

# 2009 Annual Meeting Abstracts

## MONDAY

### AFTERNOON

#### S&D 2.1 / EXH 1: Supplier Session

Chair(s): H. Plaumann, BASF Corporation, USA; and M. Robbins, Clorox Co., USA

#### **Replacing Phosphate in ADW Formulations.** J. Jefferis, K. Zack, BASF, USA

Phosphate will be removed from consumer ADW formulations by 2010. Experimental Design studies provide systematic cause and effects and are enabling formulators to determine the best approaches to close the performance gap between phosphate and non-phosphate containing products.

#### **Next Generation Oleochemical and Surfactant Technologies.** M. Shea, A. Catalano, Chemithon Corporation, Seattle, WA, USA

Chemithon Corporation has established new capabilities to provide value added processes to existing biodiesel facilities, such as distillation, hydrogenation, and ethoxylation, in addition to sulfonation processes. The presentation briefly describes each new process capability and introduces our new global operation based in Singapore - Chemithon International Pte. Ltd.

#### **The Battelle World Detergent Program.** F. Pala, Battelle Memorial Institute, USA

For more than 20 years, the Battelle World Detergent Program (BWDP) has provided accurate, quick, and cost-effective compositional analysis of detergent products found throughout the world. The BWDP is a multi-client study that shares the cost of analysis among all program subscribers. An overview of the BWDP, including the analytical capabilities for determining detergent composition and the program database supplied to the clients, will be presented.

#### **Technological Forecasting Helps Us Make Better Decisions!.** Jesse Jefferis, Shafeek Razac, Marie Fraties-Block, Heinz Plaumann, BASF Corporation, Wyandotte, MI 48192, USA

We are often involved in forecasting and trend analysis, planning our business growth (or more lately, how things might decline!). This includes such elements as market growth, planning for capital investments, acquisitions and divestitures, examining probabilities for our profitability and Return on Investment. Many times Technological Forecasting is neglected in this analysis. Such forecasting may be based strongly on life cycle analysis: When will our current product offering become obsolete? When is the correct time to undertake an R&D project and bring something new to market? Strategically, do we want to be first to market to "fast-followers"? In this paper, we present a simple approach allowing us to answer some of these questions. The Fisher-Pry model for forecasting has proven useful to us in a number of areas. A simple explanation of the model, with examples of general interest, are given (growth of home computers and internet access in USA). More pointed examples for the chemical industry are also discussed with a few directly relevant to the Consumer D&C market. The model is fairly simple to use, especially in its linearized form, and gives us information about the rate at which a new product or technology is replacing the old, as well as an estimate time for "half replacement", when the new has successfully replaced half of the old. Problems and limitations of the model are also given. Happy forecasting!

## TUESDAY

### MORNING

#### EXH 2: Exhibitor Showcase Session

Chair(s): J. Dau, TMC Industries Inc., USA

**Evaluation of a Handheld Biodiesel Analyzer for Field Testing of Biodiesel Quality and Blend Per Cent. V.**  
Gordon, D. Hirthe, K. Capizzi, K. Nelson, Paradigm Sensors, USA

An evaluation of a new biodiesel analyzer for field testing of biodiesel quality and blend percent was conducted at 10 sites including biodiesel plants, blenders and distributors, fleet terminals and end-user locations. This analyzer, the i-SPEC analyzer, was evaluated for ease of use, ruggedness, accuracy compared to traditional testing methods and repeatability on a set of selected samples. It was found anyone in the plant and in the field could use the Analyzer with brief demonstrations or discussion. The analyzer tests simultaneously the blend percent using impedance spectroscopy and original total glycerin in B100 used in blends and demonstrated blend per cent results within 1-2% for B6-B99. B100 total glycerin was determined within 0.07% of the GC method. The determination of methanol as pass/fail agreed with IR methods and acid number also determined on a pass/fail was correct for most B100 samples. Though no single testing method will satisfy all the biodiesel testing needs, the i-SPEC Q-100 demonstrated increased quantitative capabilities and accuracy for field testing while providing the advantages of ease of use, ruggedness and portability for plant and field testing.

