Invitation

The International 30th VH Yeast Conference provides you with lectures and presentations on current topics in the fields of markets and quality, applied yeast research and process innovations in yeast production.

The focus is on 'yeast per"spec"tives'. You are invited to join the interdisciplinary dialogue with experts and partners from applied science and practical experience. VH members are called to invite their partner companies to enable reduced fees for attendants.

We look forward to welcome you in Berlin.

A. Chagnon President of VH

M. Quantz General manager of VH

yeast per“spec”tives

Monday, April 24th 2017

Applied science

11:00 a.m. Conference opening and welcome

PRES. A. CHAGNON, LALLEMAND INC., CAN

11:15 a.m. Impact of yeast on bread quality

M. KINNER, A. WOLTER, M.-L. CEZANNE, M. POPP, I. CHETSCHIK, M. KLEINERT

Zurich University of Applied Sciences (ZHAW), Wädenswil
Institute of Food and Beverage Innovation, CHE

Yeast is known to play a crucial role during bread making process and influencing overall quality parameters of bread. Depending on the bread recipe and process, yeast serves to form different amounts of carbon dioxide and versatile aroma active compounds, thus influencing specific volume and aroma profile of the bread. On behalf of COFALEC, a study to scientifically investigate the impact of yeast on bread quality was carried out at ZHAW.
To show the mentioned differences in baking quality on flavour formation and sensory impression, different European bread varieties were produced with and without yeast or using baking powder instead. Breads chosen to represent European bread varieties were French baguette, Polish Bulka Wroclawska, British sandwich bread, German spelt wholegrain bread, Spanish Pages and Italian Ciabatta. Analysed quality parameters suitable to assess impact of yeast were specific loaf volume, properties of crumb texture (i.e. crumb hardness, chewiness and springiness) and crumb structure (number of cells, cell diameter and volume, porosity and wall thickness) as well as sensory attributes (visual appearance, texture, mouthfeel, taste and aroma). Additionally, chemical aroma analysis of most important aroma compounds for crumb and crust was conducted using gas chromatography-mass spectrometry after solvent extraction with dichromomethane.
For all European bread varieties, the use of yeast resulted in a higher specific volume, a crumb that was less firm, had higher pore area and volume and an increased crispiness of crust. Additionally, depending on the length of fermentation, more bread aroma compounds or higher concentrations were found when yeast was used compared to using no yeast.
Concluding, yeast as an ingredient together with different production processes influences strongly the overall character of European bread varieties.

12:00 p.m. Frozen bread and dough

C. ÖHGREN

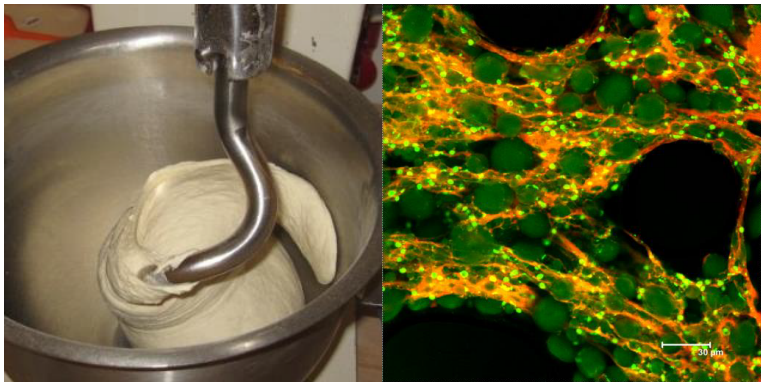
RISE-Research Institutes of Sweden
SP Foods and biotec, SWE

Today, more and more bread is frozen at the bakery as dough, non-proofed or proofed, or as partially or fully baked bread and later finished baked or allowed to thaw during transport or in the food store. Advantages are in production planning and logistics and extended market for the bakery and in reduced waste, higher convenience and freshly baked image for the food stores. However, frozen storage of both bread and dough often causes an impairment of the bread.
Important questions of relevance to provide the answers to were:

- What are the quality differences between freshly baked bread and the frozen alternatives, and what causes such differences?
- Do the consumers notice the differences?

