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THE HEALTHY CORE METABOLISM: A NEW PARADIGM FOR PRIMARY PREVENTIVE NUTRITION

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Abstract: Research in preventive nutrition aims at elucidating mechanism by which our diet helps us to remain in good health through optimal physiological functions. However, despite decades of accumulated data in human nutrition and regular subsequent nutritional recommendations, obesity and type 2 diabetes epidemics continue to progress worldwide each year leading to a regular decrease of the Healthy Life Years, notably in Western countries. Such a paradox may be explained by the Nutrition Transition, the extreme application of the reductionist paradigm in nutrition research, the lack of nutritional education and a too strong focus on curative nutrition in at risk/ill subjects. In this position paper, we hypothesized that researchers should focus more on healthy subjects, from birth until maturity. Rather than exploring what differentiates healthy and at risk/ill subjects, we propose to thoroughly study what characterizes a healthy state and its underlying metabolism. We define it as the Healthy Core Metabolism which remains stable whatever energy inputs (diets) and outputs (exercise), genetic background and external/internal stress, e.g., temporary illnesses. As a basis for Healthy Core Metabolism investigation, we observed that main physiological and ubiquitous functions of human organism, i.e., the neuro-vasculo-sarco-osteoporotic system, tend to follow a concave curve with common phases of growth, optimum, and decline. Finally, we hypothesized that true primary preventive nutrition should focus on the growth phase to reach the maximum capital of a given physiological function so that - whatever the further decline -, Healthy Life Years may approach or coincide with theoretical Life Expectancy.

Key words: Healthy core metabolism, preventive nutrition, metabolic optimum, healthy metabolic range.

Introduction

The World Health Organization has proposed to cluster prevention in 3 categories: 1) Primary prevention includes all actions intended to reduce the incidence of a disease in a population, thereby reducing the risk of occurrence of new cases. It uses measures of individual (personal hygiene, diet, physical activity and sport, vaccinations ...) and collective (drinking water, waste disposal, food safety, immunization, hygiene and habitat workplace) prevention. This traditional concept of prevention inevitably leads to a vast improvement in the quality of life and social institutions reform program; 2) Secondary prevention includes «all acts intended to reduce the prevalence of a disease in a population, thereby reducing the duration of disease progression». It takes into account the early detection and treatment of first symptoms; 3) Tertiary prevention includes all actions intended to reduce the prevalence of chronic disability or recurrence in a population, so as to minimize the functional consequences of disability from the disease; it extends the prevention to the field of rehabilitation by seeking to promote professional and social reintegration.

In theory, research in preventive nutrition aims at elucidating the mechanism by which our diet help us to remain in good health, through optimal physiological functions. Today, preventive nutrition also associates physical activities, and more generally gaining a sense of lifestyle choices and their effects upon one's health. The final objective is therefore to achieve optimal health and to live a long life in good health, idealistically to align the Healthy Life Years with Life Expectancy. Therefore, the target of this primary prevention is clearly the healthy large public. Preventive nutrition is then ensured by public health policies via different mode of communication such as food pyramids, nutritional education, national nutrition programs such as the French Programme National Nutrition Santé (PNNS, http://www.mangerbouger.fr/pnns).

Yet, diet-related chronic diseases prevalence increases each year, notably for type 2 diabetes, obesity, cancers and cardiovascular diseases. It then appears that preventive nutrition did not succeed in stopping such epidemics despite several decades of research and the huge amount of nutritional data collected (1). Several reasons may be proposed for this situation: first, the well-known nutrition transition from traditional, unrefined, nutrient-dense and minimally-processed foods to ultra-processed and energy-dense foods and the parallel reduction of physical activities together with increased sedentarity (2), second, the application of the reductionist paradigm associating one nutrient with one physiological effects and reducing food health potential to only a few compounds and that have led to fractionation-recombination of foods and to consider preventive nutrition according to a pharmacological approach on the one hand and food bioactives similar to drugs on the other hand (1), and third the generally low level of nutritional education leaving most populations powerless in front of marketing pressure (e.g., advertisements

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