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Recent trends in nutritional sciences [1]

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Nutritional Sciences are going through a unique decade. We have to deal with challenges that cover from hunger, still present in the developing countries, to new advances in its basic principles through the use of novel methods of molecular biology or isotope studies on the bioavailability of nutrients. Nevertheless, to say that this progress will only come through with the provision of a new generation of human resources in the area, including a better and comprenhensive understanding of Nutritional Sciences.

Nutritional scientists have to prepare themselves to deal with their own field of science, where basic training in chemistry, biochemistry and physiology along with mathematics, statistics, economics and politics are fundamental to understand and to urgently apply the available knowledge, for the improvement of the life quality of mankind.

Food and nutrition have now been rated high in the world policy agenda and consumers pointed it out, as second only to enviroment. The United Nations Organizations such as WHO, FAO and UNICEF are all stimulating summit meetings and congresses in the area. The Ending Hidden Hunger Conference in Canada was held October, 1991, and the International Conference of Nutrition will take place in Rome, December 1992. IUNS had and will have active participation in these events, and is also preparing its own International Congress of Nutrition, to be held in Adelaide, Australia, September 1993.

Our main interest, our roots, lie in the scientific knowledge. Because of this, our input on public health nutrition is concentrated on new survey techniques, better mathematical analysis, such as meta-analysis (1), of available data an/or the importance of micronutrients on performance and nutritional status of the population.

Of course, recent world data revealing high infant malnutrition in different countries, still worries us, as well as a large variation on individual life expectancy. This, certainly has a lot to do with nutrition.

It is also true that the presence of hunger, overt and hidden, is still a problem in a large part of the world population and, at the same time it points out that overweight and obesity are spreading from rich to de developing countries. We emphasize this situation in the case of Brazil, where we live, as it occurs in different socioeconomic population levels, although the same is also true in other parts of the world.

On the other hand, instrinsic mechanisms of nutritional problems as obesity are discussed as a reduced oxidation of fat, a metabolic energy anomaly of the obese human adipose tissue, an increased cell size of intra-abdominal lipocytes, and a release of free fatty acids from the intra-abdominal depots. It remains to be clarified whether some of them are primary factors of etiological importance, or a secondary contributor to the obese status (2-6).

The influence of nutrition on the protection mechanisms against infection has been aroused not only by the extension of AIDS, but also by other illnesses including tuberculosis, that is still a high mortality cause in de Third World (7, 8).

In the immunodeficiency virus-infected men, an increased energy expenditure that is not explained by higher levels of catabolic hormones has been shown, but which

1 Presented by Dr. Dutra de Oliveira during the 29th General Committee Meeting of the International Council of Scientific Unions (ICSU) in Oslo, Norway, on September 26th, 1991, as President of the International Union of Nutritional Sciences (IUNS).

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also justifies the weight loss in these patients (9).

The Food and Cancer Association is still going on as shown in the study of the relationship of milk-drinking and ovarian cancer risk (10). The results suggest that milk-drinking risk to cancer has some relationship, more associated to the fat content, than to the milk itself.

On the other hand, reports are also showing the importance of some nutrients such as carotenoids and vitamin A, on the risk of cancer. Knekt et al. (11) have presented an association between low beta-carotene and cancer, more evident in cases of lung cancers. The same finding has also been shown to be true in cases of breast cancer (12).

The action of some nutrients as pharmacological agents are described to be of importance as homeostatic agents (13-15). The influence of alanine and lactate release from muscle were shown to be of great influence of hepatic gluconeogenesis (16, 17). L-aspartate infusion was announced to produce a transient microproteinuria in human volunteers, through a unknown mechanism (14).

Protein synthesis in human subjects during exercise, a controversial subject for a long time, was analyzed through 3-methylhistidine and nitrogen urinary excretion. Results showed an increased muscle protein breakdown, without depletion, because the protein synthesis is stimulated during recovery (17).

Technological advances have been allowing better knowledge of nutrient studies. Such is the use of stable isotopes in urine and blood testing needed for a better understanding of energy, protein, and mineral metabolism. This methodology has shown to be quite useful on the study of the amino acid flux through urinecollection in neonates, where blood samples are always difficult to obtain (18) .

A new stable isotope technique through radio mass spectromethry was shown to be a safe and usefull means for de study of hepatic protein synthesis in humans (19).

Nuclear magnetic resonance spectroscopy has indicated to be useful in the evaluation of metabolite changes in myocardial dysfunction (20).

Double labeled water is increasing its utilization to measure energy expenditure. Experiments show that a multiple point sample collection has no advantage over a two-point one (21). This is a very important tool in community research. The utilization of this technique in burned children demostrated that the best nutritional energy support of convalescent burned patients was achieved with a 1.2 factor over the resting energy expenditure (22).

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