- How can quality loss be avoided or minimized by changing the baking methods (freezing rate, kneading time) and the recipe (fiber, emulsifiers, enzymes etc)?

We have used different methods and techniques within microscopy to find the answers of the questions.



12:30 p.m. Short poster presentations

Poster 1: Certified organic substrates from green biomass for industrial yeast propagation

[1]L. BURGSTALLER, [1]M. NEUREITER, [2]M. MANDL, [3]W. KOSCHUH

[1]University of Natural Resources and Life Sciences, Vienna, Institute of Environmental Biotechnology
[2]TWB Research Ges.m.b.H.
[3] Werner Koschuh

The "BioFer" project will develop organically certified liquid substrates to be applied for organic yeast fermentation. The widespread conventional yeast production relies on bulk chemicals such as ammonia, urea or phosphoric acid to cover nutrition needs in fermentation. Such sources are not allowed for the production of organically certified products. Organically certified biomass feedstocks (e.g. sweet sorghum, alfalfa, clover) are used to extract a pure plant derived nutrition concentrate which will be chemically characterised. Consequently this nutrition cocktail will be used as additive in fermentation trials at lab scale to generate organic yeast (organic bakery yeast and feed yeast).

Main focus of the work is the selection of strains, the optimisation of the fermentation process and product quality. In addition, the solid residues from biomass extraction will be evaluated with regard to the application as organically certified animal feed. Alternatively, the utilisation of the solid residue will be assessed for the production of energy via anaerobic digestion (biogas). Based on the project results, it will be possible to evaluate the technical and economic feasibility of the entire bio refinery pathway and to describe the potential regional embedding of the technology. The results should generate potential market proposition for organically certified nutrition concentrates in the future.
This work is funded by the Austrian Ministry for Transport, Innovation and Technology (bmvit) within the project BioFer (FFG Project Nr. 853398).

Poster 2: High throughput screening of yeasts for high gravity fermentations

M. SCHMACHT, S. KÖHLER, M. SENZ

Research and Teaching Institute for Brewing in Berlin (VLB), Department Bioprocess Engineering and Applied Microbiology, Berlin, GER

The application of so-called high gravity fermentations is done for around 40 years now. Thereby, e.g. in the brewery, higher concentrations of sugars, i.e. 15 °P or higher, are used in order to achieve high ethanol values in the resulting product, which is then diluted to usual alcohol concentrations. As a consequence, the plant efficiency is increased, since lower amounts of water and energy as well as manpower are necessary. However, the higher osmotic pressure, caused by the higher sugar concentrations, as well as the resulting higher ethanol concentrations, may impair the performance and reusability of the applied yeast cells. Therefore, the choice of the right yeast strain for high gravity fermentations is crucial.
Screenings were performed at the VLB Berlin in order to characterize different yeast strains for their ability to stay stable at high gravity conditions. Thereby the microbioreactor system BioLector® Pro was used which allows controlled batch and fed-batch fermentations in 48- or 32-well plates, respectively, with on-line measurement of biomass, pH and pO_2 at the same time. This high throughput technique allowed the demonstration of differences between different yeast strains under high gravity conditions in a short period of time.

Poster 3: ***Application of Low Frequency Electrochemical Impedance Spectroscopy as Monitoring Tool for Yeast Growth in Brewing Processes***

SLOUKA, G. BRUNAUER, J. KOPP, M. STRAHAMMER, J. FRICKE, J. FLEIG, C. HERWIG

BOKU Wien, GER

Within this contribution, electrochemical impedance spectroscopy – EIS – is used to monitor the biomass produced in aerobic and anaerobic batch cultivation approaches, simulating propagation and fermentation unit operation of industrial brewing processes. Increase in the double layer capacitance (C_{DL}), determined at frequencies below 1 kHz, are proportional to the increase of biomass in the batch, monitored in online and inline mode. A good correlation of C_{DL} with cell density is found. In order to prove this novel method, different state-of-the-art biomass measurements (DCW and OD) are performed for comparison. Since measurements in this frequency range are largely determined by the double layer region between electrode and media, rather minor interferences with process parameters (aeration, stirring) are to be expected.
It is shown that impedance spectroscopy at low frequencies is not only a powerful tool for monitoring of viable yeast cell concentrations, but is also perfectly suited to determine physiological states of the cells and may facilitate process monitoring drastically.

