LALLEMAND

LALLEMAND BREWING

ISSUE #8

THE OFFICIAL NEWSLETTER OF ALL THINGS LALLEMAND BREWING!

WE BREW WITH YOU.™

MASTERING FLAVORS AND AROMA CONTROL THROUGH SCIENCE

Welcome to this 8th edition of the WBWY newsletter. At Lallemand Brewing, we strive to select, characterize, and produce yeast and bacteria that can be used by brewers to expand their range of "tools", enhancing their ability to express originality, diversity and creativity in beverage production. This edition focuses on some aromatic compounds produced during fermentation and how the brewer can influence these compounds through control of the brewing process.

We believe it is vital for brewers to exceed expectations in the areas of **quality, consistency, and value** if they are to successfully participate in the premium segment. As a trusted partner, within the frame" We Brew With You", through our products and technical expertise, we aim to share **our passion for innovation** and to give you **access to the science** and the expertise required to achieve these objectives.

There is no doubt that both **flavor and aroma** in beer are heavily influenced by the selection of malt and hops used in brewing, but no one can ignore the huge influence of **fermentation management** where **yeast and bacteria play key roles**.

Hydrogen Sulphide (H_2S) is one of the aromatic compounds produced during alcoholic fermentation and merits special attention. While acceptable in small amounts, in excess, H_2S is a serious quality fault in most beers. A detailed understanding of yeast metabolism might be useful in 'mastering' H_2S.

The use of bacteria in the brewing of sour beers is well documented. This natural biological acidification contributes to both **quality and sensory perception**, but pH and total acidity are not the only parameters to be taken into consideration for this beer-category, which is becoming wildly popular. Lactic acid, Acetic acid, Diacetyl, Biogenic amines and THP ("Mousy taint"), are produced via specific bacterial metabolic pathways that are both species and strain dependent. But what is the sensory impact of these compounds and how does this knowledge influence our choice of bacteria for Sour beer production?

In our previous edition, we were excited to introduce you to our latest innovation, ***LalBrew Farmhouse™***, a unique yeast, bred using natural hybridization techniques, allowing the production of refreshing and dry Saison-style beers. The product update section of this newsletter is dedicated to reviewing the results and feedback from brewers who were the first to try ***Lalbrew Farmhouse™*** and have given us their feedback and testimonies. Again, a big thank you to the many brewers that agreed to share their experiences of brewing with ***LalBrew Farmhouse™***.

We hope this focus on **fermentation aroma control** will be useful in your continuous journey to improve the quality of your beers and we wish you a good reading.

Editorial by Didier Theodore
New Business Development/Product Manager

NEXT EVENTS

SEPTEMBER 29 - OCTOBER 1, 2021
CEBC Central European Brewers Conference 2021
Budapest, Hungary
cebcexpo.eu

OCTOBER 17-20, 2021
Trends in Brewing
Leuven, Belgium
trendsinbrewing.org

OCTOBER 28-30, 2021
Master Brewers Conference
Cleveland, Ohio
mbaa.com/meetings/2021Conference

