

FOREWORD TO THE SIXTH EDITION

The Composition of Foods is widely acknowledged as the key reference tool for all those who need to know the nutritional value of foods consumed in the UK, and for over 60 years it has proved invaluable to its many academic, professional and student users.

I therefore welcome this 6th summary edition, and am pleased that the Food Standards Agency has been able to play a part in its publication, working in close collaboration with the Institute of Food Research.

The series began with the vision of Professor McCance and Dr Widdowson in the 1930s. This edition is dedicated to their memory and I commend to you their foreword to the 5th edition of *The Composition of Foods*, reproduced overleaf.

A handwritten signature in black ink that reads "John Krebs". The signature is written in a cursive, slightly slanted style.

**Sir John Krebs
Chairman
Food Standards Agency**

FOREWORD TO THE 5TH EDITION OF *The Composition of Foods*

By R.A. McCance and E.M. Widdowson

In 1926 I (R. A. McC) was a medical student at King's College Hospital, London. Dr R. D. Lawrence, himself a diabetic, was in charge of the diabetic patients, and he was writing a book 'The Diabetic Life'. He wanted to include some values for the carbohydrate content of fruits and vegetables, which were then an important part of diabetic diets, but there were problems with this. First the values that were being used were derived from Atwater and Bryant's tables published in America in 1906, and these were nearly all obtained 'by difference', that is, water, fat, nitrogen and ash were determined, nitrogen was multiplied by 6.25 to obtain protein, the percentages of these were added together and the sum subtracted from 100 to give the percentage of carbohydrate. Carbohydrate calculated in this way contained not only sugar and starch which were important to the diabetic, but also the 'unavailable carbohydrate' or dietary fibre. Another problem in using the American tables was that most of the analyses had been made on raw materials, whereas people eat most of their vegetables cooked and their composition is altered by cooking. So a grant of £30 a year was obtained from the Medical Research Council for me to analyse raw and cooked fruits and vegetables for total 'available carbohydrate', that is sugars plus starch, which was the value needed for calculating diabetic diets. I analysed 109 different plant materials, each on six separate occasions, in the time I had to spare from my medical studies and the results were published in 1929 as a Medical Research Council Special Report No. 35 'The Carbohydrate Content of Foods' by R. A. McCance and R. D. Lawrence.

When Professor Cathcart, Professor of Physiology at Glasgow University, read the report he suggested that the work should be extended, and that protein and fat should be determined in meat and fish. The Medical Research Council agreed to provide a grant to cover the salaries of a chemist, H. L. Shipp, and a technician, Alec Haynes, and a study of meat and fish began. Sixty-two varieties of fish were analysed, all except oysters cooked, 26 different cuts of meats, 9 varieties of poultry and game and 9 different kinds of 'offal', all cooked in standard ways. Besides total nitrogen, purine N, amino-N and extractive-N were determined and the analyses included fat, carbohydrate when present and minerals Na, K, Ca, Mg, Fe, P and Cl. We also investigated the losses of various constituents when meat and fish were cooked in various ways. Shrinkage caused most of the losses from meat, but not from fish. All the results were published in 1933 as a second Medical Research Council Special Report No. 187 'The Chemistry of Flesh Foods and their Losses on Cooking' by R. A. McCance and H. L. Shipp.

At the end of this study H. L. Shipp left and was replaced by L. R. B. Shackleton, and it was at this point that I (E. M. W.) joined the team. We four started again on fruits, vegetables and nuts. The analyses included 56 varieties of fruit, 9 of nuts, 28 of raw vegetables and 44 of vegetables after cooking. We analysed them

for water, total nitrogen, glucose, fructose, sucrose and starch and for 'unavailable carbohydrate'. The same minerals were determined as in the meat and fish. Losses of sugars, nitrogen and minerals from vegetables while being boiled were also investigated. These results made a third Medical Research Council Special Report, No. 213, published in 1936 'The Nutritive Value of Fruits, Vegetables and Nuts' by R. A. McCance, E. M. Widdowson and L. R. B. Shackleton. The stock of all these reports was destroyed in a fire resulting from an air raid on London during World War II and they have been out of print ever since.

