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Food Classification Report: The Concept 'Ultra-Processed'

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The world population grows with the tendency to concentrate in urban areas. Having food for everyone and correct information on nutrients and diet for everyone is included in the global scope of the United Nations Millennium Sustainable Development Goals (SDGs). Science and technology play a key role. Recently the term 'Ultra-processed' has become fashionable in certain circles related to nutrition. This term is generating a great deal of confusion in certain consumer groups and in the sector of food production, since its interpretation is controversial. This document analyses the reason for this confusion. From a legal point of view, the use of the expression or concept 'ultra-processed' by the political or administrative authorities could be sanctioned. In this context, both the European Commission and national governments could take measures to avoid the use of this expression, the proliferation of which confuses the consumer, influencing their purchasing decisions and legal security. Nor can it be overlooked that those companies, whose products are disparaged to potential buyers by this label, may take legal measures to compensate for the damages and loss caused.

I. Background

Having food and correct information on nutrients and diet for everyone is included in the global scope of the United Nations Millennium Sustainable Development Goals (SDGs).

Triptolemos Foundation for the development of the Food System[1] contributes with its actions to optimize the food system, achieve adequate food for the entire population, as well as the citizens' trust and the dignity of the sector.

The Board of Trustees of the Foundation, meeting on February 18, 2020, approved the writing of a report on the concept of ultra-processed food, given the confusion that this concept generates in the citizen. Researchers from the 26 universities and the Higher Council for Scientific Research were invited to participate from among the members of the board of trustees.

Among its activities the Foundation writes reports on current issues with the scientific support and independence that characterize them, with a focus on the food system.

II. Food System

The world population grows with the tendency to concentrate in urban areas. The right to adequate and

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sustainable food for the entire population is an important challenge in the current context.

Science and technology play a key role. We have to do more with less. Science is the motor of human development in all its aspects. The growth of humanity must be harmonious and sustainable within an ethical framework. This will not be achieved if simultaneously the same evolution does not occur in the global food system and in this the role of science and responsible business activity is fundamental.

From the Triptolemos Foundation, the Food System focuses on four main basic axes: availability, economy, politics and knowledge (behaviour, knowledge and culture), which grow in fractal structure and are interconnected. All of them have to be in harmony for the proper functioning of the Global Sustainable Food System aligned with the SDGs (Sustainable Development Goals).

III. Food and Food Technology

1. Definition and Concepts

Processed foods have been part of our diet since ancient times. Food technology has evolved step by step with humanity. Its application today is complex. A process can be defined as the set of steps that lead us to obtain a product from raw material, and each of the steps in which it comprises is called a basic operation. These operations comprehend any physical change or chemical transformation. The application of the technology is complex, but it has been perfectly systematized by the food process engineering.

An example of this could be the operations carried out in the standardized process of making pasteurized milk:

After milking, the milk is usually filtered (1st operation) to eliminate possible gross contaminants, then it is refrigerated (2nd) to avoid microbial development. The refrigerated milk t is transported (3rd) in refrigeration to the dairy, where it is mechanically clarified (4th) by centrifugation or filtration, a precise quantity of cream is frequently skimmed (5th), re-mixed (6th) to normalize (thus the milk always has the same composition and, therefore, the same nutritional value), later it is homogenized (7th) so that the cream does not separate from the rest of the milk. Then it is pasteurized (8th) to eliminate pathogenic microorganisms, it is packaged (9th), refrigerated (10th) and distributed refrigerated (11th), to the point of sale, where it will continue to be refrigerated (12th). This group of twelve operations make up the processing of pasteurized milk, one of the most common foods which no one would dare to categories as ultra-processed. Technically, a product may have gone through many operations, all of which comprise one process, since remember, it is the set of operations that transform raw material into food.

Technological processes in food advance hand in hand with science and technology in order to minimize the alteration of nutritional and sensory quality with respect to the fresh product.

To minimize the risks of error in production processes (especially those related to temperature control), the manufacturing companies have incorporated HACCP self-control systems (Hazard Analysis and Critical Points Control). This started by applying better time and temperature controls in precooking processes and conventional sterilization treatments. Subsequently, Ultra High Temperatures (UHT) were applied, which considerably reduced treatment times, increasing the effectiveness in the destruction of microorganisms and minimizing the appearance of unhealthy compounds, as well as the use of High Hydrostatic Pressures (HHP) which allows destruction of some microorganisms in fresh foods, extending their shelf life in refrigeration. Lately, technologies such as Ultra High-Pressure Homogenization (UHPH) have materialized, a treatment that continuously applies mechanical forces and high pressure with peaks of high temperatures in tenths of a second, which permits obtaining stable food at room temperature.

