



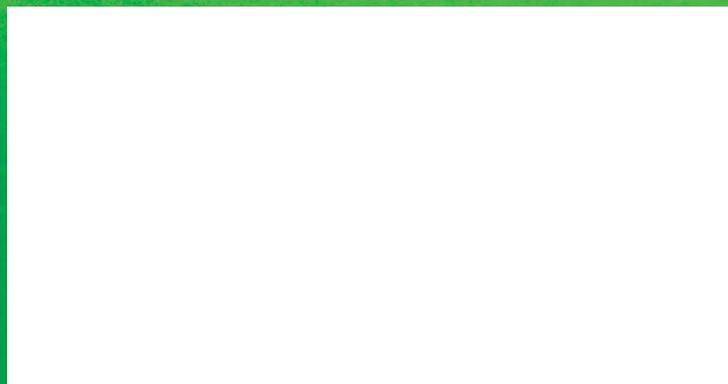
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Foam control for fabric softeners



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Oils & Fats

Animal Feed

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AOCS Mission Statement

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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Calendar

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

March

March 1–4, 2011. DEUEL Conference on Lipids, Silverado Resort, Napa, California, USA. Information: www.deuelconference.org.

March 1–6, 2011. Biofuels, Swissotel The Stamford, Singapore. Information: www.keystonesymposia.org/meetings/view-Meetings.cfm?MeetingID=1125.

March 3–4, 2011. Global Summit on Nutrition, Health and Human Behaviour: LC-Omega-3 for a Better World, Kempinski Hotel Duke's Palace, Bruges, Belgium. Information: www.omega3summit.org.

March 9–10, 2011. Soyfoods 2011: Plant Proteins & Oils for Better Nutrition, Sheraton Park Hotel at the Resort, Anaheim, California, USA. Information: www.soyatech.com/sponsor.php?id=

March 13–15, 2011. NIOP [National Institute of Oilseed Products] Annual Convention, Camelback Inn, Scottsdale, Arizona, USA. Information: niop@kellencompany.com; www.oilseed.org.

March 13–17, 2011. NACE Corrosion 2011 Conference & Expo, George R. Brown Convention Center, Houston, Texas, USA. Information: <http://events.nace.org/conferences/c2011/c2011index.asp>.

March 13–18, 2011. Pittcon 2011, Georgia World Congress Center, Atlanta, Georgia, USA. Information: www.pittcon.org/about.

March 13–18, 2011. 15th Annual Practical Short Course on Snack Foods Processing, College Station, Texas, USA. Information: <http://foodprotein.tamu.edu/extrusion/ShortCourses/snack/scsnackfood.php>.

March 14–15, 2011. BioWise 2011: Biofuels from Lab to Finance, The Crowne Plaza Hotel, Kuala Lumpur, Malaysia. Information: www.greenworldconferences.com.

March 14–16, 2011. BioPro Expo and Marketplace Conference/International Bioenergy and Bioproducts Conference, Atlanta Hilton, Atlanta, Georgia, USA. Information: www.bioproexpo.org.

March 14–16, 2011. Food Extrusion Short Course, Courtyard by Marriott, Oldsmar/Tampa, Florida, USA. Information: www.aaccnet.org/continuingeducation/2011FoodExtrusion.asp.

March 14–16, 2011. DALM (Drugs Affecting Lipid Metabolism) XVII: Diabetes, Obesity & Metabolic Syndrome, Doha, Qatar. Information: www.dalm2011qatar.org/index.html.

March 15–17, 2011. 8th International Conference Functional Foods for Chronic Diseases: Science and Practice, University of Nevada, Las Vegas, Nevada, USA. Information: www.functionalfoodscenter.net/conference_2011.html.

March 20–22, 2011. 4th Workshop on Fats and Oils as Renewable Feedstock for the Chemical Industry, Karlsruhe Institute of Technology, Karlsruhe, Germany. Information: www.abiosus.org/kit-workshop-2011.html.

March 21–24, 2011. Food Integrity and Traceability Conference, Queen's University Belfast, Northern Ireland. Information: www.qub.ac.uk/asset2011.

March 22–24, 2011. World Biofuels Markets, Beurs-World Trade Center, Rotterdam, Netherlands. Information: <http://greenpower.msgfocus.com/q/1NeTXkWKWk1ab2/wv>.

March 23–24, 2011. Wellness 11, InterContinental Chicago O'Hare, Rosemont, Illinois,

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AOCS Meeting Watch

April 30, 2011. Basics of Edible Oil Processing and Refining—AOCS Short Course, Hyatt Regency Hotel, Cincinnati, Ohio, USA. Information: email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.

April 30–May 1, 2011. Functionality of Lipids in Foods—AOCS Short Course, Hyatt Regency Hotel, Cincinnati, Ohio, USA. Information: email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.

May 1, 2011. New Technologies in Oilseed Extraction and Edible Oil Refining—AOCS Short Course, Hyatt Regency Hotel, Cincinnati, Ohio, USA. Information: email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.



May 1–4, 2011. 102nd AOCS Annual Meeting & Expo, Duke Energy Convention Center, Cincinnati, Ohio, USA. Information: phone: +1 217-359-2344; fax: +1 217-351-8091; email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.

June 18, 2011. Sensory Evaluation of Olive Oil Short Course, Hilton Hotel, Izmir, Turkey. Information: email: meetings@aocs.org; www.aocs.org/goto/Turkey2011.

June 18–19, 2011. Basics of Oilseed Processing Short Course, Hilton Hotel, Izmir, Turkey. Information: email: meetings@aocs.org; www.aocs.org/goto/Turkey2011.

June 19, 2011. Edible Oil Refinery and Optimization and Maintenance Short Course, Hilton Hotel, Izmir, Turkey. Information: email: meetings@aocs.org; www.aocs.org/goto/Turkey2011.



June 19–21, 2011. Oils and Fats World Market Update 2011, Izmir Hilton, Izmir, Turkey. Information: www.aocs.org/goto/WorldMarket.



June 21–23, 2011. World Conference on Oilseed Processing, Fats & Oils Processing, Biofuels & Applications, Izmir Hilton, Izmir, Turkey. Information: www.aocs.org/goto/Turkey2011.

September 16–18, 2011. 10th Phospholipid Congress of The International Lecithin and Phospholipid Society (ILPS): Phospholipids—Sources, Processing and Application, Congress Centre “De Doelen,” Rotterdam, the Netherlands. Information: e-mail: ilps@lecipro.nl; www.ilps.org/10th%20Congress.htm.

October 10–13, 2011. World Congress on Oleo Science and 29th ISF Congress—JOCS/AOCS/KOCS/ISF/ISBB Joint Meeting, Tower Hall Funabori, Tokyo, Japan. Information: www2.convention.co.jp/wcos2011.

October 19–21, 2011. 14th Latin American Congress on Fats and Oils, Hotel Cartagena, Cartagena, Colombia. Information: email: meetings@aocs.org.

For in-depth details on these and other upcoming meetings, visit www.aocs.org/meetings.

USA. Information: www.ift.org/meetings-and-events/wellness.aspx.

March 27–29, 2011. Congress on Steroid Research, Westin Chicago River North Hotel, Chicago, Illinois, USA. Information: www.steroidresearchcongress.com.

March 27–31, 2011. 241st American Chemical Society Meeting, Anaheim, California, USA. Information: www.acs.org.

March 28–30, 2011. Journées Chevreul 2011 “Lipids & Brain,” Paris, France. Information: www.afecg.org.

March 30–31, 2011. BioEnergy World Africa 2011, Sandton Convention Centre, Johan-

nesburg, South Africa. Information: www.terrapinn.com/2011/bioenergyza.

March 31, 2011. Allergen-Free Foods 2011: Formulation and Labelling for the Future, Royal Garden Hotel, London, England. Information: www.fn-allergenfree.com.

March 31–April 1, 2011. Practical Short Course: Algae Harvesting and Processing for Value Added Applications, Brussels, Belgium. Information: <http://home.scarlet.be/~tpm12374/smartshortcourses/algae1>.

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Call for Papers and Posters

14th AOCs Latin American Congress and Exhibition on Fats and Oils

The Resource for the Ibero-American Market

October 17 –21, 2011 | Hilton Cartagena | Cartagena, Colombia | www.aocs.org/goto/LACongress

Call for Papers and Posters

The organizing committee is welcoming abstract submissions for oral and poster presentations. The technical program will feature invited presentations by leading experts as well as volunteer oral and poster presentations.



Simultaneous translation for Spanish/English will be provided for all oral presentations.

Deadlines

- April 1, 2011 ● Abstracts submitted prior to this date will be published in the registration brochure
- May 16, 2011 ● Abstract submissions close

Exhibition

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Latin American Section of AOCs



April

April 5–6, 2011. Global Algae Biodiesel World India 2011, Jaipur, India. Information: phone: +91 9413343550 or +91 9829423333; e-mail: info@biodieselacademy.com or jatrophatraining@gmail.com; http://biodieselacademy.com/course-details.php?cid=24.

April 10–12, 2011. 15th International Conference on Hydrocolloids, Hyatt Regency Mission Bay, San Diego, California, USA. Information: phone: +1 858-451-6080; email: dseisun@hydrocolloid.com.

April 10–13, 2011. 2nd Latino-American ICC [International Association for Cereal Science and Technology] Conference, W Hotel, Santiago, Chile. Information: www.lacerealconference.com.

April 12–13, 2011. OFI Middle East 2011, Inter-Continental Citystars, Cairo, Egypt. Information: email: oilsandfats@quartzltd.co.uk; www.oilsandfatsinternational.com.

April 13–14, 2011. REACH USA 2011, Holiday Inn Atlanta Capitol Conference Center, Atlanta, Georgia, USA. Information: www.ismithers.net/conferences/XRUS11/reach-usa-2011.

April 19–21, 2011. Advanced Biofuels Leadership Conference, Capital Hilton, Washington, DC, USA. Information: http://advancedbiofuelssummit.com.

April 25–29, 2011. World Congress of Bioenergy, World Expo Center, Dalian, China. Information: www.bitlifesciences.com/wcbe2011.

April 30, 2011. Basics of Edible Oil Processing and Refining—AOCS Short Course, Hyatt Regency Hotel, Cincinnati, Ohio, USA. Information: email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.

April 30–May 1, 2011. Functionality of Lipids in Foods—AOCS Short Course, Hyatt Regency Hotel, Cincinnati, Ohio, USA. Information: email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.

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May 1, 2011. New Technologies in Oilseed Extraction and Edible Oil Refining—AOCS Short Course, Hyatt Regency Hotel, Cincinnati, Ohio, USA. Information: email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.



May 1–4, 2011. 102nd AOCS Annual Meeting & Expo, Duke Energy Convention Center, Cincinnati, Ohio, USA. Information: phone: +1 217-359-2344; fax: +1 217-351-8091; email: meetings@aocs.org; http://annualmeeting.aocs.org/index.cfm.

May 2–3, 2011. LIPID MAPS Meeting 2011: Lipidomics Impact on Systems Biology, Cancer, and Metabolic Disease, La Jolla, California, USA. Information: www.lipidmaps.org/meetings/2011annual.

May 2–5, 2011. 4th International Biomass Conference & Expo, America's Center, St. Louis, Missouri, USA. Information: www.biomassconference.com.

May 15–19, 2011. STLE [Society of Tribologists and Lubrication Engineers] Annual Meeting and Exhibition, Atlanta Hilton, Atlanta, Georgia, USA. Information: www.stle.org.

May 15–20, 2011. Lipid Biology and Lipotoxicity, INEC-Ireland's National Events & Conference Centre, Killarney, Co. Kerry, Ireland. Information: www.keystone-symposia.org/Meetings/ViewMeetings.cfm?MeetingID=1113.

May 17–19, 2011. BIT's 2nd Annual World Congress of Well Stimulation and EOR, Chongqing University of Science and Technology, Chongqing, China. Information: www.bitpetrobio.com/wseor2011.

May 20–21, 2011. Symposium: Vitamin D and Analogs in Cancer Prevention and Therapy, Schlossberg Hotel, Homburg, Germany. Information: http://tinyurl.com/Vit-D-cancer.

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PERFECT SOLUTIONS IN EDIBLE OIL FILTRATION



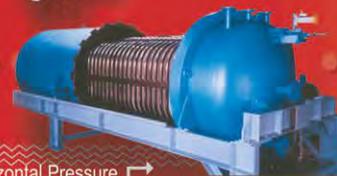
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Is there a New Normal?

Mapping future strategies for our industry

Paul Polman

Editor's note: Subtitled "New Strategies in a Dynamic Global Economy," the 7th World Conference on Detergents, held in Montreux, Switzerland, in October 2010 brought together nearly 900 participants from almost 60 countries. The heads of the three largest detergents companies—Unilever, Henkel, and P&G—provided keynote presentations. Having all three speak was a first for the conference. In Inform's continuing coverage of the event, Unilever's Paul Polman presents his keynote address. Polman is CEO of Unilever, the Anglo-Dutch consumer products giant.



- And to the "South," the urgent need to ensure that everything is underpinned by a totally new and bold move toward Sustainability.

Each of these forces is, in its own way, radically reshaping the world—changing habits, expectations, relationships, power bases, and so on. In net, changing the way the world works.

The results are being felt in everything, every day. We are starting to get used to it as "normal." But, make no mistake. This is a New Normal. And a New Normal that requires new thinking and strategies. How does this New Normal impact us—directly and indirectly?



Before attempting to answer, I should declare my own stake in this.

Unilever

The simple fact is, I am passionate about this industry ... and I am proud of it.

Having spent my whole career in FMCG (Fast Moving Consumer Goods)—much of it in detergents—I have seen firsthand how widely and frequently our industry touches the lives of people around the world. At Unilever we believe strongly that our products make people feel good, look good, and get more out of life. As I often say, we are the real economy, needed more now than ever.

I take pride in the fact that Unilever brands are an everyday part of life for many people in all the countries in which we operate. Today, they touch and positively impact the lives of someone, somewhere, two billion times a day—over five billion consumers are using our products. No other company can match that breadth and depth of consumer penetration.

The numbers are staggering. Take Laundry, for example—14 million consumers use our products every hour. A dozen of our brands now have turnover of more than a billion euros a year, and 80% of the portfolio enjoys leading market positions, especially in the fast-growing emerging markets.

As a company born at the height of the Great Depression of the 1930s, Unilever was well-prepared for the downturn. It has adapted its portfolio and business models quickly to keep consumer relevance and trust. Today, thanks to the work of 163,000 wonderful employees, Unilever is gaining share and volume in most of the 170 countries in which we operate.

Ladies and gentlemen:

It's a pleasure to be here with so many familiar faces in the audience, and a privilege to be a keynote speaker at the 7th World Conference on Detergents. With a title of "New Strategies in a Dynamic Global Economy," this conference is an ideal place to discuss the key roles we can all play in shaping the future.

Before we get to the future, however, let's be clear right now about where we start from. We are meeting at a critical time. Global business and economic trends are the most challenging they've been for a generation. Change is happening at an unprecedented rate.

But these things should inspire us. The challenges we all face offer huge potential for positive change—that is, for those who understand them. I know I do not want to live in less dynamic times!

Not all the changes around us can be characterized by a single iconic image—for example, the fall of the Berlin Wall. But the changes of today are just as enormous in their own way—and they touch even more people. They give rise to many new trends.

Today, I want to focus on four that, I believe, are central to the theme of this conference—"Defining the Future." Because these trends are global in impact, I have set them out as points on a new global map: "East" and "West," "North" and "South."

- To the "East," the biggest, fast-growing, expanding markets of the world ... most notably the BRIC (Brazil, Russia, India, and China) countries.
- To the "West," the Wireless World of increasing digitalization—and the reshaping of traditional interfaces and relationships.
- To the "North," the New Economic Order that will emerge from the financial challenges of the last few years.

Investing for the future is also key. That's why we have stepped up R&D [research and development] investment, as well as advertising. We also focus on maintaining preferred employer status and are recognized as trusted corporate citizens. Business in the Community's "Company of the Year" in the UK, and sector leader for 12 years running in the Dow Jones Sustainability Index—a record unmatched by others—are examples of this. As founding signatories of the United Nations Global Compact, we believe in a better long-term future.

But, of course, as advertisements for financial services continually remind us, "Past performance is no guarantee of future success."

So, while it is right to be proud of that heritage, it is critical that we focus on what the world needs tomorrow and into the future. Thus, I have encouraged my senior team not simply to recognize the new world, the New Normal, but to embrace it—and to challenge everything we do with a renewed sense of rigor and mission. So what do we see at the four points of the map?

Expanding Markets: The Growth of D&E

Let me start in the "East" with Expanding Markets. The term sounds unconditionally good—and it is. We all want to see markets grow and living standards rise. But we have to be clear that what we are talking about here is not just expansion, but a paradigm shift—and therefore a shift of power, away from the traditional economic strongholds of the world, and toward the Developing & Emerging (D&E) countries.

If you haven't already, I urge you to read Kishore Mahbubani's book *The New Asian Hemisphere*, although it is the subtitle of the book that really captures the essence—*The Irresistible Shift of Global Power to the East*. This new Industrial Revolution is transforming the world in just as fundamental a way as the first industrial revolution did in Western Europe in the 19th century.

The new revolution is about processes and outputs—but it is also about people, societies, and the rapidly shifting power base of the world.

The two billion incremental consumers and most of the wealth creation will come from the emerging economies. Urbanization accelerates this change. The Boston Consulting Group's "Winning in Emerging-Market Cities" report (published September 2010) covers this well: 2.6 billion people already live in emerging-market cities—that's one-third of the total world population. By 2030 this will increase to 3.9 billion. Two billion will be middle class—that's more than in developed markets. They will account for over 30% of total global private consumption by 2015.

The figures are enormous and they should inspire us.

Certainly, for Unilever: 80% of our major growth is already in D&E countries where we have over 50% of our business—so we are well positioned. And as I look out and see many of our key suppliers in the audience, I know that this will be a major opportunity for you too.

To succeed, global efficiency alone is not enough and local proximity is needed. We have to work together to understand trends, consumer needs, and how to address them better in this part of the world. It means shifting our commitment to sourcing and R&D as well as people, talent, and quality.

Suppliers and manufacturers will have to accelerate investment in these markets and adjust organizational models accordingly.

information

- Those who were unable to attend Montreux 2010 may purchase a two-DVD set of presentations from the conference. The DVDs include video synchronized with the PowerPoint presentations of the three CEOs of Henkel, P&G, and Unilever. The set also features audio synchronized with PowerPoint talks from a number of the other presenters. The list price is \$195 (AOCS member price: \$175). Visit www.aocs.org/store for more information.



102nd AOCS Annual Meeting & Expo

May 1–4, 2011
Duke Energy Convention
Center
Cincinnati, Ohio, USA



When is my committee meeting?

Get answer at

<http://AnnualMeeting.aocs.org>

Preview: 102nd AOCs Annual Meeting & Expo

The 102nd AOCs Annual Meeting & Expo (AM&E) will be held May 1–4, 2011, in Cincinnati, Ohio, USA, with more than 1,600 participants expected from 60+ countries.

The program will include approximately 650 lecture and poster presentations in 12 interest areas. In addition, hot topic symposia covering a variety of issues of general interest to attendees are scheduled for the morning of Tuesday, May 3, 2011. General chairperson for the meeting is W. Warren Schmidt, a consulting chemist and longtime AOCs member based in Cincinnati.

The Expo will feature more than 80 exhibiting companies as well as a number of networking events. This is the place to visit to find out about the latest in equipment, information, and services for the fats and oils industries. The Expo Hall will be open 5:30 p.m.–7:30 p.m., Sunday, May 1; 11:30 a.m.–5:30 p.m., Monday, May 2; and 11:30 a.m.–6:30 p.m., Tuesday, May 3.

New This Year: Focus on Foci

Navigating the AM&E can be a challenge, given the number of presentations. This year, a new tool will be available to attendees. In addition to the traditional session grid, which is printed on pages 72–73 of this issue and is organized by the 12 interest areas of the AOCs divisional structure, a new grid has been developed. This grid organizes sessions by the following focus areas: analysis, enzyme and chemical reactions, formulation, health, nonfood uses, nutrition, process and manufacturing, safety, structure/function, and sustainability.

To custom-plan your meeting experience, look for these two program grids in both the registration and program brochures. The new breakdown by focus areas will be included there along with the traditional session grid and will also be available on the AM&E website.

Also new this year: two dedicated poster-viewing sessions, which is one more than in previous years. The sessions will run from 4:00–5:30 p.m. on Monday, May 2, and from 5:00–6:30 p.m. on Tuesday, May 3.

New to AOCs and the AM&E?

If you are new to AOCs and/or the AM&E, start making connections first thing by attending the newcomer networking hour on Sunday, May 1, from 4:00 p.m.–5:00 p.m. in the Expo Hall. There, newcomers will speed network (*à la* speed dating) with fellow business leaders, entrepreneurs, and motivated individuals.

