

INFORMATION FLOWS THROUGH THE FOOD ARE IMPORTANT BUT OFTEN FORGOTTEN ASPECT OF NUTRITION

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Almost all current dominant concepts of nutrition (and diets based on them) devote their attention strictly to the equivalence between energy and constructive material needs of organism with food input. Food is an important source of energy and an essential material for organism. Unfortunately these theories neglect the fact that the food and its processing are also a significant source and generator of informational signals vital for the wellbeing of both animals and humans. These informational influences of food on organism's functions may or may not have a favorable effect but it certainly cannot be overlooked. There are several arrays of signals connected with food and eating which should be taken into account: external and internal signals that occur while food is being processed in the gastrointestinal tract. External signals (e.g. odor, sight) generate food behavior. The exploitation in commercial aims could be a significant input at health problems such as obesity, anorexia etc. Social image of food and feeding behavior is also an important factor that influence human's eating behavior that affect health.

Internal signals from the food are numerous and are comparable with pharmaceutical effect. For instance, only 0.02 % of caffeine and thiobromine, which are highly active substances, are consumed by humans in prescription drugs. The rest of 99.98% are absorbed through food. Opioids are a highly regulated substances, while its analog endorphin, is produced in our body as a normal part of food consumption. The same process exists with diuretics as a medicine and as an ingredient in vegetables. Traces of psilocybin and other psychedelic substances in edible mushrooms and plants can affect the mind through reactions with serotonin receptors and pathways. There is a particular interest in the presence of hormones and their analogs in everyday food. Most steroids, which have highly active regulatory factors, do not disappear even under culinary treatment of meat, dairy and poultry dishes. Phytosterols which in some way simulate steroid hormones, also make their input at regulatory influence on organism's functions.

Moreover, recently it was shown that receptors for such specific ligands such as DOPA, serotonin, melatonin, even benzodiazepines could be attacked by their analogs in food. Even trivial macro and micro nutrients balance, beside their direct role in metabolism can serve as an indicator of sufficient supply of organism's needs and initiate changes not only in a digestive system but in the entire organism as a whole. Their presence may initiate food behavior or switch-off appetite, activate brain and muscular activity or inhibit them, and disorganize inner hormonal regulation. A simple example are sugar and sweet substances which affect blood sugar level, behavior and modulates many other functions. In a certain way candies and cake might be considered as a treatment for condition such as depression.

Obviously, beside signals coming from food, it's processing during digestion add additional regulatory signals. Feedbacks from glands producing digestive fluids (saliva, pancreatic secretion, bile etc.) can activate other body systems to work.

In addition, substances produced by micro biome also have informational meaning. The actual digestion process doesn't occur in a sterile environment and the micro flora inside the gut generates a significant amount of physiologically active substances.

Proteins from food, besides their function as constructive materials, have certain immunological imprint too. That makes us postulate definite informational influence of food on organism's immune system as one more meaningful signal. This flow of information is especially important at first hours/days of mammalian life due to its ability to support body's immunity and chance to imprint some allergens.

Are these positive or negative signals? It depends on dosage and circumstances, but the negligence of such regulatory influences of food and digestion is definitely a food safety concern. Each of the above mentioned informational effects of food and its processing (digestion) is not our discovery but their structuralization and actualization may change the way how food safety should be considered in general.

The recommendations presented in this paper areas follows:

- * education and regulations: food consumers have to be educated regarding possibilities of manipulations with their appetite;
- * the regulations concerning meaningful signals in food have to be improved;
- * switch researcher's (including dietitians) interest from counting of energy and constructive materials in food on regulatory factors;
- * instead of balanced theories placed in the basis of the most popular diets, an adequate one has to be promoted;
- * ingredients with small common nutritional value but a significant regulatory properties could be as important for food safety as macro nutrients;
- * healthy food should be accompanied with a wide variety of remedies/supplements which are rich in regulatory (even pharmaceutical-like effect) substances;
- * keeping in mind individual differences, eaters has to be aware of like minor ingredients of food which has signal properties exactly for such specific person.

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