New lab unveiled at WL

White Labs recently completed construction of a new analytical laboratory at its San Diego headquarters with significantly more space, equipment and training possibilities. The new lab was unveiled during Siebel Institute’s Essential Quality Control Course, which was held at White Labs in September. The new space accommodated 20 students in the lab at one time.

The construction project caused some delays in yeast orders in the summer months, but White Labs is back to full strength.

For more White Labs news, including changes in the Boulder, CO office, turn to pages 4-5.

Understanding a Malt Analysis

By Dan Bies and Betsy Roberts
Technical Services Dept.,
Briess Malt & Ingredients Co.

(Editors note: This article was first published in the Nov-Dec. 2013 New Brewer)

Obtaining consistent results and efficient brewhouse performance may be two of the most coveted achievements in brewing. But brewing is a natural process made with natural ingredients which are, by their very nature, variable. Growing conditions, soil, malting barley varieties and the malting process all impact the attributes of a finished malt, making slight variations in finished malt inconvenient but inevitable. These variations can cause inconsistency and inefficiency in the brewhouse and finished beer if not properly addressed prior to brewing. Thus the need for a Malt Analysis.

The Malt Analysis brewers receive with each lot of malt is like an instruction booklet on how to use the malt. This familiar single-page document of data delivers important information for efficient processing and to help brewers hit their target yield and color. Once brewers fully understand the data on the Malt Analysis and the significance of each attribute to the brewing process, they can apply this information to achieve consistency and efficiency in the brewhouse.

A Malt Analysis will typically list three types of data — Physical Analysis of the Kernel, Wort Analysis and Chemical Analysis. The data reported on Malt Analysis is determined by the style of malt as illustrated in the chart on page 2.

While each attribute uniquely impacts the brewing process or finished beer, some have a greater impact and significance than others. To help you more easily sort through a Malt Analysis and make adjustments that will have the greatest impact on efficiency and consistency, we have starred the more important attributes.

For example, we awarded five stars to three attributes — Assortment, Color, and Extract/Grain Grind — because of the impact they may have on finished beers. Other attributes have been assigned stars based on their impact on the brewing process and/or the finished beer. Attributes with one or two stars doesn’t necessarily diminish the importance of this information, but it is intended to help keep you focused on your goal of obtaining consistent results and efficient brewhouse performance.

See “Malt Analysis,” page 2

Style Matters: Tips for American-style Märzen/Oktoberfest

In each issue, CBQ spotlights a particular beer style and provides tips from an ingredient and fermentation perspective. In this issue we examine American-style Märzen/Oktoberfest. This issue is not being printed during September, which makes this style all the more appropriate as one feature of the American version is it can and should be brewed all year long!

Malt Notes:
Märzen, or March beer, was traditionally brewed in March in celebration of Oktoberfest, which occurs in September. For those of you who are traditional ale brewers, you probably fully understand that only a lager could occupy 75% of our 12-month calendar. Fortunately for modern brewers, this is not 16th century Bavaria, and brewing is not outlawed from late April to late September. We are also blessed as brewers to have access to malt that has a modification level where we no longer need to employ decoction, or an extensive multi-step mash.

Märzen is highly dependent upon malt for its complexity. You should expect bread- and biscuit-like flavors, balanced with a subtle toffee-like sweetness, though not cloying. Märzen should also have a sufficient mouthfeel, with this and the sweetness being derived from the malt, and not a result of under attenuation. Below is a slightly modified grist bill based on the 2000 World Beer Cup Silver Medal for Märzen. This beer was brewed entirely with American barley.

