

Interview Dr. Carlos Augusto Monteiro

Hesley Machado Silva^{1,2}

¹Centro Universitário de Formiga (UNIFOR/MG) e ²Universidade de Minas Gerais (UEMG)



Brazilian science includes researchers whose contributions have transcended national borders and come to influence scientific knowledge, public policy, and professional practice on a global scale.

*Among them is **Dr. Carlos Augusto Monteiro**, physician, Professor Emeritus at the School of Public Health of the University of São Paulo (USP), and founder of the Center for Epidemiological Research in Nutrition and Health (NUPENS). Over more than five decades dedicated to research, he has built a distinguished career characterized by the production of innovative knowledge and a sustained commitment to understanding major challenges related to food, nutrition, and population health. His career began with studies on child malnutrition, mortality, and social inequalities in Brazil. As the country underwent a rapid nutritional transition over recent decades, he turned his*

attention to the rise of obesity and noncommunicable diseases, contributing to a new understanding of the factors shaping contemporary diets. This line of research led to his most significant scientific contribution: the development of the NOVA food classification system and the introduction of the concept of **ultra-processed foods**, which have transformed how researchers, health professionals, and policymakers assess diet quality. Today, the NOVA classification is used in research conducted across numerous countries and has influenced major public policies, including the **Dietary Guidelines** for the Brazilian Population, internationally recognized for their innovative approach. By establishing the degree and purpose of food processing as a central element in understanding the health effects of foods and diets, Carlos Monteiro helped introduce a new paradigm in nutrition science, broadening the debate on diet, chronic diseases, and food systems. The author of hundreds of scientific articles and one of the most influential researchers in public health, Carlos Monteiro remains actively engaged in research, coordinating studies and collaborating with national and international institutions. His scientific work has helped bridge the gap between science and society, providing evidence that informs public policy and promotes a broader understanding of the impact of food and diet on health.

It is with great pleasure that **Conexão Ciência**, the scientific journal of the University Center of Formiga (UNIFOR-MG), welcomes Dr. Carlos Augusto Monteiro for a conversation about his academic journey, the development of the concept of ultra-processed foods, current challenges in nutrition and food policy, and the future of scientific research in a context marked by the growing burden of chronic diseases and the increasing circulation of information, and misinformation, about food and health.

1. Professor Carlos Monteiro, your academic career is closely intertwined with the recent history of the School of Public Health at the University of São Paulo, where you began as a teaching assistant, pursued your entire academic career, and eventually became Professor

Emeritus. Looking back on more than five decades devoted to higher education, what have been the most significant transformations you have witnessed in Brazilian universities? Which achievements make you most proud, and what challenges still need to

be addressed to strengthen the academic profession and prepare new generations of researchers?

Dr. Carlos Monteiro: Over these decades, Brazilian universities have undergone profound changes. There has been a major expansion of graduate education, scientific research capacity, and the international presence of Brazilian science. When I began my career, our ability to conduct large epidemiological studies and participate in international scientific debates was far more limited than it is today.

One achievement that I consider particularly important has been the development, in Brazil, of research groups capable of producing original knowledge about issues relevant to our population while also contributing to international science. High-quality science does not simply mean applying, in our own context, research questions formulated in other countries. It also means being able to formulate our own questions and offer new ways of understanding universal problems.

I am very proud of having contributed to the training of researchers. Perhaps this is one of the most enduring dimensions of an academic career: seeing former students develop their own lines of research, train new generations of

researchers, and assume positions of scientific leadership.

At the same time, important challenges remain. Science requires public funding, attractive academic careers, and conditions that enable young researchers to plan their future. Building scientific knowledge is necessarily a long-term endeavor.

2. You founded and led NUPENS for decades, and today it is internationally recognized as one of the leading research centers in nutrition and public health. What was it like to build a research group of this scale in Brazil? In your view, what have been the greatest challenges in developing scientific excellence in a country facing funding constraints and frequent changes in science and technology policies?

Dr. Carlos Monteiro: NUPENS was built gradually and collectively. One of the group's defining characteristics has always been bringing together researchers at different stages of their careers and fostering intellectual autonomy, the ability to work collaboratively, and an environment in which new research questions can be formulated, refined, and answered.

In Brazil, we have high-quality public universities, highly trained researchers, national information systems, and population-based surveys that have enabled us to understand social and health transformations on a scale that few countries are able to achieve.

NUPENS's own trajectory illustrates the importance of this continuity. We began by investigating issues such as malnutrition, infant mortality, and social inequalities and, as Brazilian society underwent significant changes, we also began studying obesity and transformations in the food system. It was by closely following these changes that new research questions emerged.