2. NOVA Classification

In recent years, and in order to identify food groups with a potential detrimental effect on health and thus be able to guide public health policies on food, different food classification systems have appeared based on their degree of processing. Some of them are the IARC-EPIC system (at European level), the IFIC and UNC systems (United States), the NIPH sys-

go de Compostela (Spain); Amparo Salvador, Professor of Food Technology University of Castilla- La Mancha (Spain); and Pau Talens Oliag, Professor of Food Technology-Universitat Politècnica de València (Spain).

1 See, <http://www.triptolemos.org/en/>

tem (Mexico), the IFPRI system (Guatemala), the NOVA system (Brazil) and the SIGA system (France). Two of these classification systems, the NOVA system and the SIGA system, classify a certain group of foods as ultra-processed.

The term 'ultra-processed' appears in 2009 in a publication by Monteiro *et al.*[2], where they classify foods into four groups. This classification is accepted today by international organizations such as FAO or WHO:

Group 1: There are unprocessed (or natural) foods are the edible parts of plants (such as fruit, leaves, stems, seeds, roots) or from animals (such as muscle, offal, eggs, milk), and also fungi, algae and water, after separation from nature. Minimally processed foods are natural foods altered by methods that include removal of inedible or unwanted parts, and also processes that include drying, crushing, grinding, powdering, fractioning, filtering, roasting, boiling, non-alcoholic fermentation, pasteurization, chilling, freezing, placing in containers, and vacuum packaging. The distinction between unprocessed and minimally processed foods is not especially significant.

Group 2: Processed culinary ingredients include oils, butter, lard, sugar and salt. These are substances derived from group 1 foods or else from nature by processes such as pressing, refining, grinding, milling, and drying. Some methods used to make processed culinary ingredients are originally ancient. But now they usually are industrial products, designed to make durable products suitable for use in home, restaurant and canteen kitchens to prepare, season and cook freshly prepared dishes and meals.

Group 3: These include canned or bottled vegetables or legumes (pulses) preserved in brine; whole fruit preserved in syrup; tinned fish preserved in oil; some types of processed animal foods such as ham, bacon, pastrami, and smoked fish; most freshly baked breads; and simple cheeses to which salt is added. They are made by adding salt, oil, sugar or other substances from group 2 to group 1 foods. Processes include various preservation or cooking methods, and with breads and cheeses, Page 8 of 44 Ultra-processed foods, diet quality, and health using the NOVA classification system non-alcoholic fermentation.

Group 4: ultra-processed foods are formulations of ingredients, mostly of exclusive industrial use, typically created by series of industrial techniques and processes (hence 'ultra-processed'). Some common ultra-processed products are carbonated soft drinks; sweet, fatty or salty packaged snacks; candies (confectionery); mass produced packaged breads and buns, cookies (biscuits), pastries, cakes and cake mixes; margarine and other spreads; sweetened breakfast 'cereals' and fruit yoghurt and 'energy' drinks; pre-prepared meat, cheese, pasta and pizza dishes; poultry and fish 'nuggets' and 'sticks'; sausages, burgers, hot dogs and other reconstituted meat products; powdered and packaged 'instant' soups, noodles and desserts; baby formula; and many other types of product.

3. Rating Assessment

It is important to note that there is no legal standard that defines ultra-processed foods. Regulation (EC) No. 852/2004 defines and classifies food into two main groups, unprocessed food and processed. In that sense, foods called ultra-processed are actually included the definition of processed food. The NOVA classification considers 'ultra-processed food' according to:

- the number of ingredients;
- if they are products made by industrial techniques and processes and ingredients for industrial use;
- if the preparation has involved production (by stages) in different companies - if additives are used (despite being legal) related to sensory improvements (colorants, texturizers, flavourings, etc.)
- if it is a product obtained by new technologies despite being a classic product;
- if the identity of the main components cannot be identified with the naked eye - if they are products with a striking packaging;
- if they are products with a high economic profitability.

The following reflections are generated in this connection:

• It is an error to apply this term based on the number of ingredients included or which cannot be visually identified, since there is a risk that any com-

2 Monteiro, C.A., Cannon, G., Lawrence, M., da Costa Louzada, M.L. and Pereira Machado, P. (2019). Ultra-processed foods, diet quality, and health using the NOVA classification system. FAO. Roma. www.fao.org/3/ca5644en/ca5644en.pdf

plex dish from the culinary tradition of any country would be included in the definition. This point needs to be clarified.