In 1938 we moved to Cambridge. L. R. B. Shackleton left but Alec Haynes came with us. We finished the analyses we had begun in London on cereals, dairy products, beverages and preserves and we put the results of all our analytical work together to make the first edition of 'The Chemical Composition of Foods' by R. A. McCance and E. M. Widdowson. This was published in 1940 as the fourth Medical Research Council Special Report No. 235. The working notebooks containing the details of all the analyses have been deposited with the Wellcome Institute for the History of Medicine.

Since one of the uses of the tables was likely to be the calculation of the composition of diets, and diets generally include cooked dishes we gave some information about their composition. Most of the recipes were taken from standard cookery books, and 90 are to be found in that first edition.

A second edition appeared in 1946, which included values for wartime foods, Household milk, dried eggs and National wheatmeal flour and bread made from it. Values for the composition of about 20 'economical' dishes were included.

In the 1950s we began to work on a third edition. By then many new foods had become available, and those introduced in wartime had disappeared from the market. Alec Haynes had left, and Dr. D. A. T. Southgate joined us. He, with the help of a technician, Janet Adams, was responsible for analysing more than 100 new foods for the same constituents as we had previously done.

By the 1950s methods for the determinations of vitamins had improved, and many foods had been analysed for one or more of them. We decided to depart from our original principle of including only the results of our own analyses in the tables, and to use values taken from the literature. Dr. W. I. M. Holman, who knew a great deal about the determination of vitamins in foods, undertook the task of reading every paper he could find on the vitamin content of foods published in the past 15 or 20 years. This involved abstracting well over 1000 papers. He selected those reporting results which he believed to be reliable, and then he left us and his abstracts to take up a post in South Africa. Miss I. M. Barrett joined us, and she constructed the tables of the vitamin content of foods from the information Dr. Holman had collected together.

Values for the amino-acid content of the main protein-containing foods, cereals, meat, fish, eggs, milk and its products, and of some nuts and vegetables were also included in the third edition. These were partly taken from the literature and partly from analyses made by Dr. B. P. Hughes who was working with us at the time. The third edition was published in 1960, with a change of title to 'The Composition of Foods'. As time had gone on some cookery experts had been rather critical of our original recipes, so the whole of the section on the

composition of cooked dishes was revised with the help of members of the cookery department of King's College of Household and Social Science.

Up to the third edition we had the ultimate responsibility for the tables. I (R. A. McC) retired in 1966 and it became clear that a decision had to be made about the future of 'The Composition of Foods'. Tables such as these must be revised from time to time or they become obsolete and therefore useless. In the late sixties I (E. M. W) raised the matter at a meeting of the Interdepartmental Committee on Food Composition. It was unanimously agreed that the tables must not be allowed to die. The Interdepartmental Committee on Food Composition accepted responsibility for the revision of the tables, and appointed a Steering Panel under the chairmanship of Dr. D. A. T. Southgate to advise those responsible for the revision, leading to the fourth edition. In the event meats were completely reanalysed. The conformation of farm animals had altered and methods of butchering had changed since the 1930s when the original samples were collected. Cereals, milk and milk products were also extensively revised, but most other foods were not reanalysed, and about a third of the values in the fourth edition, published in 1978, were our original figures, obtained by what are regarded nowadays as very primitive methods 40 years before. Those methods were no less accurate than the modern automated ones, but they took a much longer time.

Since 1978 several supplements to the tables have been published covering the composition of different groups of foodstuffs as these have been revised, and tables showing the composition of foods used by immigrants in the United Kingdom were made available. Now a fifth edition summary edition of 'The Composition of Foods' has been prepared. This represents the work of many people including those who were responsible for making the analyses as we had done half a century ago. We are happy that we are still part of it.

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