

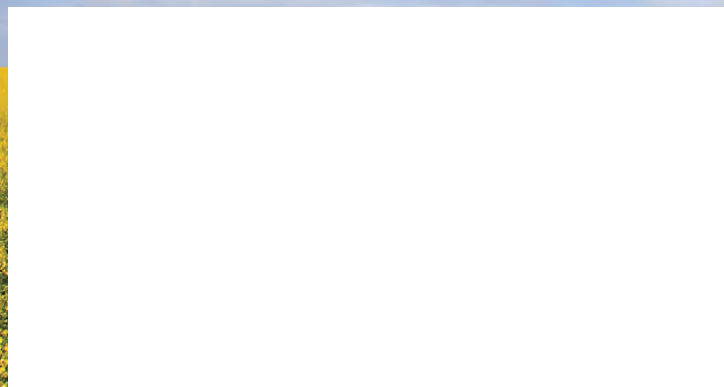
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To be a global forum to promote the exchange of ideas, information, and experience, to enhance personal excellence, and to provide high standards of quality among those with a professional interest in the science and technology of fats, oils, surfactants, and related materials.

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117 64th Annual Convention & International Conference on Oils, Fats, Fuels & Surfactants (ICOFFS)

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Calendar

Bold type: new listingFor details on these and other upcoming meetings, visit www.aocs.org/meetings.

March

March 2–5, 2010. Deuel Conference on Lipids, Laguna Cliffs Resort & Spa, Dana Point, California, USA. Information: www.deuelconference.org.

March 3–4, 2010. 4th International Symposium on Dietary Fatty Acids and Health, Frankfurt, Germany. Information: www.eurofedlipid.org/meetings.

March 3–5, 2010. SNAXPO 2010, Fort Worth Convention Center, Fort Worth, Texas, USA. Information: www.snaxpo.com.

March 3–5, 2010. 3rd Singapore Lipid Symposium, National University of Singapore. Information: www.lipidprofiles.com.

March 3–5, 2010. Victam 2010 [Animal Feed, Petfood, Aquatic Feed Technology], Queen Sirikit National Convention Centre, Bangkok, Thailand. Information: www.victam.com.

March 4–6, 2010. Commodity Classic (sponsored by the American Soybean Association, National Corn Growers Association, National Association of Wheat Growers, and National Sorghum Producers), Anaheim Convention Center, Anaheim, California, USA. Information: www.commodityclassic.com.

March 5–6, 2010. waste to energy: International Exhibition and Conference for

Energy from Waste and Biomass, Bremen, Germany. Information: www.wte-expo.com.

March 7–12, 2010. 14th Annual Practical Short Course on Snack Foods Processing, Texas A&M University, College Station, Texas, USA. Information: phone: +1-979-845-2774; email: mnriaz@tamu.edu; www.tamu.edu/extrusion.

March 10–11, 2010. Nutracon 2010, Hilton Anaheim, Anaheim, California, USA. Information: www.nutraconference.com.

March 10–11, 2010. Soyfoods 2010, Anaheim, California, USA. Sponsored by Soyatech. Information: phone: +1-207-244-9544; <http://events.soyatech.com/conferences/SF2010.htm>.

March 14–16, 2010. National Institute of Oilseed Products, JW Marriott Desert Springs Resort & Spa, Palm Springs, California, USA. Information: www.oilseed.org.

March 14–16, 2010. 3rd Workshop on Fats and Oils as Renewable Feedstock for the Chemical Industry, Emden, Germany. Information: www.abiosus.org/emden-workshop-2010.html.

March 14–18, 2010. NACE Corrosion 2010 Conference & Expo, San Antonio, Texas, USA. Information: <http://events.nace.org/conferences/c2010/c2010.asp>.

March 15–17, 2010. World Biofuels Markets, RAI Congress Centre, Amsterdam, the Netherlands. Information: www.worldbiofuelsmarkets.com.

March 18–19, 2010. Canola Council of Canada Conference, Fairmont San Francisco, San Francisco, California, USA. Information: www.canolacouncil.org/convention/default.aspx.

March 21–25, 2010. 239th American Chemical Society National Meeting and Exposition, San Fran-

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July 11–16,
2010. 19th
International Sym-
posium on
Plant Lipids,
Cairns Convention Centre,
Cairns, Australia. Informa-
tion: www.ispl2010.org.



October 4–7,
2010. 7th
World
Conference
on Detergents:
New Strategies in

a Dynamic Global Economy,
Montreux Music & Con-
vention Centre, Montreux,
Switzerland. Information:
[www.aocs.org/meetings/
montreux](http://www.aocs.org/meetings/montreux).

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March 21–25, 2010. 2010 AIChE Spring Meeting & 6th Global Congress on Process Safety, Grand Hyatt Hotel, San Antonio, Texas, USA. Information: www.aiche.org/Conferences/SpringMeeting/index.aspx.

March 22–25, 2010. American Filtration and Separations Society 23rd Annual Technical Conference & Exhibition, Grand Hyatt Hotel, San Antonio, Texas, USA. Information on meeting: www.afsociety.org/spring2010; information on short courses: www.afsociety.org/short-course.

March 23–26, 2010. 22nd International Trade Fair and Analytica Conference (“Analytica”), New Munich Trade Fair Centre, Munich, Germany. Information: www.analytica.de.

March 23–26, 2010. Advancements in Food Safety Education: Trends, Tools and Technologies (sponsored by the US Department of Agriculture and the National Science Foundation), Hyatt Regency Atlanta, Atlanta, Georgia, USA.

Information: e-mail: Atlanta2010@nsf.org;
www.fsis.usda.gov/Atlanta2010.

March 24–25, 2010. Wellness 10, Inter-Continental Chicago O’Hare, Rosemont, Illinois, USA. Information: [www.ift.org/
cms/?pid=1001994](http://www.ift.org/cms/?pid=1001994).

March 25–26, 2010. Sustainable Cosmetics Summit, New York City, New York, USA. Information: [www.sustainablecos-
meticssummit.com](http://www.sustainablecosmeticssummit.com).

April

April 14–15, 2010. CED 40 Annual Meeting [Comité Español de la Detergencia, Tensioactivos y Afines], Barcelona, Spain. Information: www.cedmeeting.com.

April 20–21, 2010. Oils & Fats International Turkey 2010, Hilton Hotel and Convention Centre, Istanbul, Turkey. Information: [www.oilsandfatsinternational.com/
publication.asp?pubid=28&nav=3&exid=
=165&subnav=0](http://www.oilsandfatsinternational.com/publication.asp?pubid=28&nav=3&exid=165&subnav=0).

**April 24–28, 2010. Lipids Interactions in Physiology and Disease: American Society for Biochemistry and Molecular Biology Annual Meeting, Anaheim Convention Center, Anaheim, California, USA. Information: [www.asbmb.org/
Meetings_01/2010mtg/2010mtgint.
aspx?id=3158](http://www.asbmb.org/Meetings_01/2010mtg/2010mtgint.aspx?id=3158).**

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Surplus biodiesel capacity in Germany and the European Union

New sales markets and actual research and development projects are needed

Dieter Bockey

Despite the amendment of import regulation on B99 (1% biodiesel + 99% petrodiesel), the German and European biodiesel business sectors are likely to face increasingly harder times. In March 2009 the European Union introduced a penalty tax depending on the biodiesel exporting company to compensate the subsidy of \$1.00/gallon ("splash and dash") from the United States. This was a significant example of predatory competition. The related structural transformation is also the result of changes in and insufficient strategic underpinning of biofuel incentives on both a national and EU (European Union) level. This development is taking place within an environment that, in light of the current policy framework of the biofuel manufacturers, now also has to contend with additional bureaucratic verification obligations and documentation requirements relating to biomasses that have been produced and processed in compliance with specific sustainability criteria.

Moreover, development of the German and European biodiesel business sectors is needlessly marking time because—among other things—the potential for quicker market penetration through

a rapid EU-wide market introduction of B7 is not being addressed with appropriate speed. Germany, France, and Austria began already in 2009 to introduce diesel containing 7 vol% biodiesel (B7) into the market. The corresponding amendment of the European standard for diesel fuel—EN 590—came into effect October 2009. B7 corresponds to a total biodiesel demand (roughly 200 million metric tons [MMT]) in the EU of about 13.5 MMT. The market situation for biodiesel manufacturers has become considerably tighter over the last two years.

Competition in Germany and the EU is characterized by surpluses and insolvencies. Biodiesel is still the most significant biofuel, though, with EU sales even registering an increase in 2008. In terms of statistics, Germany once again led the way in biodiesel sales. Plants financed with public funds were put into operation in Germany and in other EU countries within the reporting period, although politics had long pushed the incentives indicator to "red," and the market launch of biodiesel as an admixture for fossil diesel has been moving forward only sluggishly.

While the biofuels industry has been calling for sustainable production and verification management, the political sphere has so far failed to create a reliable framework for this action. Such legislation, geared toward national and EU climate protection (as well as energy supply policy targets within the transport sector), remains to be meaningfully developed. This is the conclusion that must be drawn in light of the "National Biomass Action Plan for Germany" with regard to the brief chapter on biofuels within it. The German government only presented the plan in April 2009, even though the European Commission had called on member states to submit the plan as far back as December 2005. The German government had ample time to develop a national biomass action plan, and the industry had incentives to turn plans into action. Instead, the chapter on biofuels in the biomass action plan merely describes the facts of the matter according to the "Biofuels roadmap" from June 2007. An active and progressive

strategy supported by adequate research & development for biodiesel or bioethanol is not covered in the plan.

Moreover, for the biodiesel business sector, increasingly stringent engine-specific and associated quality requirements for biodiesel following introduction of emission standard EURO 5 (from September 2009) and EURO 6 (from 2013) will make it difficult to maintain the biodiesel sales development that has already been achieved. Such lack of action is all the more extraordinary when one considers that a major proportion of the energy mix needed to meet the EU objective of sourcing at least 10% of the energy requirement from 2020 onward from renewable sources will have to be made up of biodiesel and bioethanol. In addition, the amended EU Fuel Quality Directive (2009/30/EG), which came into effect in June 2009, requires member states to work rapidly toward establishing a standard for B10. Analogous to E10 (10% ethanol in gasoline), the mandate is to be fulfilled as quickly as possible; however, in contrast to E10, this mandate does not include an appended quality standard for B10, although the European Commission has now submitted a commensurate mandate.

Biodiesel production capacity in Germany is around 5.1 MMT and around 16 MMT in the 27 EU countries. The European Biodiesel Board (EBB) states that average output of the EU biodiesel capacity (about 15.6 MMT) is estimated to be 48%; however, the degree of output per plant varies greatly from one state to another. A comparatively high output is presumed in plants where the operators have been able to secure supplier allocations of biodiesel admixture for fossil diesel on a national basis within the oil industry or have secured sales through successful participation in international tendering and/or quotas, such as in France or Italy. Conspicuous is the high output level of about 92% for biodiesel plants in France, a result of the complicated tendering process that is, to some extent, structured in a manner that favors French biodiesel manufacturers. Available statistics must be scrutinized, in particular with regard to output. Commensurate with the average utilization of 48%, around 8 MMT of biodiesel were supposedly sold in the EU, with an additional 1.5 MMT imported in the same period according to the sector information service, F.O. Licht. According to the website Biofuels Platform (<http://www.platforme-biocarburants.ch/en/infos/eu-biodiesel.php>), a total of 9.5 MMT of biodiesel was sold in the EU in 2008. As such, it may be presumed that the average output of biodiesel plants within the EU is therefore lower than 48% and that a considerable quantity of biodiesel was also imported.

As a consequence, the UFOP (Union for the Promotion of Oilseeds and Protein Plants) is striving to develop new sales markets for biodiesel. For a number of years UFOP has been working closely with the Institute for Oil Heating Efficiency (IWO) and the German Society for Petroleum and Coal Science and Technology (DGMK). These institutes were founded following an initiative of the oil industry and are partially funded through a heating oil levy (IWO) and also directly by the oil industry. UFOP participates in DGMK/IWO projects to assess the utilization of biodiesel as a biogenic component in heating oil. Shell AG, for example, already offers bioheating oil throughout Germany, where the product is primarily intended for use in new condensing boilers. Similar to the utilization of biodiesel in engines, the requirements for material compatibility and storage stability are high. Following a UFOP initiative, the IWO presented the status of development to a broad audience at the special "nature.tec" exhibition held within the scope of the International Green Week (IGW) fair in 2008 and 2009. If comprehensive application of just a 5% admixture proportion were to be introduced this would equate to a requirement of over 1 MMT of biodiesel.

BIODIESEL RESEARCH ACTIVITIES—ACTUAL PROJECTS FUNDED BY UFOP

Fleet analysis to test B10 for engine oil dilution. Project run by Verband der Deutschen Biokraftstoffindustrie, Arbeitsgemeinschaft Qualitätsmanagement Biodiesel, Shell Global Solutions Deutschland GmbH.

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JILL RICHARDS

information

The aim of this project—concluded in 2009—was to produce verifiable statements on the compatibility of modern biodiesel engines with B10 by way of practical experience from analysis of a small fleet. The background was the targeted increase of admixture from 7 to 10 vol% (B7 to B10). This increase is prescribed by the amended EU directive on the specification of petrol, diesel, and gas-oil fuels, which also contains a mechanism to monitor and reduce greenhouse gas emissions (2009/30/EC) and which went into effect in April 2009. With this directive, the European Commission has called on member states to ensure the prompt creation of an amended diesel fuel standard effecting introduction of B10 onto the market.

The aforementioned projects comprising two fleet tests provided data on the operation of diesel engines (common rail engines) with self-regenerating particle filters. The two car fleets differed in terms of regeneration strategy: post injection (i) with and (ii) without additive to accelerate burnoff in the particle filter. The effect of these different regeneration strategies on engine oil dilution was analyzed in particular with respect to the different load cycles.

The vehicles were subjected to various driving cycles (“student cycle,” “service cycle,” and mixed traffic: motorway, open road, urban traffic) and the engine oil samples analyzed. As anticipated, the fleet using the exclusively engine-supported regeneration strategy demonstrated significant engine oil dilution, particularly the student and service cycles. The additive-supported regeneration strategy did not give rise to any significant engine oil dilution and consequent reduction in the engine oil change interval.

For more information on biodiesel and the status of biodiesel in the European Union, order the new, second edition of *The Biodiesel Handbook* (ISBN 979-1-893997-62-2; phone: 1-217-693-4847; email: orders@aocs.org; or visit www.aocs.org).

Oil dilution during operation of a passenger vehicle diesel motor with mixed fuel B10. Project run by Otto-von-Guericke-University of Magdeburg, Institute for Mobile Systems, Chair for Piston Machines; cooperation partners: Volkswagen AG, Fuchs Europe Schmierstoffe GmbH.

This project was an engine test bench analysis that supplemented the above-detailed fleet test. Its aims were to determine engine oil dilution under the respective operating conditions on the basis of specific load levels and to suggest remedial measures. Focus was placed on the following questions:

- At what engine load is biodiesel registered?
- How high is the registered trace in regeneration mode?
- Are traces recorded in engine oil with subsequent engine-internal post-injection of biodiesel and frequent starts or during idle operation?
- How does fuel discharge occur under high engine loading?

The test bench analysis confirmed that the highest level of oil dilution occurs with subsequent post-injection, frequent cold starts

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with idle operation; and engine operation under low loading (light load) results in lower oil dilution.

Implementation of a test bench continuous operation trial over 500 hours and field testing for approval of DEUTZ COMMON RAIL engines in commercial vehicles, EURO 4; for biodiesel (B100). Project run by DEUTZ AG, Dept. TATE (Exhaust and Fuels).

Following DEUTZ AG approval regarding the engine type DCD 2012 and 2013 for operation with biodiesel as a pure fuel as the result of a UFOP-sponsored project, the aim of this project was to similarly give the green light to the company's industrial engines that are fulfilling the European emission requirement of EURO 4, to match also the EURO 5 exhaust emission standard for operation with biodiesel as a pure fuel. The project encompassed a standard continuous operation trial and subsequent field test control of rape methyl ester suitability in actual operation using two buses run by a public transport company. The originally planned fleet trial using three trucks was cancelled by the participating commercial vehicle manufacturer owing to the economic situation. The use of a biodiesel sensor was also tested within the field test.

As a result of this project, DEUTZ AG issued approval for the DCD 2013 L04/06-4V engine. This engine is fitted into Volvo trucks, among others. However, approval did not extend to the selective catalytic reduction (SCR) system owing to an evident reduction in NO_x efficiency of the SCR system at low temperatures, caused by the coking effects of unburned biodiesel elements on the surface of the catalytic converter. This carbonization can be reversed through burning off the catalytic converter at high exhaust temperatures; however, in the opinion of the project organizer, this may result in the irreversible presence of K and Na that, in turn, could cause deactivation of the catalytic converter during extended engine operation.

The results of this field test are also intended for use regarding approval of EURO V engines. This test is dependent on the insertion of a functioning biodiesel sensor measuring the biodiesel/diesel fuel mix ratio, so that the sensor is able to send a signal to the engine management system for the purpose of optimizing the time and duration of injection and thus ensure compliance with the NO_x emission limit.

Approval can only be initially issued for a 30% biodiesel share for Volvo engines. Approval of B100 for EURO V engines will require further analysis and field tests. In the opinion of the project organizer, testing of a biodiesel sensor and analysis of the effects of any possible deactivation of the catalytic converter owing to metal content in the biodiesel and any associated loading due to ash-forming elements needs to form the subject of a follow-up project.

Dieter Bockey is with the Union for the Promotion of Oilseeds and Protein Plants reg. Ass., and managing director of the Working Group Quality Management Biodiesel reg. Ass. Contact him via email at d.bockey@bauernverband.net.

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GREATER PHOENIX AREA
JILL RICHARDS

Christie donates Lipid Library to AOCS

In December 2009, The Lipid Library website developed by AOCS member William W. Christie officially became the AOCS Lipid Library at <http://lipidlibrary.aocs.org/>. Along with this generous donation of thousands of pages of information about lipids came thousands of daily site visitors.

“The regular statistics showed over 2,000 visitors each working day visiting about 12,000 pages in total daily, with spikes of up to 4,000 visitors,” Christie says. “During university vacations, the numbers tend to drop off by about a third.”

Christie—who was awarded an MBE (Most Excellent Order of the British Empire) in the Queen’s New Year’s Honours List in 2000—is also a fellow of the Royal Society of Edinburgh. In 1995, he received the Herbert J. Dutton Award from the Analytical Division of AOCS in recognition of his contribution to analytical methodology in relation to oils, fats, and lipids. He also received the Alton E. Bailey Award from the North Central Chapter of AOCS’ USA Section in 2004 for exceptional service in the field of lipids and associated products. In addition to his role with The Lipid Library, he is currently a member of the editorial advisory boards of *Lipids*, *Lipid Technology*, *European Journal of Lipid Science and Technology*, and *Grasas y Aceitas*. He is the founder of the Oily Press Ltd.

Noting his long-lived forebears, Christie intends to remain active in further developing the site. He will serve as editor-in-chief of the Library for at least two years, plans to continue writing his blog (<http://lipidlibrary.aocs.org/news/blog.htm>), and will coordinate the site’s editorial advisory board. That board will function under the umbrella of the AOCS Publications Steering Committee, which is chaired by Robert A. Moreau of the Eastern Regional Research Center (Wyndmoor, Pennsylvania) of the US Department of Agriculture’s Agricultural Research Service.

“For the first half of my research career,” Moreau notes, “whenever I had a question about lipid extraction, separation, or analysis, I ‘religiously’ consulted Bill Christie’s books, *Lipid Analysis* (1st, 2nd, and 3rd editions) and *Advances in Lipid Methodology* (volumes 1–4).”

Moreau’s inquiries, however, have shifted in recent years from the books to Christie’s online Lipid Library. “It is a wonderful state-of-the-art resource for any researcher who works with lipids,” Moreau says. “In addition to being the premier source of information about lipid methodology, the site also includes valuable insights about many other aspects of lipid research.

“I am very honored and excited that Dr. Christie has donated The Lipid Library to AOCS with the only stipulation being that AOCS will help to ensure that it continues to be relevant and freely accessible to anyone who needs it,” Moreau concluded.

Q&A with Bill Christie

Catherine Watkins, associate editor of inform, recently posed a series of questions to the creator of The Lipid Library, William W. Christie, following his donation of the resource to AOCS. For an earlier discussion of the site, see Christie’s article from 2006 (inform 17:781–782).

Q: What advice would you give someone who is new to the site?

A: I would advise anyone visiting the site for the first time simply to spend 20 minutes browsing through it to see what is there that might interest him or her.

Leaving aside the news/calendar/blog section of the site, there are three main content areas: About Lipids, Analysis, and Oils and Fats (we hope to add a fourth on Biochemistry/Nutrition soon). In the About Lipids section, I have introductory articles dealing with what lipids are and what they do, then each web page is centered around a specific lipid or group of lipids, where structure, occurrence, biology, and function are described. For convenience, there are separate menus dealing with fatty acids and eicosanoids, simple lipids (plus others that do not fit conveniently elsewhere), complex glycerolipids, and sphingolipids. This is the place to come to if you want to find out about a specific fatty acid or lipid.

The Analysis section is split into six areas. Two of these—on mass spectrometry of fatty acids and NMR spectroscopy—are fairly specialized and contain a wealth of information for analysts. However, my book *Gas Chromatography and Lipids*, which is available on the site by kind permission of The Oily Press (and P.J. Barnes & Associates), is an excellent source of information for both beginners and more experienced analysts, even though it is a little old as textbooks go. The section on selected topics in analysis contains a number of readable accounts on analytical topics. Finally, there is a comprehensive literature survey section with 10,000 references, including a current awareness service, which reports monthly and lists all significant new papers dealing with lipid analysis.

The Oils and Fats area of the site is relatively new and is still developing, and includes a section by Frank Gunstone on oils and fats in the marketplace, where data on the production and usage of commodity oils are listed. There is a substantial and growing section dealing with frying oils, their chemistry, analysis, and nutritional properties. Finally, the first example of the new AOCS collaboration is a new section on the history of lipid science.

Q: Are there any collaborators you particularly want to thank?



Bill Christie, at work in his office on new features for The AOCS Lipid Library.

A: My colleague and mentor Frank Gunstone has encouraged me from the beginning, first in producing a number of web pages on NMR spectroscopy for the site and then in producing a second series of articles on oils and fats in the marketplace. Gerhard Knothe took up further development of the NMR pages and will be updating those produced by Frank. Three former research collaborators, M. Carmen Dobarganes, Gloria Márquez-Ruiz, and Jean-Louis Sébédio, have assisted me in producing a series of web pages on frying oils. Boryana Nikolova-Damyanova has agreed to provide a section on silver-ion chromatography. I am grateful to all who have given so generously of their time. I am also grateful to my former employer—the Scottish Crop Research Institute—and its commercial arm—Mylnefield Lipid Analysis—who still employ me as a part-time consultant, for giving me continuing access to library facilities including online journals. Without this access, development of the website would not have been possible.

Q: Would you please talk a bit about the editorial advisory board for the AOCS Lipid Library?

A: The editorial advisory board is new and has still to find its feet, but I

have great expectations. We have invited acknowledged experts in different areas of lipid science (especially those where I have no expertise myself) to write and commission web pages in their own disciplines.

Thus, Tom Sanders will contribute articles on lipids in nutrition—always a contentious area and best left to the experts. Gary List will work on historical aspects of lipid science and scientists, and Craig Byrdwell will deal with lipidomics, an aspect of lipid analysis that is developing especially rapidly. In addition to his work on NMR spectroscopy, Gerhard Knothe will commission articles dealing with fatty acid chemistry, while Albert Dijkstra will cover industrial processing and technology. Bob Moreau is looking into information management and analytical topics, while Randy Weselake will tackle plant lipid biochemistry. We are looking for established scientists with interests in animal biochemistry and physical chemistry of lipids to round off the team for the moment.

Q: Where would you like The Lipid Library to be in five years?

A: I hope that The Lipid Library will be recognized internationally as a

CONTINUED ON PAGE 124

<http://AnnualMeeting.aocs.org>



101st AOCS Annual Meeting & Expo

May 16–19, 2010

PHOENIX CONVENTION CENTER
Phoenix, Arizona, USA

What Short Course should I attend?

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LEE ANN GALAWAY
JILL RICHARDS

Preview: 101st AOCS Annual Meeting & Expo

The 101st AOCS Annual Meeting & Expo (AM&E) will be held May 16–19, 2010, in Phoenix, Arizona, USA, with more than 1,700 participants expected from 60+ countries.

The tentative scientific program includes more than 650 lecture and poster presentations in 12 interest areas (the tentative session grid is printed on pages 74–75), as well as hot topic symposia covering a range of issues of general interest to participants. General chairperson for the event is Douglas M. Bibus of Lipid Technologies LLC and the University of Minnesota in Austin.

The Expo, with more than 90 exhibiting companies, will feature several networking events such as the opening mixer, the business breakfast, committee meetings, and several receptions. The Expo Hall will be open 5:30 p.m.–7:30 p.m., Sunday, May 16; 11:30 a.m.–6:00 p.m., Monday, May 17; and 11:30 a.m.–6:00 p.m., Tuesday, May 18. The Expo will be closed on Wednesday, May 19.

The AOCS annual business meeting and recognition program will be held during a breakfast session on Tuesday, May 18.

DIVISION AND SECTION FUNCTIONS

A number of the AOCS divisions and sections have scheduled meetings in Phoenix during the AM&E.

Among those meetings are the annual division roundtable discussions of emerging topics. These topics will then be taken by designated representatives to the Program Committee meeting on the final day, where the bare bones of the 2011 technical program will be created. There is no better way to network than to attend one of these roundtables. Simply check the program for the days and times.

In addition to luncheon and dinner meetings of the sections and divisions, Agricultural Microscopy Division will participate in a tour of the Los Cedros Arabian Horse Ranch from 8:30 a.m. to 12:30 p.m. on Wednesday, May 19. This tour will include information about equine nutrition as well as the science behind feed evaluation. Other

Shrouded by red-rock mountains, surrounded by golf courses, and covered by a near-perpetual canopy of blue sky, downtown Phoenix offers visitors a refreshing mix of urban fun and outdoor recreation.





Annual Meeting & Expo at a glance

**May 16–19, 2010
Phoenix, Arizona, USA**

Register for the meeting and make hotel reservations online at <http://AnnualMeeting.aocs.org>. March 1, 2010, is the last day to receive the special online discount.

Questions? Contact the AOCS Meetings Department (phone: +1-217-359-2344 or email: meetings@aocs.org).

tour highlights include a presentation of many National Champion horses along with stories about the horses, their history, and their accolades.

TECHNICAL SERVICES MEETINGS

AOCS' Technical Services will host three expert panel meetings (on olive oil, biodiesel, and process contaminants) at the AM&E in addition to the usual technical committee meetings. For more information about these, contact Gina Clapper at ginac@aocs.org.

The Technical Services staff also will conduct lunchtime demonstrations of AOCS methods in the CAML on the Expo floor. In this case, CAML stands for "Crop Analytics Mobile Laboratory," the versatile on-the-go laboratories developed and used by Monsanto Co. at grain elevators to ensure that its low-linolenic Vistive soybeans have not been contaminated with commodity soybeans. Look for more details at the meeting.

LEADERSHIP ORIENTATION

This year, AOCS Executive Vice President Jean Wills Hinton will again conduct an orientation session for leaders (committee, section, and division chairs) on Sunday, May 16, 2010, immediately following the Division Council meeting. There, Hinton will review the society's strategic plan and introduce society leaders to members of the AOCS Governing Board and staff.

STUDENT ACTIVITIES

AOCS has always valued student participation and encourages student attendees to take advantage of the many opportunities offered as part of the AOCS AM&E. These include substantially discounted meeting registration fees, and awards and grants designed specifically for student presenters.

In addition, students are eligible for discounted tickets for division and section luncheons and dinners, as well as having the chance to co-chair technical sessions and assist at the AOCS Foundation's silent auction. This year, the Student Common Interest Group (SCIG) plans to hold a special half-hour meet-and-greet social gathering for students during the opening mixer on Sunday, May 16. Details will follow.

The annual student-mentor get-together will again follow the SCIG luncheon on Wednesday, May 19.

For more information about any of the student programs—or to sign up to be a mentor—contact Barb Semeraro at barbs@aocs.org.

PROFESSIONAL EDUCATORS' COMMON INTEREST GROUP

This important group not only will meet on Monday, May 17, from 1:00 p.m. to 2:00 p.m. to continue setting its agenda but also has developed a hot topic session (see page 72).

CONTINUED ON NEXT PAGE



101st AOCS Annual Meeting & Expo

May 16–19, 2010

PHOENIX CONVENTION CENTER
Phoenix, Arizona, USA

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register
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GREATER PHOENIX CVB
JILL RICHARDS

The three main goals that the professional educators set at their first meeting in 2008 are:

- Collecting and posting course syllabi, prerequisites, and book selections for lipid courses,
- Developing a resource page on the AOCS website that will include public access resources (including websites) commonly referred to by students, and
- Creating a global database of lipid and food science programs.

For more information about the group, contact Barb Semeraro at barbs@aoacs.org.

SHORT COURSES

Lipid Oxidation and Health Short Course: From Chemistry to Nutrition

Saturday and Sunday, May 15–16, 2010

Course Organizer: Edwin N. Frankel, University of California, Davis, USA.