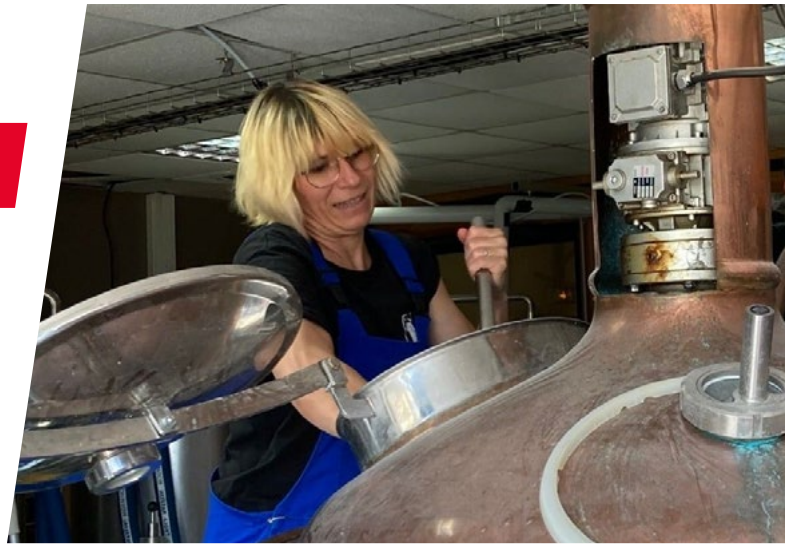
WE BREW WITH YOU™ ONLINE

Product Update

BEHIND THE SCENES OF THE LALBREW FARMHOUSE™ LAUNCH

Two months after its launch, it is time to share how you can get the most out of LalBrew Farmhouse™. But first, let us answer the question we get most often when we launch a new yeast strain. "How do you test your new strains before you release them?" As we launch new products often, we have a process to have laboratory results and field trials, in our case, brewery trials. Because we think that brewers can go beyond our lab protocols thanks to their experience and creativity, letting brewers try out a new strain can help us better understand how a specific strain will behave in a fermenter. Data collected from our field trials enable us to share specific parameters you can modulate to create the beers you like.

From that moment we dried the very first bricks of LalBrew Farmhouse™, up until today, over 20 different breweries from different countries shared comprehensive results from their brews with this new hybrid yeast. Each set of results contains the recipe, physical and chemical characteristics (pH and gravity curves, temperature, etc.), but also tasting notes from the brewers themselves. From these results, the main variable making an impact on the beers you brew with LalBrew Farmhouse™ is fermentation temperature. In most cases, lower fermentation temperatures (close to 20°C) will primarily give notes of banana and clove, something that is much closer to Belgian blonde and



Stéphanie Altermatt - Brewer at ArtMalté (Annecy), while she brewed "Girl Power" made with LalBrew Farmhouse™

Belgian wit style ales. When fermented closer to 30°C, we observe that traditional Saison characteristics are much more predominant. Brewers reported their beers as having more peppery notes, fruitiness, red apple, and bubblegum. Also, their beers tasted "fresher," and we can link this statement to a lower pH in the beers fermented this way. The idea of freshness in a Saison can be linked to the attenuation of the beer too. To achieve this "zing", some brewers reported successfully adding simple sugars or using enzymes in the mash to achieve similar attenuations to beers fermented with a Diastaticus yeast.

R&D Update

MICROBIOLOGY AND FINE-TUNING SOUR BEER

Lactic acid bacteria (LAB) have played an important role in human health and nutrition for as long as humanity have been practicing agriculture. The preservative effect of low pH and the proliferation of select LAB species are a staple in providing safe and notorious food even to this day. As such, many traditional foods and beverages have remained popular despite modern advancements negating the need for more traditional practices. The act of souring a fermentation substrate plays a vital role in traditional and stylistic flavor development. Sour beers are chief among those ancient traditions.

A sour beer is characterized by a tart flavor, low pH (< 4.0), and unique production process. Not by coincidence, these particular beers trend towards traditional styles of the pre-microbiology era of brewing. Some of these beers may be regarded as an artisanal endeavor, taking months to years to produce a final product, and in low volumes. Brewers, being the innovative breed that they are, have coopted natural souring processes to develop efficient methods of sour beer production using the same microbes "accidentally" used for millennia, albeit in a much more precise technique.

For a brewer, the goal is to produce a consistent product using consistent processes. By far the most common sour beers produced today are those made through controlled kettle souring: a method which involves the inoculation of fresh, sterile wort with a pure LAB culture (e.g., Lactobacillus brevis) and fermented for 12 to 72 hours prior to undergoing a yeast-mediated primary fermentation. The primary advantage of this method is that it offers a degree of control over lactic acid development without the use of industrial additives, as well as enhanced flavor and stylistic development.

Control comes in three primary forms: **sterility** – wherein only a specific species of microorganism is allowed to proliferate at any given time, **substrate** – controlling the amount of available glucose and other vital components to flavor development, and **temperature control** – lactic acid fermentation can be highly influenced by the temperature at which the selected microorganism is allowed to work under.

