

2010 Annual Meeting Abstracts

Exhibitor Showcase

MONDAY

N/A

TUESDAY

MORNING

EXH 1: Exhibitor Showcase

Chair(s): B.S. Cooke, The Dallas Group, USA

Cold Water Enzyme Performance. J.C. Naab, Genencor, Rochester, NY, USA

Detergent consumers are faced with the dilemma of two conflicting desires. There is the first desire for things to be clean. We want our clothes to be spotless and our dishes to sparkle. However, there's also a growing consumer desire to be a little kinder and gentler to our environment. The phrase, "Reduce, Reuse, Recycle," has become everyday language. The key element of the "Reduce" portion of this mantra is reducing energy consumption. The means by which detergent consumers have the most control in reducing energy consumption is to elect to wash at lower temperatures. Historically, washing at lower temperatures has resulted in reduced cleaning, creating a conflict with desire number one. Significant efforts from all spectrums of the cleaning industry including machine manufacturers, detergent formulators and ingredient suppliers have been made to enable consumers to make choices without compromising desire number one, cleanliness, OR desire number two, reduced energy use. This talk will focus on how new detergent enzymes allow for consumers to wash at lower temperatures without compromising the stain removal benefits that enzymes deliver to detergent wash performance. Enzyme products specifically designed for lower temperatures and shorter washes play a critical role in the Green Detergency movement.

CARS Microscopy: A New Chemical Way for Lipid Imaging in Food Samples. Vanessa Lurquin, Leica Microsystems CMS GmbH, Mannheim, Germany

Confocal and multiphoton microscopies are powerful fluorescence techniques for morphological and dynamic studies of labeled molecules / cell structures, but hardly applicable in food industry without modifying the product properties. Until today no powerful imaging method for non-fluorescent cell components was available in the market. The new Leica TCS CARS overcomes this restriction. CARS (Coherent Anti-Stokes Raman Scattering) microscopy is based on the intrinsic vibrational properties of molecules and can be used for imaging various elements of cells such as lipids, proteins, water, carbohydrates, etc. In the TCS CARS, two picosecond near-infrared lasers are tightly overlapped spatially and temporally and sent directly into the confocal system. By combining this new CARS technology with the TCS SP5 II, Leica Microsystems provides several outstanding features: the fully integrated CARS technology itself, a conventional scanner for maximum resolution in food imaging and a resonant scanner for high time resolution (29 fps in 512x512) for following dynamic processes, e.g. food processing or food metabolism. In summary, CARS microscopy combined with the tandem scanner makes the Leica TCS SP5 II a powerful tool for three-dimensional imaging of chemical and food samples at sub-cellular level. We will show results from recent studies with the Leica TCS CARS instrument to illustrate the potential of CARS microscopy in food industry.

Novel Rinse Aid Surfactants for the Modern ADW Market. R. Ettl, J. Jefferis, BASF, Wyandotte, MI, USA

Rinse aid performance is anticipated to become increasingly important in the modern ADW market. The modern ADW market brings new challenges such as post phosphate-ADW detergents, lower wash temperatures, and shorter cycle times. The topic will cover the role of rinse aid surfactants, the physical properties of novel rinse aid surfactants as well performance in ADW applications.

Rapid, Multi-Component Analysis of Soybeans by FT-NIR. C. Heil¹, Y. Fintschenko², ¹Thermo Fisher Scientific,

Madison, WI, USA, ²Thermo Fisher Scientific, San Jose, CA, USA

Analysis of oilseeds by near infrared spectroscopy has greatly improved the speed of analysis and sample throughput for oilseed quality testing. Companies that store or process oilseeds can use near infrared to replace much more time consuming and complex laboratory test methods that often involve significant sample preparation and hazardous chemicals. Near Infrared can not only determine the quality of soybeans at the receiving location or the quality of the final products but can also be used for in-process analysis at key production control points for components of interest. This presentation will show how the Antaris FT-NIR from Thermo Fisher Scientific is the ideal instrument for rapid, multi-component analysis of soybeans. The importance of using a sample cup spinner accessory on the Antaris allowing for analysis of whole soybeans over a large sample area will be discussed. Calibration models developed on whole soybeans will show how a rapid, non-destructive technology can accurately predict important components in soybeans. Key attributes of the Antaris FT-NIR will be discussed showing its fit for use and simplicity to operate in oilseed processing facilities.