This one-and-a-half day comprehensive short course is newly expanded with basic and practical instruction from leaders in the field. It is designed to help participants understand the major factors that affect the stability of oil-bearing foods. Further, registrants will learn how antioxidants can be used to minimize the effects of lipid oxidation in foods and biological systems, as well as how stabilized lipids can be used as the basis for development of healthful products.

Whether you are attending a seminar or lunchtime event, multi-day conference or formal gala at the Phoenix Convention Center, the experience will be one you will not soon forget—We guarantee it! The Phoenix Convention Center, expanded in 2008, offers more than 900,000 square feet of meeting and event space and more than two million in total square footage, making it one of the top 20 convention venues in the United States.

Basics of Edible Oil Processing and Refining Short Course

Saturday, May 15, 2010

Course Organizer: Sefa Koseoglu, Smart Short Courses, College Station, Texas, USA.

This program will cover the chemistry of oils and fats, as well as every step of unit operations dealing with degumming, neutralization, bleaching, dyeing, hydrogenation, interesterification, and deodorization. This program is a must for engineers, chemists, and any other technicians needing to develop a good understanding of edible oil refining and processing.

New Technologies in Oilseed Extraction and Edible Oil Refining Short Course

Sunday, May 16, 2010

Organizer: Sefa Koseoglu, Smart Short Courses, College Station, Texas, USA

Speakers from industry will discuss new technologies and processing techniques in oilseed processing and crude oil refining. This program provides extensive networking opportunities for plant engineers, superintendents, and technicians. In addition, there will be a panel discussion of some practical problems in plant operations.

HOT TOPIC SYMPOSIA

Tuesday, May 18, from 9:00 a.m. to 12:00 p.m.

Challenges and Opportunities in Lipids and Oil/Fats Education and Curriculum Development

Preparing students for careers in industry, government, and academia through the development of lipid/oils/fats learning strategies is becoming increasingly important. This symposium aims to allow participants to learn about challenges and opportunities in developing educational approaches from the point of view of faculty, students, and industry, with a comparative review of practices in different countries. A roundtable discussion will further explore key issues and provide guidance for the Professional Educators' Common Interest Group to promote education and prepare future professionals.

Food Safety Management Systems

After the many worldwide food safety scares of recent years—including dioxin-tainted food products, melamine in pet food and milk, and peanut product recalls—consumers lack confidence in the food supply system. Thus, food companies are looking to differentiate their products in the marketplace through promoting their food safety and quality management systems audits to consumers.

This symposium's topics will include the Global Food Safety Initiative, ISO 22000 (the food safety standards developed by the International Organization for Standardization), third-party audits, as well as how best to train staff and auditors. The discussion will involve speakers and selected representatives who have themselves implemented management systems.

High-Protein Diets and Weight Management

Obesity is now epidemic worldwide; its frequency is increasing at a rapid rate in various populations and across all age and income groups.



Jill Richards; background image: Brock Peoples



The AOCS Student Common Interest Group, along with the AOCS Foundation, has for more than a decade hosted a silent auction during the AOCS Annual Meeting & Expo. Proceeds from the auction benefit student programs. The 15th Annual Silent Auction will begin during the opening mixer on Sunday night, May 16, 2009, in the Expo Hall at the Phoenix Convention Center. For more information about how to donate an item for auction—such as this gift basket donated by Kraft Foods for the 2009 auction—contact AOCS Foundation Development Manager Amy Lydic at amyl@aoacs.org. And yes, that is former AOCS Honored Student Steve Hill, a Kraft employee, who currently is secretary of AOCS.

a controversial topic over the past 30 years. Currently, individual fatty acids are being investigated as never before for their health effects. Given the emerging science, what advice on fats will the new *Dietary Guidelines for Americans* present in its 2010 edition? (The *Guidelines* are revised every five years and issued by two US federal agencies. The recommendations made affect what North Americans eat and what products they demand.) For the 2010 revision, a special subcommittee on fatty acids was formed under the umbrella of the Dietary Guidelines Advisory Committee to review the science and determine which dietary fats should be limited and which are essential.

Presenters at this symposium will look at trends concerning edible oils and examine new clinical data specific to healthful oils. In addition, they will discuss how to formulate more healthful products for a number of applications, including shortening and baking. ■

Many human studies suggest that protein is more satiating than fat or carbohydrate and helps promote weight loss and build lean muscle mass. The mechanisms by which protein exerts these beneficial effects are the subject of state-of-the-art research that will be presented in this symposium. In addition, speakers will provide an overview of high-protein diets and weight management, high-protein diets and satiety, and high-protein diets and sports nutrition for lean mass preservation.

Value-Added Fats and Oils: What's on the Horizon?

Recommendations on dietary fat have been

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INTEREST AREA	Monday Morning 8:00 am–12:00 pm	Monday Afternoon 2:00 pm–4:00 pm	Monday Evening 4:00–6:00 pm Dedicated Poster Viewing and Reception	Tuesday Morning 9:15 am–12:15 pm
Agricultural Microscopy AM	AM 1: Agricultural Microscopy I	AM 2/PRO 2: Food/Feed Safety and Quality	AM-P: Agricultural Microscopy Posters	<div data-bbox="1278 296 1576 611">Hot Topic Symposia</div> <div data-bbox="1278 737 1576 852">Challenges and Opportunities in Lipids and Oil/Fats Education and Curriculum Development</div> <div data-bbox="1318 926 1538 999">Food Safety Management Systems</div> <div data-bbox="1318 1073 1538 1146">High Protein Diets and Weight Management</div> <div data-bbox="1299 1220 1557 1293">Value-Added Fats and Oils: What's on the Horizon?</div> <div data-bbox="1318 1965 1538 1997">EXH 1: Exhibitor Showcase</div>
Analytical ANA	ANA 1: Nutraceutical and Desert Plants	ANA 2: Rapid and Non-Destructive Technologies	ANA-P: Analytical Posters	
Biotechnology BIO	BIO 1: Sterols I BIO 1.1: Biocatalysis I BIO 1.2/PCP 1: Process and Co-Products of Biofuel and Industrial Productions	BIO 2: Sterols II BIO 2.1/PRO 2.1: Processing Technologies	BIO-P: Biotechnology Posters	
Edible Applications Technology EAT	EAT 1: Lipid Crystals and Structural Properties in Food	EAT 2: Structured Solutions EAT 2.1/PHO 2: Lipids in Nanotechnology I	EAT-P: Edible Applications Technology Posters	
Food Structure & Functionality Forum FS&FF	FS&FF 1: Food-Body Interactions	FS&FF 2: Design of Successful Performing Interfaces	FS&FF-P: Food Structure & Functionality Forum Posters	
Health and Nutrition H&N	H&N 1: Lipid and Inflammation and Lipid Signaling Molecules	H&N 2: Bioactivity and Emerging Benefits of Short and Medium Chain Fatty Acids	H&N-P: Health and Nutrition Posters	
Industrial Oil Products IOP	IOP 1: Alternative Fuels	IOP 2: Bio-based Lubricants, Plasticizers, and Value-added Products	IOP-P: Industrial Oil Products Posters	
Lipid Oxidation and Quality LOQ	LOQ 1: Stability of Omega-3/Omega-6 Lipids in Emulsions and Microemulsions	LOQ 2: Specialty Antioxidants	LOQ-P: Lipid Oxidation and Quality Posters	
Phospholipid PHO	PHO 1: Nutritional and Biological Functions of Polar Lipids	PHO 2/EAT 2.1: Lipids in Nanotechnology I	PHO-P: Phospholipid Posters	
Processing PRO	PRO 1: Processing Hot Topics	PRO 2/AM 2: Food/Feed Safety and Quality PRO 2.1/BIO 2.1: Processing Technologies	PRO-P: Processing Posters	
Protein and Co-Products PCP	PCP 1/BIO 1.2: Process and Co-Products of Biofuel and Industrial Productions	PCP 2: Ground Corn Meal in Ethanol Industry — Food Grade Applications	PCP-P: Protein and Co-Products Posters	
Surfactants and Detergents S&D	S&D 1: Extended Chain Surfactants S&D 1.1: General Surfactants I	S&D 2: Dynamic Properties of Surfactants S&D 2.1: General Surfactants II	S&D-P: Surfactants and Detergents Posters	
Exhibitor Sessions EXH				

Tuesday Afternoon 2:00–5:00 pm	Wednesday Morning 8:00 am–12:00 pm	Wednesday Afternoon 2:00–5:00 pm	INTEREST AREA
AM 3: Agricultural Microscopy II			Agricultural Microscopy AM
ANA 3: Mass Spectrometry	ANA 4: General Analytical I	ANA 5: General Analytical II	Analytical ANA
BIO 3: Plant Lipid Biotechnology BIO 3.1: Biocatalysis II	BIO 4 / S&D 4.1: Biobased Surfactants and Ingredients BIO 4.1: Designing Soybeans for 21st Century Markets	BIO 5: General Biotechnology	Biotechnology BIO
EAT 3: Food Emulsions and Dispersed Systems EAT 3.1/LOQ 3.1: Antioxidants in Omega-9 Oils	EAT 4: Confectionery Fats	EAT 5: General Edible Applications	Edible Applications Technology EAT
FS&FF 3: Phase Transitions and Rheology of Food Structures	FS&FF 4: New Processing Approaches for the Creation of Novel Food Structures	FS&FF 5: Structuring at Nano Level for Food Applications	Food Structure & Functionality Forum FS&FF
H&N 3: N-3, N-6 Benefits/Liabilities: Interactions, Competition	H&N 4: General Nutrition I	H&N 5: General Nutrition II	Health and Nutrition H&N
IOP 3: New Glycerol Uses (page 16)	IOP 4: Oleochemicals and Polymers	IOP 5: General Industrial Oil Products	Industrial Oil Products IOP
LOQ 3: Shelf-life Stability and Sensory Properties of Whole Grains and Cereal Products LOQ 3.1/EAT 3.1: Antioxidants in Omega-9 Oils	LOQ 4: Frying Oil Chemistry Quality, and Nutrition	LOQ 5: General Lipid Oxidation and Quality	Lipid Oxidation and Quality LOQ
PHO 3: Analytical Characterization and Quantification in Phospholipids PHO 3.1: Lipids in Nanotechnology II	PHO 4: Industrial Feed Applications of Phospholipids	PHO 5: General Phospholipids	Phospholipid PHO
PRO 3/EXH 2: Processing Exhibitor Presentations	PRO 4: Personnel and Facility Safety	PRO 5: General Processing	Processing PRO
PCP 3: Proteins for Healing - From Peptides to Macromolecules	PCP 4: Novel Technologies for Isolation and Extraction of Proteins and Co-Products	PCP 5: General Protein and Co-Products	Protein and Co-Products PCP
S&D 3: Green Ingredients and Labeling S&D 3.1: Industrial Applications	S&D 4: General Cleaning – New Surfaces S&D 4.1 / BIO 4: Biobased Surfactants/Ingredients		Surfactants and Detergents S&D
EXH 2/PRO 3: Processing Exhibitor Presentations			Exhibitor Sessions EXH

Technical Program-at-a-Glance



The tentative Technical Program has been prepared from presentation titles submitted as of October 5, 2009, and is subject to additions, changes, and deletions. For the most up-to-date Technical Program, visit <http://AnnualMeeting.aocs.org> and click on "Technical Program."

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News & Noteworthy

Argentina's 2009–2010 sunflower harvest is expected to be the worst in 40 years because of drought, according to the country's *El Cronista* newspaper. The report suggests that the harvest will be down by 44% from 2008–2009.

The European Food Safety Authority (EFSA) has set a new Maximum Residue Limit (MRL) in refined olive oil of 4 mg/kg of the pesticide thiacloprid. The previous MRL was 0.02 mg/kg. The complete ruling can be found at www.efsa.europa.eu/EFSA/Reasoned_Opinion/1410.pdf?ssbinary=true.

In related news, EFSA and the Food Safety Commission of Japan have signed a Memorandum of Cooperation on the “collection and sharing of data required for the assessment of current and emerging risks.” The memorandum signed with Japan is the second formal international cooperation agreement the agency has signed with a national food safety authority outside the European Union. In 2007, EFSA and the US Food and Drug Administration signed a memorandum designed to facilitate sharing of confidential scientific information.

Euro Fed Lipid has started an oils-fats-lipids wiki that the group hopes will develop into a “valuable source of information for scientists and the general public on all aspects of oils, fats, and lipids.” A wiki is a website that allows the easy creation and editing of any number of interlinked web pages via a web browser.

The wiki is available at www.eurofedlipid.org/oflwiki/index.php?title=Main_Page

Brazil's Carbono Quimica and Bracol Oleoquimicos, a subsidiary of Bertin, are jointly developing and manufacturing oleochemicals and derivatives using renewable materials, according to *BNAmericas Petrochemicals News*. Bertin's facility in Lins, São Paulo, is the production site. Technology implementation and product distribution is being handled by Carbono. ■



Previous cargo issue evaluated—again—by EFSA

In December 2009, the European Food Safety Authority (EFSA) issued its second opinion in six months on the bulk transport of edible fats and oils.

Because edible oils and fats are shipped around the world in containers that are not exclusively reserved for the transport of foodstuffs, any substances previously transported in such containers need to be assessed regarding possible safety concerns. Following a request from the European Commission, EFSA evaluated the safety of 14 different substances and mixtures that could be transported as cargoes in ship containers that are then used to ship edible fats and oils into the European Union.

The nine substances and five mixtures/groups of substances in question have a variety of different industrial or agricultural uses. EFSA's expert panel on contaminants in the food chain (the CONTAM panel) assessed their safety as previous cargoes based on criteria that were adopted by the panel earlier in 2009.

CONTAM considered that six of the substances evaluated (calcium nitrate, ammonium nitrate, hydrogen peroxide, isobutanol, kaolin slurry, and fructose) would not be of concern as previous cargoes for containers used to transport edible fats and oils by sea.

However, the panel considered that cyclohexanol (often used in the manufacture of nylon and pharmaceuticals), cyclohexanone (used, among other things, in the electronics industry), and 2,3-butanediol (which can be used in printing inks, perfumes, and plasticizers) did not meet the criteria for acceptability as previous cargoes because of certain toxicological concerns and/or a lack of data to confirm their safety.

CONTAM considered that mixtures of fatty acids and mixtures of fatty alcohols would not cause any health concern as previous cargoes as long as they were derived from edible oils and fats. The same conclusion was made for fatty ester mixtures produced from fatty acids and fatty alcohols, or from fatty acids and methanol or ethanol, if the fatty ester mixtures are derived from non-contaminated sources (and do not include oils from waste collection sites, for example).

Finally, the panel did not have enough information on epoxidized vegetable oils to evaluate them as previous

cargoes (apart from epoxidized soybean oil, which has already been confirmed as an acceptable previous cargo).

The European Commission asked EFSA to assess these particular substances as they have been put forward for possible inclusion in an international list of acceptable previous cargoes to be discussed in the framework of Codex Alimentarius in the near future.

To review the complete scientific opinion from EFSA, see www.efsa.europa.eu/en/scdocs/scdoc/1391.htm.

Most recent WASDE report

The monthly *World Agricultural Supply and Demand Estimates* (WASDE) report provides the US Department of Agriculture's (USDA) comprehensive forecasts of supply and demand for major US and global crops.

According to WASDE Report No. 477, dated December 11, 2009, total US oilseed production for 2009–2010 is projected at 97.9 million metric tons (MMT), up fractionally because of a small increase in cottonseed production. Soybean exports are increased 15 million bushels to 1.34 billion bushels reflecting the record export pace set at the end of 2009 and higher projected soybean imports by China. US export commitments (shipments plus outstanding sales) were at a record high through November 2009, up almost 60% from the previous year. With projected crush unchanged, soybean ending stocks for 2009–2010 are projected at 255 million bushels, down 15 million from the previous report.

Soybeans and product price projections were all higher. The US season-average soybean price range for 2009–2010 is projected at \$8.75 to \$10.25 compared with \$8.20 to \$10.20 in November 2009. The soybean meal price is projected at \$260 to \$310 per short ton, up \$10 on the bottom of the range. Soybean oil prices are projected at 35.5 to 38.5 cents per pound compared with 33 to 37 cents in the previous report.

Global oilseed production for 2009–2010 is projected at 428.6 MMT, down 0.3 MMT from November 2009. Foreign oilseed production accounts for most of the change with increases for soybeans, rapeseed, and cottonseed more than offset by reductions for sunflowerseed and peanuts.

Global rapeseed production is projected at a record 59.4 MMT, up 1.3 MMT from the previous report, with gains for Canada more than offsetting lower production for India. Canadian rapeseed production is raised 1.6 MMT to 11.8 MMT based on the latest survey results from Statistics Canada. Higher-than-expected yields account for the change. India rapeseed production is lowered owing to reduced harvested area. Hot, dry conditions during much of the planting season prevented harvested area from reaching earlier expectations. Global sunflowerseed production is projected at 30.7 MMT, down 1 MMT from November 2009. Lower production in Argentina and Russia accounts for most of the change. Other changes include reduced peanut production for China and India and increased cottonseed production for Pakistan.

Global oilseed trade is projected at 94.4 MMT, up 0.7 MMT from November 2009. Increased rapeseed exports from Canada and Australia and increased soybean exports from the United States account for most of the change. China soybean imports are raised 0.5 MMT to 41 MMT, just below the record 41.1 MMT imported in 2008–2009.

The most recent US 2009–2010 cotton forecasts include a slight increase in production, higher exports, and lower ending stocks. Production is raised 96,000 bales from the previous report as reductions for the Mississippi Delta states are more than offset by increases in the other three regions. Domestic mill use is unchanged. Exports are raised 500,000 bales owing to higher expected foreign import demand. Ending stocks are forecast at 4.5 million bales, 400,000 bales below November 2009, and 31% of total use. The average price received by producers is forecast at 56 to 64 cents per pound, 4 cents higher on each end of the range.

The world cotton 2009–2010 forecasts include lower beginning stocks and higher consumption relative to November 2009, resulting in a 3.6% reduction in ending stocks. Beginning stocks are lowered mainly in India and Uzbekistan owing to adjustments in the prior-year balance sheets. Production is lowered in India and Peru, but is raised in Pakistan and the United States. World consumption is raised 1.0 million bales from November 2009, including increases for China, India, Vietnam, Uzbekistan, and Thailand. World trade also is raised owing to increased demand by

several importing countries, which is partially offset by a reduction for Pakistan. The China import forecast is increased 500,000 bales to 9.0 million as the government has recently announced larger-than-expected import quotas, thereby removing a key constraint on imports and consumption. Exports are raised in the United States, Brazil, India, Pakistan, and Greece, but are lowered in Uzbekistan. World ending stocks are now forecast at 51.8 million bales.

Brazil's transportation needs

An investment of about \$30 billion through 2025 is needed to bring rail freight in Brazil up to 38% of the total carried by road, rail, and water. Railroads currently carry 25% of the country's total freight, according to a Xinhua News Agency report on the annual survey by Brazil's National Confederation of Transport (CNT).

The CNT survey found that at least \$14.5 billion is needed to expand the country's railway system from the current total mileage of 29,800 km to 40,000 km; connections to more neighboring countries are also needed, CNT said. Brazil now has railway connections with Argentina, Bolivia, and Uruguay. The country shares borders with Colombia, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela.

Brazil has invested \$10.6 billion in its railway system in the past 11 years, the CNT survey noted, and has experienced a 95% growth in cargo transportation of primarily iron ore, soybeans, and fuel between 1997 and 2008.

Bunge builds Vietnamese plant

Bunge Vietnam, the wholly owned subsidiary of Bunge Ltd. (White Plains, New York, USA), announced that it has begun construction within the Phu My port complex of a \$100 million integrated soybean processing plant—the first of its kind in Vietnam.

When fully completed, the facility will have soybean crushing and multi-oil refining/bottling capabilities. The first phase of the two-part project includes assembling a 3000-metric-ton-per-day crushing line with

related flat and vertical storage for raw materials and end products. First-phase operations are scheduled to begin in early 2011.

Corn for control of lipid oxidation

Using a nanoparticle from corn, a Purdue University (West Lafayette, Indiana, USA)

scientist has found a way to lengthen the shelf life of many food products and sustain their health benefits.

Food scientist Yuan Yao has successfully modified the phytylglycogen nanoparticle, a starchlike substance that makes up nearly 30% of the dry mass of some varieties of sweet corn. The modification allows the nanoparticle to attach to oils and emulsify

them while also acting as a barrier to oxidation. His findings appeared in the early online version of the *Journal of Agricultural and Food Chemistry* (<http://pubs.acs.org/doi/abs/10.1021/jf903170b>).

"This can be widely used in the food industry, cosmetics and nutritional supplements—any system in which the oxidation of lipids is a concern," Yao said. ■

Acquisitions/mergers

Cargill announced in December 2009 that it has entered into an agreement to purchase **Goodman Fielder's** Commercial Edible Fats and Oils business. The A\$240 million (more than US \$216 million) purchase includes four fats and oils refining assets located in West Footscray in Melbourne; Murarrie in Brisbane; Bunbury near Perth; and East Tamaki in Auckland, New Zealand. Goodman Fielder will retain title to the land at the Brisbane facility, which is subject to an extended lease-back to Cargill. The sale also involves a long-term supply agreement under which Cargill will supply refined fats and oils products to Goodman Fielder. The purchase is subject to a number of conditions, including approval from the Australian Competition and Consumer Commission (ACCC).

■■■

Crown Iron Works has acquired **Harburg-Freudenburger's** (HF) solvent extraction technology, the companies announced in December 2009. The acquisition includes all design and technology in HF's Solvent Extraction division including the Carousel Extractor and the Flash Desolventizing System. Crown Iron Works (a CPM Company) is based in Roseville, Minnesota, USA; HF has headquarters in Hamburg, Germany.

■■■

The Procter & Gamble Co. (Cincinnati, Ohio, USA) announced in December that it will acquire the Ambi Pur global air care brand from the **Sara Lee Corp.** (Downers Grove, Illinois, USA) for €320 million (about \$470 million). The transaction, which is subject to customary closing

conditions and regulatory clearances, is expected to close in the current P&G fiscal year, which ends on June 30, 2010. Under the terms of the agreement, P&G will acquire Ambi Pur and several toilet care products with strong presence in Western Europe and Asia.

Commodities

COCONUT OIL

It was likely in December 2009 that the Philippines would miss its 2009 export target for coconut oil by 5–6% because of high local demand for biofuels, according to an article in the *Manila Standard* newspaper. Coconut oil export receipts were also expected to decline by 46% to \$558.4 million from \$1.034 billion in 2008.

ECHIUUM OIL

Bioriginal Europe/Asia B.V. of the Netherlands has obtained novel food approval in Europe for its refined Echium oil. The oil can now be used in food and dietary supplements as well as cosmetics. The oil is said by Bioriginal to contain a minimum of 12% stearidonic acid, around 33% α -linolenic acid, and about 12% γ -linolenic acid.

OLIVE OIL

A recent review article by authors from the University of Alcalá in Spain examines 77 traceability studies aimed at finding out the botanical origins of olive oil. The review authors conclude that methods do not exist that will provide regulatory agencies with a foolproof way to confirm the authenticity of olive oil. New traceability markers less influenced by environmental conditions, fruit ripening, and extrac-

tion technology are needed. The article appeared in the *Journal of Agricultural and Food Chemistry* (58:28–38, 2010).

PALM OIL

Indonesia's crude palm oil (CPO) production now controls almost 14.4% of the world's vegetable oil market, Agriculture Minister H. Suswono said in December 2009, according to the Asia Pulse newswire. Further, he noted that Indonesia's CPO controlled 44.7% of the world's CPO market. Together with Malaysia, Suswono said, Indonesia controlled 85% of the world's CPO market.

In a second report from Jakarta, the Indonesian Trade Ministry announced in late December that it would increase the export tax for palm oil from zero to 3% in January 2010 to ensure domestic supply.

SUNFLOWER OIL

Cargill was the largest exporter of sunflower oil in Ukraine in marketing year 2008–2009, with 376,000 metric tons (MT), according to the APK-Inform Agency. The top five also included Holding Grain Trading Co., with 224,200 MT; Suntrade, with 149,200 MT; Kernel Trade, with 143,000 MT; and Myronivsky Plant for Manufacturing Groats and Feeds, with 113,300 MT. APK-Inform is an agribusiness information and consulting agency based in Dnipropetrovsk, Ukraine.

R&D

Proteins extracted from Atlantic cod can keep metal and plastic surfaces clean. These antifouling properties could come in handy as nonstick coatings on medical implants, according to Saju Pillai, Ayyoob Arpanaei, and Peter Kingshott at Denmark's Aarhus University (*Biomacromolecules* 10:2759–2766, 2009). ■

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This Code has been adopted by the AOCS to define the rules of professional conduct for its members. As a condition of membership, it shall be signed by each applicant.

AOCS Code of Ethics • Chemistry and its application by scientists, engineers, and technologists have for their prime objective the advancement of science and benefit of mankind. Accordingly, the Society expects each member: 1) to be familiar with the purpose and objectives of the Society as expressed in its Bylaws; to promote its aim actively; and to strive for self-improvement in said member's profession; 2) to present conduct that at all times reflects dignity upon the profession of chemistry and engineering; 3) to use every honorable means to elevate the standards of the profession and extend its sphere of usefulness; 4) to keep inviolate any confidence that may be entrusted to said member in such member's professional capacity; 5) to refuse participation in questionable enterprises and to refuse to engage in any occupation that is contrary to law or the public welfare; 6) to guard against unwarranted insinuations that reflect upon the character or integrity of other chemists and engineers.

I hereby subscribe to the above Code of Ethics.

Signature of Applicant _____

Briefs

A new website out of Canberra, Australia, www.world-of-algae.com, has been created by David Sieg and Steve Ewings. It is intended to provide up-to-date information and a full range of do-it-yourself algae products. The site promotes two of Sieg's e-books, *Making Algae Biodiesel at Home* and *Making Photobioreactors at Home*. Whereas large companies are pouring millions of dollars into algal research, very little information or practical advice exists for the average householder. World-of-Algae aims to provide a repository of useful information and advice on the Internet. Another product that is being promoted is an Algae Educational Kit, which, according to Ewings, "was developed for both the school and home." The kit contains a workbook, lesson plans, nutrient solution, light, valving, pump, and other laboratory equipment needed to grow algae on a small scale.



Researchers from the University of California-Los Angeles have genetically modified the cyanobacterium *Synechococcus elongatus*, by increasing the quantity of the CO₂-fixing enzyme RuBisCO, to produce liquid isobutanol photosynthetically from CO₂. Isobutanol holds promise as a gasoline alternative. Advantages of the reaction include recycling of CO₂, thus reducing greenhouse gas emissions from the burning of fossil fuels, and conversion of CO₂ into a liquid fuel that can be used in today's automobiles. The article is available from *Nature Biotechnology* (27:1177–1180, 2009) and online at www.nature.com/nbt/journal/v27/n12/abs/nbt.1586.html.



In partnership with the US Department of Energy-affiliated Clean Cities chapters, the United Soybean Board (USB) is again promoting the availability and use of soy biodiesel in 2010. The Clean Cities program is a government-industry partnership whose chapters work to reduce petroleum consumption. USB asked Clean Cities applicants to

CONTINUED ON NEXT PAGE

Biofuels News



BIODIESEL

Canadian trains test biodiesel

Canadian Pacific and Natural Resources Canada are cooperating in a biodiesel fuel pilot project under the National Renewable Diesel Demonstration Initiative (NRDDI). Through their efforts biodiesel is being used for the first time in Canadian cold-weather rail service.

The government of Canada intends to regulate an average 5% renewable fuel content based on the national gasoline poll as of 2010, as well as require an average 2% renewable content in diesel fuel and heating oil by 2011 or earlier, subject to technical feasibility. The NRDDI provides an opportunity for real-world testing and performance evaluation in advance of regulatory action.

According to Fred Green, president and chief executive officer of Canadian Pacific, "This partnership with the Government of Canada is an opportunity to test the reliability of biodiesel in cold weather, ensuring we continue to provide safe and efficient

operations for customers across North America."

As part of the five-month test cycle, Canadian Pacific is operating four GE AC4400 Diesel Locomotives with FDL-16 engines in captive service between Calgary and Edmonton. Calgary-based 4Refuels is supplying the fuel.

Canadian Pacific will perform routine mechanical examinations of the locomotives to determine if 5% biodiesel mixed with petroleum diesel (B5) has any significant adverse effects on a locomotive or its associated systems in a cold-climate operation.

Biodiesel production in US curtailed

The US government tax credits of \$1 per gallon for blenders of biodiesel and \$0.10 per gallon for biodiesel producers expired on December 31, 2009. Without these tax credits, a number of biodiesel refineries across the nation curtailed or canceled production.

A one-year extension of the credits had passed the House of Representatives in

develop programs that communicate the benefits of soy biodiesel through education, demonstrations, and promotional activities in suburban and urban areas. The USB provided up to \$100,00 to fund these soy biodiesel communications programs.



