HAS IT GOT THE POWER? by Mike Retzlaff

I found a recipe based on a German brew log from 1890. This recipe for a Doppelbock consists of 100% Munich 20 malt. I thought this might make an interesting beer and starting playing with the idea. I was lucky enough to win a 5 gallon pail of Briess Munich 20 (thanks to Al Bourg!) at CCH's Pig Roast and Swap Meet. This seemed to be an excellent opportunity to do something special with the malt.

Munich 20, as a base malt, is rather dark and I started wondering if it actually has enough diastatic power to convert itself in the mash tun. A little surprise was waiting for me on the Briess web site. Their Munich 20 is rated at only 20° Lintner. Degrees Lintner refers to the amount of alpha and beta amylase in the malt. These are the diastase enzymes and the amount present in any particular malt translates into diastatic power. Several references indicate that 30° Lintner is about the minimum for conversion and, at that low level, it might require a much longer mash time. 35° Lintner is suggested as a safer low end for the mash.

Calculating DP in the mash is rather easy if you can get that specification from the maltster. You multiply the degrees Lintner for each malt by the quantity used, add up the figures, and divide by the total grain bill; well, sort of – more on that later.

As in the above cited recipe:
15# Munich 20 @ 20° Lintner = 300 ÷ 15 = 20° Lintner (diastatic power is too low)

An adjustment might be the substitution of 6 row barley @ 15% of the grain bill:
12.75# Munich 20 @ 20° Lintner = 255
2.25# 6 row barley @ 160° Lintner = <u>360</u>
Total = 615 ÷ 15 = 41° Lintner (sufficient diastatic power)

This simple calculation can come in handy if using a lot of adjuncts. Flaked grains are commonly used in recipes as are torrified grains. Raw wheat is a staple of Witbier. These ingredients require diastatic enzymes from another source to convert them into beer wort. When you calculate, don't include heavily roasted grains and malts such as roast barley, chocolate malt, or black patent malt. These ingredients have zero diastatic power but on the other hand they have no convertible starch so they cancel out as far as these calculations go. Crystal (caramel) malts require no further mashing and are simply along for the ride; just like the roasted grains.

The old, standard, stout recipe is 7# of pale malt, 2# of flaked barley, and 1# of roast barley. The only ingredient in this recipe with diastatic power is the pale malt. For this exercise, we'll use Maris Otter pale malt which has a DP of 120. 7 X 120 = 840 ÷ 9 = 93.3 DP for the mash. I didn't include the 1# of roast barley in the division as it contains no convertible starch. As far as the enzymes are concerned, the roast barley could be a pound of gravel or some broken bricks; it neither helps nor hinders the mashing. The mash has plenty of enzymes available for the conversion of the pale malt and flaked barley in this recipe.

If we were to substitute Golden Promise malt for the Maris Otter, there would be a difference. Golden Promise has about 70 DP. Therefore: 7 X 70 = 490 ÷ 9 = 54.4 DP for the mash. There are still plenty of enzymes to convert the grist of this mash bill.

If we were to brew a Witbier using 4# of Belgian Pils (DP 110) + 2# of raw wheat + 2# of flaked wheat, we would calculate: 4 X 110 = 440 ÷ 8 = 55 DP for the mash. Again, there are plenty of enzymes to do the job.

Below is a short reference list of commonly used mash ingredients with their approximate degrees Lintner:

American 2 Row Malt: 140 °L	Munich Malt (20 SRM): 20 – 25 °L
American 6 Row Malt: 160 °L	Vienna Malt: 75 °L
British Pale Malts: 40 – 70 °L	Wheat Malt, German: 60 – 90 °L
Maris Otter Pale Malt: 120 °L	Wheat - raw, flaked, torrified: 0 °L
Belgian Pale Malt: 45 – 70 °L	Crystal Malt (all): 0 °L
German Pilsner Malt: 110 °L	Chocolate Malt: 0°L
Munich Malt (10 SRM): 70 °L	Black Patent Malt: 0 °L

Diastatic power is a small but significant factor in recipe formulation. It can make a big difference when you're brewing close to the edge. Keep this in mind and you might not have to find out the hard way!