See “Style Matters,” page 7
Malt Analysis

Attributes: Physical Analysis of the Kernel

Attribute: Assortment *****

Significance: Frequently overlooked as the problem child it can be, assortment plays a critical role in the brewing process because it tells you how to set your mill. Extract losses in brewing when using a lautern are frequently related to mill settings, especially within a two-roller mill which can't be set to ideally grind multiple kernel sizes correctly. A wider assortment makes it more difficult to set a mill. There are also typically differences in assortments between 2-Roll malts and 6-Rol malts, due to their kernel size differences, with 2-Roll being more plump than 6-Roll. When using a mash filter and hammer milling malt, obviously assortment isn't as great of a concern. However larger plump percentages can indicate higher ratios of endosperm to total kernel and generally indicate lighter colored and higher yielding malt. In addition, specialty malts may often be thinner than base malts. Fortunately specialty malts offer some wiggle room when milling because, due to less friability, they do not require as good of a crush as base malts.

Test: This test is manually performed using a shaking device with four screens to quantify kernel size. A 100-g sample is the standard amount used for assortment. The sample is placed on the top screen of the shaker and allowed to shake for three minutes. The contents on top of each screen and then the bottom screen are then weighed and quantified separately. The screen that remains on top of the 7/64th-inch and 6/64th-inch screens is considered the plump portion. Grains that remain on the 5/64th-inch screen is thin, and grains that pass through all screen is thin.

Ideally: Plump values should be around 80%. Thin values should not exceed 3%.

Attribute: Bushel Weight *****

Significance: Bushel weight has little impact on the brewing process, but is an important piece of information for breweries with bulk malt storage. Bushel weight indicates the size and density of malt, and can be used to calculate how much malt will fit in a silo or other storage unit. Brewers new to bulk malt storage will want to work closely with their malt supplier to determine appropriate conversion values and techniques to calculate quantity. Variations typically occur between malts that undergo significantly different processing conditions.

Test: The definition of bushel weight is the volume of grain required to fill level full a bushel measure which is equivalent to 2150 cubic inches. This translates to pounds per 32 US dry quarts or pounds per 35 liters. Ask your malt supplier for their bushel weight testing equipment complies with USDA specifications.

Attribute: Friability *****

Significance: When used in conjunction with other analyses that indicate malt modification, friability is a great tool that may indicate lautering performance. Slow lautering is often due to under modification of malt. Under modification can lead to poor mash conversion and more high viscosity polysaccharides such as beta glucan. It is typically reported only on Base Malts as it is not appropriate for many specialty malts, such as caramel malts, which are glassy and hard by nature.

Test: In this test which indicates the level of modification, malt is crushed using a friability instrument. The portion that remains on the screen of the instrument is weighed. This weighed portion is the “under modified” portion. The result of the test is reported as a percentage.

Ideally: A good friability value for base malts is considered >85%. An exception is the friability of Pilsen Malt which is intentionally undermodified to retain light color. Standard friability values for Pilsen Malt are 85%.

Attribute: Glassy/Mealy *****

Significance: The percentage of glassy/mealy kernels in a malt sample is most often used as an indicator of conversion in Caramel Malts, of poor modification in Base Malts, and to detect the presence of cross contamination in base malt.

Test: This test is manually performed using a tool that does a cross cut through grain. The cross cutter holds 50 kernels sorted into individual slots, then sliced through the middle with a sharp edge. The pieces are separated and the inside of the kernels is observed. The number of mealy, glassy and half-glassy are counted and multiplied by two to determine a percentage out of 100.

Ideally: Since base malts are kilned at lower temperatures to preserve enzymatic activity in the finished sample, their cross cut should be 98% mealy. Caramel malts can range from 100% glassy for high color, well converted caramels to 85% glassy, 15% half-glassy for low color caramels. Lower color Caramel Malts have a greater the likelihood of having more half-glassy kernels.

Attribute: Moisture **

Significance: Malt with very low moisture is brittle and prone to breakage while malt with excess moisture will become sticky and may present milling difficulties and suffer from shortened shelf life. Malt with higher moisture will result in a proportional loss in is-6-extract. Moisture levels will commonly vary by malt type and by season. Many specialty malts, such as low color Caramel Malts or extra light Base Malts (Pilsen Malt), will have slightly higher moisture levels than high color malts based on the time/temperature constraints required to obtain the specific color in a roaster. Also several dark roasted malts will have lower moisture contents due to necessary intense drying.

