Effects of Culturing Conditions of Koji on the Flavor Quality of Sorghum Spirits

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ABSTRACT

This thesis can be divided into four parts. In the first part of this thesis, five or ten percent soy flour was added into hard or soft wheat flour to make into kojies to adjust protein and amino acid content in the raw material of kojies. The saccharifying power and the fermentation ability of kojies were compared. Soft wheat koji and soft wheat koji with soy flour added was found to have higher saccharifying power than that of hard wheat koji and hard wheat koji with soy flour added. Whereas, hard wheat koji was found to has higher fermentation power. When comparing the yield of sorghum spirit made by different kojies without soy flour added, the spirit made from winter-made soft wheat koji was found to have the highest yield. When comparing the yield of sorghum spirit made by different kojies with soy flour added, the spirit made from summer-made hard wheat koji was found to have the highest yield. The spirit made from the hard wheat koji with 10 % soy flour added was found to have the highest overall preference. In the second part of this thesis, volatile compounds in the spirits made from soft or hard wheat kojies with or without soy flour added were compared. With soy flour added into soft or hard wheat kojies to prepare sorghum spirit, the amount of total acid and total ester in the spirit were found to increase. With soy flour added into hard wheat kojies to prepare sorghum spirit, the amount of n-propanol, i-butanol, n-butanol, acetic acid, caproic acid, and acetate in the spirit were found to increase. In the third part of this thesis, five kinds of temperature controlling methods were used to prepare high inner-temperature hard wheat or soft wheat kojies. The spirits made from high inner-temperature man regulated or computer regulated kojies have lower overall preference. The high inner-temperature computer regulated soft wheat koji was found to have lower saccharifying power and fermentation ability than others. In the fourth part of this thesis, volatile compounds in the spirits made from the kojies made by different temperature controlling methods were compared. The spirit made from high inner-temperature man regulated hard wheat koji have higher amount of acetic acid, methanol, 2,3-butanediol, phenyl ethanol, furfural, acetoin, ethyl acetate, ethyl lactate, diethyl succinate, and 2-phenylethyl acetate, whereas lower amount of n-propanol, 2-methyl -1-butanol, iso-butanol, and 3-methyl-1-butanol than others.

Keywords : koji ; sorghum spirit ; solid fermentation ; temperature control