

MASHING by Mike Retzlaff

When we decide on a particular style of beer we want to brew, a lot of thought goes into the components of the grain bill, the hops we'll use and how long to boil them, the strain of yeast we'll use, and the temperature of the ferment. It seems that virtually no thought goes into how to mash that grain bill. This is a very important part of brewing and probably the most overlooked aspect of the "recipe".

The major purpose of mashing is to degrade proteins, gums, and starches in the grain to produce a wort which will suit our purposes as brewers. Different beer styles require a wort of specific properties. Some beers are supposed to be thick, malty, and sustaining while others should be thinner, crisp, and refreshing. The method of mashing you employ will determine the kind of beer you produce.

Crushed malt can be added to ambient temperature water and it will convert if given enough time. Of course, the chance of a bacterial or other organic infection increases over time. If a perfect environment is established including temperature, mash thickness, and pH, malted barley will convert in as little as 12 minutes. Most of us don't have lab quality brewing conditions and equipment so we need to do things somewhere between the two extremes.

Single Infusion Mashing

Crushed malt is added to heated water (or vice versa) to a strike temp for saccharification. The mash is stirred to mix and equilibrate and then left for some period of time; usually in some sort of insulated container. It works quite well with modern fully modified malts and is the simplest and most widely used method.

Step Infusion Mashing

An infusion mash is employed with a lower strike temp. Near boiling water is added to raise the temp of the mash. This can be repeated as required. Each time near boiling water is infused, the mash thickness is reduced and the temp increased. This style of mashing has a number of benefits. It accommodates the temps and mash thicknesses at which the groups of enzymes work best. I really don't know if this is coincidence or Providence but it works.

Step Mashing

A single infusion mash is employed at a lower strike temp. Heating of the mash tun or kettle is done while constantly stirring the mash to prevent scorching of the grain. It parallels the step infusion method without adding water. This is basically the process employed by RIMS and HERMS systems which use pumps instead of a paddle or other stirring method.

Decoction Mashing

A single infusion mash is employed at a lower strike temperature. A portion of the mash is removed and heated in a separate kettle. It is brought to a saccharification temp and allowed to rest for 10 to 20 minutes. It is then heated to a boil while constantly stirring. After a short boil, it is returned to the main mash as in the step infusion method. This can be repeated as a double or triple decoction. The decoction mash is time and energy consuming but can add some very desirable properties to a finished beer. Decoction mashing was developed in Europe at a time when under-modified malts were the norm and "high-tech" gizmos such as the thermometer and hydrometer had yet to be invented. Most German breweries have nearly abandoned decoction mashing because of the availability of fully modified malts and the economic need to reduce labor and energy costs.

Other mash regimens include various combinations of the aforementioned mashing methods. As an example, I often mash in at a lower temp and step mash by direct firing of my kettle. Because I'm too lazy to stir constantly with a paddle, I built a motorized mixer to keep the mash moving so it doesn't scorch on the bottom of the kettle. I can incorporate many rests during the mash, but usually use only two or three. Some of the temps I employ in mashing are 139° for a glucan rest, 144° for a maltose rest, and a saccharification rest at 155°. If I am trying to develop more dextrins in the wort, I might increase that rest to 158° to 162°.

Some of the beers I brew are much better when I utilize step mashing while others seem to approach perfection with single infusion. (I'll let you know if I ever get there!)

Anheuser-Busch achieves extremely fermentable wort in their Bud Light by mashing for 3.5 hours at 140°. Many of the old Munich brewers employed an acid rest of about 99° for several hours just to get the mash pH down to reasonable levels. Mashing does a lot of different things and can be harnessed by most any brewer to brew better beer. When you formulate your next beer, consider the importance of mashing as part of the design along with grain bill, hops, and yeast. Keep your options open by getting out of your comfort zone to try something different. There are many books available which describe all of the various mash regimens in detail.

It's no wonder that brewers of yesteryear were likened to alchemists. They turned grain into an elixir to sustain a populous besieged by hard times and disease . . . well; I guess things really haven't changed that much after all.