Test: Malt is weighed then heated in an oven for three hours to drive off water. The dried sample is then weighed to determine the percentage of moisture remaining.

Ideally: The optimum moisture range for Base Malts is 3-6%.

Attributes: Wort Analysis

As mashing is the heart of the brewing process, it is also the heart of Malt Analyses. In the U.S., this procedure is called a Congress Mash, an industry standard method provided by the American Society of Brewing Chemists (ASBC). The parameters spelled out in the method include malt grind, liquor-to-grist ratio, temperature ramps and holds, and filtration. The process uses 80 grams of malt and 400 milliliters of water. Conversion is usually complete within 2.5 hours with a final conversion step of 70°C (158°F). This mash determines extract, viscosity, color, beta glucans, turbidity and soluble protein.

Attribute: Color ****

Significance: A second five-star malt attribute because of its impact to a finished beer is color. Malt is normally the largest source of beer color in beers over 3 SRM and invariably, if tight controls for color are desired, formulations may have to be adjusted to hit your target color. While volumes have been written about the importance of beer color, and there are many simple tools available to calculate wort and beer color, predicting it precisely remains one of the more difficult tasks for the malster and brewer because of the inherent variability in analysis and difficulty in obtaining a completely homogeneous and representative sample.

Test: Determined by a Congress Mash wort analysis and reported in degrees Lovibond, SRM or EBC.

Ideally: The color will be at the target color that was used to formulate the beer. If the color varies outside this target in a See “Malt Analysis 2,” page 6
A look at the 2013 Briess Malt & Brew Workshop

By Briess Malt & Ingredients Co.

Forty brewers and three guest speakers spent two hot August days in Chilton immersed in the world of malting and brewing at Briess Malt & Ingredients Co. in Chilton, WI.

During the annual Malt & Brew Workshop, the group toured the malthouse, roasting operation and extract plant which includes a mill, 500bbl brewhouse, evaporator, dryer and pilot brewery. Technical sessions ranged from handcrafting specialty malts to the production of malt extract to hands-on sensory of eight malts in dry, wort and finished beer. Special thanks to guest speakers Jason Perkins of Allagash Brewing Co., Mark Carpenter of Anchor Brewing Co., and Joe Hertrich, retired AB, who shared their experiences with the group.

Next year's workshop is scheduled for August 13-14, with a welcome social kicking off the event the evening before. Registration will open in 2014. Watch for announcements. The workshop is limited to 40 brewers and participants working in a licensed commercial brewery or brewing-related capacity.

The Briess company store - free shipping for a limited time

Tees, hats, bottle openers and other Briess gear is now available at the new online Briess Company Store. To give you a jumpstart on your holiday shopping, we're offering free shipping with no minimum purchase for a limited time only.

Visit the store at —
BrewingWithBriess.com/store
White Labs workshop schedule released for 2014

The following is the tentative schedule for White Labs classes for 2014. Consult whitelabs.com for full class details and ordering information, or call 1-888-5-YEAST-5.

2/27/2014
- Fermentation Fundamentals for Homebrew II, White Labs classroom, San Diego

A half-day course for beginning and intermediate homebrewers. Learn about yeast and fermentation from the experts at White Labs. Covers metabolism basics, making starters, and yeast handling fundamentals.

3/6/2014
- Yeast & Fermentation for Winemakers, White Labs classroom, San Diego

Fermentation skills and knowledge are critical to making great wine but it is an area often overlooked and under-appreciated in modern teaching. This course will fill in these gaps with expert tips and help that can make your wine more consistent, flavorful and successful. Instructors include White Labs fermentation professionals, winemakers and industry experts.

