Studies on Shochu Manufacture

On the manufacture of Sweet-Potato Shochu

by

Norio Nagata
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and Matsuo Nanie
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(Received June 10, 1960)

It is the common practice that one makes sweet-potato Shochu by fermenting the first mash consisting only of rice Koji for about 7 days and then by further fermentation of the second mash prepared by addition of the steamed, crushed sweet-potatoes to the first mash.

The authors changed the process in several points:
(1) Sweet-potatoes were used as cut, steamed pieces and added on the 9th, and then on the 13th day from the beginning (divided into two parts).
(2) Rice Koji was decreased to about half of the usual, and one third each was used at the beginning and at the times of addition of sweet-potatoes.
(3) Rice and sweet-potatoes were steamed in an autoclave and vacuum was applied to cool them by evaporation.
(4) A closed, large tank was used in place of an open jar.

By these practices, the authors could suppress the sudden rising to too high temperature of the fermenting mash soon after the addition of sweet-potatoes and too rapid formation of alcohol leading to low yield. They raised the alcohol yield to 82% as the mean value for 6 tanks after acidification with HCl.

On the Colorimetric Determination of vitamin B₁ (V. B₁) in the Seasoning Foods such as Miso.

(Chiefly, on the Influence of NaCl)

by

Michio Miura
(The Fukuoka Industrial Institute)

(Received Apr. 28, 1960)

The colorimetric determination of V. B₁ was studied by diazo-coupling method in the seasoning foods containing much NaCl.
(1) NaCl inhibits V. B1 adsorption by acid clay. The quantity of V. B1 which can be adsorbed by a certain quantity of acid clay is affected by the ratio of quantities of V. B1 and NaCl in the solution.

(2) The absorption capacity of acid clay remarkably increases when it is dried at 150°C for 2 hours. It is, however, extinguished by the treatment with HCl.

(3) Although the color reaction of V. B1 with diazo-reagent is not affected by NaCl alone, the intensity of color is decreased by NaCl in coexistence with acid clay, which is, supposedly, caused by either inhibition to the reaction or decomposition of V. B1 by both of them.

(4) The colorimetric determination of V. B1 with much NaCl is possible by means of the increase of quantity and suitable treatment of acid clay to be used.

The Method of Measuring the concentration of alcohol in aqueous solutions by the phenomenon of cloudy precipitation in ternary solution

by

Tadashi KAWASAKI

(Received May 10, 1960)

ABSTRACT.—Some ternary solutions, in which two pairs of components are completely miscible and the third pair is almost unmiscible, often show the phenomenon of cloudy precipitation at the definite composition for given temperatures. In the present work, it is made clear that aqueous solutions of alcohol sharply show this phenomenon by addition of a third appropriate component and that this method is sufficiently applicable with considerable accuracy for the practical measurement of concentration of alcohol.

The added component is benzene or trichloroethylene for solution above 50 %, and a saturated solution of K2CO3 for solutions below 50 %. The latter case is peculiar and seems to be theoretically interesting. The main usefulness of this method compared with the conventional alcohol-hydrometers lies in the following features:

(1) This method enables the direct measurement in alcoholic drinks without the process of distillation, and
(2) It requires a very small amount of test sample (10~20°C).

Studies on the “Myrin Rice Koji” preparation by “Kasten” system molding plant.

by

Hiroshi INOUE, Masaru Ugai, Kinya FUJINO and Masahiro UCHIDA

(Fushimi Researching division. Takara Shuzo Co., Ltd.)

(Received July 19, 1960)

In order to mold automatically, the following plant is employed:

According to the advice of Fujio Oana, Amano’s patent molding plant is adopted, which is
similar to “Kasten” system of beer malting plant.

The results are following:
1. The area of Kasten is less than half of that of old type koji room.
2. The time expended for molding is shortened from 44 hrs to 33 hrs.
3. In case of producing 32 koku koji by old system more than 40 workes are necessary, while in this method only 10 workers are wanted.
4. By this method, any work at midnight is unnecessary.
5. Special expert is not demanded.

