

# Current Food Classifications in Epidemiological Studies Do Not Enable Solid Nutritional Recommendations for Preventing Diet-Related Chronic Diseases: The Impact of Food Processing<sup>1,2</sup>

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## ABSTRACT

To date, observational studies in nutrition have categorized foods into groups such as dairy, cereals, fruits, and vegetables. However, the strength of the association between food groups and chronic diseases is far from convincing. In most international expert surveys, risks are most commonly scored as probable, limited, or insufficient rather than convincing. In this position paper, we hypothesize that current food classifications based on botanical or animal origins can be improved to yield solid recommendations. We propose using a food classification that employs food processes to rank foods in epidemiological studies. Indeed, food health potential results from both nutrient density and food structure (i.e., the matrix effect), both of which can potentially be positively or negatively modified by processing. For example, cereal-based foods may be more or less refined, fractionated, and recombined with added salt, sugars, and fats, yielding a panoply of products with very different nutritional values. The same is true for other food groups. Finally, we propose that from a nutritional perspective, food processing will be an important issue to consider in the coming years, particularly in terms of strengthening the links between food and health and for proposing improved nutritional recommendations or actions. *Adv Nutr* 2015;6:629–38.

**Keywords:** food processing ranking, food groups, health potential, epidemiological studies, dietary guidelines

## Introduction

National dietary recommendations are generally based on a systematic review of human-based studies that examine the associations between food groups and health outcomes; recommendations are also developed based on age and sex (1–3). Although terminologies differ between reports, the relations between food groups and disease prevalence are generally ranked as convincing, probable, possible or suggestive, or insufficient. However, obtaining definitive and convincing associations is very difficult because of the contradictory results for some food groups and associated pathologies (1–3). The origin of these apparent contradictions may result

partly from the large diversity of products encountered in a specific food group. Indeed, foods with different processing types are mixed within food groups (e.g., fruit juices and whole fruits, whole-grain and sweetened breakfast cereals, and red and processed meat). In addition, many processed foods within a “food group” may have differential impacts on health. Consequently, by considering the processes applied to food, specific processed foods likely do not simultaneously increase and decrease the risk for a given chronic disease.

In addition, food health potential does not result from chemical composition alone but is also related to food structure, which involves nutrient interactions, starch structures (degree of complexation with lipids and of gelatinization or the amylase/amylpectin ratio), and matrix porosity and density (**Figure 1**) (4). Food structure characteristics are of prime importance because they can affect the feeling of satiety, nutrient bioavailability, and presence of fiber copassengers; all of

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