China's first non-grain-ethanol production facility began operations at the end of 2009. The China National Cereals, Oils and Foodstuffs Corp. (COFCO Group), China's largest food processing, manufacturer, and trader, is producing ethanol from cassava in Beihai, Guangxi Province. Beihai has dedicated 150,000 Mu (10,000 hectares) to growing the plant; estimated



yield is 225,000 metric tons (MT) annually. Facilities for processing the cassava in Guangxi Hepu Industrial Park in Beihai have been scaled for 200,000 MT of ethanol, 50,000 MT of feed, 29.7 million cubic meters of methane, and 50,000 MT of carbon dioxide per year.



The National Algae Association is proposing to sponsor and conduct an Algae Production Certification Program. Topics to be covered include algae strains and cultivation; growing, lighting, harvesting, extraction; and benchmarking, cost analysis, and economics. Instructors are being sought for this program. For further information about employment in the program or about enrolling, go to www.nationalalgaeassociation.com. ■

early December, but it stalled in the Senate as legislators dealt with the extensive debate on revisions to the health care bill. Finance Committee Chairman Max Baucus (D-Montana) and Charles Grassley (R-Iowa), the committee's top Republican, said on December 22 that they would propose legislation to extend these as soon as possible when the Senate reconvened (January 19) after the Christmas holiday in 2010. Grassley added, "I look forward to working with Chairman Baucus to retroactively extend these provisions. . . ." However, on January 5 Grassley indicated he did not think there would be a vote on the extension until February or even March.

Without the tax incentive, the price of blended biodiesel exceeds the cost of straight petroleum diesel, the price of which has also fallen since the highs in mid-2008. With this situation, there is little reason for petroleum marketers to purchase biodiesel blends for sale to the consumer. In the absence of demand for biodiesel blends, there is little need to manufacture biodiesel.

For example, Renewable Energy Group (REG; Ames, Iowa, USA) notified customers that, "Effective Jan. 1, 2010, Renewable Energy Group's price sheet will reflect B100 [i.e., 100% biodiesel, with no admixed petroleum diesel] as the only available product until the tax credit is officially extended." BiofuelsDigest.com quoted REG Chief Operating Officer Daniel J. Oh as saying, "REG is evaluating feedstock pricing, demand opportunities, production levels and in turn, staffing options for each one of the biodiesel plants in our nationwide network to determine the best outcome for our customers and company. . . . We expect some limited biodiesel demand to remain in the marketplace, despite the tax credit lapse."

The Associated Press reported on January 1 that the nation's largest biodiesel refinery, in Houston, had shut down in response to nonrenewal of the tax credit. Small producers too announced closure.

According to the National Biodiesel Board (NBB), at the end of 2009 the country's biodiesel industry was operating at only 15% of its potential capacity of 2.7 billion gallons per year, largely because the price of traditional diesel had collapsed.

Glycerine prices

In response to curtailments in the production of biodiesel (see preceding story), there

may be sharp increases in the price for crude glycerine, according to ICIS.com (January 6). The main source of crude glycerine in the United States at present is the biodiesel industry; glycerine is a co-product in the transesterification of fats and oils to form fatty acid methyl esters (biodiesel).

ICIS.com also pointed out that Archer Daniels Midland (Decatur, Illinois, USA) may put more pressure on the glycerine market in the near future when its renewable propylene glycol plant starts up during the first quarter. The plant has a nameplate capacity of up to 125,000 metric tons per year and is expected to be a huge draw on US crude glycerine.

"Domestic glycerine sellers said prices could jump by as much as \$0.10/lb . . . in the next few months" until suppliers in Asia and Europe fill the breach, according to ICIS.com.

Europe protests Argentine imports

Argentine biodiesel exports to the European Union countries increased from less than 5,000 tons in July 2008 to almost 100,000 tons per month in July 2009. At the end of December, the European Biodiesel Board (EBB) predicted Argentine exports would exceed 1 million metric tons, compared with only 70,000 metric tons in 2008. The EBB attributed this surge in Argentine biodiesel exports to the EU to a set of differentiated



export taxes (DET) and said they created an artificial incentive for production and export of the finished product—biodiesel—rather than its raw material, or soybean oil.

The differential between the 32% export tax on soybean oil and the 20% export tax on biodiesel creates an incentive to process soybean oil into biodiesel rather than to export it, says the EBB. Furthermore, the EBB claims that *ad hoc* implementation of rules makes the differential closer to 20%, rather than the 12% that initially appears to exist.

The EBB is investigating possible dumping practices by Argentina, as well as the compatibility of Argentine DET with World Trade Organization rules.

Biodiesel from Argentina at present enjoys duty-free access to the EU biodiesel market as coming from a developing country, whereas Argentina levies a 14% customs duty on biodiesel from Europe and other countries.

Nanoparticles catalyze biodiesel production

Currently, the most widely used processes for making biodiesel involve mixing a hydrophobic liquid, such as palm or soybean oil, with a hydrophilic alcohol, such as methanol, in the presence of a catalyst such as lye. The reaction produces biodiesel (fatty acid methyl esters), glycerine, perhaps a bit of soap, water, and residual alcohol. This mixture, when allowed to stand, will separate into layers. Glycerine can be drained off the bottom, but most of the impurities will concentrate in the region between the glycerine and the biodiesel. The steps needed to purify the biodiesel can be tedious, and of course add to the cost.

Researchers in the School of Chemical, Biological, and Materials Engineering at the University of Oklahoma (Norman, USA) have developed new solid catalysts that can stabilize water-oil emulsions and catalyze reactions at the liquid/liquid interface (Crossley, S., *et al.*, *Science*: doi:10.1126/science.1180769).

The catalysts consist of palladium deposited onto carbon nanotube-inorganic oxide hybrid particles. The oxides are hydrophilic, and the nanotubes are hydrophobic. In an accompanying perspective piece in

Science (doi: 10.1126/science.1184556) David Cole-Hamilton of the University of St. Andrews, Scotland, described these as “Janus catalysts,” which sit at the surface like a large surfactant molecule. However, the nanoparticles are solids, unlike a surfactant, and can be easily separated/recovered.

The Oklahoma researchers studied two preparations with nanotubes of different types. The solid nanotubes localized at the interface between homogeneous liquid phases (e.g., hydrophobic soybean oil or palm oil, and an alcohol such as methanol) and formed an emulsion in a layered configuration: oil/emulsion/water. By removing oil-soluble products from the top layer and water-soluble products from the bottom layer, the reaction could continue in the emulsion without experiencing inhibition by-product formation.

Formation of the emulsion maximized the extent of the interface at which the reaction occurred.

Hydrogenation was the dominant reaction at ~100°C, hydrogenolysis at 200°C, and decarbonylation at 250°C.

Potential advantages of these Janus catalysts include the greater amount of precision and control that would be available to fuel makers, and speedier reaction times. *Ars Technica* (<http://arstechnica.com/science/news/201%1/nanoparticles-make-biofuel-production-more-efficient.ars>) pointed out that filtration methods and reusability of the catalyst particles were not addressed in the research report.

Jatropha and karanja for biofuel

The Indian Oil Corporation (IOC) plans to acquire 50,000 hectares of wasteland in Uttar Pradesh for the purpose of growing jatropha (*Jatropha curcas*) and karanja (*Pongamia*). IOC also intends to acquire wasteland in the Lalitpur area near Jhansi and plant jatropha. Seeds will be harvested and the oil from them used for biodiesel production. B.M. Bansal, director of business development at IOC, told the *Business Standard* on January 5, “Plantation . . . will be done partly by IOC and partly through contract farming.”

The company already has 30,000 hectares in Chhattisgarh and 2,000 hectares in Madhya Pradesh. Bansal said 1,000 hectares

had already been planted, and 10,000 hectares will be planted in 2010. Harvest is anticipated to commence in three or four years.

IOC has also set up a Memorandum of Understanding with Indian Railways to plant jatropha on railway land.

Biodiesel produced by the IOC has met international standards. Indian Railways and Haryana Roadways, in cooperation with the IOC, have used biodiesel in 5% and 10% blends with petrodiesel and recorded a 10–15% reduction in density of smoke emitted by the locomotives with the blended product.

Biofuel production in Indonesia falls

Indonesia fell far short of meeting the target it set for itself for use of biofuels in 2009. Petrol sold by state-owned oil and gas company PT Pertamina was mandated to contain at least 1% biofuel. The major reason for the shortfall was that prices of crude palm oil (CPO), the major feedstock, rose more than 57% in 2009 because of demand from India and China, the world’s largest consumers. Also, reduced supplies of soybeans resulting from drought in South America early in the year led to increased demand for CPO.

Biofuel producers spent much of 2009 waiting for the government to formulate the benchmark biofuel price and the subsidy level. Ultimately, the subsidy for 2009 was Rp 1,000 (\$0.11) per liter. (The subsidy for 2010 is set for Rp 2,000 per liter.)

Evita Legowo, director general of oil and gas at the Energy Ministry, was quoted by *The Jakarta Globe* newspaper (January 3, 2010) as saying, “Biofuel production slumped last year because biofuel companies were waiting for assurance on the government subsidy, as the palm oil [price] rise meant it was not economically feasible to develop without the subsidy.”

According to the *Globe*, total biofuel production in the country was 104,100 kiloliters in 2009, a 96% fall from the 2.56 million kiloliters in 2008. The Indonesian Biofuel Producers Association reported that six out of 11 Indonesian palm oil-based biodiesel firms halted production during 2009. The other five were at below 5% of capacity.

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ETHANOL

Valero buys more ethanol plants

San Antonio, Texas-based petroleum refiner Valero Energy entered the ethanol-production field in April 2009 by purchasing five ethanol production facilities belonging to the bankrupt VeraSun Energy Corp. (Sioux Falls, South Dakota, USA; see *inform* 20:422, 2009). The ethanol facilities were subsumed under the name Valero Renewable Fuels Company, LLC, and the latter announced in mid-December that it had agreed to buy two more ethanol plants from ASA Ethanol Holdings, LLC; these also had previously been owned by VeraSun Energy. Valero also received approval from a bankruptcy court to acquire Renew Energy's 100 million gallon (380 million liter) per year facility located near Jefferson, Wisconsin.

Valero said it purchased the three plants for roughly 41% of their estimated replacement cost.

These purchases expand the company's ethanol production capacity to 1.1 billion gallons (4.2 billion liters) per year. Production at the two VeraSun plants will likely restart by the end of the second quarter; both plants will also produce dry distillers' grains, which will be sold as livestock feed. The Renew facility has been operating at reduced rates but should resume full production during 2010.

Philippines invites "gin-makers" to produce bioethanol

The Philippine Department of Energy is thinking of offering the country's "gin-makers" the opportunity to switch their production from alcohol as a beverage to alcohol as a fuel. The reasoning behind this action is that the government anticipates the supply of ethanol in 2011 will not be adequate for the Biofuels Law, which mandates that all gasoline be blended with 10% ethanol by February 2011.

Although San Carlos Bioenergy Inc. (San Carlos City), Leyte Agricultural Inc. (Ormoc City), and Roxol Bioenergy Corp. (La Carlota City) are expected to be able supply the country with 183 million liters of ethanol in 2011, the government calculates

that demand will be 218 million liters in that year, according to the *Manila Bulletin* newspaper (January 5, 2010).

ALGAE

Solix supplying algal biofuel samples

Solix Biofuels, based in Fort Collins, Colorado, USA, has been sending algae-based biofuel from its new demonstration facility to potential partners for testing for six months. The company's Coyote Gulch Demonstration Facility, located on a two-acre site in southwestern Colorado on land provided by the Southern Ute Indian Tribe, began production in July 2009. Doug Henston, chief executive officer of Solix, told *Cleantech.com* (January 5, 2010), "We are very pleased with scale-up of production. . . Now we're paring back . . . because shorter days of the winter season means less sunlight, and less algae production."

Algae and animal feeding

XL Renewables (Phoenix, Arizona, USA) is marketing its Super Trough System, an on-farm patent-pending system of troughs designed for cost-effective, large-scale algae production and harvest. Liners for the troughs carry carbon dioxide gas and nutrients the algae need for growth. The company claims the system uses 80% less horsepower per acre in growing the algae than a high-rate raceway system with paddlewheels (see *inform* 19:432–437, 2008).

Troughs are 5 feet (1.5 m) wide and 18 inches (46 cm) deep. The company intends their system to be implemented in 40-acre units. Capital costs are estimated at \$5–7 million per 160 acres, and annual algae yields at about 50 tons or more per acre. Net income is estimated as \$10,000 per acre.

In mid-October the company signed a Memorandum of Understanding with Hong-Kong-based Biofuels HK Limited to build a 2,880-acre algae farm in China. The project goal is to produce 150,000 metric tons of algae and extract about 16 million gallons of algae oil annually for the Chinese biofuels market. A 40-acre pilot facility is scheduled to be constructed in 2010.

According to *Western Farm Press* (http://westernfarmpress.com/news_archive/microalgae-feed-0104-) XL Renewables is investigating the advantages of co-locating algal farms with concentrated animal feeding operations. Algae could be fed to animals and provide them with omega-3 fatty acids. Nutrients from the manure and urine of the animals could be fed to the algae. Excess excrement could be sent through a digester to produce methane, which could be oxidized to CO₂ and then pumped back to the algae.

RENEWABLE DIESEL

Hawaiian Electric chooses renewable biodiesel for generator

Hawaiian Electric Company (HECO; Honolulu, USA) announced in January that it had signed a contract with a subsidiary of Renewable Energy Group (REG; Ames, Iowa, USA) to supply three to seven million gallons (11–27 million liters) of renewable biodiesel per year for two years to be used for Hawaiian Electric's new 110-megawatt combustion turbine generator unit at Campbell Industrial Park Generating Station.

REG, which won an earlier bid to supply biodiesel for emissions testing in the unit, emerged as winning bidder from among eight companies seeking to fill the two-year contract. As in the earlier contract, the new two-year agreement calls for REG to supply high-quality biodiesel processed from used cooking oil and waste animal fat.

Delivery of the biodiesel could begin within about four months of approval by the Hawaii Public Utilities Commission.

"Utilizing biodiesel as a source for electric power generation is a sustainable, efficient, clean-burning alternative," said Jeff Stroburg, REG chairman and chief executive officer. "According to the US Energy Information Administration, more than 600 million gallons of foreign petroleum are burned each year for electric power generation. Using biodiesel helps HECO, their neighbors, and the entire power generation industry breathe better." ■

Briefs

Food-borne diseases are far more deadly than the United Nations' World Health Organization (WHO) previously estimated, according to the Reuters news agency. In people over the age of five years in Southeast Asia and Africa, 1.2 million deaths per year are from unsafe food, the agency now says. This figure is three times more adult deaths than the Geneva-based WHO had thought occurred in the whole world.

■■■

The Center for Science in the Public Interest (Washington, DC, USA) has proposed a makeover for nutrition labeling, including more emphasis on calories, added sugars, saturated and *trans* fats, and sodium. The consumer advocacy group is also calling on the US Food and Drug Administration to crack down on deceptive health claims, to mandate the labeling of caffeine content, and to disallow companies from claiming that a product contains zero grams of *trans* fat if it is high in saturated fat.

■■■

Front-of-pack traffic-light nutrition labeling did not change the purchasing habits of consumers over a four-week period, according to results of a study published in *Health Promotion International* (24:344–352, 2009). The researchers, led by Gary Sacks of the University of Oxford's School of Exercise and Nutrition Sciences, suggested that further research is needed. Traffic-light labels are so called because they use red, amber, and green to signify whether foods are high in certain nutrients. ■

information

Did you know that *inform* provides news updates on the AOCS homepage at www.aocs.org? As well as alerts on Twitter at www.twitter.com/theAOCS and Facebook at www.facebook.com/AOCSFan?



Health & Nutrition



Soy and breast cancer

A step in answering the question “Is soy food consumption safe for women with breast cancer?” has been taken by a study published in the *Journal of the American Medical Association* (302:2437–2443, 2009).

Research led by Xiao Ou Shu of the Vanderbilt University Medical Center in Nashville, Tennessee, USA, finds that “among women with breast cancer, soy food consumption was significantly associated with decreased risk of death and recurrence.” As an accompanying editorial (*JAMA* 302:2483–2484, 2009) notes, the observational study of a cohort of 5,042 breast cancer patients in Shanghai was “well-designed” and shows the way toward studies in larger cohorts with longer follow-up periods. (The follow-up period in the Shu study was four years.)

“This new research from Shanghai is consistent with the clinical evidence showing that soy foods are safe for women with breast cancer,” commented Mark Messina, an adjunct associate professor at Loma Linda University in California, USA,

and president of the Nutrition Matters, Inc. consultancy in Port Townsend, Washington, USA. “And with the additional findings that soy consumption may actually improve prognosis, this study should help put women’s minds at ease about consuming these foods during and after treatment for breast cancer.”

The researchers analyzed data from the Shanghai Breast Cancer Survival Study, a large, population-based study of 5,042 female breast cancer survivors in China. Women aged 20 to 75 years with diagnoses of breast cancer between March 2002 and April 2006 were recruited and followed through June 2009. Information on cancer diagnosis and treatment, life style factors after cancer diagnosis, and disease progression was collected at approximately six months after cancer diagnosis and was reassessed at three follow-up interviews conducted at 18, 36, and 60 months after diagnosis. A Shanghai Vital Statistics Registry database was used to obtain survival information for participants who were lost to follow-up.

After a median follow-up of 3.9 years, 444 total deaths and 534 recurrences or breast cancer-related deaths were documented among the group of 5,033 surgically-

treated breast cancer patients. Soy food intake, as measured by either soy protein or soy isoflavone intake, was inversely associated with mortality and recurrence. Patients in the group with the highest intake of soy protein had a 29% lower risk of death during the study period, and a 32% lower risk of breast cancer recurrence compared to patients with the lowest intake of soy protein. The adjusted four-year mortality rates were 10.3% and 7.4%, and the four-year recurrence rates were 11.2% and 8.0%, respectively, for women with the lowest and highest groups of soy protein intake.

“The inverse association was evident among women with either estrogen receptor-positive or -negative breast cancer and was present in both users and nonusers of tamoxifen,” the researchers write.

The drug tamoxifen is prescribed to reduce the recurrence of breast cancer in patients with estrogen receptor-positive breast cancer. It works by blocking the estrogen receptors and preventing estrogen from attaching to them. Soy contains phytoestrogens such as the isoflavone genistein, which can act as an estrogen in the body. The concern has been that soy foods may interfere with tamoxifen by binding to estrogen receptors in the body.

“In summary, in this population-based prospective study, we found that soy food intake is safe and was associated with lower mortality and recurrence among breast cancer patients. The association of soy food intake with mortality and recurrence appears to follow a linear dose-response pattern until soy food intake reached 11 grams/day of soy protein; no additional benefits on mortality and recurrence were observed with higher intakes of soy food. This study suggests that moderate soy food intake is safe and potentially beneficial for women with breast cancer.”

New work on soy peptide

Two University of Illinois at Urbana-Champaign (U of I; USA) studies report that lunasin, a soy peptide often discarded in the waste streams of processing plants, may have health benefits that include fighting leukemia and blocking the inflammation that accompanies such chronic health conditions as diabetes, heart disease, and stroke.

“We confirmed lunasin’s bioavailability in the human body by doing a third study in which men consumed 50 grams of soy protein—one soymilk shake and a serving of soy chili daily—for five days. Significant levels of the peptide in the participants’ blood give us confidence that lunasin-rich soy foods can be important in providing these health benefits,” said Elvira de Mejia, a U of I professor of food science and human nutrition.

In the cancer study, de Mejia’s group identified a key sequence of amino acids—arginine, glycine, and aspartic acid (the RGD motif)—that triggered the death of leukemia cells by activating a protein called caspase-3.

“Other scientists have noted the cancer-preventive effects of the RGD sequence of amino acids so it’s important to find proteins that have this sequence,” she said.

The scientists also verified lunasin’s ability to inhibit topoisomerase 2, an enzyme that marks the development of cancer, and they were able to quantify the number of leukemia cells that were killed after treatment with lunasin in laboratory experiments.

In another study, the first to report lunasin’s potential anti-inflammatory activity, they showed that lunasin blocked or reduced the activation of a marker called NF-kappa-B, a link in the chain of biochemical events that causes inflammation.

They also found statistically significant reductions in interleukin-1 and interleukin-6, both players in the inflammatory process. The reduction in interleukin-6 was particularly strong, de Mejia said.

Although inflammation is linked in the public mind with chronic health problems such as heart disease and diabetes, she noted that it also plays a role in the development of cancer. “We know that chronic inflammation is associated with an increased risk of malignancies, that it’s a critical factor in tumor progression,” she said.

Although the high cost of obtaining lunasin from soy waste limits its use for nutritional interventions, soy flour does contain high concentrations of the peptide, she added.

And de Mejia utilized the USDA soybean germplasm collection housed at the U of I, studying 144 soy genotypes to learn which varieties contain the most lunasin.

“Some genotypes contain very high concentrations of lunasin, others contain no

lunasin, and some locations yield more lunasin-rich beans than others,” she said.

The leukemia study was published online in *Molecular Nutrition & Food Research* (doi: 10.1002/mnfr.200900073). Lunasin’s anti-inflammatory effects were described in *Food Chemistry* (114:108–115, 2009). Both studies were funded by the USDA Future Food Initiative.

The plasma and genotype studies appeared in the *Journal of Agricultural and Food Chemistry* (57:1260–1266, 2009). The environmental conditions study was published in the *Journal of AOAC International* (91:936–946, 2008).

Roe as source of omega-3s

The roe of hake, lumpsucker, and salmon are an “adequate” dietary source of omega-3 fatty acids, according to a study by researchers at the University of Almería (UAL) in Spain.

The scientists analyzed the eggs, or roe, of 15 marine animals, and found all of these contained more than 30% of their fatty acids as EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). These long-chain polyunsaturated fatty acids (LC-PUFA) are much in demand for their heart-healthy qualities.

Previous work recommended edible roe from fish species as a source of LC-PUFA. The new study looked at roe from marine species commonly eaten in several Mediterranean countries.

“We have classified these eggs as unequivocal sources of omega 3, and have proven that this appears at high concentrations in all the species studied,” José Luis Guil Guerrero, director of the study and a researcher in the Food Technology Department of the UAL, told the Scientific Information and News Service.

The results show that omega-3 fatty acids are present in all fish roe, but especially in the eggs of Atlantic bonito (*Sarda sarda*), mackerel (*Scomber scombrus*), squid (*Loligo vulgaris*), cuttlefish (*Sepia* sp.), lumpsucker (*Cyclopterus lumpus*), hake (*Merluccius merluccius*), and salmon (*Salmo salar*). Further, the researchers found most of the studied species showed saturated fatty acid contents between 20 and 30%, monounsaturated fatty acid contents above 20%, and LC-PUFA contents above 40%.

(The fatty acid percentages were based on dry weight of roe.)

"Results obtained in this work suggest that further investigation is desirable in this field: e.g., the correlation between dietary fatty acid and fatty acid composition in roe from farmed fishes, the determination of the lipid classes in the better EPA and DHA sources . . . and their positional analysis to know how these PUFA are distributed into triacylglycerols and other lipid classes," the authors write.

CLA and chick embryo mortality

Studies have shown that giving laying hens supplements of conjugated linoleic acid (CLA) led to the death of developing embryos. Now researchers think they know why.

Egg yolks from chickens fed a conventional diet contain little or no CLA. Chicken eggs can be enriched to contain 11% CLA by feeding 50 grams CLA per kilogram in the laying hen diet, but dietary CLA can cause 100% embryo mortality in fertile eggs of chickens and Japanese quail by inhibiting stearoyl-CoA desaturase. This enzyme catalyzes the insertion of a double bond between the C9 and C10 atoms of either 16:0 or 18:0 fatty acids in 16:1n-7 and 18:1n-9, respectively.

Thus, the inhibition of stearoyl-CoA desaturase can lower the levels of mono-unsaturated fatty acids or unsaturated fatty acids (UFA) and elevate the levels of saturated fatty acids (SFA).

The findings, which were reported in the *Journal of the Science of Food and Agriculture* (89:2687–2691, 2009), concluded that CLA was not directly toxic for the developing embryo. Instead, CLA caused mortality in the fertile eggs by increasing the ratio of SFA to UFA in the egg yolk.

Role of fat intake in weight gain

The role of dietary fat in obesity and weight gain is disputed. A new study suggests that the percentage of calories that subjects got from fat (vs. protein or carbohydrates) had nothing to do with how much weight they gained over time.

In the study, researchers led by Nita G. Forouhi of the Institute of Metabolic Science, Cambridge, UK, examined data on almost 90,000 men and women from six countries participating in the European Prospective Investigation into Cancer and Nutrition Study. Participants were followed for up to 10 years.

Average fat intake ranged from 31.5% to 36.5% of total calories. On average, people gained about a quarter of a pound every year. But analyses that accounted for several factors found no relationship between how much weight people gained and how much fat they ate, or their intake of polyunsaturated fats vs. saturated fats.

The researchers noted that the findings should not be seen as showing that people can eat as much fat as they want. The study appeared in the *American Journal of Clinical Nutrition* (90:1632–1641, 2009).

Balanced protein intake = long life?

Getting the correct balance of proteins in the diet may be more important for healthy

aging than reducing calories, a recent study suggests.

The research may help explain why caloric restriction—reducing food intake while maintaining sufficient quantities of important nutrients—appears to have health benefits. In many organisms, such as the fruit fly (*Drosophila*), mice, rats, and the rhesus monkey, these benefits include living longer. Evidence suggests that dietary restriction can have health benefits for humans, too, though it is unclear whether it can increase longevity.

In their studies of fruit flies, researchers led by Richard C. Grandison of University College in London found that levels of the amino acid methionine were crucial to maximizing lifespan without decreasing fertility. Adding methionine to a low-calorie diet boosted fertility without reducing lifespan; likewise, reducing methionine content in a high-calorie diet prolonged lifespan. Previous studies have also shown that reducing the intake of methionine in rodents can help extend lifespan.

The work appeared in *Nature* (462:1061–1064, 2009). ■

Oil content for biodiesel feedstocks

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In December, *The New York Times* reported that Monsanto Co. (St. Louis, Missouri, USA) issued letters to farm associations and seed companies stating that it would allow farmers to continue using its Roundup Ready I soybeans after the expiration of its Roundup Ready I soybeans patent in 2014. The company's move is in response to speculation that it plans to pressure farmers and seed companies to adopt its new, more expensive product, Roundup Ready 2 Yield.

■ ■ ■

Syngenta AG (Basel, Switzerland) announced in late December that it has received approval for cultivation of its genetically modified (GM) corn trait Bt11xGA21 from the Ministry of Agriculture in Argentina. Bt11xGA21 is a double-stacked corn trait combining insect resistance and herbicide tolerance in a single product. The product will be available to Argentine growers for the 2010/2011 season.

In related news, the company also announced that it had licensed a number of cotton varieties and certain cotton technology to the Dow AgroSciences subsidiary of Dow Chemical Co. (Midland, Michigan, USA). Terms were not disclosed. In a statement in January, Syngenta said that the license would enable Dow AgroSciences to develop and commercialize combinations of what Syngenta calls its COT102 transgenic event, which helps cotton resist insects, with the agricultural crop traits produced by the Dow subsidiary.

■ ■ ■

FuturaGene PLC announced in January that it had been granted a second cell wall modification patent in Japan. The new patent augments the Japanese patent issued in April 2009 and covers additional proteins. Both patents cover transgenic plants expressing cell wall-modifying proteins that result in higher biomass, faster growth rate, higher cellulose content, higher amenability for digestion by ruminants, or increased resistance to heat, biodegradation or pests and apply to the company's genetic research and development into global forestry, biofuel, and agricultural markets. ■

Biotechnology News



Sunflower genome project announced

The sunflower family includes a number of valuable food crops, with sunflower-seed production alone valued at about \$14 billion annually. Yet the sunflower family is the only one of a handful of economically important plant families where a reference genome is not available to enable the breeding of crops better suited to their growing environment or consumers' tastes.

A new research project, largely funded by Genome Canada, Genome BC, the US Departments of Energy and Agriculture, and France's INRA (National Institute for Agricultural Research), will create a reference genome for the sunflower family—currently the world's largest plant family, containing 24,000 species of plants, including many crops, medicinal plants, horticulture plants, and noxious weeds.

The \$10.5 million research project, titled *Genomics of Sunflower*, will use next-generation genotyping and sequencing technologies to sequence, assemble, and annotate the sunflower genome and to locate the genes that are responsible for

agriculturally important traits such as seed-oil content, flowering, seed dormancy, and wood-producing capacity.

One of the potential applications of this research includes the creation of a hybrid variety of sunflower, grown as a dual-use crop. The wild Silverleaf species of sunflower, known for its tall, woody stalks that grow 3 to 4.5 meters tall and up to 10 centimeters in diameter, could be crossbred with a commercially valuable sunflower plant that produces high-quality seeds, capitalizing on the desirable traits of both species.

"The intent is to have the basis for a breeding program within four years," says Loren Rieseberg, a professor in the Department of Botany at the University of British Columbia. "The seeds would be harvested for food and oil, while the stalks would be utilized for wood or converted to ethanol. As a dual-use crop it wouldn't be in competition with food crops for land."

In addition, this fast-growing annual crop could be highly drought resistant, thanks to desirable traits from the Silverleaf variety, and could therefore be suitable for use in subsistence agriculture in places like sub-Saharan Africa, as well as in much of North America.

Biofuel from GE tobacco leaves?

Will tobacco be the next source of biodiesel? You be the judge.