3/30/2014 (both classes held pre-ADI, Seattle)
- Yeast Handling for Distillers

One of the less straightforward aspects to the production of distilled spirits, yeast is nonetheless, critical. This 2-hour workshop will guide you through optimally working with yeast from start to finish. Learn tips and techniques on how to handle both dry and liquid yeast, to have the most successful fermentations.
- Sensory for Distillers

Gain the basics of identifying individual flavor and aroma congeners in this 2-hour workshop. Learn where these congeners come from and how to make your heads and tails cuts to produce spirits with the right combination for you.

4/7/2014
- Yeast Handling for Brewers, Pre-CBC, Denver CO

Covers troubleshooting fermentation issues related to poor yeast handling practices, as well as provides techniques for reliable brewery propagation.

5/15/2014-5/16/2014
- Yeast Essentials for Brewers (East Coast)

NOW 2 DAYS! This course covers the basics of yeast metabolism, fermentation conditions and impact on flavor compounds, and brewery yeast handling. Includes hands-on laboratory work geared towards practical brewing quality control. Gain practical tips and techniques from our staff and learn how to be your own yeast handling and fermentation expert.

- Yeast Essentials for Brewers (SF Bay Area)

7/11/2014
- Secrets to Sour Beer Fermentation

This course will give you in-depth knowledge about using Brettanomyces and bacteria in beer. Special guest lecturers and experts will guide you through this mysterious process! Back by popular demand.

7/24/2014
- Fermentation Fundamentals for HB Level II, San Diego

7/25/2014
- Advanced Techniques for Yeast Handling (Homebrew), San Diego

8/22/2014-8/23/2014
- Yeast Essentials for Brewers (Davis)

9/15/2014-9/26/2014
- Siebel Institute’s Essential Quality Control Course, San Diego

The only course of its type anywhere, the Essential Quality Control Course presents a full range of topics related to QC that will give you the tools required to create beers of the highest quality and consistency. This course will cover all of the most important aspects of a complete QC program; Sensory Evaluation, Analytical testing and Microbiological testing.

10/10/2014-10/11/2014
- Yeast & Fermentation for Distillers, San Diego

This course provides detailed information on yeast & fermentation metabolism basics, as well as the contribution of yeast strain selection on spirits congeners. Learn how various sugar sources can affect your fermentation and how to provide ideal conditions for the most successful fermentations. Gain more knowledge on sensory attributes of your product—what they mean and how to get the most from your cuts.

10/23/2014-10/24/2014
- Yeast Essentials for Brewers (San Diego)

WL testing new wastewater treatment technology

At White Labs a new biological wastewater treatment technology is being tested. The technology is based on microbial fuel cells (MFCs) that remove the organic content of wastewaters, creating clean water and electricity.

The system was developed locally in San Diego by the J Craig Venter Institute and Synthetic Genomics.

The system is installed to treat the wastewater from White Labs production and is being tested for an initial 6-months period.

In addition to cleaning wastewater, the microbial fuel cells have the advantage over current wastewater treatment systems by not creating excess sludge—another waste stream that needs to be accounted for—but instead allowing the energy created by conversion of the organic content of the wastewater to be extracted as electricity.

The pilot plant at White Labs will be used to validate the MFC technology and determine the reduction of water and energy usage at White Labs when re-use of the cleaned water has been fully integrated.
Brewers ask me, and I share with you the ‘why’

I heard from a brewer recently that he loves us, but he lamented that it takes us so long to make yeast.

This brewer was right — it takes us a long time to make yeast. But he was wrong in terms of what that means for brewers.

It might take us 17 days to make yeast — we never compromise on our proven process for making yeast that survives as many generations as you need it — but that doesn’t mean you have to wait long for it.

I will explain what I mean, but first let me show you the other side of the coin. I have brewers, when they get our yeast in two days, thank me for speeding up the production of their yeast.

Regardless of whether we get yeast to people in two days or two weeks, all yeast production is the same and follows our purposely effective process. We never speed up yeast. Proper yeast work requires time, including multiple testing steps that add additional days to the production process.

