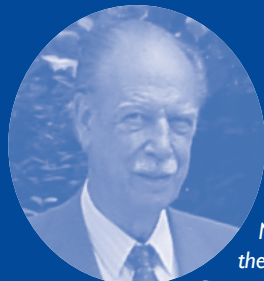


Newsletter

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EDITORIAL



The Danone International Prize for Nutrition, one of the most prestigious Prizes within the field of

nutritional sciences, has been awarded this year to Dr. Ricardo Bressani for his lifetime contribution to finding long term effective solutions for the global issue of undernourishment. Dr. Bressani, an internationally respected food and nutrition scientist, spent most of his life researching at the Nutrition Institute of Central America and Panama (INCAP). At present he is heading the Food Science and Technology Research Department of the Universidad del Valle in Guatemala where he also teaches (post graduate programme).

Also this year, a great number of people has been involved in the selection process. This includes the 626 members of the Nomination College, the 64 applicants to the Prize, the 27 members of the different committees and jury, as well as several administrative persons.

We acknowledge the good will and efforts of all those involved and thank them for their dedication, time and contribution to this challenging but not always easy task.

As the Chairperson of the different working groups, I have the pleasure to say that I am honoured to award this year's edition of the Danone International Prize for Nutrition to Dr. Ricardo Bressani. Together with his research team, he has greatly contributed to innovative research within the field of food and nutrition, and most in particular, has played a significant role in the prevention of undernourishment and the improvement of the nutritional status and quality of life of thousands of children from several countries in Latin America.

We congratulate Dr Bressani for this major achievement.

Prof J. E. Dutra de Oliveira,
University of São Paulo, Brazil
Chairman of the 2003 Danone International Prize for Nutrition

Ricardo Bressani, 2003 Awardee

The 2003 Danone International Prize for Nutrition is awarded to Dr Ricardo Bressani for his lifetime dedication to the "silent" emergency of undernourishment in Latin America. In more than 40 years of ongoing research activities on finding practical solutions to local nutrition issues, which affect women and children in particular, Dr Bressani's findings have had a profound impact on the well being of populations in Guatemala.



Dr Ricardo Bressani's contributions are marked by innovation and persistence. Realising the importance of nutrition on public health while being a student, he started pioneering soon after completing his basic scientific education in 1951. In his earliest work he studied the genetic variability of the nutritional value of corn - a cereal grain on which Guatemalans as well as most Latin American populations greatly depend on- and a topic he continued to study throughout his entire career. The aim of this research was to obtain improved varieties with better lysine and tryptophan content-amino acids in maize which limit the nutritional quality of its protein. Bressani's breakthrough methods in this area led to the development of Opaque-2 corn - with a protein quality nearly equivalent (90%) to the one found in cow milk- found by Purdue University scientists in 1964. Further studies on the amino acid supplementation of maize, rice, wheat flour and oats in

young children were carried out. The results of these studies among other have proven useful in relation to the improved modification of the FAO/WHO reference amino acid pattern.

In light of the stringent protein-energy malnutrition problem (PEM) -the most lethal form of malnutrition- in Guatemala, Dr. Bressani continued in 1953 research activities on the development of vegetable protein mixtures for children and adults. Studies followed to formulate a series of mixtures based on local resources (cereals, legumes, oil seeds, starchy foods) and to test the nutritional value and safety for human beings. This ambitious research project led to the development of a series of high nutritional quality products such as Incaparina, Bienestarina and Innovarina, which have been on the Guatemalan market for over 40 years and have become part of the Guatemalan food basket and diet. In order to maximise acceptability of these protein mixtures amongst the population, producers successfully organised local information and testing/ sampling sessions to explain the nutritive value of the products to the affected populations. The success of these projects caught the attention of neighbouring Latin-American countries such as Colombia, Venezuela, Costa Rica, Panama, and others.