Poster 4: ***RPP-project: → Influence of flour quality on dough gas retention***

[1]U. SCHMALE; [1]D. WEHMEYER, [2]J. SUTHOFF, [3]M. QUANTZ

[1]BlueSens gas sensor GmbH, GER
[2]Staatliche Fachschule für Lebensmitteltechnik Berlin, Fachrichtung Bäckereitechnik, GER
[3]VH Berlin, GER

Poster 5: ***Separation design***

H. HELGERS

GEA Westfalia Separator, GER

Poster 6: ***VH Standard Seminar & Training: Yeast „zulauf“ fed batch process and accredited yeast quality analysis methods***

M. QUANTZ, E. POLLMANN

VH Berlin, GER

01:00 p.m. Lunch break

Markets & Clients

02:00 p.m. Data Analytics in Process Industry – more than a technical discussion

B. MATHES

Head of PRAXISforums
DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V., Frankfurt/Main, GER

Big Data analytics has become more and more important to the process industries and reveals new market opportunities, as well as providing the potential to lead to process advantages and cost reductions within the production. No matter whether it is the chemical, pharmaceutical, biotech, steel, energy or other related industries: Enormous amounts of data are created every second and need to be analysed to improve processes further, enhance production, develop innovative products, optimise feedstock costs and procurement processes or predictive maintenance. The application areas in which data analytics can be used profitably are diverse and nowhere in the process industry near exhausted. Data analytics will become so important to the whole industry – and not only their marketing departments – that it could become the ultimate business tool of the future.
DECHEMA is organising the only Big Data event solely focusing on the needs of the Process Industry. Mr. Mathes will present results from this event and address aspects from transforming data not only into insights but actionable knowledge. Collecting data and identifying trends, patterns and anomalies is one thing, but how to build the right organisational framework for that and making data analytics an incremental part of its operations is sometimes even more complicated.

02:30 p.m. Manufacturing Optimal Yeast Inoculum for Ethanol Fermentation

P. KRASUCKI

FermAxiom LLC, Overland Park, KS, USA

Ethanol fermentation processes are functionally dependent on the biocatalytic activity of a living microorganism, *Saccharomyces cerevisiae*. In large scale ethanol manufacturing, the initial inoculum build up strategy is singularly dependent on commercially available yeast strains and relies on the use of the diluted grain medium. The inherent scale limitations dictating use of self-limiting batch propagation & fermentation platforms offers many process control challenges resulting in often unpredictable terminal ethanol performance. Review of the current industrial data and relevant publications indicates that in view of the specific attainable ethanol fermentation performance goals, the traditional yeast propagation processes contribute an unreasonable amount of uncertainty – frequently resulting in ethanol performance losses.
Critically, often unnecessary limitations imposed on the traditional yeast propagations lead to the very low volumetric productivity and final yeast biomass with less than optimal ethanol fermentation capacity. Yet, key solutions to these issues are easily derived through bioprocess miniaturization, fed-batch bioprocessing, mix culture and controlled medium formulation. To illustrate available bioprocessing options required for high density low volume yeast inoculum, a comparative analysis between batch and fed batch yeast biomass propagations systems in view of ethanol fermentation targets will be examined.
Importantly, the proposed strategy not only improves yeast biomass propagation but also provides unparalleled flexibility in a scale cost effective ethanol fermentation management. The combined modified yeast biomass propagation strategy results in what can be viewed in comparison, as manufacturing of optimal yeast inoculum for ethanol fermentation.

03:00 p.m. Coffee break

Quality

03:15 p.m. Protein hydrolysates from plant and animal byproducts for yeast cultivation

[1]T. GRIMM, [2]B. FRIKELL, [2]P. NEUBAUER

[1]ANiMOX GmbH, Berlin, GER

[2] TU Berlin, Bioverfahrenstechnik/Bioprocess Engineering, GER

The biotechnological production of yeast needs carbon and complex nitrogen sources that are responsible for a large part of the fermentation costs. New cost efficient alternative material sources and extraction processes must be detected and developed to produce these microorganisms. To fill this gap, protein hydrolysates from plant by-products (plant oil production) and animal by-products from the food industry were tested in the lab. The substitution experiments with these protein hydrolysates show results, which could be a promising solution.