Another new event will be the newcomer networking breakfast on Monday, May 2, from 7:00–8:00 a.m. in the Expo Hall. Stop by for a continental breakfast and to connect with veteran attendees who can help you navigate the conference. Newbies need to identify themselves as such using the check-off box on the registration form; if you did not do so and are qualified to attend the newcomer events, please contact the meeting registrar, Jamie Lourash (phone: +1 217-693-4823; email: jamiel@aocs.org).

Committee Meetings

Build your CV by sharing your experience, knowledge, and expertise at any of the open AOCs committee meetings held throughout

the AM&E. A committee meeting schedule will be available at <http://AnnualMeeting.aocs.org>.

Optional Tour

Following the Agricultural Microscopy scientific session on Wednesday morning, a behind-the-scenes tour of the world-famous Cincinnati Zoo designed especially for those interested in ag microscopy will complement the morning's presentations. One-way transportation and a one-day zoo pass are included in the discounted ticket price for this tour. Check the Optional Tour page in the registration brochure or the website for more information.

Division and Section Functions

Attendees are welcome to participate in all open division or section events, including roundtable discussions and social events. For a better understanding of the divisions and sections, visit www.aocs.org/membership.

In the run-up to the meeting, the AOCs divisions and sections are busy putting together their luncheon and dinner programs. (Luncheon events will take place at the convention center; dinner events will take place at the Hilton Cincinnati Netherland Plaza.) For the latest information on speakers, see the meeting website.

102nd AOCs Annual Meeting & Expo at a glance



May 1–4, 2011
Duke Energy Convention Center
Cincinnati, Ohio, USA

The latest meeting information is available at <http://AnnualMeeting.aocs.org>.

Questions? Contact the AOCs Meetings Department (phone: +1 217-693-4821 or email: meetings@aocs.org).



If you have attended an AOCs Annual Meeting & Expo before, you know that the silent auction adds atmosphere and intrigue to the Expo Hall. The auction is a joint project of the AOCs Student Common Interest Group and the AOCs Foundation. This year, the 16th Annual Silent Auction will begin at 5:30 p.m. during the opening mixer on Sunday, May 1, 2011. For more information about how to donate an item for auction, contact AOCs Foundation Development Manager Amy Lydic at amyl@aocs.org.

In the meantime, we can confirm that the speaker for the Processing Division luncheon on Tuesday, May 3, will be Manuel G. Venegas, associate director, Research and Development, P&G Chemicals. The title of his talk is “Processing of Sustainable Surfactants—A Formulator’s Perspective.”

The Edible Applications Technology and Phospholipid Divisions will hear a presentation from former AOCs President James Daun, who is the recipient of the 2011 Alton E. Bailey Award, at their joint dinner on Monday, May 2. The USA Section will host the winner of that section’s Hans Kaunitz Award at its luncheon meeting on Tuesday, May 3.

Also on May 3—the Biotechnology Division dinner. There, attendees will hear Phillip R. Green, a principal scientist with The Procter & Gamble Co., talking about “White Biotechnology: Its Promise and Challenges for Development of a Sustainable Chemical Industry.”

In addition, newly elected division chairpersons, vice chairpersons, and secretary-treasurers will benefit from role-specific leadership orientation sessions on the morning of Sunday, May 1.

AOCs is grateful for corporate support of AOCs division and section events. As this issue goes to press, sponsors include Mead Johnson and Avanti Polar Lipids, Inc. (Health & Nutrition Division technical program); Air Products, American Cleaning Institute, Church & Dwight, Rhodia, Sasol North America, Shell Global Solutions (Surfactants and Detergents Division Networking Reception); Archer Daniels Midland Co., Bunge North America, and Solae LLC (USA Section Workshop).

Workshop

Update on US Regulatory Issues Affecting the Food Industry
Sunday, May 1, 2:00–5:00 p.m.

Organized by the USA Section of the AOCs; free for AM&E attendees.

This workshop will focus on US regulatory updates for those involved in the fats and oils industries, including suppliers and end-user manufacturers. Speakers and a panel discussion will address a variety of topics, including:

- Nutritional labeling of fats and oils,
- Fats and oils terminology in the list of ingredients on food labels,
- GRAS (Generally Recognized as Safe) safety expectations—are they changing?
- Allergen labeling,
- Sanitary Food Transportation Act of 2005 (which the US Food and Drug Administration [FDA] is in the process of implementing), and
- The FDA’s Reportable Food Registry.

Common Interest Groups

Common interest groups provide a forum for persons with similar pursuits to share ideas. Any group with a shared interest may contact the AOCs Meetings & Exhibits Department at meetings@aocs.org to reserve a time and space to meet.

Both already-established AOCs common interest groups will meet in Cincinnati. The Student Common Interest Group Luncheon and Mentoring Program will be held from 12:00 p.m.–2:00 p.m. on Wednesday, May 4. In addition to organizing a Hot Topic Symposium, the Professional



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Duke Energy Convention Center
Cincinnati, Ohio, USA



What Short Course should I attend?

Get answer at

<http://AnnualMeeting.aocs.org>

Educators' Common Interest Group will hold a formal meeting. The day and time are not yet set; visit the AM&E website for the latest on meeting details.

Technical Services Meetings

AOCS' Technical Services will host three expert panel meetings (on olive oil, biodiesel, and process contaminants) in addition to various technical committee meetings such as the Uniform Methods Committee. For more information, contact Gina Clapper at Gina.Clapper@aocs.org.

The Expert Panel on Process Contaminants will continue its work validating direct methods for the analysis of esters of both 3-MCPD (3-monochloropropane, 1,2-diol) and glycidol. The Tuesday afternoon analytical session will be devoted to the latest work on the detection of these process contaminants; see <http://tinyurl.com/ProcessContaminants> for details on the Expert Panel meeting as they become available.

AOCS Short Courses

Short courses will be held at the Hyatt Regency Cincinnati; the technical programs

Did you know?

Following are just a few of many firsts for the city of Cincinnati:

- 1835 First bag of airmail lifted by a hot air balloon.
- 1869 First professional baseball team—the Cincinnati Red Stockings, now known as the Cincinnati Reds.
- 1870 First city in the US to establish a municipal university—the University of Cincinnati.
- 1870 First city to hold annual industrial expositions.
- 1880 First and only city to build and own a major railroad.
- 1902 First concrete skyscraper built in the US—the Ingalls Building.
- 1935 First night baseball game played under lights.
- 1954 First city to have a licensed public television station—WCET-TV.

for each course may be found at <http://AnnualMeeting.aocs.org>. Short course attendees may attend the Opening Mixer and the Expo on Sunday, May 1, at no additional charge.

Function of Lipids in Foods

Saturday and Sunday, April 30–May 1, 2011

Course Organizer: Neil Widlak, Director of Product Services and Development, ADM Cocoa, Milwaukee, Wisconsin, USA.

In addition to providing an overview of the function of neutral lipids in foods, this course serves as an introduction for sessions

on related topics and cutting-edge technologies presented during the AM&E. It is designed for scientists, engineers, product developers, and food technologists who have an understanding of chemistry but lack experience or general knowledge of lipid chemistry and applications.

Basics of Edible Oil Processing and Refining

Saturday, April 30, 2011

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

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This short course 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. It is designed for engineers, chemists, and technicians who desire an enhanced understanding of edible oil refining/processing.

New Technologies in Oilseed Extraction and Edible Oil Refining
Sunday, May 1, 2011

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

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

Hot Topic Symposia

Tuesday, May 3, 9:00 a.m.–12:00 p.m.

Additional Hot Topic Symposia will be reviewed and considered through March 15, 2011. To submit a proposal, visit <http://AnnualMeeting.aocs.org>. The website also houses the latest information on speakers.

Fragrance in Today's Household Products

Fragrance is a key ingredient in most household products and is one of the main drivers for consumer purchase. With the current environmental concerns and troubled economy, fragrance-related innovations are a hot topic for every detergent and household product manufacturer and supplier.

New Horizons for Healthful Oils: Innovative Approaches to Meeting Government Guidelines
The 2010 revision of the *Dietary*

Guidelines for Americans likely will cause shifts in the consumption of dietary fats—and not just in the United States. This year, as various governments consider front-of-pack and restaurant menu labeling initiatives, it is more important than ever for food manufacturers to enhance the healthfulness of their products. Oil selection is critical to improving the nutritional profile of foods. This program will provide insight into novel oils currently in development or newly in the marketplace that are available or will soon be available for product reformulation.

Tough Topics to Teach

How do you address certain lipid topics that pose instructional problems? These difficulties may be due to a lack of clear information, ambiguous information, or an abundance of information that needs to be focused on relevant issues. Academics and industry professionals will benefit from a clear presentation of these problem areas from speakers who have a record of teaching excellence and established research experience with each topic of interest.

Vitamin D: New Dietary Intake Recommendations and Emerging Health Effects

Learn more about the report by the US Food and Nutrition Board of the Institute of Medicine on new recommended dietary intake levels for vitamin D. What are the science and rationale underpinning these new recommendations? What is the emerging science related to the health effects of vitamin D? This symposium will answer these questions and review the implications of the new Dietary Reference Intakes for the food industry in terms of nutrition labeling, food fortification, and health-related claims, as well as public health recommendations in future revisions of the *Dietary Guidelines for Americans*.



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When is my Division event?

Get answer at

<http://AnnualMeeting.aocs.org>



The view from Mt. Echo, one of the seven hills surrounding Cincinnati. Photo courtesy of Aaron Davidson.

Monday Evening
4:00–5:30 pm
Dedicated Poster Viewing and Reception

Tuesday Morning
9:00 am–12:00 pm

INTEREST AREA	Monday Morning 8:00 am–12:00 pm	Monday Afternoon 2:00 pm–4:00 pm	Monday Evening 4:00–5:30 pm Dedicated Poster Viewing and Reception
Agricultural Microscopy AM	AM 1: Agricultural Microscopy I	AM 2/PRO 2.1: Food and Feed Safety	AM-P: Posters
Analytical ANA	ANA 1/BIO 1: Lipidomics and Metabolic Analysis ANA 1.1/S&D 1.2: Advances in Analytical Methods for Surfactants and Detergents	ANA 2: Advances in Spectroscopic Techniques	ANA-P: Posters
Biotechnology BIO	BIO 1/ANA 1: Lipidomics and Metabolic Analysis BIO 1.1: Biocatalysis I	BIO 2: Oil-based Biofuels	BIO-P: Posters
Edible Applications Technology EAT	EAT 1: Lipid Structures—Fundamentals	EAT 2: Lipid Structure—Applications	EAT-P: Posters
Food Structure & Functionality Forum FS&FF	FS&FF 1: Food-Body Interactions	FS&FF 2: Phase Transitions: Engineering and Stability	FS&FF-P: Posters
Health and Nutrition H&N	H&N 1/PCP 1.1: Mark Bieber Memorial Symposium: Childhood Obesity—Understanding and Implications of a National Epidemic	H&N 2: Lipids and Inflammation	H&N-P: Posters
Industrial Oil Products IOP	IOP 1: Alternative Fuels	IOP 2: Biobased Lubricants, Plasticizers, and Value Added Products	IOP-P: Posters
Lipid Oxidation and Quality LOQ	LOQ 1: A Re-examination of the Antioxidant “Polar Paradox” Paradigm LOQ 1.1: Lipid Oxidation Challenges and Potential Solutions in Food Systems I (10:15 am-noon)	LOQ 2: Lipid Oxidation Challenges and Potential Solutions in Food Systems II	LOQ-P: Posters
Phospholipid PHO	PHO 1: Phospholipids in Pharma and Cosmetic Applications	PHO 2: Structured Lipids and Phospholipids	PHO-P: Posters
Processing PRO	PRO 1: Safety, Operational Cost Reductions at Plant Level PRO 1.1: Algal Oil Processing	PRO 2: New Technology/Hot Topics in Processing PRO 2.1/AM 2: Food and Feed Safety	PRO-P: Posters
Protein and Co-Products PCP	PCP 1: Co-Product Utilization from Biofuels PCP 1.1/H&N 1: Mark Bieber Memorial Symposium: Childhood Obesity—Understanding and Implications of a National Epidemic	PCP 2: Alternative Plant Food Proteins and Co-Products	PCP-P: Posters
Surfactants and Detergents S&D	S&D 1: Emerging Technologies in Industrial Application of Surfactants (8:00-10:00 am) S&D 1.1: Emerging Surfactant Applications (10:00 am-noon) S&D 1.2/ANA 1.1: Advances in Analytical Methods for Surfactants and Detergents	S&D 2: Surfactants and Performance Enhancers for Fabric Care: Polymers to Chelating Agents S&D 2.1: General Surfactants and Detergents	S&D-P: Posters
Exhibitor Sessions EXH			EXH 1: Exhibitor Showcase Presentations



Hot Topic Symposia

●
Fragrance in Today's Household Products

●
New Horizons for Healthful Oils: Innovative Approaches to Meeting Government Guidelines

●
Tough Topics to Teach

●
Vitamin D: New Dietary Intake Recommendations and Emerging Health Effects

Tuesday Afternoon 2:00–5:00 pm	Tuesday Evening 5:00–6:30 pm Dedicated Poster Viewing and Reception	Wednesday Morning 8:00 am–12:00 pm	Wednesday Afternoon 2:00–5:00 pm	INTEREST AREA
AM 3: Agricultural Microscopy III	AM-P: Posters	AM 4: Agricultural Microscopy IV		Agricultural Microscopy AM
ANA 3: Emerging Analytical Issues in Process Contaminants—The Search for Truth ANA 3.1/LOQ 3: Antioxidants and Oxidation Control: Analytical Methodologies and Efficacies	ANA-P: Posters	ANA 4: General Analytical I	ANA 5: General Analytical II	Analytical ANA
BIO 3/H&N 3.1: Functional Lipids—Bioactive Properties BIO 3.1: Biocatalysis II	BIO-P: Posters	BIO 4/S&D 4: Bio-based Materials: Surfactants, Polymers, and Enzymes in Green Cleaning BIO 4.1: Plant Lipid Biotechnology	BIO 5: General Biotechnology	Biotechnology BIO
EAT 3/S&D 3: Film, Emulsions, and Foams	EAT-P: Posters	EAT 4/FS&FF 4: Cocoa Butter and Chocolate Structuring	EAT 5: General Edible Applications	Edible Applications Technology EAT
FS&FF 3: New Concepts for Food Structuring	FS&FF-P: Posters	FS&FF 4/EAT 4: Cocoa Butter and Chocolate Structuring	FS&FF 5: Strategies for Sugar and Salt Reduction	Food Structure & Functionality Forum FS&FF
H&N 3: Lipid Modulators and Messengers H&N 3.1/BIO 3: Functional Lipids - Bioactive Properties H&N 3.2/PHO 3: Applications of Phospholipids w/n-3 Fatty Acids	H&N-P: Posters	H&N 4: General Nutrition I H&N 4.1/LOQ 4: Omega-3 Challenges: Stability, Processing, and Human Nutrition	H&N 5: General Nutrition II	Health and Nutrition H&N
IOP 3: New Glycerol Uses	IOP-P: Posters	IOP 4: Oleochemicals and Polymers	IOP 5: General Industrial Oil Products	Industrial Oil Products IOP
LOQ 3/ANA 3.1: Antioxidants and Oxidation Control: Analytical Methodologies and Efficacies	LOQ-P: Posters	LOQ 4/H&N 4.1: Omega-3 Challenges: Stability, Processing, and Human Nutrition	LOQ 5: General Oxidation	Lipid Oxidation and Quality LOQ
PHO 3/H&N 3.2: Applications of Phospholipids w/n-3 Fatty Acids PHO 3.1: Symposium on NMR in Lipids	PHO-P: Posters	PHO 4: Phospholipids in Food and Nutraceutical Applications	PHO 5: General Phospholipids	Phospholipid PHO
PRO 3: Sustainability - Waste Utilization and Reduction PRO 3.1/EXH 2: Processing Exhibitor Presentations	PRO-P: Posters	PRO 4: General Processing		Processing PRO
PCP 3: Health Aspects of Food Proteins and Peptides	PCP-P: Posters	PCP 4: Functional Properties of Proteins and Co-Products	PCP 5: General Protein and Co-Products	Protein and Co-Products PCP
S&D 3/EAT 3: Film, Emulsions, and Foams S&D 3.1: Fundamental Principles and Applications of Surfactants Science: Special Session in Honor of Prof. Milton Rosen	S&D-P: Posters	S&D 4/BIO 4: Bio-based Materials: Surfactants, Polymers, and Enzymes in Green Cleaning S&D 4.1: Surface Cleaning, Disinfection, Antimicrobials, and Odor Control (8:00-10:00 am) S&D 4.2: Alternate Cleaning Methods: Solvents and Low Water Systems (10:00 am-noon)		Surfactants and Detergents S&D
EXH 2/PRO 3.1: Processing Exhibitor Presentations				Exhibitor Sessions EXH



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TECHNICAL SERVICES **AOCS** 

News & Noteworthy

The European Commission's Scientific Committee on Emerging and Newly Identified Health Risks has approved a definition of "nanomaterial" as a basis for future regulatory safety evaluations and risk assessments. The committee concluded that size is the most relevant consideration in defining the term, and that no scientific justification exists to prefer any specific size limit other than the range from 1 to 100 nanometers. According to the committee, "size influences bio-distribution (and distribution kinetics) in an organism or in an ecosystem which should be taken into consideration in the risk assessment of nanomaterials." The committee did not distinguish between natural and manufactured nanomaterials in its definition.



The Italian Society for Fat Research (SISSG) celebrated the 50th anniversary of its founding on December 10, 1960, by organizing a two-day workshop on October 28–29, 2010, in Massa Marittima.



The University of California, Davis Olive Oil Sensory Laboratory has satisfied the requirements set forth by the International Olive Council (IOC; Madrid, Spain), thereby earning official certification for its taste panel. This will be the first time in several years that the United States has an IOC-accredited sensory panel.



Archer Daniels Midland Co. (ADM; Decatur, Illinois, USA) announced in December 2010 that it will assume operation of Carolina Soya's Estill, South Carolina, USA, assets, which include a soybean storage facility and a shuttered soybean processing plant. ADM is in discussions with Carolina Soya to acquire the property and will lease the facility until the transaction is completed. ADM said it will operate the grain storage facility, which has a storage capacity of three million bushels (more than 80,000 metric tons), but currently has no plans to operate the processing plant.



In December 2010, researchers found high levels of polybrominated diphe-

CONTINUED ON NEXT PAGE

New 3-MCPD/glycidol ester method

A direct method for the determination of fatty acid esters of both 3-MCPD and glycidol has been published in the *Journal of the American Oil Chemists' Society* (JAOCS). The method uses liquid chromatography–time-of-flight mass spectrometry (LC-TOFMS). The full manuscript is available via open access at <http://tinyurl.com/3-MCPDmethod>.

Esters of both 3-MCPD (3-monochloropropane-1,2-diol) and glycidol are process contaminants of interest to the global fats and oils industries. For more information, see the AOCS web resource on process contaminants at <http://tinyurl.com/ProcessContaminants>.

Publication of the new LC-TOFMS method follows the fifth meeting of the AOCS Expert Panel on Process Contaminants at the Westin Grand Hotel in Munich, Germany, on Sunday, November 21, 2010, preceding the Euro Fed Lipid conference. The sixth meeting of the Expert Panel meeting will be in February 2011 in Penang, Malaysia, which will coincide with the 22nd Session of the Codex Alimentarius Committee on Fats and Oils.

AOCS has begun a collaborative study, in cooperation with the Japan Oil Chemists' Society, of another direct method for determination of fatty acid esters of glycidol. This method has also been published in JAOCS but has since been revised. For more information about the work of the Expert Panel and/or the collaborative study, contact AOCS Technical Director Richard Cantrill (phone: +1 217-693-4830; email: Richard.Cantrill@aoacs.org).

Volatility in short term: Rabobank

Over the next three to five years, agribusiness companies are likely to face increased market volatility and higher prices, according to a Rabobank Food & Agribusiness Research and Advisory (FAR) report released in mid-December 2010.

According to the report, "Looking for Delta: Tectonic Shifts Toward Higher and More Volatile Agricultural Markets," this will present challenges as risk management and positioning become even more important. However, a more volatile environment will

CONTINUED ON NEXT PAGE



nyl ether (PBDE) flame retardants in one in 10 samples of butter bought at five Dallas, Texas, USA, grocery stores. The PBDE levels in the contaminated sample were more than 135 times higher than the average of the other nine samples. The scientists found that PBDE levels in the butter's paper wrapper were more than 16 times higher than levels found in the butter. Whether the paper was contaminated before or after it reached the butter packaging plant—and the actual source of contamination—is not known. The study appeared in *Environmental Health Perspectives* (doi: 10.1289/ehp.1002604).



