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The safety of Asian fermented foods: Conventional and molecular genetic approaches to study occurrence and control of biogenic amines

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Fermentation is one of the oldest technologies in food processing and preservation in the world. A variety of fermented dairy products have been extensively developed in western countries, while a diversity of fermented vegetable (or soybean) products have been steadily developed in eastern countries. Asian fermented foods (excluding alcoholic beverages) can be classified into three groups: Fermented vegetables such as Korean kimchi; fermented soybeans such as Korean Jang and Japanese Hishio and; fermented fish such as Korean Jeotgal and Japanese Narezushi. Among them, fermented soybean foods have been largely used as significant protein sources in Asian countries at least for millennia and recently proven to exert various outstanding health benefits such as anticancer, anti-diabetic, antihypertensive, anti-inflammatory, antioxidant, and fibrinolytic effects. Nowadays fermented soybean foods are popular and consumed frequently even in western countries. Meanwhile, it is well known that fermentation of protein-rich raw materials (e.g., meat, milk) commonly provides abundant amino acid precursors of biogenic amines, and consequently results in a significant accumulation of biogenic amines in the final products (e.g., sausage, cheese). Likewise, previously reported data indicate that bacterial communities of fermented soybean foods can steadily produce substantial amounts of biogenic amines during processing (i.e., fermentation), distribution and storage, which may occasionally lead to a risk of food intoxication associated with digesting biogenic amines. Thus, a clear understanding of the occurrence of biogenic amines in fermented soybean foods is necessary to monitor and control biogenic amine formation in the foods. Unfortunately, empirical data on determining the dominant producers (and related genes) of biogenic amines and controlling the formation (and related gene expression) of biogenic amines in fermented soybean foods are scarce in literature. In this presentation, therefore, conventional and molecular genetic approaches to study the occurrence and control of biogenic amines in fermented soybean foods are described.

Biography

Jae Hyung Mah has completed his BS, MS and PhD from Korea University, Republic of Korea and Post-doctoral studies from University of Wisconsin-Madison, USA and Washington State University, USA. He is a Professor of Food and Biotechnology at Korea University (Sejong Campus), Republic of Korea. He has published about 50 papers in reputed journals and has been serving as an Editorial Board Member and referee for several peer-reviewed journals in food science and technology. His researches focus on the analyses of hazardous chemicals and microorganisms in fermented foods and development of novel protective and preservative strategies such as application of genetically designed starter culture to food fermentation and inactivation kinetics of foodborne pathogenic and spoilage microorganisms exposed to chemical, physical and biological intervention treatments.

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