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Physicochemical and physiological characteristics of the wheat-makgeolli

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The need for research makgeolli is the oldest Korean traditional wine with 6–7% alcohol made from rice (mostly), wheat or barley. Unlike there alcoholic beverages, makgeolli is highly nutritious and functional because of proteins, sugars, vitamins, bioactive compounds, and various organic acids they contains. Makgeolli is brewed by conventional methods by using nuruk or koji. A fungi starter known as nuruk, which saccharifies the rice (wheat, barley) starch during fermentation are added in makgeolli-making process. Nuruk is starter culture, made from wheat or grits moistened to make cake-shaped products through pressure and natural fermentation, allowing the growth of various microorganisms such as fungi, yeast and lactic acid bacteria (LAB). Since *Makgeolli* is made through a rough filtration of fermented mash and contains turbid ingredients with much more microbes than wine or beer. Makgeolli consist of water, yeast, wheat, barley and rice that have been fermented for about 2 weeks after distillation on day 2. Makgeolli especially made by rice rather than wheat are mostly studied until now. In this study, we investigated the different characteristics of Wheat-makgeolli according to the different milling degree of each wheat varieties. Moreover, we confirmed Anti-obesity effects of makgeolli in 3T3-L1 preadipocytes.

Contents of Research: In order to investigate the effects of different milling degrees on the quality of wheat-makgeolli (WM), Korean traditional alcohol drink, physicochemical and physiological characteristics of WM were evaluated. Samples of WM brewed from 100, 85 and 70% milling recovery rates of three Korean wheat cultivars were analyzed for ethanol, pH, coloring degree, total acids, soluble solid, free sugars, organic acids, and adipocytes. As the milling recovery rate in wheat decreased, sugar contents increased and pH decreased. The WM made from wheat exhibited 0.63-0.84% in acidity, 10.2-12.5 Brix in sugar, and 14-16% in alcohol contents. Free sugar contents of the WM significantly changed with fermentation, with glucose and mannitol showing the highest percentage in WM, at 1.60-5.67 g/L and 3.70-5.29 g/L, respectively. WM contained excess lactic acid, which is produced by lactic acid bacteria (LAB). Anti-obesity effects of makgeolli were investigated in 3T3-L1 preadipocytes. Compared to the negative control, makgeolli inhibited the differentiation of preadipocyte as quantified by Oil red O dye. In particular, 100 µg/mL makgeolli reduced 20 to 40% of differentiation. The in-vitro results demonstrated that Makgeolli inhibited the differentiation of 3T3-L1 adipocytes through down-regulation of adipogenic gene expression. Findings of this study suggest that makgeolli has inhibitory activities against adipogenesis.

Biography

Eun Yeong Sim has her expertise in diversifying usage of crop resources. There are many crops such as rice, wheat, soybean etc., for research. For past several years, she focused on the high-amylose rice called Dodamssal released in Korea. Its resistant starch (38%) is good for health of the people who have to control their blood glucose or weight. Wheat is famous for staple food in many countries. But in Korea, its usage is restricted for mostly noodle under natural weather conditions. She has studied Korean traditional fermented alcohol, called Makgeolli made by wheat for recent years. She evaluated physicochemical characteristics according to the different milling degree (100%, 85% and 70%). From last year, she analyzed texture, toyo glossiness, pasting viscosity of various kind of rice for selecting as processed rice. She is planning to develop food especially for elderly or infant using by excellent crop resources, which balance their necessary nutrition. The results of her study will suggest that it's possible to expand the processing usability of top quality crop cultivated in Korea.

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