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Getränkeherstellung

**SCHLISSMANN
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Brennereitechnologie

- Instruction for the production of fruit brandies -

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Technical informations and instructions for use

Background information:

The rapid, fermentation of the mash without bacterial infections is the basis for the production of first-class fruit spirits.

Clean, alcoholic and aromatic, pumpable and easy to distil mashes are the result of careful mashing of fresh, ripe, healthy and clean fruits with the addition of liquefying enzyme and dry selected yeast as well as fermentation with acid protection.

Adjuvants:

- **Säure-Kombination MS (Acid combination MS) / PM-Säure (PM acid)**

The fermentation of fruit mash with acid protection stops the reproduction of harmful bacteria and the formation of their metabolic products (acetic acid, butyric acid, acrolein, silage-like false flavours).

Acid combination MS ("mash protection") is a ready-to-use mixture of lactic and malic acid. **PM acid**, a concentrate of lactic and phosphoric acid, not only prevents faulty fermentation and spoilage, but also acts as a yeast nutrient.

Occasionally, distilling mashes are acidified with chemically pure, very aggressive **sulphuric acid** because of the lower price. But be careful! This acid can cause the formation of volatile sulphur dioxide during fermentation and thus the SO₂ or "sulphur" sting in the distillate.

Acid combination MS and **PM-acid**, on the other hand, do not carry this risk. Both preparations are suitable for the acidification of mash from pome, stone and berry fruit as well as Jerusalem artichoke tubers

The acid dosage required for mash protection depends on the type of fruit and the biological fluctuations of the fruit ingredients. A pH value of 3.0-3.3 (check with **pH sticks** or **Brenner-pH-Meter!**) is considered as sufficient acid protection.

- Pectin enzymes **ULTRA-"Fruit"** / **Pectinlyase**

ULTRA-"Fruit" is an enzyme preparation for the complete liquefaction of pome and stone fruit mashes. In addition to pectinase, it also contains cellulase activities that can dissolve larger pieces of fruit pulp and even stone houses.

Pectinlyase, on the other hand, is a single enzyme with a similar liquefaction effect and the advantage of reduced release of methanol from plant pectin. However, since this enzyme can only be obtained from genetically modified microorganisms, it must not be used for the production of organic fruit brandies.

Both enzyme preparations with an optimum temperature of 15-30°C and an optimum pH of pH 3-3.5 are very well adapted to the mashing and fermentation conditions of fruit mashes.

- Dry yeasts **AROMA plus / LT 8 plus**

Our dry selected yeasts have been the epitome of fermentation power and aroma formation for over 20 years.

AROMA plus is suitable for the gentle fermentation of cherries, mirabelle, apricots, Williams-Christ pears and other types of fruit harvested in early and high summer and fermented at a temperature of 15°C or higher. The average fermentation rate prevents excessive mash heating and the loss of volatile aromas.

LT 8 plus is a dry selected yeast with excellent cold fermentation suitability for all fruit varieties harvested in late autumn at low temperatures and fermented at a minimum of 8°C (e.g. quince, civet, medlar). **LT 8 plus** is also the yeast of choice for deliberately cool fermentation of all fruits and fruit wines at 12-16°C.

- **Brennmaischnährstoff (Mash-nutrient)**

Mash nutrient, a permissible combination of yeast nutrients and growth substances, facilitates fermentations, which from experience are sluggish or incomplete due to lack of nutrients. These include fruit juices and mashes made from nitrogen-poor pome fruit, berries rich in tannins and very sugary grapes.

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Instructions for mashing of pome, stone and berry fruit

- Thoroughly clean fruit materials, carefully rinse soft fruits (cherries, pears);
- test peaches, apricots, early harvested pome fruit for the presence of plant starch using the **Iodine Starch Test ("Jod-Stärke-Test für Brenner")** for distillers; if the fruit is blue (positive result, risk of mash sticking in the still), stir in **amylase GA 300** (glucoamylase preparation, dosage 20 ml/hl mash) thoroughly when transferring the mash into the fermentation container;
- crush hard fruits (apples, quinces) with the help of a muster; convey soft pome fruit (Williams-Christ-pears) through an eccentric screw pump; only crush stone fruit by hand or scribe with a **mash whisk** (Maischequirl) or a **cutting and stirring device** (Schneid-und Rührwerk);
- Transfer raw material porridge into the fermentation tank with 20-25% rising space;
- Add enzyme preparation **ULTRA-"Fruit"** (3-6 ml/hl mash) or **pectinlyase** (5-10ml/hl); pre-dilute enzyme dose with ten times the amount of tap water, then **stir in thoroughly**;
- Add dry selected yeast **AROMA plus** or **LT 8 plus** (dosage see notes below); first mix yeast in water at a temperature of about 30°C (86°F) and stir thoroughly into the mash after 10-20 minutes (beginning to form bubbles or foam on the yeast);
- Acidify the mash with acid combination MS (1-2 l/hl mash) or PM acid (150-300 ml/hl) or sulphuric acid (55-90 ml/hl) to pH 3.0 - 3.2, i.e. stir the acid thoroughly into the mash:
PM- and sulphuric acid must be pre-diluted, protective goggles and acid protective clothing! Slowly (!) add acid to about ten times the amount of tap water and stir carefully (self-heating!). Under no circumstances pour the water into the acid!
- Check pH value with **pH-test-sticks** 2.5-4.5 or **Brenner-pH-Meter** and add more acid if necessary;
- Seal the fermentation tank airtight with **DUPLEX stoppers** and **DUPLEX Getränkeschützer** or **fermentation tube**, barrier liquid water or solution of **Doppelsalz I+II** in water;
- After approx. 12-24 h and after 48-72 h fermentation time, push in the pomace cap; if necessary, add distilling **mash nutrient** (20-30g/hl mash), previously mixed in some water or mash liquid;
- In the decaying fermentation, do **not** stir in the marc cap any more, avoid unnecessary air access to the mash, fill the the complete volume of the fermentation container with similar mash and close the fermentation tank tightly with stoppers; if necessary, release excess pressure from time to time;
- Check the completeness of fermentation with the **MEDI "Glucose" test** or the **Restzuckertest**, distil fermented mash as quickly as possible;
- if storage of the fermented mash for several weeks is unavoidable, place **glucose oxidase** (dosage: 0.5-1.5 g/hl) on the mash surface to protect it from acetic acid, close the fermentation container again airtight and store it as cool as possible.

Indications:

In fruit mashes, the fermentation temperature should not exceed 18-20°C (65-68°F) so that volatile aroma components are not discharged with the fermentation carbonic acid. The quantity of yeast to be used

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must therefore be measured in relation to the temperature of the fruit and the fermentation room. Higher yeast quantities are required at lower temperatures than at higher temperatures:

Fermentation temperature 10 - 15°C 15 - 10 g yeast per hl mash
Fermentation temperature 15 - 20°C 10 - 5 g yeast per hl mash

All additives must be stirred evenly and thoroughly into the mash. It must be ensured that the entire mash is acidified to about pH 3. If the acid is unevenly distributed, strong bacterial infections can occur in areas with higher pH values, especially in viscous mashes, and lead to spoilage of the mash!