A number of news sources picked up a story about research out of the Biotechnology Foundation Laboratories of Thomas Jefferson University (Philadelphia, Pennsylvania, USA), suggesting that bioengineered tobacco can be used as a source of biofuels.

Vyacheslav Andrianov and colleagues point out that tobacco seeds contain about 40% (dry weight) oil. On the other hand, tobacco plants yield only about 600 kg of seed per acre. (For comparison, in the central United States, a typical yield of soybeans might be 44 bushels, or 1200 kg, per acre.)

Andrianov and his coworkers have genetically engineered (GE) tobacco, a nonfood crop, so that its leaves synthesize oil. Typical un-engineered tobacco plant leaves contain 1.7–4% oil (dry weight). The GE plants were made to overexpress one of two genes: the diacylglycerol acyltransferase (DGAT) gene or the LEAFY COTYLEDON 2 (LEC2) gene. The DGAT gene modification led to about 5.8% oil (dry weight) in the leaves, or about twofold the amount of oil produced normally. The LEC2 gene modification led to 6.8% oil (dry weight). For comparison, soybeans can easily contain more than 20% oil on a dry weight basis.

The research was published online (DOI: 10.1111/j.1467-7652.2009.00458.x), ahead of publication in *Plant Biotechnology Journal*.

Sequencing of soybean genome

US Department of Agriculture (USDA) scientists are part of a team involving 18 institutions that has sequenced the majority of the soybean genome, providing an unprecedented look into how this crop converts sunlight, water, carbon dioxide, and nitrogen into protein and oil, the basic building blocks for many consumer products. Federal, state, public, and private organizations cooperated in this research, published in the journal *Nature* (463:178–183, 2010).

The team used a so-called “whole-genome shotgun” (WGS) approach to

New soybean line resists key nematode

Alfredo Flores

A new soybean line developed by US Department of Agriculture Agricultural Research Service (USDA ARS) scientists is good news for growers. The line, JTN-5109, is effective against the most virulent soybean cyst nematode, called LY1.

The soybean cyst nematode is a pervasive soybean pest worldwide. In the United States, the nematode is the most damaging soybean pest; it caused an estimated yield loss of nearly 94 million bushels in 2007. Genetic resistance has been the most effective means of controlling the pest.

Nearly all nematode-resistant soybean varieties currently available contain resistance genes from one of two sources—soybean lines “Peking” or Plant Introduction (PI) 88788. JTN-5109, however, has combined nematode resistance from three sources—“Peking,” PI 437654, and PI 567516C.

JTN-5109 is the latest soybean line developed by geneticist Prakash Arelli and his team at the ARS Crop Genetics Research Unit’s satellite laboratory in Jackson, Tennessee, USA. The soybean was developed using a combination of traditional plant breeding and genetic marker-assisted selection.

JTN-5109 provided yields of 26 bushels per acre in field studies conducted in 2008 at Jackson, and Ames Plantation near Grand Junction, Tennessee. That yield is not far below the 29 bushels per acre produced by 5601T, which is a commonly used cultivar, but one susceptible to LY1. The JTN-5109 line will be an excellent source material for breeding high-yielding soybeans with resistance to nematodes, especially for the LY1 nematode population.

Arelli collaborated on the project with scientists at the University of Tennessee (Knoxville), Michigan State University (East Lansing), Iowa State University (Ames), and the University of Missouri (Columbia), as well as the ARS Corn and Soybean Research Unit at Wooster, Ohio.

Alfredo Flores is USDA ARS public affairs specialist; he can be reached at Alfredo.Flores@ars.usda.gov.



sequence 85% of the 1.1 billion nucleotide base pairs that spell out soy’s entire DNA code. The sequence also provides researchers with a critical reference to use in deciphering the genetics of some 20,000 other legume species.

One question that may be explored with this new knowledge about the soybean

genome is how to increase the oil content of the seed.

“We can now zero in on the control points governing carbon flow towards protein and oil,” said Tom Clemente, professor, Center for Biotechnology, Center for Plant Science Innovation at the University of Nebraska, Lincoln. “With the combination

of informatics, biochemistry, and genetics we can target the development of a soybean with greater than 40% oil content.”

Monsanto's pipeline report

In early January, biotech oilseed giant Monsanto Co. (St. Louis, Missouri, USA) presented its annual R&D pipeline report. Two of the 11 projects discussed will see commercial release in 2010: Genuity™ SmartStax corn and Genuity™ Roundup Ready 2 Yield soybeans.

Genuity SmartStax corn simplifies planting of biotech corn by allowing farmers to sow one product over the entire field, rather than having to plant a separate “refuge” area. (A refuge is a section of crops that are not genetically modified to include insect-protection traits. Farmers are required to plant at least 5% of a field with nonbiotech plantings as a refuge, in order to minimize the risk of target pests developing resistance to plant-produced pesticides.) SmartStax corn was developed in collaboration with Dow AgroSciences (Indianapolis, Indiana, USA).

In January, Monsanto and Dow AgroSciences announced that they had received import regulatory approvals from Korea and Taiwan for corn grain produced from SmartStax. The food and feed safety of SmartStax corn was reviewed and approved by the Korean and Taiwan agencies charged with regulating biotech traits. These two additional approvals follow US, Canadian, and Japanese regulatory approvals announced by the companies in July 2009. Grain produced from SmartStax corn can now be imported to Japan, Taiwan, Korea, Australia, and New Zealand among other countries.

The Genuity Roundup Ready 2 Yield soybean product, which is also expected to see commercial release in 2010, is the first biotech soybean product developed specifically for the Brazilian market. It combines insect protection with yield enhancement traits.

DuPont, Monsanto react to court ruling

In January, *The News Journal* (Wilmington, Delaware, USA) reported that a US



federal court had ruled against DuPont in a licensing dispute with Monsanto Co. The ruling, handed down by US District Judge E. Richard Webber, found that DuPont was not licensed to combine (or “stack”) Monsanto’s Roundup Ready® trait with its own Optimum® GAT® trait in corn or soybeans. Further, he found that, if DuPont insisted on stacking the two traits, Monsanto “could sue DuPont for breach of contract.”

According to Scott Partridge, chief deputy general counsel for Monsanto, “The Court ruled that the Monsanto-DuPont license agreements ‘are unambiguous and do not grant Pioneer [a subsidiary of DuPont] the right to stack’ the Roundup Ready trait with the Optimum GAT trait. DuPont negotiated and signed a contract with a specific set of rights, at the financial terms they preferred, and the rights did not include making this stacked combination. This was DuPont’s business decision.”

He continued, “The court record further highlights that DuPont was authorized to create any stacked trait product with our Roundup Ready technology other than one such as Optimum GAT, a conscious business decision that they made at the time the contract was negotiated and signed. DuPont has always had the rights to create a stacked product such as Roundup Ready with its Plenish™ High Oleic soybean oil product, or adding a second herbicide tolerance mode like its proprietary ALS-herbicide-tolerance combined with Roundup Ready.”

DuPont disagreed. In a statement, the company said that it plans to pursue license, antitrust, and patent fraud claims against Monsanto.

“This litigation is just beginning,” said Tom Sager, DuPont senior vice president

and general counsel. “By gathering further evidence through the discovery process and proceeding quickly to trial, we will demonstrate that DuPont has the legal right to provide farmers with the best yielding, most innovative seeds. As the court clearly indicated, the ruling does not affect DuPont antitrust and patent fraud claims filed against Monsanto in June 2009. Nor does it affect the related ongoing US Department of Justice formal antitrust investigation involving Monsanto.”

Monsanto and DuPont are the world’s first- and second-largest seed producers, respectively.

Also in January, Bloomberg News reported that DuPont had signaled that it would “continue creating modified soybeans that a court ruled violate a license with Monsanto Co. because it [DuPont] expects to prevail on other claims in the case.” Bloomberg reported that DuPont has plans to sell Optimum GAT soybean seeds that include the Roundup Ready trait as early as 2013.

“It’s important to recognize that the whole set of information around the dispute has yet to be presented to the judge,” Bloomberg quoted Paul Schickler, president of DuPont’s Pioneer Hi-Bred seed unit, as saying. DuPont maintains that Monsanto is using its clout in the biotech market to “stifle competition” and that “its Roundup Ready patent is invalid.”

Partridge stood by the court’s decision:

“He [Judge Webber] just entered a ruling that they [DuPont] are not licensed to make this combination. They are doing so at their own peril.” ■

Briefs

The Procter & Gamble Co. (Cincinnati, Ohio, USA; P&G) announced in December 2009 that A.G. Lafley, 62, chairman of the board, will retire from the company effective February 25, 2010. He stepped down from his role as chairman on January 1, 2010. Robert A. McDonald, 56, currently president and chief executive officer, was elected chairman of the board, in addition to his other responsibilities, effective January 1, 2010.

■ ■ ■

In other P&G news, the company has expanded its powder-detergent plant in Augusta, Georgia, USA, adding about 150 jobs. The facility is the only one in the world making Bounce dryer bars and Gain laundry detergent in a bag, according to *The Augusta Chronicle* newspaper. The bags of Gain are available on the West and East Coasts as well as the Gulf region of the United States, the report noted. They are also available under the Ariel brand in Central and South America.

■ ■ ■

Alberto Culver, a manufacturer and marketer of personal care products based in Melrose Park, Illinois, USA, announced it has entered into an agreement to purchase UK-based skin care company Simple for £240 million (about \$390 million). The company will purchase Simple from private-equity group Duke Street, which bought the business in 2004.

■ ■ ■

AkzoNobel (Amsterdam, Netherlands) has introduced Berol CLF® to the North American market. Berol CLF is a surfactant blend that provides low-foaming water-based degreasing performance that the company claims is superior in many cases to solvent-based cleaning formulations but without volatile organic compounds.

■ ■ ■

The greenwashing problem in cosmetics and personal care products in Germany is significant, according to a study completed by the regional

CONTINUED ON PAGE 124

Surfactants, Detergents, & Personal Care News



Yeast strains exhibit moisturizing properties

New moisturizing products may be on the way, thanks to glycolipids produced by a number of yeast strains. The glycolipids may also help damaged skin cells recover, according to a recent study led by Tomotake Morita of the Research Institute for Innovations in Sustainable Chemistry, National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki, Japan.

Mannosylerythritol lipids (MELs) can be produced on vegetable oil substrates by different strains of the genus *Pseudozyma* at a yield of over 100 g per liter, according to the study. Because MELs have a similar structure and biochemical action to ceramides—which are commonly used skin-moisturizing ingredients—the scientists decided to investigate the effects of the compounds on damaged skin.

The team used a three-dimensional cultured human skin model to investigate the compound's effects on the skin. Using the

yeast *Pseudozyma antarctica* to produce MELs on a soybean oil substrate, the researchers then purified the MELs, leaving only MEL-A for the study. Next, cells of the human skin model were damaged by the detergent sodium dodecyl sulfate (SDS) before being treated with different concentrations of MEL-A and with ceramide and olive oil as controls. According to the study, use of 5 wt% MEL-A and 10 wt% MEL-A led to recovery rates of 73% and 91%, respectively.

The study appeared in the *Journal of Oleo Science* (58:639–642, 2009).

Personal care markets in India and China

The Indian market for personal care products is estimated at \$4 billion, according to an article in the India Business Insight Database (IBID; www.ibid.informindia.co.in/). Personal hygiene products in India are dominated by bar soaps; bath and shower products (including bar soaps) account for 46%

of the total Indian personal care market, IBID says. The segment grew by 5% per year between 2004 and 2008.

Likewise, the domestic hair care market, which accounts for 31% of the Indian personal care market, exhibited growth of 9–10% per year during the same period. By comparison, the skin care segment contributes only 16% to the Indian personal care market.

IBID notes that China's per capita spending on skin care products is 10 times more than India's. Similarly, on a per capita basis, China spends six times as much on cosmetics, two times more on hair care products, and more than two times as much on oral hygiene products. "However, with a GDP growth of 8–9% per year, the Indian personal care market is estimated to reach \$8 billion, with a growth rate of 15–16% by 2012–2013," IBID noted.

First commercial use of SABLIN® technology

Saudi Basic Industries Corp. (SABIC; Riyadh, Saudi Arabia) and The Linde Group (Munich, Germany) have announced the first successful commercial application of linear α -olefins (LAO) manufactured by using the SABLIN® technology developed jointly by the two companies.

The SABLIN technique is a low-pressure ethylene oligomerization process conducted over a heterogeneous catalyst in a slurry bed. The process yields a C_4 – C_{20+} distribution of α -olefins.

LAO have a variety of applications, such as in light-cut production of butene-1, hexene-1, and octene-1 used in the growing polyethylene market. Medium cuts such as decene-1, dodecene-1, and tetradecene-1 are used for synthetic oils, detergents, and shampoos. Heavy cuts are used in lubricant oil additives, surfactants, oilfield chemicals, and wax product applications.

Unilever shuts facility

Unilever announced in December 2009 that it planned to close its manufacturing plant in City of Industry, California, USA, and shift

production to other facilities in the United States.

Manufacturing will be transferred to Unilever plants in Jefferson City, Missouri, and Raeford, North Carolina, beginning by the second quarter of 2010. All production was expected to have been moved elsewhere by the third quarter of 2010, according to Unilever.

The City of Industry facility manufactures personal care brands such as Dove, Suave, and Axe.

Global cleaning products market grows in 2009

The global cleaning products market finished out 2009 with sales of approximately \$55 billion—a growth of 1.1% over 2008 estimates—according to a study from IntertechPira (www.intertechpira.com). Annual sales are projected to top \$70 billion by 2014, representing a compound annual growth rate of 5.1%, the company said.

Among the market segments included, laundry is the largest category with approximately \$30.7 billion in sales, followed by surface cleaners at \$18.5 billion, and dish-washing products at \$5.8 billion. Most products are used in the home sector, with only about 20% being used in industrial and institutional cleaning, IntertechPira said.

Consumer product ingredients dictionary

The Consumer Specialty Products Association (CSPA) has issued the first edition of its Consumer Product Ingredients Dictionary.

The dictionary was developed to standardize and define ingredient nomenclature for companies engaging in the industry's voluntary Consumer Product Ingredient Communication Initiative. According to CSPA, "The dictionary will help assure consistency in the naming of chemicals for the initiative. Because one ingredient can have several names due to the differing nomenclature used for various product lines, it is important to provide consistency so that companies participating in the Initiative are using the most common ingredient name."

The first edition is available on a CD that contains all of the ingredient monographs approved through October 2009 by the CSPA Nomenclature Committee. Each ingredient monograph features the CSPA name for the ingredient, a complete technical definition, plus further information on the ingredient functions, the types of products in which it may be used, regulatory references, other names used for the ingredient, and the trade names of the suppliers that have submitted applications.

For more information, visit www.cspa.org.

Patents

Hand fabric laundering system

Lapinig, D.V., The Procter & Gamble Co., WO/2009/148800, December 10, 2009

An improved laundering system contains a laundry detergent and a rinsing composition. The laundry detergent is suitable for overnight soaking containing therein a bactericide and retards bacterial growth upon soaking a bacteria-contaminated fabric in a wash liquor for 6 hours at 25°C. The bactericide is selected from a bleach, an enzyme, and/or a surfactant.

Surfactant concentrate

Courchay, F.C., *et al.*, The Procter & Gamble Co., WO/2009/148914, December 10, 2009

The invention relates to a surfactant concentrate comprising at least 75% of an essentially completely neutralized anionic sulfated surfactant and 5% to 25% carboxylic acid, of which 4 % to 96% of the carboxylic acid is in its free acid form, the process for making it, and a detergent composition containing it.

Surfactant-free in-shower gel

Patel, R., *et al.*, Hindustan Unilever Ltd., WO/2009/135755, November 12, 2009

The invention relates to substantially surfactant-free gel compositions comprising hydrophobic and hydrophilic benefit agents and methods of enhancing deposition. Unexpectedly, the applicants have found these agents deposit with greater substantivity from such liquid gel compositions relative to surfactant-containing lotion.

Novel personal wash bar

Pfeiffer Campbell, N., and S. Zhu, Unilever PLC, WO/2009/121757, October 8, 2009

A solid moisturizing personal wash bar with the characteristics of a moisturizing cosmetic composition is desired. Previous attempts to provide such a solid moisturizing personal wash bar have met with only partial success because of the limited amount of the moisturizing cosmetic composition that may be incorporated into the solid personal wash bar before it becomes unsuitable for conventional soap bar manufacture as its hardness decreases and its stickiness increases. The aforementioned drawback has been addressed by providing a solid moisturizing personal wash bar comprising a continuous phase and a discontinuous phase, the discontinuous phase in the form of a plurality of discrete domains having a longest dimension of 100 to 20,000 microns, wherein the continuous phase is a solid personal wash composition comprising one or more surfactants, the discontinuous phase is a solid anhydrous moisturizing cosmetic composition comprising a first fatty acid material, a first organic base, and an emollient and/or humectant, wherein the degree of neutralization of the first fatty acid material is 8–60%, preferably 10–50%, most preferably 15–35%.

Natural heavy-duty cleaner

Scheuing, D.R., *et al.*, The Clorox Co., US7618931, November 17, 2009

A cleaning composition with a limited number of natural ingredients contains an anionic surfactant, a hydrophobic syndetic, a hydrophilic syndetic, and a solvent. The cleaning composition can be used to clean laundry, soft surfaces, and hard surfaces and cleans as well or better than commercial compositions containing synthetically derived cleaning agents.

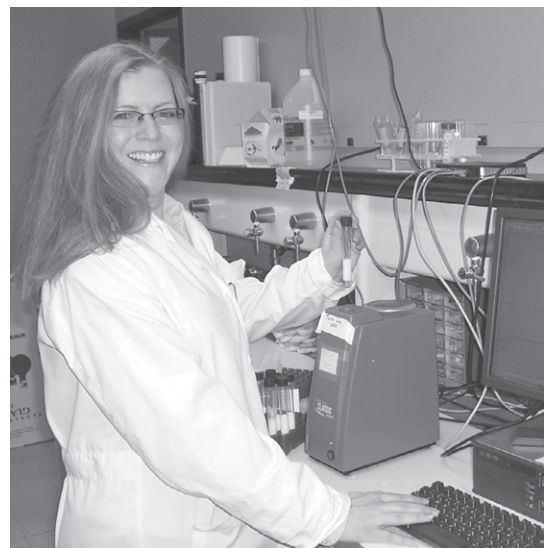
Solid laundry detergent composition

Somerville-Roberts, N.P., The Procter & Gamble Co., WO/2009/140071, November 19, 2009

The present invention relates to a solid laundry detergent composition comprising: from 1 wt% to 40 wt% light-density silicate salt having a bulk density of less than 400 g/L and a weight average particle size of less

Meet Megan Tippetts

From the US Air Force, where she was a bio-environmental engineer, to Utah State University (USU; Logan, USA), where she is currently a Ph.D. candidate in Food Science, 2009 AOCS Honored Student Megan Tippetts has made an impression. Silvana Martini—herself a former AOCS Honored Student who currently heads a research group that includes Tippetts—describes her not only as “humble, happy, and energetic” but also as an “outstanding perform[er]” whose “vocation for science is growing exponentially.” At USU her verve for helping and representing her fellow graduate students in the USU senate is also well-known. *inform* conducted this Q&A to delve a bit deeper into Tippetts’ professional and personal interests.



Q. How did you become interested in your current line of research?

A. Emulsion research was the basis of my master’s, where I studied the physicochemical and thermal characteristics of oil-in-water emulsions to find a replacement for *trans*-fatty acids. When I first started my food science degree, I had never thought about how emulsions are in most of our everyday foods and also other basic necessities. The opportunity to continue to study emulsions and put them into other foods to make those foods functional was a chance I didn’t want to pass up, and so I decided to continue [those] studies at USU.

Q. Please tell us a bit more about your work.

A. The emulsions that I’m working on currently could be considered a transport device for moving functional lipid-soluble ingredients into a solid food matrix. In other words, I’m trying to increase the retention of vitamin D in cheese by using emulsions as the carrier. I hope that, with this research, other lipid-soluble components may be added to cheese or other solid food products in the most economical fashion.

Q. What are you hoping to do after you complete your Ph.D. work (Tippetts expects to finish in May 2011)?

A. I would like to work in product development. I really enjoy being on the product development team here at USU and getting to make new, ingenious food products.

Q. What are your first memories of having an interest in science?

A. I always liked having a bit of knowledge about everything. Science was one of those topics that just stuck with me, and I couldn’t stop taking science classes as I continued through school. I guess it was because they were more hands-on. So, even though there was a lot of book learning, I also had the chance to do all sorts of experiments and watch reactions happen, which made science more interactive and therefore more fascinating than most other topics.

Q. Do you have any hobbies? Special talents? Non-research-related activities?

A. I love going to theatrical performances, so even on a student budget I try and get out to new and interesting performances. I’m also an avid walker/hiker; enjoying the outdoors on foot is one of the best ways to relax and to see the amazing world around us. Finally, I really enjoy baking and trying new recipes, then sharing them with friends and colleagues. ■

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People News/ Inside AOCS

GOED recognizes Anthony Bimbo

The Global Organization for EPA [eicosa-pentaenoic acid] and DHA [docosa-hexaenoic acid] Omega-3s (GOED) Board of Directors selected **Anthony Bimbo** to receive its 2009 Industry Excellence Award. The award was announced at the Supply Side West Exposition in Las Vegas on November 12, 2009.

As of June 2009, Bimbo had been in the fish oil business for 47 years. Among Bimbo's first assignments was to refine—in the laboratory—55-gallon (208-liter) containers of South African pilchard (sardine) oil, which had already been fractionated by the Solexol process, into a very high-omega-3 (i.e., polyunsaturated fatty acid) fraction. That oil was then converted to methyl esters and fractionated again in a liquid/liquid extractor.

In his final five years with Zapata (now known as Omega Protein Corp., headquartered in Houston, Texas, USA) he directed sales, operations, and research for their refinery in Reedville, Virginia. He was successful in turning a money-losing situation into an extremely profitable operation.

Bimbo played a significant role in IFOMA (International Fishmeal & Oil Manufacturers Association), which is now part of the International Fishmeal and Fish Oil Organization (IFFO), where he chaired the Scientific Committee for seven years. He is also recognized in the industry for chairing the task force that obtained GRAS (generally recognized as safe) affirmation for menhaden oil. He was also involved in the first attempt to establish a Codex standard for fish oils in the 1970s.

After 33 years with Zapata/Omega Protein, Bimbo became an international consultant for the global fish oil industry. He assists nutritional oil, pharmaceutical, and food companies in locating marine oils

that meet their needs, and also assists progressive producers of fish oil in matching their oils to buyer requirements.

Douglas new president of Pump Solutions Group

Dover Fluid Management (Redlands, California, USA), a segment within Dover Corporation, named Dean E. Douglas to the position of president of Pump Solutions Group (PSG) in early December. PSG comprises six pump manufacturers: Blackmer, Wilden, Almatex, Movex, Neptune, and Griswold.

Douglas has 20 years of pump-industry experience, including 12 years with the Peerless Pump Company of Indianapolis, Indiana, USA.

New president/CEO at Aarhus-Karlshamn AB

During the second quarter of 2010, **Arne Frank** will become president and chief executive officer (CEO) for AarhusKarlshamn AB (AAK; Malmö, Sweden). He comes to AAK from Carl Zeiss Vision, where he was chairman of the board and CEO. Frank is replacing **Jerker Hartwall**, who came to AAK as a new CEO in 2000; since 2005 he has led the integration of Aarhus United and Karlshamn in the new group created with the merger of the two companies.



Arne Frank



Jerker Hartwall

AAK is organized in three business areas; Chocolate & Confectionary Fats, Food Ingredients, and Technical Products & Feed. The cosmetics unit is part of Chocolate & Confectionary Fats. AAK is a producer of high value-added vegetable oils, and claims to be a prime mover behind the Roundtable for Sustainable Palm Oil and GreenPalm Ltd.

Tangavelu joins COC

T. Tiger Tangavelu joined the California Oils Corporation (COC), a processor of specialty edible oils in Richmond, California, USA, as its technical director on October 1. Before joining COC, Tangavelu was the regional manager (Americas) of the Malaysian Palm Oil Board in Washington, DC.



Frenkel named director for Chemtura

Chemtura Corporation, a global specialty chemical company based in Middlebury, Connecticut, USA, has appointed **Peter Frenkel** as director of innovation and business development for biobased products and derivatives. As a member of the PVC Additives business leadership team, he will be responsible for defining and executing the business strategy for new products from renewable feedstock through internal development and licensing as well as through leveraging university research. Frenkel brings to his new role more than two decades of senior level experience in research & development, technical service, business development and consulting. Chemtura Corporation produces epoxidized soybean oil that is used primarily as a PVC plasticizer-stabilizer.

Santiago heads CEN-CENELEC

The respective boards of CEN (Comité Européen de Normalisation) and CENELEC (Comité Européen de Normalisation Électrotechnique) appointed Elenora Santiago

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2010–2011 AOCS Governing Board Candidates

Ballots for the election of the American Oil Chemists' Society Governing Board members were sent to eligible members by mail or e-mail in December. Completed ballots must be received (either electronically or via mail) at AOCS Headquarters (P.O. Box 17190, Urbana, IL 61803-7190 USA) by February 15, 2010. The new officers will be installed during the 101st AOCS Annual Meeting & Expo in Phoenix, Arizona, USA, on Tuesday, May 18, 2010.

President Candidate



J. Keith Grime (2003): President, JKG Consulting, Cincinnati, Ohio, USA, 2007–present; Adjunct Professor, Department of Chemical & Biological Engineering,

Northwestern University, Chicago, Illinois, USA, 2007–2009.

Education: Graduate, 1970, Royal Institute of Chemistry, University of Salford, United Kingdom; Ph.D., 1973, University of Salford, United Kingdom; post-doctoral research Fellow, 1974, Florida State University; post-doctoral research Fellow, 1975, The Pennsylvania State University.

Previous Employment: Vice President (retired), Corporate Research and Development, Procter & Gamble Research &

Development, 1981–2007; Assistant Professor, Department of Chemistry, University of Otago, New Zealand and University of Denver, 1976–1981; Product Development Technologist, Crown Paints, United Kingdom, 1964–1968.

AOCS Activities: Vice President and Executive Committee, AOCS Governing Board, 2009–present; chairperson, Technical Steering Committee (TSC), 2008–2009; secretary and executive committee, AOCS Governing Board, 2007–2008; chairperson, Membership Steering Committee (MSC), 2007–2008; member-at-large, AOCS Governing Board, 2002–2007; general chairperson, 7th World Conference on Detergents (Montreux Conference), 2010; speaker and session chairperson, AOCS Annual Meeting & Expo, Québec, 2007; second vice chairperson, Financial Steering Committee (FSC), 2004–2005; member, planning committee, executive committee, and conference co-chairperson, 4th, 5th, and 6th World Conference on Detergents (Montreux Conference) 1998, 2002, 2006; session chairperson and speaker, 3rd, 4th, 5th, and 6th World Conference on Detergents (Montreux Conference), 1994, 1998, 2002, 2006; session chairperson, New Horizons Conference, 1992.

Other: Technical Committee, Nominations Committee, Soap & Detergent Association, 1993–2002; advisory board, Department of Chemical and Biological Engineering, Northwestern University, 2002–present; editorial board, *Chimica Oggi*, 1998–2003; author, "Analytical Solution Calorimetry," Wiley-Interscience, 1982; authored over 40 scientific publications in analytical calorimetry, pharmaceutical

analysis, surface and colloid science, and innovation strategy; frequent speaker and session chairperson on innovation strategy at national and international conferences.

Research Interests: Innovation strategy; colloid and surface science; product development; research and development (R&D); and organizational effectiveness.

Vice President Candidate



Erich E. Dumelin (1987): Retired Vice President, Supply Chain Strategy and Technology Foods, Unilever, Zurich, Switzerland.

Education: Diploma and Ph.D.,

1975, Food Science, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland.

Previous Employment: Post-doctoral Fellow, Department of Food Science, University of California, Davis 1975; product development, Unilever, Switzerland with SAIS-ASTRA, 1977; assistant refinery manager, Union Deutsche Lebensmittelwerke, Kleve, Germany, 1979; oil processing manager, Maple Leaf Monarch, Windsor, Ontario, Canada, 1980; production manager, Loders-Croklaan, Silvertown, London, United Kingdom, 1982; technical director, Lipton-Sais (Unilever's foods business in Switzerland with activities in oil milling, oil

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Cid as common director general of the CEN-CENELEC Management Centre effective January 1. At her appointment, Santiago said, "I am convinced that . . . both organizations will move closer to making the European Standardization System a world leader." The purpose of the European Standardization System is to enable a united response to the challenge of supporting the long-term competitiveness of Europe in the global economy.

Santiago has been with CENELEC since 2003. Before that she served as the Spanish representative to a number of transnational standardization organizations.

Honary on NLGI Board of Directors

AOCS recently learned that AOCS member Lou Honary, director of the University of Northern Iowa's National Ag-Based Lubricants Center (Waterloo, USA), was selected to be a member of the Board of Directors of the National Lubricating Grease Institute (NLGI) for 2009–2010. The NLGI is an international technical trade association that serves the lubricating grease and gear lubricant industry. ■

processing, oil and spreads manufacturing, savory, dressings products and tea), 1985; head, Industrial Business Unit, and member, Issue Management Team (i.e., GMO), Swiss Food Industry, 1995; director, Global Technology Unit Spreads and Cooking Products Category (TUSCC), Unilever Foods R&D, Vlaardingen, Netherlands, 1997–2006; member, Food Research Management Team, Foods R&D, Vlaardingen, Netherlands, 1997–2006; vice president, Supply Chain Strategy and Technology, Unilever Foods, Vlaardingen, Netherlands, 2006–2007.

