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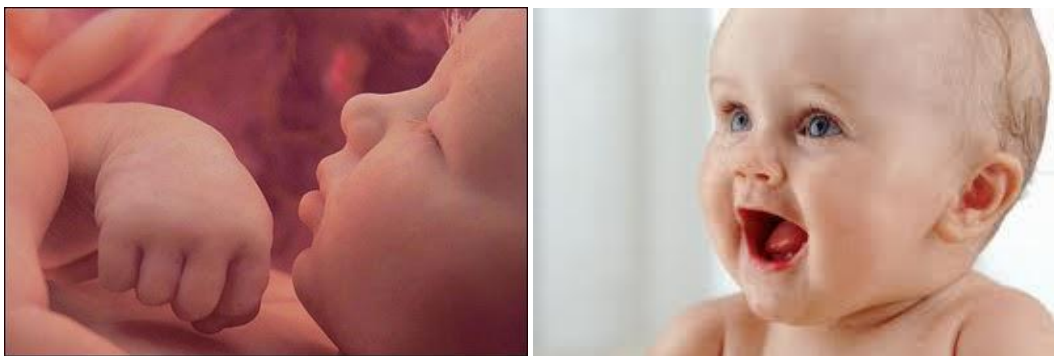
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*Editorial*

## It's the beginning of a new age



***The best science and the best reasoning on nutrition support common sense.  
It is at the beginning of life that the seeds of health and of disease are sown.***

Here we introduce and celebrate two *WN* contributions. First is the position paper produced by the society for the Developmental Origins of Health and Disease (DOHaD) (1). It is their submission to the UN Summit on prevention of chronic disease taking place in New York in four months' time. Second is the latest commentary on ultra-processed products by Association Council member Carlos Monteiro (2). Its topic this month is the process of hydrogenation. The themes of both these contributions, derived from the highest level of excellent research and reasoning in our field, are revolutionary, in analogous ways.

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### **Ideas always come first**

It is often thought that new discoveries in science depend on an initial meticulous methodical accumulation of a mass of well-ordered data, from which new concepts spring, which may then become the basis of public policies and actions. Typically this is not actually what happens. The idea, or hypothesis, comes first, and is then tested by research. Sometimes ideas are fairly rapidly shown not to fit with the facts. At other times, an idea may stand up pretty well, although anomalies become evident. Alternatively, an idea may be consistently backed with research results, but somehow, when made the basis of policies and actions, it seems not to work. At such times it is typically said that more research is needed. Usually, however, what is needed is more thought. This is too often forgotten. As the poet and playwright TS Eliot lamented: ‘Where is the wisdom we have lost in knowledge? Where is the wisdom we have lost in information?’(3).

An often fruitful approach, evident in the two *WN* contributions introduced here, is to examine information that already exists, but from a new point of view. Like the sleuthing of the great fictional detectives Sherlock Holmes and Hercule Poirot, this can lead to exciting or disconcerting discoveries and insights. Take, for example, the epic ‘Seven Countries Study’ masterminded by the powerful US epidemiologist Ancel Keys (4). Its best-known finding was that Cretan peasants consumed a great deal of fat, in the form mostly of olive oil, but had low levels of cardiovascular disease. The conclusion was that the main dietary determinant of cardiovascular disease risk was not fat in general, as had been thought, but a sequence of chemical components of fat – saturated fatty acids, which up to that time were practically unheard of, other than by food scientists and specialist nutrition scientists. This has remained the mainstream view for the past 40 years, with almost iconic status.

But is it true? A recent book by a leading US science writer says no, the saturated fat theory is wrong (5). A number of leading researchers including the Harvard group led by Association member Walter Willett do not dismiss the theory, but give it diminished importance (6).

There are at least five alternative theories that do or may fit the facts. One is that the crucial dietary factor in Crete has been not low levels of saturated fat, but abundant amounts of unsaturated oil, in this case from olives. Another is that the traditional Mediterranean diet includes many vegetables and other plant foods, rich in a variety of nutrients and bioactive constituents. A third, complementary idea is that garlic consumed in abundance has extraordinary protective powers. A fourth observation is that at the time the Seven Countries study was undertaken, Cretan peasants fasted for around half of every year. The Greek Orthodox Church stipulates abstinence from meat, fish, milk, eggs, cheese – and olive oil – every Wednesday and Friday, and for the 40 days of Lent, the 15 days of the Assumption, and the 40 days before Christmas. This was overlooked by the Seven Countries investigators, so some of

their findings may be dud (7). Maybe the protective factor all along was dietary restriction. And there is a fifth idea, on which more below. This is that the crucial causative dietary factor is not so much saturated fat from meat and dairy products, the interpretation placed on the Keys doctrine in high-income countries, but fats generated by industrial processes.

