obesity would be effectively reduced. But since obesity in Germany is on the rise and has a high latency period for several severe diseases, the authors expect the economic costs to increase substantially in the future. The study estimates that obese people on average lose up to four years of life expectation. 102,000 persons die prematurely due to obesity in Germany each year: a figure close to the 110,000 annual deaths due to smoking in Germany. Additionally, pain and suffering, assessed by the authors with the likelihood of being diagnosed with acute or chronic pain during the observation time and additional comorbidity burden is significantly increased. For example, the likelihood of being diagnosed with pain is 6 to 12 percentage points higher among obese persons. More than half of the older obese women in Germany suffer from acute

or chronic pain. This displays the loss in quality of life that an obese individual suffers on average. Concerning the third focus of the study: the decreased lifetime does not compensate the high costs that accumulate throughout the life-cycle. Every obese male adolescent aged 15 causes net costs of 166,911 € in present value terms throughout the life-cycle; women even cause 206,526 € due to lower wages and working-times.

A wake-up call for Germany: The need for effective prevention

The derived figures display a crucial truth often neglected by public health politicians especially in Germany: Behavior-orientated prevention instruments, e.g. information-campaigns and education in school on nutrition, which have been widely promoted by the food industry in Germany, are mostly ineffective. Industry’s food-marketing has constantly generated an “adipogenic environment” with advertising being aimed at children and low prices for unhealthy foods. Obesity is the manifestation of an unhealthy lifestyle that due to the strong habituation of eating also calls for strong instruments of prevention. Higher taxes on unhealthy foods high in fat, salt and sugar seem to be a strong and promising instrument to curb and reduce the occurrence of obesity in Germany. Finally, more than half of the incident cases of obesity in Germany are documented among subjects younger than 20 years of age. Public health politicians should realize that the roots of unhealthy eating and the obesity pandemic lie in childhood and adolescence. An important step forward in prevention would thus be the ban of food advertising to children in mass media, since they do not understand the lures of advertising appropriately. Most of Germany’s parents would surely consent to this.



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