Low Field NMR Methods for Measuring Oil Content for the Biofuel and Food Industries. Alexander Sagidullin¹, Kevin Nott¹, Debadeep Bhattacharya², ¹Oxford Instruments Magnetic Resonance, Tubney Woods, Abingdon, Oxfordshire, OX13 5QX, UK, ²Oxford Instruments Magnetic Resonance, 300 Baker Avenue, Suite# 150, Concord, MA 01742, USA

Low field NMR is a technique widely used for the determination of oil in a variety of materials including seeds, snack foods, and textiles. In this study, low field NMR methods were developed and applied to algae and large seed/nut products relevant to the petroleum and food industries. Both algae and Jatropha seeds have been suggested as possible sources of oil for biofuel as they do not use land suitable for food crops. In addition to the bulk analysis of Jatropha, it is important also to measure single seeds in order to optimise further propagation. Existing extraction methods require at least three seeds for analysis whereas NMR can measure seeds individually using a 100% oil calibration without oven drying. Results agreed with those obtained using the Weibull-Stoldt method for total oil determination. Oil content of peanuts was also measured at different stages of processing using a 100% oil calibration. The effect of sample homogeneity was tested by carrying out the measurements with whole and separate kernels as well as different sample sizes. Low field NMR is an appropriate analytical method for rapid measurements of oil content in algae, Jatropha seeds and peanuts either for research (to increase yield) or during processing. In addition, it can be successfully applied to analysis of various sample sizes ranging from one seed with mass of a few hundred milligrams up to samples with mass of one hundred grams.

Lipid Profiling of Mono-, Di-, and Tri-acyl Glycerols by HPLC. L.L. Lopez, D.C. Hurum, B.M. De Borba, J.S. Rohrer, Dionex Corporation, Sunnyvale, CA, USA

Chemical analysis and profiling of lipids in biomass feed stocks, including microalgae, are important steps in the production of biodiesel. Determination of carbon chain length and the degree of saturation is critical to ensuring high quality biodiesel that delivers optimum performance during engine combustion. Lipid profiling is commonly done by GC, however this methodology has several limitations. The high temperatures associated with GC can cause pyrolysis and thermal degradation of certain lipids, interfering with the summative mass closure calculations that are typically done to determine the total composition of microalgal biomass. New methods based on HPLC at ambient temperatures are emerging as the preferred method for biomass lipid profiling. In this presentation we demonstrate the analysis of Mono-, Di-, and Tri-acyl Glycerols in Biodiesel Fuels by HPLC with charged aerosol detection (CAD).

The Battelle World Detergent Program. Franco Pala, Battelle, USA

The Battelle World Detergent Program (BWDP) provides accurate, quick, and cost-effective compositional analysis of detergents commercialized throughout the world. The BWDP is a multi-client study that shares the cost of analysis among all program subscribers providing market intelligence with cost saving. BWDP's analytical capabilities for determining detergent composition will be presented focusing on the application of LC-MS/MS methodologies for the characterization of anionic, non-ionic, amphoteric and cationic surfactants.

Automatic Bulk Filling and Packaging of Semi Liquids. Frans Mortier, Pattyn Packing Lines, Brugge, Belgium

Compact Cold Press Oil Expelling Systems. A.C. Reinholz, Scott Tech USA. A Division of PBT Distributors, Inc., USA

In a world of increasing concerns for the environment and the responsible use of natural resources, vegetable oil has increased its importance in fields such as energy, cosmetics, pharmaceutical and industrial applications, etc. In fact, vegetable oil extraction has considerably increased in areas where in the past it was not recognized for its merits. One major example would be the Amazon, where the diversity of plant life is the largest available and vegetable oil extraction has been defined as one of the major reasons for the conservation of the forests due to the need to harvest from living plants. The equipment involved must be capable of processing an array of seeds and nuts in order to suit the many applications necessary. Scott Tech is proud to be a part of this conservation effort with our green technology and capabilities. Our 15 years of experience in engineering and manufacturing equipment has allowed us to develop the only system that can process (which has been proven) more than 65 different types of seeds without demanding any technical adjustments.

