

## THE IMPORTANCE OF TENDER LOVING CARE: ELSIE WIDDOWSON'S RESEARCH IN GERMANY



**Ursula Arens**  
Writer; Nutrition  
& Dietetics

Ursula has spent most of her career in industry as a company nutritionist for a food retailer and a pharmaceutical company. She was also a nutrition scientist at the British Nutrition Foundation for seven years. Ursula helps guide the *NHD* features agenda as well as contributing features and reviews



**Dr Margaret Ashwell, OBE, PhD, FAFN, RNutr (Public Health), Research Fellow**

Dr Margaret Ashwell has been a Senior Research Scientist with the Medical Research Council, Science Director of the BNF and an Independent Consultant, working for government and industry. She is an author and editor of the biography of the nutrition pioneers, McCance and Widdowson. She was appointed an OBE in 1995 and was elected as a Fellow of the Association for Nutrition (AfN) in 2012.

**Dr Elsie Widdowson (1906-2000) was an extraordinary pioneer dietitian and the fact that the BDA annual lecture bears her name is just one of the many ways that her achievements continue to be recognised. A tribute to her and Professor Robert McCance was edited by one of the authors (MA) and published by the British Nutrition Foundation in 1993. Their joint professional timeline spanned 60 years, but some of their most fascinating research adventures occurred during their time in bleak, post-war Germany.**

In 1946, the Medical Research Council suggested that funding was given to Robert McCance and Elsie Widdowson to examine how war and extreme food shortages had affected the German civilian population. They toured many cities and found that the hospital in Wuppertal had the best laboratory facilities, but especially of interest, was the presence of a completely bilingual English-German doctor who was anxious to support their research. What had started as a six-month project stretched into three years of data collection.

One of the projects that Elsie led, was an examination of the effects of different kinds of bread on growth. This was specifically to support decisions on post-war bread specifications, for although the war time national loaf made from high extraction flour was healthy, it was unpopular. In January 1947, Elsie found a suitable orphanage in Duisburg for the bread feeding experiments. The children were all underweight and under height and for 18 months they were fed five different diets where 75 percent of energy was provided by bread. The breads were made from one of five types of flour: 100 percent (wholemeal), 85 percent and 72 percent extraction (white) and two white flours enriched with B vitamins and iron by a smaller or greater amount. In addition, all flours were for-

tified with calcium carbonate. Conclusions were that all of the breads were equal in relation to supporting growth in the children. Elsie announced her results at the annual conference of the British Medical Association and, in a time before PowerPoint, presented five of the girls, one from each of the different bread groups, and challenged the learned audience to detect any differences (there were none). Perhaps not the most scientific way to document the effects on growth of different diets, but a very exciting adventure for some young German orphans and a very interesting visual aid for the learned medics.

Another project that Elsie led was an examination of the effects of providing additional bread to the meagre baseline diets of young children. In 1948, Elsie recruited two small municipal orphanages which each housed about 50 children between the ages of four and 14 (the average age was just under nine). The children were all short and thin and would be weighed every fortnight for a year. For the first half year, all children would be on the normal official rations and for the second half year, children at one of the orphanages would be given unlimited amounts of additional bread to fully satisfy their appetites, along with some extra margarine/jam and concentrated orange juice.



The results observed in the first six months were peculiar. Although all the children appeared to consume the same diet, changes in weight and height were different. At one of the homes, children gained exactly the predicted average amount of 1.4kg weight. In contrast, children in the other home gained on average less than 0.5kg.

The results in the next six months were even more peculiar. In complete contradiction to prediction, weights and heights of the children kept on standard meagre rations increased significantly. Children given the extra bread rations grew at only modest levels and, astonishingly, after the six month period, their average weights and heights were below those of the children in the orphanage not receiving supplementary foods. The observations were completely bizarre because weights had been so systematically collected, the food intakes so carefully measured and observed. The results

seemed absurd and Elsie was mystified.

Elsie was busy, but always had time to care for the little things that needed thought and attention. Lois Thrussell was a research nurse tasked with doing all the measurements for the energy and mineral balance studies. But Lois was unhappy about the fact that she had been commanded out of a room in the orphanage; she had to do her research in a hen house. The issue of concern was that the hen house had whitewash on the walls, but it was prone to flake off and ruin the calcium balance measurements. Elsie was the Miss Fix-it, and found an expensive piece of cretonne to drape over the walls. But Lois was still full of tears and told Elsie of her anxieties over the way that the orphans were treated by the very harsh and vindictive housemother. Mealtimes were dreaded by the children, because this was the time in their day for public scorn and rebuke over trivial misdemeanours. ►



Elsie went to investigate and was able to confirm the constant fear of the children over public and victimizing reprimand by the housemother at mealtimes. Food would be cold and children would be in tears. Further examination led Elsie to find out the amazing coincidence that the 'dragon-lady' had transferred from one of the orphanages to the other (the one being given the additional bread) at exactly the six-month changeover period of the project. During the dragon-lady's reign at the first orphanage, the children gained nearly one kilo less than at the second orphanage, despite identical food rations. During her reign at the second orphanage, growth in the children decelerated to the point that weights were below those of children not receiving the additional bread and juice. Elsie further discovered that the dragon-lady had a few particular favourites; children who could do no wrong in her eyes were always given praise. When she transferred between orphanages, she was able to transfer eight of these children with her; in the year of the project, the favourite children gained on average four kilos: one kilo more than any of the other children.

Elsie concluded from her study that psychological stresses due to harsh and unsympathetic handling could seriously curtail growth

rates, maybe through influences on digestion. Of course, it would be impossible to repeat or confirm the research. But in poetic form, she included in her 1951 Lancet paper, the biblical reference from Proverbs that, 'Better is a dinner of herbs where love is, than a stalled (fatted) ox and hatred therewith'.

More than 20 years ago, one of the authors (MA) was able to get Elsie to pull together her thoughts on research into a very short list of golden nuggets of advice, and many of the items reflect outcomes from her projects in Germany. This guidance, resulting from 60 years of research into nutrition science, is still valuable to dietitians and other researchers today and is the essential share-it item.

### Advice to a young scientist - by Elsie Widdowson

- Treasure your exception - Your extreme results may be the most interesting part of your study.
- Vary your conditions - Sometimes changing two variables give you results that changing single variables will not detect.
- Do not be afraid of owning up to a mistake, even if your results have already been published - It is better that you publish a correction than giving someone else the pleasure.
- If you're using an animal as a model for human adults or children, be careful to choose an appropriate species of the right age for your experiments - Some observations are age or species specific.
- If your results don't make physiological sense, think! You may have made a mistake or you may have made a discovery - Check everything, but then think of alternative explanations - sometimes they are the new discovery. As shown above in the German orphanage study, tender loving care of children may make all the difference to growth and health.

#### Information sources

- Ashwell M (ed) McCance & Widdowson; a scientific partnership of 60 years. British Nutrition Foundation, 1993
- Buklijas T. Food, growth and time: Elsie Widdowson's and Robert McCance's research into prenatal and early postnatal growth. Studies in History and Philosophy of Biological and Biomedical Sciences (2013)
- Widdowson EM (1951) Special Articles: Mental Contentment and Physical Growth. Lancet, 1951, i: 1316-1318