**Kosher: The Market, The Certification Process And Its Relationship To The Oils and Fats Industry.** S. Sichel, STAR-K Kosher Certification, Baltimore, MD USA

OUTLINE:- What is Kosher? (Does the Rabbi really come and bless our plant?)- My product is oil. Why is it not inherently kosher?- Kosher Terminology- Advantages of kosher: Who buys kosher products?- How do I know if a product is kosher?- How do I choose a kosher certification agency?- The kosher certification process - Now that we are kosher certified, how do we stay in compliance?- Questions and Answers

**Breeder/Small Sample Analysis Using a Commercially Available Near-infrared Spectrometer.** W Shadow<sup>2</sup>, D Honigs<sup>1</sup>, A Hedberg<sup>3</sup>, S Tordenmalm<sup>3</sup>, <sup>1</sup>Perten Instruments, Springfield, IL USA, <sup>2</sup>Perten Instruments, Salt Lake City, UT USA, <sup>3</sup>Perten Instruments, Stockholm, Sweden

Seed breeders and growers often have a need to measure small sample amounts rapidly and non-destructively. The results of these tests allow for more rapid selection of promising genetic lines. The non-destructive nature of the analysis allows the actual seeds to be planted. A new, patented sampling device facilitating such analysis will be presented. The device provides analysis capabilities for breeder size samples with a commercially available diode array based near-infrared spectrometer with results available in six seconds. The analyses includes constituents such as moisture, protein, oil, and fatty acids. The presentation includes a description of the device and its operating principle. Comparison of spectra from small samples to bulk samples for soybeans (including single beans) and canola will be displayed. The spectra are then predicted using calibrations based upon bulk sample measurements and the results discussed.

**Overcome Common IR Challenges in Quality Control with QTA.** Kangming Ma, Cognis Corporation/QTA, USA

QTA<sup>®</sup> (Quality Trait Analysis) is a turnkey solution for rapid on-site quality and process analysis & data management using Cognis patented technology. We combine highly advanced FT Infrared instrumentation with quick and easy instructions enabling anyone to perform many analyses on a single sample within 2 minutes with no sample preparation and overcome the common challenges in IR implementation. When customers contract with Cognis Corporation, the QTA<sup>®</sup> system is placed at their facility, where they analyze oilseeds, and any of their downstream products, like meal, crude and refined oils, biodiesel and crude glycerin. The instrument communicates over the internet with the QTA<sup>®</sup> system's central processor, where the analysis process and calibrations are continuously managed. The central processor calculates the results, returns them to the user, and stores the data for future retrieval.

**Rapid Automated Extraction of Lipids from Foodstuffs Using Accelerated Solvent Extraction.** R. Carlson, E.S. Francis, S.E. Henderson, B.J. Murphy, B. Dorich, B.E. Richter, Dionex Corporation, Salt Lake City, UT, USA

Accelerated Solvent Extraction (ASE®) is a robust, automated, and efficient instrument for extracting solid and semi-solid samples. ASE extract yields are typically similar or better than Soxhlet or Mojonnier techniques and complete in less than 30 minutes. ASE is routinely used by many government agencies, regulated industries, and contract laboratories and is approved as Pressurized Fluid Extraction in U.S. EPA Method 3545A. ASE is used to characterize standard reference materials, product formulations and is rugged enough to survive pilot and production plant environments. Recent advances in ASE instrumentation allow automated extraction of acid hydrolyzed samples thereby replacing the time consuming Mojonnier process. In addition, ASE has been successfully applied to the extraction of lipids in snack foods and chocolate, oil in various oilseeds, isoflavones from soybeans, and vitamin E homologues from plants, seeds, and nuts. Using ASE, lipid values in snack foods, meat, dairy products and other foodstuffs can be determined rapidly and reproducibly. This paper will explain the details of ASE extraction and present data from a variety of oily samples.

**CSK Glycerine Distillation Technology for Production of Absolutely Odourless Glycerine - Pharmaceutical Grade (USP).** Bernd Emersleben , CIMBRIA SKET GmbH, Magdeburg, Germany

As a second final product during the biodiesel production, glycerine is achieved as well. CIMBRIA SKET presents their own process for the distillation of crude glycerine out of biodiesel plants, with which completely odourless, distilled glycerine is produced. Further advantages of this process are the only very low losses of glycerine and that only a small quantity of activated carbon is needed to bleach the glycerine. Therefore, distinctively better waste water figures can be achieved.