Arising from all these data and insights, a master theory emerges, which does not dismiss the reductionist saturated fat theory, but which, in the best detective tradition, puts it in a brighter light, so that you exclaim, after the explanation, 'Of course, how obvious!' This is that healthy food systems and supplies, and therefore dietary patterns, emphasise fresh and minimally processed foods, and meals made from these foods with the addition of staple ingredients (8,9). Your grandmother could have told you this. Well, grandmothers are wise women.

### **Finding the right time**

This leads to the position paper we publish in this issue, from the Society for the Developmental Origins of Health and Disease – DOHaD (2).

Since the 1960s and 1970s a consensus on the best dietary patterns to prevent cardiovascular disease, and also obesity, diabetes, common cancers, and other conditions, has developed and been confirmed again and again (10). It has been summarised in the most recent WHO report on the subject (11). As we all know, it is, for societies consuming typical industrialised diets: less saturated fats, adequate unsaturated fats, more carbohydrate and dietary fibre but less sugar, less salt, and more fruit and vegetables.

Practically everybody in the profession accepts this rather dismal prescription. The trouble is though, that it seems not to work. The relevant cancers are generally increasing, except where screening and treatment is relatively effective. Rates of overweight, obesity and diabetes are rocketing. Rates of death from cardiovascular disease have dropped impressively in high-income countries, but changes in rates of incidence are far less impressive, suggesting that the main factor is improved treatments with drugs and surgery. Besides, rates of death in lower-income countries continue to rise. So what has gone wrong?

Cynics will say that most folks don't read or act on reports issued by UN agencies and national governments. True, but many governments, together with relevant industries and non-government organisations, have taken action. The shapes of national food supplies have often changed somewhat as recommended. But apart from impressive improvements in rates of hypertension and stroke following rigorous national measures in a few countries, the results are unimpressive. So others may say that by the time chronic diseases emerge, it's usually too late to do much about them. Exactly! Enter DOHaD.

The ‘developmental origins’ thesis is summarised in a book written for the professional and also interested lay reader, by the DOHaD Society president Mark Hanson, and his co-author from New Zealand, DOHaD trustee Peter Gluckman (12). They say: ‘The fundamental idea is that early in life, primarily in the embryonic, fetal and perhaps the postnatal period, mammals make irreversible choices in their developmental trajectories – not primarily to deal with the immediacy of their environment at the time... but rather because they are predicting the environment into which they will be born or grow up.... When put into the human context it... explains the origins of many common diseases including heart disease and type 2 (or adult-onset) diabetes mellitus’. They continue: ‘This radically changes our concepts of how and when to intervene in populations to reduce the burden of disease... The consequences for our species are particularly dramatic because perhaps for the first time in our evolutionary history, humans now inhabit an environment in which we have not evolved to live’.

What is meant by this profound proposal is indicated in the DOHaD position paper (2). Thus, it emphasises that in infancy and young childhood, rates of breastfeeding, and especially exclusive breastfeeding, once the universal norm, remain low. And in later childhood, to quote: ‘Data from all regions of the world show that rapid weight gain after infancy, which is to say at any time during childhood and adolescence, is associated with an increased risk of adult obesity, hypertension and cardiovascular disease, and type 2 diabetes. This is especially true on a background of impaired fetal and infant growth. This high-risk pattern of growth is increasingly common in low- and middle-income countries, where low birth weight and infant growth faltering are common, but where economic development is leading to rapid childhood weight gain’. For ‘economic development’ read sugary fatty salty energy-dense ultra-processed ready-to-heat and ready-to-eat products and sugared drinks, plus being driven everywhere and computer games.

Moreover: ‘There is a large body of evidence that cardio-metabolic risk factors, including adiposity, blood pressure, plasma lipids, insulin resistance, “track” into adult life – children with higher levels of adiposity, blood pressure and insulin resistance will become adults at highest risk of non-communicable diseases’.

It is impossible to overstate the importance of these statements. What they are saying, is that dietary recommendations to prevent chronic diseases are not wrong, but are turned into public policies and actions at the wrong time, in adult life, when it is indeed usually too late. This has many implications. One is that resources should now be diverted to protect the health primarily not of us, nor indeed our older children, but of the next generation. The main responsibility of adults, as family members and citizens, is to set a good example.