• The definitions of ultra-processed foods that exist in some cases refer to the type and degree of processing that they undergo and in other cases to the formulation and composition. Classifying a food as ultra-processed based only with the degree of processing makes no sense since the effect that the food has on health will largely depend on its final composition.

• According to what has been published in different media with more or less scientific rigor, 'ultra-processed foods' are processed foods, which incorporate additives (sugars, preservatives, artificial flavours, colours, among others) or artificially modified ingredients such as hydrogenated oils, or refined flours, etc., as opposed to processed foods, in which no such ingredients appear. The reality is that the addition of an ingredient as a specific preservative to a processed food does not make it 'ultra-processed', because the technological process to which it is to be subjected, or has been subjected, is the same.

• From a technological point of view in the NOVA description, the definition of the first 3 groups is based on the enumerative description of the operations and processes used. However, in the definition of ultra-processing, there is no technological description of what the conditions are. There is no list of the basic operations that define the process, despite the fact that the intended description occupies three pages of the publication. The only basic operation that is cited is extrusion.

• It is a mistake to associate ultra-processed foods with foods of low nutritional quality since this depends not only on the intensity or complexity of the process but also on the final composition of the food. Any culinary process is capable of being automated, or optimized for large-scale production, without necessarily compromising its sensory or nutritional quality, its food safety, nor need it be against fidelity to the traditional dishes or foods which it reproduces.

• With this classification, you want to define a process, but you are describing the composition of a mixture, that is, of several foods already processed. Being a mixture, the identity of the ingredients, their quality and the possible additives that can be used, as well as the control of the applied technology, is strictly regulated by the authorities based on very exhaustive and reviewable scientific dossiers. The level of additives and other regulated substances is set by the total provided by the different components.

• Defining an ultra-process based on the impact of its packaging or its economic profitability, involves using criteria of marketing strategies, not technological.

• This does not refer to basic operations but to products with variable, unspecified technologies, and an ambiguous typology of their ingredients. The same authors acknowledge the difficulty of identifying whether a product has been ultra-processed and recommend resorting its composition, a fact that demonstrates the weak technological basis of the classification.

Despite the fact that there is no legal norm that defines the term ultra-processed food and that the different definitions proposed by these classification systems have generated a lot of scientific controversy, its use has been spreading among society, even being used in scientific fields.

So, a rigorous description of what an ultra-processed food is, is necessary in order to avoid confusion to consumers.

IV. Diet and Nutritional Balance

1. A Confusing Classification

The referenced document (NOVA classification), as has been argued, classifies a miscellaneous set of products without technologies that define them. It gives some nutritional recommendations about their use in diet, based on a confusing technical classification.

Diet is not a product. A diet is the amount of food that a living being provides its body with. Diet defines our nutritional behaviour; it is a set of nutrients that the body absorbs after the habitual consumption of food. A diet beneficial to human health, that is one with energetic and nutritive balance, must contain a sufficient quantity of calories and essential nutrients for the correct growth and development of the organism in each of the stages of its life.

Changes in our diet and among sedentary lifestyle, are causing the growth of non-communicable degenerative diseases (NCDs), including obesity, cardiovas-

cular disease and Type 2 diabetes, pathologies that dramatically affect western society and are increasingly frequent in developing countries.

2. Classification and Diet

For example, excessive consumption of foods rich in saturated fats or sugar should not be abuse, but neither should they be eradicated from the diet, except when it is necessary for health reasons. You cannot call certain foods as ultra-processed and condemn them, when that term is, at least, imprecise and can be confusing.

The human being is omnivorous which means that he can eat everything and not deprive himself of anything, but, of course, within rational limits and based on his beliefs. It is not good to overindulge in anything, including many of the so-called ultra-processed products but to eradicate them - all of them - from the diet of healthy people is unreasonable. It is obvious that certain products can be harmful to a certain population group and that some foods contribute very little to a balanced diet, except for calories or pleasure. The industry reformulates its products, improves them, and pursues consumer satisfaction. It is in the hands of society to direct their tastes towards certain foods or others.