Omega Protein Corp. of Houston, Texas, USA, announced in mid-December 2010 that it has acquired Cyvex Nutrition, Inc. of Irvine, California, USA. Cyvex is an ingredients manufacturer for dietary supplement makers. Omega produces refined menhaden fish oil for the omega-3 fatty acid market.



A federal court in California, USA, has denied a joint motion for preliminary approval of a class settlement in two cases involving butter substitutes. The court was concerned about “the waiver of certain damages claims and need for opt-out in a Federal Rule of Civil Procedure 23(b)(2) injunctive class where the proposed class received no monetary relief.” The cases, filed in 2009, involve claims that butter-substitute makers have violated consumer protection laws by promoting their products as “healthy” and “nutritious” when they contain purportedly dangerous levels of *trans* fats. ■

also create opportunities—and not just of a trading and market-positioning nature.

“With slow world economic growth and food demand shifting east, companies will need to rebalance their operating portfolios or risk having regional imbalances, or more importantly, risk being left behind in the establishment of global production, distribution and trading networks,” said Rabobank FAR Global Strategist David Nelson, who focuses on the global grains, oilseed, and protein markets.

However, he also notes that “while the cost of being wrong has gone up, so has the benefit of being right.”

Overall, the report outlines and quantifies the key factors that, over the next few years, are likely to move world agricultural markets to higher, more volatile price levels than have been seen in the past. FAR developed the report to identify the major underlying factors that will drive developments in the global grain, oilseed, and protein markets in the years ahead, and which may currently be underappreciated in the market place.

“You can only steer through the hills, valleys, and curves when you can see them coming,” said Nelson. “And we have found it’s going to be a bumpy ride. A combination of factors—primarily in Brazil, Russia, China, and India—will cause those bumps as agricultural markets move higher and become more volatile.”

BLACK SEA REGION

“The 2010 drought will severely impact grain exports from the Black Sea region for at least one year and probably several more,” said Nelson. “As a result, companies that buy, sell, and trade crop commodities will need to reconsider balance sheet management factors such as working capital and risk-management practices.”

Structurally, the Black Sea region has become the primary incremental producer of world grain due to its available arable land. However, the poor environment and unreliable weather are and will continue to cause global grain prices to trend higher and with more volatility. Further contributing to tighter grain supplies in the region are growing international demand and Russia’s move toward self-sufficiency in chicken and ultimately pork production.

“Beyond grain, this will have a longer-term impact on the protein trade, causing shifting trade patterns, and threatening big meat exporters unless new markets are found,” said Nelson.

CHINA: NEW SWING FACTOR

“Profound shifts appear to be underway in terms of China’s ability to be self-sufficient in key feed grains that could have significant implications for the industry globally,” said Nelson. “For the first time in 15 years, China will import a meaningful amount of corn this year.”

China’s need for feed grains is likely to accelerate with its plans to rapidly industrialize meat production, which inherently reduces feed input flexibility and shifts animal diets toward standard rations, typically dominated by corn or feed-grade wheat. When

considered in the context of net growth in China’s soybean imports over the past decade, the order of magnitude of China’s potential need for corn imports is enormous—in the tens of millions of metric tons annually.

It looks increasingly likely that this need may come much sooner than many had previously predicted. While the industrialization policies are partly driven by food safety concerns and partly by the need for efficiency, there are also overriding market forces such as the natural evolution in food retailing and foodservice that take place as economies mature.

INDIA: AN EMERGING SWING FACTOR

“The bottom line is that we see India shifting from a soymeal exporter to an importer over the next few years, which represents about a six million metric ton swing,” said Nelson.

While this growth in soymeal consumption is high in percentage terms, the starting base is quite low so the impact on world tonnage will be somewhat small. What might be most unappreciated by the world’s protein players is the large and growing role of India’s beef (buffalo) exports in global meat markets. Consumption of milk from buffalo is growing about 6.5% each year, which is faster than the growth in domestic beef consumption. This has made India the fourth largest exporter of beef in the world. The low cost of this product makes it especially attractive in Middle Eastern and Asian markets where the product competes on price with chicken.

BRAZIL’S CHALLENGES

“With ample and reliable rainfall, supportive industry leaders and government, and plenty of untapped land potential, the future looks bright for agriculture in Brazil,” said Nelson. “However, we see two big challenges on the horizon that may affect the profitability of future growth prospects: currency and infrastructure.”

While currency appreciation is reducing the country’s relative advantages, Brazil’s infrastructure weakness has been magnified by growing production, and is the primary challenge. It often costs between \$2 and \$3 to ship a bushel of crops from Mato Grosso, Brazil, to port, which is about twice as much as it costs to ship a bushel of grain from the United States to China. While infrastructure is improving, it is coming at a slow pace—slower than agricultural output is growing.

However, Nelson said, “Improvement in Brazilian infrastructure could eventually

unlock a vast quantity of productive land and crop output.”

UNITED STATES AND GM CROPS

Acceptance of genetically modified (GM) crops has been primarily limited to the US corn market, which is the only major grain with demonstrated technology-driven yield growth. Additionally, there are no foreseeable prospects for GM wheat; because, even in North America, there are many obstacles to accepting the technology. Therefore, when considering the potential role GM seeds could play in providing production and productivity growth to feed rising food demand, it is essentially in the context of the US corn market. In the longer term, there are output traits in the pipeline for drought resistance and nitrogen utilization that could prove meaningful.

However, Nelson said, “While the world could use every bit of productivity and supply growth it can muster right now, advances in GM crops are not likely to move the needle meaningfully any time soon.”

ADM celebrates fifth anniversary

In December 2010, Archer Daniels Midland Company (ADM; Decatur, Illinois, USA) celebrated its fifth year of working with West African farmers to produce higher-quality cacao crops through the company’s Socially and Environmentally Responsible Agricultural Practices (SERAP) program. One of the world’s first sustainable cacao programs, SERAP encourages farming cooperatives to work together to address social and environmental issues and offers financial incentives to help implement sustainable agricultural practices.

In 2005, ADM worked with West African farming cooperatives to develop the SERAP program to meet customer requests for sustainable cacao that was both traceable and auditable. In 2010, the program distributed \$1.25 million in funding to cooperatives and their members in Côte d’Ivoire, raising the total amount provided to participating cooperatives to more than \$4.5 million.

Participation in the SERAP program has tripled since its implementation in 2005 and has provided almost 49,000 metric tons (MT) of sustainable cacao during this time. During the initial 2005–2006 growing year,



Sustainability watch

The National Sunflower Association (NSA; Mandan, North Dakota, USA) has produced a sustainability statement that is available online at www.sunflowernsa.com/all-about/sunflower-sustainability. The statement traces a dramatic decrease in the use of active ingredients of various crop protection products from the 1990s through to the present time. In addition, the shift to no-till and reduced-till systems has greatly reduced soil erosion as well as fuel use for planting and weed control, NSA says.



Cargill’s work to improve livelihoods for cacao farmers and their families in Africa, Asia, and South America earned it the US Chamber Business Civic Leadership Center 2010 International Community Service Award. The award recognizes contributions to positive economic and social development in a country outside the United States.



The Global Packaging Project of the Consumer Goods Forum (Paris, France) is expected to issue a guidance document in the first quarter of 2011. The document will include a suggested set of common definitions, metrics, and principles for packaging in the context of sustainability. About 52 metrics have been identified, including recycled content, life cycle impact, global warming potential, water consumption, waste production, and energy usage. The document will be available at <http://globalpackaging.mycgforum.com>.



A new NASA computer modeling effort has found that additional growth of plants and trees in a world with doubled atmospheric carbon dioxide levels would create a new negative feedback—a cooling effect—in the Earth’s climate system that could work to reduce future global warming.

The cooling effect would be -0.3°C globally and -0.6°C over land, compared with simulations where the feedback was not included, said Lahouari Bounoua, of Goddard Space Flight Center, Greenbelt, Maryland. Bounoua led the research, which appeared in *Geophysical Research Letters* (doi:10.1029/2010GL045338, 2010). Without the negative feedback included, the model found a warming of 1.94°C globally when carbon dioxide was doubled.

Bounoua stressed that although the model’s results showed a negative feedback, it is not a strong enough response to alter the global warming trend that is expected.



The Economic Research Service (ERS) of the US Department of Agriculture has created an electronic briefing room highlighting the ERS climate change research program known as Economics of Markets for Agricultural Greenhouse Gases (EMAGG). That program “builds on extensive expertise on the economics of land use, land management, technology adoption, conservation program design, and biofuels production and distribution,” ERS said in a news release.

Landowner responses to carbon policies are a key factor in establishing the costs of greenhouse gas offsets from agriculture. In fiscal 2010, the EMAGG program awarded \$735,000 to seven projects to examine the economics of agricultural activi-

ties and practices and the effects of programs and greenhouse gas markets in reducing agricultural greenhouse gases. A detailed list of funded projects is available at <http://tinyurl.com/EMAGG>.



The Roundtable on Sustainable Palm Oil (RSPO; Kuala Lumpur, Malaysia) has introduced a logo for use on product packaging to inform consumers that the palm oil within has been sourced following RSPO rules. According to the RSPO, about half of the packaged products (both food and personal care) in supermarkets contain palm oil. ■

six cooperatives with approximately 6,000 farmer members participated, delivering 4,000 MT of cacao. During the 2009–2010 growing year, the number of participating cooperatives grew to 49, representing more than 18,000 farmers who together delivered more than 14,000 MT of sustainable SERAP cacao. Moreover, an analysis of cacao bean quality has shown that SERAP participants regularly produce better cacao beans with lower moisture levels.

FDA acts on phytosterols

In December 2010, the US Food and Drug Administration (FDA) proposed an

expansion of the foods enriched with phytosterols that can carry a health claim linking the ingredients to a reduced risk of coronary heart disease (CHD).

In addition to adding bread, cereal, orange juice, and low-fat dairy foods to the list of approved foods, the FDA also proposed a redefinition of “phytosterol.” The revised definition includes “both phytosterols esterified with certain food-grade fatty acids and, for the conventional foods for which the claim is authorized, nonesterified phytosterols as substances for which the health claim may be made.

“[H]owever, FDA is not proposing that dietary supplements containing only

nonesterified phytosterols be eligible for the health claim,” the proposed rule (*Federal Register* 75:76526–76571, 2010) states.

FRA awards biobased fuels, lubricants grants

The Federal Railroad Administration (FRA) has awarded two research grants totaling \$766,562 intended to advance the use of biobased fuels and lubricants.

North Carolina State University (Raleigh, USA) received \$395,189 to continue its research into the use of biofuels for freight and passenger rail operations, which will result in a possible recommendation of a “premium” biofuel blend for locomotive engines.

In addition, the National Ag-based Lubricant Center at the University of Northern Iowa received \$371,373 to study the feasibility of using readily biodegradable soy-based lubricants by freight and passenger railroads.

Canada invests in oilseed research

The governments of Canada and Saskatchewan will invest \$4.5 million toward an oilseed development project through the Canada-Saskatchewan Western Economic Partnership Agreement.

The investment of \$4.5 million will support a three-year research initiative, led by Genome Prairie, to develop new varieties of *Camelina sativa* (false flax) and *Brassica carinata* (Ethiopian mustard) for industrial applications.

Genome Prairie (Saskatoon, Saskatchewan) will work in collaboration with leading research companies and federal and provincial government partners. Research will focus on the potential of engineering the oil profile of camelina and *B. carinata* for use as a petroleum substitute in a variety of high-value, nonfuel applications such as lubricants, hydraulic fluids, greases, and polymers. Future commercialization of these new crops will lead to increased oilseeds diversification, providing growers with more choices for crop production and potentially increased revenues. ■

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Euro Fed Lipid Meeting Report

Euro Fed Lipid President Marc Kellens officially convened the 8th Euro Fed Lipid Congress, entitled "Oils, Fats and Lipids: Health & Nutrition, Chemistry & Energy" on Sunday, November 21, 2010, in Munich, Germany. In his opening remarks, Kellens reported that nearly 600 delegates from more than 40 countries were participating in the Congress (400 from academia and 200 from industry). He announced that for the first time, the Euro Fed Lipid Congress offered a table top exhibition, which included 15 company displays.

At the opening plenary session, Michael Bockisch, Bockisch-Consult (Jesteburg, Germany), longtime AOCS member and author of AOCS's *Fats and Oils Handbook*, was presented the DGF Normann Medal. In his award lecture, "Fish Oil—from the Bad and the Ugly to the Precious and Good," Bockisch described the development in medical and nutritional science that has made more apparent the

close relationship between health and long-chain polyunsaturated fatty acids (LC-PUFA).

Bart Staels, Université Lille Nord de France, received the European Lipid Science Award and presented his award lecture on "Nuclear Receptors Connecting Lipid Metabolism to the Nucleus." He described how nuclear receptors are a family of transcription factors that mediate responses to environmental changes by modulating genomic expression and how these nuclear receptors play an important role connecting lipid metabolism and energy homeostasis to the nucleus.

Earlier in the day, the Euro Fed Lipid Board of Directors welcomed its 12th member organization, the newly formed Turkish Association of Fats and Oils.

At the Congress banquet, Michel Parmentier was awarded the first-ever Fellow Award of Euro Fed Lipid. Parmentier was cited for his involvement with the initial

conception of Euro Fed Lipid as well as for his many years of service to the organization during its formative years. Parmentier was the first president of Euro Fed Lipid, serving from its creation in 2001 through 2005.

At the closing session, AOCS member Fereidoon Shahidi, Memorial University of Newfoundland, Canada, received the European Lipid Technology Award. His award lecture, "Novel Antioxidants in Food Quality Preservation and Health Promotion," provided a detailed account of dietary polyphenols and their derivatives, including those with omega-3 fatty acids from marine and algal sources as well as phytosterols, in food quality preservation and in health and disease.

The 9th Euro Fed Lipid Congress, "Oils, Fats and Lipids for a Healthy and Sustainable World," will be held September 18–21, 2011, in Rotterdam, Netherlands. ■

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I hereby subscribe to the above Code of Ethics. Signature of Applicant _____

Briefs

A report prepared by Don O'Connor of (S&T)² Consultants Inc., Vancouver Canada, entitled *Life Cycle Analysis Canola Biodiesel*, contends that canola biodiesel reduces life cycle greenhouse gases by 90% compared with fossil diesel. In releasing the report, Robert Hunter, vice president of the Canola Council of Canada, told the Canadian Renewable Fuels Association Summit meeting in Ottawa on November 30, "Countries around the world are implementing biofuel sustainability policies, and here we have a report that clearly demonstrates that Canadian canola can be a leader."



Finnair airplanes are set to use fuel produced from renewable sources on regular flights as early as the second quarter of 2011. For now, Neste Oil (Porvoo, Finland) will produce the necessary bio-kerosene in its production facilities in Porvoo and Singapore. Neste is also constructing another facility in Rotterdam that ultimately can supply fuel for Finnair. Neste uses animal fat or logging waste in synthesizing bio-kerosene. The Finnish government owns majority stakes in Finnair and in Neste.



Lennart Hallgren, project manager of the Stockholm (Sweden) Public Transport, told Xinhua News Agency in December 2010 that the city's goal is for its public transport to be free of fossil fuels by 2025. By the end of 2009, nearly 35% of all public buses in the city were fueled by either biogas or ethanol (for a total of 630 buses). The fleet will be expanded by 700 more green buses. The city is also testing an ethanol hybrid bus, which runs on a combination of electricity and ethanol. Additionally, all rail traffic presently runs on renewable wind and hydroelectric power.



On December 15, the Canadian federal government's Renewable Fuels Standard officially came into force. Its effect will be to add some two billion liters of renewable fuels, such as biodiesel

CONTINUED ON NEXT PAGE

Biofuels News



GENERAL

US President signs tax legislation

On December 17, 2010, US President Barack Obama signed the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act. Among other things, this tax legislation extends incentives for ethanol and biodiesel production.

The legislation extended the \$1.00 per gallon incentive for biodiesel and diesel created from biomass, which had expired December 31, 2009, retroactively through 2010 and on to December 31, 2011.

Since the previous tax credit for biodiesel expired at the end of 2009, the industry in the United States has been severely crippled. For example, almost half of the biodiesel plants in the state of Iowa either closed or went into idle mode, resulting in the loss of thousands of jobs.

For ethanol, the legislation included an extension of the Volumetric Ethanol Excise Tax Credit (VEETC) at the current rate,

\$0.45 per gallon, through 2011; and an extension of the tariff on imported ethanol (\$0.54 per gallon). Additionally, the bill extended through 2011 the \$0.10 per gallon tax credit for ethanol producers manufacturing less than 60 million gallons of ethanol annually; excise tax credits for alternative fuel and alternative fuel mixtures; and alternative fuel refueling property.

Renewable Fuels Association President and Chief Executive Robert Dinneen was quoted (<http://tinyurl.com/Biofuel-credit>) as saying the extension of the biofuels credits for a year would allow time for debate on longer-term incentives for renewable fuels.

DOE awards computing time

The US Department of Energy (DOE) announced the largest ever awards of its supercomputing time to 57 innovative research projects—using computer simulations to perform virtual experiments that in most cases would be impossible or impractical in the natural world. Utilizing two supercomputers with a computational capacity

and ethanol, into the Canadian gasoline pool each year. Gordon Quaiattini, president of the Canadian Renewable Fuels Association, said, "Five percent of the gasoline that Canadians pump into their vehicles will come from renewable green sources harvested and produced across Canada." ■

roughly equal to 135,000 quad-core laptops, the research could, for example, help speed the development of more efficient solar cells, improvements in biofuel production, or more effective medications to help slow the progression of Parkinson's disease.

The projects represent both academic and commercial research, including partnerships with companies such as GE and Boeing to use sophisticated computer modeling in the development of better wind turbines and jet engines.

The DOE is awarding time on two of the world's fastest and most powerful supercomputers—the Cray XT5 ("Jaguar") at Oak Ridge National Laboratory (Oak Ridge, Tennessee) and the IBM Blue Gene/P ("Intrepid") at Argonne National Laboratory (Argonne, Illinois). Jaguar's computational capacity is roughly equivalent to 109,000 laptops all working together to solve the same problem. Intrepid is roughly equivalent to 26,000 laptops.

The awards include nearly 1.7 billion processor hours on DOE's advanced supercomputers—the largest total ever—reflecting both the growing sophistication of the field of computer modeling and simulation and the rapid expansion of supercomputing capabilities at DOE National Laboratories in recent years.

Awarded under the DOE's Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program, many of the new and continuing INCITE projects aim to further renewable energy solutions and understand the environmental impacts of energy use. The program, open to all scientists, is supported by the DOE's Office of Science and managed by the DOE Leadership Computing Facilities at the Argonne and Oak Ridge National Laboratories, which host some of the world's fastest supercomputers.

US EPA's RFS2 numbers for 2011

At the end of November, the US Environmental Protection Agency (EPA) released the percentage standards for 2011 for the four categories of fuel—cellulosic biofuel, biomass-derived diesel, advanced biofuel, and renewable fuel—that make up the agency's renewable fuel standard program, known as RFS2. This program was established through the Energy Independence and Security Act of 2007 (EISA).

Overall volumes and standards for 2011 are as follows:

- Cellulosic ethanol: 6.6 million gallons (25 million liters); 0.003%
- Biomass-based diesel: 800 million gallons (3.03 billion liters); 0.69%
- Advanced biofuel: 1.35 billion gallons (5.11 billion liters); 0.78%
- Renewable fuel: 13.95 billion gallons (52.81 billion liters); 8.01%

It is notable that the requirements for cellulosic biofuel have been lowered by 97% from the EPA's original goal of 250 million gallons (950 million liters), but the overall amount for all renewable fuels has been maintained. This reduction was based in part on the EPA's assessment that only five US facilities have the potential to make volumes of cellulosic biofuel commercially available for transportation use in the United States in 2011.

EPA is currently aware of more than 20 facilities representing over 300 million gallons of production that are targeting commercial production of cellulosic biofuels in 2012. As a result, although the cellulosic biofuel standard the agency set for 2011 is considerably less than the applicable volumes established in EISA, EPA believes there is reason for optimism going forward to 2012 and beyond.

The 240 million gallon shortfall of cellulosic biofuels was added on to the 1.15 billion gallons of advanced biofuels in 2011 to keep the total at 1.35 billion gallons.

The complete ruling as it appeared in the *Federal Register* can be downloaded at <http://edocket.access.gpo.gov/2010/2010-30296.htm>.

JATROPHA

Jatropha in Mozambique

Sergio Gouveia, business development manager of Sun Biofuels Mozambique, announced in late November that the company, a subsidiary of UK-based Sun Biofuels Ltd., plans to expand its cultivation of jatropha in the country by more than five times in the next five years.

At present, the company has jatropha plants growing on 2,000 hectares; when expansion is complete, 11,000 hectares in central Manica and Sofala provinces will have been planted.