**Rolls - The Main Tool for Food Processing Made from Tailor Made Materials.** M. Grosskreutz<sup>1,2</sup>, <sup>1</sup>Siwaco, Netphen, NRW, Germany, <sup>2</sup>Walzen Irl, Netphen, NRW, Germany

As in many other different production processes rolls are one of the key tools as well for producing or converting food products. The IRLE group has gained experience from producing rolls for plastic, rubber, paper, steel and food industry for many years. This experience enables us to provide you with tailor made materials for all your food producing applications. IRLE Rolls are manufactured and used for the processing of oil seeds and many grain sorts for example: soya beans, rape-oil seeds, sun flower seeds, cocoa beans, sweet-corn, wheat and oats. This paper will introduce our patented material variety to you. Do the names OCG, OCC, OCE, OCR or ORT mean anything to you? Advantages of each of the materials for different applications will be presented in this paper. Depending upon the mechanical demands, we can manufacture rolls as single- or compound rolls with nodular iron - (S) or grey cast iron core (G), statically or centrifugally cast. According to the application the rolls are equipped with shrink fit or bolted on journals. For the flaking of grains, we offer temperature controlled rolls in various construction designs. We also have expanded our production capacity by installing a new foundry which this paper will introduce to you as well.

## WEDNESDAY

### MORNING

**PRO 4 / EXH 3: Processing Exhibitor Session**

Chair(s): T. Neuman, Westfalia Separator Inc., USA; and J. Mulholland, N. Hunt Moore & Associates, USA

**Using Centrifugal Force and High Vacuum to Distill Heat Sensitive Materials.** D. Casilio, R. Kromer, Myers Vacuum, Kitanning, PA, USA

A high vacuum centrifugal still is a physical process that has been designed to optimize separation of heat sensitive, high molecular weight material. This paper will detail the features of applying a very thin, continuously moving film on a heated rotor under high vacuum. The residence time is measured in tenths of seconds. This allows the user to make very fine cuts with the least amount of decomposition from heat. This short path still has the advantage of a condenser equal in size to the heated surface. A comparison to wiped and falling film principles will be shown and some applications will be presented.

**Controlling Process through Color Change.** T. Schwalbach, Optek Inc., Germantown, WI, USA

In line process control can be precisely done by monitoring the real-time changes of color intensity during the process. In measuring Chlorophyll to 300ppb, the Optek sensor will use the AOCS scale for Chlorophyll to measure low level green in oil. To measure the amount of clay residue in edible oils after the bleaching process, the Optek sensor will use the AOCS scale for red to monitor the success or identify interruption of the filtration process. The Optek process control concept is based on the Lambert-Beer's law of light absorption. The powerpoint presentation will address how in-line process control using light absorption will provide precision and repeatability.

**Purification of Glycerin from Biodiesel Plants.** P. Alasti, Artisan Industries Inc., Waltham, MA, USA

With the expected growth of biodiesel in the United States, as emphasized by Barak Obama during his Presidential campaign, we can expect a glut of crude glycerin in the coming years, as more biodiesel plants come on stream. Refining the glycerin to various purities will be instrumental in insuring profitability regardless of feedstock and energy costs. We will present Artisan's refining process and compare it with two alternate processes currently available in the market.

**Purifine<sup>®</sup> PLC: Industrial Application in Degumming and Refining.** Tim Hitchman, Verenum Corporation, San Diego, CA, USA

Purifine<sup>®</sup> PLC is a unique enzyme product for application in the degumming step of edible and industrial oils processing. Use of Purifine<sup>®</sup> PLC results in increased oil yield, enhanced processing efficiency and other benefits. The product works by breaking down phospholipid impurities that are normally removed in the heavy phase during degumming. As a result neutral oil normally entrained in the gum is released and available for recovery. Furthermore, Purifine<sup>®</sup> PLC is unique in that it converts the phospholipid impurities into diacylglycerol (DAG), which is equivalent to neutral oil and provides additional oil yield. In total, neutral oil + DAG benefits are proportional to the phosphorus content of the oil, reaching 2% yield gains in the case of crude soybean oil with 1000 ppm phosphorus. Industrial scale implementation requires a minimal modification of most existing plant layouts. Use of the Purifine<sup>®</sup> PLC product results in a low phosphorus degummed oil that is easily refined for edible or biodiesel end uses.