03:45 p.m. Project scope → Spent brewer's yeast cell walls for spray coating functional ingredients

[1]M. QUANTZ, ([2]S. MITTERMAIER)

[1]VH Berlin, ([2]FhG IVV), GER

Food with functional ingredients, like omega 3 fatty acids, became more present in the markets.
The valuable ingredients need to be (micro-)encapsulated with coating protective materials.
The common materials, like gelatine hydrogels, gummi aribicum and else, show a distinct price increase due to limited availabilities and competition. Complex organic structure by-products from food or beverage, like spent beer yeast, can be considered to fill this gap due to their natural containment properties.

The objective of the joint collective project “funct. YCW” of the FhG Verfahrenstechnik & Verpackung (Process & Packaging, IVV), the TU Munich, Chair Cereal & Brewing science, as well as the VH Berlin, is to achieve versatile spent beer yeast cell wall (YCW) fragments for this purpose.

The work packages comprise cleaning, pre-conditioning and characterisation of the spent beer batches, a yeast cell auto-/plasmolysis and separation of the interior and the YCW. As an alternative or add-on process step, high pressure cell disruption will be excamined.
The obtained YCW fragments need to be analyzed and by-products need to be excluded from the process preparation for the coating specification.
Further work packages are to develop spray coating formulations for YCW use, either with or without (chemical) modification and test these with common functional ingredients e.g. colourants, vitamins, omega's for food and cosmetics application.
The scientific approach comprises the global characterisation, the detail characterisation of the MW and molecular, physical/chemical structure of the YCW fragments and the necessary chemical modifications to achieve stable YCW coated capsules. The project started end of 2016 will be conducted until October 2018.

04:00 p.m. End of Monday lecture sessions

05:00 p.m. - 07:00 p.m. Group visits of three sites in the Adlershof complex (each group): Jet stream test hall, tower and VH Berlin Labs

07:10 p.m. Shuttle transfer to Schlosscafé Köpenick, Germany

07:30 p.m. Conference dinner and convivial evening (until 11 p.m.)

Tuesday, April 25th 2017

Applied science

9:00 a.m. The yeast *S. cerevisiae* as a production platform for short chain fatty acids, alcohols and alkanes

E. Boles, M. Fischer, M. Grininger

Goethe-Universität Frankfurt, GER

Yeasts obtained from conventional breeding of wild type strains are extensively applied in the food and drink industry for centuries. Nowadays, the powerful tools of recombinant DNA technology and specific mutagenesis turn yeasts into producers of dedicated proteins and chemicals. This is already commercially used in the multi-billion dollar industry of biopharmaceuticals and has a growing impact in the so-called *White Biotechnology* for the production of high value commodity chemicals.
Here we present the metabolic engineering of *S. cerevisiae* via rational mutagenesis of a dedicated enzyme to specifically produce short chain fatty acids with a length of six and/or eight carbon atoms. Fatty acids are considered as strategically important platform compounds and can suit as precursors for further processing into biofuels. Since mainly the chain length of hydrocarbons determines their physico-chemical properties with regard to combustion processes in engines, this is an important parameter, which we now can control with our system in the range of petrol fuel. Beside the long lasting usage of bioethanol or biodiesel from microbial fermentation or plant oil processing, this can give access to new *drop-in* biofuels without the need of engine or infrastructure adaption due to high homology to existing fuels.