According to Bloomberg.com (November 25, 2010), Gouveia said the company "will follow the pattern of land zoning approved by the government so that we do not affect food productions."

The state-run Petroleos de Moçambique SA will purchase the oil for production of biofuel.

The company is presently experimenting with six varieties of jatropha, from which it will choose the most suitable for planting in their expanded efforts.

ALGAE

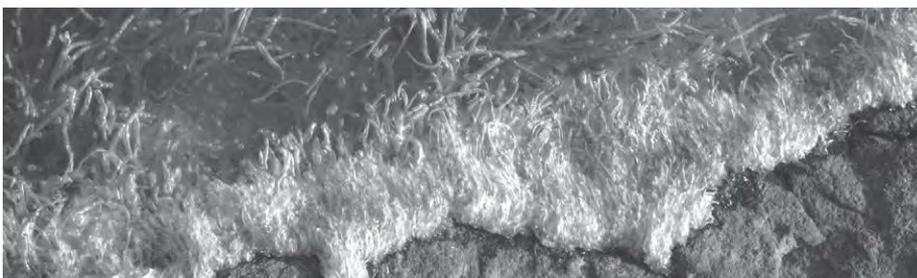
Viral Genetics boosts algal oil production

Viral Genetics, Inc., of San Marino, California, USA, has created a subsidiary it is calling VG Energy, Inc. The new entity, headed by Chief Executive Officer Haig Keledjian, has been formed to market the company's biofuel technology.

VG Energy is marketing an algae-enhancing technology that can increase the yield of oil from algae by as much as 300%.

In a company statement, Keledjian said, "We believe our approach to biofuels can change the economics of green energy by simply increasing the oil yield in certain plants." He added, "Many competitive technologies focus on genetically modifying algae strains, and developing expensive new growing methods."

M. Karen Newell-Rogers, of the Texas AgriLife Research Blacklands campus (Temple, Texas) has been instrumental in developing the yield-enhancing technology



and has received one patent and applied for several others under exclusive license to VG Energy for this work.

“Our research seems to indicate that we can trigger plant cells to increase their fat stores,” said Newell-Rogers. “We can manipulate plant cells so that they store oil and eventually release those reserves instead of burning the fat for fuel when glucose stores are low. The end result is more oil is available for processing into a biofuel.”

BIODIESEL

Analytical procedures for biodiesel

Total glycerin, glycerin, and cloud point. ASTM International Subcommittee D02.E0 passed three ballot votes in early December for inclusion of AOCS Standard Procedure Ck 2-09 as an approved method within the biodiesel B100 specification D6751. (B100 refers to fuel that is 100% biodiesel with no added petroleum diesel.)

AOCS Standard Procedure Ck 2-09 provides a method for using the QTA System marketed by Cognis Corp. (Cincinnati, Ohio, USA) for the rapid determination in biodiesel of total glycerin, free glycerin, and cloud point via a QTA (quality trait analysis)-specific infrared spectrometer that uses attenuated total reflectance.

Analyses can be conducted using a single drop of biodiesel, with no sample preparation or use of chemical reagents. The results are available within two minutes. Since its introduction in 2006, roughly two million biodiesel tests have been conducted using the QTA System, according to Cognis.

The next step is for the ASTM International D02 Committee as a whole to vote on the method in the first half of 2011. If the ballot passes, the Ck 2-09 procedure will be added to D6751 as an approved alternate test method for free and total glycerin as well as cloud point; analyses conducted by the QTA System could be used by BQ-9000 facilities and would qualify under the D6751 specification.

Methanol. Additionally, the ASTM Main Committee D02 voted to include the AOCS Standard Procedure Ck 2-09, the QTA System

method, as an approved method within the biodiesel B100 specification D6751 for the properties of methanol content. The revised D6751, with Ck 2-09 included, is scheduled to be published in February 2011 and methanol analyses conducted by QTA system will qualify under the D6751 specification and can be used by BQ-9000 facilities.

RENEWABLE DIESEL

Lufthansa to use biofuel on commercial flights

In a press conference held November 29, 2010, the German airline Lufthansa, along with government officials and the German Aerospace Center, announced a biofuel project that will begin in April 2011. At that time Lufthansa will begin flying an Airbus A321 on scheduled commercial flights going from Hamburg to Frankfurt and back to Hamburg. One of the aircraft’s engines will use a 50:50 mix of biofuel and traditional kerosene. A primary purpose of the project is to

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evaluate the long-term effects of biofuel on engine maintenance and engine life.

According to Lufthansa Chairman and Chief Executive Officer Wolfgang Mayrhuber, "Lufthansa will be the world's first airline to utilize biofuel in flight operations within the framework of a long-term trial."

As part of its preparations for these tests, Lufthansa is acquiring biofuel in sufficient volume to conduct these flights. Logistics also must be determined well in advance. The aircraft will be fueled only in Hamburg. This entails the airline changing its internal procedures, since it does not normally use a plane exclusively on a single route. Instead, a plane always flies in a rotation to different destinations.

The project is estimated to cost Lufthansa €6.6 million. Supplier of the biosynthetic kerosene will be Neste Oil (Porvoo, Finland), a fuel refining and marketing company. Certification of its biofuel is expected in March 2011.

A company statement indicated Lufthansa has improved its fuel efficiency by 30% since 1991. Average fuel consumption per passenger is now 4.3 liters of kerosene over 100 kilometers.

British Airways plc is also preparing to fly with biofuels. It is cooperating with Solena Group Inc. to build a waste-to-biofuels plant east of London. Construction is expected to begin in 2012, with fuel production to start in mid-2014. British Airways, anticipates buying all of the plant's 16 million gallons (61 million liters) of biofuel, made from 500,000 metric tons of waste biomass otherwise destined for landfill, annually for up to 10 years, said Jonathon Counsell, the airline's head of environment, in a July 2010 interview (<http://tinyurl.com/BA-Solena>).

Brazil joins effort to fuel aviation with renewable diesel

On November 22, TAM Airlines (São Paulo, Brazil) and Airbus carried out the first jatropha-based biofuel flight in Latin America, using an Airbus A320 aircraft designed to carry up to 174 passengers. The flight, in Brazilian air space over the Atlantic Ocean, lasted for 45 minutes before returning to its point of origin.

Fuel development for the flight was led by Curcas Brasil, a company that specializes in Brazilian renewable energy project



development, and Brasil Ecodiesel, a biofuel producer. Airbus and AirBP (the jet fuel distribution unit of BP) are also supporting the project.

To make the fuel, jatropha seeds were collected from family agricultural projects and farms in Brazil involved in the pioneer culture of *Jatropha curcas*, and crude oil was extracted from them. The oil was then shipped to the United States to be processed into bio-kerosene by UOP, a Honeywell Company, to make a 50:50 blend with regular aviation kerosene.

Plans are to ramp up the planting of jatropha crops within Brazil and to construct a processing plant to receive the jatropha seeds. According to a statement from Airbus (<http://tinyurl.com/Brasil-TAM>) the processing plant should start operations in 2013 with initial processing capacity of 80,000 metric tons per year of the fuel.

Airbus is sponsoring sustainability studies related to use of jatropha as a feedstock for aviation at Yale University (New Haven, Connecticut, USA).

AICHE recognizes UOP

In November 2010, the American Institute of Chemical Engineers (AIChE) presented its Sustainable Energy Award for 2010 to UOP LLC (Des Plaines, Illinois, USA), a Honeywell company, for its work on biofuels process technology. The award recognizes contributions toward the innovation, sustainability, and conservation of energy through the application of chemical engineering.

In a company statement, Rajeev Gautam, president and chief executive officer of Honeywell's UOP, said, "The solutions we have

created to convert biological feedstocks into real, drop-in fuels are not only economically viable under current regulations, but they are aligned with today's standard refinery practices and can greatly contribute to the reduction of greenhouse gas emissions."

Honeywell's UOP and Eni SpA (headquartered in Rome, Italy) jointly developed the UOP/Eni Ecofining™ process, which uses hydroprocessing technology to convert nonfood natural oils and animal fats to Honeywell Green Diesel™ fuel. The product is chemically indistinguishable from traditional diesel fuel, UOP says, and it has a higher cetane value, excellent cold-flow performance, and reduced emissions compared with biodiesel and petroleum-based diesel.

The company has also developed the process to produce Honeywell Green Jet Fuel™ for use in commercial and military aircraft. It has been tested so far on six commercial biofuel flights and several jet and helicopter flights with the US Navy and Air Force.

Barley as possible feedstock for oil

Researchers at the Eastern Regional Research Center (Wyndmoor, Pennsylvania) of the US Department of Agriculture Agricultural Research Service laboratory have reported the results of their research on the use of barley feedstocks as a source of bio-oil.

AOCS members Robert Moreau and Kevin Hicks, along with lead scientist Akwasi Boateng, Charles Mullen, and Neil Goldberg have evaluated the yields of bio-oil from

Briefs

Approximately 250 US soldiers deployed to Iraq are taking part in a study to determine whether supplementing soldiers' diets with fish oil capsules will improve their mood and combat stress symptoms, according to the *Stars and Stripes* newspaper. The research leader, Scott Smith of the Johnson Space Center in Houston, Texas, USA, designed the study after attending a Department of Defense-hosted conference in 2009 on the benefits of omega-3 fatty acids.



Antioxidant peptides found in human milk and subsequently synthesized by Canadian researchers could have possible applications in enriched infant formula. A study in *Food Chemistry* (doi: 10.1016/j.foodchem.2010.11.146) identified eight novel peptides that may contribute to the bioactivity of human milk. Two peptides in particular—YGYTGA and ISELGW—had strong antioxidant activity. Apollinaire Tsopmo of Carleton University (Ottawa, Ontario, Canada) led the research.



Raising "good" cholesterol levels may help prevent Alzheimer's disease, according to a study led by Christiane Reitz of Columbia University's Taub Institute for Research on Alzheimer's Disease in New York City, USA. The study, which appeared in *Archives of Neurology* (67:1491–1497, 2010), found that persons with low levels of high-density lipoprotein (HDL) or "good" cholesterol had a 60% greater risk of developing Alzheimer's disease after the age of 65 than those who had high levels.



A meta-analysis presented at the meeting of the American College of Neuropsychopharmacology in early December 2010 found that the proper ratio of EPA to DHA is critical in alleviation of depression. The analysis, which was led by John Davis, a professor of psychiatry at the University of Illinois at Chicago (USA), examined the results of 15 controlled clinical trials on the use of omega-3 fatty acids—commonly found

CONTINUED ON NEXT PAGE

Health & Nutrition News



Catherine Clarke and her UCLA research team (L. to R.: Catherine Clarke, Shauna Hill, Vincent Tse, and Bradley Kay) in the laboratory, courtesy of Reed Hutchinson/UCLA.

New method for preventing oxidative damage to cells

A new method for preventing oxidation in the essential fatty acids of cell membranes could lead to a new class of more effective nutritional supplements and potentially help combat neurodegenerative disorders such as Parkinson's disease and perhaps Alzheimer's disease as well, according to a group of biochemists from UCLA (University of California, Los Angeles, USA).

Polyunsaturated fatty acids (PUFA) are essential nutrients for everything from brain function to cell function, but they are the most vulnerable components in human cells because of their high sensitivity to oxidative modifications.

The UCLA biochemists, led by chemistry and biochemistry professor Catherine Clarke, set out to develop a new method for increasing the stability of PUFA. Along the way, they discovered a way to make PUFA more difficult to fracture so that oxidation is

less likely to occur, rather than relying on antioxidants to repair damage after it occurs.

"These compounds (PUFA) are so important, yet so fragile," Clarke said. "In many diseases, cell membrane function deteriorates, and it's exciting to think an enhanced class of supplements may be able to correct neurodegenerative diseases, and perhaps even oxidative stress-related aging. It would be a new strategy to treat and reinforce the molecule at the place where it is most prone to damage, instead of taking more antioxidants. This could be a new approach to battling diseases resulting from oxidative stress."

In the study, Clarke and her colleagues show that PUFA can be strengthened by replacing their most vulnerable hydrogen atoms, which are easily stripped away, with more stable deuterium (^2H), an isotope of hydrogen with one extra neutron. The result is the creation of a fatty acid that serves the same function as its predecessor, but without the same susceptibility to oxidation.

The biochemists also describe applying this reinforcement process to two essential dietary fatty acids and show that yeast cells treated with the reinforced PUFA are much



in oily fish or in fish oil supplements—to treat depressed persons. The scientists found that when used by itself, DHA (docosahexaenoic acid) did not appear to help. On the other hand, DHA combined with EPA (eicosapentaenoic acid) did offer an improvement in depressive symptoms.



Here is a study that is specialized, to say the least. The outcome: Nutritionist Scott Smith of the Johnson Space Center in Houston, Texas, USA, says astronauts worried about bone loss should eat more fish. With a typical monthly bone mass loss while in orbit of between 1 and 1.5%, astronauts lose as much bone in a month as a menopausal woman does in a year. Smith's research showed strong ties between how much fish astronauts eat while in orbit and the amount of bone they were able to preserve. The study was presented at the American Astronautical Society meeting in Cape Canaveral, Florida, USA, in December 2010 and appeared in the *Journal of Bone and Mineral Research* (25:931–1192, 2010).



A study in *Nutrition & Dietetics* (67:182–189, 2010) compares the level of omega-3 fatty acids in a number of commercially available supplements in Australia with manufacturers' self-reported omega-3 content information. Although the study was on supplements available in Australia, the authors feel the findings will generalize because of the global nature of the industry. "We observed a high level of congruency between our experimental data and disclosures by the manufacturers, which tended to support current practice in pre-market assessment of complementary medicines in Australia," the researchers suggest. ■

more resistant to oxidative stress than yeast treated with normal PUFA.

The researchers conducted experiments with a strain of yeast specially modified to lack antioxidants. They found that colonies treated with normal, naturally occurring PUFA died quickly, whereas those treated with the deuterium-reinforced fatty acids displayed resilience on par with wild, unmodified yeast. The replacement of a few hydrogen atoms with deuterium meant the difference between a rapid death and vigorous life for the yeast samples.

"[We] tested fatty acids in yeast mutants that lacked the antioxidant coenzyme Q₁, where we know they are very sensitive to stress," Clarke said. "What they showed is that when the yeast were treated with the isotopically reinforced fatty acids, they were fine, but when the yeast were treated with standard PUFA, 99% of them died in just four hours."

"We tested the viability of yeast—with the hydrogen atoms—that lacked the antioxidant coenzyme Q₁ and our test showed that they were not able to survive," said Shauna Hill, lead author of the report. "However, wild, normal yeast with coenzyme Q were able to grow, and survived."

The researchers then replaced four hydrogen atoms with four deuterium isotopes.

"The difference was enormous," Hill said. "We were really surprised that the heavy isotopes had such a drastic effect."

"Initially, I did not believe the results were correct," said Beth Marbois, a UCLA research chemist and co-author of the research. "But they were."

Yeast normally do not contain PUFA but will absorb both the normal and the isotope-reinforced fatty acids without preference when they are presented in solution, Hill and Marbois showed.

Reinforced PUFA potentially could create membranes that are at least somewhat resilient to oxidative damage, Clarke said.

After one PUFA molecule is damaged, a chain reaction ensues as the adjacent fatty acids throughout the membrane become similarly degraded. What was once a semi-permeable barrier that regulated cell function becomes a rigid lattice of cross-linked fatty acids that prevents the cell from achieving its purpose—which could be anything from synthesizing a protein to sending a signal to the nervous system.

Antioxidants are like a mop-up crew, Clarke said. After the hydrogen atoms are

pulled off, antioxidants stop the harmful chain reaction. Using another analogy, Clarke said, "Instead of taking an antioxidant to jump in front of a bullet, you place bulletproof vests on the hydrogen atoms."

Although wild yeasts are resistant to oxidation at room temperature, they do begin to experience stress as the temperature rises. At high temperatures, wild yeast colonies treated with deuterium-reinforced PUFA showed much greater resilience than those treated with unmodified fatty acids—a result that indicates that even cells with integrated antioxidant mechanisms can benefit from the addition of deuterium-enhanced fatty acids, Clarke said.

The research, federally funded by the US National Institutes of Health, appeared in *Free Radical Biology and Medicine* (doi: 10.1016/j.freeradbiomed.2010.10.690).

Mitochondrial damage and diabetes

A new study led by researchers from Yale School of Medicine shows that enhancing activity of a gene in the mitochondria, the power plant of the cell, prevents damage that can trigger type 2 diabetes.

Type 2 diabetes is an outgrowth of insulin resistance. But the underlying mechanism for the increased prevalence as persons age has been unknown until now.

The Yale team found that overexpression of the human catalase gene prevented mitochondrial damage and an excessive buildup of muscle lipids, and preserved mitochondrial function in aging mice. This in turn protected the aging mice from developing muscle insulin resistance, which is the major underlying factor that leads to type 2 diabetes.

Previous studies by the Yale group had shown that elderly individuals, even when healthy, had a 35% reduction in muscle mitochondrial activity, associated with a 30% increase in the fat content in muscle cells and severe muscle insulin resistance. According to senior author Gerald I. Shulman, a professor of medicine and cellular and molecular physiology: "This transgenic mouse study builds on our previous human studies and allowed us to directly test the hypothesis that age-associated reductions in muscle mitochondrial function can lead to intramuscular fat accumulation and insulin resistance—something that would be virtually impossible to do

Biotechnology News

In January, DuPont launched a new generation of corn hybrids developed and tested to help deliver a yield advantage in water-limited environments, allowing growers to minimize risk and maximize productivity. These hybrids will be offered to growers under the Optimum® AQUAmax™ brand name through DuPont business Pioneer Hi-Bred (Des Moines, Iowa, USA). The hybrids, introduced for planting in 2011, contain a collection of native corn traits that improve water access and utilization and deliver greater yields in water-limited conditions. The initial class of Optimum AQUAmax innovations will include five hybrid platforms across a range of maturities and technology packages.



In its last major grant before closing its doors, the Danforth Foundation will give \$70 million to the Donald Danforth Plant Science Center (St. Louis, Missouri, USA); this funding will support the Danforth Center's endowment, the income from which will help fund the Danforth Center's current research and launch phase one of its anticipated expansion. The mission of the Donald Danforth Plant Science Center, which was founded in 1998, is to "Improve the human condition through plant science." Besides seeking to improve nutrition and feed the world's hungry, Danforth Center researchers are working to develop renewable sources of energy and other sustainable products that will preserve and enhance the environment.



Reuters reported in January that researchers from Cambridge and Edinburgh Universities had genetically modified (GM) chickens in order to make them unable to transmit bird flu infections. The researchers reported that, although the GM chickens did sicken and die when exposed to the H5N1 bird flu, they did not spread the virus to other chickens.

"Preventing virus transmission in chickens should reduce the economic impact of the disease and reduce the risk posed to people," said Laurence Tiley, of Cambridge's department of veterinary medicine, one of the lead researchers on the study. ■



Fernando Weberich

GM crop adoption rises in Brazil

Three-quarters of the area in Brazil farmed with soybeans and more than half of the area planted with corn have used GM (genetically modified) seeds in the 2010/11 season, according to a study performed by the consulting company Celeres. Celeres found that three out of every four hectares planted with soybeans in Brazil in the 2010/11 crop season were sown with GM seeds, as revealed by their 2nd Monitoring of the adoption of agricultural biotechnology in Brazil. Considering also the area cultivated with transgenic summer corn seeds, winter corn, and cotton, this is the highest rate of adoption of transgenics in the history of the national agriculture. And, according to Celeres, the trend will continue in the future.

In the case of soybeans, for the current crop season Celeres forecasts that 18.1 million hectares have been planted with transgenic herbicide-tolerant soybeans, which represents 76.2% of the total area sown with the oilseed. GM corn crops should occupy 1.22 million hectares—an area 45.5% larger than in the 2009/10 season. Out of this area,

325,000 hectares will be planted with GM varieties containing insect resistance technologies, herbicide tolerance, or both technologies stacked. This last case, which represents the first crop season using this stacked technology, should reach 7.8% of the area with cotton.

Gene helps plants use less water while preserving biomass

Researchers have found a genetic mutation that allows a plant to better endure drought without losing biomass. Plants can naturally control the opening and closing of stomata, the pores that take in carbon dioxide and release water. During drought conditions, a plant might close its stomata to conserve water. By doing so, however, the plant also reduces the amount of carbon dioxide it can take in, which limits photosynthesis and growth.

The research, entitled "The *Arabidopsis* GTL1 Transcription Factor Regulates Water Use Efficiency and Drought Tolerance by Modulating Stomatal Density via

Transrepression of *SDD1*,” was published in *The Plant Cell* (22:4128–4141, 2010). The research was conducted by Chan Yul Yoo, Heather E. Pence, Michael J. Gosney, Paul M. Hasegawa, and Michael V. Mickelbart of Purdue University (West Lafayette, Indiana, USA); Jing Bo Jin of the Chinese Academy of Sciences (Beijing); and Kenji Miura of the University of Tsukuba, Japan.

