National Research Institute of Brewing (2012)

How to make sake with less “hineka” after storage

Recently, it was reported that dimethyl trisulfide (DMTS) is one of the main components of the unpleasant aroma of aged sake, called “hineka” in Japanese. However, there are many kinds of sake, some of which develop strong “hineka” after storage, and others which do not. We produced sake under various conditions in order to investigate the relationship between the conditions used for making sake and the DMTS-producing potential (DMTS-pp) of fresh (unpasteurized) sake. DMTS-pp indicates how strongly sake will develop “hineka” after storage, and is estimated by the concentration of DMTS in sake after accelerated aging (stored at 70°C for a week). We found that the higher the ratio of dead yeast cells in sake mash was, the higher the DMTS-pp of fresh sake was. The enzymes leaked from dead yeast cells probably caused the increase in DMTS-pp. In addition, longer storage and higher storing temperature after filtration were found to increase the DMTS-pp of fresh sake.

Therefore, to prevent sake from increasing DMTS after storage, it is important that fermentation is carried out under conditions minimizing the dying ratio of yeast cells in sake mash, fresh sake is stored at low temperature after filtration, the residual yeast cells are removed from fresh sake by precipitation, and fresh sake is pasteurized as soon as possible.

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The increase of dead yeast cells in sake mash results in the increase of DMTS, a main component of “hineka”, in sake after storage

Does it due to the leakage of the contents of dead yeast cells into sake mash ？

Addition of yeast cell free extract to fresh sake enhanced DMTS formation

Longer storage and higher storing temperature after filtration enhanced DMTS formation

DMTS-increasing compounds containing in yeast cells were relatively high molecular weight and heat sensitive

DMTS-increasing compounds containing in yeast cells were though to be enzymes

To prevent sake from increasing DMTS after storage, following things are probably useful

- The fermentation was carried out under the condition minimizing the dead yeast cells in sake mash
- Fresh sake is stored at low temperature after filtration
- Fresh sake is pasteurized as soon as possible.
- The residual yeast cells are removed from fresh sake by precipitation