ESTIMATING THE QUALITY OF FOODS

Lab. Quality Analysis and Assessment
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We are doing research to estimate the quality of foods and food materials using various techniques from multiple viewpoints. As main subjects relating to food quality, we have been studying the sensory properties (taste sensation, aroma perception, etc.).

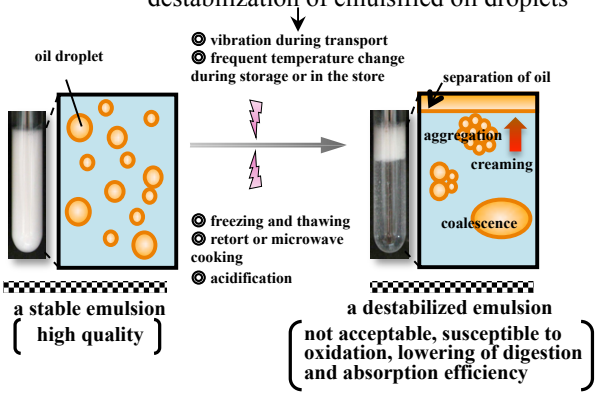
Assessment and improvement of processing characteristics of raw materials

Processed foods are generally produced from various types of raw materials; tofu and bread are produced from soybean and wheat, respectively. In the case of agricultural products, a wide variety of cultivars are used, and processing characteristics greatly differ according to production area, weather, and storage/distribution conditions. However, it is impossible to analyze the quality of all the samples on the real processing scale. We are always required to evaluate the quality efficiently and accurately in a small scale test. The purpose of our research is to develop the appropriate methods for the evaluation and unravel the factors determining the quality of processed foods and their raw materials. We are also trying to improve raw materials and food products by physical treatments or enzymatic reactions.

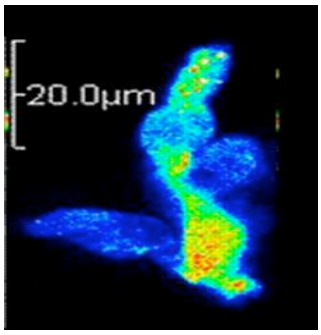
Controlling the Behavior of Fats and Oils in Foods

Fats and oils are normally mixed and interacting with water, proteins, starches and other ingredients in foods such as mayonnaise, ice cream and soybean curd (tofu). The physical properties of fats and oils in foods are closely related to food acceptance and preservation. On the other hand, chemical changes such as oxidative deterioration influence not only the taste and flavor of foods but also the safety, nutrition and physiological functions of foods. Our main goal is to improve the quality of foods by controlling the physical and chemical properties of fats and oils.

Various stresses cause the deterioration of food quality by accelerating the destabilization of emulsified oil droplets



Mouse gulping preferable-tasting water.



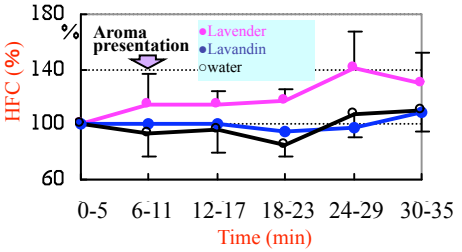
Change of color implies that the cell senses the taste.

How Do We Perceive Taste?

The taste of food is composed of various basic tastes. Taste receptor cells distinguish each basic taste and transduce the taste information to electric signals. By applying physiological and psychological techniques to taste receptor cells, taste nerves and intact animals (human and mice), we have been seeking to elucidate 1) the transduction mechanism in the taste receptor cell, 2) the interaction mechanism between the complex tastes in food, and 3)effects of physical condition such as stress on the taste perception.

Aroma compounds in plants and foods

We enjoy enormous varieties of aroma compounds in plants (flowers and leaves) and foods. The composition of aroma compounds is various according to the kinds of plants and foods. Aroma compounds are also influenced by diverse environmental factors, for example, climate and nutritional conditions in the soil for plants, and processing and storage conditions for foods. We are investigating the effects of aroma compounds from plants and foods on human physiology.



Lavender oil can increase the activity of parasympathetic nervous system (relax effect)

2012.4.1

Keywords

Quality improvement by enzymatic treatments, emulsion, gel, mouth-feeling, taste, mouse, neuroscience, intracellular signal transduction, lipid, aromatic compounds, physiological effects of aroma

Recent Publications

Adsorption and structural change of β-lactoglobulin at diacylglycerol-water interface.
Sakuno M.M, Matsumoto S, Kawai S, Koseki T and Matsumura Y（2008）
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Hydrocolloids from leaves of corchorus olitorius and its synergistic effect on carageenan gel strength.
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Y. Miyamoto, K. Matsumiya, H. Kubouchi, M. Noda, K. Nishimura and Y. Matsumura (2009)
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Recent Publications

Carbohydrate Moieties Contribute Significantly to the Physicochemical Properties of French Bean 7S Globulin Phaseolin
Aiko Kimura, Mary Rose G. Tandang-Silvas, Takako Fukuda, Cerrone Cabanos, Yasuhiro Takegawa, Maho Amano, Shin-Ichiro Nishimura, Yasuki Matsumura, Shigeru Utsumi and Nobuyuki Maruyama (2010)
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