AOCS Activities: Member-at-Large, AOCS Governing Board, 2006–present; second vice chairperson, Education and Meetings Steering Committee (EMSC), 2009–present; second vice chairperson, Financial Steering Committee (FSC), 2007–2008; second vice chairperson, Technical Steering Committee (TSC), 2006–2007 and 2008–2009; chairperson, AOCS Sections Committee, 2007–present; session chairperson, World Conference, Istanbul, 2002 and AOCS Annual Meeting & Expo, 2009; member-at-large, AOCS European Section; contributor and presenter, AOCS conferences, short courses, and workshops focusing on sustainability and renewable energy.

Other: Various papers and presentations in the area of oil and fat technology, sustainability of raw materials and renewable energy resources, e.g., at the Canola Council Annual Convention, Vancouver, 2001; the Roundtable for Sustainable Palm Oil, Kuala Lumpur, 2003; Renewable Energy/Biodiesel Workshop (ISF), Prague, 2005; UNEP meeting, Nairobi; winner, International Lecture Award of the Society of Chemical Industries, UK, 2009; member, Swiss Society of Food Science and Technology, 1970–present; member, Institute of Food Technologists (IFT), 1976–2007.

Research Interests: Sustainability and environmental impact of the total supply chain in foods and renewable energy. Management of the interface between innovation and supply chain processes.

Candidate Statement

It is an honour to be nominated for the office of Vice President of the American Oil Chemists' Society (AOCS), an organisation I became familiar with during my very early days in lipid research at UC Davis and that continued to follow me closely during my more than 30 years in the oils and fats industry.

AOCS' mission is to be the global forum for the science and technology of fats, oils, surfactants, and other related materials. Its connections with academia, industry, and government provide an excellent basis for the sharing of latest experience and developments.

No other independent organization in our industry is so well placed as AOCS to promote the exchange of ideas, information, and experience among those with a professional interest in our field and to respond to the growing number of more global challenges in our industry. Issues like sustainability, global warming, renewable energy, GMO, product safety, or the harmonisation in regulations and legislation show the need for more multilateral, global platforms and wider, interdisciplinary cooperation.

The increasing use of modern communication technologies including the electronic accessibility of all our resources to improve communication among fats and oils professionals worldwide (such as via the AOCS website or the online learning modules) facilitates this role. Further steps were made with the introduction of the "Hot Topic" Symposia at our Annual Meeting & Expo, the topical conferences and short courses (e.g., renewable and alternative resources; latest nutritional developments) throughout the year and electronic delivery of AOCS products. Changes in the organisation and meeting rotations at international sites in cooperation with local institutions (as the recent biodiesel meeting in Munich or the Latin American Congress on Fats and Oils in Rosario, Argentina) have helped to cope with global challenges and to broaden the international network. A recent strategy review showed also that the awareness of AOCS globally and on corporate levels could still be further improved.

Over the years I have had the privilege of contributing to and working on AOCS conferences and course programmes and more recently of getting to know the AOCS leadership and staff group on a personal basis as a member of the Governing Board. I very much enjoyed this cooperation and the determination of these teams.

If elected, I would bring more than 30 years of experience in our industry, primarily associated with supply chain activities and product/process research and development. Experience, I feel, would be an asset to me as Vice President of AOCS. My primary objectives would be to maintain our

established values and cope with our new challenges; to help AOCS broaden its global network and to further position AOCS as the pre-eminent international organisation in the global oils and fats world.

VICE PRESIDENT CANDIDATE #2
VOLUNTARILY WITHDREW FROM
ELECTION

Secretary Candidates



Sevim Z. Erhan (1996): Center Director, Eastern Regional Research Center, U.S. Department of Agriculture, Agricultural Research Service, Wyndmoor, Pennsylvania, 2008–present;

adjunct faculty, Department of Chemical Engineering, Penn State University, College Park, Pennsylvania, 2009–present.

Education: B.S., 1979, Chemical Engineering, University of Istanbul, Turkey; M.S., 1980, Chemical Engineering-Physical Chemistry, University of Istanbul, Turkey; Ph.D., 1987, Organic-Polymer Chemistry, Western Michigan University, Kalamazoo, Michigan.

Previous Employment: Research Leader, Food and Industrial Oil Research Unit, U.S. Department of Agriculture, Agriculture Research Service, National Center for Agricultural Utilization Research, Peoria, Illinois, 1996–2008; research chemist, Oil Chemical Research Unit, USDA, ARS, NCAUR, 1991–1996; research associate, Oil Chemical Research Unit, USDA, ARS, NCAUR, 1988–1991; part-time faculty, Western Michigan University, Kalamazoo, Michigan, 1987–1988.

AOCS Activities: Member-at-large, AOCS Governing Board, 2007–present; second vice chairperson, Education and Meetings Steering Committee (EMSC), 2009–present; second vice chairperson, Financial Steering Committee (FSC), 2008–2009; member, Publications Steering Committee (PSC), 2006–present; member, A.R. Baldwin Distinguished Service Award Committee, 2008; member, AOCS Young Scientist and AOCS Fellow Award Committees, 2009; member, Biotechnology and Industrial Oil Products Divisions, 1989–present;

chairperson, Industrial Oil Products Division, 2008–present; vice chairperson, Industrial Oil Products Division, 2006–2008; member-at-large, Industrial Oil Products Division, 2000–2006; member, Technical Program Committee, World Conference and Exhibition on Oilseed and Vegetable Oil Utilization, Istanbul, Turkey, 2002, 2006.

Other: Association for the Advancement of Industrial Crops, 1989–present; Technical Association of the Graphic Arts, 1992–1997; Federation of Societies for Coating Technology, 1996–2000; Society of Tribologists and Lubrication Engineers, and Peoria Section, 1997–present; American Chemical Society, Biobased Industrial Materials Division, and Peoria Section, 2000–present; United Soybean Board Technical Advisory Panel, Ink, Coatings and Lubricants, 1989–present; chairperson, U.S.–Japan Natural Resource (UJNR) Food and Agricultural Panel, 2008–present; member, U.S.–Japan Natural Resource (UJNR) Food and Agricultural Panel, 1996–present; editor, Elsevier International Journal, 2008–present.

Awards: Vehbi Koc Foundation Scholarship Award for Outstanding Performance Among University Students in Turkey, 1976–1980; Highest GPA Award in the Chemical Engineering Department of Istanbul University since its foundation, 1980; awarded teaching assistantship during graduate studies at Western Michigan University, Chemistry Department, Kalamazoo, Michigan, 1981–1987; Who's Who Among Students in American Universities and Colleges, Recognition of Outstanding Merit and Accomplishment Award, 1986–1987; Land of Lincoln Soybean Association Market Award for Soybean Oil-Based Printing Ink Formulations, 1991; Who's Who Among Young American Professionals, 1992; USDA, ARS Distinguished Service Award, 1992; Federal Laboratory Consortium Award for Excellence in Technology Transfer, 2004 (U.S. Patent Nos. 5,122,188; 5,713,990 and 6,583,302 have been licensed).

Research Interests: Soybean oil-based industrial products including printing inks, paints, coatings, lubricants, biodiesel, hydraulic oils, polymers, and composites.

Neil R. Widlak (1977): Director, Product Services and Development, ADM Cocoa, Milwaukee, Wisconsin, March 2009–present.

Education: B.S., 1975, food science,



University of Illinois, Champaign-Urbana, Illinois; M.S., 1980, food science, University of Illinois, Champaign-Urbana, Illinois; M.B.A., 1985, Lake Forest Graduate School of Management, Lake Forest, Illinois.

Previous Employment: Director, Strategic Technology Development, Archer Daniels Midland Co., Decatur, Illinois, 1995–March 2009; manager, Chemistry and Applications, Intermountain Canola, Pennsauken, New Jersey, 1992–1995; manager, research and development, Lou Ana Foods, Opelousas, Louisiana, 1989–1992; section manager, Kraft Foods, Glenview, Illinois, 1976–1989; refinery supervisor, Best Foods, Chicago, Illinois, 1975–1976.

AOCS Activities: Member-at-Large, AOCS Governing Board, 2008–present; second vice chairperson, Membership Steering Committee, 2009–present; chairperson, Edible Applications and Technology Division, 1996–2001; member-at-large, Edible Applications and Technology Division, 2001–present; member-at-large, Industrial Oil Products Division, 2000–2002; member-at-large, AOCS Governing Board, 1984–1985; chairperson and member-at-large, North Central Section, 1980–1989; technical chairperson, AOCS Annual Meeting & Expo, 1988; member, Education and Meetings Steering Committee (EMSC), 1987–1990; co-author/instructor, short courses on Refining of Fats and Oils (North and Latin America), Physical Properties of Fats and Oils, Applications of Fats and Oils in Baking; session chairperson, Symposia on Fat Crystallization, 1997–present, chairperson, Conference on Physical Properties of Fats, Oils, and Emulsifiers, 1997 and 2000; chairperson, Award of Merit Canvassing Committee, 1999–2004.

Other: Treasurer and board member, Soyfoods Association of North America, 2005–present; vice president, Peoria Chapter of Product Development and Management Association, 2006–2008; conference co-chairperson, Product Development and Management Association, Annual Conference, 2009; member, Institute of Food Technologists (IFT); member, American Society of Baking.

Research Interests: Innovation,

product development, application of fats in foods and fat crystallization; the entire evolution of an idea from concept to commercialization and optimizing the technology value chain; applying and teaching what we learn to gain greater insight into what we do not know and stimulate the imagination for greater innovation.

Member-at-Large Candidates



Richard H. Barton (1995): Owner and President, N. Hunt Moore and Associates, Inc., Memphis and Collierville, Tennessee, 2001–present.

Education:

B.Sc. and M.Sc., Agricultural Engineering, 1975–1980, Texas A&M University, College Station, Texas. Honors include Tau Beta Pi (Engineering) and Alpha Epsilon (Agricultural Engineering).

Previous Employment: Primary Engineer, N. Hunt Moore and Associates, Inc., Memphis, Tennessee, 1994–2001; plant superintendent, Central Soya Company, Inc., Indianapolis, Indiana, 1991–1994; senior process engineer, Central Soya Company, Inc., Fort Wayne, Indiana, 1988–1991; corporate project manager, Ag Processing, Inc., 1986–1988; project manager, assistant plant manager, plant engineer, Bunge Corporation, 1981–1986; research engineer, University of Kentucky, Lexington, Kentucky, 1981.

AOCS Activities: Member, Nominations and Leadership Canvassing Committee, 2000–2004; immediate past chairperson, AOCS Processing Division, 2002–2004; chairperson, AOCS Processing Division, 2001–2002; organizer, Processing Facility Manager Summits, 2003, 2004; secretary/treasurer, AOCS Processing Division, 2000–2001; division representative, Education and Conferences Administration Committee, 2000–2003; section representative, Sections Committee, 2000–2002; president, AOCS Mid-South Section, 2000–2002; vice president, AOCS Mid-South Section, 1999–2000.

Other: Chairperson, National Fire & Protection Association Committee 36,

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Standard for Solvent Extraction Plants; presenter, Food Protein Research & Development Center, Texas A&M University; licensed professional engineer in Tennessee and Texas; chairperson, Tri-State Oil Mill Superintendents Association (assisted in merger with International Oil Mill Superintendents Association) 1992–1994.

Research Interests: Energy optimization within oilseed processing; novel applications for preparation systems for extruder-press plants; novel extraction methods for non-HAP solvents; biomass-to-electrical energy systems.



Douglas M. Bibus (1994): Community Faculty, Center for Spirituality and Healing, University of Minnesota; president, Lipid Technologies, LLC; director, Holman Center for

Lipid Research, 2002–present.

Education: B.S., 1991, Chemistry, Mankato State University, Mankato, Minnesota; M.S., 1995, nutrition, University of Minnesota, Minneapolis, Minnesota; Ph.D., 1998, Nutritional Biochemistry, University of Minnesota, Minneapolis, Minnesota.

Previous Employment: Assistant Scientist, Scientist, and Fellow, Hormel Institute at the University of Minnesota, 1986–2002; research assistant, Department of Surgery, University of Minnesota, 1990–1997; scientist, Surgical Research, St. Paul-Ramsey Medical Center, 1989–1997.

AOCS Activities: Chairperson, AOCS Awards Administration Committee, 2003–2009; director, AOCS Foundation, 2003–2009; member, Membership Steering Committee (MSC), 2003–present; chairperson, Health and Nutrition Division, 2006–2008; vice chairperson, Health and Nutrition Division, 2004–2006; Division representative to Membership Development Committee, 2002–2004; treasurer, Health and Nutrition Division, 2000–2003.

Other: AOCS Honored Student Award Winner, 1994; member, American Chemical Society; member, International Society for the Study of Fatty Acids and Lipids; awardee, American Chemical Society Award in Analytical Chemistry, 1990 and 1991; scientific advisor, Essential Nutrient Research Corporation (ENRECO); scientific advisor, Coromega, Inc.

Research Interests: The role of essential fatty acids in human and companion animal nutrition; role of omega-3 fatty acids in the down regulation of the inflammatory response; role of polyunsaturated fatty acids in disease and the role of omega-3 fatty acids in mood disorders; oxidative adaptation of living systems and its implications in atherogenesis; role of polyunsaturated fatty acids in tumor incidence and promotion; neuro-psychiatric implications of nutrients in aggression models; analytical techniques for determining lipid and fatty acid content in tissues and food products.



David R. Duncan (1998): Senior Vice President, Research & Development, Home & Personal Care, Unilever, London, England, 1995–October 2009 (retired); president,

DRD Consulting, England, 2009.

Education: 1st Class Honours B.Sc. degree, Chemistry, and ordinary B.Sc. degree (with distinction), Chemistry, University of London.

Previous Employment: Senior Vice President, Research & Development, Home & Personal Care, Unilever, London, England, 2001–2009; senior vice president, Research & Development, Home & Personal Care, Europe, 1995–2001; head of Research & Development, S.C. Johnson, Europe, 1988–1995; head of chemistry, Sterling Drug, 1982–1985; senior chemist, Procter & Gamble.

AOCS Activities: Past chairperson, Executive Committee, World Conference on Detergents (Montreux Conference), 2010; chairperson, Executive Committee, World Conference on Detergents (Montreux Conference), 2006; member, Editorial Advisory Board, *Journal of Surfactants and Detergents (JSD)*, 2002–2004; member, Planning and Executive Committees and co-chairperson, World Conference on Detergents (Montreux Conference), 1998, 2002.

Other: Fellow, Royal Society of Chemistry; chartered chemist, chartered scientist, and member, American Chemical Society; board member, AISE (European Detergent Industry Association), 1995–2000; member, COLIPA, The European Cosmetics Industry Association; board member, COLIPA, 1998–2000; member, Research Institute

for Fragrance Materials (RIFM), 2006–2009; advisory board member, Unilever technology ventures, 2003–2008; science advisory board member, Institute of Materials Research and Engineering, Singapore; member, Strategy Board of Chemistry Innovation (a joint UK Government and Royal Society of Chemistry initiative), 2006–2009; company member, Research and Innovation Council of CEFIC (the European Chemical Industry Association), 2006–2009; representative of downstream users, High Level Group set up by the European Commission to review the future for the European chemical industry which reported in February 2009; member, Tallberg Forum, 2006–2008.

Research Interests: Sustainability, green chemistry, innovation, materials, technology exploitation, and commercialisation.



Mila P. Hojilla-Evangelista (1990): Research Chemist, Plant Polymer Research Unit, National Center for Agricultural Utilization Research, U.S. Department of Agriculture-Agricultural Research Service,

Peoria, Illinois, 2001–present.

Education: B.S. (cum laude), 1980, Food Technology, University of the Philippines at Los Baños; M.S., 1984, Food Science, University of the Philippines at Los Baños; Ph.D., 1990, Food Technology, Iowa State University, Ames, Iowa.

Previous Employment: Research associate, Plant Polymer Research Unit, USDA, ARS, NCAUR, Peoria, Illinois, 1997–2001; assistant scientist, Department of Food Science and Human Nutrition, Iowa State University, Ames, Iowa, 1994–1997; research associate, Department of Food Science and Human Nutrition, Iowa State University, Ames, Iowa, 1990–1994; instructor, food chemistry and food processing, Institute of Food Science & Technology, University of the Philippines at Los Baños, College, Laguna, Philippines, 1980–1986.

AOCS Activities: Chairperson, Protein and Co-Products (PCP) Division, 2004–2006; PCP Division representative to the Annual Meeting Planning Committee, 2002–2006; member, Honored Student Award Selection Committee, 2003, 2004;

invited participant, inform Annual Brainstorming Session, 2004; member, Archer Daniels Midland Best Paper Award Selection Committee (chemistry/nutrition category), 2003; vice chairperson, PCP Division, 2002–2004; PCP Division technical program chair, 2003–2004; associate editor, *Journal of the American Oil Chemists' Society (JAOCS)*, 2001–present; secretary/treasurer, PCP Division, 2000–2002; chairperson, Archer Daniels Midland Best Paper Award Selection Committee, 2000–2002; organizer and chairperson of various technical sessions, PCP Division, 2000–2006. AOCS awards received: Archer Daniels Midland Best Paper Awards, engineering/technology category, 1993, 2003; Outstanding Paper Presentation Awards, 1991, 1994, 1998, 2000, 2004.

Other: Award recipient, Federal Laboratory Consortium (FLC) Awards for Excellence in Technology Transfer, 2007; winner, Outstanding Paper in Cereal Chemistry Award, American Association of Cereal Chemists–Corn Refiners Association, 1990; member, American Chemical Society and Peoria Section, 2001–present; organizer and chairperson, technical session on Proteins and Co-products Utilization, American Chemical Society Great Lakes Regional Meeting, Peoria, Illinois, 2004; United Soybean Board Technical Advisory Panel, Fundamental Research and Adhesives, 1998, 2000, 2004; invited presenter, World Soybean Research Conference VIII, Beijing, China, 2009; invited presenter, 37th Annual Meeting of the United States-Japan Cooperative Program in Natural Resources (UJNR): Food and Agricultural Panel, Chicago, Illinois, 2008; invited presenter, Seminário Internacional: Soja-Recurso Renovável para Usos Industriais Não Alimentares (International Seminar–Soybean: Renewable Resource for Industrial Nonfood Utilization), Rio de Janeiro, Brazil, 2007.

Research Interests: Development of value-added proteinaceous products from the processing of agricultural crops, especially corn, soybeans, and alternative oilseed crops. Characterization of the chemical and functional properties of novel, traditional, or nontraditional protein by-products. Identification and evaluation of potential applications based on the most notable properties of protein co-products.

Alejandro G. Marangoni (1993): Professor and Canada Research Chair, Food



and Soft Materials Science, University of Guelph, Guelph, Ontario, Canada, 2001–present.

Education: B.Sc., 1987, agricultural chemistry and physics, McGill University; Ph.D., 1990, food science, University of Guelph.

Previous Employment: Assistant Professor, University of Guelph, Food Science, 1991–1996; associate professor, University of Guelph, Food Science, 1996–2001.

AOCS Activities: Member-at-Large, AOCS Governing Board, 2008–present; second vice chairperson, Technical Steering Committee (TSC), 2008–present; associate editor, *Journal of the American Oil Chemists' Society (JAOCS)*, 2006–present; vice chairperson, AOCS Canadian Section, 2005–2007; member, technical organizing committee, 26th International Society for Fat Research Congress, Prague, Czech Republic, 2005.

Other: Editor-in-Chief of *Food Research International* (Elsevier); 2000 AOCS Young Scientist Research Award; AOCS T.L. Mounts Award, 2004; Premier's Research Excellence Award (Ontario), 1999; Canada Research Chair, 2001–2006; Ontario Distinguished Researcher Award (2), 2002; E.W.R. Steacie Memorial Fellowship, 2002; Canadian Foundation for Innovation Career Award, 2002; Canada Research Chair, 2006–2011.

Research Interests: Physical properties of foods, particularly fats and oils; food materials science; relationship between food structure and nutrition.



Texas A&M University.

Previous Employment: Manager, Oilseed Processing Division, Bunge, 2004–2006; operations support manager, Oilseed Processing Division, Bunge, 2003–2004; facility manager, Council Bluffs, Iowa, Bunge, 1999–2003; facility manager, Cairo,

Illinois, Bunge, 1989–1999; project engineering and department manager, Cairo, Illinois, Bunge, 1986–1989; plant engineer and assistant plant manager, Destrehan, Louisiana, Bunge, 1980–1982.

Education: B.Sc., 1987, agricultural chemistry and physics, McGill University; Ph.D., 1990, food science, University of Guelph.

Previous Employment: Assistant Professor, University of Guelph, Food Science, 1991–1996; associate professor, University of Guelph, Food Science, 1996–2001.

AOCS Activities: Member-at-Large, AOCS Governing Board, 2008–present; second vice chairperson, Technical Steering Committee (TSC), 2008–present; associate editor, *Journal of the American Oil Chemists' Society (JAOCS)*, 2006–present; vice chairperson, AOCS Canadian Section, 2005–2007; member, technical organizing committee, 26th International Society for Fat Research Congress, Prague, Czech Republic, 2005.

Other: Editor-in-Chief of *Food Research International* (Elsevier); 2000 AOCS Young Scientist Research Award; AOCS T.L. Mounts Award, 2004; Premier's Research Excellence Award (Ontario), 1999; Canada Research Chair, 2001–2006; Ontario Distinguished Researcher Award (2), 2002; E.W.R. Steacie Memorial Fellowship, 2002; Canadian Foundation for Innovation Career Award, 2002; Canada Research Chair, 2006–2011.

Research Interests: Physical properties of foods, particularly fats and oils; food materials science; relationship between food structure and nutrition.

Michael A. Snow (2003): Industrial Director, Bunge North America, St. Louis, Missouri, 2006–present

Education: B.S., 1980, Agricultural Engineering,

Illinois, Bunge, 1989–1999; project engineering and department manager, Cairo, Illinois, Bunge, 1986–1989; plant engineer and assistant plant manager, Destrehan, Louisiana, Bunge, 1980–1982.

AOCS Activities: Member, Processing Division; Chairperson, Processing Division, 2008–present; vice chairperson, Processing Division, 2006–2008; member, Proven Practices Ad Hoc Committee, 2009; Processing Division presenter and regular technical session co-chairperson.

Other: Member, National Oilseed Processors Association Technical Safety and Environmental Committee (TESH), 2003–2007; chairman, TESH Technical and Research Subcommittee, 2004–2007; member, Bunge Global Productivity, Quality, Safety and Environmental Steering Committee, 2008–present.



Daniel K. Y. Solaiman (2000): Research Scientist, Eastern Regional Research Center, Agricultural Research Service, U.S. Department of Agriculture, Wyndmoor, Pennsylvania, 1989–present.

Illinois, Bunge, 1989–1999; project engineering and department manager, Cairo, Illinois, Bunge, 1986–1989; plant engineer and assistant plant manager, Destrehan, Louisiana, Bunge, 1980–1982.

Education: B.A. (magna cum laude), 1973, Chemistry and Biology, Milton College, Milton, Wisconsin; M.S., 1976 and Ph.D., 1978, Chemistry, the University of Wisconsin at Milwaukee, Wisconsin.

Previous Employment: Assistant Professor, Department of Chemistry, Duquesne University, Pittsburgh, Pennsylvania, 1984–1988; National Institute of Environmental Health Sciences (NIEHS) postdoctoral fellow, Department of Pharmacological Sciences, State University of New York at Stony Brook, 1981–1984; postdoctoral research associate, Department of Microbiology, Michigan State University, 1979–1981.

AOCS Activities: Vice Chairperson, Publications Steering Committee (PSC), 2007–present; member, PSC, 2003–present; associate editor, *Journal of the American Oil Chemists' Society (JAOCS)*, 2002–present; member-at-large, Biotechnology Division Executive Committee, 2005–2007; secretary/treasurer, Biotechnology Division Executive Committee, 2007–present; session co-chair, Conference on Industrial Applications of Renewable Resources, Chicago,

CONTINUED ON NEXT PAGE

Illinois, 2004; served (many anonymously) as chairperson and member of various AOCS and divisional search, canvassing, and award committees, 2006–present.

Other: SDA/NBB Glycerine Innovation Research Award (Group), 2008; National Research Initiative Competitive Grant Award, CSREES/USDA, 2003–2007; convened a panel on Industrial Materials from Agricultural Lipids and Coproducts, 4th BIO World Congress on Industrial Biotechnology and Bioprocessing, 2007; invited as a foreign expert to present talks at the 6th Sino-American Technology and Engineering Conference, Beijing, Shijiazhuang, Shanghai, and Chengdu, China, 2004; Visiting Professor, Sichuan University, Chengdu, China, 2004; Philadelphia Federal Executive Board Bronze Medalist for Technology Transfers Accomplishment (Group), 2002; Society for Industrial Microbiology Special Recognition Award for co-chairing Annual Meeting Program Committee, 1996; Adjunct Faculty, Department of Chemistry, Temple University, Philadelphia, Pennsylvania, 1989–1991; Federal Executive Board Bronze Medalist for Technical Accomplishment (Group), 1993; U.S. Department of Energy Summer Faculty Research Participation Award, Argonne National Laboratory, 1985–1988; Health Research and Services Foundation Research Grant

Awards, 1985–1987; National Institutes of Health (NIH) Research Grant Award, 1987–1989; Faculty Development Research Grant Awards, Duquesne University, 1985–1988; NIEHS Postdoctoral Fellowship Award, 1982–1984; Trustee Fellowship, Milton College, 1971–1973.

Research Interests: Multidisciplinary approach to improve the process economics and the product quality in the bioconversion of agricultural renewables (i.e., fats, oils, proteins and carbohydrates) into biobased products (i.e., microbial polymers and surfactants, and platform chemicals).



Manfred Trautmann (2004): Vice President and Head of Detergents & Intermediates Business Unit, Clariant International, Muttentz, Switzerland, February 2009–present.

Education: B.Sc., 1976, Chemical Engineering, University of Darmstadt, Germany.

Previous Employment: Global Head of Marketing & Sales, RBU Detergents & Intermediates, 2007–2009; head of New Business Development of the Business Unit Detergents, 2000–2007; salesperson, Global

Marketing & Sales positions for the Detergents, Personal Care and Plant Protection Additives Business of the Surfactants/FUN Division during the transition of Hoechst to Clariant, 1996–2000; product manager, national accounts manager, and marketing manager for the Detergents and Personal Care Business of American Hoechst/Hoechst Celanese, North America, Charlotte, North Carolina, 1986–1996; application manager for Detergents and Personal Care in R&D, Hoechst AG, 1979–1986; project engineer in the Hoechst Engineering Department, 1976–1979.

AOCS Activities: Presenter, speaker, and/or co-author, various AOCS Annual Meeting & Expos; member, Executive Committee, 7th World Conference on Detergents (Montreux Conference), 2010; member, Organizing Committee, 5th and 6th World Conference on Detergents (Montreux Conference), 2002, 2006.

Other: Member, TEGEWA organization (German Surfactant Association); member, Organizing Committee, CESIO 2004, Berlin, Germany.

Research Interests: Green chemistry, including chemicals and/or intermediates derived from bioethanol, biodiesel, and glycerol. ■

CALENDAR (CONTINUED FROM PAGE 63)

April 25–27, 2010. IMR Conference Food Hydrocolloids, Grand Hyatt Hotel, Berlin, Germany. Information: www.hydrocolloid.com.

April 27–28, 2010. Advanced Biofuels Leadership Conference, Hilton Embassy Row, Washington, DC, USA. Information: <http://advancedbiofuelssummit.com>.

May

May 3–4, 2010. LIPIDS MAPS Annual Meeting 2010: Lipidomics Impact on Cell Biology, Atherosclerosis and Inflammatory Disease, Scripps Seaside Forum of the University of California San Diego's

Scripps Institution of Oceanography, La Jolla, California, USA. Information: www.lipidmaps.org/meetings/2010annual.

May 3–6, 2010. BIO [Biotechnology Industry Organization] International Convention, McCormick Place, Chicago, Illinois, USA. Information: <http://convention.bio.org>.

May 3–7, 2010. 18th European Biomass Conference and Exhibition, Cité Internationale—Centre de Congrès, Lyon, France. Information: www.conference-biomass.com.

May 13–15, 2010. International Symposium on Microbial Lipids: From Genomics to Lipidomics, Vienna, Austria. Informa-

tion: www.eurofedlipid.org/meetings/vienna2010.

May 16–19, 2010. 101st AOCS Annual Meeting and Expo, Phoenix Convention Center, Phoenix, Arizona, USA. Information: phone: +1-217-359-2344; fax: +1-217-351-8091; e-mail: meetings@aocs.org; http://Annual_Mtg.aocs.org.



