Mead – the drink of the gods

| Fermentation | Honey Wine | Mead | Wine-like Beverages | Yeast |

Introduction

Honey wine, better known as mead, is a beverage which is regarded as rather a niche product. Here in Germany it is usually sold cheaply as there is a lack of recognition. Most recently, however, it has experienced a comeback. The market is growing rapidly, especially in the USA. A new mead cellar opens in Europe too every week.

Men who have had access to honey have produced mead since ancient times. In those days an alcoholic drink was produced as a result of spontaneous fermentation, which became the drink and gift of the gods in mythology.

What is mead? The mixture of honey and water is fermented to produce alcohol through the addition of yeast. The result is a drink, similar to wine, with an alcohol content of 9 % to 16 % ABV. Honey wine and sparkling honey wine represent a separate category within the field of fruit wine. Various quantities of residual sugar are defined for dry (up to 25 g sugar/litre), off-dry (from 25.1 to 60 g), semi-sweet (60.1 to 100 g) and sweet (more than 100 g sugar/litre).

Production of mead is widespread in many European countries, particularly countries such as Denmark, England, France, Poland, Sweden, Switzerland and Slovakia. Specific types of honey wine are known by the names fruit mead (melomel), spiced mead (metheglin) or cyser (honey cider), to name just a few. Names such as gvirc (Croatian honey wine), sima (Finnish honey wine) and tej (Ethiopian honey wine) may be familiar to some people from their holidays.

Volumes of wine products based on honey have risen steadily in Germany in recent years. In 2016 the volume was 701,000 litres, in 2018 it had reached 808,000 litres.

Figure 1: Sensory properties of different cultured yeasts *© Shutterstock*

Table 1: Overview of yeasts

Yeast	Oenoferm® Icone	Oenoferm® InterDry F3	Oenoferm® PinoType F3	Oenoferm® X-treme F3
Oenological yeast type	Cerevisiae	Cerevisiae	Cerevisiae	Bayanus
Aroma	Ripe honey notes	Fresh honey notes	Floral notes	Spicy notes
Fermentation onset in h	10–20	10–20	10–20	30
Inoculation concentration in g/100 L	20–30	20–30	20–30	20–30
Nutrient requirement	Slight	Moderate	High	Slight
Recommended fermentation temperature	18–25 °C	18–22 °C	18–22 °C	10–22 °C
Alcohol tolerance	Up to 16.5 % ABV.	Up to 14 % ABV.	Up to 16 % ABV.	Up to 17 % ABV.

Choice of materials

Selected raw materials are needed to produce a flavoursome mead. The choice of suitable types of honey plays an important role. It is usually polyfloral honeys, i.e. honeys produced from several varieties of plant, that are used for fermentation. They are much cheaper than monofloral honeys. It is predominantly raw materials from China, Mexico, Argentina and North Africa that are processed. Prices for honey on the global market commonly range from €0.50 to €3.00 per kilo. Monofloral honeys, such as acacia, rape, clover and other varieties, tend to be used for high-quality meads. The purchase prices for these honeys can reach up to €15/kg. In view of such prices, honey is one of the most expensive raw materials for the production of alcoholic beverages.

The use of suitable cultured yeasts also plays a major role (see table 1). Honey consists of fructose, glucose, maltose, and erlose, etc. As the proportion of fructose is very high, it is necessary to select a suitable yeast. Generally, selection of the appropriate cultured yeast can have a positive effect on the sensory properties of the desired end product and support a specific honey aroma profile (see figure 1).

Honey, as a medium, is a raw material deficient in nutrients, so the yeast must be well supplied with nutrients to counteract stuck and faulty fermentation.

