



Central European
Digital Media
Observatory



Nutrition, non-communicable diseases, information flows and scientific studies

Coffee Beans

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"To eat or not to eat, that is the question"

The parody of Hamlet is not an end in itself, the question of the relationship between nutrition and NCDs is indeed full of questions and ballast in the form of misinformation and misleading claims. Every living organism on this planet needs energy to exist. In 1937, Hans Adolf Krebs (1900-1981) described the process by which cells convert food into energy. Called the Krebs cycle after its discoverer, its molecular machinery is hidden in the mitochondria, the cellular organelles of which each cell in our body has several hundred. Mitochondria convert the molecular energy of nutrients into a compound called adenosine triphosphate (ATP), which is the cell's own energy store. Energy provided by nutrients obtained from the environment in the form of organic molecules and sunlight is created by eukaryotic cells, i.e. cells that have a nucleus, energy-rich molecules such as ATP, and then store the excess energy in larger energy-rich molecules such as polysaccharides (starch and glycogen) and lipids [1]. Therefore, nutrition is the focus of human attention. And not just nutrition per se, but the nutrition preferred by a given individual. The issue of nutrition in adverse conditions of the body, such as physical or mental fatigue or illness, is also extremely important. It is precisely in these conditions that the information flows transmitted by social networks and disseminated through personal messages come into play. This also includes misinterpreted scientific messages, targeted misinformation and advertising by food manufacturers.

Social networks allow access to a huge amount of data which, according to the information flows, can be divided into those where the consumer is the sender of the message and those where the consumer is the receiver of the message. In terms of content, the data can be classified as informational, intended to increase knowledge and information about a given nutritional product, and into messages tending to change individual behavior in the direction of consuming "unhealthy" foods [2]. Food, beverage, and dietary supplement manufacturers use social networks for digital marketing with features that increase consumer interaction and engagement. Common techniques include efforts to engage users through games and various apps. The social aspects of personal information on social networks are also used, and thus individual companies try to increase the reach and personal relevance of their marketing messages [3]. This creates an opaque web of company messages and consumer reactions to a given food on social media, expressing subjective views. This is compounded by the changing views of food over time, which are initiated by scientific studies and often sponsored by the producers of the food in question. Conspiratorial narratives in science can distort the true nature of phenomena. In the absence of very strong evidence, there is a serious risk of dubious messages that can influence dietary policy [4].

An example is the "Sugar conspiracy", which started in 1972 with the publication of the book "Pure, White and Deadly" by John Yudkin. The content of the book concerned the adverse health effects of sugar consumption, particularly in relation to obesity and heart disease. The book's motto was then stated in the last paragraph of the first chapter: 'I hope that when you read this book, I will convince you that sugar is really dangerous' [5]. There was criticism of these conclusions, especially from the sugar industry and confectionery manufacturers. This was compounded by criticism from the American physiologist Ancel Keys, who argued in

favor of restricting dietary fat rather than sugar [6, 7]. The link between fat intake and cardiovascular disease has also been demonstrated by the study known as the "Seven Country Study" and subsequent studies that have followed [8]. Uncertainties regarding the impact of sugars and fats on obesity and cardiovascular disease persist to this day. There are many sugars, i.e. mono- and oligosaccharides species and it depends on which ones and in what form they are consumed. This also applies to fats. It is now reported that the association of high consumption of sugars (even the monosaccharide fructose, which is generally considered to be beneficial to health) with the incidence of cardiovascular disease is conclusive, more conclusive than in the case of fats [9, 10]. Insoluble polysaccharides, such as cellulose, hemicellulose, and especially insoluble β -glucans, have been shown to be health-promoting in some studies [11], but other studies question this [12].

If we analyze the data on the effect of diet and nutrients on cancer pathogenesis and progression we come to the same conclusion - the data are inconclusive. A number of studies, both experimental animal studies and clinical studies, admit that dietary composition can influence the process of tumorigenesis, i.e. the processes leading to tumor formation. The search for a link between diet and cancer in humans has a long history, as does the interest in the mechanisms by which dietary factors may increase or decrease the risk of cancer. Some, particularly older review studies, have reported that for most cancers there is no conclusive evidence to support a relationship between certain dietary factors and the development or progression of tumors [13]. Others acknowledge that dietary factors are likely to contribute directly or indirectly to the development of cancer in various organs - namely the esophagus, stomach, colorectum, liver, breast or endometrium, as well as the oral cavity and larynx [14]. More recent studies have reported a possible relationship between diet and epigenetic changes, i.e. changes in gene function without altering their nucleotide sequence, and cancer risk [15]. Currently, some influence of diet on cancer development has been attributed to the composition of gut microbiota, i.e. the microbial makeup of the human gut, which is influenced by diet [16, 17]. However, clear answers from clinical studies are still lacking, and moreover, these studies avoid determining which nutrients have a positive or negative effect on tumorigenesis [18, 19].

This situation, which concerns a basic necessity of life, i.e. nutrition, and its relationship to life-threatening conditions, perpetuates misinformation aimed at widening the spectrum of users of misinformation and influencing public opinion. However, social networks also present a challenge to the scientific community to actively confront information disorders. Reputable experimental and clinical researchers should play a vital role in evaluating food and nutrition information and expanding the spectrum of truthful information to provide a clue for patients seeking answers to their questions [20]. It should be acknowledged that knowledge about a given issue expands and refines over time, but there may be situations where new information negates existing information.

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