May 16–20, 2010. STLE [Society of Tribologists and Lubrication Engineers] 2010 Annual Meeting, Bally's Hotel & Casino, Las Vegas, Nevada, USA. Information: www.stle.org. ■

Book Review

Chocolate: History, Culture, and Heritage

Louis Evan Grivetti and Howard-Yana Shapiro (eds.)
John Wiley & Sons, Inc. 2009, 975 pages
ISBN 978-0-470121-65-8

Marguerite S. Torrey

As copyeditor of journal articles on chocolate for AOCS, I wondered whether *Chocolate: History, Culture, and Heritage* might be the “All you ever wanted to know about chocolate” volume for my reference shelf.

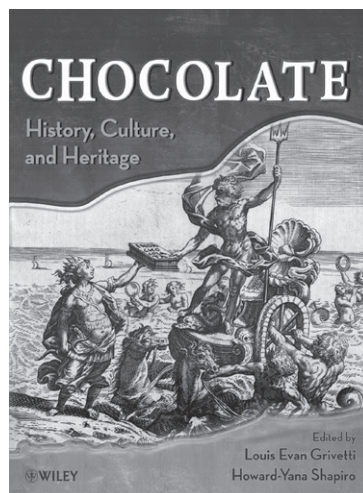
The editors of the book, Louis E. Grivetti, of the Department of Nutrition at the University of California, Davis (USA), and Howard Shapiro, vice president of Mars, Inc., however, indicate in the preface that their intention was not “to produce a full history of chocolate.” Instead, the multi-authored 56 chapters present specific themes within the breadth and scope of chocolate history that illustrate the importance of chocolate through the millennia.

These themes appear in somewhat chronological order, and within this order are interspersed chapters on religion and chocolate, medicine and chocolate, advertising and chocolate, and crime and chocolate. There are even five chapters on utensils used over the past four centuries for preparing and serving chocolate beverages—antique collectors will find those chapters interesting.

The importance of some of the chapters may initially seem peripheral. The 10-page discussion by Martha Macri on the origin of the word *cacao* seemed at first to me to be excessive, but her concluding section skillfully shows how “an understanding of words related to cacao and to chocolate preparation has the potential for providing unique insight into the history of trade and cultural relationships among the diverse peoples of Mesoamerica. That is why determining the ultimate source of words such as *cacao* becomes important.”

The relationship between chocolate and religion, beyond the Mayan peoples who first developed cacao as a drink for use in religious ceremonies, was also surprising. Chocolate played a role in the Spanish Inquisition as it was imposed in Mexico in the 1600s and 1700s; and it served as an outlet for Jewish investment, through the Dutch West Indies Company, which invested in cocoa production during the later years of the Inquisition.

The idea that chocolate has medicinal properties did not originate in the 21st century, with current reports about the healthful benefits of consuming dark chocolate. Over the past 450 years, five consistent medical-related claims and uses for chocolate have been identified: (i) Chocolate causes weight gain; (ii) chocolate stimulates the nervous system; (iii) chocolate calms and soothes overstimulated persons; (iv) chocolate aids digestion and elimination; (v) chocolate can serve as a pharmacological binder for the administration of drugs. The account (Chapter 7) of the relation between chocolate and smallpox epidemics in the city of Boston in 1721 and 1764, though, seemed tenuous.



Chapter 20 introduces the reader to the high value once attributed to chocolate as a rare, expensive commodity. Cacao beans, cocoa, and manufactured chocolate were relatively easy targets for thieves in the early days after its introduction to Europe, and criminal activity presented considerable economic risk to cacao/chocolate traders. The criminals took risks too, of course, and some lost. A survey of Old Bailey (London) court records

between 1693 and 1834 found 76 convictions for chocolate-associated crimes; of those, 13 resulted in sentences for execution. Another common punishment meted out to chocolate felons was transport to the Americas or to Botany Bay, Australia.

Other sections are devoted to chocolate as a beverage in the colonial and Federal eras in North America, and its presence in the southeastern and southwestern borderlands of what became the United States. The importance of cacao and chocolate in the Caribbean and in Cuba up to 1912, from the standpoint of both production and consumption, is reviewed at some length. Chocolate on the Continent of Europe is considered, especially from 1819 onward when the first eating chocolate was developed in Switzerland.

I had anticipated that a history of manufacturing practices regarding chocolate would form a major part of the text, but only six chapters are devoted to history of the production and manufacturing of chocolate. Coverage seems to cease around 1920. A book such as Stephen J. Beckett's *Industrial Chocolate Manufacture and Use*, 4th edition (Wiley-Blackwell, 2009) is a better source for an account of the industrialization of chocolate manufacture in the 20th and 21st centuries.

I also had anticipated at least brief histories of some of the major companies involved with chocolate—such as Baker, Barry Callebaut and its predecessors, Cadbury, Ghiardelli, Hershey, Lindt, Mars, and Nestlé—but these were not specifically covered.

On the next edition of this text, a worthy inclusion could be the history of how production of cacao spread from Brazil to Indonesia, Cameroon, Ghana, Nigeria, and Côte d'Ivoire. One wonders if that history will be as dramatic as the smuggling of rubber-tree seeds out of Brazil to Kew Gardens in England in 1876 and thence to the Indian subcontinent and Malaysia for cultivation on plantations (Joe Jackson, *The Thief at the End of the World: Rubber, Power, and the Seeds of Empire*, Penguin Books, 2008).

Chocolate: History, Culture, and Heritage provides interesting new insights on the wonderful confection so many people crave. Although the book has little information relevant to a chemist working with cocoa butter and chocolate, it provides lots of chocolate-related trivia to introduce at your next party.

Marguerite Torrey has a Ph.D. in water chemistry from the University of Wisconsin and worked for 12 years as a copyeditor of AOCS refereed journals before joining *inform* as technical projects editor. She can be contacted at mtorrey@aocs.org.

Patents

Published Patents

Lubricant formulations for sheet metal processing

Heenan, D.F., *et al.*, Novelis Inc., US7569525, August 4, 2009

A lubricant for food, beer, or beverage container and container component stock is provided containing as a conductivity-enhancing additive a phospholipid having fully saturated fatty acyl radicals derived from saturated fatty acids containing from about 10 to 22 carbon atoms; and choline salts and mono-salts of Group I and II metals and fatty acid neutralized ethanolamine. Lubricant formulations are also described comprising 0.5 to 50 wt% fatty acid ester of propylene glycol, 0.5 to 90 wt% petrolatum, and 0.5 to 90 wt% mineral white oil. A lubricant for metalworking is described containing as a load-bearing additive a fatty acid monoester of propylene glycol as given in which the acyl moiety is hydrogenated to maximize saturation.

Plant, seeds and oil with increased saturated triacylglycerols content and oil having a high stearic acid content

Martinez-Force, E., *et al.*, Consejo Superior de Investigaciones Científicas, US7569712, August 4, 2009

The invention relates to a sunflowerseed comprising sunflower oil having increased stearic acid content (19.1–35%). At least 3.4% of the oil molecules have the general formula SMS [where S = saturated fatty acid; M = monounsaturated fatty acid] and not more than 50% of triacylglycerol species that have the general formula SMM. The invention further relates to oil extracted from the seeds, a method for preparing the sunflower seeds, a method for preparing such sunflower oil, sunflower plants produced from the seeds, and use of the oil.

Extraction of palm vitamin E, phytosterols, and squalene from palm oil

May, C.Y., *et al.*, Malaysian Palm Oil Board, US7575767, August 18, 2009

Phytosterols, squalene, and vitamin E are recovered from phytonutrients concentrate derived from crude palm oil by the disclosed invention via esterification, transesterification, vacuum distillation, saponification, crystallization, and organic solvent partitioning. Crude palm oil is subjected to esterification and transesterification for the production of crude palm oil methyl esters. A phytonutrient concentrate containing phytosterols, squalene, vitamin E, and unreacted monoglycerides is recovered from crude palm FAME (fatty

acid methyl esters) by multistage vacuum distillation in which components with higher molecular weight are filtered during second-stage vacuum distillation. The purified phytonutrient concentrate is saponified, and the unsaponifiable matter is solvent-crystallized to purify phytosterols. The filtrate enriched in squalene and vitamin E is partitioned by organic solvents.

Integrate chemical processes for industrial utilization of seed oils

Lysenko, Z., *et al.*, Union Carbide Chemicals & Plastics Technology Corp., US7576227, August 18, 2009

Integrated processes of preparing industrial chemicals starting from unsaturated oils or esters free of metathesis catalyst poisons (particularly hydroperoxides). The oil is subjected to metathesis with a lower olefin such as ethylene to form a reduced-chain olefin, preferably a reduced-chain α -olefin, and a reduced-chain unsaturated acid or ester, preferably a reduced-chain α,ω -unsaturated acid or ester. The reduced-chain unsaturated acid or ester may be (trans) esterified to form a polyester polyolefin that can be epoxidized to form a polyester polyepoxide. The reduced chain unsaturated acid or ester may be hydroformylated with reduction to produce an α,ω -hydroxy acid or α,ω -hydroxy ester that may be (trans)esterified with a polyol to form an α,ω -polyester polyol. Alternatively, the reduced-chain unsaturated acid or ester may be hydroformylated with reductive amination to produce an α,ω -amino acid or α,ω -amino ester that may be (trans)esterified to form an α,ω -polyester polyamine.

Method for improving the oxidative stability of industrial fluids

Costello, M.T., *et al.*, Chemtura Corp., US7579306, August 25, 2009

An oxidatively stable biodegradable industrial fluid comprising an epoxidized vegetable oil or synthetic ester and at least one antioxidant is disclosed. A method for improving the oxidation stability of industrial fluids is also disclosed and comprises employing as the base oil of said hydraulic fluid an epoxidized synthetic ester in combination with at least one antioxidant.

Rapid development of heat resistance in chocolate and chocolate-like confectionery products

Simburger, S., Kraft Foods R&D Inc., US7579031, August 25, 2009

The invention relates to a process for manufacturing heat-resistant chocolate or chocolate-like confectionery products wherein (i) chocolate mass or chocolate-like confectionery mass that has been mixed with a water-in-oil emulsion or (ii) chocolate mass or chocolate-like confectionery mass having an increased water content, is molded and microwaved prior to, during, and/or after cooling. The heat resistance is developed essentially instantaneously and the chocolate can be subjected to temperatures of up to about 40 or even 50°C without losing its form. The invention also relates to the products obtainable by that process.

Two-stage extraction of soybean oil

Tysinger, J.E., Carolina Soy Products LLC, US7579492, August 25, 2009

Soybean oil is extracted by a two-stage process in which up to 85% (preferably about 60–75%) of the oil is extracted by mechanical or solvent extraction to produce first extracted oil and oil-containing meal. The first extracted oil is then refined by caustic or physical refining. Substantially all of the oil remaining in the meal is extracted by solvent extraction to produce second-extracted oil and substantially oil-free meal. The second-extracted oil may be transesterified for use in biodiesel fuel.

Method for transesterification of triglycerides

Banavali, R.M., and A. Benderly, Rohm and Haas Co., US7582784, September 1, 2009

A method for transesterification of triglycerides, especially oils containing free fatty acids, with methanol using a catalyst derived from an acidic ion exchange resin is disclosed. The catalyst is contacted with a reaction mixture containing a triglyceride and methanol under conditions suitable for transesterification.

Production of a shell-like formed consumable item from a fat-containing mass

Klaes, D., Buehler Bindler GmbH, US7582319, September 1, 2009

The invention relates to a method for the production of a cocoa or chocolate shell. A cell is initially filled with the fatty mass in flowable temperature state in a dosed manner in a mold whereupon a cooling body with a temperature below melting temperature of the tempered fatty mass is dipped into the liquid fatty mass so that the flowable fatty mass can be distributed in the intermediate space defined by the cell and the cooling body. The cooling body is maintained in dipped position inside the fatty mass for a given space of time until the fatty mass located in the intermediate space hardens. According to the invention the flowable tempered fatty mass is vibrated for a given space of time after filling the cell and before dipping the cooling body.

Carbon fiber-reinforced resin composite materials

Suzuki, Y., *et al.*, Toho Tenax Co. Ltd. and Showa Highpolymer, US7585558, September 8, 2009

The present invention discloses: A composition comprising (i) an epoxy group-containing vinyl ester resin having in the molecule 0.8 to 0.3 equivalent of epoxy group and 0.2 to 0.7 equivalent of an ethylenically unsaturated group, (ii) a radical-polymerizable monomer, (iii) a curing agent, and (iv) a carbon fiber impregnated with 0.5 to 5 percent by mass of (iv) a vinyl ester resin as a sizing agent obtained by an addition reaction of an epoxy resin and an ethylenically unsaturated carboxylic acid and a carbon fiber-

reinforced resin composite material produced by curing the above composition.

Low *trans*-fatty acid fat compositions; low-temperature hydrogenation, e.g., of edible oils

van Toor, H., *et al.*, Cargill Inc., US7585990, September 8, 2009

The present disclosure provides low *trans*-fatty acid fat compositions methods of hydrogenating unsaturated feedstocks (e.g., oils) and hydrogenation catalyst compositions. One exemplary method involves producing an activated catalyst composition by heating a nickel-based catalyst to a first temperature of at least about 100°C in the presence of hydrogen and a fat component. An unsaturated feedstock may be contacted with the activated catalyst composition and hydrogenated by sustaining a hydrogenation reaction at a second temperature of no greater than about 70°C. Some specific implementations of the invention permit the production of partially hydrogenated seed oils with low *trans*-fatty acid contents.

High arachidonic acid producing strains of *Yarrowia lipolytica*

Damude, H.G., *et al.*, E.I. du Pont de Nemours and Co., US7588931, September 15, 2009

Engineered strains of the oleaginous yeast *Yarrowia lipolytica* capable of producing greater than 10% arachidonic acid (ARA, an ω -6 polyunsaturated fatty acid) in the total oil fraction are described. These strains comprise various chimeric genes expressing heterologous desaturases, elongases, and acyltransferases and optionally comprise various native desaturase and acyltransferase knockouts to enable synthesis and high accumulation of ARA. Production host cells are claimed as are methods for producing ARA within said host cells.

Mixtures of triglycerides of natural polyunsaturated fatty acids with high polyunsaturated fatty acid content, method for producing same and use thereof

Fabritius, D., Nutrinova Nutrition Specialties & Food Ingredients GmbH, US7588791, September 15, 2009

A process for increasing the concentration of PUFA (polyunsaturated fatty acid) triglycerides present in natural PUFA oils in which a natural PUFA oil having a triglyceride content of more than 85% by weight based on the total weight of the mixture and having a total PUFA content of more than 39% by weight of total fatty acids is dissolved in an organic solvent or an organic solvent mixture; the mixture is allowed to stand at a temperature of from –35 to –100°C for a period of more than five minutes. The mixture is separated into a supernatant comprising PUFA-triglyceride mixture and a sediment phase; the separation preferably taking place by filtration or centrifugation and the solvent or solvent mixture after

the removal of the sediment phase is separated from the supernatant. PUFA-triglyceride mixtures having a PUFA content of more than 55% by weight of total fatty acids of a main PUFA or at least two PUFAs selected from stearidonic acid, eicosapentaenoic acid, docosapentaenoic acid, docosahexaenoic acid, γ -linolenic acid, and arachidonic acid and also use thereof in pharmaceutical, cosmetics, and food preparations.

Compositions for use in energy curable compositions

Turgis, J.-D., and W. Wilczak, Sun Chemical Corp., US7589131, September 15, 2009

A composition comprised of a fatty acid metal salt and a fatty compound for use in an energy-curable coating having improved gloss and low coefficient of friction.

Oil-resistant sheet material

Akiyama, K., and Y. Asai, Tokushu Paper Mfg. Co. Ltd., US7588831, September 15, 2009

An oil-resistant sheet material that has low resistance to gas permeation and excellent oil resistance and is suitable especially for use as a packaging material for foods containing an edible oil. The oil-resistant sheet material is obtained by forming at least one coating layer from a material comprising a hydrophobized starch and a crosslinking agent on at least one side of a base in an amount of 0.5 to 20 grams per square meter. By incorporating a fatty acid and/or polyvinyl alcohol into this coating layer oil resistance is improved. A coating layer comprising a fatty acid as the main component or a coating layer comprising polyvinyl alcohol as the main component may be formed on that coating layer. Thus, a coating layer composed of at least two layers may be formed.

Phospholipases and uses thereof

Albermann, K., *et al.*, DSM IP Assets BV, US7588925, September 15, 2009

The invention relates to a newly identified polynucleotide sequence comprising a gene that encodes a novel phospholipase isolated from *Aspergillus niger*. The invention features the full-length nucleotide sequence of the novel gene, the cDNA sequence comprising the full-length coding sequence of the novel phospholipase, as well as the amino acid sequence of the full-length functional protein and functional equivalents thereof. The invention also relates to methods of using these enzymes in industrial processes and methods of diagnosing fungal infections. Also included in the invention are cells transformed with a polynucleotide according to the invention and cells wherein a phospholipase according to the invention is genetically modified to enhance or reduce its activity and/or level of expression.

Use of high oleic high stearic oils

Martinez-Force, E., *et al.*, Consejo Superior de Investigaciones Científicas, US7592015, September 22, 2009

The invention relates to the use in food products such as spreads, sauces, ice cream, soups, bakery products and confectionery

products, and cosmetic products such as creams, lotions, lipsticks, soap bars, and skin or hair oils of an oil having an oleic acid content of more than 40 wt% and a stearic acid content of more than 12 wt% based on the total fatty acid content of said oil and wherein a maximum of 10 wt% of the fatty acid groups in the stereospecifically numbered (*sn*)-2 position of the triacylglycerol molecules constituting the oil are saturated fatty acid groups.

Triglycerides and method of preparation thereof

Narayan, R., K., Board of Trustees of Michigan State University and Bioplastic Polymers and Composites LLC, US7589222, September 15, 2009

A process for the preparation of polyols from a natural oil is described. The process involves ozone cleavage of double bonds in the fatty acid chains of the oils along with coupling of a di- or polyol to the cleaved ends of the molecules resulting from the cleavage with a base. The resulting polyols are as intermediates for polymers.

Composition for oil-based liquid cleansing

Takeuchi, N., and Y. Abe, Fancl Corp., US7592298, September 22, 2009

This invention provides an oil-based liquid cleansing preparation that does not drip from the hands during use, exhibits excellent spreadability during cleansing, gives excellent feeling on use, is usable on wet skin, has a high level of detergency, and is free from residual oil touch after water washing. This composition comprises an ester of a fatty acid with polyglycerin, glycerin esters of a monocarboxylic acid and a dicarboxylic acid, and a monocarboxylic fatty acid ester that is liquid at 25°C and has a viscosity of 300 to 3,000 mPa·s.

Compositions and processes for making high soy protein-containing bakery products

Vodovotz, Y., and C. Ballard, Ohio State University, US7592028, September 22, 2009

Mixes, doughs, and processes for commercial production of leavened high soy protein-containing bakery products that have from 2 to 7 grams of soy protein per serving are disclosed. The mixes comprise separate wheat and gluten-based and soy-based premixes. The processes involve preparation of a gluten development mixture having long gluten strands and a hydrated soy mixture and the subsequent combination and resting of these mixtures in the preparation of doughs and breads and other bakery products.

Patent information is compiled by Scott Bloomer, a registered US patent agent with Archer Daniels Midland Co., Decatur, Illinois, USA. Contact him at scott_bloomer@admworld.com.



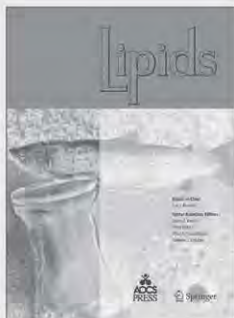
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Extracts & Distillates

How to study lipidomes

Seppänen-Laakso, T., and M. Oresic, *J. Mol. Endocrinol.* 42:185–190, 2009.

Lipidome is loosely defined as the entire spectrum of lipids in a biological system. Given that modern lipidomics platforms for the first time empower us with the ability to obtain a snapshot of a complete cellular/organismal lipidome, many surprises and discoveries are likely awaiting us in the area of lipids as related to cellular/organismal physiology. Lipidomics approaches can be applied both for the phenotyping platform and for the hypothesis-driven research aiming to elucidate (e.g.) a specific pathway or gene function. Modern lipidomics methods combine the latest mass spectrometry technology and bioinformatics methods with traditional methods, such as for sample preparation and lipid extraction.

Identification of endogenous acyl amino acids based on a targeted lipidomics approach

Tan, B., *et al.*, *J. Lipid Res.* 51:112–119, 2010.

Using a partially purified bovine brain extract, our laboratory identified three novel endogenous acyl amino acids in mammalian tissues. The presence of numerous amino acids in the body and their ability to form amides with several saturated and unsaturated fatty acids indicated the potential existence of a large number of heretofore unidentified acyl amino acids. Reports of several additional acyl amino acids that activate G-protein coupled receptors (e.g., N-arachidonoyl glycine, N-arachidonoyl serine) and transient receptor potential channels (e.g., N-arachidonoyl dopamine, N-acyl taurines) suggest that some or many novel acyl amino acids could serve as signaling molecules. Here, we used a targeted lipidomics approach including specific enrichment steps, nano-LC/MS/MS (liquid chromatography/tandem mass spectrometry), high-throughput screening of the datasets with

a potent search algorithm based on fragment ion analysis, and quantification using the multiple reaction monitoring mode in Analyst software to measure the biological levels of acyl amino acids in rat brain. We successfully identified 50 novel endogenous acyl amino acids present at 0.2 to 69 pmol g⁻¹ wet rat brain.

Comparison of the sensitivity of evaporative universal detectors and LC/MS in the HILIC and the reversed-phase HPLC modes

Mitchell, C.R., *et al.*, *J. Chromatogr. B* 877:4133–4139, 2009.

It was hypothesized that the hydrophilic interaction liquid interface chromatography (HILIC) mode should produce more response than the reversed-phase HPLC (high-performance liquid chromatography) mode on detectors with an evaporative component to the detection process. HILIC mobile phases are mostly composed of polar organic solvent and are more volatile than reversed-phase mobile phases. Therefore, the more easily evaporated HILIC mobile phases should produce greater sensitivity for those detectors that remove mobile phase by evaporation. The responses of 12 compounds were measured in the reversed-phase mode and the HILIC mode with three detectors: evaporative light-scattering detector (ELSD), corona charged aerosol detector (cCAD), and electrospray ionization mass spectrometry (ESI-MS). The compounds studied were very polar compounds that were retained in the HILIC mode. Generally, the HILIC mode was able to achieve greater sensitivity than the reversed-phase mode for these compounds. The increases in sensitivity observed can be attributed to the more-volatile HILIC mobile phase. For the ELSD, the HILIC mode produced slightly greater sensitivity than the reversed-phase mode. The cCAD was approximately 10 times more sensitive in the HILIC mode, and the ESI-MS was approximately 5–10 times more sensitive in the HILIC mode. There was one instance in the study where a compound produced more response in the reversed-phase mode. Thymine yielded more sensitivity in the reversed-phase mode with the ESI-MS detector. In a given mode of operation, there was significant variation in the measured response factors for all compounds on each detector. While this

is not unexpected for the ESI-MS detector, variation in the response factors between compounds indicates that the cCAD and ELSD are not truly universal detectors in the sense that all compounds have identical responses.

Effect of olive ripeness on chemical properties and phenolic composition of Chétoui virgin olive oil

Youssef, N.B., *et al.*, *J. Sci. Food Agric.* 90:199–204, 2010.

The aim of the present work was to investigate the influence of fruit ripening on oil quality in an attempt to establish an optimal harvesting time for Chétoui olives, the second main olive variety cultivated in Tunisia. Our results showed that many analytical parameters—for example, peroxide value, UV (ultraviolet) absorbance at 232 and 270 nm, and contents of chlorophyll pigments, carotenoids, and oleic acid—decreased during ripening, whereas oil content and linolenic acid increased. Free acidity remained practically stable with a very slight rise at the highest maturity index. Trends in oxidative stability, total phenols, and *o*-diphenols showed an increase at the early stages followed by a reduction at more advanced stages of maturity. The major phenolic compounds—including hydroxytyrosol, ligstroside aglycon, elenolic acid, acetoxypinoresinol, and oleuropein aglycon—seemed to have the same behavior. In the case of tyrosol, a strong decrease was observed that was directly related to ripening progress. On the basis of the evolution of the analytical parameters studied, the best stage of Chétoui olive fruits for oil processing seems to be at ripeness index higher than 2.0 and lower than 3.0.

Effect of pre-germination time of brown rice on serum cholesterol levels of hypercholesterolaemic rats

Roohinejad, S., *et al.*, *J. Sci. Food Agric.* 90:245–251, 2010.

Brown rice (BR) and pre-germinated brown rice (PGBR) are known to contain various functional compounds such as γ -oryzanol, dietary fiber, and γ -aminobutyric acid (GABA). In the present study, experimental diets containing BR and PGBR (24,

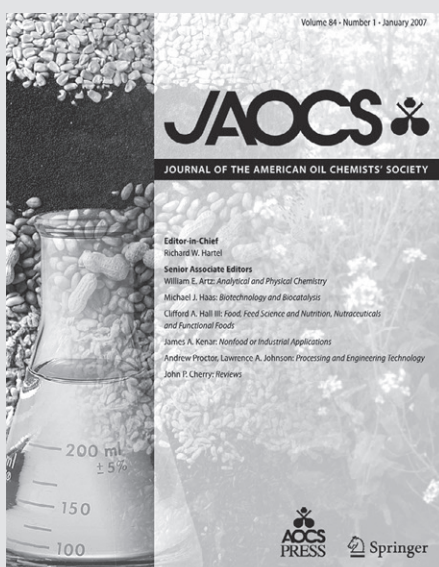
48 h pre-germination) were used to investigate the influence of pre-germination time of BR on blood cholesterol in male Sprague-Dawley rats. Hypercholesterolemia and elevation of LDL (low density lipoprotein)-cholesterol were successfully ameliorated by the experimental diets containing BR and PGBR (24 and 48 h pre-germination). As compared to the control sample, the pre-germination time had a significant ($P < 0.05$) effect on blood cholesterol of male Sprague-Dawley rats. Prolonging the pre-germination time also produced a significantly ($P < 0.05$) better effect on lipid profile of hypercholesterolemic rats. As compared to non-germinated BR, the germinated BR showed a higher cardio-protective effect on hypercholesterolemic male Sprague-Dawley rats. The present study suggests that the changes of blood cholesterol can be mainly modulated by using PGBR rather than BR. Prolongation of pre-germination time led to an increase in the bioactive components, thereby providing a more efficient functional diet affecting the high blood cholesterol. This study suggests that PGBR can be used instead of BR and polished rice in the human diet.

Analysis of free fatty acids in beer: Comparison of solid-phase extraction, solid-phase microextraction, and stir bar sorptive extraction

Horák, T., *et al.*, *J. Agric. Food Chem.* 57:11081–11085, 2009.

Solid-phase extraction (SPE), solid-phase microextraction (SPME) using carbowax/divinylbenzen fiber, and stir bar sorptive extraction (SBSE) followed by solvent back extraction have been used for the extraction of free fatty acids (caproic, caprylic, pelargonic, capric, lauric, myristic, palmitic, stearic, oleic, linoleic, and linolenic acids) from beer. Subsequent gas chromatographic analyses with flame ionization detection were used for the determination of these compounds. Medium-chain fatty acids (caproic–lauric acid) were determined as free acids, and long-chain fatty acids (myristic–linolenic acids) were determined as methyl esters after methylation by BF_3 –methanol 14%. Linearity, recovery, and repeatability of all methods have been determined and compared with the SPE method

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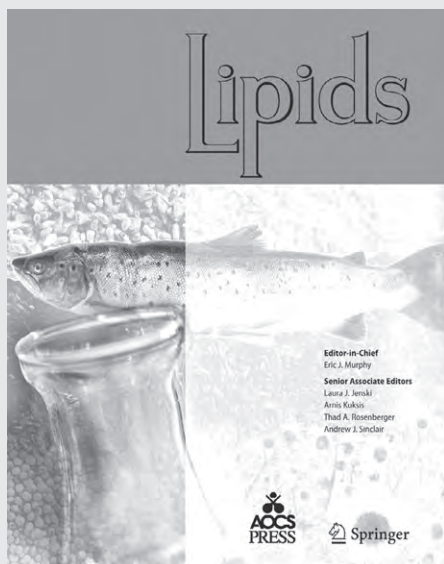
Journal of the American Oil Chemists' Society (January)

- A review of the application and pharmacological properties of α -bisabolol and α -bisabolol-rich oils, Kamatou, G.P.P., and A.M. Viljoen
- High oleic and low *trans* fatty acid formation by an electrochemical process, Xiao, H., H.J. Kim, D.B. Min, and S.B. Lalvani
- Bloom formation on poorly-tempered chocolate and effects of seed addition, Kinta, Y., and R.W. Hartel
- Detection and quantification of free glycerol in virgin olive oil by ^{31}P -NMR spectroscopy, Hatzakis, E., A. Agio-myrgianaki, and P. Dais
- Antioxidant activity of the phenolic leaf extracts from *Monechma ciliatum* in stabilization of corn oil, Mariod, A.A., R.M. Ibrahim, M. Ismail, and N. Ismail
- Continuous lipase-catalyzed alcoholysis of sunflower oil: Effect of phase-equilibrium on process efficiency, Jachmanián, I., M. Dobroyán, M. Moltini, N. Segura, B. Irigaray, J.P. Veira, I. Veitez, and M.A. Grompone

- Scalable preparation of high purity rutin fatty acid esters, Lue, B.-M., Z. Guo, M. Glasius, and X. Xu
- Chemical characteristics and fatty acid profile of foxtail millet bran oil, Liang, S., G. Yang, and Y. Ma
- Physical and sensory attributes of a *trans*-free spread formulated with a blend containing a structured lipid, palm mid-fraction, and cottonseed oil, Lumor, S.E., A.M. Pina-Rodriguez, R.L. Shewfelt, and C.C. Akoh
- The effect of phospholipids on butter physical and sensory properties, Fedotova, Y., and R.W. Lencki
- Novel two-phase catalysis with organometallic compounds for epoxidation of vegetable oils by hydrogen peroxide, Jiang, P., M. Chen, Y. Dong, Y. Lu, X. Ye, and W. Zhang
- Characterization of aromatherapy massage oils prepared from virgin coconut oil and some essential oils, Songkro, S., A. Sirikatitham, S. Sungkarak, K. Buaking, J. Wungsintaweeikul, D. Maneenuan, and K. Oungbho
- Effects of bleaching and deodorization processes of beef tallow on cholesterol removal by lecithin treatment, Yavari, A., A. Heshmati, M. Hamedi, and S. Haghbin
- Selectivities in partial hydrogenation, Dijkstra, A.J.