3. Your career was already well established when your research led to the concept of ultra-processed foods and, subsequently, to the NOVA classification. How did this intellectual process unfold? At what point did you realize that the traditional explanation based solely on nutrients was no longer sufficient to understand the epidemic of obesity and chronic diseases? Did you ever imagine that this concept would achieve such global recognition and reshape the scientific agenda in nutrition?

Dr. Carlos Monteiro: NOVA emerged from a relatively simple question: what had changed in the diet of the Brazilian population that could explain why, at the same time that hunger was declining, obesity and other chronic diseases were increasing so rapidly?

For a long time, nutrition science focused much of its attention on individual nutrients: fat, sugar, sodium, fiber, and vitamins. Naturally, all of these components are important. But we realized that looking exclusively at nutrients did not allow us to understand a much broader transformation that was taking place in food systems.

Foods were being progressively replaced by industrial formulations made from substances extracted or derived from foods and from additives, designed to be highly convenient, long-lasting, intensely palatable, and highly profitable.

It was from this observation that the NOVA classification emerged, taking into account the nature, extent, and purpose of industrial food processing. Today, a substantial body of evidence has been produced by researchers in many countries, using different study designs, greatly expanding our understanding of the health effects of ultra-processed foods.

4. Although the term “ultra-processed” is becoming increasingly familiar to the public, many people still have questions about what actually characterizes these foods. What are the key features that distinguish an ultra-processed food from a processed food? Which products commonly consumed in the everyday diet of Brazilians deserve greater attention, and what scientific evidence demonstrates their impact on health?

Dr. Carlos Monteiro: It is important to begin by emphasizing that processing is not synonymous with something harmful. Cooking, freezing, pasteurizing, grinding, and fermenting are forms of processing that have long been part of human diets. In NOVA, processed foods are *in natura* or minimally processed foods to which culinary ingredients such as salt, sugar, or oil have been added. Examples include certain cheeses, traditional breads, preserved vegetables, and fruits in syrup.

Ultra-processed foods are different. They are industrial formulations composed predominantly of substances derived from foods, often combined with additives used to modify color, flavor, aroma, and texture. In general, they contain little or no whole food. Examples include soft drinks, flavored milk drinks or yogurts, such as fruit- or chocolate-flavored varieties, filled cookies, “cereal”

bars, breakfast “cereals,” packaged snacks, instant noodles, freeze-dried soups, frozen ready-to-eat pasta dishes, and reconstituted meat products.

5. The NOVA classification has become one of Brazil’s most significant contributions to nutrition science and is now used in research and public policies in many countries. In your view, why has this approach had such a major international impact? How has it changed the way scientific knowledge is produced and recommendations on food, nutrition, and public health are formulated?

Dr. Carlos Monteiro: I believe its impact stems, first and foremost, from the fact that NOVA helped identify a real transformation that was occurring simultaneously in many countries: the replacement of traditional foods and culinary preparations by ready-to-consume industrial formulations.

It provided a relatively simple tool for studying an extremely complex phenomenon. This enabled researchers to investigate the contribution of ultra-processed foods to the diets of different populations and their association with diet quality, obesity, diabetes, cardiovascular diseases, and other health outcomes.

But I consider its contribution to public policy equally important. NOVA shifts some of the focus away from individual nutrients toward foods, diets, and the food system that produces these products.

This has made it possible to formulate recommendations that are easier for the public to understand. Instead of telling people to constantly calculate grams of fat, sugar, or sodium, we can recommend making *in natura* or minimally processed foods the basis of their diet and avoiding ultra-processed foods. This is the rationale behind the “golden rule” of the *Dietary Guidelines for the Brazilian Population*.

6. Like any innovative scientific proposal, the NOVA classification has also faced criticism and questioning, particularly regarding the diversity of foods included in the ultra-processed category. How do you view this debate? In what ways have these criticisms contributed to the advancement and refinement of research, and what misconceptions about the concept are still common?

Dr. Carlos Monteiro: Criticism is an indispensable part of science. NOVA has been discussed, questioned, and refined since it was first formulated, and this has helped make both the classification itself

and the research questions surrounding it more precise.

A common misconception is that NOVA classifies foods simply according to the number of ingredients they contain or whether they are industrially produced. That is not the case. What matters is the extent and purpose of processing. A food can undergo industrial processing without being ultra-processed.

