ASBC Hot Steep

Material, Method, and Notes provided as a reference. Modified wort separation method will be demonstrated as a rapid alternative to filtration.

Hot Steep Evaluation - Materials

- 16-ounce canning jar with lid
- Immersion heater or oven
- Hot water bath maintained at 65˚C/150˚F or oven set to ~150˚F
- Plastic funnel with ~500 ml volume
- Fluted filter paper, fluted, 32 cm in diameter (Ahlstrom No. 515 or similar)
- Electric coffee/spice grinder
- Graduated cylinder to measure water
- Kitchen scale capable of weighing 50.0 g
- Deionized water
- Whole kernel malt samples

Hot Steep Evaluation - Method

- Place approximately 52 g of malt in electric grinder.
- Close lid and grind for 10 seconds or until a course flour consistency is achieved.
- Weigh 50 ± 0.1 g of malt flour into canning jar.
- Pour 400 mL of 65°C water into canning jar.
- Cap and vigorously shake for 20 seconds to ensure malt grist is completely wetted and mixed
- Place canning jar in hot water bath or oven and let rest for 15 minutes.
- During this time, place filter paper inside funnel and wet paper with deionized water to minimize aroma contribution.
- Position filter and funnel into empty canning jar and leave until use for wort collection.
- When 15-minute hold is complete, vigorously swirl contents of canning jar for 20 seconds to bring settled particles back into solution, uncap, and quickly pour all of mash liquid into filter (see Note 3).
- Collect and pour first 100 mL of filtrate back into canning jar used for sample preparation.
- Swirl wort with sample residuals, then gently repour back into filter. Allow wort to filter to completion (see Notes 4–6).
- Evaluate the samples using sight, smell, and taste.

Hot Steep Evaluation - Notes

1. Evaluate base malts with 50 g of sample (100% inclusion), specialty malts with 25 g of sample and 25 g of base malt (50% inclusion), and dark-roasted specialty malts with 7.5 g of sample and 42.5 g of base malt (15% inclusion).

2. If different malts are to be milled, clean electric grinder with a dry rag in between samples to prevent cross-contamination.

3. The entire contents must be poured though the filter at once so that the grain bed can settle without being disturbed. Filter paper should be free of aromas and large enough to hold the entire contents of the canning jar.

4. Filtration rate and sample yield will be influenced by malt type and modification level. Approximately 300 mL of wort can be collected in 30-45 minutes (serves six to eight tasters).

5. Perform wort sensory evaluation within 4 hours of filtration. Serve at room temperature.

Malt Calculation

The metric system is used as the international language for brewing recipes. And the grist bill is always expressed in terms of % of total extract. This language is very easy with a little practice.

Calculating Extract

- Extract tells us how much “stuff" is contained in wort.
- Carbohydrate represents about 90% of total extract and protein makes up the remaining 10%.
- ˚Plato and specific gravity are both used to calculate wort extract.

Given:

- 10 l cold wort volume
- 12.15˚Plato / 1.049

Question:

- How many kg of extract are present?

Key Information Needed:

- Liters of wort
- Wort strength and density

Long-Hand Extract Calculation

Solution:

Volume = 10 liters

Density = 1 + (˚Plato ÷ (258.6 - ˚Plato x 0.8796))

= 1 + (12.15 ÷ (258.6 – 12.15 x 0.8796))

= 1 + (12.15 ÷ (247.9129))

= 1 + (0.049)

= 1.049 kg wort /l wort

Long-Hand Extract Calculation

Solution:

Volume	=	10 liters
Density	=	1 + (˚Plato ÷ (258.6 - ˚Plato x 0.8796))
	=	1 + (12.15 ÷ (258.6 – 12.15 x 0.8796))
	=	1 + (12.15 ÷ (247.9129))
	=	1 + (0.049)
	=	1.049 kg wort /l wort
12.15˚Plato	=	0.1215 kg extract / kg wort

Also need to throw some units on ˚Plato to be able to make the units all agreeable!

Long-Hand Extract Calculation

Solution:

Volume = 10 liters

Density = 1.049 kg wort /l wort

12.15˚Plato = 0.1215 kg extract / kg wort

$$\text{kg extract} = \frac{10\ \cancel{\text{l wort}}}{} \times \frac{1.049\ \cancel{\text{kg wort}}}{\cancel{\text{l wort}}} \times \frac{0.1215\ \text{kg extract}}{\cancel{\text{kg wort}}}$$

kg extract = 1.28 kg extract

Kilos Extract Allow for Grist Calculations

For Example:

10 hl cold wort volume | 12.15˚Plato | 1.28 kg extract
85% brewhouse yield (actual vs. laboratory)

80% Pils malt with 75.2% extract (cg, as-is)
10% Vienna malt with 76% extract (cg, as-is)
5% Light Munich malt with 78% extract (cg, as-is)
5% Carahell malt with 72% extract (cg, as-is)

Question:

How many kg of each malt are required?

Kilos Extract Allow for Grist Calculations

Solution:

Pils Extract = 1.28 kg extract x $\frac{\text{0.80 kg Pils extract}}{\text{kg extract}}$

= 1.02 kg Pils extract

kg Pils Malt = $\frac{\text{1.02 kg Pils extract} \times \text{kg Pils Malt} \times \text{kg extract}}{\text{0.752 kg Pils extract} \times \text{0.85 kg extract}}$

1/(CG-as is) *1/(Brewhouse Yield)*

kg Pils Malt = 1.60 kg Pils Malt

Kilos Extract Allow for Grist Calculations

Solution:

$$\text{Vienna Ext.} = 1.28 \text{ kg extract} \times \frac{0.10 \text{ kg Vienna extract}}{\text{kg extract}}$$

$$= 0.13 \text{ kg Vienna extract}$$

$$\text{kg Vienna} = \frac{0.13 \text{ kg Vienna extract} \times \text{kg Vienna Malt} \times \text{kg extract}}{0.76 \text{ kg special ext.} \times 0.85 \text{ kg extract}}$$

$$= 0.20 \text{ kg Vienna Malt}$$

Kilos Extract Allow for Grist Calculations

Solution:

$$\text{Munich Ext.} = 1.28 \text{ kg extract} \times \frac{0.05 \text{ kg Munich extract}}{\text{kg extract}}$$

$$= 0.64 \text{ kg Munich extract}$$

$$\text{kg Munich} = \frac{0.64 \text{ kg Munich extract} \times \text{kg Munich Malt} \times \text{kg extract}}{0.78 \text{ kg special ext.} \times 0.85 \text{ kg extract}}$$

$$= 0.97 \text{ kg Munich Malt}$$

Kilos Extract Allow for Grist Calculations

Solution:

$$\text{Carahell Ext.} = 1.28 \text{ kg extract} \times \frac{0.05 \text{ kg Carahell extract}}{\text{kg extract}}$$

$$= 0.64 \text{ kg Carahell extract}$$

$$\text{kg Carahell} = \frac{0.64 \text{ kg Carahell extract} \times \text{kg Carahell Malt} \times \text{kg extract}}{0.72 \text{ kg special ext.} \times 0.85 \text{ kg extract}}$$

$$= 1.05 \text{ kg Carahell Malt}$$