Their work found that a genetic mutation in the research plant *Arabidopsis thaliana* reduces the number of stomata. But instead of limiting carbon dioxide intake, the gene creates a beneficial equilibrium.

“The plant can only fix so much carbon dioxide. The fewer stomata still allow for the same amount of carbon dioxide intake as a wild type while conserving water,” said Mickelbart. “This shows there is potential to reduce transpiration without a yield penalty.”

Mickelbart and Yoo used an infrared gas analyzer to determine the amount of carbon dioxide taken in and water lost in the *Arabidopsis* mutant. Analysis showed that the plant, which has a mutant form of the gene *GTL1*, did not reduce carbon dioxide intake but did have a 20% reduction in transpiration. The plant had the same biomass as a wild type of *Arabidopsis* when its shoot dry weight was measured.

Of the 20 genes known to control stomata, *SDD1* was highly expressed in the mutant. *SDD1* is responsible for regulating the number of stomata on leaves. In the mutant, with *GTL1* not functioning, *SDD1* is highly expressed, which results in the development of fewer stomata.

Mickelbart said the next step in the research is to determine the role of *GTL1* in a crop plant.

Monsanto’s annual pipeline update

In January, Monsanto Co. (St. Louis, Missouri, USA) highlighted products in their pipeline entering the next phase of development. The updates included:

MONSANTO AND BASF PLANT SCIENCE COLLABORATION

- Nitrogen-Utilization Corn (Advanced to Phase 2)—Nitrogen-Utilization Corn targets ways that corn plants can use nitrogen more efficiently, exploring the potential to boost yield under normal nitrogen conditions or to stabilize yield

in low nitrogen environments.

- Second-Generation Higher-Yielding Soybeans (Advanced to Phase 2)—When stacked with the first-generation soybean yield product and the higher yield opportunity of Genuity® Roundup Ready 2 Yield®, this product is designed to deliver improved yield compared with first-generation higher-yielding soybean varieties.

The Monsanto and BASF Plant Science collaboration was initiated in 2007 to jointly develop traits to improve farm productivity and profitability in corn, soybeans, cotton, and canola.

CORN

- Roundup® Hybridization System (Advanced to Phase 4)—The Roundup Hybridization System (RHS) is designed to replace detasseling in hybrid seed corn production.
- Roundup Hybridization System II (Advanced to Phase 1)—The second-generation Roundup Hybridization System II (RHS II) is designed to replace detasseling in hybrid seed corn production and increase seed yield in production, further reducing the cost of goods.

SOYBEANS

- Dicamba-Tolerant Soybeans (Advanced to Phase 4)—The addition of dicamba tolerance to the Genuity Roundup Ready 2 Yield soybean platform would enable the use of dicamba and glyphosate for pre-plant burndown and in-season weed control, resulting in an effective and high-yielding weed management system.
- Second-Generation Insect Protected Soybeans (Advanced to Phase 2)—This pipeline product is the second generation of insect-protected soybeans using Bt technology widely adopted in corn and cotton to control economically significant insect pests in Brazil. This product would broaden the spectrum of insect control and durability of the trait compared to the first-generation product.

CANOLA

- Dicamba-Tolerant Canola (Advanced to Phase 1)—Dicamba tolerance, when stacked with Roundup Ready® technology, is designed to add an additional

herbicide mode of action, which would enhance the flexibility for weed control options available for canola growers.

Researchers use LCD light to control brains in GM animals

Researchers from the Georgia Institute of Technology (Georgia Tech; Atlanta, USA) have used inexpensive components from ordinary liquid crystal display (LCD) projectors to control the brains and muscles of tiny organisms, including freely moving worms. Red, green, and blue lights from a projector activate light-sensitive microbial proteins that are genetically engineered into the worms, allowing the researchers to switch neurons on and off like light bulbs and turn muscles on and off like engines.

Use of the LCD technology to control small animals advances the field of optogenetics—a mix of optical and genetic techniques that has given researchers unparalleled control over brain circuits in laboratory animals. Until now, the technique could be used only with larger animals by placement of an optical fiber into an animal’s brain, or required illumination of an animal’s entire body.

The research was published in the journal *Nature Methods* (doi: 10.1038/nmeth.1555).

“This illumination instrument significantly enhances our ability to control, alter, observe, and investigate how neurons, muscles and circuits ultimately produce behavior in animals,” said Hang Lu, an associate professor in the School of Chemical & Biomolecular Engineering at Georgia Tech.

Lu and graduate students Jeffrey Stirman and Matthew Crane developed the tool with support from the National Institutes of Health and the Alfred P. Sloan Foundation.

The illumination system includes a modified off-the-shelf LCD projector, which is used to cast a multicolor pattern of light onto an animal. The independent red, green, and blue channels allow researchers to activate excitable cells sensitive to specific colors, while simultaneously silencing others.

“Because the central component of the illumination system is a commercially available projector, the system’s cost and complexity are dramatically reduced, which we hope will enable wider adoption of this tool by the research community,” explained Lu.

Bomb-detecting plants?

Researchers at Colorado State University (CSU; Fort Collins, USA) have modified plants to allow them to detect explosives, toxic chemicals, and air pollution. The work could eventually be used for a wide range of applications such as security in airports or shopping malls, or monitoring for pollutants such as radon in a home.

“The idea to make detector plants comes directly from nature,” said CSU’s June Medford. “Plants can’t run or hide from threats, so they’ve developed sophisticated systems to detect and respond to their environment. We’ve ‘taught’ plants how to detect things we’re interested in and respond in a way anyone can see, to tell us there is something nasty around.”

“Plant sentinels engineered to detect explosives may ultimately help us protect our troops from improvised explosive devices (IED),” said Linda Chrisey, program officer for the Naval Biosciences and Biocentric Technology Program at the Office of Naval Research. The research—“Programmable Ligand Detection System in Plants Through a Synthetic Signal Transduction Pathway”—appears in *PLoS One* (doi: 10.1371/journal.pone.0016292).

Medford and colleagues used a computer program to redesign naturally occurring proteins called receptors. These redesigned receptors specifically recognize a pollutant or explosive. Medford’s lab then modified these computer-redesigned receptors to function in plants, and targeted them to the plant cell wall where they can recognize pollutants or explosives in the air or soil near the plant. When the plant detects the substance, it activates an internal signal that causes the plant to change from green to white.

Based on research so far, detection abilities of these plants are similar to or better than those of dogs, Medford said. The initial or first-generation plants respond to an explosive in hours, but improvements are under way to reduce the response time to a few minutes.

Progress made in control of “superweeds”

“Superweeds”—undesirable plants that can tolerate multiple herbicides, including the popular glyphosate, also known

as RoundUp—can cost time and money because the only real solution is for farmers to plow them out of the field before they suffocate corn, soybeans, or cotton. Zhanyuan Zhang, a research associate professor of plant sciences and director of the University of Missouri Plant Transformation Core facility, partnered with research scientists at Dow AgroSciences, LLC, to engineer soybean plants that can tolerate an alternative herbicide that may help slow the spread of superweeds such as tall waterhemp.

Using a genetic database and a bioinformatic approach, Dow AgroSciences researchers identified two bacterial enzymes that, when transformed into plants, conferred resistance to the herbicide 2,4-D (2,4-dichlorophenoxyacetic acid), commonly used in controlling dandelions. The enzymes were successfully put into corn and soybean plants, and those new plants showed excellent resistance to 2,4-D, including no negative effects on yield or other agronomic traits. Other advantages of 2,4-D include low cost, short environmental persistence, and low toxicity to humans and wildlife.

“Unlike glyphosate, which targets amino acid synthesis, 2,4-D is a hormone regulator. Because it has a different mode of action, 2,4-D is an ideal herbicide to deal with glyphosate-resistant weeds,” said Zhang, who managed the soybean transformation portion of the study and contributed to some of the data analysis.

Zhang believes that 2,4-D could be combined with other herbicides in the near future. In the meantime, Zhang says an integrated weed management plan can help farmers be productive and ultimately save money for the consumer.

Study results were published in the *Proceedings of the National Academy of Sciences* (doi: 10.1073/pnas.1013154107).

Technique allows researchers to identify key maize genes

The study, led by researchers from Cornell University (Ithaca, New York, USA) and the US Department of Agriculture-Agricultural Research Service (USDA-ARS) at Cornell and North Carolina State University (Raleigh), is the first to relate genetic variation across the entire maize genome to traits in a genome-wide association study. The

researchers have so far located 1.6 million sites on the maize genome where one individual may vary from another, and they used those sites to identify the genes related to changes in leaf angle that have allowed the planting of corn to a greater crop density.

Yield increases have mostly resulted from adaptations made to maize by breeders so crops can be planted closer together. Along with changes in roots and nutrient uptake that also play roles in increased crop densities, the leaves of maize crop plants have become more upright to maintain access to sunlight in crowded plots.

The team of researchers found that natural mutations in genes that affect ligules—the first thick part of the leaf where it wraps around the stalk—contributed to more upright leaves. Also, the changes in leaf angle result from many small genetic effects added together; while leaf angles may vary from one maize variety to another by up to 80°, the biggest effect from a single gene was only 1.5°.

“Although each gene and variant has a small effect, we can make very accurate predictions,” said Ed Buckler, the paper’s senior author, a USDA-ARS research geneticist in Cornell’s Institute for Genomic Diversity. Lead authors include Feng Tian, a postdoctoral researcher in Buckler’s lab, and Peter Bradbury, a computational biologist with the USDA-ARS in Ithaca.

The genome-wide association study method allows researchers to examine a corn plant’s genome and predict a trait with 80% accuracy. This would be analogous to predicting the height of a person by sequencing and analyzing their genes, or genotyping a seed to predict traits of the plant, said Buckler. The methodology may be applied to other traits, crops, and species, including animals.

“This method will allow the intelligent design of maize around the world for high-density planting, higher yields, and disease resistance,” said Buckler.

The study offers proof that variation in traits is the sum of many small effects in genes, a hypothesis that has also been proposed by some human geneticists. The study appeared in *Nature Genetics* (doi: 10.1038/ng.746). Also in the same online issue, a companion paper by the same research team, but led by those at USDA-ARS and North Carolina State University, used the same technique to identify key genes associated with southern leaf blight in maize (doi:10.1038/ng.747). ■

Briefs

Beiersdorf announced in December 2010 that it will pull out of the color cosmetics market in Germany to focus instead on skin care. The company is based in Hamburg.



Denmark's Novozymes has added granulation capacity at its enzyme plant in Tianjin, China. As one of Novozymes' three strategic production bases around the globe, the plant is capable of manufacturing various enzymes for the biofuel, food, brewing, and detergent industries.



Godrej Consumer Products Ltd. of Mumbai, India, has acquired the Swastik and Genteel brands for an undisclosed amount, according to a filing with the Bombay Stock Exchange. The Swastik line consists of two soap brands—Shikakai and Neem—whereas Genteel is the second-largest liquid detergent brand after Godrej's Ezee. In the filing, Godrej said it had acquired a 100% stake in Naturess Consumer Care Products (former owner of the Swastik brand) and Essence Consumer Care Products (former owner of Genteel).



Procter & Gamble Pakistan (P&G) inaugurated a new production facility for its Ariel brand detergent at Port Qasim in December 2010. P&G has been in Pakistan for two decades, according to the country's *Daily Times* newspaper.



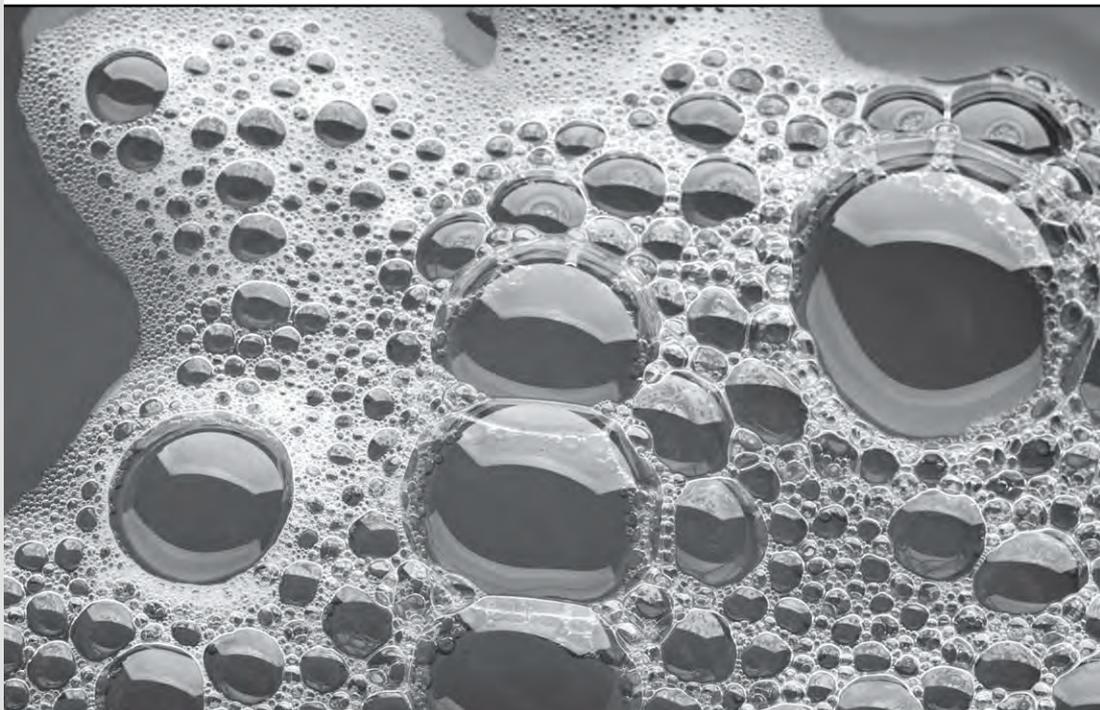
Keya Detergent and Keya Soap, subsidiaries of the Khaleque Group of Industries in Bangladesh, will merge with a third subsidiary, Keya Cosmetics Ltd. The amalgamation is subject to approval of shareholders, and subsequent sanction of the High Court.



An era is over: After creating and producing the first radio soap opera as an advertising vehicle for its cleaning products, The Procter & Gamble Co. (P&G; Cincinnati, Ohio, USA) is out of the soap opera production business. The company's *Guiding Light* television program was cancelled in 2009, and

CONTINUED ON NEXT PAGE

Surfactants, Detergents, & Personal Care News



Can being too clean make you sick?

Young people who are overexposed to antibacterial soaps containing triclosan may suffer more allergies, and exposure to higher levels of bisphenol A (BPA) among adults may negatively influence the immune system, a new University of Michigan School of Public Health (U-M; Ann Arbor, USA) study suggests. The study appeared in *Environmental Health Perspectives* (doi: 10.1289/ehp.1002883).

Using data from the 2003–2006 National Health and Nutrition Examination Survey, U-M researchers compared urinary BPA and triclosan with cytomegalovirus (CMV) antibody levels and diagnosis of allergies or hay fever in a sample of US adults and children over age 6. Allergy and hay fever diagnosis and CMV antibodies were used as two separate markers of immune alterations.

“We found that people over age 18 with higher levels of BPA exposure had higher CMV antibody levels, which suggests their cell-mediated immune system may not be functioning properly,” said Erin Rees Clayton,

research investigator at the U-M School of Public Health and first author on the paper.

Researchers also found that people age 18 and under with higher levels of triclosan were more likely to report diagnosis of allergies and hay fever.

“The triclosan findings in the younger age groups may support the ‘hygiene hypothesis,’ which maintains living in very clean and hygienic environments may impact our exposure to microorganisms that are beneficial for development of the immune system,” said Allison Aiello, associate professor at the U-M School of Public Health and principal investigator on the study.

As an antimicrobial agent found in many household products, triclosan may play a role in changing the microorganisms to which persons are exposed in such a way that immune system development in childhood is affected.

“It is possible that a person can be too clean for their own good,” said Aiello, who is also a visiting associate professor of epidemiology at Harvard.

Previous animal studies indicate that BPA and triclosan may affect the immune system, but this is the first known study to

look at exposure to BPA and triclosan as it relates to human immune function, Aiello said.

One surprise finding is that with BPA exposure, age seems to matter, said Rees Clayton. In people 18 or older, higher amounts of BPA were associated with higher CMV levels, but in people younger than 18 the reverse was true.

“This suggests the timing of the exposure to BPA and perhaps the quantity and length of time we are exposed to BPA may be affecting the immune system response,” Rees Clayton said.

This is just the first step, she noted, but a very important one. Going forward, the researchers would like to study the long-term effects of BPA and triclosan in people to see if they can establish a causal relationship.

One limitation of the study is that it measured disease and exposure simultaneously and thus shows only part of the picture, Aiello said.

“It is possible, for example, that individuals who have an allergy are more hygienic because of their condition, and that the relationship we observed is, therefore, not causal or is an example of reverse causation,” Aiello said.

The U-M study does not reflect “real-world usage of a proven, beneficial product used safely and effectively on a daily basis,” according to the American Cleaning Institute (ACI), a trade association based in Washington, DC, USA.

“This is speculation at its worst. The researchers do not provide data to show a problematic cause-and-effect from usage of antibacterial soap containing triclosan,” said Richard Sedlak, ACI’s senior vice president of Technical & International Affairs.

“Triclosan has been extensively reviewed, researched, and regulated for four decades and is globally accepted as safe for daily use,” he added.

ACI also expressed disappointment at how the researchers “hyped and distorted” the study’s conclusions in their attempts to market the research. “Unlike the actual published article, the researchers’ press release omits any mention of the serious limitations, lack of causal demonstration, and highly tentative nature of the conclusions in the study.”

For its part, the US Food and Drug Administration (FDA) said in April 2010 that recent research raised “valid concerns” about the possible health effects of triclosan. The FDA and the US Environmental

Protection Agency announced then that they were taking another look at triclosan, whose use is so widespread that is found in the urine of 75% of the population, according to the US Centers for Disease Control and Prevention.

REACH moves ahead

November 30, 2010, was the deadline for registration of high-tonnage materials and substances of concern under the European Commission’s REACH chemical regulation (EC 1907/2006). The regulation deals with the Registration, Evaluation, Authorization, and Restriction of Chemical substances. Following the registration deadline, the European Chemicals Agency (ECHA) began the evaluation of ingredients. The regulation requires all chemicals produced or imported into the European Union at quantities of more than one metric ton (MT) to be registered. A dossier must be prepared for each substance, which is then sent to ECHA for evaluation before the relevant member state evaluates whether the substance poses a threat to human health or the environment.

As a first step during 2011, ECHA will publish the nonconfidential parts of the registration dossiers on its website and must evaluate 5% of the dossiers before the next deadlines in 2013 and 2018. Those deadlines apply to chemicals produced or imported in quantities of between 100 and 1,000 MT and those between 1 and 100 MT, respectively.

EPA expands Endocrine Disruptor Screening Program

In December 2010, the US Environmental Protection Agency (EPA) issued a list of 134 additional chemicals to be tested under the agency’s Endocrine Disruptor Screening Program (EDSP) for substances that may affect the human hormonal system.

The 134 chemicals have been added to the existing list of 67 chemicals, named by EPA earlier in 2010 and now subject to agency test orders. EPA also issued a draft set of supplemental policies and procedures for the EDSP to account for Safe Drinking Water Act requirements.

Among the 134 chemicals are a large number of pesticides; industrial chemicals, such as plasticizers; and chemicals used in the production of pharmaceutical and personal

As the World Turns stopped in September 2010. *The New York Times* newspaper reports P&G, which produced more than 20 soap operas over the decades, still advertises on daytime dramas but will focus more energy collaring consumers via YouTube, Facebook, Twitter, and smart phone apps, among other digital media. ■

care products. The supplemental draft policies are subject to a 60-day comment period, which ended on January 18, 2011.



California “Green Chemistry” Rules

Officials of the US state of California have made “dramatic” changes to proposed regulations for “safer consumer product alternatives,” according to the American Cleaning Institute (ACI; Washington, DC, USA; formerly the Soap and Detergent Association). But the rules still require more revisions to make them manageable and workable for industry, consumers, and regulators alike, ACI said. The Green Chemistry Alliance (of which ACI is a member) also praised the Department of Toxic Substances Control (DTSC) for streamlining the proposed rules and making them workable, but said “many serious problems remain unresolved or merely deferred to a later time.”

In its December 3, 2010, comments to DTSC, ACI said it appreciated the department’s willingness to consider the Institute’s previous comments and to simplify the regulations. Still, there are sections of the rules that lack clarity or need further revision, including language governing “chemical and product information.” Further, the State should provide an assessment to explain “the

burdens the regulations place on the regulated community and how that will impact manufacturers, both those based inside as well as outside of the state, and subsequently impact the California economy, environment and public health in the state.”

