

Nottingham Mashing and Sparging Notes March 2014

The Mashing and Sparging questionnaire had a total of 25 respondents with the following results:

1. 84% buy their malt ready crushed, with only Alan Q, Peter F, Steve H and Allan G crushing their own. Whole malt is supposed to have a longer shelf life than crushed and this was demonstrated recently when Allan G did a trial brew with some recently crushed wheat malt which was over 2 years old. An excellent 80% mash efficiency was obtained.
2. In answer to the question to describe our mash tuns and components, all manner of set ups were used, with 28% using stainless steel and the rest plastic.
3. 68% of respondents add their grain to water when mashing and 16% add water to grain. The remaining 4% add them both together.
4. Nearly everyone uses a ratio of 2.5 kilos grain to 1 litre water.
5. 72% of us mash for 90 mins, while others mash for between 60 mins and 120 mins. In one case an overnight mash is used.
6. Strike temperatures of 68 – 78C are used, with one respondent varying his temperature between summer and winter.
7. Goods temperatures of between 62 – 68C are used, with only one person adjusting if necessary. The following comments have been supplied by Peter F in relation to the effect of mashing at different temperatures.

Mash Times and Temperatures

In general, mashing temperatures range from 64 – 68C with times between 60 and 90 minutes using a typical water to grain ratio of 2.5 – 2.7 litres per kilogram. Using these guidelines we can expect an all grain beer to attenuate to approximately one quarter to one fifth of the original gravity depending on the characteristics of the particular yeast strain used. If quite large amounts of sugar are used however (10 – 20%) the beer may attenuate further than desired so a mash temperature as high as 70C may be tolerated under these circumstances to ensure a good balance between fermentable sugars and unfermentable dextrins.

Many craft brewers assume that mashing at the higher temperature range will provide a “sweeter and fuller” flavour, however I’ve found the effect at best is marginal in terms of palate fullness with no evidence at all of an increase in residual sweetness. Varying the temperature between 64 – 68C seems to make only small variations in the attenuation and final gravity, however varying the mash *times* between 60 and 90 minutes seems to have a slightly greater effect.

A couple of examples; if brewing an Old Ale, Mild or Porter with generous amounts of crystal, amber and dark malts I’d probably mash at 64C for 90 - 100 minutes to ensure a good balance of fermentables as the sugars extracted from the roasted / dark malts do not ferment well so this action should restore the balance. At the other extreme I’m making a Pale Ale using 80% pale malt, 3% crystal and 17% sugar. Here I’d mash at around 69C for 60 to 70 minutes to attain a good balance of fermentable sugars bearing in mind that cane sugar is 100% fermentable. And finally for an all grain low – medium gravity Bitter I’d mash at 67C for 75 minutes. As for liquor to grain ratios I’ve settled for 2.6L per kg which I find practical for almost all the different styles that I brew.

8. Most respondents experience very small temperature losses during mashing. These range from hardly any at all to 3C, with the majority in the 1 – 2C region. Two people regularly experience large losses and when questioned the reason seems to be that they check the temperature during mashing. The message seems to be – once you have doughed in, leave the mash tun well alone until ready for sparging.
9. 84% of us do not check mash Ph. Allan G checks his mash Ph during or after the boil on the basis that, although it may be too late to adjust this brew, any minerals added will have been evenly distributed and therefore give an accurate reading. This method also provides useful information for future brews and ensures there is no drift in Ph over time.
10. Nearly everyone uses a single temperature infusion when mashing.
11. Approximately 2/3rds of respondents have never experienced a stuck mash. The remainder who have had a stuck mash, have got over this problem by stirring, using compressed air or in one case blowing up the tap.
12. 80% of respondents do not carry out an iodine test.
13. In response to the question on sparging equipment, 50% use a rotating arm and the remainder use a variety of methods including using a jug, a barbecue tray and even a dog bowl.
14. 72% use fly sparging and 16% batch sparge – either 1, 2 or even 3 times. Steve S sometimes also uses a no sparge technique.
15. The length of time people sparge for varies from 15 mins up to 1 ½ hr. 50% of us take less than 45mins and 25% take about an hour.
16. Generally sparging temperatures vary from about 75 – 78C, although sometimes temperature losses from the HLT through the sparge equipment make it difficult to be precise.
17. 64% stopped sparging depending on volume alone, whereas 24% stop according to gravity. One respondent stops after 15mins as a matter of course.
18. Only 16% do a mash out by raising the mash temperature to 77C in order to stop further enzyme activity.
19. 68% calculate their mash efficiency in one form or another.