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Food engineering at the farm level - improving food quality through feeding

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Feeding farm animals is the largest cost of animal production. Consequently, the nutrition of animals became highly influenced by the need for improvement of feeding efficiency. Feed conversion to animal product has been maximized by supplying precisely designed feeds to animals bred for large scale intensive production. This practice, on one hand, led to animal products with standardized quality that not always meets the requirements of demanding customers in regards to flavor or nutritional quality. On the other hand, the utterly intensive production led to the physiological deficit of the farm animals causing health risks. In the long run, these effects are challenging the profitable production, and have to be compensated adequately. Nowadays, supplementary feeds are a highly important part of precision animal nutrition. The reason for application is double: (1) to prevent or cure metabolic disorders of intensively producing farm animals; (2) to improve the nutritional quality of foods with added values, leading to functional foods enriched with bioactive compounds promoting human health. Both cases may lead to animal products with altered nutritional and organoleptic properties. Thus, the effects of these interventions on the food raw materials have to be monitored and evaluated. This presentation provides a collection of studies where the effect of supplementary feeds on the quality of foods was investigated employing chemical analyses, human sensory panel tests, and artificial flavor fingerprinting technologies. The demonstrated results cover dairy, egg, pork and poultry productions, giving a broad spectrum of the effect of animal nutrition on food quality.