Meantime, in its December 3, 2010, comments, the Green Chemistry Alliance (GCA) acknowledged many of the post-hearing changes made by the department in an attempt to make the proposal more streamlined and workable. But GCA says, “One of the largest continuing problems is a failure to more clearly enunciate the criteria and process for consistently and systematically identifying and prioritizing chemicals of concern and priority products.”

ACI’s complete comments are available on its website at www.cleaninginstitute.org.

Samsung introduces new washing machine

South Korea’s Samsung Electronics has introduced its new Eco Bubble front-loading washing machine.

The latest Bubble Care engine generates foam by dissolving detergent with air and water before the normal cycle starts. Thus, liquid detergent is distributed evenly and

penetrates fabrics 2.5 times faster than high-efficiency detergents, according to Samsung. “It also effectively provides thorough cleaning to delicate fabrics like silk or wool with less damage than traditional washers, as the fine bubbles act as a cushion,” a company spokesperson said.

Dow Corning introduces antifoam product

Dow Corning has introduced its GP 4503 Powdered Antifoam technology, which it says enables formulation of detergents with foaming surfactants for automatic dishwashing applications. Under current operating conditions, these foaming surfactants produce significant amounts of foam, which can affect the efficiency of the cleaning mechanism.

“Until now, there hasn’t been an effective way to control foam levels,” said Yan Cortes, Dow Corning Household Care global marketing manager. “Surfactants that produce excessive foam slow the rotation of spray arms and reduce cleaning and spraying efficiency. The new antifoam solves that problem.”

Dow Corning® GP 4503 Powdered Antifoam is formulated with a water-soluble carrier to limit residue on dishes and

dishwasher parts. It was developed to perform in extreme conditions, especially under high pH and high agitation, which typically generate excessive foam. The new silicone antifoam provides effective foam control throughout the entire dishwashing cycle with no noticeable buildup on dishes, the company says.

SC Johnson begins “green” ad campaign

Consumer products maker S.C. Johnson (Racine, Wisconsin, USA) has upped the ante for other manufacturers with an advertising campaign touting the company’s commitment to disclose the ingredients of its household cleaning products such as Glade, Pledge, and Windex.

The ads began during the US Thanksgiving holiday in late November 2010. The commercial then ran on family-friendly channels such as Hallmark and TLC before it moved online to high-profile sites such as CNN.com, marthastewart.com, and the like.

The ads promise that the company will disclose all of its ingredients, “right down to the fragrances and dyes” by 2012. The information is being phased in on labels and will also appear on the S.C. Johnson website (www.scjohnson.com). ■

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People News/ Inside AOCS

GOED appoints new head of board of directors

AOCS member **Baldur Hjaltason**, the strategic business development and sales manager of EPAX (Aalesund, Norway), was named the new chair of the board of directors for the Global Organization for EPA and DHA Omega-3 in late November 2010. GOED is an international association of processors, refiners, manufacturers, distributors, marketers, retailers, and supporters of products containing eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) omega-3 fatty acids



Hjaltason has more than two decades of experience in the omega-3 industry, with expertise in the trends and science of the marine-based omega-3 category. He views his task as “to grow the organization’s membership, provide education on the rapidly expanding omega-3 industry, and communicate the many health benefits of these essential fatty acids.”

Quencer returns to Dow

Lisa Quencer joined Dow Polyglycols, Surfactants & Fluids (PS&F), a business unit of The Dow Chemical Company (Midland, Michigan, USA), in November. In her new role, Quencer will be responsible for technical customer interactions in North America for surfactant-based products, driving growth in strategic applications with existing and new products. In addition, she will also support new product development.

She has extensive experience in the chemical industry, specifically involving surfactants with emphasis on research and development, technical services and development, change management, and organizational leadership. She holds a Ph.D. in physical (surfactant) chemistry from the University of Missouri-Rolla. Quencer is returning to Dow after spending several years outside the chemical industry.

Bloom business director for Industrial Chemicals at ADM

On December 6, Archer Daniels Midland Co. (ADM; Decatur, Illinois, USA) announced the appointment of AOCS member **Paul Bloom** as business director, Industrial Chemicals. Bloom will be responsible for developing and commercializing renewable chemicals, and for managing the commercial activities of ADM’s industrial chemicals business. At present ADM’s Industrial Chemicals group produces

In Memoriam

DONALD F. KUEMMEL

On August 3, 2010, Donald Kuemmel died in Cincinnati, Ohio, USA, at the age of 82. He received his B.S. degree in 1950 and his M.S. in 1952 from Marquette University, Milwaukee, Wisconsin, USA. He earned his Ph.D. from Purdue University, West Lafayette, Indiana, USA in 1956.

He was employed with the Procter & Gamble Co. in Cincinnati from 1955 until his retirement, working as a research analytical chemist. Kuemmel joined AOCS in 1957, and published in both the *Journal of the American Oil Chemists’ Society* and *Lipids*.

He is survived by his wife Juanita, two sons, and one daughter.

polymers, solvents, and starches for industrial and consumer applications such as paints, plastics, household cleaners, and pharmaceutical excipients. The company’s line of Evolution Chemicals™, launched by the Industrial Chemicals group in 2009, includes biobased industrial ingredients such as isosorbide, glycerin, and industrial ethanol.



ADM is constructing a facility in Decatur, Illinois, to produce propylene and ethylene glycol from biobased renewable sources. The facility is expected to be fully operational by spring 2011.

Kruse moves to Stratas Foods

Effective January 3, 2011, **Tedd Kruse** became chief executive officer of Stratas Foods, Memphis, Tennessee, USA. Stratas Foods LLC is a joint venture of Archer Daniels Midland Company (ADM; Decatur, Illinois, USA), and ACH Food Companies, Inc., which is a subsidiary of Associated British Foods. Stratas provides customers with service and product innovation in edible oil and global sourcing.

Kruse formerly was vice president of sweetener sales for ADM, and before that was vice president of North American Foods oils (ADM).

CSIRO Research award for omega-3 land plants

The Omega-3 Land Plants Team (of the CSIRO in Australia) received the CSIRO 2010 Research Achievement Medal in October 2010. This medal recognizes exceptional research of CSIRO scientists or teams.

The Omega-3 Land Plants Team received the award for research leading to the development of an alternative and sustainable source of essential long-chain omega-3 eicosapentaenoic acid and

docosahexaenoic acid (DHA) oils in canola. These omega-3 oils are important in a range of human health conditions including cardiovascular disease, inflammatory disease, and brain function. The positive health effects of long-chain omega-3 fatty acids, such as those found in fish oil, are widely known.

The Food Futures Flagship Omega-3 Land Plants Team is developing an omega-3 DHA canola crop that will sustainably meet the growing demand for these important oils.

Team members named to the award include AOCS members **Surinder Singh, Peter Nichols, Allan Green, Mahinda Abeywardena, and Chakra Wijesundera.** Others named in the award are **James Petrie, Stan Robert, Xue-Rong Zhou, Matthew Morell, Qing Liu, Pushkar Shrestha, Sue Blackburn, Peter Mansour, Craig Wood, Matthew Miller, Dion Frampton, Soressa**

Kitessa, Anne Mackenzie, Adam White, Lijun Tian, Rob Defeyter, and Lindsay Adler.

New appointments at ADM

Archer Daniels Midland (Decatur, Illinois, USA) has announced a number of management appointments, which became effective December 1, 2010.

- **Mark Bemis** has been named senior vice-president and president, Corn. Previously, he served as vice-president and president, Cocoa, Milling and Financial Services.
- **Matt Jensen** is now senior vice-president. He continues to serve as president, Global Oilseeds.

- **Craig Huss** also has been named senior vice president. He continues to serve as president, Agricultural Services.
- **Joe Taets**, vice president, has been named president, Grain.
- **Mark Kokhorts** has been appointed a corporate officer and named vice president and president Milling and Cocoa.
- **Victoria Podesta**, vice president, has been named chief communications officer.
- **Mike Baroni** has been named vice president, Economic Policy. He most recently served as president of the Corn business units.
- **Kris Lutt** is now president, Milling.
- **Chris Boerm** has been named advisor, Office of the Chairman.
- **Conrad Givers** has been appointed vice president, Sweetener Sales. ■

CALENDAR (CONTINUED FROM PAGE 65)

May 22–27, 2011. Bioenergy III: Present and New Perspectives on Biorefineries, Lanzarote, Canary, Islands, Spain. Information: www.engconfintl.org/11aa.html.

May 26–28, 2011. 10th Yeast Lipid Conference, Oulu, Finland. Information: www.yeastlipid2011.org.

May 26–28, 2011. China International Cleaning Industry Expo 2011, China National Convention Center, Beijing, China. Information: www.clean-expo.com.

June

June 5–9, 2011. 13th International Groupe Consultatif International de Recherche sur le Colza (GCIRC), Prague Congress Centre, Prague, Czech Republic. Information: www.irc2011.org.

June 6–8, 2011. 8th World Surfactant Congress and Business Convention (CESIO 2011), Austria Center Vienna, Austria. Information: www.cesio2011.com.

June 11–15, 2011. Institute of Food Technologists' Annual Meeting and Expo,

New Orleans, Louisiana, USA. Information: www.ift.org.

June 18, 2011. Sensory Evaluation of Olive Oil Short Course, Hilton Hotel, Izmir, Turkey. Information: email: meetings@aocs.org; www.aocs.org/goto/Turkey2011.

June 18–19, 2011. Basics of Oilseed Processing Short Course, Hilton Hotel, Izmir, Turkey. Information: email: meetings@aocs.org; www.aocs.org/goto/Turkey2011.

June 19, 2011. Edible Oil Refinery and Optimization and Maintenance Short Course, Hilton Hotel, Izmir, Turkey. Information: email: meetings@aocs.org; www.aocs.org/goto/Turkey2011.



June 19–21, 2011. Oils and Fats World Market Update 2011, Izmir Hilton, Izmir, Turkey. Information: www.aocs.org/goto/WorldMarket.

June 19–24, 2011. Atherosclerosis: Understanding the Pathophysiology and Identifying New Modes of Prevention, Gordon Research Conference, Salve Regina Uni-

versity, Newport, Rhode Island, USA. Information: www.grc.org/programs.aspx?year=2011&program=athero.

June 21–22, 2011. Enzymatic Processing and Modification, Het Pand, Ghent University, Belgium. Information: phone: +44 (0)20 7598 1561; www.soci.org/General-Pages/Display-Event?EventCode=OF107.



June 21–23, 2011. World Conference on Oilseed Processing, Fats & Oils Processing, Biofuels & Applications, Izmir Hilton, Izmir, Turkey. Information: www.aocs.org/goto/Turkey2011.

June 21–23, 2011. 15th Annual Green Chemistry and Engineering Conference/5th International Conference on Green and Sustainable Chemistry, Washington, DC, USA. Information: www.gcande.org.

June 27–30, 2011. BIO [Biotechnology Industry Organization] International Convention, Walter E. Washington Convention Center, Washington, DC, USA. Information: <http://convention.bio.org>. ■

Book Review

Oxidation in Foods and Beverages and Antioxidant Applications. Volume 1: Understanding Mechanisms of Oxidation and Antioxidant Activity

E.A. Decker, R.J. Elias, and D.J. McClements (eds.)
Woodhead Publishing Ltd., 2010, 408 pages
ISBN 978-1-84569-648-1, \$245.

William Artz

The editors have selected an excellent group of authors. Most are from Europe, but five of the 15 chapters are written by research scientists from the USA, and one chapter is written by an expert from Israel. The book (the first of two volumes) comprises two parts: oxidation in foods and beverages, and antioxidants (AOs) in foods and beverages. It is a well-written and informative resource for those interested in food lipid oxidation, particularly those interested in AOs and how AOs can best be used to prevent or reduce oxidation.

The 15 chapters cover two main themes: the mechanism of oxidation and AOs, and the measurement of the extent and rate of oxidation and AO activity. The first chapter introduces a wide range of topics, from reactive oxygen and nitrogen species to various AOs such as iodide, polyphenols, and uric acid. The chapter includes an introductory section on AOs and antireductants. The very important topics of transition metals, transition metal-containing proteins and enzymes, and their effects on lipid oxidation are well covered in three separate chapters. Singlet oxidation is covered in a separate chapter, with emphasis on singlet oxygen chemistry and its effects on various food products, as well as selected compounds that have AO activity with respect to singlet oxygen. There are well written chapters on the flavor impact of oxidation, as well as the negative effects of oxidation on the nutritional quality of fats/oils. The first part ends with chapters on the various methods used to quantify the extent of lipid oxidation and the methods used to determine and predict food product shelf life.

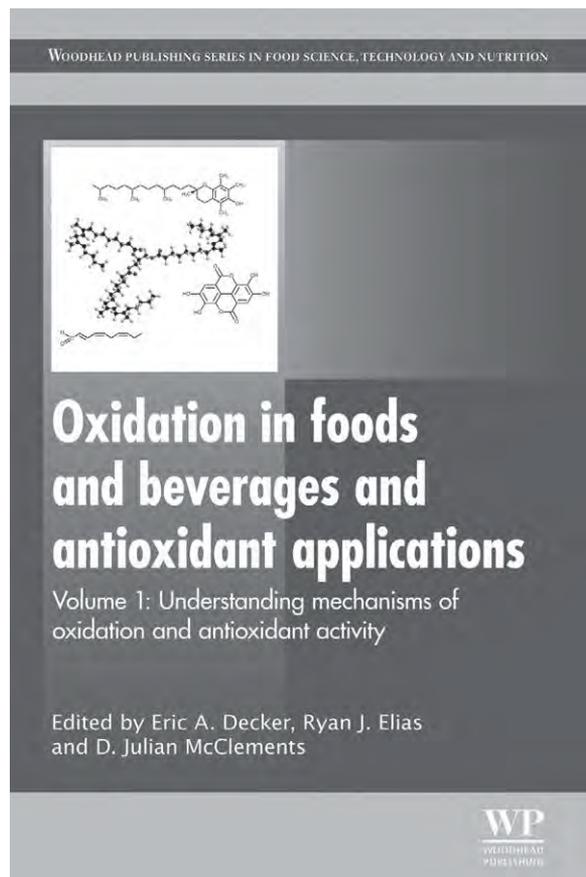
The second part on AOs starts with a very informative chapter on AO mechanisms, ranging from free radical inactivation to transition metal chelation to the control of reactive oxygen species, such as singlet oxygen. The next two chapters discuss protein-based AOs and other natural as well as synthetic AOs, with the emphasis on applications.

The book ends with three very useful chapters. The first considers food structure and ingredients and their relationship to AO activity. The next chapter examines a topic that has proven challenging to many who are doing AO research, the accurate assessment of AO activity using the appropriate method. The authors discuss, for example, methods for assessing AO activity based on free radicals of biological relevance, synthetic free radicals, and radicals derived from lipid oxidation products. They present many of the assessment techniques

developed and published during the past decade or so. The book ends with a chapter on the effects of processing and storage on AO efficacy. Processing, whether it is oil refining or thermal processing to produce a particular food product, generally has some effect on AO activity, and the effect can be substantial with some processes.

The book covers oxidation, particularly with respect to AOs, extremely well. It offers substantial advice on experimental design with regard to AO activity and efficacy examination, as well as examining the effect of various AOs and AO mixtures on product quality during storage. Each chapter is well referenced, with no less than 40 to more than 150 references per chapter. I am sure I will refer to my copy often during the next few years.

William Artz is a faculty member at the University of Illinois, Urbana-Champaign, USA with 25+ years of experience in fats/oils chemistry and analysis. He may be contacted at wartz@illinois.edu.



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Patents

Published Patents

This month's column has the additional feature of a listing of patent "Family members" for the majority of US patents listed here. Patent family members include non-US issued patents as well as US and non-US patent application publications. The first two letters indicate the country code; a list of country codes can be found in many places, including the World Intellectual Property Organization at www.wipo.int/pct/guide/en/gdvol1/annexes/annexk/ax_k.pdf.

Process for converting a hydroxycarboxylic acid or salts thereof to an unsaturated carboxylic acid and/or its esters

Bogan Jr., L., *et al.*, Rohm and Haas Co., US7754916, July 13, 2010

A process for converting a salt of a hydroxycarboxylic acid to an unsaturated carboxylic acid, or esters thereof. The process involves converting an ammonium salt of a hydroxycarboxylic acid in aqueous solution to a corresponding hydroxycarboxylic acid and ammonium cation in aqueous solution; and separating the ammonium cation from the aqueous solution, leaving the hydroxycarboxylic acid in aqueous solution. The converting and separating steps may be accomplished by employing a hydrophobic acid or an acid ion exchange resin each of which must have an acid dissociation constant, i.e., pK_a , at least 0.5 less than that of the salt of the hydroxycarboxylic acid. Where a hydrophobic acid is used, it must be immiscible in water, and its salt must also be immiscible in water, and the resulting multiphase solution comprises an aqueous phase comprising the corresponding hydroxycarboxylic acid, as well as a nonaqueous phase comprising a neutralized acid. Alternatively, where the ion exchange resin is used the aqueous solution of the ammonium salt of a hydroxycarboxylic acid is contacted with the resin, thereby converting the salt to a hydroxycarboxylic acid and capturing the ammonium cations on the resin. In either case, the aqueous solution is treated, such as by heating, to separate and recover the hydroxycarboxylic acid. The nonaqueous phase or resin is treated to separate and recover ammonia useful for preparing additional ammonium salt of a hydroxycarboxylic acid.

Process for improving enzymatic degumming of vegetable oils and reducing fouling of downstream processing equipment

Dayton, C.L.G., *et al.*, Bunge Oils Inc., US7713727, May 11, 2010

A process controls enzymatic degumming characteristics which cause fouling of postreactor equipment of industrial-scale processing of edible oils. An antifouling agent including an organic or mineral acid is added after the reactor and before any postreactor equipment such as heat exchangers and centrifuges. Typically the antifouling agent is added at greater than about 100 ppm of the oil, and typically the pH of the aqueous phase of the oil is between about 3.5 and 4.2.

Fungicide compositions

Coleman, R.D., Summerdale Inc., US7741244, June 22, 2010

This invention relates to agricultural compositions that find particular use as a fungicide composition. The fungicide composition can include one or more fatty acids and one or more organic acids different from the fatty acid. The organic acid can but need not exhibit any fungicidal activity; however, when combined with a fatty acid, the organic acid functions as a potent synergist for the fatty acid as a fungicide. Additionally, the fungicide composition can include other components such as emulsifiers, adjuvants, surfactants, and diluents. The fungicide composition significantly reduces or prevents the fungal infection of cash crops including vegetables, fruits, berries, seeds, grains, and at higher application rates, can also be used as a harvest aid or desiccant for harvested crops such as potatoes.

Patent family members: AU2003202265 AA, US2004266852 AA, US2007249699 AA, US7741244 BB, US7820594 BB, WO03059063 A1

Animal litter, process for preparing animal litter, and method of removal of animal waste

Wang, L., *et al.*, Grain Processing Corp., US7757638, July 20, 2010

Disclosed is an animal litter that includes a palm oil residue, possibly in combination with another absorbent material such as whole ground grain, virgin germ, seed meal, spent germ, or clay. The palm oil residue may be palm kernel cake, palm oil sludge, or palm pressed fiber. Also disclosed are a method for removing animal waste and a process for preparing an animal litter. The method for removal of animal waste includes allowing an animal to excrete waste into a container that includes a litter, the litter comprising a palm oil residue. The process for preparing an animal litter comprises combining the materials that make up the litter to form the litter.

Patent family members: CA2653395 AA, EP2023714 A2, JP2009539382 T2, US2007277739 AA, US7757638 BB, WO07146623 A2, WO07146623 A3

Dry fractionation method for fat

Kuwabara, Y., *et al.*, Fuji Oil Co. Limited, US7767241, August 03, 2010

It is intended to provide a dry fractionation method for fat whereby the performance for fractionating a fat into a high-melting fraction, a medium-melting fraction, and a low-melting fraction can be improved, thereby preventing in particular the medium-melting fraction from worsening of the melting properties in the mouth and a decrease in the melting point with the passage of time and, in its turn, improving the melting properties in the mouth of a chocolate product which is produced by using the thus obtained hard butter for chocolates, etc. A method of fractionating a fat wherein a fraction (in particular, a medium-melting fraction) obtained by dry fractionation is efficiently separated from a high-melting fraction and a low-melting fraction mixed therewith. More specifically, a dry fractionation method which comprises heating a crystal fraction containing a large amount of 1,3-disaturated-2-unsaturated triglycerides to thereby melt the 1,3-disaturated-2-unsaturated triglyceride components followed by solid/liquid separation of trisaturated triglycerides as a crystal fraction, thereby achieving a favorable performance

of fractionating 1,3-disaturated-2-unsaturated triglycerides and saturated triglycerides.

