



**In memory of
Brittmarie
Sandström,
1945–2002**

Professor Brittmarie Sandström, PhD, passed away on 22 October 2002, at the age of only 57 years. Nordic nutrition science has lost one of its most competent, respected and productive researchers. Brittmarie Sandström was born in Umeå, Sweden. She worked for most of her professional career at the Research Department of Human Nutrition, Royal Veterinary and Agricultural University in Copenhagen, Denmark, where she started in 1987 as Associate Professor. In 1990 she got a 5-year grant as Research Professor and in 1995 she was awarded a Chair as Professor of Nutrition.

Brittmarie Sandström died after a two-year-long disease, against which she fought with determination, refusing to give in. She remained professionally active until the very end of her life.

Brittmarie's basic education in nutrition began with a BSc in Home Economics in 1968, giving her practical knowledge and experience in food composition and food preparation. She then took a BSc in Nutrition in 1973 at the Institute of Nutrition Research, University of Oslo, Norway. The research training at the Department of Clinical Nutrition, University of Gothenburg, Sweden, included education as a dietician, RD, and a PhD in nutrition in 1980, followed by a position as Lecturer in Nutrition until 1987. In her thesis *Zinc absorption from composite meals* she developed a radioisotope method for studying zinc absorption in human subjects. She applied this method to study the effects of the extraction rate of flour, and protein source and amount, on the absorption of zinc. Brittmarie addressed these questions in a series of well-designed studies, and the results are still of significance in human zinc nutrition. Her strong dedication to developing solid and valid methodology, applying the methods to questions of practical nutritional relevance, was evident already in her thesis.

After the dissertation Brittmarie joined a research group at the University of California, Davis, USA, to study zinc absorption from infant diets. Breast milk, cow's milk and infant formulae were explored, as well as individual factors in such diets affecting zinc absorption. The results of these studies were of key importance as a basis for future studies on zinc in infant nutrition and in establishing the zinc requirements of infants. One important step was the development of a suckling rat pup model, a useful, quick and inexpensive way to assess zinc bioavailability before human studies. Later, the experience gained from zinc studies was used to develop a radioisotope method for studying manganese absorption in human adults.

The international Zinc Nutrition Consultative Group (IZiNCG) was formed to evaluate critically knowledge about zinc nutrition in human populations, to assess zinc status and absorption, to establish zinc requirements, and to devise strategies for zinc fortification and supplementation. Brittmarie was a natural choice as a member of the scientists constituting this group. She participated at the formative meeting but was unfortunately too ill to travel to the subsequent meetings. However, from her office and home in Copenhagen she contributed very actively to the working documents. The final comprehensive document is now under review by the World Health Organization (WHO) and will, without doubt, prove to be the guide for nutritionists, programme planners and health administrators for the foreseeable future.

Brittmarie Sandström moved to Copenhagen in 1987 to participate in the establishment of a new research institute on human nutrition at the Royal Veterinary and Agricultural University. She directed a number of studies on the effect of diet on various risk factors for cardiovascular diseases. She started with the unique 8-month-long fully controlled study of the effect of a diet in accordance with the current Nordic Nutrition Recommendations (NNR), with special emphasis on its low-fat and high-fibre profile. Young healthy subjects were compared with a matched control group in which the subjects ate their usual diet. The intervention group showed significant and favourable changes in their blood lipids, body weight, blood pressure and various haemostatic variables, all of which deteriorated after the trial as the participants gradually returned to their former traditional Danish dietary habits. A number of studies followed on the

effect of various fats and fatty acids in experimental 3 week periods. The participating subjects were randomized to the diets in a cross-over design separated by washout periods. The test fat replaced most of the fat in their otherwise ordinary meals.

Brittmarie participated in several councils within the WHO, European Union-concerted actions and non-governmental organizations such as the International Life Science Institute, and in several national and international expert committees, including the Danish Nutrition Council.

She had a longstanding affiliation with the Swedish National Food Administration and was regularly consulted on matters relating to minerals and trace elements. She was a member of the Swedish Expert Group for Food and Physical Exercise and Health from 1987. Her contributions were always wise and well balanced. She was one of the authors of the much appreciated reference book *Diet, physical exercise and health*.

Brittmarie also participated actively in the elaboration of the NNR in a Committee under the Nordic Council of Ministers, from the beginning

of this work in 1980. She was the chairperson of the committee in 1992–1996, which produced the third edition of NNR in 1996. Thanks in large measure to her high ambitions, this edition attained a status similar to major international counterparts.

The study and understanding of nutrition were in focus in Brittmarie Sandström's life, and her competence and experience in teaching have left their impression on Swedish and Danish education in dietetics and nutrition in many ways. Her capacity for work, her immense knowledge and her status as a leading international expert in zinc metabolism will remain recognized and respected after her death, not only in Scandinavia but also internationally. Brittmarie was a quiet but determined person, with a strong character, and she was well liked in all circles. The field of nutrition has lost one of its great scientists, and we have lost a good colleague and a close friend.

Arne Astrup, Björn Isaksson, Bo Lönnerdal, Åke Bruce, Gösta Samuelson and Nils-Georg Asp