Modern techniques are continuously refined and improved, which inevitably results in better beer and happier consumers. Though production methods may change, the heart of the style remains the same. A greater diversity of pure-culture microorganisms, improved characterization methodologies, and enhanced brewing practices ensure that these styles of beers will remain relevant for years to come.

Read complete article **here**.

Shayevitz Avi - Research associate, Lallemand Brewing

R&D Update

IMPACT OF HYDROGEN SULFIDE IN BREWING

UNDERSTAND THE ROLE OF YEAST IN CONTROLLING H_2S TO CRAFT BETTER BEER.

Sulphur metabolism is of special relevance for beer quality during the entire brewing process. Humans have evolved to be very sensitive to sulfur compounds, which are associated with toxic or rotten foods. Nowadays we can determine food quality by other means, however, these molecules still play an important role in beer flavor and quality.

There are a wide range of sulfur compounds in beer. Hydrogen sulfide (H_2S) is of particular interest because its presence is related to the yeast strain and metabolism. H_2S is a very small molecule, known in the brewing industry since the end of the 19th century. It is highly volatile with a very low flavor threshold level reminiscent of rotten eggs. H_2S can impact the beer flavor profile directly or can mask other flavor compounds present in the beer.

Although small amounts of this compound can be acceptable, or even desirable, in excess it can lead to unpleasant off-flavors, usually described as rotten eggs. For this reason, H_2S production by the yeast should be limited as much as possible during fermentation, which requires a detailed understanding of the metabolism and nutritional requirements of specific yeast strains.

Sulfur is an important element required for all living organisms, particularly as a component of the amino acids cysteine and methionine as well as a component of vital co-factors. The brewing yeasts, as well as many other microorganisms, can metabolize sulfur compounds by different pathways. It is generally recognized that the major pathway for H_2S formation in yeast is the sulfate reduction sequence (SRS) pathway. The activity of SRS pathway enzymes is strain dependent and influenced by environmental conditions, which is described in detail in **a dedicated white paper** from Lallemand Brewing.

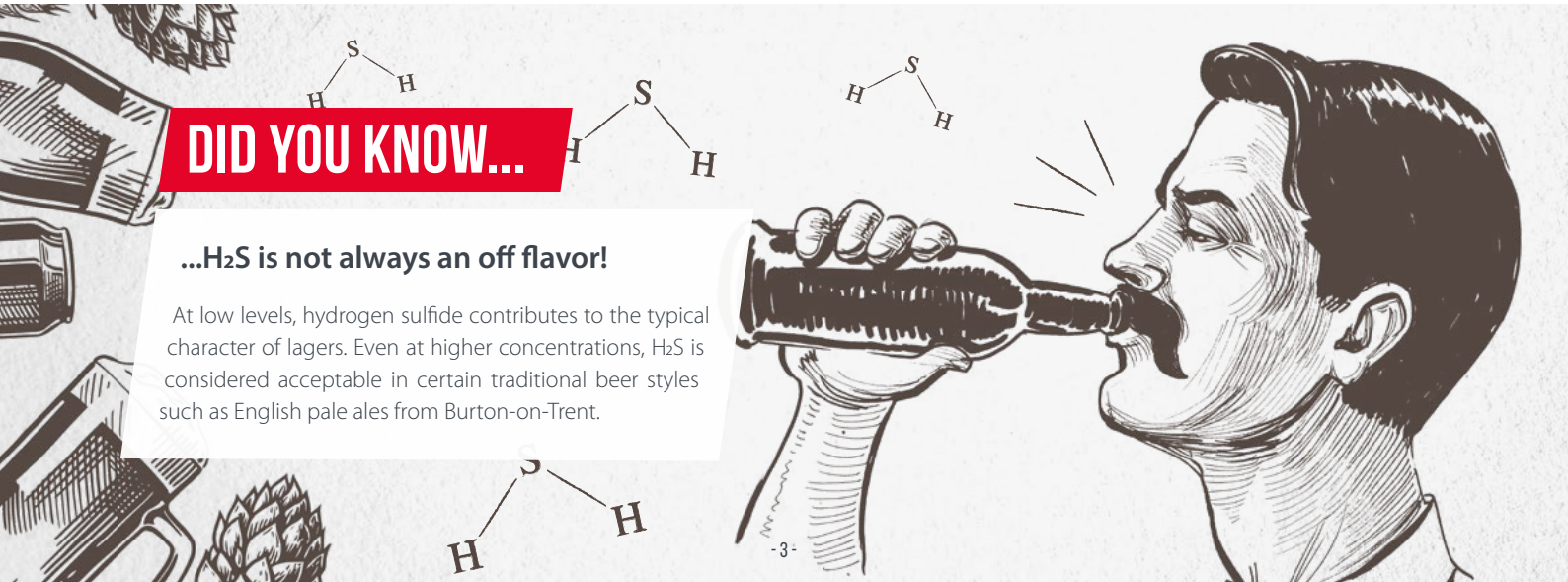
Elevated levels of H_2S may also result from conditions that stress the yeast or contribute to its premature autolysis. On top of that, hydrogen sulfide is also a very reactive molecule that may combine with carbonyl compounds to produce other more stable off-flavors such as the pungent vegetal, rubbery or sewer-like aromas of mercaptans.