So why do we sometimes take a few days and other times weeks?

More than half of our yeast is available for next day shipping via Yeastman. Earlier this year, a little home-work on our part showed that the average time it takes us to get people yeast was under five days for the first time in our history, which was a drop of 10 days since 2008, thanks in part to increased yeast production and factors such as Yeastman, which makes it easy to get yeast as soon as possible. (We had a hiccup in the summer as construction at White Labs delayed yeast shipments, but we are back at full strength).

We have yeast dueing our testing processes every day. Yeastman can tell you what we have available or what is coming available. For instance, you can log into Yeastman.com and see if White Labs has WL.001 available, and if not, the upcoming day in which the next batch will clear QC.

My brother Mike, who runs the system for us, tells me one can order yeast from start to finish in less than one minute, although at times the system can get bogged down by heavy use. Mike assures me he will make it faster in 2014.

But if it does take a little longer than expected, bear with us. Quality sometimes takes time.

Chris White is President of White Labs Inc. He has a Ph.D. in biochemistry from the University of California, San Diego. Feel free to write him at cwhite@white labs.com about this column.

Around the world with White Labs: Our dispatches

White Labs Dispatches includes news and notes from primary and remote offices.

San Diego Headquarters

White Labs is expanding into Building 2 in San Diego with more space for shipping and receiving, research and development, yeast propagation, offices, and employee amenities such as an expanded break room. Look for more news about this expansion project in the next issue of The Quarterly.

White Labs Gift Shop

Visit the White Labs Gift Shop during the holidays to view shirts, hats, jackets and special items such as White Labs ornaments. Find the gift shop at Whitelabs.com.

White Labs Colorado

Construction continues on the relocated office for White Labs in Boulder, CO. The White Labs sales and customer service office, a fixture in Boulder for more than a decade, is in its third location after previous stops in Niwot and the Boulder neighborhood of Gunbarrel. The new office is at 1898 S. Flatirons Ct., Suite 213, Boulder, CO 80301. It is located on the second floor of the new, expanded location for Upslope Brewing Company. In September, one of the worst storms in years hit the region — described as a 1,000-year rain and a 100-year flood — and the White Labs office was closed for a day due to the surrounding floods.

White Labs Davis

The White Labs office in Davis, CA, is undergoing changes as research and development projects (the first use of the office) are being transferred and implemented at San Diego headquarters. More about this new technology will be unveiled in 2014. Meanwhile, close ties exist between White Labs and the rejuvenated Sudwerk Brewery (where the White Labs office is located). The brewery, under new ownership, is implementing numerous changes as crew bring new life into one of California’s longest-standing breweries. Look for their beers on tap in an expanding number of locations in Northern California and elsewhere.

White Labs Yeast is sold on location (see graphic above).

White Labs Tasting Room

(At White Labs headquarters in San Diego)

Recent changes include additional seating and a new, larger window into the expanded analytical lab. Especially popular in recent months has been the Franke stout beers, which are made with a special blend of 96 yeast strains. The beers, which have included stouts, pale ales and others, generally sell out quickly. Stop by soon for a taste!

Craft Beer Quarterly

The purpose of CBQ is to provide information and tips about brewing from an ingredient perspective — malt, hops and yeast. CBQ is sent each quarter to thousands of professional brewers. CBQ is sponsored by Breiss Malt, Hopunion LLC and White Labs Inc.

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Malt Analysis 2

significant way, formulation changes may be necessary.

Attribute: Extract as determined by Coarse Grind as is ****

Significance: The main purpose of diastatic malt is to provide sugar or extract, this is what you are paying for. Extract is tested using a fine ground malt sample that is milled to a standardized grind profile. For base malts, extract is also determined using a coarsely ground sample also standardized and used to obtain fine/coarse difference. Extract includes fine grind and sometimes coarse grind, and is reported on an “as-is” and “dry basis”. As-is extract is more relevant to a brewers formulation than dry basis because it is a more practical way of representing yield potentials. The Extract/Coarse Grind as-is data most closely indicates the performance you can expect in the brewhouse, thus it has the most impact on your brew.

