**HEALTH' FOODS, IMPLICATIONS FOR AGRO-FOOD INDUSTRIES**

# Advice Note

**adopted by vote**
**by the National Academy of Technologies of France (NATF)**
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From a quantitative standpoint, in relation to the foodstuff-nutritional conditions for Earth's populations on a global scale, we can observe two dramatic and opposing situations, with on one hand, close on one billion inhabitants who do not have enough food intake, while at the same time there is an almost equivalent number who suffer from being overweight and/or are obese.

Recognizing these facts calls for determined sustained initiatives. And this Academic Advice Note goes further, inasmuch as at national level the qualitative aspect of food is something that goes back a long way, given that from times immemorial, food has always been seen over and above its nutritional features, as something 'preventive' or even 'curative' in terms of our state of health.

Public authorities in France, conscious as they are that a varied food intake and balanced nutrition contribute in an essential manner to maintaining a high level of the state of health of the populations, have prioritized the objective to improve the state of health generally in France by focusing food intake practice and the composition of meals. A more proactive educational policy should accompany this priority axis, starting with children in primary schools, in relation to acceptable feeding behaviour. In terms of public health, it is especially important that these steps taken with all the actors concerned be crowned with success.

Companies operating in the agro-food sector also have to assume their part of the responsibilities here. After all, it is they who fabricate and sell high nutritional quality foodstuffs and beverages, which in certain cases, can even be beneficial for health (health improvement food): they can, for instance, reduce the calorie-intensive molecules (sugars and fatty compounds) or those that are dangerous when ingested in excess (salt), or increase the micronutrient contents (vitamins, minerals and other micro-nutriments), or add recommended nutriments (omega 3 fatty acid) and avoid – for certain consumers – the presence of molecules for which they are 'intolerant' (wheat gluten, lactose) or allergic (to proteins from a variety of sources).

They can also add molecules or microorganisms (probiotics) with particular effects on human metabolism as identified through recent scientific discoveries and progress in our understanding of the underlying mechanisms. In such instances, the qualifier proposed is that of foodstuffs with "specific physiological effects" aka "functional food". These different health foods are diversified and come with a complex nomenclature.

The companies that assemble food supplements and other ingredients are often major companies (but they include medium-sized companies and start-ups) lie at the core of the

development of foodstuffs with specific physiological effects mainly because of their capacity to discover the active principles in their ingredients or mixes, in interacting and co-operating with academia. Also, given that because of the inherent complexity and associated costs, development of a new active principle can only be economically justified if the product(s) that contain the principle is sold on a large scale, and in an ideal vison in several foods segments simultaneously.

The manufacturers will potentially be able to benefit from new nutrition research results and perspectives: a better understanding of the intestinal microbiota (microorganisms present in our intestines), of the relationship between the human genome and food (which are studied in nutrigenetics and nutrigenomics), development of new exploratory techniques (metabolomics, big data analysis), of the impact of food ingested on out metabolism and health as consumers. Crossing these "new frontiers'" could open the way to introducing more personalized foodstuffs.

**RECOMMENDATIONS**

1 – **Among the scientific breakthroughs, perhaps the most promising for the coming years lies in the discovery of the numerous impacts that our microbiota have on our bodies**. Given the high level research conducted by French research scientists in this field (microbiologists, nutritionists, physiologists, clinical practitioners), microbiota studies should be encouraged financially and strategically by public authorities. The impact of food ingestion behaviour on the nature and the way our microbiota "operate" calls for in-depth analysis. There are start-ups currently active in this sector which is also proving attractive to major companies.

2 – On a longer term, the fact that our food intake habits has an influence on the way our genes express themselves and indeed our individual reactions to food in general, depending on specific genomic features, could have important spin-off effects on the "personalization" of foodstuffs. With our knowledge in these matters being 'preliminary' as it stands today, only the major multinational consortia possess the high level research capacity need to engage in this path. **Public research establishments, in contradistinction, could be supportive of other professional in this sector, through their "watch-tower" monitoring policies and findings.**

3 – Nutritional research for the development of products that are best adapted to children, ill persons or senior citizens, in particular those suffering from specific disorders and illnesses such as diabetes, cancer or Alzheimer is more than necessary. **More particularly an effort must be sustained to improve care for patients with de denutrition (or a risk of)**, such as new-born babies, youngsters and senior citizens for whom the observed physiological state and associate pathology(ies) identify specific nutritional needs, not forgetting those who have chronic disorders.