Cryptomeria Flavour in Sake

by
Masakazu Yamada and Ken Takahashi
(Research Institute of Brewing)
(Received Sept. 15, 1960)

In the old time sake was characterized with a flavour of cryptomeria because the vessels for fermentation, storage and transportation were all made of cryptomeia timbers.

But now we use iron-porcelain tank for both fermentation and storage, glass bottle for transportation and so cryptomeria flavour of sake was nearly forgotten. Meanwhile, like oak flavour in whisky, brandy or wine, cryptomeria flavour in sake is yet very lovely one, and so we planned to give sake a good and delicate smell of cryptomeria.

We hung respectively 1g, 2g, 3g or 4g of cryptomeria chip of the best quality produced from Yoshino district in Nara prefecture in 1L of sake for days and tasted the flavour during the period.

The results indicated that the suitable condition was hanging 1g of chip for 20 days, 2g for 15 days, 3g for 10 days, or 4g for 5 days.

Studies on Water used for Sake-brewing

by
Masakazu Yamada, Hideo Asahara, Minoru Nagasawa and Iwao Kobayashi
(Research Institute of Brewing)
(Received Sept. 15, 1960)

Water gushed at Nishinomiya city in Hyogo prefecture is named ‘Miyamizu’ and is prized highly as the best water for sake-brewing.

Miyamizu is characterized by containing an extraordinary large quantity of phosphates, for example 4~5mg P₂O₅ in 1L, which is said to come from shells of ‘Torigai,’ a shell-fish, after dissolution with water containing CO₂ gas. The sake made with this water shows some agreeable thick taste.

So we searched waters of the same property all over the country and found the following data:
They are all special cases of containing large quantities of \( \text{P}_2\text{O}_5 \). Now we must confirm if they show excellent properties for sake brewing like Miyamizu or not and why waters at Nagano city contain so much phosphates.

Waters used preferably for sake brewing in Kanto district show following properties:

<table>
<thead>
<tr>
<th>City</th>
<th>Pref.</th>
<th>( \text{N}_2\text{O}_5 )</th>
<th>( \text{N}_2\text{O}_3 )</th>
<th>( \text{NH}_3 )</th>
<th>( \text{SO}_2 )</th>
<th>Cl mg</th>
<th>Fe mg</th>
<th>Org. matter mg</th>
<th>Hardness</th>
<th>Evaporating residue mg</th>
<th>( \text{P}_2\text{O}_5 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kōnosu</td>
<td>Saitama</td>
<td>much trace not detected slight 104.0 —</td>
<td>0.9</td>
<td>10.6</td>
<td>542</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gyōda</td>
<td>&quot;</td>
<td>little not detected &quot; &quot; 79.4 0.01</td>
<td>0.9</td>
<td>5.6</td>
<td>309</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ogawa</td>
<td>&quot;</td>
<td>&quot; &quot; not detected &quot; &quot; 45.5 —</td>
<td>0.9</td>
<td>9.9</td>
<td>280</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuki</td>
<td>&quot;</td>
<td>slight &quot; &quot; &quot; &quot; 71.5 —</td>
<td>0.9</td>
<td>7.0</td>
<td>306</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oyama</td>
<td>Tochigi</td>
<td>little trace &quot; little 59.0 —</td>
<td>0.9</td>
<td>10.0</td>
<td>478</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yuki</td>
<td>Ibaraki</td>
<td>&quot; &quot; &quot; &quot; &quot; &quot; 63.0 0.01</td>
<td>1.3</td>
<td>8.7</td>
<td>—</td>
<td>0.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koga</td>
<td>&quot;</td>
<td>not detected not detected &quot; slight 73.1 0.01</td>
<td>1.0</td>
<td>16.6</td>
<td>524</td>
<td>not detected</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

In making yeast culture of old type in sake brewing nitrate in water is known to exert an important role. Nitrite produced from nitrate by some bacteria makes yeast not to propagate so soon before insufficient production of acid by bacteria and the fact is very important in yeast culture.