In 1956 Dr. Bressani pioneered in the scientific literature with his studies on the nutritional and technological implications of the "nixtamalisation" process of maize to produce tortillas and other products. Nixtamalisation is an old Maya and Aztec cooking process by which corn is cooked in a lime solution- and is still widely used in Latin America today. Dr Bressani's extensive research throughout the years led to the discovery that nixtamalisation generates significant losses in B-vitamins; changes in protein solubility; decrease in fibre and phytic acid content, but also to substantial gains in calcium. More specifically, Dr Bressani established that -due to nixtamalisation- calcium contents in the whole grain and endosperm of 11 tested varieties increased 18 times due to lime cooking when compared to calcium in the raw sample, and in the germ about 24 times.

The 2003 Organisation Committee

Chairman

• **Prof. José E. Dutra de Oliveira**, University of São Paulo, Brazil (Chairman)

Vice-Chairpersons

• **Prof. Héctor Bourges Rodriguez**, National Institute of Nutrition, Mexico (Vice-Chairman)

• **Dr. Barbara O. Schneeman**, University of California, USA (Vice-Chairwoman)

• **Prof. Soichi Arai**, Tokyo University of Agriculture, Japan

• **Prof. Zuzana Brazdova**, Masaryk University, Czech Republic

• **Prof. Marcello Giovannini**, University of Milan, Italy

• **Prof. André Huyghebaert**, University of Gent, Belgium

• **Prof. Peter Jones**, McGill University, Canada

• **Prof. Emanuel Lebenthal**, University of Jerusalem, Israël

• **Prof. Liming Li**, Chinese Academy of Preventive Medicine, China

• **Prof. Valentin Pokrovsky**, Russian Academy of Medical Science, Russia

• **Prof. Daniel Rigaud**, CHU Le Bocage, France

• **Prof. Manuel Serrano Rios**, University of Complutense of Madrid, Spain

• **Prof. Jerzy Socha**, Institute of Child Health, Warsaw, Poland

• **Prof. Günther Wolfram**, Technical University of Munich, Germany



Interview of Franck Riboud Chairman and CEO of Groupe Danone

Mr Riboud, what is the specific role of the Danone International Prize for Nutrition in relation to your Group's policy?

"Health is a value historically linked to Danone products. Our company's core commitment has made us become a key promoter of innovative research in the field of nutrition, diet and food science so we can offer consumers products that offer optimal taste and nutrition with guaranteed safety. The Danone International Prize for Nutrition is one of our company's key drivers to help fulfil this mission. More specifically, this Prize contributes to promoting public health through better nutrition worldwide, particularly by encouraging top level scientists to undertake innovative research and advance knowledge of nutrition, diet and food science and, as a result of this, finding effective solutions that will help people live healthier lives."

Other prizes for innovative nutritional research exists: what is so peculiar about the Danone International Prize for Nutrition?

"The Danone International Prize for Nutrition, created in 1997 with the active support of the French Foundation Recherche Médicale awards 120,000 Euro (approximately \$130,000 U.S. dollars) to a researcher or team of researchers whose work in Human nutrition has made a major contribution to public health. The selection procedure which is under the responsibility of renowned and independent scientists is based on that of the most prestigious prizes, and guarantees complete objectivity and transparency. Today, we are proud to see that the Danone International Prize for Nutrition is recognised as one of the most distinguished Prizes and operates as a true key promoter for innovative research in the field of health & nutrition. During the three past editions of the Prize the finest range of international researchers applied to the Prize and have been rewarded. This year's edition is no exception. It is my distinct pleasure to congratulate Dr. Ricardo Bressani as the 2003 recipient of the Danone International Prize for Nutrition for his significant contribution to finding effective long-term solutions that help the Guatemalan people live healthier lives."

Are there any other initiatives Danone is involved in?

"Yes, of course. Other key company initiatives include Danone Vitapole, our Research & Development centre near Paris and, also, very

importantly, the worldwide network of the Danone Institutes.