To avoid problems with H_2S in your beer, choose a yeast strain that produces less H_2S and make sure to understand its nutrient requirements. Ensure a vigorous fermentation to drive off volatile H_2S through CO_2 stripping and ensure that healthy yeast is present in the beer at the end of fermentation to reabsorb the remaining H_2S. Strain choice is particularly important for lager strains, which are less vigorous and therefore do not efficiently remove H_2S through CO_2 stripping. Vigorous fermentations are achieved by pitching a sufficient amount of healthy yeast into a nutrient-rich wort and fermenting at an appropriate temperature for that strain. Reabsorption of H_2S by the yeast after fermentation is promoted by allowing longer maturation times, especially for lager strains.

The best defense against H_2S is to ensure that it is never produced in the first place. At Lallemand Brewing, we are providing brewers with useful tools that will limit the production of H_2S and help the brewer to deal with it. As you might have read in our previous WBWY newsletter, through a recent partnership with Renaissance Biosciences (Vancouver, Canada), Lallemand Brewing is now able to produce novel hybrid yeast strains that are unable to produce H_2S and eliminate the risk of this common off-flavor from the brewery. Our global technical team is always available and willing to share tips and recommendations regarding traditional methods to prevent or reduce H_2S in beer. We are constantly working on the characterization of our yeasts to be able to provide more and more information regarding their specific nutritional and environmental requirements. We invite you to take a look at Lallemand Brewing's recent white paper on this topic and please feel free to contact your local rep for any additional information you might need.

Interested to read more about H_2S? Download our whitepaper **here**.

Eric Abbott - Global Technical advisor and Technical Sales Manager - Canada
Gianmaria Ricciardi - Technical Sales Manager – Italy & Slovenia



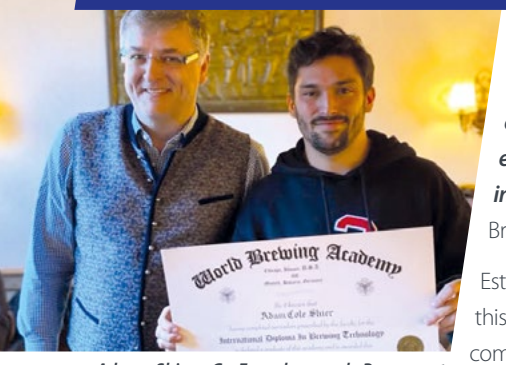
DID YOU KNOW...

...H_2S is not always an off flavor!

At low levels, hydrogen sulfide contributes to the typical character of lagers. Even at higher concentrations, H_2S is considered acceptable in certain traditional beer styles such as English pale ales from Burton-on-Trent.

Siebel Institute of Technolgy Update

CELEBRATING 20 YEARS OF PIONEERING BREWING EDUCATION AND TRAINING



Adam Shier, Co-Founder, and Brewer at True History Brewing, Toronto, Canada (WBA International Diploma in Brewing Technology Program, 2020)

Q. What do you get if you combine the resources of two iconic brewing education and training institutions? A. The World Brewing Academy (WBA)!