Production

Honey and water is used at a ratio of two parts water to one part honey, without the addition of other types of sugar. The honey should be warmed to 30 °C, so that it combines better with the water. A cultured dried yeast requires careful preparation. Particular attention should be paid to rehydration. The yeast is mixed with the honey and water mixture at a temperature of 37–42 °C. Yeast activator VitaDrive® F3 is added after 10 minutes. After another 20 minutes the yeast culture can be added to the fermenting batch of honey and water. The temperature difference between the yeast mixture and honey and water mixture to be fermented should be less than 8 °C. Complex nutrients such as ammonium, thiamin, vitamins and minerals (Vitamon® Plus) can now be added. Staggered addition of one third

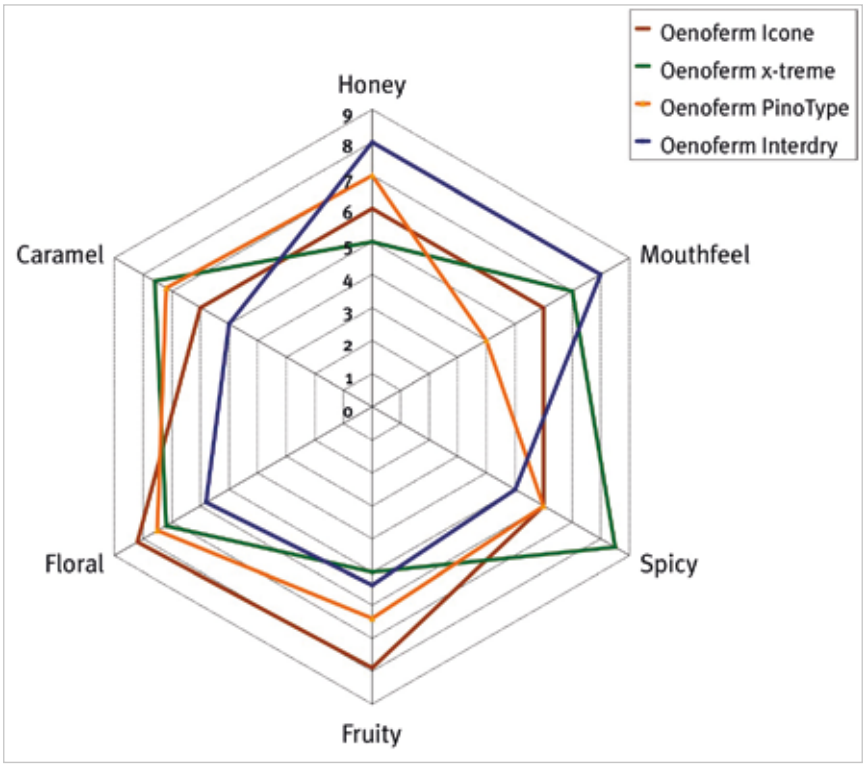

Figure 1: Sensory profile of various yeasts *© Erbslöh*

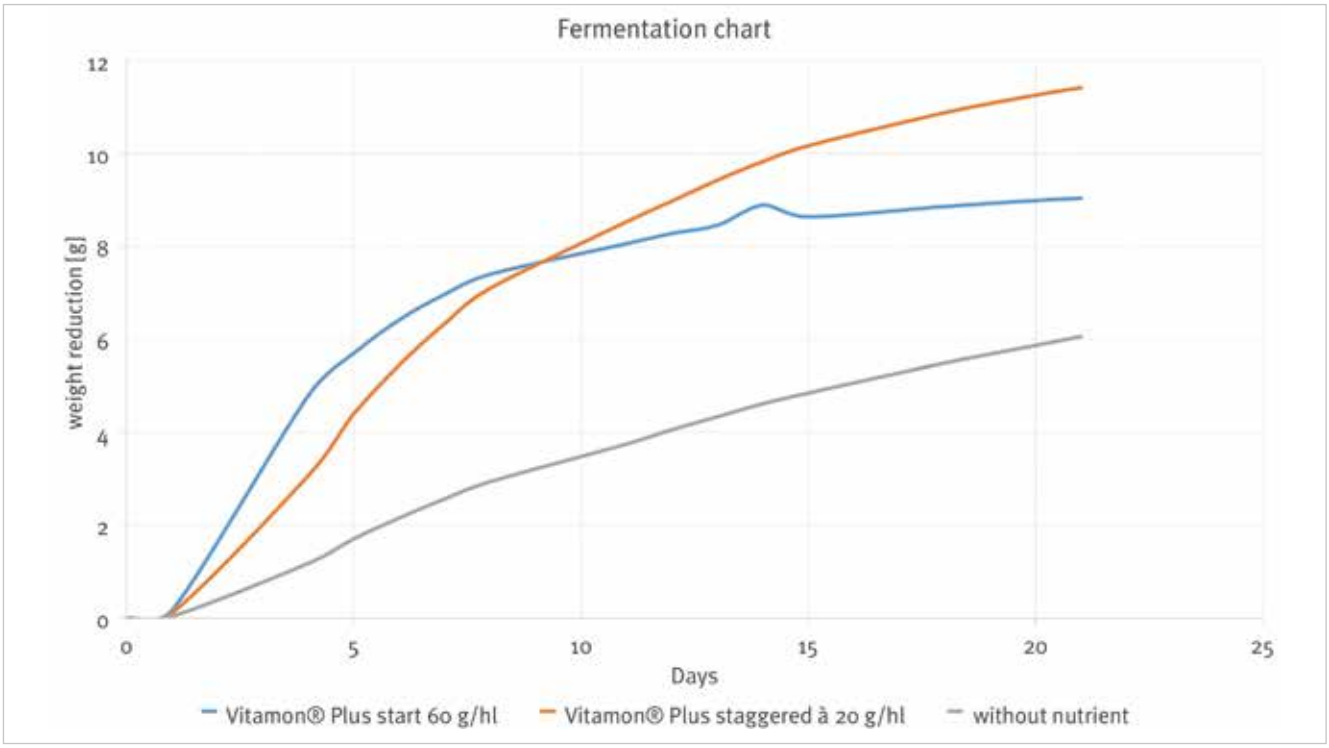

Figure 2: Influence of addition of nutrients to fermentation progress *© Erbslöh*

of the nutrient each time improves fermentation performance. Higher alcohol contents and shorter fermentation times can be seen. One third is added immediately, the second after around one week, and the final addition occurs after around two weeks' fermentation. Different fermentation times are possible depending on the temperature and yeast type and the cycles can be longer or shorter.

We recommend nutrients be added in liquid form during ongoing fermentation, especially where staggered addition is concerned. As a liquid nutrient complex, Vitamon® Liquid is the best supply of nutrients for good, continuous fermentation. Addition of a liquid nutrient does not cause spontaneous release of large quantities of carbon dioxide, retaining the aroma and preventing foaming over. Depending on the yeast, the temperature should be between 18 and 25 °C. It is possible to speed up fermentation by enlarging the surface using cellulose fibres (CelluFluxx® P 50). If fermentation has ceased, the yeast should be racked off and then oxidation prevented through the addition of sulphur (Kadifit). It is necessary for bentonite (NaCalit® PORE-TEC) and silica sol (Klar-Sol Speedfloc) to be added for stabilisation and fining. The sediment settles rapidly and the mead can be filtered off with suitable filter sheets (Erbslöh filter sheet G-16).

Variations on mead

Depending on the raw material, length of fermentation and yeast, extract adjustment and typing can begin. The simplest method would be adding water to reduce the alcohol content. The addition of honey as a sweetener is another option for producing various versions as off-dry, semi-sweet or sweet wines. The imagination can run riot.

