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Overview of Nanotechnology Research for Food Science in the Netherlands

F. Kampers
Wageningen UR, P.O. Box 8026, 6700 EG Wageningen, Netherlands
frans.kampers@wur.nl

From demographic trends like aging and increasing world population, combined with the development of welfare diseases like obesity which develops into health problems like diabetes, it has been recognized that in a few decades healthcare will become a large financial burden to industrialized societies. A solutions to this problem is to shift from curative healthcare (solve health problems) to preventive healthcare (prevent health problems from occurring or postpone them to a later age). Food is an important component of preventive healthcare and micro- and nanotechnology can contribute to that concept. Micro- and nanotechnology will lead to sensors and diagnostic instruments with improved sensitivity and selectivity that will be able to monitor food processes and assure food quality. These new instruments will enable much faster measurements in or near production lines by non-expert personnel. But micro- and nanotechnology will also result in new concepts for food production processes. Examples are microsieves for separation and fractionation which can also improve emulsification processes and can result in new products like low-fat mayonnaise. Control of matter at the nanoscale will enable fine tuning of specific food characteristics like texture to the demands of specific target groups. The use of drug delivery concepts for nutrient delivery will improve the nutritional quality of food products. Nanotechnology can be used to improve packaging materials. Combined with printable electronics and low cost sensors information about the product and its quality will become readily available to consumers. The GMO issue has shown that consumer perception is crucial for the acceptance of a new technology. Objective information on risks, e.g. of nanoparticles, and good communication to enable individual consumers to evaluate risks and benefits are essential for the confidence in the new technology.