Lipids (January)

- Early and sustained enrichment of serum n-3 long chain polyunsaturated fatty acids in dogs fed a flaxseed supplemented diet, Dunbar, B.L., K.E. Bigley, and J.E. Bauer
- The consumption of food products from linseed-fed animals maintains erythrocyte omega-3 fatty acids in obese humans, Legrand, P., B. Schmitt, J. Mourot, D. Catheline, G. Chesneau, M. Mireaux, N. Kerhoas, and P. Weill
- Dietary source of stearidonic acid promotes higher muscle DHA concentrations than linolenic acid in hybrid



striped bass, Bharadwaj, A.S., S.D. Hart, B.J. Brown, Y. Li, B.A. Watkins, and P.B. Brown

- Mitochondrial cholesterol transporter, StAR, inhibits human THP-1 monocyte-derived macrophage apoptosis, Bai, Q., X. Li, Y. Ning, F. Zhao, and L. Yin
- HOCl-mediated glycerophosphocholine and glycerophosphoethanolamine generation from plasmalogens in phospholipid mixtures, Leßig, J., and B. Fuchs
- Olive oils modulate fatty acid content and signaling protein expression in apolipoprotein E knockout mice brain, Alemany, R., M.A. Navarro, O. Vögler, J.S. Perona, J. Osada, and V. Ruiz-Gutiérrez
- The spectrum of plant and animal sterols in different oil-derived intravenous emulsions, Forchielli, M.L., G. Bersani, S. Tala, G. Grossi, C. Puggioli, and M. Masi
- Lipid abnormalities in a never-treated HIV-1 subtype C-infected African population, Fourie, C.M.T., J.M. Van Rooyen, A. Kruger, and A.E. Schutte
- Use of comparative proteomics to identify key proteins related to hepatic lipid metabolism in broiler chickens: Evidence accounting for differential fat

deposition between strains, Huang, J., X. Tang, J. Ruan, H. Ma, and S. Zou

- Electron paramagnetic resonance investigation of stratum corneum lipid structure, Nakagawa, K.

Journal of Surfactants and Detergents (Issue 1)

- Relation of supersaturation ratio in mixed anionic surfactant solutions to kinetics of precipitation with calcium, Soontravanich, S., and J.F. Scamehorn
- Use of a nonionic surfactant to inhibit precipitation of anionic surfactants by calcium, Soontravanich, S., and J.F. Scamehorn
- Characterization of scale formed on the surfaces of toilet bowls, Ohki, T., N. Nishikawa, T. Hasegawa, T. Okano, and Y. Tanizawa
- Synthesis and physicochemical characterization of anionic surfactants derived from cashew nut shell oil, Scorzza, C., J. Nieves, F. Vejar, and J. Bullón
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- Effect of temperature and other variables on the optimum formulation of anionic extended surfactant-alkane-brine systems, Velásquez, J., C. Scorzza, F. Vejar, A.M. Forgiarini, R.E. Antón, and J.-L. Salager
- Influence of substructures on the spreading ability and hydrolysis resis-



tance of double-tail trisiloxane surfactants, Peng, Z., C. Lu, and M. Xu

- Viscosity adjustment of aqueous micellar solutions of gemini surfactants by interaction with additional surfactants, Liu, J., and J. Zhao
- Micellization and clouding behavior of EO-PO block copolymer in aqueous salt solutions, Patel, K., B. Bharatiya, Y. Kadam, and P. Bahadur
- Interactions between an anionic fluorosurfactant and a PEO-PPO-PEO triblock copolymer in aqueous solutions, Wang, Z.
- Sodium lauryl ether sulfate micellization and water solubility enhancement towards naphthalene and pyrene: Effect of the degree of ethoxylation, Aoudia, M., B. Al-Haddabi, Z. Al-Harthi, and A. Al-Rubkhi
- On plate identification of coexisting polyoxyethylene (20) stearyl ether, cetyl pyridinium chloride, tetradecyl trimethyl ammonium bromide and polyoxyethylene (9.5) octyl phenyl ether surfactants with preliminary separation by planar chromatography, Mohammad, A., and S.A. Bhawani

used as a reference (SPME method was used only for medium-chain fatty acid determination). All three procedures provide similar working parameters characterized by high repeatability (2.3–16.3%) and good linearity (correlation coefficient ranging from 0.9919 to 0.9999). Results of beer analyses obtained by using these three methods were highly correlated. Although all methods provide compatible alternatives, for medium-chain fatty acid analysis SPME may be a more appropriate technique due to its operational simplicity, repeatability, and low cost.

Dietary supplementation with *cis*-9,*trans*-11 conjugated linoleic acid and aortic stiffness in overweight and obese adults

Sluijs, I., *et al.*, *Am. J. Clin. Nutr.* 91:175–183, 2010.

Animal studies suggest that dietary *cis*-9,*trans*-11 (*c9,t11*) conjugated linoleic acid (CLA) may inhibit the development of atherosclerosis or cause it to regress. The effect of CLA on atherosclerosis has not been assessed in humans. We investigated the effect of *c9,t11* CLA supplementation on aortic pulse wave velocity (a marker of atherosclerosis) and on cardiovascular risk factors in overweight and obese but otherwise apparently healthy subjects. In a double-blind, randomized, placebo-controlled, parallel-group trial, we randomly assigned 401 subjects, ages 40–70 yr and with a body mass index (in kg/m²) ≥ 25 , to receive either 4 g CLA/d (2.5 g *c9,t11* CLA/d and 0.6 g *trans*-10,*cis*-12 CLA/d) or placebo supplements for 6 mo. Aortic pulse wave velocity, blood pressure, anthropometric characteristics, and concentrations of fasting lipid, glucose, insulin, and C-reactive protein were measured before and after supplementation. During the intervention, mean (\pm SE) pulse wave velocity did not change in the *c9,t11* CLA group ($\Delta 0.00 \pm 0.07$) compared with the placebo group ($\Delta 0.09 \pm 0.06$). There was no effect of *c9,t11* CLA supplementation on blood pressure, body composition, insulin resistance, or concentrations of lipid, glucose, and C-reactive protein. This study does not support an anti-atherosclerotic effect or an effect on cardiovascular risk factors of *c9,t11* CLA. This trial

was registered at www.clinicaltrials.gov as NCT00706745.

Evaluation of the effect of dietary virgin olive oil on blood pressure and lipid composition of serum and low-density lipoprotein in elderly type 2 diabetic subjects

Perona, J.S., *et al.*, *J. Agric. Food Chem.* 57:11427–11433, 2009.

Dietary virgin olive oil may help to reduce blood pressure in hypertensive individuals, but little is known about the effect on type 2 diabetic patients. For the present study, 17 type 2 diabetic elderly subjects and 23 healthy elderly controls received a diet rich in virgin olive oil for 4 weeks. Blood pressure, biochemical parameters, low density lipoprotein (LDL), and oxidized LDL lipids and fatty acids were measured. Systolic blood pressure was reduced after virgin olive oil consumption in both controls and diabetic patients. Although the biochemical parameters were not modified, the intervention protected LDL from oxidation and restored the levels of dihomog- γ -linolenic acid (20:3n-6) in serum cholesterol esters and phospholipids of diabetic patients. In conclusion, the present study provides new evidence of the effects of dietary virgin olive oil on blood pressure and LDL oxidation in type 2 diabetics. It is likely that the components responsible for the observed effects are the monounsaturated fatty acids and the antioxidants in the oil, but this topic needs further investigation.

2-Propanol in the mobile phase reduces the time of analysis of CLA isomers by silver ion-HPLC

Kuhnt, K., *et al.*, *J. Chromatogr. B* 878:88–91, 2010.

Individual isomers of octadecadienoic acid (18:2) with conjugated double bonds (conjugated linoleic acids; CLA) exert different biological activities. Their distribution in food and tissues differs. Therefore, the separation of the various positional and geometric isomers is important. The time of analysis using silver ion-high performance liquid chromatography can extend up to 90 min. In this study the time of

analysis was reduced from *ca.* 90 min to 45–35 min, respectively, by the addition of 0.05% or 0.1% (v/v) 2-propanol to the mobile phase [acetonitrile (0.1%; v/v) and diethyl ether (0.5%; v/v) in *n*-hexane]. There was no effect on resolution of the 17 individual CLA isomers of the CLA mixture. Regarding the lowest coefficient of variation and an adequate baseline separation, the use of 0.05% 2-propanol in the mobile phase is recommended, without any disadvantages and adverse effects on the service life of columns. Adding 0.05 or 0.1% 2-propanol to the mobile phase shortens the time of analysis of CLA isomers, saves solvents, and reduces costs.

Fatty acids are rapidly delivered to and extracted from membranes by methyl- β -cyclodextrin

Brunaldi, K., *et al.*, *J. Lipid Res.* 51:120–131, 2010.

We performed detailed biophysical studies of transfer of long-chain fatty acids (FA) from methyl- β -cyclodextrin (MBCD) to model membranes (egg-phosphatidylcholine vesicles) and cells and the extraction of FA from membranes by MBCD. We used (i) fluorescein phosphatidylethanolamine to detect transfer of FA anions arriving in the outer membrane leaflet; (ii) entrapped pH dyes to measure pH changes after FA diffusion (flip-flop) across the lipid bilayer; and (iii) soluble fluorescent-labeled FA-binding protein to measure the concentration of unbound FA in water. FA dissociated from MBCD, bound to the membrane, and underwent flip-flop within milliseconds. In the presence of vesicles, MBCD maintained the aqueous concentration of unbound FA at low levels comparable to those measured with albumin. In studies with cells, addition of oleic acid (OA) complexed with MBCD yielded rapid (seconds) dose-dependent OA transport into 3T3-L1 preadipocytes and HepG2 cells. MBCD extracted OA from cells and model membranes rapidly at concentrations exceeding those required for OA delivery but much lower than concentrations commonly used for extracting cholesterol. Compared with albumin, MBCD can transfer its entire FA load and is less likely to extract cell nutrients and to introduce impurities.

¹H NMR-based protocol for the detection of adulterations of refined olive oil with refined hazelnut oil

Mannina, L., *et al.*, *J. Agric. Food Chem.* 57:11550–11556, 2009.

A ¹H nuclear magnetic resonance (NMR) analytical protocol for the detection of refined hazelnut oils in admixtures with refined olive oils is reported according to ISO format. The main purpose of this research activity is to suggest a novel analytical methodology easily usable by operators with a basic knowledge of NMR spectroscopy. The protocol, developed on 92 oil samples of different origins within the European MEDEO project, is based on ¹H NMR measurements combined with a suitable statistical analysis. It was developed using a 600 MHz instrument and was tested by two independent laboratories on 600 MHz spectrometers, allowing detection down to 10% adulteration of olive oils with refined hazelnut oils. Finally, the potential and limitations of the protocol applied on

spectrometers operating at different magnetic fields, that is, at proton frequencies of 500 and 400 MHz, were investigated.

Dose effects of dietary phytosterols on cholesterol metabolism: A controlled feeding study

Racette, S.B., *et al.*, *Am. J. Clin. Nutr.* 91:32–38, 2010.

Phytosterol supplementation of 2 g/d is recommended by the National Cholesterol Education Program to reduce LDL (low density lipoprotein) cholesterol. However, the effects of different intakes of phytosterol on cholesterol metabolism are uncertain. We evaluated the effects of three phytosterol intakes on whole-body cholesterol metabolism. In this placebo-controlled, crossover feeding trial, 18 adults received a phytosterol-deficient diet (50 mg phytosterols/2000 kcal) plus beverages supplemented with 0, 400, or 2000 mg phytosterols/d for 4 wk each, in random order. All meals were prepared in a metabolic kitchen; breakfast and dinner on weekdays were eaten on site.

Primary outcomes were fecal cholesterol excretion and intestinal cholesterol absorption measured with stable-isotope tracers and serum lipoprotein concentrations. Phytosterol intakes (diet plus supplements) averaged 59, 459, and 2,059 mg/d during the three diet periods. Relative to the 59-mg diet, the 459- and 2,059-mg phytosterol intakes significantly ($P < 0.01$) increased total fecal cholesterol excretion ($36 \pm 6\%$ and $74 \pm 10\%$, respectively) and biliary cholesterol excretion ($38 \pm 7\%$ and $77 \pm 12\%$, respectively) and reduced percentage intestinal cholesterol absorption ($-10 \pm 1\%$ and $-25 \pm 3\%$, respectively). Serum LDL cholesterol declined significantly only with the highest phytosterol dose ($-8.9 \pm 2.3\%$); a trend was observed with the 459-mg/d dose ($-5.0 \pm 2.1\%$; $P = 0.077$). Dietary phytosterols in moderate and high doses favorably alter whole-body cholesterol metabolism in a dose-dependent manner. A moderate phytosterol intake (459 mg/d) can be obtained in a healthy diet without supplementation. This trial was registered at clinicaltrials.gov as NCT00860054. ■

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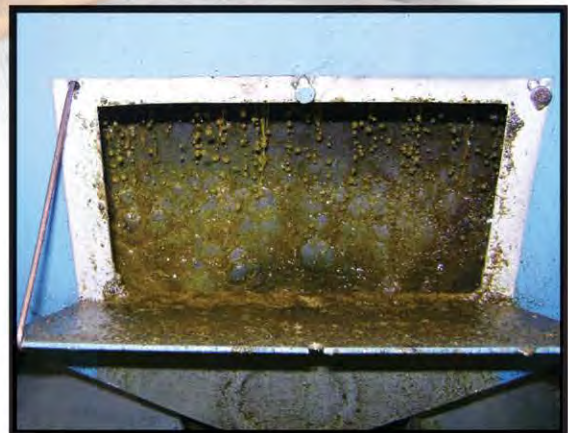
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Hermann Pardun (1908–2009)

Who was this German oil and lecithin pioneer, and how did his inventions change the lecithin world?

Willem van Nieuwenhuyzen

In the summer of 2009, Dr. Hermann Pardun of Germany passed away at the age of 101. During his professional life he published over 60 papers about fats, oils, and lecithins, all in German. He filed many patents on lecithin inventions, resulting in granted patents for his employer (Unilever). But who was Pardun, what were his research and development capacities, and how have his inventions changed the lecithin world?

YOUTH AND EDUCATION

Hermann Heinrich Theodor Pardun was born April 14, 1908, in the city of Münster, in the state of Westfalia, at a time when Germany could still be considered an empire. He grew up in Münster and attended primary school there during World War I, and then the Gymnasium. From 1926 to 1930 he studied chemistry, with submajors in physics, mathematics, geology, and biology (botany), at the University of Münster. During this time, one of his chemical experiments went awry and ended with an explosion that cost him one of his eyes.

Due to the economic crisis of the 1930s, it was difficult for Pardun to find a job. In 1931, Dr. Hans Paul Kaufmann, full professor for pharmacy and chemical technology at the University of Münster, offered Pardun the position of scientific assistant. He was awarded his Ph.D. *magna cum laude* in 1932 for his dissertation “Activation of heavy metal sulphides by additives.” In Kaufmann’s institute, Pardun started to work on projects involving the chemistry of fats; his interest in the topic would determine much of his career and life. (During this same time, Kaufmann became internationally famous as a fats chemist, and also founded the DGF [the German Society of Fat Science], initiated the German Federal Institute of Fat Research in Münster, and the ISF [International Society of Fat Research].)

PROFESSIONAL CAREER

In 1936, Pardun became manager of the development laboratory for the firm Noblee & Thörl (now part of Archer Daniels Midland Co.) in Hamburg-Harburg. He worked on synthetic fatty acid production, improving oxidation by the Fischer-Tropsch-Gatsch reaction. The



inventions were filed in about 20 patent applications. During World War II, he worked on reducing the amount of solvent used in oilseed extraction. At that time, plant-scale extraction was carried out batch-wise, and specifications on residual solvent in meal did not exist.

In 1948, Pardun joined the Unilever Central laboratory in Hamburg. In 1954, Unilever offered him the position of chief chemist of the Quality Assurance and Development laboratory at the site of the Unilever-Van den Bergh’s Margarine (Margarine Union) Plant in Cleve, Germany. Cleve is a small town in the lower Rhine area close to both the Dutch border and other former Unilever plants at Emmerich and Spyck. At that time, the development laboratory worked on local projects for the margarine plant, but also it would take on chemical-technical development projects for other Unilever oils and fats factories. Pardun’s solvent extraction expertise was applied in small (from today’s perspective) oil milling operations spread over Europe.

LECITHIN MODIFICATIONS

A first project was the process of upgrading rapeseed lecithin for use as an emulsifying and antispattering agent in margarine, which was needed because of a lack of soy lecithin after World War II. (The performance of soy lecithins as a replacer of egg yolk in margarine had already been proven [1].) The result was the de-oiling of crude rapeseed lecithin (containing high levels of erucic acid) in a continuous process with a mixture of 2:1 hexane/acetone (2). A full-scale plant was never built, though, because soy lecithin became available again. Within the framework of the Marshall Plan (also known as

the European Recovery Program), North American lecithin manufacturers were happy to export lecithin to Europe after World War II. European lecithin-importing manufacturer Lucas Meyer received larger than requested quantities of light-colored US lecithin, which the company then strongly super-heated into a dark-colored lecithin, acceptable for European food processors. Those processors had always used dark lecithin before and during the war.

Around 1960 the crystallization of margarine during batch production according to the Churning-Drum Process was replaced by the continuous Votator® crystallization process. The antispattering function of standard soy lecithin became insufficient. Colleagues in the Unilever Research Laboratory, Vlaardingen, Netherlands (Henk J. Duin, among others) and Unilever Research in Hamburg patented an invention—an alcohol-soluble phosphatidylcholine (PC)-enriched fraction with a PC/phosphatidylethanolamine (PC/PE) ratio of 4:1—that gave excellent frying properties without spattering in low-salt-containing margarines (3). As a result of the removal of most of the divalent calcium-containing PE and phosphatidic acid (PA) the calcium insensitivity was improved; thus, calcium ions from the milk could not inactivate the phospholipid function.

Pardun's development group established optimal process conditions (4), after which a unit for the production of PC-enriched lecithin fractions was built in the Unilever oil mill Ölwerke Spyck near Cleve (process details are contained in a publication by Liebing [5]). Another fractionation plant was installed in the 1960s at the VOZ-Unimills oil mill in Zwijndrecht, near Rotterdam, Netherlands, which unit was shut down in 1971. At the sale of the Spyck oil mill to ADM in 1986, the Spyck lecithin fractionation unit was transferred to the site of this Zwijndrecht oil mill. Recently, Unimills (now part of the Malaysian Sime Darby Group) again took over the management of this robust plant from Loders Croklaan. The lecithin fractions and other specialties produced here are marketed for use in margarines, other foods, and pharmaceutical products.

Later, Pardun and other Unilever scientists found that enzymatic hydrolysis of soy lecithin with phospholipase A2 (PLA2) yields a product with similar antispattering properties (6), which allowed for the plant-scale production of a range of products with tailor-made degrees of partial hydrolysis in continuously running reactors at VDO Mannheim (Germany) and VOZ-Unimills (Zwijndrecht) oil mills. The enzyme source was milled pancreas powder, purchased under the trade name Pankreatin. Since PLA2 remains active at 60–70°C, the powder is stirred into hot water at low pH, inactivating the amylase, protease, and lipase enzymes, which are not needed. In the 1980s purified PLA2 Lecitase enzyme, extracted from pancreas, became available. Currently enzyme companies supply PLA2 and PLA1 enzymes that are produced by microorganisms.

Pardun also investigated the use of soy protein flours as an antispattering agent in low-salt margarines. And indeed soy protein concentrates were used in Italian margarine recipes in the early 1970s, because Italian food laws did not allow dairy protein inclusion at those times. I had the opportunity to reconfirm the positive effect of functional soy protein concentrate and soy protein isolate on the frying performance of margarine some years ago.

The lecithin expertise of Pardun and colleagues in four Unilever Research Centers was also key in the extension of the Unilever lecithin business outside the margarine sector; lecithin sales to third parties became important. New fields of application were discovered. For example, hydrolyzed lecithin became an important emulsifier in the production of milk replacers for calf and piglet feeding.

Unilever's former ownership of palm oil plantations, palm oil processing plants, and vegetable seed oil mills was based on the company's strategy of owning oil supply chains for the margarine and detergents business. In the course of the 1960s, soybeans became an important oil source, which induced Unilever management to concentrate all local operating European oilseed crushing plants in the Unilever Oil Milling Division (Unimills; Hamburg, Germany) in 1971.

Soybean crushing required another, more internationally focused commodity market approach, in which the value of the soybean meal (constituting 82% of the total weight of soybeans) contributes significantly to the crushing margin. New crushing plants were installed, and by the early 1980s Unilever was the leader in European oil milling activities, as well as the largest European lecithin producer. After 1985, Unilever divested its seed oil milling activities and refineries and, more recently, their palm oil plantations.

OILS AND FATS

Nevertheless, Pardun's function in the Cleve margarine factory required that most of his time was spent on oils and fats (O&F) quality assurance, bacteriological control, and O&F developments.

He worked on the fractionation of palm oil, which became a leading source of oil for the European margarine industry in the 1950s. And the high-melting fractions could be used as a cocoa butter replacer in chocolate production. That knowledge was used by the Unilever company Ölwerke Germania in Emmerich.

Unilever also spent much time on the development of methods for determination of shelf life and quality of refined O&F. Pardun and Edith Kroll developed a variation on the SWIFT Test (a well-accepted test procedure for determining oxidation stability of frying oils). Pardun promoted the measurement of the Extinction Value E 232 and E 268 as parameters of oil quality during neutralization, bleaching, and deodorization in the refining process. Hydrogen peroxide formation increases the E 232 value, and the formation of trienoic acid increases the E 268 extinction value.

In 1969 he published an extensive chapter on "Analysis of fats and fat products" in Schormüller's *Handbuch der Lebensmittelchemie (Handbook of Food Chemistry)*. This was followed in 1976 by the monograph "Analyse der Nahrungsfette" ("Analysis of Nutritional Fats"). He was involved in university courses for students in food chemistry and technology. And, of course, he also worked on acid-degumming processes, for which he tried to find an optimum between good oil quality and lecithin quality and performance.

DGF

Together with Kaufmann, Pardun was the initiator of the German Society for Fat Science (Deutsche Gesellschaft für Fettwissenschaft; DGF) in 1936. He was an active member, with presentations at many conferences. From 1973 to 1975, he was chairperson of the Analysis and Standard Methods division, which was a good platform for discussing analytical parameters and tests for determining heat damage in frying oils. Many of the DGF official methods were influenced by his investigations.

For almost two decades he was a member of ISO (International Organization for Standardization) and its Analytical Committee, whose analytic methods were binding for his company worldwide.

The DGF honored Pardun with its prestigious Normann Medal Award in 1982. His keynote paper was on 50 years of the technology

of vegetable oils and fats, where he presented his experience since starting work with Kaufmann. Topics that he covered included the extraction of oilseeds, degumming of crude oils, and modification of lecithins and quality aspects of refined oils (7). He was made an honorary member of DGF.

On the occasion of his 100th birthday in 2008, the DGF announced the annual Hermann Pardun Prize for the best scientific paper on oils and fats by a young academic scientist.

RETIREMENT: TIME FOR EDITING A LECITHIN BOOK

Pardun retired in 1973. He received the Bundesverdienstkreuz I. Klasse (the Order of Merit first class) from the Federal Republic of Germany for his vocational and scientific achievements. Hence, his retirement was a challenge for him to spend even more time on editing scientific papers on O&F, developing lecithin ideas, and being active in the DGF. He advised Unilever lecithin factories, where his patents were used. For a number of years he was a valuable consultant to the Lucas Meyer lecithin firm in Hamburg.

In addition to various presentations at conferences and publications, he edited papers on O&F and lecithin. Pardun's invaluable, important book in the German language *Die Pflanzenlecithine* (*The Vegetable Lecithins*) was published in 1988 (8). He had reached the age of 80 years. The book summarizes many of his former internal Unilever reports and patents. As an exacting chemist, he and his staff recorded extensively all experiments in laboratory journals,

of which the most important data were selected for publication. Although his research activities ended around 1970, he continued to search the literature for relevant materials to include in his scientific papers till 1988. I still use this book as a basis for inspiration and setup of experiments. It is remarkable how exactly phospholipid compositions measured by qualitative thin-layer chromatography in the 1960–1970s agree with today's experimental data, measured with quantitative high-performance liquid chromatography or ^{31}P nuclear magnetic resonance. The book also describes a number of creative empirical emulsification tests, demonstrating the differences in emulsifying power of modified lecithins. Pardun published his last lecithin review paper in 1989 (9). All his papers were published in German, which might be why some of his ideas have not been disseminated as widely as they should have been by now. However, Unilever filed all his lecithin patent applications in the English language.

Pardun kept his interest in O&F and lecithin developments all of his life. He joked that writing about lecithin kept one in good health. In reasonably good health, he and his wife lived in their home in Cleve until 2005, when his wife passed away. After that, he moved to a retirement home. He celebrated his 101st birthday with a fresh mind. Hermann Pardun passed away August 5, 2009, at the age of 101 years. A giant in lecithin and oil research became past.

ACKNOWLEDGEMENT

I would like to thank Armin Wendel, managing director of Phospholipid GmbH (Cologne, Germany) for permission to use a picture and the text of an unpublished interview with Dr. Pardun in 2002. Wendel is also author of the article "Lecithin: The first 150 years" in *inform* 11:885–892 and 992–997 (2000).

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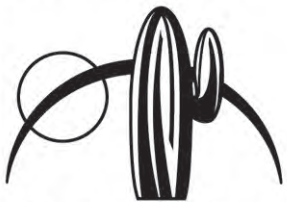
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Notice of Annual Business Meeting

The annual business meeting of the American Oil Chemists' Society will be held on Tuesday, May 18, 2010 at 7:30 a.m., at the Phoenix Convention Center, Phoenix, Arizona, USA. Routine business of the Society will be conducted, including reports from the secretary and president, and new officers will be installed.

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Today's petroleum prices and supply issues mean more interest in biobased surfactants and detergents, which can outperform synthetic, petroleum-derived, surfactants (biodegradability, biocompatibility, and measures of sustainability). Consumers want eco-friendly and biobased products, leading to increased use of biobased surfactants. This new, must-have book highlights the latest biobased surfactants being developed, the potential for the "sustainable" manufacturing of biobased surfactants via a biocatalytic route, and novel applications for biobased surfactants. Contents include how to reduce manufacturing and purification costs, impurities, and by-products.

CONTENTS

Part 1. Introduction, Importance, and Relevance

- Biobased Surfactants: Overview and Industrial State-of-the-Art

Part 2. Biosynthesis of Rhamnolipids and Sophorolipids

- Production and Modification of Sophorolipids from Agricultural Feedstocks
- Mannosylerythritol Lipids: Production and Downstream Processing
- Advances in Bioprocess Development of Rhamnolipid and Sophorolipid Production
- Microemulsions of Rhamnolipid and Sophorolipid Biosurfactants
- Lipopeptide Biosurfactants and Their Use in Oil Recovery

Part 3. Employment of Phospholipids and Their Mimics in Biomedical Applications

- Influence of Pulmonary Surfactant Protein Mimics on Model Lung Surfactant
- Lung Surfactants: Formulation, Evaluation, and Polymeric Additives
- Self-assembling Properties of Glycolipid Biosurfactants and Their Functional Developments

Part 4. Sugar-, Polyol-, and Amino-based Lipids: Biodegradable and Biocompatible Surfactants for Foods, Health Care Products, and Pharmaceuticals

- Basic Properties of Sucrose Fatty Acid Esters and Their Applications
- Selective Enzymatic Synthesis of N-Acylated Alkanolamine Emulsifiers
- Synthesis of Saccharide Fatty Acid Ester Biosurfactants Catalyzed by Lipase
- Synthesis, Aggregation Properties, and Applications of Biosurfactants Derived From Arginine
- Design of Vegetable Oil Metalworking Fluid Microemulsions Using Biobased Surfactants
- Polyol and Amino Acid-based Biosurfactants, Builders, and Hydrogels
- Interfacial Properties of Sugar-based Surfactants

64th Annual Convention & International Conference on Oils, Fats, Fuels & Surfactants (ICOFFS)

Ashwani K. Sharma

The Oil Technologists' Association of India (OTAI), Northern Zone, organized the 64th Annual Convention & International Conference on Oils, Fats, Fuels & Surfactants (ICOFFS) held December 9–11 at the Hotel Crowne Plaza, New Delhi. Nearly 500 delegates attended the three-day program.