Test: Determined by a Congress Mash wort analysis. In the case of the Extract/Fine Grind test, a controlled lab mash is prepared from finely ground malt. A portion of the wort is analyzed for specific gravity. This value determines the amount of solids that can be extracted from grain. Dry basis results remove the influence of malt moisture from the extract calculation. For example, an 80% dry basis extract of a malt with 5% moisture would have a 76% as-is extract.

Ideally: As-is extract will be as high as possible. Adjustments may be required if the number is lower or higher than the beer was originally formulated with, although it usually does not vary a great deal.

Attribute: Viscosity ***

Significance: A high viscosity value will indicate potential problems in brewhouse operations.

Test: Malt viscosity is performed on Congress Mash wort usually in a viscometer tube. It is a measure of a liquid’s ability to resist flow through a capillary column. The measurement is the time of amount required for a predetermined volume to flow through the thin tube in comparison with water, and is frequently reported in units called CPS.

Ideally: Typical Congress Mash wort viscosities from Base Malt are 1.45 to 1.60 CPS. Values in excess of 1.60 may indicate a potential for slow runoff.

Attribute: Turbidity (Haze) **

Significance: Caused by proteins and beta glucans that have not been sufficiently degraded, this attribute has relatively little impact on the brewing process but can contribute haze to the finished beer.

Test: Determined by a Congress Mash wort analysis and reported in Nephelometric Turbidity Units (NTU), turbidity is a measure of the light scattering properties of liquid due to suspended solid materials.

Ideally: Typical values of clear wort are 4 NTU. At values greater than 15NTU haze is evident.

Attribute: Beta Glucan **

Significance: High beta glucan levels have long been associated with lauterating difficulties, due to the effect they have on mash viscosity. Viscosity is a more practical indicator of how a malt will affect brewhouse performance, making beta glucan data a minor player compared to its four- and five-star colleagues on the Malt Analysis.

Test: Beta glucan analysis is most commonly determined by a Congress Mash wort analysis in a flow analyzer where fluorescent compounds are bound to beta glucan molecules. The intensity of fluorescence is used to determine the number of beta glucan molecules. The test itself commonly shows high coefficients of variation (10-25%), and detects only the number of beta glucan molecules. It does not take into account the size (molecular weight) of the individual molecules, an attribute that can have a marked effect on lautering and viscosity.

Ideally: Beta glucan should be <180 for trouble-free runoff.

Attribute: Soluble Protein, Total Protein** and S/T Ratio

Significance: S/T Ratios are used often in malting guidelines to determine the extent of modification. Total protein is reported separately on a Malt Analysis because it impacts brewhouse performance. It varies for 2-row and 6-row varieties, with high protein barley potentially causing reduced extract yield and higher color.

Test: This test is determined by a Congress Mash wort analysis. It is a measurement of the soluble protein in wort in relation to the total protein of the malt. During the malting process, storage proteins that are present in barley get broken down by proteases to smaller fragments which become soluble during the mashing process. Soluble protein is measured using a spectrophotometer at wavelength in the UV range. The absorbance values are correlated to a protein value obtained through the standard method of protein measurement, kjeldahl kjeldahl is used for the total protein analysis and involves an acid digestion at high temperatures of the ground malt sample. This breaks down all of the protein in the sample, which is then distilled off as ammonia and quantified as total nitrogen.

This value is multiplied by a standard conversion factor. Protein values are reported as a percentage of the overall sample.

Ideally: Total protein values for all malts are typically <14% dry basis. A minimum S/T of 30 is required to prevent lautering issues with malt. The CV for this analysis is +/- 10%, which is much lower than other modification indicators such as Fine/Coarse difference.