Two is that public health measures designed to protect the interests of babies and children, and crucially of children yet to be conceived and born, must include statutory measures. Examples of these are extended maternity leave, to enable exclusive breastfeeding, and stringent restrictions on the advertising and marketed of ultra-processed products to children. It is good to see that the NCD Alliance of leading global bodies concerned with the prevention of chronic diseases, have asked in their own position paper to the UN Summit, just published, that member states 'By 2013, develop and implement comprehensive strategies to decrease childhood obesity, and eliminate all forms of marketing, particularly those aimed at children, for foods high in saturated fats, trans-fats, salt and refined sugars by 2016' (13).

### **Looking in the right place**

And so now to the new commentary on ultra-processing by Carlos Monteiro that we publish in this issue (1).

In 1950, towards the end of his life, Norbert Wiener, one of the founding fathers of electronic communications, published a valedictory book (14). In it he wrote about chemical experiments. He said: 'With our modern techniques, we can hydrogenate or dehydrogenate fats as we please... Even minute quantities of these and other deleterious products may be fatal after many years of apparently innocuous use, and may contribute to the toll of degenerative disease. It is certain that the processing of food is subjecting us to many risks universal to the nation if not to the race, which may not show themselves until it is too late to do anything much about them'. Nobody paid any attention, of course.

Over 60 years later, the topic of Carlos Monteiro's commentary is hydrogenation. His general thesis is that with nutrition and health, the issue is not so much food, or its nutrients and constituents, so much as what is done to food before we buy and eat it, and that the big public health issue is ultra-processing (8.9). Hydrogenation, used to turn liquid oils into solid fats, is a malign process, in its effects on human health. So turning back to the doctrine originally developed by Ancel Keys, the issue is not so much saturated fats, the constituents, as the hydrogenation process that generates saturated fats and, as we all know now – though the authors of the Seven Countries Study did not – *trans* fats.

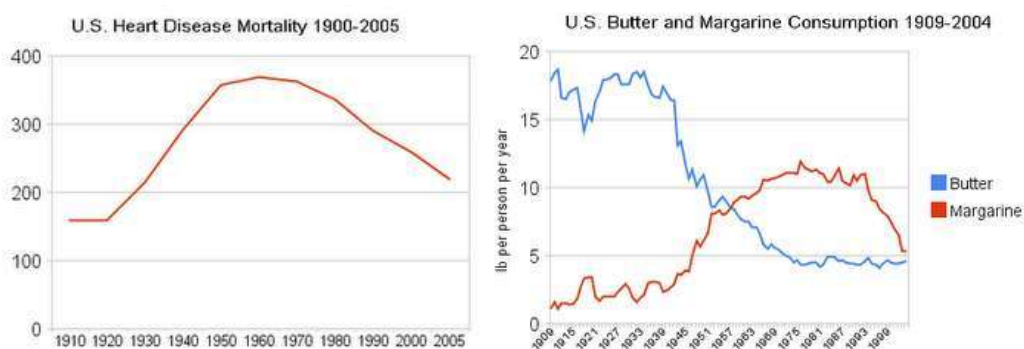
The commentary does not exonerate saturated fats from meat, meat products, and milk and dairy products, in the quantities typical within industrialised food supplies. Not at all. In any case, industrial production of animals is itself a type of process, which makes meat and milk cheap, and also increases the fat in the bodies of animals raised in factory conditions and makes it more saturated.

As well as the evidence and reasoning in Carlos Monteiro's commentary, there is an intriguing set of data available on many websites. A search using key words like

‘margarine’, ‘butter’ and ‘heart disease’ readily turns up graphics like those in Figure 1, below. These show that the curves of margarine consumption and of heart disease mortality, here shown in the US, look rather similar, whereas the curves of butter consumption and of heart disease mortality are in completely different directions. Such crude epidemiological data are normally not seen as amounting even to weak evidence, and in any case table fats are only one source of saturated fats.

*Figure 1*

### **US heart disease mortality 1900-2005 and US butter and margarine consumption 1909-2004**



*The main single source of trans fats in US and other food supplies until the later 20th century was hard margarine. Graphs like these are suggestive only*

But there is a different interpretation of this information, as being not about butter or margarine, the foodstuffs, but about hydrogenation, the process mainly used to make margarine and shortening, and many home-cooked and commercial baked and other foods. Until the 1980s these ingredients and products were stuffed with saturated fats and also toxic *trans* fats. Then starting in the 1980s, margarine manufacturers, aware of the science on different types of fatty acid, began to reformulate their products. Could the impressive decrease in rates of death from cardiovascular disease be at least to some extent down to margarine manufacturers? Older readers whose mothers are still alive may now feel like making anxious enquiries about the types of table and cooking fat used at home when they were children. We leave you with this thought.

*The editors*

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## **Acknowledgement and request**

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