Another misconception is to treat the category as though we were claiming that all ultra-processed products are identical. Clearly, they are not. There is heterogeneity in the composition of these products. The relevant questions here are: 1) Do ultra-processed foods share characteristics arising from their formulation and from the way they are produced and marketed that justify investigating them as a group? 2) Within the same food category, such as breads, yogurts, or breakfast cereals, are nutrient profiles and other health-related characteristics more favorable in non-ultra-processed products than in their ultra-processed counterparts? 3) Is the overall substitution of non-ultra-processed foods by ultra-processed equivalents associated with a greater risk of disease?

At present, evidence generated by different research teams in different

countries, using a variety of study designs, provides affirmative answers to all three questions.

7. You coordinated the scientific evidence base that supported the development of the *Dietary Guidelines for the Brazilian Population*, regarded by many experts as one of the world's most innovative documents on healthy eating. In your view, what characteristics have made these guidelines an international reference? On the other hand, why is it still so difficult to translate their recommendations into meaningful changes in the dietary habits of the Brazilian population?

Dr. Carlos Monteiro: A fundamental characteristic of the *Dietary Guidelines* is that they address food and eating, rather than nutrients alone. Eating does not simply mean consuming proteins, carbohydrates, vitamins, or minerals. It means choosing foods, preparing meals, eating in particular contexts, sharing food with others, and participating in a food culture.

The *Guidelines* incorporated these dimensions while also using NOVA to formulate very clear recommendations. Their golden rule is to make *in natura* or minimally processed foods and freshly prepared dishes and meals the basis of

the diet, while avoiding ultra-processed foods.

But individual knowledge alone is not enough to determine what people eat. Food choices are profoundly shaped by the environment. Ultra-processed foods are widely available, convenient, promoted through sophisticated marketing strategies, and produced by large corporations with enormous economic power. The *Guidelines* themselves draw attention to advertising, including marketing directed at children and adolescents.

For this reason, we cannot place the entire responsibility on individuals. Implementing the recommendations of the *Guidelines* requires public policies: adequate school meals, protection of children from food marketing, food labeling, fiscal policies, and environments that make the healthy choice also the more accessible choice.

8. O senhor acompanhou de perto a transição nutricional brasileira desde os estudos sobre desnutrição infantil até o atual cenário de crescimento da obesidade. Como avalia a situação nutricional das crianças brasileiras, hoje? Quais avanços considera mais importantes e quais problemas deveriam preocupar pais, educadores e

gestores públicos, nos próximos anos? You have closely followed Brazil's nutritional transition, from early studies on child malnutrition to the current rise in obesity. How do you assess the nutritional status of Brazilian children today? What do you consider the most important advances, and which problems should be of greatest concern to parents, educators, and public policymakers in the coming years?

Dr. Carlos Monteiro: The study of the epidemiology of chronic diseases in the adult population and their relationship with diet has taken up all of my time as a researcher. For this reason, I have not been able to follow studies on child nutrition in Brazil as closely as I would like.

9. We live in a time when information about food and nutrition circulates at unprecedented speed. On social media, evidence-based recommendations coexist with promises of miracle cures, fear-based nutrition messaging, the demonization of traditional foods, and influencers who frequently contradict the scientific consensus. How do you view this phenomenon? What role should researchers, universities, and health professionals play in addressing misinformation about food and nutrition?

Dr. Carlos Monteiro: Particularly in the case of ultra-processed foods, the industry devotes substantial resources to marketing and to creating scientific doubt. For this reason, addressing misinformation cannot be framed solely as the responsibility of individuals, who are supposedly expected to learn on their own how to distinguish what is true from what is false. Increasing investment in science communication and public engagement with Science, within universities and health institutions, is essential, but it is also necessary to regulate the environment in which these messages circulate.

This includes restricting advertising and other forms of promotion of ultra-processed foods, particularly those targeting children and adolescents, and addressing new digital marketing strategies, including the use of influencers and content that the public may not always recognize as advertising. The same principle applies to other settings. Schools and health services, for example, should be protected from the commercial promotion of these products.

10. Throughout your career, you have trained dozens of master's and doctoral students and researchers, while also leading one of Latin America's most

respected research groups in the field of nutrition. Many readers of *Conexão Ciência* are students who hope to pursue an academic career. What advice would you give these young people? What qualities do you consider essential in a researcher, and what do you value most in a student who wishes to join a research group such as NUPENS?

Dr. Carlos Monteiro: I would say that science is built collaboratively. Exchange among researchers, critical discussion, and a willingness to share knowledge are fundamental to scientific progress. I also consider it essential to preserve the independence of research and to avoid conflicts of interest. In the field of food, nutrition, and health in particular, the commercial interests at stake are substantial. Scientific research must therefore be protected from interests that could interfere with the formulation of research questions, the interpretation of results, or the communication of evidence.