09:30 a.m. e:Bio project „Yeast Scent“ - Investigation of the Crabtree effect using off-gas analysis

[1]C. Halbfeld, [2]A.-K. Sippel, [3]E. Pollmann, [1]B. E. Ebert, [3]M. Quantz, [4]J. Zierow, [2]J. I. Baumbach, [1]L. M. Blank
[1]iAMB - Institute of Applied Microbiology, RWTH Aachen University, Aachen, GER
[2]Department Applied Chemistry, Reutlingen University, Reutlingen, GER
[3]Versuchsanstalt der Hefeindustrie e.V., Berlin, GER
[4]B&S Analytik, BioMedicalCenter, Dortmund, GER

The Crabtree effect describes aerobic ethanol formation under glucose excess conditions. In Baker's yeast production, this phenomenon must be strictly avoided as ethanol formation reduces product yield and quality. Currently, this is achieved by controlling the molasses feed based on ethanol measurements in the fermentation broth.
An ion mobility spectrometer (IMS) coupled to a multi capillary column (MCC) might be an alternative analytical technique for near real-time detection of ethanol in yeast fermentations. The system can measure noninvasively, online and directly out of the fermentation off-gas. Since the system is extremely sensitive to ethanol (detection limit < 0.1% in aqueous solution) and has a high measurement frequency (in the lower minute range), it has the potential to detect the onset of the Crabtree effect much earlier than other detectors.
Here, we show, the results of MCC-IMS measurements of the off-gas of 20 L pilot scale fermentations. We ran fed-batch fermentations with an industrial and a lab *S. cerevisiae* strain in molasses- as well as in minimal medium and monitored the response to overfeeding. Importantly, MCC-IMS detected ethanol formation considerably earlier because of its low sensitivity.
The ability to detect ethanol prior to other sensors might allow a more robust regulation of the feed and to keep ethanol production at a minimum thereby avoiding wasted fermentations.

10:00 a.m. e:Bio project „Yeast Scent" Modelling and Control of the aerobic Growth of *Saccharomyces cerevisiae*

[1]S. Wegerhoff, [1]S. Engell, [2]E. Pollmann

[1]TU-Dortmund, GER
[2] VH Berlin, GER

Saccharomyces cerevisiae is a species of yeast, as a eukaryotic microorganism belonging to the fungus kingdom. *S. cerevisiae* has a facultative aerobic metabolism and is usually known as Baker's yeast or Brewer's yeast according to its traditional application for baking, winemaking and brewing. Other applications of *S. cerevisiae* are the production of recombinant proteins or the production of bioethanol and it is an important model organism in biological research. This high variety of application ranges leads to an increasing demand of yeast cells with an annual production of 900,000 tons in Europe of which 600,000 are consumed in the European Union (source: www.lesaffre.com). The yeast cells are produced in a series of fed batch reactors which are fed with oxygen and molasses that contain glucose as the main carbon source. One problem during the cultivation process is that the cell culture can switch to the undesired production of ethanol, although the process is aerobic, which is known as the Crabtree effect or Glucose effect. The Crabtree effect is influenced by high glucose concentrations in the reactor and leads to decreased yield of biomass. Also when the ethanol concentration is at the end of the process greater than a tolerable range then the batch cannot be sold.
For increasing the yield of biomass, while avoiding the switch to ethanol production by the cells, a suitable control strategy has to be developed. This work presents a novel method where a model predictive controller is used to control the production process of yeast cells. Therefore a dynamic model has to be developed which must be able to predict the switch to ethanol production and to describe the growth of the cell culture so that the operating policies can be optimized. The model in this work follows a novel approach that uses a reduced dynamic metabolic model, which is derived from a biochemical stoichiometric network, where the transition to ethanol production is realized by taking ATP as a key regulator. The dynamic model was fitted to different experimental data and has shown in each case a good fit.
To use the model in a model predictive control, the model has to be extended by a state estimator because ethanol is the only concentration which is measured. The concentrations of biomass and glucose are unknown but needed for the control. The state estimator uses the current measurements of ethanol to calculate the rates and to correct the concentrations which are predicted by the model. The model predictive control was then tested in simulations and it has shown that with ethanol as the only known concentration which is measured the other concentrations can be estimated and that this approach is suitable to control the process.