Danone Vitapole co-ordinates an R&D community of 800 employees, including 500 researchers and engineers of 20 nationalities located in France. 300 collaborators are also located in others countries, in order to develop new products specifically answering to the needs of local consumers. It offers scientific and technological expertise at the service of the Group's 3 key activity areas: fresh dairy products, cereal biscuits and snacks, packaged waters. Besides its own programme of activities, Danone Vitapole also develops research programs in partnership with other food companies or public research institutions, in different countries, in order to advance major concepts in nutrition.

A concrete example of one of Danone Vitapole's key achievements is the so-called EDP concept (slow diffusion energy). This concept relies on the *glycemic index of food* which is a ranking of foods based on their immediate effect on blood glucose (blood sugar) levels. Carbohydrate foods that breakdown quickly during digestion have the highest glycemic indexes. Their blood sugar response is fast and high. Carbohydrates that breakdown slowly, releasing glucose gradually into the blood stream, have low glycemic indexes. The collaboration of researchers from Danone Vitapole with international experts on this issue led to the development of LU EDP biscuits with a low glycemic index.

Thanks to a continuous process of innovation, Danone is engaged to the local nutritional situation that can be improved through the development of products that meet the specific nutritional needs of individuals. In Latin-America, and more specifically in Brazil, Danone biscuits enriched in calcium as well as Danone dairy products enriched in calcium and iron are now available for children and adolescents. The international network of the **Danone Institutes** also plays a very important role when it comes to promoting health & nutrition. Through the Danone Institutes which are non-profit organisations and independent from the Danone Group, we can truly make a positive impact on the progress of health & nutrition knowledge and practice on a global level. Today, more than 200 international experts in diet and nutrition are involved in the 15 Danone Institutes located around the world, where they develop programs on diet and nutrition for researchers, health professionals, educators and the general public.

(continued on page 4) >>

The composition of the 2003 Jury

Chairman

• **Prof. José E. Dutra de Oliveira**, University of São Paulo, Brazil (Chairman)

Pre-selection Committee

• **Dr. Héctor Bourges Rodriguez**, National Institute of Nutrition, Mexico (Vice-Chairman)

• **Dr. Barbara O. Schneeman**, University of California, USA (Vice-Chairwoman)

• **Prof. Soichi Arai**, Tokyo University of Agriculture, Japan

• **Prof. Matty Chiva †**, University of Paris X, France

• **Prof. John H. Cummings**, Ninewells Hospital and Medical School, United Kingdom

• **Dr. John W. Erdman Jr.**, University of Illinois, USA

• **Prof. Pipop Jirapinyo**, Siriraj Hospital, Thailand

• **Prof. Emanuel Lebenthal**, University of Jerusalem, Israël

• **Prof. Manuel Serrano Rios**, University of Complutense, Spain

• **Dr. Viktor Tutelyan**, Russian Academy of Medical Science, Russia

• **Dr. Xiaoguang Yang**, Chinese Centre for Disease Control and Prevention, China

The 2003 Selection Jury

• **Prof. Christine Williams**, University of Reading, United Kingdom

• **Prof. Agus Firmansyah**, Medical Faculty University of Indonesia, Indonesia

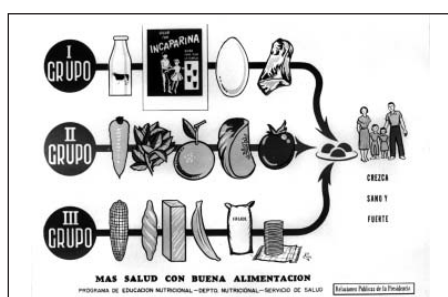
• **Prof. Franco Lajolo**, University of São Paulo, Brazil

• **Dr. Allan Walker**, Harvard Medical School, United-States

• **Dr. Mark Wahlqvist**, Monash Asia Institute, Australia

• **Prof. Bernard Dastugue**, INSERM and Clermont-Ferrant University of Medicine, France

This calcium was found to be highly bioavailable. This breakthrough insight brought Dr Bressani to the understanding that nixtamalisation was a key process for the prevention of calcium deficiency - a very important finding given for populations which have a diet that is likely to induce such deficiencies due to poor consumption of foods of animal origin such as milk. A protein - vitamin-mineral supplement for tortilla was developed in 1970 and studies with children showed it highly improved protein value. Recently vitamin C addition to tortilla flour has been shown to be relatively stable and helps to increase iron bioavailability. At present, the nutritive value of the nixtamalisation process has also been acknowledged in other parts of the world: in Europe (UK) for example, products resulting from nixtamalisation have already been brought onto the market.



