

学 位 論 文 要 旨	
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題 目	A study on the relationship among manufacturing conditions, analytical quality, and flavor of sweet potato <i>shochu</i> . (芋焼酎における製造条件と酒質分析値および香味の関連性に関する研究)
<p>Sweet potato <i>shochu</i> is one of the traditional spirits in Japan, which uses sweet potato as the main ingredient. There are many types of <i>shochu</i> products having diverse flavors, which is achieved by using <i>koji</i> mold strains, sweet potato varieties, and different manufacturing conditions. However, the comprehensive analysis of several commercial <i>shochu</i> products has not been done. It is necessary to clarify the relationship among manufacturing conditions, analyzed quality, and flavor of numerous commercial <i>shochu</i> products to further improve and diversify <i>shochu</i> quality.</p> <p>In this study, the quality analyses were firstly carried out on 74 kinds of commercial <i>shochu</i>, and the relationship between the obtained analytical results, <i>koji</i> mold strains, sweet potato varieties, and manufacturing conditions was investigated. The distribution of each analytical value, such as general quality values (pH, acidity, turbidity, ultraviolet absorption, TBA value) and concentration of flavor components, can be classified into six types in terms of a histogram expression. The characteristic flavor compounds of sweet potato <i>shochu</i>, such as citrus-flavored linalool and sweet-flavored β-damascenone, were strongly affected by manufacturing conditions. In addition, dimethyl disulfide and dimethyl trisulfide were found to be compounds that contribute to full-bodied <i>shochu</i>, and their thresholds were determined for the first time. Furthermore, several correlations were statistically found among the flavor components, which were considered to relate to the yeast metabolism or distillation behaviors of <i>shochu</i> components. Previously, it was pointed out that the thiobarbituric acid (TBA) value, which is an index of oxidized oil odor, had a low correlation to that of <i>shochu</i>. However, it was found that the reactivity of some <i>shochu</i> components that are unrelated to the oxidized oil odor with TBA changed significantly depending on the combination of compounds, which should be the reason for low correlation.</p> <p>The influences of the primary <i>moromi</i>'s acidity on the fermentation state and on the analyzed quality and flavor were examined using small-scale brewing of sweet potato <i>shochu</i>. It was found that when the acidity of primary <i>moromi</i> was low, the number of viable yeasts decreased due to the high concentration of alcohol by excessive fermentation in the primary <i>moromi</i>. Therefore, the early alcoholic fermentation of the secondary <i>moromi</i> was delayed. It was also revealed that as the primary <i>moromi</i>'s acidity increased, the concentration of linalool and β-damascenone in sweet potato <i>shochu</i> increased, resulting in a flowery and gorgeous sweet potato <i>shochu</i>. Furthermore, 13 fractions of distillate were collected in the distillation phase of the small-scale brewing of sweet potato <i>shochu</i>, and the distillation behaviors of 57 compounds were investigated. Regarding the patterns of distillation behaviors of these compounds, in addition to the already known three patterns (sudden decrease, gradual decrease, and gradual increase patterns), six kinds of new patterns were found. Therefore, the author proposed that the distillation behavior of sweet potato <i>shochu</i> components could be classified into nine patterns in total. It was revealed that the characteristic flavor compounds, linalool and β-damascenone, had a peak in the middle fraction during distillation, and the sweet flavor of steamed sweet potato was most strongly felt in the middle and later fractions during distillation.</p> <p>In summary, this study clarified the relationship among the manufacturing conditions, analytical quality, and flavor of sweet potato <i>shochu</i> by conducting comprehensive and statistical analyses of various commercial <i>shochu</i> products and model experiments using small-scale brewing of <i>shochu</i>.</p>	