A good nutritional education is necessary, far from falsehoods and fads, so that the healthy consumer eats everything, in proportionate amounts and enjoys it. It cannot be forgotten that food, besides nurturing, satisfies, and the human being is hedonistic. The consumer society is very well supplied - perhaps too much - and, hopefully, it will continue to be so. A well-informed consumer will opt for the least harmful foods, but we cannot force him to give up pleasure, the undoubted satisfaction of gratifying a gastronomic whim. He should be provided with a solid understanding, and appropriate information, and public health will benefit.

Before classifying any processed food as ultra-processed, it would be necessary to carry out studies comparing the impact of diets with high consumption of processed foods, which contain ingredients that can contribute to the generation of health problems, to diets based on processed foods that do not present these ingredients in their composition.

Scientific works can be found that try to evaluate the effect that ultra-processed foods have on health, without qualifying the type, accepting this classification and definition of ultra-processed foods. These must not be confused with foods with unbalanced nutritional profiles.

Thus, to avoid the detrimental effect of food on our health, the important thing is a good nutritional education that must be started from an early age, since it is very important to know how to eat and have a varied diet, choosing foods that best meet our nutritional necessities, whether or not they are processed. As a concept, Paracelsus defined said (17th century): 'there are no poisons but doses', the poison is not in the product but in the dose.

V. Final Comment

There is universal concern about food and nutrition. Any effort to improve it should be welcomed. Feeding is a vital necessity.

It is possible to ask people with training, from the fields of communication, but much more with scientific and health degrees such as Nutrition to avoid the use of words lacking scientific rigor, and if they consider that for health reasons it is convenient to reduce or avoid the consumption of some type of product, firstly to do so with scientifically based arguments, and secondly to unequivocally identify the risks and the specific foods subject to these recommendations.

The reality is that we need some term that correctly defines these foods, and precisely the term 'ultra-processed' is not the most appropriate because it is confusing and does not correctly imply what we mean. It will not be easy to eliminate the term 'ultra-processed' from newspaper reports and even less from social media, but as has been argued, it cannot be rigorously assigned to a certain food category. To consider such products as unhealthy and inadvisable seems inappropriate and unethical.

VI. Conclusion

This document evaluates the NOVA classification (above mentioned) using the current concepts in food technology and its relationship with diet. In order to use the concept of ultra-processed food in public health policies, it is necessary to define the term more rigorously. Despite its ambiguity, to date, the introduction of the keywords ultra-processed foods in the

prestigious database, in scientific terms, FSTA (Food Science and Technology Abstracts) provides a total of 714 entries, ultra- processed foods and health, 535 or ultra-processed food intake, 130. The entry concepts should be reviewed with criteria of scientific rigor.

The term 'ultra-processed' is extremely confusing and misleading, lacking scientific rigor and misleading from a scientific-technical point of view. There is no talk of technology, but rather of products of varied technologies and compositions and the typology of their ingredients, not their required quality and based on this, dietary behaviour is defined. Science advances by trial and error. In short, it is a concept accepted by some institutions, but it should be revised due to its lack of precision.

Concerns and fears such as those generated by the confused concept of 'ultra-processed' should lead us to various reflections, among them, sensitize the scientific world (technologists, nutritionists, dietitians, toxicologists, doctors, pharmacists, veterinarians, biologists, chemists, agronomists, etc.) of their responsibility to achieve agreed definitions with a proven scientific basis (not to be confused with only working hypotheses or assumptions), with an understandable and transparent wording for the average citizen, that administrations and the media must then apply and disclose.

Official statistics show that we have never, in the history of humanity, had such safe food and that we have increased life expectancy, however citizen mistrust grows. The confusion, the fake news, the half-truths, the lack of rigor ... do not help, quite the opposite.

From a legal point of view, the use of the expression or concept 'ultra-processed' by the political or administrative authorities should be avoided. In this context, both the European Commission and national governments could take measures to elude the use of this expression, the proliferation of which confuses the consumer, influencing their purchasing decisions and legal self-confidence. Nor can it be overlooked that those companies, whose products are denigrated with effects on potential buyers by this disqualification, may take legal measures to compensate for the damages and loss caused.

All institutions and everyone involved in any of the multiple aspects of the nutrition system should contribute to the transmission of confidence in their responsible companies and administrations which try to feed a growing population daily with limited means. As citizens, we should be critical and demanding as well as responsible and, above all, avoid confusion.

General training in the food system and specific nutritional education of citizens, based on demonstrable science, must lead to having the right food energy (with a sense of nutritional balance in the diet), as the fundamental motor of life.