The Guatemalan Food Basket including Incaparina as a source of protein.

Throughout the years, Dr Bressani extensively studied food grain legumes such as, for example, common beans, which constitute the main supplementary protein source in the Latin American diet. His research established the exceptionally high protein complementary effects of beans to cereal-based diets of mixtures of 7 parts cereals / 3 parts beans. The quantitative needs of grain legumes in food systems containing cereals tubers and starchy foods were established by Dr Bressani thanks to a new short nitrogen balance technique usable in adult human subjects. Dr Bressani also gave much attention to bean processing and nutritive value, to the hard-to-cook problem due to poor storage which not only increase energy expenditure during cooking but also affects nutritional quality, to the nutritional role of polyphenolic compounds affecting protein utilisation and finally to the protein digestibility problems in humans. Today, the optimum mixture of 7/3 is being used for the development of dried soup mixtures and as a component in composite flours. Dr Bressani has extensively researched other legume grains such as canavalia, cowpeas, faba beans and mucuna beans for variability in chemical composition, nutritive value and practical applications.

The study of the nutritional potential of autochthonous grains and vegetables such as the amaranth grain, a plant used by the ancient Maya, Aztec and Inca civilization for its high nutritional value, is one of his most recent research projects. It is currently used as a supplement to rice, maize and wheat

and as a horticultural crop. Other new focuses of Dr Bressani's work is to use coffee pulp as a source of nutrients for animal feeding. Extensive research was carried out in relation to its processing and this was evaluated in various animal species. While at INCAP, as head of the Division of Food and Agricultural Science, Dr. Bressani helped developing a postgraduate program in Food Science and Technology and Animal Nutrition for university students from Agronomy, Chemistry, Biology, Engineering, and Veterinary Medicine. This programme has been highly successful over the past 15 years with 120 graduates from Latin America and other countries of the world.

Dr Bressani's expertise has been sought after, worldwide. He is an active international member of the US National Academy of Sciences and member of both the Guatemalan Academy of Science and Third World Academy of Science, the Academy of Science of the International Union of Food Science and Technology, the Latin American Society for Nutrition and the American Institute of Food Technology. Throughout his career, he has been awarded numerous times. Most recently, in 2001, he was awarded with the Ibero American Prize in Science and Food Technology from the Mexican Government for his lifetime contributions to food science.

Dr. Bressani's extensive research activities generated over 500 published papers in Europe, the US and Latin America, namely in food science and technology and nutrition research; new food sources; protein nutrition and quality; food composition and utilisation in humans and animals; nutrient bioavailability; and processing and nutritive value. He was the editor of *Archivos Latino Americanos de Nutrición* for 15 years and editor of the *Amaranth Newsletter*.

Dr Bressani was born in Guatemala City, Guatemala, in 1928. He received his BS from the University of Dayton (US) in 1949 and his MS from Iowa State University (US) in 1951. He returned to Guatemala the same year to join the Institute of Nutrition of Central America and Panama (INCAP) while working on his PhD in Biochemistry, which he obtained from Purdue University (US) in 1956. Dr Bressani headed the Division of Food and Agricultural Science at the Institute of Nutrition of Central America and Panama (INCAP) until 1993. At present, he leads the Research Centre in Food Science and Technology at the Universidad del Valle de Guatemala.

In honour of this life-time commitment to maximise the understanding of the nutritional potential and limitations of local basic foods and to improve these foods successfully by using simple low cost technology at the service of consumer health in Latin America, Dr Ricardo Bressani is awarded the 2003 Danone International Prize for Nutrition.

