BEER ANALYSES

A WORKSHOP FOR MICRO-BREWERS IN THE DANISH MICROBREW CONSORTIUM

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The Danish Microbrew Consortium is a publicly funded project in which breweries, suppliers to the industry, applied research institutions as well as the Faculty of Life Sciences, University of Copenhagen, partake.

The aim of the consortium is to foster projects that will make life easier for small breweries, cast light on some of the unique challenges these breweries face, and to enable the participating suppliers to offer products and services that are relevant to the small breweries. In the SBR, we will in the time to come publish a series of articles that highlight both the consortium as well as the results it produces. We start the series in this issue with an article, written by two representatives from AgroTech A/S, the coordinator of the work in the consortium.

'I never imagined that you could learn so much in a single day – I'm starting to wonder if getting started on alcohol testing and lactic acid analysis would be an idea'. Quote: Niels Erik Lange, Baldersbrønde Bryggeri (the production brewery part of Nørrebro Bryghus).

On 29 March 2012, AgroTech held a workshop at Indslev Brewery, in Nørre Aaby, Funen, more or less in the centre of Denmark, as part of the activities in the Danish Microbrew Consortium (www.danishmicrobrew.com). No less than eight micro-breweries and a total of fifteen participants turned up for a challenging day of beer analysis, microbiological methods, and more.

The purpose of the workshop was to provide an insight into the methods available in the market to quickly and easily assist with important aspects of the quality assurance of the beer production. A further goal was to apply both chemical and microbiological analysis of selected beers the participating micro-brewers had brought along with them. The participants were thus given directly usable tools to take home, along with new knowledge about their own products and production.

The workshop was mainly aimed at brewers and brewery technicians who wished to obtain hands-on analyses of their own beers. The participants could try out the various analyses and tests used to describe important elements of beer quality, such as spectrophotometric alcohol tests, lactic acid/acetate analysis, measurement of the content of bitter substances,

Mathias Andersen of AgroTech guided the participants through a packed day's programme of analytical protocols, so all that was required was attention.

Henrik Sørensen from Thisted Brewery working with the alcohol test, etc.

Else Birk of Grauballe Brewery carrying out analyses, guided by Mathias Andersen.

analysis of beer colour, Gram staining, microscopy of yeast and identification of beer spoilers, etc. The participants were also able to work with various quick tests, and were given an introduction to spoiler identification using molecular methods.

Examples of the spectrophotometric tests carried out were:
- Alcohol tests
- VFA analysis (lactic acid/acetate)
- Beer colour according to EBC (European Brewing Convention)
- Bitter substances, etc.

In addition, a number of microbial analyses were carried out by microscopy, with an introduction to the use of the microscope, including a presentation of quick tests:
- Gram staining
- Yeast fitness; examples of yeasts selected from the top, bottom and centre of the fermentation tank
- Microbiology; examples of spoilers
- Photography of the breweries' own yeast strains and possible spoilers
- Cultivation in liquid and solid media
- Quick testing via ABD/Döler NBB tests
- Introduction to the identification of spoilers via molecular methods

More details are available in the programme for the day here: http://www.danishmicrobrew.com/Nyheder/Workshop_marts_2012.htm

ARE BEER ANALYSES USEFUL TO BREWERS?

In concrete terms, the brewers were given an overview of the options available within quick and simple quality analyses through readily available and easily implementable methods. All of the analyses can be carried out within a day and can determine whether there are problems with contamination of the beer and whether the specifications for acceptable beer quality have been met.

The alcohol test and the test for the presence of lactic acid/acetate in the beer were especially interesting for the participants. The simple microbiological tests also provide a quick indication of whether the process is under control. It is important for a brewer to know that there are no spoilers present in the fermentation tank, the finished beer, etc.

A prerequisite for developing the capability to carry out your own quality testing is investment in the necessary testing equipment, including a small spectrophotometer and a reasonably good microscope. The participating brewers were given an informed overview of the options and the prices and took part in a discussion of the potential of building up their own mini-labs with the most basic equipment, including the size of the investment, training requirements for employees, etc.

In the worst case, the consequences for individual breweries of failing to stay up to date with the latest knowledge and implementing quality assurance of their production can be →

DANISH MICROBREW CONSORTIUM – INNOVATION IN PRODUCTION AND QUALITY

Thirteen companies, Danish and international, including five microbreweries, two technological institutes (AgroTech and DHI) and one university (KU Science) have joined efforts to increase the quality in microbrew through innovation and research combined with good practice. The project period is 2009-2013.

More info at www.Danishmicrobrew.com.

Brewmaster Niels Erik Lange from Baldersbrønde/Nørrebro Brewery got thoroughly involved in the analytical process and had a large number of beers with him for testing.

Some of the micro-brewery beers brought along for quality testing.

PHOTOS: BODIL PALLESEN, AGROTECH.

The art of microscopy, as demonstrated by Stefan Peter Stadler, the head brewer of Indslev Bryggeri, with his own microscope in his own laboratory and Rise Brewery with AgroTech's microscope.

putting bad/sour beer onto the market, or perhaps having to discard entire production batches.

AgroTech works continuously to develop and test new rapid methods which are adapted to the needs of micro-brewers. AgroTech can offer services relating to both conventional mini-tests and larger and more complex testing processes. We always tailor the scope of the analyses to the individual customers and their specific needs. AgroTech possesses a modern laboratory and the latest equipment in the field. AgroTech can offer training courses in the use of laboratory equipment, as well as support in the construction of test facilities. Contact mxa@agrotech.dk for further information.
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ABOUT AGROTECH

AgroTech is an authorised technological service institute which offers impartial consultancy and provides technological services based on the latest knowledge. Our fields of expertise cover agriculture and food, and our knowledge of biology and technology allows us to perform complex tasks within the entire value chain from primary production to final consumption. Our target groups are the food industry, nurseries and suppliers to the agricultural industry: processing companies and suppliers of machinery, technology and other aids.
AgroTech is the lead institute covering the value chain of biomass utilization from the field to bioenergy and bio-based products. Special expertise in e.g. agriculture, raw materials, logistics, harvest, analyzing biomass potentials, biogas, environmental technology, documentation and verifications, carbon foot-prints analysis, plant fibres, biogas, bio-energy, straw.

MATHIAS ANDERSEN

Fields of Expertise
Microbiology, Business Development and Innovation, Project management.

Vitae
Mathias Andersen, innovation consultant at AgroTech, Dept. for Bioressources, has a Master's in Microbiology from University of Aarhus, from 2007. He is in charge of the technology project about microbial interactions in the Danish Microbrew Consortium and co-operate with companies and research institutes in innovation and business development.

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Fields of Expertise
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Vitae
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