Attribute: Free Amino Nitrogen (FAN)**

Significance: FAN is another analysis that can indicate the amount of free amino groups available to yeast during fermentation. This analysis is only performed on Base Malts. It has no significance in specialty malts.

Test: This is a test to measure the amount of free amino nitrogen content in a wort sample. The assay is typically run on an automated flow instrument. It involves the reaction of the sample under controlled temperatures with ninhydrin, a colored compound that changes incrementally with reaction to amino groups.

Ideally: A standard FAN value for most base malts is 180ppm and above.

Attribute: Modification as determined by the Fine Grind/Coarse Grind Difference*

Significance: This attribute has minor impact in the brewhouse because the difference between these two extracts is such a small variation that it is difficult to measure using even the most sophisticated equipment.

Test: Determined by a Congress Mash wort analysis. The FCG/CG Difference is determined when two worts are prepared from the same malt, one ground coarser than the other. Both samples are analyzed for extract on a dry basis. The difference between these values is called the Fine Grind/Coarse Grind Difference. But the difference between the extract of a fine and coarse ground sample is very small in well modified malt, typically 0.5% in well modified malts. This small difference is roughly the same as the error in the extract method, so it’s not impossible for a properly reported fine/coarse difference to be zero or negative.

Ideally: A FCG/CG difference of 1.5% or less indicates well modified malt. Well modified malts have the potential for high extract yields with in an infusion mash.

Attributes: Chemical Analysis

Attribute: Alpha Amylase****

Significance: Diastatic enzymes are necessary in brewing to convert starches into simple sugars that yeast can ferment. Conversion of starch to reducing sugars by the diastatic enzymes in malt is due to the action of two enzymes, Alpha Amylase and Beta Amylase. Alpha amylase levels will indicate the ability of malt to convert a standard mash properly. Alpha amylase is primarily a degrading or liquefying enzyme. It chops starch into shorter chain dextrins and allows the Beta Amylase access to all of the reducing ends of the dextrins to break them down into sugars that yeast can use. While high levels of Alpha Amylase are more important for brewing high ad- junct beer than to the craft breaver, they must be sufficient to allow for consistent and adequate conversion.

Test: This test determines the activity of the degrading enzyme alpha amylase. Malt enzymes are measured using methods that indicate the activity of the enzymes in the sample through measurement of the liquefaction of a standardized starch.

Ideally: Enzyme levels required to achieve sufficient conversion vary with the type of malts being mashed. An all-malt mash can be converted with Alpha Amylase levels of 30 or above. A mash that requires a cereal cook requires higher levels.

Attribute: Diastatic Power****

Significance: Diastatic Power indicates the total enzymatic power of a malt, both Alpha Amylase and Beta Amylase. Similar to Alpha Amylase, a minimum value of Diastatic Power is required to properly convert a mash.

Test: Diastatic Power is determined by the measured breakdown of a specialized starch. This breakdown is measured by reaction with potassium ferricyanide. This agent reacts with the reducing sugars produced by the action of the enzyme.

Ideally: Levels of 50 or above are required for a normal mash program. Lower levels may still be effective with special mash programs. Diastatic Power values can vary up to +/ -10% due to measurement error. This value is also very important in the distilling industry as those mashes need high diastatic malt to convert the other cereals in the mash.

Attribute: Deconyvalenal (DON)*

Significance: DON is an FDA-regulated compound with established limits in wheat and barley. DON is a type of mycotoxin produced by certain molds that can be present in barley. Infection with the mold can occur during the growing season of the crop, or through improper storage of barley or malt. Exposure of the malt or barley to high moisture or humidity could promote the growth of DON producing molds.

Ideally: Levels should be below 1ppm. After receiving malt, always store it in a dry cool environment to

See "Malt Analysis 3," page 7
Briess Munich style in German-style lagers? Ja!