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The 2003 Prize numbers

- 626** renowned nutrition experts consulted as members of the Nomination College,
- 72** countries represented
- 110** nominated scientists,
- 29** countries represented
- 64** applications,
- 27** countries represented

>> Danone Institutes are truly active organisations. Up to date, Danone Institutes sponsored more than 500 research projects which accounted for more than 8 million EUR; more than 50 prizes and awards have been attributed to outstanding research works and other professional initiatives for 1.3 million EUR; since 1991 about 115 events have reached more than 15.000 health professionals via scientific meetings, symposia, etc.; 64 publications and 6 newsletters present professionals with overviews of recent developments, promote consensus and/or explore controversy of relevant issues on a regular basis Danone Institutes are also very active when it comes to education

programmes for the general public with almost 40 programmes such as nutrition lectures, folders and brochures, TV and radio programs etc... In countries such as Brazil and Mexico, Danone Institutes contribute to the local nutritional situation through the investment in nutritional and dietary education. As an example, both of them contributed to the publication of local dietary guidelines, ie *Eating standards and guides for the Brazilian population* and *The Mexican Daily Recommended Intakes review*.

We will continue this challenging mission to help people live healthier lives day-by-day."

News from the previous Laureates



Professor Alfred SOMMER

Johns Hopkins School of Hygiene and Public Health, Baltimore, USA, 2001 laureate

The issue of Vitamin A deficiency is a global problem and the importance of its control has now reached mainstream interest and acceptance. It is one of the major *Millennium Development Goals*, and a recent UNICEF report indicates that control programs are now under way in over 80 countries around the world. Estimates suggest that nearly a quarter of a million children's lives are saved every year because of active Vitamin A supplementation work.

The last major research issue which Prof Sommer and his team presently have under way in Bangladesh is a large randomised trial to replicate the extraordinary findings from their third major Nepal (NNIPS3) study, which strongly indicated that weekly (or daily) supplementation of women of child-bearing age with either beta carotene or its equivalent of vitamin A reduces mortality related to pregnancy and childbirth by 40 to 50 percent, and this benefit extends at least through one year post-partum.



Professor Leif HALLBERG

University of Göteborg, Sweden, 1999 laureate

Prof Hallberg's research work currently focuses on increasing bioavailability of iron in weaning foods which is crucial for the mental development of children. It was quite evident that the only way this could be done is by modifying the weaning diet in such a way as to provide the infant with a better diet with respect to iron. This could be made by "the infants being served a diet that was prechewed by the mothers and that contained appreciable amounts of meat iron". Prof. Hallberg and his team were able to design a diet that also contained red meat powder that gave a total daily iron absorption of 1.08mg Fe/1000 Kcal thus meeting the iron requirements in 95% of infants aged 12 months.

Another field of recent research of Prof. Hallberg is the development of a method to examine the bioavailability of metallic iron powders in man under realistic conditions. Metallic iron powders cannot be labelled with radioiron isotopes. By comparisons of plasma iron changes with ferrous sulphates given to blood donors, it was possible to calculate the plasma iron increases induced by various metallic iron powders (electrolytic and reduced) in relation to ferrous sulphate.

Reference: Hallberg L, Hoppe M, Andersson M, Hulthen L. 2003. The role of meat to improve the critical iron balance during weaning. *Pediatrics*, 111: 864-70.



Professor Vernon YOUNG

Massachusetts Institute of Technology, Boston, USA, 1997 laureate

Vernon Young continues to pursue his major research interest on human amino acid metabolism and its nutritional corollaries. He enjoys a highly productive collaboration with Professor Anura Kurpad at St John's Medical College, Bangalore, India, and together, using tracer techniques, they have established the requirements for a number of the indispensable amino acids, including leucine, threonine, lysine and methionine. He has shown that the requirements for healthy Indian and US adults are essentially the same. These estimates have played a central role in the new revisions of the amino acid requirement patterns for adults as well as the younger age groups now being formulated by WHO/FAO/UNU. Professor Young recently completed 6 years as chair of the US Food and Nutrition Board DRI Committee, charged with updating, developing and expanding nutrient based dietary reference intakes (DRIs).