

# MASHING AND SPARGING

Official NORTHERN BREWER Instructional Document

## CRASH COURSE IN MASHING

The information below is for a single-step infusion mash. This is the simplest mash schedule and is used extensively in ale brewing.

### PROCEDURE

**COLLECT THE STRIKE WATER.** You will need 1.3 quarts of water for every pound of grain to be mashed.

**HEAT THE STRIKE WATER TO 175° F.** Pour the heated water into the mash tun. Slowly add the grist (crushed grain) to the water in the mash tun. Stir well to prevent clumping. The temperature should stabilize at 154° F. Hot or cold water can be added to correct the temperature, but a 5° variation is fine. **DO NOT EXCEED 168° F DURING THIS STEP**, or you may destroy the enzymes needed for starch conversion.

- **NOTE** - if you are following an all-grain recipe, use the mash temperature specified in the recipe, and adjust the strike water temperature accordingly.

**REST AT THIS TEMPERATURE FOR 60 MINUTES.** During this saccharification rest, malt enzymes convert the grain's starch into fermentable sugars.

**WHILE THE MASH IS RESTING, COLLECT SPARGE WATER.** You will need 1/2 gallon of sparge water per pound of dry grist in the recipe. Heat the sparge water to 175° F.

**MASH-OUT BY RAISING THE TEMPERATURE TO 168-170° F.** Add very hot (200° F) water to the mash, stirring constantly. Do not allow the mash temperature to exceed 170° F as hot temperatures can leach harsh-tasting tannins from the grain.

**REST AT THIS TEMPERATURE FOR 5-15 MINUTES.**

- **NOTE** - The main benefit of mashing-out is to raise the temperature of the mash in preparation for sparging, or the rinsing of sugars out of the mash. If the temperature of the mash gets too cold, the sugars will gum up making it exceedingly difficult for water to flow through the grain bed. Mashing-out also destroys the enzymes in the mash, preventing any additional starch conversion.

**AT 170° F TRANSFER THE SPARGE WATER.** Move water to the sparge water tank and continue with the procedure for sparging given below.

### PRINCIPLES AND ADVICE

At a mash temperature range of 150° to 158°F, enzymes in the malt activate and convert complex starches to simple sugar molecules that are fermentable.

Avoid temperatures greater than 168° F until you are ready to mash-out, or finish the mashing process. If you measure temperatures greater than 168°F in your mash, quickly cool the mash by adding cold water.

If you undershoot the target mash temperature by more than 5° F, you may raise the mash temperature by adding heat. Stir the mash constantly while you are applying heat.

In order to increase the accuracy at which you hit mash temperatures, it is absolutely essential that you take good notes. At a minimum, you should log the time and temperature before and after every significant heat input.

## CRASH COURSE IN SPARGING

### PROCEDURE

**RECIRCULATE!** The initial runoff from the lauter tun is cloudy and filled with draff - small solid grain particles. The runoff should be clarified by recirculating the runoff through the grain in the lauter tun. To recirculate, open the valve on the lauter tun slightly and collect the runoff in an intermediate vessel(s) - two 1 quart measuring cups or pitchers work well. Fill one vessel and pour it gently down the side of the lauter tun. While you are pouring the wort back into the lauter tun fill the other vessel. Switch back and forth, filling and dumping, until the wort appears clear. At this point the wort can be drained into the boiling kettle. Make sure you keep the grain bed wet during the recirculation. Usually, after 5-15 minutes of recirculation, clarity improves dramatically.

**SPARGING.** Open the valve on the sparge water tank to gently disperse the 170° F sparge water over the top of the grain bed. As in recirculating, do not allow the grain bed to go dry until sparging is complete. Avoid sparge water temperatures in excess of 175° F, as this promotes the extraction of tannins from the grain and leads to a harsh, astringent flavor in the finished beer. Stop sparging once you have collected an adequate amount of wort, or when the runoff reaches a specific gravity of 1.008-1.012.

**MOVE THE KETTLE TO A BURNER.** When the sparge is finished and the wort collected, (it's very heavy and hot - be careful!) move the kettle and proceed with the boil. Clean the mash/lauter tun and thoroughly rinse it with hot water; store components dry to keep them ready for the next brewing day!

### PRINCIPLES AND ADVICE

The process of separating the newly created wort from the mash is called sparging or lautering. The objectives of sparging are to collect as much sugar from the mash as possible while leaving behind as many undesirable compounds as possible.

Sparging is conducted in a specialized container called a lauter tun. A lauter tun is essentially a strainer. Wort collects in the foundation space beneath the false bottom and exits through the valve, where it collects in the boiling kettle.

### A NOTE ON STUCK MASHES

A stuck mash occurs when the runnings from the lauter tun slow to a trickle and stop because the filter bed of husks has clogged. This may be caused by crushing the grain too fine, putting too much sparge water on the grain bed, losing too much heat in the lauter tun, and/or using glutinous adjuncts like wheat, oats or unmalted barley. Running wort off too quickly can compact the grain bed and exacerbate the problem.

To remedy a stuck mash, close the valve and stop adding sparge water. Gently stir the bed up into suspension (adding a bit of sparge water may help a thick bed). Slowly begin to draw wort off, repeating the recirculation step before recollecting wort. In extreme instances you may have to remove the mash, clean the lauter tun, put the mash back in the lauter tun, reheat the mash to 168° F, and start over.