10:30 a.m. Coffee break

Production

11:00 a.m. Establishment of a sterilization regime for sugarcane molasses used in baker's yeast production

[1]S. Salem, [2]Y. A. Heikal, [1]M. M. Naguib, [3]H. H. El-Sheikh

[1]Food Toxins and Contaminants Dept. National Research Center, EGY
[2]Food Science Dept., Faculty of Agriculture, Ain Shams University, EGY
[3]Botany and Microbiology Dept. Fac. of Science, Al-Azhar University, EGY

Geobacillus stearothermophilus is a major contaminant of sugarcane molasses which withstand the traditional primary heat treatment of crude molasses and compete with baker's yeast in sugar fermentation. Present work aims to study the thermal death kinetic of *G. stearothermophilus* and to establish a heat treatment regime for the molasses used in baker's yeast production. Thermal inactivation studies were carried out on spores of *G. stearothermophilus* strain- isolated from Egyptian sugarcane molasses, and populated on TSB as well as diluted molasses (10º Brix) adjusted to pH 4.7. Thermal death kinetics were calculated using TDT-tubes at temperatures ranging from 90ºC to 130ºC. The thermal death experiments were done after one hour from primary preheating the spore suspensions at 80ºC for 10 min. This eliminate the vegetative cells and induce heat shock for the spores. Survival curves of spores are linear following first- order kinetic pattern for spore heated at temperatures > 115 ºC. Obtained decimal reduction time (D-values) were 23.71; 8.07; 4.68; 0.834; 0.473 and 0.174 min for spore suspensions heated in molasses media at 100, 110, 115, 120, 125 and 130ºC, respectively. Spore suspensions heated in TSB media showed higher D-values. The temperature range (Z- value) required to reduce the D-value by 1/10 was in the range of 14.05 ºC. The obtained D- and Z- values were used to establish a continuous sterilization regime for molasses to achieve a reduction of *G. stearothermophilus* spores of 7 logarithmic cycles to insure molasses sterility. The proposed sterilization system is based on steam injection, holding a molasses in a sterilization tube for the necessary time and flashing to reduce the molasses temperature. Calculated sterilization time was 73.08, 32.11 and 14.11 sec for sterilization temperatures 130, 135 and 140ºC, respectively. The corresponding length of necessary holding tube was 89.16; 39.17 and 17.21 m, respectively. The pump power required to force the flow of molasses through sterilization system was in the range of 1.37 to 1.7 HP and the steam pressure needed for sterilization was 4 to 5 bar. The steam requirement is of 1 kg steam for each 10 kg molasses.

11:30 a.m. Cooling with waste heat

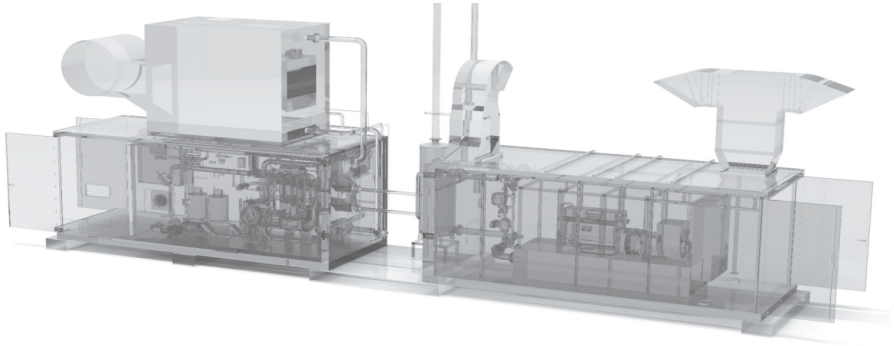
G. HEIN

AGO AG Energie + Anlagen, GER

AGO AG Energie + Anlagen in Kulmbach, Bavaria is a plant engineering company with various competencies, including combined cooling, heat and power plants (CCHP), biomass plants, steam and hot water boiler systems, and industrial cooling plants. The company specializes in engineering, planning and building of co-generation and tri-generation plants for food processing industries like: Dairies, Meat Processing Companies, Food and Juice Processing, Breweries and Cold Storage.

Economic conditions for industrial and agricultural cooling have changed considerably over the years. Electricity tariffs are rising constantly, and with heat being available from combined heat and power generation, absorption chillers that use heat instead of electricity are becoming more economically favorable.