The creative craft brewer has no shortage of imported and domestically-produced Munich Malts with which to brew. And, as the chart (at right) illustrates, Briess produces four. Since all Briess malts are produced in the U.S.A. from North American-sourced malting barley, some brewers seeking "authentic" appeal for their traditional German-style lagers feel they can use only imported Munich Malts for these styles.

Once given the opportunity to perform in the brewhouse, however, Briess Munich Malts almost always perform or outperform their imported counterparts. Why? Flavor is the most frequently cited reason. And while some of that can be attributed to the pure freshness of its traveling from malthouse to brewery in a much shorter period of time under less stressful conditions, a great deal of that flavor is due to the quality of Briess recipes and our small batch, handcrafted malting techniques.

Small batch, handcrafted malting techniques are critical to the development of rich, full flavored specialty malts. In addition, many malt recipes used today at Briess were developed years ago by German-trained malster/brewer Roger Briess. The late husband of CEO Monica Briess, Roger embraced the young craft beer industry and spent his life developing and producing quality specialty malts for it.

For years Briess malts have been used by craft brewers to produce award-winning beers in both traditional and American-styles. For example, check out the Marzen recipe provided by Rich Ellis in this issue’s featured beer article (American-style Marzen).

Style Matters

with Briess products, and triumphed over competitors that were using German malts.

Goldpils® Vienna Malt 50%
Bolander® Munich Malt 20%
2-Row Caramel Malt 60L 15%
Aromatic® (Munich) Malt 5%
Wheat Malt, White 5%

Malt Analysis 3

prevent mold growth that could lead to DON production.

By interpreting a Malt Analysis by level of importance each attribute plays in the brewing process, you're more likely to stay focused on the three "five-star" attributes that make the most significant impact—Assortment, Color, and Extract/Grain Grind. Do this, while giving due diligence to the other data on the Malt Analysis, and German version. Most Bavarian-type lager yeasts will do you well for this style, including:

WLP820 Oktoberfest/Märzen Lager Yeast, WLP838 German Bock Lager Yeast, WLP858 Southern German Lager Yeast, and WLP920 Old Bavarian Lager Yeast.

Fruity esters, diacetyl and chill haze should not be perceived.

White Labs Brewer Joe Kurowski says: "If I was to pick a yeast strain for a Märzen, I would choose either WLP820, Oktoberfest/Märzen Lager Yeast or WLP920 Old Bavarian Lager Yeast.

"Both of these yeasts showcase the malt character of the beer very well, condition well over long periods producing a crisp, malty beer. When brewing a Märzen, you need those two characteristics, malt forward and stays clean under long conditioning times.

"The difference I've seen is that WLP820 is a slower fermenter, while WLP920 produces more nutty characteristics. I would also consider WLP830 for the hoppy lagers. It has great pairing with hop aroma, and nothing goes better with bitterness and hops than clean and dry."

— White Labs
Tasting Room Data at White Labs helps many

The White Labs Tasting Room in San Diego provides a unique opportunity to compare beers made with different yeast strains.

Generally beers made with the same ingredients are split into four batches, and each batch is fermented with its own unique yeast strain.

What may be less well known is that you don’t have to go to San Diego to determine the differences between the yeast choices.

By visiting the White Labs Tasting Room link at whitelabs.com, one has the opportunity to explore the data from almost every beer brewed at White Labs (the company’s primary business is making yeast).

Users can compare same beers made with different yeasts all in the same screen, viewing such key details as alcohol and calories.

Thank you GABF attendees

White Labs customers gained 59 percent of the medals passed out at the Great American Beer Festival.

Congratulations to all the breweries that attended the GABF and entered their beers in competition. For winners and everyone else who competed, it was a special week.

White Labs support was seen throughout the festival. The company sponsors a team that raises money for breast cancer research, called Beer for Boobs, and the team’s booth raised much needed funds through the sale of merchandise. White labs also sponsored events such as a brewers gathering. See you next year!