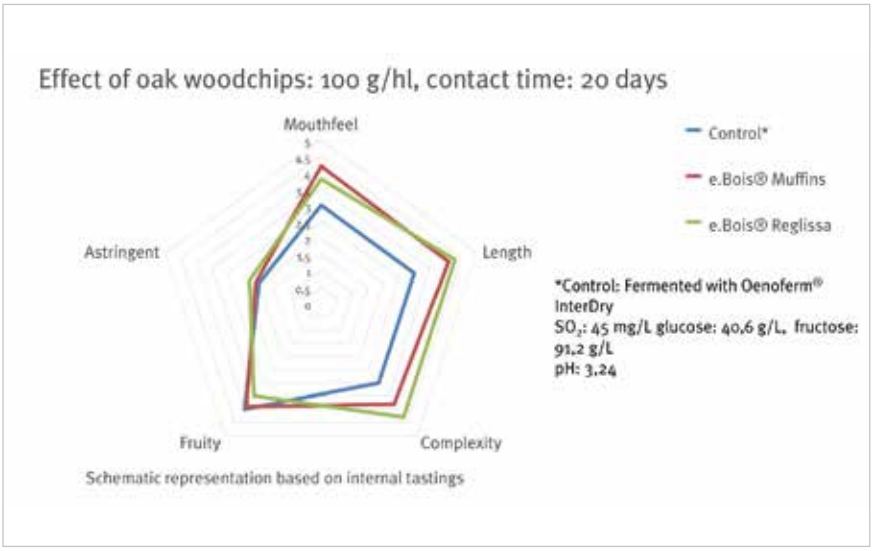

Figure 3: Possibility of typing using wood chips *© Erbslöh*

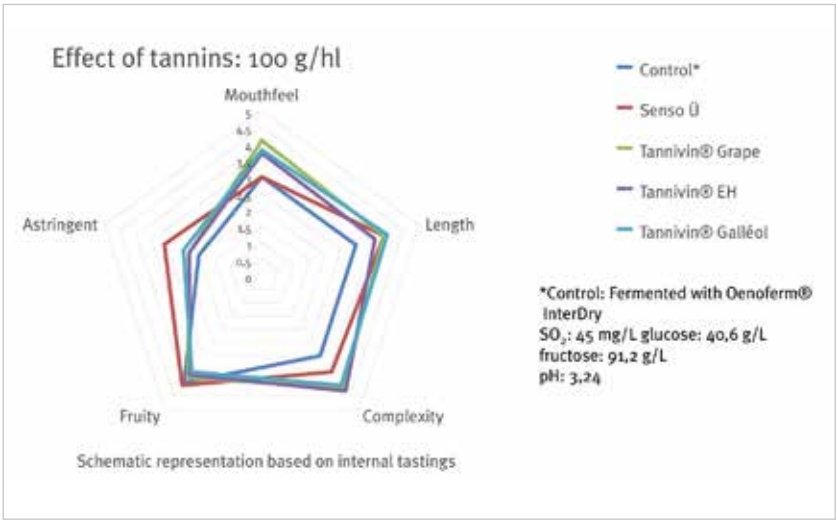

Figure 4: Possibility of typing using tannins *© Erbslöh*

Honey wine can be made interesting by the addition of sour cherry juice, for example (Viking blood). Hops and spices, such as ginger, cinnamon, cloves, herbs and flavourings, can also be added to honey wine. Honey wine like this is an excellent alternative to mulled wine. According to regulations, the addition of a maximum of 3 g/L citric acid is also permitted, to optimise the ratio of sugar to acidity.

The use of tannins can improve mouthfeel. If the preference is to emphasise the popular, typical woody note, various types of oak chips can be used.

Another version of mead can be produced by adding carbon dioxide at minimum 3 bar pressure. It turns into sparkling honey wine – a sparkling, refreshing drink.

Summary

Consumers are constantly searching for new, interesting and creative drinks. Micro breweries produce craft beers. Cider and apple wine are known and loved far beyond the Frankfurt area. Mead is an exciting alternative to established fruit wines. Its numerous variations make it an excellent candidate to supplement the beverage industry portfolio. Rising production volumes show that consumers are increasingly aware of mead as a tasty drink. It can be enjoyed still or sparkling, and served chilled, at room temperature, or hot. It can be drunk neat or with a mixer. A drink for every occasion!

Sources:

- Regulations for wine-like and sparkling wine-like beverages of 27 November 2002.
- LAVES Institut für Bienenkunde Celle – August 2011
- Regulation amending the Regulation on the quality of honey wine and sparkling honey wine.
- Progress report by the German Fruit Wine & Sparkling Fruit Wine Industry Association.
- Revision of the regulations for honey, Honey Ordinance of 16 January 2004.
- Zuckersüße Chemie (Saccharine Chemistry), Georg Schwedt, 2010

Author:
Kay-Uwe Lührs
ERBSLÖH Geisenheim GmbH
www.erbsloeh.com