To reduce the operating costs and at the same time improve the environmental footprint of its customers, AGO has developed an absorption chiller for temperatures below 0°C. The product **ago Congelo®** is an ammonia / water (NH3 / H2O) absorption chiller that enables cooling outlet temperatures as low as -30°C. Waste heat, which accumulates during industrial processes or through electricity generation by means of a gas motor or gas turbine, is needed to operate the absorption process. Compared to reciprocating compression chillers, the electricity demand for this system is only marginal.



All in one – Containerized Gas Motor and Absorption chiller combination

Process solutions

12:00 p.m. Drying of Baker's yeast pellets : experimental characterization and modelling

L. SPREUTELS, CO-AUTHORS: R. LEGROS, C. VAN ENGLAND, B. HAUT

Polytechnique Montreal, Quebec, CAN

The design and optimisation of a Baker's yeast drying process rely on achieving a balance between energy efficiency, drying duration and product quality, and should therefore be based on a good understanding and modeling of the drying

process. The relationship between mass and energy transport phenomena occurring at different scales during the drying (e.g: pellet, drier), and the evolution of the moisture content and of the quality of the Baker's yeast are complex to characterize and to model.
This presentation provides a description of a new phenomenological model of the drying of a Baker's yeast rod-shaped pellet based on the experimental results obtained with an original set using a precision balance, a microscope and an infrared camera. The model predicts the time evolution of the pellets moisture content, dimensions and surface temperature, as well as the evolution of the fermentative activity (gassing power) of the Baker's yeast during drying as a function of its moisture content for a set of operating conditions (air temperature, air velocity and initial pellet diameter). An application of the model to the design and optimisation of different types of drier (fluidised bed and spouted bed) is also presented and discussed.

12:30 p.m. Lunch break

01:30 p.m. Anaerobic wastewater treatment from yeast production for COD and nitrogen removal – concepts and carbon footprint

N. Trautmann

Netra Consult UG, GER

Waste water produced by the yeast industry is characterized by high COD and nitrogen concentration, besides other contents, e.g. sulfate and betain. Anaerobic technologies for the treatment of those waste waters enable a path for energy recovery from the COD-fractions. In combination with innovative nitrogen removal processes (e.g. Anammox), an overall concept for energy efficient treatment is presented. The efficiency of the treatment processes is influenced by the waste water-matrix. Difficulties can derive from an incorrect COD-balance, as betain from beet-molasses is not detected with standard COD-determination procedures. As betain is fully anaerobically degradable to methane, it influences directly the load of the organic pollution. An alternative thermal determination-process was tested with wastewater from beet-molasses based yeast-production and can be applied to get real COD-values. Different concepts for the treatment of yeast-production wastewater (aerobic, anaerobic + anammox, vaporization + anaerobic) are compared by their energy balance and their carbon footprint. The primary-energy-balance revealed, that with the combination of anaerobic processes and an post-treatment by anammox, up to 42 [kWh/m³] primary-energy per meter-cubic wastewater can be generated.

02:00 p.m. CIP Validation: take cleaning-processes under control!

C. Browatzki, K. Zinaoui

Dr. Weigert, GER

Whether in the pharmaceutical and cosmetics industry, the dairy industry or the beverage and food industries – without a safe cleaning and disinfection of the production paths, high quality and durability can not be achieved, neither canas compliance with regulatory requirements and legal provisions. *Chemische Fabrik Dr. Weigert* offers a broad range of cleaning and disinfection agents, but sees itself as a provider for complete system solutions, for the realization of customized cleaning concepts, to provide the necessary safety in the production of hygienically safe products.

Cleaning containers, manufacturing plants and pipelines is normally realized with CIP-systems (Cleaning in Place) by means of automated cleaning programs. It is a fact that insufficient results of cleaning and disinfection can provoke contamination (residues, microbiological contamination, chemical residues, unsolves scale, etc.) in the products produced. These process steps can be optimized in most of the cases. In the last years, the optimization was focused to save energy, time, water etc.
To ensure a high product quality, the optimized cleaning process should always lead to repeatable results. A validation of the process of cleaning and disinfection should verify this and ensures the responsible manufacture to put safe products on the market.
Why and how to organize such a cleaning validation, and how to operate in a validation procedure is part of the presentation.

02:30 p. m. Feedback and final remarks

03:00 p. m. End of the conference