

Perspective

Metabolism, Food and Evolution. A Social Science Perspective

Fernandez Unsain R^{*1} and Vicente Junior CJ²¹Department of Anthropology, National University of Buenos Aires and Department of Public Health Federal University of Sao Paulo, Baixada Santista, Brazil²Alimentary Disorders Program (AMBULIM)- Psychiatry Institute (IPq)-Clinical Hospital-Faculty of Medicine-University of Sao Paulo, Brazil***Corresponding author:** Fernandez Unsain R, Department of Anthropology, University of Buenos Aires and Department of Public Health, Federal University of Sao Paulo, Av. Cásper Líbero 73-Ap.94. Sao Paulo-SP-Brazil**Received:** June 22, 2020; **Accepted:** July 14, 2020;**Published:** July 21, 2020

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Through this intervention, we would like to introduce an issue not always present in classic researches regarding nutrition and metabolism: that is, culture.

Our goal is to demonstrate from an evolutionary perspective how nature and culture need to be considered in a constant and fluid dialogue to explain the metabolic processes more clearly.

In this sense, it is vital to establish first a definition of metabolism to try to start a dialogue among nature and culture.

In general, approaches to what metabolism is are, despite some exciting discussions, similar in many ways. Let us consider one of them: "Metabolism comprises all of the chemical reactions that take place in a living system, be it a cell, a tissue, an organ, or an organism. Metabolic reactions are almost all enzyme-catalyzed and include transformations of energy and nutrients, syntheses and degradations, and excretions of waste products" [1]. So we study and research metabolism with the help of molecular biotechnology and genomics. Those combined with other sophisticated methods, lead us to important discoveries and let us approach new frontiers regarding the metabolic pathways and the metabolic disorders at large. We do know that the metabolism of a given species can be profoundly different from any other. An interesting article by Bozek et al., [2] compares the metabolism between humans and other animals. He confirms that our brains and muscles are extraordinary and that their metabolisms may be the key to what makes us uniquely human. Compared to other animals, we possess voracious brains. Our neurons consume almost 20% of the calories we eat in a day in their vital activities. They concluded, "The observed rapid metabolic changes in brain and muscle, together with the unique human cognitive skills and low muscle performance, might reflect parallel mechanisms in human evolution." [2]. The caloric demands of the brain, with all its varied functions, which only our species can carry out, are very significant. In order to feed a human brain, as extraordinary and complex as ours, our metabolism had to sacrifice the calories it devoted to other tissues.

Abstract

This is a perspective regarding the relation between metabolism, food and social sciences. A matter not always considered by publications, and for us crucial in this health context.

Keywords: Food; Evolution, Metabolism; Social Sciences

Furthermore, in order to adapt to contemporary sedentary life and its reflection on the abundant and overloaded diet of substances rich in caloric performance, our metabolism has had to undergo adaptations that are not entirely healthy. When did these adaptations start to occur? At what point did our species begin a path that certain privileged specificities and not others. That is when the dialogue among nature and culture started a profound and no return path?

The oldest hominid fossil remains are approximately four million years old [3]. From that moment, we can find a significant amount of evidence that enables us to elaborate on the design of the process of the hominid evolution until our days. From one of our ancestors (the *Australopithecus aphaerensis*) to the contemporary *Homo Sapiens Sapiens* the emergence of new skills consolidated the *Homo* lineage through evolutionary time. The homo lineage effectively achieves the ability to build intelligent adaptive strategies that the environment can present, and from this perspective, we define intelligence as the capacity to offer creative solutions to the difficulties of the environment. No less critical on the evolutionary path was the ongoing, highly adaptive sexuality of the homo lineage species members and, most notably, the sharing of food. Nevertheless, it is not only the act of sharing food and sharing food by constructing the idea of commensality as a conscious adaptive behavior for the group's reproduction. At this point, culture comes in as an articulator of different adaptive phases within the *Homo* lineage and a higher weight in the *Homo sapiens sapiens* species.

What evidence do we have of this? The capacity for symbolic thinking can be documented, for many researchers, from the existence of archaeological remains that give an account of community life and a certain level of organized social norms. This path is important to underline, approximately 10,000 to 12,000 years Before the Present (B.P.), what is called the "Neolithic Revolution" [4]. This event took place in some areas of the planet. It was a historical economic, demographic, and cultural process that witnessed the domestication of plants and animals and, among some groups of hunter-gatherers, the abandonment of nomadic life to settle permanently in specific

conducive spaces. It is at this point that agriculture was invented [5]. The process mentioned above and others that followed altered not only man's relationship with nature but also how nutrients and energy were processed.

Since the appearance of the homo lineage, our ancestors went through dramatic metabolic changes in dialogue with the culture and the political, economic, and symbolic systems that the different human groups built. For Pontzner et al., [6,7], the human lineage "has experienced an acceleration in metabolic rate, providing energy for larger brains and faster reproduction without sacrificing maintenance and longevity." Furthermore, this fact was crucial in extending symbolic thinking and culture as a whole. In essence, and now from our point of view, nature and culture are related in a complementary and dialogical way pursuing effective adaptive solutions.

In that sense, we are part and consequence of a clear dialogue between nature and culture, acting together as protagonists in processes of life, health, illness, and death in human beings.

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