

## Fibre and Water, The mega nutrients of metabolic health

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### Abstract

Nutrients are conventionally classified as macronutrients (carbohydrates, fat and protein), and micronutrients (vitamins, minerals, electrolytes). This classification is based upon the quantity required to maintain health, and also, perhaps, the caloric value of the concerned nutrient. We support the use of the descriptor meganutrient for fibre and water. The latter is required in significantly larger quantities to maintain health, and manage metabolic disease such as diabetes and obesity. Fibre has a chemical mega-structure, and its description as a meganutrient reinforces its functions, which are different from other carbohydrates.

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### Defining a Mega Nutrient

A nutrient is chemical substance that is used by organisms to survive, grow and reproduce. Nutrients can be classified as macro and micro nutrients. Macronutrients (carbohydrates, fats, proteins) are consumed in large quantities (grams) to generate energy and promote growth. Micronutrients (vitamins, minerals, electrolytes) are required in sub-gram quantity to run cellular metabolic and haemostatic processes.<sup>1</sup>

The word "mega" means very large, or huge, as opposed to "macro" which means large. A mega nutrient may be defined according to its requirement (more than that of macronutrients), or perhaps according to its chemical structure and size (larger than that of macronutrients) both of which have a significant impact on the cardiometabolic risk.<sup>2</sup>

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### The Candidates

Water is a substance that is required in much larger quantities than the conventional macronutrients.<sup>3</sup> It is essential for life; its deficiency can cause disease and excess consumption can also be harmful to health. Hence, it makes sense to term it as a meganutrient.

Dietary fibre or roughage is that part of plant derived food which cannot be broken down by human digestive enzymes. Fibres can be classified as soluble and insoluble. There are varied definitions of fibre, based upon the molecular size, characteristics and digestibility.<sup>4</sup> The recommended daily allowances are 25 g/ day for adults as per the European Union and 30 g/ day as per the British Nutrition Foundation. The United States suggests different requirements for men and women of different age groups, varying from 21 g to 38 g/day. This is much less than the need for macronutrients like carbohydrates and fats.<sup>4</sup>

The size of fibre molecules (they are carbohydrate polymers with more than 10 monomeric units (as per the Codex Alimentarius Commissions) implies that they are mega-sized nutrients.<sup>5,6</sup> Based upon this, perhaps they may be termed mega nutrients.

### Pragmatism

The words macronutrients and micronutrients are well-entrenched in vocabulary. It does not make sense therefore to disturb them. At the same time, there is enhanced understanding of the psychological role of water and fibre, as well as their importance of maintaining and improving health. Creating a new category of meganutrients may be an effective way of highlighting their need, as well as underscoring the distinct properties of fibre and other carbohydrates. This will help contribute to a more comprehensive prescription of medical nutrition therapy (MNT), and lead to better outcomes in health.<sup>7</sup>

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