Patent family members: AU2003266689 AA, EP1548094 A1, EP1548094 A4, JP2004123839 A2, JP4534986 B2, US2006165867 AA, US7767241 BB, WO2004029185 A1, WO05028601 A1

Production method of oil or fat containing polyunsaturated fatty acid-containing triglyceride

Akimoto, K., *et al.*, Suntory Holdings Limited, US7767427, August 3, 2010

The present invention relates to a production method of an oil containing triglyceride in which medium-chain fatty acids are bound to the 1- and 3-positions of the triglyceride and polyunsaturated fatty acid is bound to the 2 position by allowing lipase, which specifically acts on ester bonds at the 1- and 3-positions that has been immobilized on a porous ion exchange resin support having a pore size of about 100 Angstroms or more, to act on a mixture of medium-chain fatty acids and raw material oil containing at least one polyunsaturated fatty acid selected from the group consisting of ω -6 series polyunsaturated fatty acid having 18 or more carbon atoms and 3 or more double bonds and ω -9 series polyunsaturated fatty acid having 18 or more carbon atoms and 2 or more double bonds but not containing ω -3 series polyunsaturated fatty acid, oils, and fats or triglycerides obtained by that method, and the use of the oils and fats or triglycerides in a food, beverage or pharmaceutical composition.

Patent family members: AT457357 E, AU2002311326 BB, CA2452401 AA, CN100523206 C, CN101037641 A, CN1522301 A, DE60235303 D1, DK1411129 T3, EP1411129 A1, EP1411129 A4, EP1411129 B1, KR20040030787 A, US2004171127 AA, US2009076149 AA, US7538238 BB, US7767427 BB, WO03004667 A1

Koji mold-origin phospholipase A₂

Kitamoto, K., *et al.*, National Institute of Technology and Evaluation; National Institute of Advanced Industrial Science and Technology; National Research Institute of Brewing, US7763444, July 27, 2010

It is intended to provide koji mold-origin phospholipase A₂ and a DNA encoding it. Namely, phospholipase A₂ comprising the following protein (i) or (ii): (i) a protein having an amino acid sequence represented by SEQ ID NO: 1 or 2; and (ii) a protein having an amino acid sequence derived from an amino acid sequence represented by SEQ ID NO: 1 or 2 by a partial modification and serving as phospholipase A₂.

Patent family members: US2009263888 AA, US7763444 BB, WO04078967 A1

Absorbent articles with compositions for reducing irritation response

Dvoracek, B.J., and D.J. Tyrrell, Kimberly Clark Worldwide, Inc., US7771735, August 10, 2010

The present invention relates to compositions and absorbent articles including compositions for protecting the skin barrier. The compositions can be applied to the bodyfacing surfaces of absorbent articles so that the compositions come into contact with the skin.

The compositions of the invention provide several benefits including prevention and alleviation of skin irritations associated with the use of absorbent articles. The compositions can include hydrophilic and nonaqueous components as well as extracted botanical actives.

Patent family members: AR068067 AA, DE60141346 D1, EP1345632 A2, EP1345632 B1, KR100926397 B1, KR20030068190 A, MXPA02000044 A1, MXPA03005200 A1, US2002120242 AA, US2002136755 AA, US2003206979 AA, US6749860 BB, US7771735 BB, WO02051456 A2, WO02051456 A3

Phytosterol compositions

Wester, I., and J. Ekblom, Raisio Nutrition Ltd., US7771771, August 10, 2010

This invention relates to phytosterols and phytostanols, in particular to fatty acid esters of phytosterols and phytostanols with a specified fatty acid composition. The invention further relates to methods for preparation of the phytosterol and phytostanol esters and their uses.

Patent family members: AT236535 E, AU199939349 A1, AU758747 B2, BRPI9910248 A, CA2332000 AA, CA2332000 C, DE69906719 D1, DE69906719 T2, DE69906719 T3, DK1075191 T3, DK1075191 T4, EP1075191 A1, EP1075191 B1, EP1075191 B2, ES2197640 T3, ES2197640 T5, FI111513 B, FI981011 A, FI981011 A0, JP2002513079 T2, NZS08578 A, PT1075191 T, US2004047969 AA, US2005079258 AA, US6589588 BA, US6800317 BB, US7771771 BB, WO9956558 A1

Fat compositions for use in food

Wester, I., Raisio Nutrition Ltd.; Raisio Benecol Ltd., US7771772, August 10, 2010

Fatty acid esters, such as the unsaturated fatty acid esters of sterols and/or stanols, are used as a replacement for a substantial portion or all of the undesirable saturated and trans-unsaturated fats used as structure-giving hardstocks in edible foods such as margarines, mayonnaise, cooking oils, cheeses, butter, and shortening. Because of the similarity in the crystallinity and physical properties of the esters to those of the undesirable hardstock fats, the substitution or replacement contributes favorably to the flavor, texture, and other sensory properties of the foods. Only the fatty acid portion of the phytosterol esters defined herein as texturizing agent is digested or absorbed, with the sterol part being unabsorbable, thereby resulting in a reduction in total caloric uptake. Furthermore, the phytosterol fatty acid esters reduce the absorption of both dietary and biliary cholesterol from the digestive tract, thereby lowering the blood serum cholesterol level, especially the LDL-cholesterol.

Patent family members: AT341214 E, AU199748699 A1, AU736020 B2, AU736020 C, BRPI9712869 A, BRPI9712869 B1, CA2271676 AA, CA2271676 C, CN1101655 C, CN1239407 A, CZ298783 B6, CZ9901586 A3, DE69736783 D1, DE69736783 T2, EE04699 B1, EE9900172 A, EP1011343 A1, EP1011343 B1, EP1762146 A1, ES2274538 T3, HU0001806 AB, HU0001806 AC, HU1806 U, HU71136 A2, HU9400712 A0, HU9700203 U0, IL129749 A0, IL129749 A1, JP2001503623 T2, JP2008073058 A2, JP4105234 B2, NO314822 B1, NO992086 A, NO992086 A0, NZ335801 A, PL188845 B1, PL333141 A1, RU2202895 C2, SI1011343 T1, SK286008 B6, SK60299 A3, UA69378 C2,

US2003175402 AA, US2004219277 AA, US2007071875 AA, US6162483 A, US6929816 BB, US7771772 BB, WO9819556 A1, ZA9709903 A

Process for enzymatic production of triglycerides

Galante, J.H., *et al.*, Stepan Co., US7759096, July 20, 2010

A process for enzymatic production of glyceride compositions, specifically industrially practicable production of triglycerides, including conjugated linoleic and linolenic acid triglycerides, and the compositions produced by such process. An enzymatic reaction zone is first utilized, in which a mixture of glycerol and fatty acids or fatty acid derivatives is reacted in the presence of an enzymatic catalyst to form 1,3-diglycerides. The mixture is then circulated through a second thermal rearrangement zone, maintained at a higher temperature, to promote rearrangement of the 1,3-diglycerides to 1,2-diglycerides. Triglycerides are produced by recirculating the mixture through the enzymatic production zone.

Patent family members: EP1749099 A2, US2009131701 AA, US7759096 BB, WO05081669 A2, WO05081669 A3

Vegetable oil lubricating composition

Stunkel, B., and G.A. Aguilar, R.T. Vanderbilt Co., Inc., US7772168, August 10, 2010

A lubricating composition includes, in weight percentage, at least 90% of a vegetable oil, and an additive composition including: (i) about 1.5–2% triphenylphosphorothionate (TPPT), (ii) about 0.1–3% hindered phenolic antioxidant, (iii) about 0.05–0.25% 1-[di(phenyl)aminomethyl]tolutriazole, and (iv) about 0.05–0.5% alkyl succinic acid half ester rust inhibitor.

Patent family members: EP2121880 A2, EP2121880 A4, US2008132434 AA, US7772168 BB, WO08067430 A2, WO08067430 A3

Whippable food product with improved stability

Perks, C., *et al.*, Rich Products Corp., US7776376, August 17, 2010

A whippable food product having improved stability characteristics without detectable change in the organoleptic characteristics is provided. The product comprises triglyceride fat, one or more sugars, and an emulsifier component comprising destabilizing and stabilizing emulsifiers in amounts sufficient to stabilize the product. This product can be stored at ambient temperatures for extended periods of time and can also be whipped and displayed at ambient temperatures.

Patent family members: BRPI0410208 A, CA2525765 AA, CN1787746 A, EP1628538 A2, EP1628538 A4, IN04927DN2005 A, IN243994 B, JP2007500516 T2, KR20060028387 A, MXPA05012122 A1, RU2005138856 A, RU2335133 C2, TW200509804 A, US2004265468 AA, US2008131576 AA, US7351440 BB, US7776376 BB, WO04103088 A2, WO04103088 A3, ZA200508834 A

Wax emulsion coating applications

Borsinger, G., and A. Hassan, HRD Corp., US7776928, August 17, 2010

Waxes prepared from hydrogenated plant oils, such as castor, palm, and soybean, are used to prepare water-based emulsions. The inventive waxes, obtained from naturally derived, renewable resources

were emulsified under anionic, cationic, and nonionic conditions, producing emulsions having a solids content up to about 45% solids. The emulsions are stable, and are characterized by having an average particle size less than 1,000 nanometers. When used to coat fibrous cellulosic articles, such as paperboard, the emulsions' performance was similar to emulsions containing petroleum-derived waxes. The inventive waxes have a low iodine value (between 2–5) and melting points between approximately 120–200°F (49–94°C) (Mettler drop point). The inventive waxes are used as an alternative to petroleum-derived, or expensive naturally occurring waxes in the manufacture of emulsions used in coatings, polishes, adhesives, paper products, paperboard, and other manufacturing operations.

Patent family members: CA2519163 AA, DE602004020878 D1, EP1608707 A1, EP1608707 B1, ES2322853 T3, JP2006521448 T2, US2006289138 AA, US2007068642 AA, US7267743 BB, US7776928 BB, WO04083310 A1, WO04083310 B1, WO08061003 A1, WO08061003 B1

Inverse emulsion polymer and method of use thereof

Strominger, M.G., *et al.*, Nalco Co., US7776958, August 17, 2010

The present invention provides an inverse emulsion polymer having a dispersed phase composed of an aqueous solution of an acrylic polymer and a continuous phase composed of an ester of a fatty acid and a water-soluble alcohol. The present invention further includes a method of water treatment which includes adding the inverse emulsion polymer to an industrial water system and hydrolyzing the ester of a fatty acid and a water-soluble alcohol into a fatty acid salt. The inverse emulsion polymer may be used as a flocculant to clarify industrial water systems at elevated temperature and/or elevated pressure and high pH.

Patent family members: AU2005259987 AA, BRPI0512825 A, CN1980960 A, EP1765876 A1, EP1765876 A4, IN03945KN2006 A, KR20070061483 A, RU2007103352 A, RU2384589 C2, US2006004130 AA, US7776958 BB, WO06004745 A1

Lubricant base from palm oil and its by-products

Kian, Y.S., *et al.*, Malaysian Palm Oil Board, US7781384, August 24, 2010

The invention relates to a biodegradable functional fluid composition based on vegetable oil. This functional fluid, which is suitable for lubricant, hydraulic and like fluid, comprises palm olein and its by-product generated from fractionation of palm oil. The by-product is esterified by a hindered alcohol prior to blending together with palm olein and additive packages. The hydraulic fluid is particularly suited for tropical climate with temperature ranging from 15–40°C.

Patent family members: EP1533360 A1, SG112024 A1, US2005112267 AA, US7781384 BB

Lipophilic-coated microparticle containing a protein drug and formulation comprising same

Kim, M.-J., *et al.*, LG Life Sciences, Limited, US7785625, August 31, 2010

A solid lipophilic microparticle having an average particle size ranging from 0.1 to 200 µm, comprising a lipophilic substance,

hyaluronic acid, or an inorganic salt thereof and an active ingredient selected from the group consisting of a protein or peptide drug, retains the full activity of the active ingredient; and when formulated in the form of an oil dispersion or oil-in-water emulsion, it releases in an *in vivo* environment the active ingredient in a controlled manner over a long period.

Patent family members: US2003064105 AA, US2005158392 AA, US7785625 BB

Preparation and administration form comprising an acid-labile active compound

Dietrich, R., and R. Linder, Nycomed GmbH, US7785630; US7790198; US7794752, August 31, 2010; September 7, 2010; September 14, 2010

Three separate patents: Novel administration forms and preparation for acid-labile active compounds are described. The novel administration forms contain individual active compound units, the active compound being present in the active compound units in a matrix made of a mixture comprising at least one fatty alcohol and at least one solid paraffin, in a matrix made of a mixture of a triglyceride and at least one solid paraffin or in a matrix made of a mixture comprising at least one fatty acid ester and at least one solid paraffin. In particular, the active compound units are microspheres which can be produced by prilling.

Patent family members: AT300285 E, AU200050741 A5, AU775995 B2, BG106165 A, BRPI0011347 A, CA2376202 AA, CA2376202 C, CN1361683 A, CZ20014405 A3, DE60021570 D1, DE60021570 T2, DK1187601 T3, EA005803 B1, EE200100660 A, EP1187601 A1, EP1187601 B1, EP1616562 A1, ES2246238 T3, HR20020006 A2, HU0201637 AB, HU0201637 AC, IL146504 A0, IL146504 A1, JP2003501377 T2, MXPA01012659 A1, NO20015980 A, NO20015980 A0, PL352882 A1, PT1187601 T, SI1187601 T1, SK200101802 A5, SK285247 B6, TR200103527 T2, US2006127477 AA, US2008069882 AA, US7785630 BB, US7790198 BB, US7794752 BA, WO0074654 A1, ZA200110000 A

Robust multi-enzyme preparation for the synthesis of fatty acid alkyl esters

Basheer, S., *et al.*, Transbiodiesel Ltd., US7790429, September 7, 2010

A process for the preparation of short-chain alkyl esters of fatty acids, preferably fatty acid methyl esters (biodiesel) in solvent-free system is disclosed. In particular, the process comprises (i) providing a fatty acid source, (ii) stepwise adding a short-chain free alcohol, preferably methanol, or any other alcohol donor, to said fatty acid source in the presence of a lipase preparation, and (iii) allowing the reaction to proceed under suitable conditions, until said fatty acid source triglycerides are converted to fatty acid methyl esters (FAME). The lipase preparation comprises at least two lipases. The two lipases being separately or jointly immobilized on a suitable support and wherein at least one of the lipases has increased affinity for partial glycerides and at least one of the lipases is *sn*-1,3 positional specific.

Patent family members: AU2008331092 AA, CA2706972 AA, EP2225385 A2, IN01124MN2010 A, KR20100098421 A, MX2010005841 A1, US2009133322 AA, US2010330629 AA, US7790429 BB, WO09069116 A2, WO09069116 A3

Process for obtaining an oil composition and the oil composition obtained therefrom

Siew, W.L., *et al.*, Malaysian Palm Oil Board, US7785645, August 31, 2010

The present invention relates to a process of producing an oil composition by blending and fractionation steps and the oil composition obtained therefrom. The invention is directed to any vegetable oils such as palm oil, palm olein, or palm stearin blends with unsaturated oils of soybean, corn, canola, rapeseed, sunflower oil, where the oleic content is more than 20% and the linoleic and linolenic contents are more than 30%. The new liquid oil is clear and is used as salad oils, cooking oils, etc. The stearins from such blends are of use in margarine and shortenings.

Patent family members: CN100475048 C, CN1547929 A, HK1069076 A1, JP2004329204 A2, JP4447894 B2, US2004224071 AA, US7785645 BB

Modified vegetable oil-based polyols

Petrovic, Z.S., *et al.*, Pittsburg State University, US7786239, August 31, 2010

Methods of making unsaturated modified vegetable oil-based polyols are described. Also described are methods of making oligomeric modified vegetable oil-based polyols. An oligomeric composition having a modified fatty acid triglyceride structure is also described. Also, methods of making a polyol including hydroformylation and hydrogenation of oils in the presence of a catalyst and support are described.

Patent family members: AR054970 AA, AU2005267131 AA, BRPI0512511 A, CA2571214 AA, CN101014583 A, EP1797057 A1, IN04769CN2006 A, JP2008504287 T2, MX2007000022 A1, US2006041157 AA, US2010311992 AA, US7786239 BB, WO06012344 A1, ZA200610662 A

Edible compositions for lowering cholesterol

Wester, I., *et al.*, Raisio Nutrition Ltd., US7794745, September 14, 2010

The present invention is related to improved compositions for reducing serum total and/or LDL cholesterol levels. The compositions are combinations of dietary fiber and plant sterol. The compositions are used as such or more advantageously in food products and comprise one or several fibers, preferably β '-glucan, in combination with one or several plant sterols and/or stanols in their free and/or esterified forms.

Patent family members: AU2002246174 BB, CA2442118 AA, EP1377181 A1, FI20010780 A0, JP2004519254 T2, JP2010183924 A2, JP4562352 B2, US2004131657 AA, US2010298261 AA, US7794745 BB, WO02082929 A1, ZA200308718 A ■

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.



Extracts & Distillates

Lipidomics era: Accomplishments and challenges

Khalil, M.B., *et al.*, *Mass Spectrom. Rev.* 29:877–929, 2010.

Lipid mediators participate in signal transduction pathways, proliferation, apoptosis, and membrane trafficking in the cell. Lipids are highly complex and diverse owing to the various combinations of polar head groups, fatty acyl chains, and backbone structures. This structural diversity continues to pose a challenge for lipid analysis. Here we review the current state of the art in lipidomics research and discuss the challenges facing this field. The latest technological developments in mass spectrometry, the role of bioinformatics, and the applications of lipidomics in lipid metabolism, cellular physiology, and pathology are also discussed.

Tocotrienols, the vitamin E of the 21st century: Its potential against cancer and other chronic diseases

Aggarwal, B.B., *et al.*, *Biochem. Pharmacol.* 80:1613–1631, 2010.

Initially discovered in 1938 as a “fertility factor,” vitamin E now refers to eight different isoforms that belong to two categories: four saturated analogs (α , β , γ , and δ) called tocopherols and four unsaturated analogs referred to as tocotrienols. While the tocopherols have been investigated extensively, little is known about the tocotrienols. Very limited studies suggest that both the molecular and therapeutic targets of the tocotrienols are distinct from those of the tocopherols. For instance, suppression of inflammatory transcription factor NF- κ B [nuclear factor-kappaB], which is closely linked to tumorigenesis and inhibition of HMG-CoA reductase, mammalian DNA polymerases, and certain protein tyrosine kinases, is unique to the tocotrienols. This review examines in detail the molecular targets of the tocotrienols and their roles in cancer, bone resorption, diabetes, and cardiovascular and neurological diseases at both pre-clinical and clinical levels. As disappointment

with the therapeutic value of the tocopherols grows, the potential of these novel vitamin E analogs awaits further investigation.

Identification and quantification of phosphatidylcholines containing very-long-chain polyunsaturated fatty acid in bovine and human retina using liquid chromatography/tandem mass spectrometry

Berdeaux, O., *et al.*, *J. Chromatogr. A* 1217:7738–7748, 2010.

The retina is one of the vertebrate tissues with the highest content in polyunsaturated fatty acids (PUFA). A large proportion of retinal phospholipids, especially those found in photoreceptor membranes, are dipolyunsaturated molecular species. Among them, dipolyunsaturated phosphatidylcholine (PC) molecular species are known to contain very long chain polyunsaturated fatty acids (VLC-PUFA) from the n-3 and n-6 series having 24–36 carbon atoms (C_{24} – C_{36}) and four to six double bonds. Recent interest in the role played by VLC-PUFA arose from the findings that a protein called elongation of very-long-chain fatty acids 4 (ELOVL4) is involved in their biosynthesis and that mutations in the ELOVL4 gene are associated with Stargardt-like macular dystrophy (STD3), a dominantly inherited juvenile macular degeneration leading to vision loss. The aim of the present study was to develop an HPLC-ESI-MS/MS [high-performance liquid chromatography–electrospray ionization–tandem mass spectrometry] method for the structural characterization and the quantification of dipolyunsaturated PC molecular species containing VLC-PUFA and validate this methodology on retinas from bovines and human donors. Successful separation of phosphatidylethanolamine, phosphatidylinositol, phosphatidylserine, PC, lyso-phosphatidylcholine, and sphingomyelin was achieved using a silica gel column and a gradient of hexane/isopropanol/water containing ammonium formate as a mobile phase. A complete structural characterization of intact PC species was obtained by collision-induced dissociation (CID) in the negative mode. Fatty acid composition and distribution can be clearly assigned based on the intensity of *sn*-2/*sn*-1 fragment ions. The PC species were characterized on bovine retina, 28 of which were dipolyunsaturated PC species containing one VLC-PUFA (C_{24} – C_{36}) with three to six

double bonds. VLC-PUFA was always in the *sn*-1 position while PUFA at the *sn*-2 position was exclusively docosahexaenoic acid (DHA, C22:6n-3). Most of these VLC-PUFA-containing dipolyunsaturated PCs were detected and quantified in human retinas. The quantitative analysis of the different PC molecular species was performed in the positive mode using precursor ion scanning of *m/z* 184 and 14:0/14:0-PC and 24:0/24:0-PC as internal standards. The relationship between the mass spectrometric peak intensities of different PC species and their carbon chain length was included for calibration. The main compounds represented were those having VLC-PUFA with 32 carbon atoms (C32:3, C32:4, C32:5, and C32:6) and 34 carbon atoms (C34:3, C34:4, C34:5, and C34:6). Dipolyunsaturated PCs with 36:5 and 36:6 were detected but in smaller quantities. In conclusion, this new HPLC-ESI-MS/MS method is sensitive and specific enough to structurally characterize and quantify all molecular PC species including those esterified with VLC-PUFA. This technique is valuable for a precise characterization of PC molecular species containing VLC-PUFA in retina and may be useful for a better understanding of the pathogenesis of STD3.