**Waste Water Evaporation and Recycling in Fats and Oils Processing.** Sorin Dinu<sup>1</sup>, William Younggreen<sup>1</sup>, John Piazza<sup>2</sup>, <sup>1</sup>Alfa Laval Copenhagen A/S, Soborg, Denmark, <sup>2</sup>Alfa Laval Inc., Richmond, Virginia, USA

This paper discusses the minimization of water consumption in fats and oils processing by use of evaporation systems. Multiple-effect evaporation systems allow for concentration of contaminants in waste water streams such as the heavy phase from the wash stage centrifuge in a neutralization line or the effluent from vacuum systems. The water recovered from this concentration is clean enough to be reused in the process. System setup as well as process economics are presented.

**Increased Efficiency for Grains and Oilseeds Drying.** Farah Salaria, Solex Thermal Science, Calgary, AB, Canada

The drying of oilseeds extends the harvest season and prevents spoilage thus reducing field losses. Oilseeds have different limits on temperatures that they can be heated up to and varying ideal moisture content for storage. The drying process is governed by typical factors like ambient conditions outside, relative humidity, temperature, grain texture, sensitivity to heat, moisture content and toughness of the kernel, etc. Conventional methods involve high volume of hot air which is blown through the bed of oilseeds/grains. Use of hot air as the heating media as well as for moisture removal limits the efficiency of this technique. Large volumes of air must be heated for heat transfer and as the air picks up moisture from the oilseeds the temperature of air drops and the air reaches saturation. Much of this energy is lost up the stack. Distribution of air through grain beds and silos is often not ideal leading to non-uniform drying. Use of indirect heat through hot water or steam, in many cases obtained from a waste heat source, can radically reduce the volume of air, consumption of energy and emissions. This is achieved through plate heat exchanger designed for cross air flow for removal of moisture. The indirect heating reduces demand for a large volume of hot air

and keeps the air temperature constantly high which enables the air to carry increased amounts of moisture before reaching saturation.

**HF Screw Press Evolution: Bigger and Better.** Harald C. Boeck, Harburg-Freudenberger Maschinenbau GmbH, Hamburg, Germany

**Latest Developments in Ice Condensing in Oil Refining: An Economical and Environmental Must.** Marc Kellens, Desmet Ballestra, Belgium

The ice condensing technology has been introduced in the edible oil refining industry since the early 90's. Its initial purpose was to reduce the environmental impact of a refinery. Despite a proven reliability and good industrial track record, the technology today is still being mainly considered for those cases where local permits or environmental restrictions discourage the use of classical barometric vacuum systems. The economical savings were often found not enough to value the higher investment cost, as the capital return was in the range of 4 to 6 years. New technological developments and higher energy prices have made the ice condensing technology more efficient and hence more competitive on both capital as well as operational cost. Capital investment return is now less than 2 years. Ice condensing systems maintain low pressures, typically below 2 mbar, in deodorisation processes by the condensation and freezing of sparge steam from the deodorisation process on internally cooled tubes. These units substantially reduce steam consumption (both motive and sparge steam) as compared to classical vacuum systems. The Sublimax dry ice condensing vacuum system has been further developed and improved over the years, with a minimum refrigerant content and even lower energy consumption, using more energy efficient chillers. The current vertical ice condensing technology reduces pressure drops to a minimum, allowing an operating pressure in the deodoriser vessel even below 1 mbar. This opens new perspectives for the mild refining of heat sensitive oils like for example fish oil and even cocoa butter. Examples of some technological innovations and resulting applications, are given to demonstrate the potential of the new generation vacuum ice condensing.

**Pretreatment for Biodiesel.** T. Neuman, Westfalia Separator Inc., USA.