4 **– Continued and intensive analysis of Big Data** (in data banks) is increasingly undertaken to getter a better understanding of the interactions that exist in complex systems. In the area of life sciences, the pharmaceutical industries are investing massively in this sector. Given the interest represented by this approach, still in its infancy, to better understand the incredibly complex relationships between our nutritional behaviour and our health, the

**NATF advocates that it be taken on board by both the public authorities and health professionals** with a view to issuing guideline recommendations on *'How to eat well and healthily*" and also by industrialists to develop new health foods with specific physiological effects.

5 – At a European level, the launching of ambitious programmes associating clinical research, physiology and nutrition biology, then sheer power of the various *"-omics"* specialties, bio-data computing and processing should enable scientists to understand better the actions and mechanisms of foodstuffs with specific physiological effects, to also ident new foodstuffs and to characterize biomarkers that will assist in the process of validating (or refuting) health improvement and enhancement claims.
The steps above are fundamental to ensure progress in this field. Indeed, one of the methodological difficulties encountered is to obtain precise answers as to the impact of foodstuffs with specific physiological effects, which preferentially target consumers with only mild metabolic disorders, whereas the exponents are, in most cases, carried out with "healthy" human guinea pigs.
The approach is deemed satisfactory when the health food ingested makes some known risk factor evolve positively. However, and most frequently, **the main difficulty stems from an absence of markers that could be used to indicate the transition from a state of 'good health' to a 'pathological' state. This is the challenge facing the research scientist active in this area. NATF invites them to engage in in-depth studies on this complex question**.

6 – It can be observed that regulations represent sources for evolution and progress for enterprise, generally speaking. But this is not the case in Europe, as far as foodstuffs with specific physiological effects are concerned. Assessment in compliance with the very stringent rules of EFSA (European Food Safety Authority) of claims made by the petitioners makes it very costly to set up a certification case, and makes it highly uncertain that for the investment made by the enterprises, there will be a positive agreement response.
This discourage the actors from making commitments in innovative and breakthrough research. When they emerge, the European market-places are by-passed and non-EU markets places benefit. Without incriminating regulations that are necessary to avoid "marketing effects" that ignore the consumers' interests, it does appear relevant and appropriate now that **the criteria used for assessment for health-enhancing and improvement claims should be re-examined**.
A formula along the lines of that used by the Food and Drug Administration (FDA) in the USA that imply two levels of requisite: level 1 – health claims and level 2 – qualified health claims, the latter calling for less definitive proofs allowing for a transitional (*i.e.,* not definitive) certification. A contractive dialogue should be initiated between European authorities, academia and industrialists to see changes in a situation that paralyses industrial sectors and research in Europe in this field.

7 – **The boundary between foodstuffs and medicinal drugs should not be crossed**. It nonetheless sketches out a territory which is common to several aspects in medicine and the use of food supplements and foodstuffs with specific physiological effects. Recognizing the situation as it stands could serve as a prelude for collaborative agreements between pharmaceutical, agro-food and ingredient manufacturers, at least at the R&D directorates

which can combine their complementary research skills, even if the foodstuff companies and the pharmaceuticals are competitors for the same new market slots.

8 – **Small and medium-sized companies (SMEs) that prove themselves to be really innovative inn health-foods must be financially supported on a regional level**. Assessing R&D dossiers must be envisaged as soon as a new project emerges and this task and responsibility should be entrusted to experts chosen from a list established on a national level by relevant public authorities.

9 – **Consumers' rights and interests must be protected.** Insofar as foodstuffs with specific physiological effects possess different properties that differentiate them from traditional foods, they should not be presented for sale on the same shop shelves (for example anti-cholesterol margarines enriched with phytosterols placed side by side with traditional, fatty content goods), as is already the case for dietetic produce items. Moreover, consumers are faced with a prolific amount of recommendations conveyed in the media, sometimes self-contradictory and in many case erroneous and non-scientifically based – they are in essence guided by market strategies only. Public authorities are advised that they should take the initiative to examine these questions and issue where appropriate the warnings to potential consumers.

10 **– The market introduction of foodstuffs with specific physiological effects that are more expensive than traditional food does raise ethical questions, for example, the question of access for all to food sources that are more beneficial for our health**. Framed in more general terms, we see here the issue of inequality of access to technology and to new products. Issues and questions alike these merit further consideration and analyses. Moreover, it also lies within the ethical responsibilities of enterprises not to have potential consumers believe – through complacent adverts or press reassess – that foodstuffs with specific physiological effects are "miracle food" and that they can advantageously replace a varied and balanced food intake or even therapy.