OPENING CEREMONY AND AWARDS

Y.C. Nijhawan, chief director, Ministry of Consumer Affairs, Food and Public Distribution (Government of India; GoI), opened the meeting on the evening of December 9, in a packed Elysée Hall. Ashwani K. Sharma, OTAI North Zone president and convener, extended his heartiest welcome to all delegates from India and abroad, to speakers, and to supporters of the conference. Ashok Mahindru, Steering Committee chairman, explained that the goal of the conference was to keep concerned industries informed of the latest trends and future possibilities through the multiple lenses of technology, the economy, regulation, the environment, and sustainability, and ultimately to aid them in constructing well-informed business strategies.

OTAI President B.R. Gaikwad offered a glimpse of the history, achievements, and visions of the globally recognized association, founded in 1943 with delegates from around the world. In his keynote address, AOCS President Ian Purtle drew the delegates' attention to the potential pressures of increasing world population on food and fuel supply. He exhorted them to remain prepared with appropriate solutions. Prabhat Kumar, OTAI North Zone and conference secretary, thanked all those who had provided invaluable support for the conference program.

As a mark of respect toward their tremendous contribution to industry, academia, and society at large, the honorable Chief Guest Y.C. Nijhawan presented lifetime achievement awards to S.C. Singhal, former president of both OTAI and the AOCS India Section; A.K. Vasishta, former director of HBTI (Harcourt Butler Technological Institute, Kanpur, India) and president of OTAI, currently director-general at the Bharat Institute of Technology (Meerut, India); and K.S. Krishnan, emeritus chairman of Milindia Ltd. (Noida, Uttar Pradesh, India) and former OTAI president.

PLENARY SESSIONS

December 10. Plenary sessions began December 10 with "Agricultural Know How," chaired by J.P. Singh, former secretary, GoI.



Crowds visit exhibit booths at the 64th Annual Convention & International Conference on Oils, Fats, Fuels & Surfactants (ICOFFS), held December 9–11, 2009, and organized by the Oil Technologists' Association of India (OTAI).

Kyaw Myint reviewed the oilseed farming and seed and oil processing industries in Myanmar, with an eye toward the possible role of foreign participation. In his presentation on "Compulsion of Raising Oilseed Productivity and Production to Combat Import Glut," D.M. Hegde shared his review of the current status of agricultural practices, research issues, government efforts, and a potential roadmap toward achieving maximum self-reliance in the segment.

In the second session on "Oilseed Processing," Richard Young (Europa Crown, East Yorkshire, United Kingdom) spoke about the salient features of design and operation of shallow bed extraction systems for oilseed processing.

Rajiv Iyer (Cimbria Unigrain India, New Delhi) and Rajiv Mehrotra (Tank Connection, Parsons, Kansas, USA) shared their views on scientific storage practices of raw materials and products in oil and seed-processing industries.

In his characteristically energetic presentation, Rajan Skharia (Mecpro Heavy Engineering Pvt. Ltd., New Delhi) stressed the importance of research and development for developing efficient processing technologies for oils and oilseeds. This session was chaired by R.P. Singh, former director of HBTI and incoming OTAI president.

CONTINUED ON NEXT PAGE

In the day's third session ("Oil Processing"), M.S. Alam (Texas A&M University, College Station, USA) reviewed the current status of research on specific frying oils that can be adopted as better alternatives to *trans*-fat-containing oils and fats.

David Cowan (Novozymes, Nottingham, United Kingdom), in his speech on enzymatic interesterification, spoke about different parameter optimization issues at the industrial production scale. He especially focused on issues important for the oil supplier, as well as the designer of in-house techniques. Robert Zeldenrust (GEA Westfalia Separator GmbH, Oelde, Germany) revisited the importance of solvent phase chemical refining of oils. Roberto Berbasí (Oil-Dri Corporation of America, Chicago, Illinois) presented data on global trends and the importance of natural silicates in oil processing. This session was chaired by Eduardo Dubinsky from Argentina.

In the final session of the day (Biofuels), David Cowan substituted for Anwar Shalmashi (Iranian Research Organization for Science and Technology). He spoke about the latest developments in the application of enzymatic techniques in biodiesel processes. Ajay Dalai (University of Saskatchewan, Canada) shared new research on biodiesel processes and biodiesel utilization to enhance viability of the future biodiesel industry. Camilo Holiché (SPEC India, Ahmedabad) reviewed the biodiesel scene and indicated that the industry has the technology to handle a variety of raw materials. This session was chaired by Jai Uppal (senior consultant, renewable energy).

The busy second day concluded with a one-hour cultural program on Dances of India, followed by a gala dinner.

December 11. The third day of the conference began with a speech by K.V. Thomas, minister of state, Department of Agriculture and Public Distribution, GOI. He underlined the importance of efforts being made by government and the private sector to bridge the demand and supply gap of edible oils. Thomas welcomed OTAI's efforts and suggestions in this direction, and Ashwani K. Sharma thanked him for his commitment to the program.



S.C. Singhal (third from left) receives the Lifetime Achievement Award during ceremonies at ICOFFS 2009. Joining him are, from left, Prabhat Kumar, secretary, OTAI-North Zone; Ian Purtle, president, AOCS; Y.C. Nijhawan, chief director, Ministry of Consumer Affairs, Food and Public Distribution (GoI); B.R. Gaikwad, president, OTAI; and Ashwani Sharma, president, OTAI-North Zone.



ICOFFS 2009 attendees listen during one of the conference's plenary sessions.

The session "Confectionery/Bakery/Nutrition/Energy" was jointly chaired by S.K. Handoo (Amrit Vanaspati India) and Ashok Jain (Vibrant Consultants, India). Terry Yanagita (Saga University, Japan, and director of the Japan Oil Chemists' Society) reviewed the physiological functions and molecular reactions of bioactive lipids such as omega-3 fatty acids, conjugated fatty acids, medium-chain fatty acids, diacylglycerols, and phosphatides. He examined their role in the development of metabolic syndrome so as to arrive at a quantity and type of lipids to be consumed by humans to avoid life-style and diet-related metabolic syndrome.

Eduardo Dubinsky, former president of the Latin American Section of AOCS, spoke about the role of high-oleic sunflower oil in successfully replacing *trans* fat in bakery products in Argentina and neighboring countries. Punit Bhatia and Vikas Tripathi of Thermax India (Pune) reviewed heating and chilling solutions for the edible oil industry.

In the "Bio Surfactants" session, Rajesh Iyer (Rhodia, France) presented facts about Miracare SLB liquid surfactant technology, which enables formulators to suspend natural/synthetic oil and water-insoluble additives in cleaning formulations to provide unique performance in moisturizing and conditioning on skin and hair. Niranjana Gupta (Hindustan Unilever Ltd.) shared his vision on "Opportunities in Surfactants and Role of Bio Surfactants." In the last presentation of the session, Manfred Hoffman, director-technology (Lurgi GmbH, Frankfurt am Main, Germany) spoke on "Fixed Bed Hardening Technology," which offers advantages over a batch process in terms of lessened catalyst consumption and inactivation and reduced formation of unwanted by-products. This session was chaired by B.R. Gaikwad, outgoing OTAI president.

The next session, "Business Economics," was a big draw; it was jointly chaired by G. Chandrashekhar (senior editor-Commodities, The Hindu Group) and Keith Steve (chief executive officer, ADM India). The first speaker, O.P. Goenka (CMD-Foods, Fats and Fertilizers Industries, Hyderabad) shared his vision on possible challenges and opportunities that will shape the oil industry in coming decades. His urgent recommendation—"Revolutionize your

vision, scenes on the horizon will change”—resonated with delegates. Swaroop Mahanty (PricewaterhouseCoopers) spoke about the latest changes in carbon credit policies meant to enhance the potential viability of biodiesel projects. In the final presentation, Prafulla Kumar (Chemexil) discussed mandatory compliances for exports to European Union.

RESEARCH SESSIONS

Research sessions, both oral and poster, were held in parallel on December 10 and 11. S.N. Naik (IIT Delhi), Jayanti Adhikari (Ganesh Scientific Research Foundation, Delhi), and M.K. Shrivastav coordinated all sessions. In all, about 30 research papers were presented in oral sessions and 14 in poster sessions.

CONCLUDING SESSION

The concluding session was held on the evening of December 11. Ashok Mahindru (chairman, ICOFFS Steering Committee) reviewed highlights of the proceedings during various sessions of the past two and a half days and expressed deep satisfaction on the same. R.P. Singh, the new president of OTAI, shared his vision of strengthening OTAI both internally and globally, with support from and to other all-India organizations:

Parliament member K. Sudhakaran from the state of Kerala was the chief guest of the function. In his valedictory speech, he asked delegates to implement new ideas and practices that had been discussed at ICOFFS '09 for bridging the gap between supply and

demand and to improve processing efficiencies in industry operations. On his behalf, he promised total support to the organization on all genuine issues concerning industry and consumers at large. He requested all stakeholders to remain vigilant on the tasks concerning food and energy security for the country.

This session also included the presentation of awards for contributions to the industry and society at large. Lifetime achievement awards were given by Sudhakaran to S.C. Jain (former general manager, Hindustan Lever) and S.P. Gupta (senior consultant, Soaps, Detergent, Oils & Fats Processing, Ghaziabad). T.N. Agarwal and K.P. Sharma, both former presidents of OTAI-Northern Zone, were given awards for exceptional commitment and exceptional leadership for the Northern Zone. Asish Mantri (Abhay Cotex Pvt. Ltd.) was given the Young Achiever Award. Fortune & Ghari were given the Brand Achievement Award in the fields of refined oils and detergents, respectively.

Finally, Ashwani K. Sharma proposed a vote of thanks and expressed gratitude to Singh and all zonal presidents (R.B.N. Prasad, S.K. Roy, Sanjay Trivedi, Ashok Garg) for their guidance and cooperation. He also thanked all supporting organizations (AOCS, JOCS, SCA, IVPA, VMA, SOPA) and all sponsors and exhibitors for making great contributions toward the success of ICOFFS '09.

Ashwani K. Sharma (Pegasus Technologies, New Delhi) is an oil technologist having more than three decades of experience in the field of oilseeds and oil processing. Contact him at info@icoffs09.com.

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Food Ingredients Europe 2009

Sustainability, economic recovery among exhibition topics



Willem van Nieuwenhuyzen

The Food Ingredients Europe (FiE) 2009 Exhibition held November 17–19, 2009, in Frankfurt, Germany, was a premier meeting place for the global ingredients industry. The 1,260 exhibitors from 55 countries, among them 350 newcomers, welcomed over 20,000 visitors for professional contacts and discussions, making this FiE exhibition a successful business event. The number of booths represented a 12% increase compared to FiE 2007 (see *inform* 19:65–67, 2008). The Canadian pavilion comprised 30 company booths, the US pavilion 30+ companies, and the Chinese pavilion 100. (These numbers represent only the smaller companies' booths, because many companies with a large European market volume occupied their own booths.) In conjunction with FiE, Nutritional Ingredients 2009 (Ni) was held. Booth representatives for both exhibitions were enthusiastic about the high number of contacts, which may signal economic recovery. Most company representatives reported recovering sales turnover starting during the third quarter of 2009, after weak sales in the first half of 2009. Exhibitors and visitors were in a positive mood.

FIE 2009 AWARD WINNERS

Best innovations in five categories (Dairy, Savory/Meat, Confectionery, Bakery, and Snacks/On the Go) were selected by a group of world-class judges. A short list of two or three nominees per category had the opportunity to present their innovations to both the judges and the public on the first day of the exhibition, after which the award ceremony took place.

National Starch Food Innovation (Manchester, United Kingdom) received the Fi Excellence Innovation of the Year Award for its ingredient N-Dulge FR—a co-texturizer that enables the amount of butter, margarine, or shortening used in cake recipes to be reduced by 75%.

Explaining the panel's decision, Henry Dixon, chair of judges, said: "The judges quickly identified two frontrunners for this award. In our final analysis we looked for an ingredient that not only benefits the manufacturer and retailer but that also holds out the promise of helping consumers overcome a real and significant challenge."

Confectionery Innovation of the Year was Fuji Oil Europe's Redusat, which contains half the amount of saturates as normal saturated fats, but maintains the same structure. The product addresses a major problem in health and nutrition: overconsumption of saturated fats. Saturated fats increase the risk of cardiovascular diseases, but from a functional point of view we need them to give structure to food products. This prize was accepted by Bernard Cleenewerck, chief executive officer of Fuji Oil Europe (Izegem, Belgium).

Other nominees in the confectionery area were:

- Deliar NH, a nonhydrogenated smooth aerated confectionery filling fat with high whipping capacity from AAK AarhusKarlshamn Group (Aarhus, Denmark)
- Biscuitine 580, a zero-*trans* filling fat that needs no tempering, from IOI Lodders Croklaan (Wormerveer, Netherlands)

In addition to receiving the overall Innovation of the Year accolade, National Starch beat out J. Rettenmaier & Söhne (Rosenberg, Germany) to win Bakery Innovation of the Year.

Chr. Hansen A/S (Hørsholm, Denmark) also celebrated a double coup, winning Savory/Meat Innovation of the Year for Bactoferm® Rubis, and Dairy Innovation of the Year for CHY-MAX® M. Bactoferm Rubis solves the problem of oxidization in packaged meats naturally thanks to its ability to consume oxygen, while CHY-MAX M delivers reduced costs-in-use, better process control, improved flavor, and increased shelf life in dairy applications.

Lastly, the Snacks/On-The-Go category was won by Lyckeby Culinar AB (Fjälkinge, Sweden), with Culinax®, the flavoring system for "difficult to flavor" products.

CONFERENCES, SHOWCASE, NEW PRODUCTS

Each day the exhibition organizers offered a selection of 15 seminars with food ingredients topics and 4 seminars with specific natural ingredients topics. Each seminar included three or four speakers and lasted an hour and a half. Topics were Health Claims & Functional Foods, Ingredient Innovation, Product Applications, and Consumer Trends & Sourcing Strategies. In the Showcase area, strategically situated in the entrance hall, 12 companies presented their products or technological expertise. In the New Product Zone the latest ingredients innovations were presented.

Pre-show Breakfast Briefings about Megatrends in the Food Industry and Agricultural Demand/Supply were given by The Nielsen Co. (Netherlands) and ING Wholesale Banking (Amster-



The exhibit floor at the Food Ingredients Europe (FiE) 2009 Exhibition, held November 17–19, 2009, in Frankfurt, Germany.

dam, Netherlands). Lunchtime cooking demonstrations and master classes complemented the range of activities.

EXHIBITION

Oils and fats (O&F). The exhibitor list included 30+ suppliers. In the bulk O&F sector the usual fats were presented. The commodity seed crushers have added European specialty fat activities in confectionery cocoa butter replacers and bakery fats to their portfolio over the last decade. ADM Europe (Archer Daniels Midland Co.; Rolle, Switzerland) promotes the NovaLipid™ bakery fats and margarines and Chocovit® CBE (cocoa butter equivalent) and Chocotan confectionery fats. Cargill Europe (Mechelen, Belgium) has also extended chocolate ingredient production capacities in the cocoa bean-growing countries and European sites.

In contrast, specialty confectionery fat producers such as IOI Lodens Croklaan, Sime Darby-Unimills (Zwijndrecht, Netherlands), and AAK have extended potentials with palm oil sources. In particular, Sime Darby-Unimills has made the transition from a straight oil refinery to a specialty producer of bakery and confectionery fats, well-documented with brochures. Walter Rau A.G. (Neuss, Germany) and Lipidos Santiga S.A. (Santa Perpetua de Mogoda, Spain) offer locally fractionated and interesterified fats. No doubt the competition in the stable West European market will be heavy, but growth potentials may exist in other regions.

Most of these companies are now members of the Roundtable on Sustainable Palm Oil (RSPO) and Round Table on Responsible Soy (RTRS) in order to establish certified rules for sustainable farming, harvesting, and processing of raw materials. First shipments of certified palm oil have been delivered in Europe.

Interestingly, the call for sustainable cocoa bean production, cocoa powder, and cocoa butter processing is loud. The leading producers, such as Barry Callebaut (Wieze, Belgium), ADM, and Cargill, have invested in new plants and in education of local farmers. Chocolate producers and retailers reported on fair trade chocolate sources. Cocoa bean processors are integrating their activities with semi-finished chocolate production. Fuji Oil Europe, a division of

Fuji Oil Japan, reported the opening of their new division Flanders Fillings & Compounds with the startup of a new compound chocolate plant having a 2,600-m² production area. It will produce compound chocolate for the confectionery, biscuit, and ice-cream industry. Many customer-specific recipes will be offered to customers in the praline and toffee industry.

Other O&F companies promoted their specific products such as omega oils with specific health claims. Martek Biosciences Corp. (Columbia, Maryland, USA), Cognis (Düsseldorf, Germany), and DSM (Delft, Netherlands) offer specific sourced omega oils. Both Aker BioMarine (Oslo, Norway) and Neptune Technologies & Bioresources Inc. (Québec, Canada) offer krill oils with 40% phospholipids, of which 80% are phosphatidylcholine with high omega-3 fatty acid content. Neptune has received the EFSA (European Food Safety Authority) Novel Food clearance and also approval for use for particularly nutritional purposes (PARNUTS) allowing its commercialization in diet meal replacements.

Soy-derived isoflavones and phytosterols are settled ingredients in the O&F health portfolio. Solbar (Ashdod, Israel) pushed its isoflavone concentrate. Lipid Nutrition (Wormerveer, Netherlands), sister company of IOI Lodens Croklaan, emphasized its Vitatrin, a tocotrienol antioxidant derived from palm oil.

Protein. All leading soy protein suppliers (ADM, Cargill, Solae, and Solbar) offered soy protein flours, concentrates, and isolates. The Solae Co.-Europe (Geneva, Switzerland) launched its new Supro Isolate SUPRO® XF in Europe after a spring launch in North America. This soy protein isolate (SPI) uses proprietary technology to enhance the flavor and functionality for ready-to-drink and powdered beverages.

Solbar introduced Solpro 958QS calcium-fortified SPI for pH-neutral beverages. Local European producers of soya ingredients are Sojaprotein Co. (Becej, Serbia) and Soja Austria (Vienna).

Various producers in the Chinese pavilion promoted their functional soy protein concentrates and SPI. High-quality soy products have established a steady but small place on the supermarket shelf with soy beverages, desserts, and meat replacers. In northwest Europe the Alpro soy drinks (Alpro-Belgium, now owned by Dean Foods, Dallas, USA) are well known. But at the end of November, Unilever decided to discontinue the sales of its ADEZ soy fruit drink in the Netherlands after it had already disappeared from the British supermarkets. Meat replacers may benefit from calls for eating less meat for health and environmental reasons, but the experience of the last four decades shows that market growth is slow and requires hard-working efforts.

Pea protein is offered by Roquette (Lestrem, France) and Cosucra (Warcoing, Belgium). Solanic functional potato protein of Solanic B.V. (Veendam, Netherlands) has successfully been launched in the food market.

Many dairy companies promoted dairy proteins, functional hydrolyzed whey proteins, and (poly)peptides. Industrial protein supplier DMV (Veghel, Netherlands) and encapsulation expert De Kievit (Meppel, Netherlands) had neighboring stands, demonstrating that they are sister companies of the recently integrated dairy co-operatives FrieslandCampina.

Lecithin. Over 30 of the exhibitors offer lecithin in their ingredients portfolio. Non-GMO (genetically modified organism) IP (identity preserved) lecithins are sourced worldwide by lecithin manufacturers for use as food emulsifiers and nutritional food supplements in Europe (ADM, Bunge, Solae, and Cargill). In addition to

soy lecithin, sunflower lecithin is increasingly used in food recipes. Food processors report that the market can absorb larger quantities of lecithin having excellent emulsifying properties. A significant supply of IP non-GMO liquid lecithins comes from Brazil, managed by Imcopa Inc. (São Paulo, with a European office in Den Bosch, Netherlands). The company announced partnership with Ruchi Oil Milling Group (India) to strengthen the IP-sourcing channels.

Lasenor (Barcelona, Spain) sources lecithins on three continents and has modification plants for supplying tailor-made soy, sunflower, and canola lecithins. Lecico CY (Hamburg, Germany) continues its recently started business activities with lecithin specialties from soy, dairy, and marine origin, produced through partnerships. Stern-Wywiol Group (Hamburg, Germany), with 11 companies, has also increased lecithin sales activities within its extensive range of ingredients; their new research and development center has state-of-the-art application laboratories and pilot plants.

Since India has become an important IP non-GMO source, two new lecithin specialty companies presented their products. Perfect Biotech (Mumbai, India) offered deoiled lecithin powders and granules and lecithin fractions from its own production. VAV Life Sciences Pvt. Ltd. (Mumbai) also entered the European market with light-colored liquid soy lecithins, lecithin granules, and soy- and egg-lecithin fractions.

Novastell (Paris, France) was among the medium-sized companies offering specific phospholipids for targeted applications.

Egg products have long been important ingredients, offered by quite a number of egg ingredient suppliers. What's new is the push for inclusion of egg phospholipids in health and baby foods.

Källbergs Industri (Treboda, Sweden) produces egg phospholipids of pharmaceutical quality; for the first time they exhibited at the FiE in conjunction with LeciForLife (Wendelsheim, Germany). Beloved-UNL Egg Co. (Wiltz, Luxembourg) reported startup of a sophisticated Ovolife egg phospholipid fractionation plant.

NI

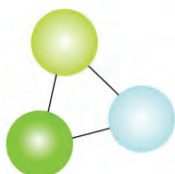
The Natural Ingredient Exhibition was mixed with the FiE. The division between Natural and Food Ingredients is, of course, difficult to make. Many well-known large enterprises offer natural products. The definition "organic" may be stricter, assuming that the farming, harvesting, and processing meet certified rules. More than 200 exhibitors offered organic ingredients, including many large food ingredient companies. The European consumer niche market for organic foods grows, as long as the foods are not significantly more expensive than "normal" foods. Particularly during down economic times, the consumer may prefer price discounts, which may affect organic foods negatively.

LOOKING FORWARD TO FIE 2011

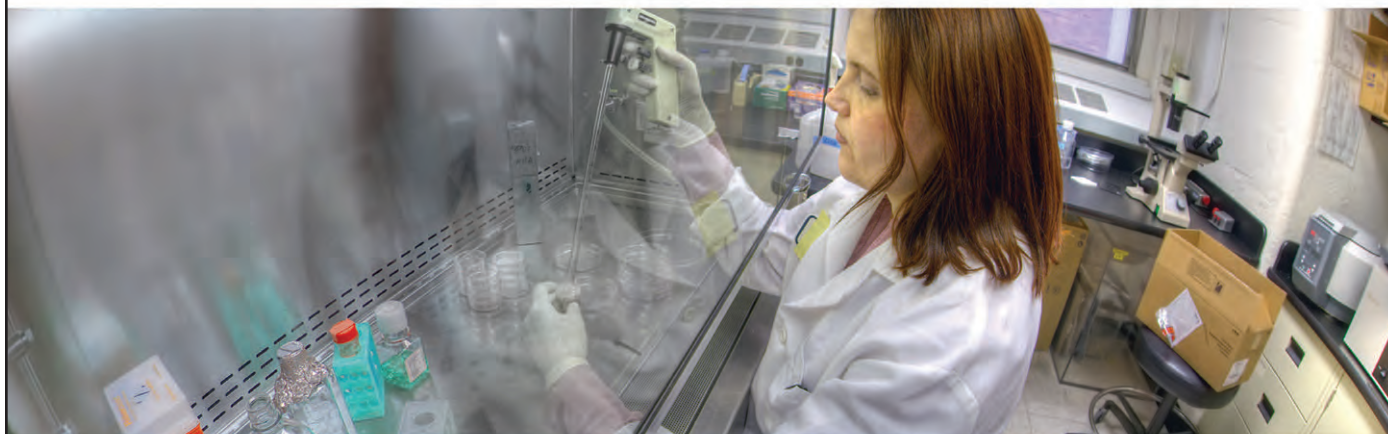
The next FiE Excellence Awards will be presented at FiE 2011, which will run from November 29 to December 1, 2011, in Paris, France.

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Q&A WITH BILL CHRISTIE (CONTINUED FROM PAGE 69)

fully comprehensive educational/informational resource dealing with all aspects of lipid science and, most importantly, freely accessible to all. It should be the first port of call for anyone wishing to understand what lipids are, how they function in animal and plant tissues, and how they are used in food and industry. I expect each of the areas outlined in my answer to the previous question to have a substantial content of relevant information.

Q: Is there anything else you would like to talk about regarding The Lipid Library?

A: One difficulty with any website is aiming the pages at the correct level. In much of what I have done in the About Lipids section of the site, for example, I have been aiming at graduate or near-graduate level. However, when I write about biochemical aspects I am not writing primarily for biochemists but for chemists, nutritionists, food scientists, physicists, and so forth, who need some biochemical information. On the other hand, I try to include

enough references to current review articles to enable specialist biochemists to find the information they may require. There are other topics where we need to write for a more specialist audience, and others that should be written with nonscientists in mind. Finding the correct balance is not always easy, and I am always grateful for feedback from users of the site. I hope the editorial advisory board will also be useful here.

I hope I do not appear patronizing, but web users are notoriously impatient when they visit a site. They want to find information quickly and in a way that is readily digested, and they perhaps subconsciously want to find the experience satisfying from an aesthetic standpoint. One advantage of the web over the printed word is that there is unlimited space for pictures, whether these are photographs, reaction schemes, diagrams, graphs, or simply decoration; and these can all be in color. In a major published review article on mass spectrometry of fatty acids, for example, I might be allowed about a dozen figures. This section of my website has 500 (not to mention a

further 1,300 in an archive). The old adage that a picture is worth a thousand words still holds true.

I believe it is also helpful to add photographs of the authors of contributions to the site, together with brief biographies, as this shows that these are written by real people and not a computer.

Q: AOCS' web administrator, Mark Atkinson, calls The Lipid Library "a gorgeous textbook website from a coding standpoint." How did you learn to code?

A: I am flattered, but I am also aware of deficiencies in the site, as I am entirely self-taught from books in the mechanics of web production. However, it has been a satisfying intellectual exercise and a challenge, which I have enjoyed, to understand HTML (Hypertext Markup Language) coding and to provide the most elegant solutions to problems. I am looking forward to having Mark improve the menu structure and perhaps set up a search facility on the site, and I am sure he will find other items that could be better. ■

SURFACTANTS, DETERGENTS, & PERSONAL CARE NEWS (CONTINUED FROM PAGES 91 & 93)

Consumer Association in Hamburg, Germany. That group analyzed the ingredients of 20 products marked as being "natural" or "organic" and compared those ingredients with the NaTrue "natural" cosmetics label requirements. Many of the products were mislabeled, the association noted in a news release.

■ ■ ■

The European Flavour and Fragrance Association (EFFA) has reorganized in light of increasing regulation of the flavor industry. Effective January 1, 2010, the fragrance group within EFFA moved its regulatory and advocacy activities to the International Fragrance Association (IFRA). ■

than 300 micrometers; from 5 wt% to 60 wt% deterative surfactant; from 0 wt% to 50 wt% carbonate salt; from 0 wt% to 40 wt% sulfate salt; from 0 wt% to 10 wt% phosphate builder; from 0 wt% to 5 wt% zeolite builder; and from 0 wt% to 15 wt% water; wherein the composition has a bulk density of 600 g/L or less.

Ultra-concentrated liquid degreaser

Tadrowski, T.J., Ecolab Inc., WO/2009/125335, October 15, 2009

A substantially nonaqueous concentrate composition is provided comprising an amine oxide surfactant, a water-soluble solvent, a source of alkalinity, a chelating agent, and a hydrotrope wherein the concentrate composition is useful in preparing a stable, aqueous, totally water-soluble solution. The composition may optionally include any one or combination of a

nonionic surfactant, anionic surfactant, a corrosion inhibitor, dye, perfume, or preservative. The ultra-concentrated composition of the invention is uniquely suited for multiple delivery methods including coating on a substrate before dilution or adding the liquid concentrate directly to the diluent.

Lime scale and soap scum remover

Choczaj, B.G., *et al.*, Ecolab Inc., WO/2009/124314, October 8, 2009

A cleaning composition including an acid component is provided, along with methods for using the composition to remove soil from hard surfaces. The concentrate cleaning composition includes between about 1 wt% and about 70 wt% of methane sulfonic acid, about 0.1 wt% to about 15% wt of a surfactant component, up to about 90% of a solvent and other adjuvants. ■

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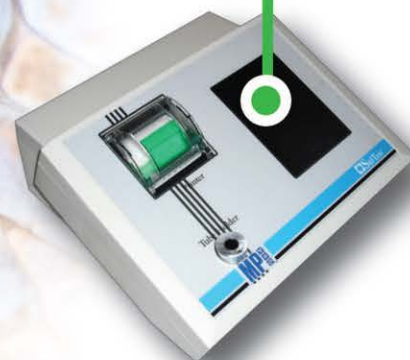
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