Established 20 years ago, this groundbreaking concept combined the resources of the Siebel Institute of Technology and Doemens Academy to form the World Brewing Academy. Rapidly becoming acknowledged as a leading global force in the education and training of professional brewers, the WBA continues to inspire new generations of brewers, many of whom have become leading players and innovators in the industry.

From the outset, the WBA has engaged only the most knowledgeable and experienced teachers, content experts with real world practical experiences to share with students.

Did you know that the World Brewing Academy is a pioneer in online brewing courses and programs? Previously, very few online courses allowing brewers to reach a high level of education were offered by recognized institutions. With twenty years of experience and expertise, the World Brewing Academy has established itself as a leader in providing professional brewing education online.

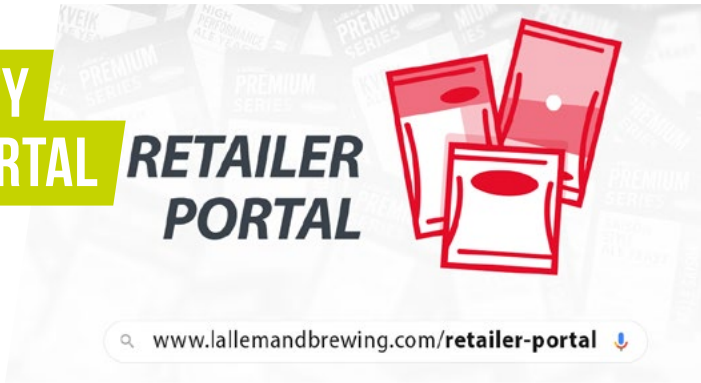
Offering entry, intermediate and advanced level courses and programs, the WBA has something to offer anyone interested in embarking on or advancing in a professional brewing career.

Many of the WBA entry and intermediate courses are offered in both eLearning and traditional on campus formats. Recent extensive investments in content and delivery systems make the WBA eLearning experience a flexible, versatile and economically attractive alternative to traditional classroom learning. However, for those that thrive on the higher level of interaction provided by in-person learning, the intermediate level **WBA Concise Course in Brewing Technology** is an intensive 2-week class at the Chicago campus. The higher level **WBA International Diploma in Brewing Technology** and **WBA Master Brewer** programs are both dual campus (Chicago/Munich) and are unique not to be missed experiences. The dual campus/dual continent WBA is in a class of its own – world class brewing education and training combined with the opportunity to learn all about brewing in two unique brewing cultures.

Whether eLearning or campus, you can be assured that the quality, depth, and detail of knowledge shared is exactly the same for all World Brewing Academy students.

Homebrew update

HELPING OUR HOMEBREW COMMUNITY WITH THE LAUNCH OF A RETAILER PORTAL



We have exciting news to share with our homebrew and home wine retailers worldwide. We have been working behind the scenes to create a tool specific for your success. Our brand-new retailer portal is loaded with resources to help share your business info on our website as well as increase the traffic to yours.

Included in our Retailer portal are a few key features. The first is our Retailer Map which highlights each business that carries our home brew and home wine products. Help us to promote your business by submitting the information you would like customers to see. Homebrewers and home winemakers can then visit our website and find a business close to them that sells Lallemand products. The map will continue to be updated so the information is as accurate as possible. We hope this tool will bring more visitors to your website and more business through your front door!

An additional exciting feature is our continuously updated library or resources. This library includes our most up-to-date product photos, print and digital advertisements, printable posters, advertorials, helpful downloads, and links to an abundance of technical information. It is our goal to provide you with what is needed to help keep your website up to date with our latest information and branding so customers are able to easily locate their favorite products. Also included are recipes showcasing our yeasts, including some from breweries, our technical sales reps, home brew clubs and more. We have also included links to our educational series of videos including past seminars and webinars that you can access to share with customers for an extra level of support.

Homebrewers and Retailers, we are happy to announce that we are also able to provide you with dedicated support. If you need assistance, please contact Marie Coppet at **mcoppet@lallemand.com**. On this note, should you have a suggestion on how we can help support your business, please do not hesitate to reach out.

Are you a retailer? Click **here** to create your account.