This phenomenon was found for the first time at Suzaki in Köchi prefecture 50 years ago by Namiki Kawashima.

Waters in that district were ordinarilly said to contain nitrates. Now the fact was also found in several well-waters in that place.

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**Studies on browning of Sake**

**Part 1**

**Application of colored cellophane to protection of browning of Sake**

by (No. 11. 780)

Hiroichi Akiyama,
Toshiro Hurukawa and Minoru Nagasawa

(Research Institute of Brewing)

(Received Sept. 22, 1960)

The authors tested the browning of bottled sake kept wrapped with different colored market cellophanes and polyethylene sheets. The deep orange colored cellophane capable of adsorbing all light waves is quite excellent in protecting the browning of sake.
A problem on the influence of oxygen on the action of koji-diastase

by

Hideya Murakami, Kiyomi Takagi, Mamoru Iwatsuki, Kimiya Fujino and Mitori Kawai
(Research Institute of Brewing)
(Received Sept. 20, 1960)

Two different results were obtained in the experiments on the influences of oxygen on the action of takadistase: Oxygen did influence in one case and it did not influence at all in the other case. The authors described the details on these experiments and considered that it was due to the impurities of the enzyme preparations used.

Studies on Cream of Tartar in Wines

by

Shigeru Nemoto and Kazuo Iijima
(Kamiya Shuzo Co., Ltd.)
(Received Sept. 26, 1960)

The authors re-examined the Berthelot's analytical method for cream of tartar. The cream of tartar in wines was then analysed by this method, and the following results were obtained.

(1) When filter paper is used in the filtering process in this method, some amount of tartaric acid remains adherent to it and this makes the analytical value erroneous. But this error can be nearly omitted by using No. 4 glassfilter instead of filter paper.

(2) Wines are refrigerated at -5°C for twenty-one days and the relations between the precipitation of the cream of tartar and its content in initial wines are investigated.

In the case of white wines, cream of tartar would not deposit when its content is below 0.077 g per 100 ml. But, when the amount of cream of tartar is over 0.077 g per 100 ml, the precipitation proceeds till the content in filtrate decreases down to 0.065 g per 100 ml.

In red wines, total cream of tartar, that is cream tartar in filtrate and precipitate, is proved to be more than that contained in initial wines. This fact, the authors consider, is worthy of attention.

In case of red wines, cream of tartar does not separate by itself as in case of white wine, but is separated accompanied by lee.

(3) When potassium metabisulfite is added to wines, cream of tartar increases in them.
On the Oxidation Reduction Potential of “Kyushiki-Shochu”

by

Masahisa Taketa

(Department of Brewing, the Tokyo Agricultural University)

and Toraji Tsukahara

(The Society of Brewing, Japan)

(Received Sept. 20, 1960)

We measured the oxidation reduction potential of the commercial Shochu before and after storage.

(1) The commercial Shochu had pH 16.0~23.5.

(2) Shochu of higher quality had higher potential.

(3) Shochu of lower Eh (volt) showed higher pH. It seemed to be due to the effect of KMnO₄ treatment.

(4) The change of oxidation reduction potential during the storing period of Shochu was different according to samples. The potentials of shochu were higher after one year of storage than soon after the distillation. For example, in case of the Shochu made from rice bran, the value of Eh rose from +0.193 volt to +0.290 volt after one year.

On the methods of estimation of tyrosine and tryptophan in sake

by

Mamoru Iwatsuki and Hideya Murakami

(Research Institute of Brewing)

(Received Nov. 6, 1960)

The ultraviolet ray absorption method was tried to estimate the tyrosine and tryptophan in sake. This method gave, on one hand, always too high value because of other substances absorbing the ultraviolet rays contained in sake, but, on the other hand, it was favourably applied to estimate the quantitative changes of these amino acids in the same samples. Finally it was found that the extinctions E₂₉₄.₄ and E₂₈₀ were closely correlated to the qualities of sake.