AFTERNOON

PRO 3 / EXH 2: Exhibitor Presentations

Chair(s): T. Neuman, GEA Westfalia Separator Inc., USA; and J. Piazza, Alfa Laval Inc., USA

Seeds and Grain Pre-Heating, Conditioning and Drying - Flexible Operation and Waste Heat Recovery. F. Salaria, Solex Thermal Science, Calgary, AB, Canada

Different seed crushing processes require seed pre-heating, conditioning and drying in one or multiple steps. The use of plate heat exchanger technology allows great flexibility for these steps allowing plants to process different seeds and adjust temperature and moisture over a wide range. The technology also adapts to cooling of seed or meal. The technology utilises indirect heat transfer for heating and evaporation with combination of nominal volumes of cross flow air for moisture removal. The units consist of multiple banks. These heat transfer banks can be configured for flexible operation. The banks can provide pre-heating or drying as may be required. This is accomplished by switching between various heat transfer media like hot water or steam. . The total heat transfer to the seed can be very easily and precisely adjusted. The technology also offers uniform heat transfer to the seed bed . The temperature profile of seed across the bed can be accurately thermally modelled to predict outlet conditions. The amount of cross flow air can be regulated to attain various levels of moisture removal. The technology also allows great opportunity to utilise waste heat from the plant for preheating or conditioning. The preheat step can be easily incorporated with the dryer /conditioner .

Phospholipase C Enzymatic Degumming: A New Technology for Oil Refining. T. Hitchman, Verenum Corporation,, San Diego, CA, USA

Purifine[®] PLC is a unique enzyme product for application in the degumming step of edible and industrial oils processing. Use of Purifine[®] 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[®] 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 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[®] PLC product results in a low phosphorus degummed oil that is easily refined for edible or biodiesel end uses.

Semi-Continuous Deodorization: New Design Featuring Enhanced Heat Recovery and Stripping Efficacy. W.

Younggreen, S. Balchen, Alfa Laval Copenhagen A/S, Denmark

Abstract forthcoming

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

With the expected growth of biodiesel in the United States, as emphasized by President Obama during his Presidential campaign, we can expect a glut of crude glycerin in the coming years, as more biodiesel plants come on stream and existing plants will begin to ramp up production. 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.

Advances in Distillation and Solvent recovery Equipment and Processes. Adolfo Subieta, Desmet Ballestra North America, USA

The need for energy conservation is always present in solvent extraction plants. At the same time finding new creative ways of reducing operating costs is desirable. New designs in distillation equipment introduced by Desmet Ballestra North America help to lower oil temperatures while improving performance parameters. Moreover, existing processes such as DT vapor scrubbing, mineral oil hexane recovering and others have been analyzed in order to achieve savings in maintenance and operating costs.

Chemical Refining of Oils in Solvent Phase. T. Neuman, GEA Westfalia Separator Inc., USA

Process Photometry—Using Filtered Light Waves to Identify Change for In-line Conditional Process Control. Tom Schwalbach, optek-Danulat, Inc., USA

The presentation will consist of a description of the science involved in the Optek Photometric Sensor capabilities for chemical and edible oil process applications. We will discuss the utilization of light absorption, color absorption and scattered light technology for the Edible oil industry, and a how we have adapted the science to a rugged industrial process installations for application of the science. Common Optek Edible Oil applications installed and proven successful are: oil in water, water in oil, turbidity in oil or tallow, chlorophyll to less than 10ppb, Lovibond Red, and bleaching clay applications. The industries served by Optek-Danulat, Inc. are the following: food, edible oil, sweeteners, dairy, beverage, petroleum, chemical, biotech, pulp and paper, wastewater, water, power plants, biofuels, fermentation, blood sciences, automotive, chlorine chemistry, semiconductor, metals, and mining.

Canola and Sunflower Seed Crushing: Development and Best Practice. H. Boeck, Harburg-Freudenberger Maschinenbau GmbH, Hamburg, Germany

The production of rapeseed/canola and of sunflower seed has increased substantially over the past decades. The processing plants have adapted their technologies to the needs in terms of processing capacity as well as efficiency with the help of the leading equipment suppliers. High degree of availability, low operating cost and high oil yields are key characteristics of a modern processing facility.

What's New in Buhler Preparation Equipment. C. Brockmeyer, Buhler, Inc., Plymouth, MN, USA

Buhler Inc., a worldwide company celebrating it's 150th year anniversary, has been a leader in the Grain Handling Industry since 1860, they continue to put new technologies into the Oil Processing Market:- October 2009 Buhler announced the launch of a new high capacity Flaking Mill for the Oil Seeds Industry. The new big flaker, OLFB, compliments our high capacity Cracking Mill the OLCB. - Buhler designs 2 new large models of Fluidbed Drier OLHA for the hot dehulling of soybeans. - Buhler has upgraded its dehulling and conditioning equipment with DIRO and ATMAWe now promote a full line of preparation equipment along with advanced technology, automation and customer service.

WEDNESDAY

N/A

[Technical Program](#)