Editorial

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P. Schreier (above) and H.-U. Humpf (left)

On with the trend – Functionality

Healthy nutrition is a popular subject in the world of western life style and a highly competitive market in industry. Consequently, the interest in the relationship between diet and health has increased the demand for information about 'functional foods'. Biologically active components in 'functional foods' may impart health benefits or desirable physiological effects. Functional attributes of many traditional foods are being discovered, while new food products are being developed with beneficial components. This wave of interest in healthy nutrition was already making demands on science years ago and is currently raising new challenges. Not only according to Hippocrates' doctrine: "Your food should be your medicine and your medicine your food", but also in accordance with Paracelsus' theorem: "All things are poison and nothing is without poison, only the dose permits something not to be poisonous", researchers from various disciplines are working to establish criteria to evaluate benefit und risk of 'functional food' on the basis of an experimentally secure fundament.

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That is an enormous challenge for interdisciplinary research. Although epidemiologists can investigate what type of nutrition is beneficial to health and what one should avoid in order to grow old in good health, it is a different matter developing functional food. It must never be forgotten that when working on cells in the laboratory one only sees a tiny section of a complex phenomenon with possibly a huge variance. What is the situation *in vivo*? At which degree is the metabolism individually different, what are the interactions with other ingredients? One has not only to elucidate whether and which effect a substance has in relation to a disease, but also which role it may play in its course, *i. e.* how relevant it is in total for a disease. In addition, it has to be clarified whether it really exhibits an additional function in relation to 'normal' food. Finally, it is obvious that with increasing amounts and varying formulations that are different from those of 'normal' food, undesirable effects cannot be excluded. The report recently provided by the Senate Commission on Food Safety (SKLM) of the German Research Foundation (DFG) [1] on food supplements delivers a convincing opinion: "…considers a comprehensive safety assessment and scientific substantiation of the postulated nutritional or physiological effects …to be essential within the interest of consumer health protection". Thus, comprehensive tests and evaluations in agreement with the generally accepted principles of risk analysis have to be performed, including known elements such as product characterization, risk identification, hazard characterization, exposure assessment, and risk characterization. To aid evaluation, statements concerning reduction of disease risks should be substantiated on the basis of generally accepted scientific standards in accordance with evidence-based medicine. The claimed effect must be proven for the individual product, in particular if interactions between various constituents of the product cannot be excluded. To ascertain sustainable consumer health protection it has also been recommended (i) to generate consumption data for an exposure assessment, and (ii) to establish an alert system for suspected cases of undesired effects.

In principle, the recent EU legislation follows the requirement on scientific evaluation of health-promoting or disease risk-reducing effects of components. It is clear that basically all those claims are forbidden which are not explicitly allowed, a turnaround from the principle to date. How complex it will be to protect against imitations those products tested with regard to risk/benefit which are beneficial to health represents a particular challenge for the industry concerned.

As scientific and technological advances develop in the field of health and nutrition, more and more focus has been directed towards the emerging field of nutrigenomics or 'personalized nutrition'. The science of nutrigenomics involves the application of the human genome to nutrition and personal health to provide individual dietary recommendations. By using an individual's unique genetic makeup and nutritional requirements to tailor recommendations, consumers may have in future a greater ability to reduce their risk of disease. Personalizing nutrition to an individual's unique genetic makeup has the potential for positive health outcomes overall. Choosing an individualized

approach, over a more traditional or general approach, to health and nutrition recommendations can provide consumers with the most appropriate and beneficial information for their specific nutritional needs. However, research is still in the preliminary stages, and years may pass before reliable and effective recommendations can be made for individuals.

Summarizing, functional foods can be an important part of an overall healthful lifestyle that includes a balanced diet and physical activity – and here the circle closes with Hippocrates!

Molecular Nutrition & Food Research was created in order to provide a platform for an interdisciplinary research exchange, in particular regarding functionality, risk and benefit. Progress reveals that our strategy to combine the interests of various fields of molecular nutrition in MNF has found increasing acceptance. We will continue along these lines in future and, according to the current trend, further profile MNF by focusing on 'health/risk-benefit' topics.

Encouraged once again this year by positive feedback, we are looking forward to further successful cooperation and wish you all a successful and healthy NEW YEAR.

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[1] Eisenbrand, G., Evaluation of food supplements containing other ingredients than vitamins and minerals. *Mol. Nutr. Food Res*. 2007, *51*, 1300 – 1304.