Optimization of standard gas chromatographic methodology for the determination of trans fat in unlabeled bakery products

Phillips, K.M., *et al.*, *Food Anal. Methods* 3:277–294, 2010.

Analytical parameters and quality control measures were optimized for standard direct gas chromatographic (GC) analysis of *trans* fat in unlabeled bakery products, and differences in concentrations measured in samples assayed with and without the modifications were evaluated. Total lipid was extracted with chloroform/methanol from homogenized cakes, cookies, doughnuts, pastries, muffins, and commercially available reference materials (NIST SRM 2387 Peanut Butter, LGC7103 Sweet Digestive Biscuit). Total lipid was saponified, and fatty acids were derivatized to methyl esters (FAME) and analyzed by GC using a 100% nonbonded bis-cyanopropyl polysiloxane column (100 m \times 0.25 mm, 0.2 μ m film). Total FAME entering GC were optimized to separate C18:1-12*t* and C18:1-13*t* isomers that occur at a significant level but often remain unresolved from the C18:1-9*c*

peak in products containing partially hydrogenated vegetable oils. Silver-ion solid-phase extraction was used to validate identification of the major C18:1 *cis/trans* peaks. For samples assayed by the standard method and with specific sample-to-sample quality control and GC optimization, the former underestimated *trans* fat by 2 to 5 g/100 g (0.2–0.6 g/serving) in some products. Differences were less for foods containing <1 g/100 g, but nonetheless could have implications for labeling because *trans* fat levels <0.5 g/serving may be declared zero according to US Food and Drug Administration regulations. The practical modifications and controls described can be implemented in routine standard GC analysis to increase the consistency and validity of *trans* fat measurement across a range of samples with unknown fat content and fatty acid composition.

Development and validation of a sensitive and selective UHPLC-MS/MS method for simultaneous determination of both free and total eicosapentaenoic acid and docosahexenoic acid in human plasma

Bowen, C.L., *et al.*, *J. Chromatogr. B* 878:3125–3133, 2010.

A sensitive, selective, and quantitative method for the simultaneous determination of free and total eicosapentaenoic acid (EPA) and docosahexenoic acid (DHA) has been developed and validated in human plasma using fatty acid-free human serum albumin as a surrogate matrix. Cleanup for free EPA and DHA employs a liquid-liquid extraction with hexane to remove plasma interferences and provide for cleaner chromatography. The method for total EPA and DHA requires a digestion of the triglycerides followed by liquid-liquid extraction with hexane. Ultra high-performance liquid chromatography (UHPLC) technology on a BEH C18 stationary phase column with 1.7 μm particle size was used for chromatographic separation, coupled to tandem mass spectrometry (UHPLC-MS/MS). The method for free EPA and DHA was validated over the concentration range of 0.05–25 $\mu\text{g/mL}$, while total EPA and DHA concentration range was 0.5–250 $\mu\text{g/mL}$. The results from assay validation show that the method is rugged, precise, accurate, and well suited to support pharmacokinetic studies. To our knowledge,

this work represents the first UHPLC-MS/MS-based method that combines both free and total EPA and DHA with a relatively small sample volume (25 μL aliquot) and a run time of 1.5 min, facilitating automation and high throughput analysis.

Oxysterols: A world to explore

Otaegui-Arrazola, A., *et al.*, *Food Chem. Toxicol.* 48:3289–3303, 2010.

Oxysterols (oxidized derivatives of cholesterol and phytosterols) can be generated in the human organism through different oxidation processes, some requiring enzymes. Furthermore, oxysterols are also present in food due to lipid oxidation reactions caused by heating treatments, contact with oxygen, exposure to sunlight, etc.; and they could be absorbed from the diet, at different rates depending on their side chain length. In the organism, oxysterols can follow different routes: secreted into the intestinal lumen, esterified and distributed by lipoproteins to different tissues, or degraded, mainly in the liver. Cholesterol oxidation products (COP) have shown cytotoxicity, apoptotic and pro-inflammatory effects, and they have also been linked with chronic diseases including atherosclerotic and neurodegenerative processes. In the case of phytosterol oxidation products (POP), more research is needed on toxic effects. Nevertheless, current knowledge suggests they may also cause cytotoxic and pro-apoptotic effects, although at higher concentrations than COP. Recently, new beneficial biological activities of oxysterols are being investigated. Whereas COP are associated with cholesterol homeostasis mediated by different mechanisms, the implication of POP is not clear yet. Available literature on sources of oxysterols in the organism, metabolism, toxicity, and potential beneficial effects of these compounds are reviewed in this paper.

Lipolysis—A highly regulated multi-enzyme complex mediates the catabolism of cellular fat stores

Lass, A., *et al.*, *Prog. Lipid Res.* 50:14–27, 2011.

Lipolysis is the biochemical pathway responsible for the catabolism of triacylglycerol (TAG) stored in cellular lipid droplets. The hydrolytic cleavage of TAG generates non-esterified fatty acids, which are subsequently used as energy substrates, essential

precursors for lipid and membrane synthesis, or mediators in cell signaling processes. Consistent with its central importance in lipid and energy homeostasis, lipolysis occurs in essentially all tissues and cell types; it is most abundant, however, in white and brown adipose tissue. Over the last five years, important enzymes and regulatory protein factors involved in lipolysis have been identified. These include an essential TAG hydrolase named adipose triglyceride lipase (ATGL) [annotated as patatin-like phospholipase domain-containing protein A2], the ATGL activator comparative gene identification-58 [annotated as α/β hydrolase containing protein 5], and the ATGL inhibitor G0/G1 switch gene 2. Together with the established hormone-sensitive lipase [annotated as lipase E] and monoglyceride lipase, these proteins constitute the basic “lipolytic machinery.” Additionally, a large number of hormonal signaling pathways and lipid droplet-associated protein factors regulate substrate access and the activity of the “lipolysome.” This review summarizes the current knowledge concerning the enzymes and regulatory processes governing lipolysis of fat stores in adipose and nonadipose tissues. Special emphasis will be given to ATGL, its regulation, and physiological function.

Lecithin:cholesterol acyltransferase—from biochemistry to role in cardiovascular disease

Rousset, X., *et al.*, *Curr. Opin. Endocrinol. Diabetes Obesit* 16:163–171, 2009.

We discuss the latest findings on the biochemistry of lecithin:cholesterol acyltransferase (LCAT), the effect of LCAT on atherosclerosis, clinical features of LCAT deficiency, and the impact of LCAT on cardiovascular disease from human studies. Although there has been much recent progress in the biochemistry of LCAT and its effect on high-density lipoprotein metabolism, its role in the pathogenesis of atherosclerosis is still not fully understood. Studies from various animal models have revealed a complex interaction between LCAT and atherosclerosis that may be modified by diet and by other proteins that modify lipoproteins. Furthermore, the ability of LCAT to lower apoB [apoprotein B] appears to be the best way to predict its effect on atherosclerosis in animal models. Recent studies on patients with LCAT deficiency have shown a modest

but significant increase in incidence of cardiovascular disease consistent with a beneficial effect of LCAT on atherosclerosis. The role of LCAT in the general population, however, has not revealed a consistent association with cardiovascular disease. Recent research findings from animal and human studies have revealed a potential beneficial role of LCAT in reducing atherosclerosis, but additional studies are necessary to better establish the linkage between LCAT and cardiovascular disease.

The effects of phytosterols present in natural food matrices on cholesterol metabolism and LDL-cholesterol: A controlled feeding trial

Lin, X., et al., *Eur. J. Clin. Nutr.* 64:1481–1487, 2010.

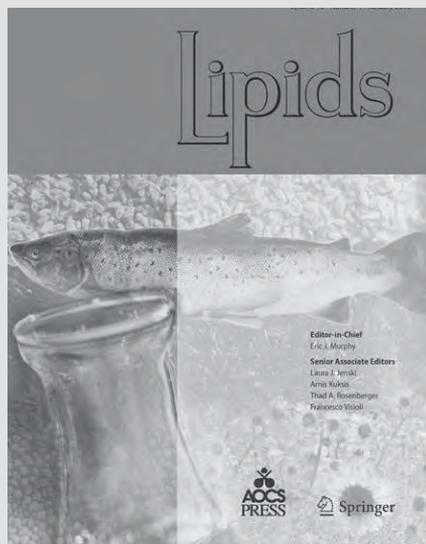
Extrinsic phytosterols supplemented to the diet reduce intestinal cholesterol absorption and plasma low-density lipoprotein (LDL)-cholesterol. However, little is known about their effects on cholesterol metabolism when given in native, unpurified form and in amounts achievable in the diet. The objective of this investigation was to test the hypothesis that intrinsic phytosterols present in unmodified foods alter whole-body cholesterol metabolism. In all, 20 out of 24 subjects completed a randomized, crossover feeding trial wherein all meals were provided by a metabolic kitchen. Each subject consumed two diets for four weeks each. The diets differed in phytosterol content (phytosterol-poor diet, 126 mg phytosterols/2,000 kcal; phytosterol-abundant diet, 449 mg phytosterols/2,000 kcal), but were otherwise matched for nutrient content. Cholesterol absorption and excretion were determined by gas chromatography/mass spectrometry after oral administration of stable isotopic tracers. The phytosterol-abundant diet resulted in lower cholesterol absorption [$54.2 \pm 2.2\%$ (95% confidence interval 50.5%, 57.9%) vs. $73.2 \pm 1.3\%$ (69.5%, 76.9%), $P < 0.0001$] and 79% higher fecal cholesterol excretion [$1,322 \pm 112$ (1,083.2, 1483.3) vs. 739 ± 97 mg/day (530.1, 930.2), $P < 0.0001$] relative to the phytosterol-poor diet. Plasma lathosterol/cholesterol ratio rose by 82% [from 0.71 ± 0.11 (0.41, 0.96) to 1.29 ± 0.14 $\mu\text{g}/\text{mg}$ (0.98, 1.53), $P < 0.0001$]. LDL-cholesterol was similar between diets. Intrinsic phytosterols at levels present in a healthy diet are

AOCS Journals



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- Synthesis and properties of ascorbyl esters catalyzed by lipozyme TL IM using triglycerides as acyl donors, Reyes-Duarte, D., N. Lopez-Cortes, P. Torres, F. Comelles, J.L. Parra, S. Peña, A.V. Ugidos, A. Ballesteros, and F.J. Plou
 - The influence of secondary emulsifiers on lipid oxidation within sodium caseinate-stabilized oil-in-water emulsions, Richards, A., M. Golding, C. Wijesundera, and L. Lundin
 - Analysis of lard's aroma by an electronic nose for rapid *halal* authentication, Nurjuliana, M., Y.B. Che Man, and D. Mat Hashim
 - Effects of seed roasting on tocopherols, carotenoids, and oxidation in mustard seed oil during heating, Vaidya, B., and E. Choe
 - Simplifying the process of microalgal biodiesel production through *in situ* transesterification technology, Xu, R., and Y. Mi
 - Organic-inorganic coatings based on epoxidised castor oil/APTES/TEOS, Becchi, D.M., M.A. de Luca, M. Martinnelli, and S. Mitidieri
 - Investigation on sliding wear behaviour and mechanical properties of jatropha oil cake-filled glass-epoxy composites, Mohan, N., S. Natarajan, S.P. Kumaresh-Babu, and Siddaramaiah
 - Glycerol behenate and its suitability for production of aceclofenac solid lipid nanoparticles, Chawla, V., and S.A. Saraf
 - Changes of total tocopherol and tocopherol species during sunflower oil processing, Naz, S., S.T.H. Sherazi, and F.N. Talpur
 - Production of low-*trans* fatty acids edible oil by electrochemical hydrogenation in a diaphragm reactor under controlled conditions, Fu, H., F. Xiao, S. Wang, L. Yang, and Y.M. Lo
 - Synthesis of phytosteryl esters by using alumina-supported zinc oxide (ZnO/Al₂O₃) from esterification production of phytosterol with fatty acid, Meng, X., Q. Pan, and T. Yang
 - Enhancement of oil extraction from sumac fruit using steam-explosion pretreatment, Chen, G., and H. Chen
 - Positional distribution of fatty acids in perilla (*Perilla frutescens* L.) oil, Yoon, S.H., and S. Noh
- Direct determination of MCPD fatty acid esters and glycidyl fatty acid esters in vegetable oils by LC-TOFMS, Haines, T.D., K.J. Adlaf, R.M. Pierceall, I. Lee, P. Venkatasubramanian, and M.W. Collison
 - Generalized method to quantify glycidol fatty acid esters in edible oils, Masukawa, Y., H. Shiro, N. Kondo, and N. Kudo
 - Compositional and antioxidant activity analysis of *Zanthoxylum bungeanum* seed oil obtained by supercritical CO₂ fluid extraction, Xia, L., J. You, G. Li, Z. Sun, and Y. Suo
 - Ultrasonic attenuation measurements of the mixing, agglomeration, and sedimentation of sucrose crystals suspended in oil, Yucel, U., and J.N. Coupland
 - Regulatory infrared spectroscopic method for the rapid determination of total isolated *trans* fat: A collaborative study, Mossoba, M.M., A. Seiler, H. Steinhart, J.K.G. Kramer, L. Rodrigues-Saona, A.P. Griffith, R. Pierceall, F.R. van de Voort, J. Sedman, A.A. Ismail, D. Barr, P.A. Da Costa Filho, H. Li, Y. Zhang, X. Liu, and M. Bradley
 - Comparison of biopolymer emulsifier performance in formation and stabilization of orange oil-in-water emulsions, Qian, C., E.A. Decker, H. Xiao, and D.J. McClements



Lipids (January)

- Springer in the International Year of Chemistry 2011
- Oxidative stability of marine phospholipids in the liposomal form and their applications, Henna Lu, F.S., N.S. Nielsen, M. Timm-Heinrich, and C. Jacobsen
- Elucidation of phosphatidylcholine composition in krill oil extracted from *Euphausia superba*, Winther, B., N. Hoem, K. Berge, and L. Reubsæet
- Metabolic effects of krill oil are essentially similar to those of fish oil but at lower dose of EPA and DHA, in healthy volunteers, Ulven, S.M., B. Kirkhus, A. Lamglait, S. Basu, E. Elind, T. Haider, K. Berge, H. Vik, and J.I. Pedersen
- A high omega-3 fatty acid diet has different effects on early and late stage myeloid progenitors, Varney, M.E., J.T. Buchanan, Y. Dementieva, W.E. Hardman, and V.E. Sollars
- Omega-3 index correlates with healthier food consumption in adolescents and with reduced cardiovascular disease risk factors in adolescent boys, O'Sullivan, T.A., G.L. Ambrosini, T.A. Mori, L.J. Beilin, and W.H. Oddy
- Biosynthesis of 14,15-hepoxilins in human L1236 Hodgkin lymphoma cells and eosinophils, Brunnström, Å., M. Hamberg, W.J. Griffiths, B. Mannervik, and H.-E. Claesson
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gemmacea, Wang, C.-Y., J. Zhao, H.-Y. Liu, C.-L. Shao, Q.-A. Liu, Y. Liu, and Y.-C. Gu

- Modeling the primary oxidation in commercial fish oil preparations, Sullivan, J.C., S.M. Budge, and M. St-Onge
- Rapid quantitative analysis of lipids using a colorimetric method in a microplate format, Cheng, Y.-S., Y. Zheng, and J.S. VanderGheynst



Journal of Surfactants and Detergents (Issue 1)

- Springer in the International Year of Chemistry 2011
- Effect of surfactants as dispersing agents on the properties of microemulsified inkjet inks for polyester fibers, Kosolia, C.T., E.M. Varka, and E.G. Tsatsaroni
- Determination of sodium fatty acid in soap formulation using Fourier transform infrared (FTIR) spectroscopy and multivariate calibrations, Rohman, A., and Y.B. Che Man
- Esterification of stearic acid with triethanolamine over zirconium sulfate supported on SBA-15 mesoporous molecular sieve, Geng, T., Q. Li, Y. Jiang, and W. Wang
- Synthesis and study of the surface properties of alkylnaphthalene and alkylphenanthrene sulfonates, Abdel-Raouf, M.E., N.E. Maysour, A.M. Abdul-Raheim, S.M. El-Saeed, and R.K. Farag
- Synthesis, characterization and surface properties of series sulfobetaine surfactants, Qu, G., J. Cheng, J. Wei, T. Yu, W. Ding, and H. Luan
- Synthesis and characterization of a novel series of cationic fumaric polymerizable emulsifiers, Qiao, W., C. Cao, Y. Sun, H. Liu, X. Zhao, and X. Fu
- Synthesis and characterization of sodium nonylphenol ethoxylate(10) sulfoitaconate esters, Ding, J., B. Song, C. Wang, J. Xu, and Y. Wu
- Synthesis and surface-active properties of uronic amide derivatives, surfactants from renewable organic raw materials, Laurent, P., H. Razafindralambo, B. Wathelet, C. Blecker, J.-P. Wathelet, and M. Paquot
- Synthesis and some surface properties of glycine-based surfactants, Mousli, R., and A. Tazerouti
- A new cationic gemini surfmer: Synthesis and surface activities, Su, X., B. Wang, Z. Lu, L. Wei, and Y. Feng
- Mixtures of nonionic surfactants made from renewable resources with alkyl sulfates: Comparison of headgroups, Werts, K.M., and B.P. Grady
- Synthesis and properties of dissymmetric gemini surfactants, Xu, Q., L. Wang, and F. Xing
- Counterion effect of cationic surfactants upon the interaction with poly(methacrylic acid), Anghel, D.F., S. Saito, A. Iovescu, A. Băran, and G. Stîngă
- Microemulsion systems with rhodium tris(3-sulfophenyl)phosphine trisodium salt complex for product isolation and catalyst recycling in the hydrogenation of dimethyl itaconate, Milano-Brusco, J.S., J. Touitou, V. Stempel, and R. Schomäcker
- Surface properties and thermodynamic parameters of some sugar-based ethoxylated amine surfactants: 1—synthesis, characterization, and demulsification efficiency, Abdel-Raouf, M.E.-S., A.-R.M. Abdul-Raheim, and A.-A.A. Abdel-Azim
- Synthesis and evaluation of a new cationic surfactant for oil-well drilling fluid, Mahmoud, S.A., and M.M. Dardir
- Emulsification of chemically modified vegetable oils for lubricant use, Doll, K.M., and B.K. Sharma
- Determination of alcohol ethoxylates derivatized with naphthoyl chloride, in waste water treatment plant influent, effluent and sludge samples by liquid chromatography mass spectrometry, Cassani, G., F. Tibaldi, G. Donato, and N. Andriollo

biologically active and have large effects on whole-body cholesterol metabolism not reflected in circulating LDL. More work is needed to assess the effects of phytosterol-mediated fecal cholesterol excretion on coronary heart disease risk in humans.

Cuphea growth, yield, and oil characteristics as influenced by climate and soil environments across the upper Midwest USA

Kim, K.-I., *et al.*, *Ind. Crops Prod.* 33:99–107, 2011.

Cuphea is a potential new oilseed crop rich in medium-chain fatty acids (C8:0 to C14:0) that may serve as a renewable, biodegradable source of oil for lubricants, motor oil, and aircraft fuel. Impacts of climate and soil environment on cuphea growth and development are not well understood. The objective of this study was to evaluate the influence of climate and soil on growth, seed yield, and seed oil characteristics of two semi-domesticated cuphea genotypes [PSR23 and HC-10 (*Cuphea viscosissima* Jacq. × *C. lanceolata* W.T. Aiton)] and three wild species [*C. wrightii*, *C. lutea*, and *C. viscosissima* (VS-6-CPR-1)] that show potential for domestication. The study was conducted in 2007 and 2008 at US field sites in North Dakota (ND), Minnesota (MN), Iowa (IA), and Illinois (IL). Cuphea PSR23 and HC-10 were direct-seeded in the field, while the three wild species were transplanted. The two plantings were treated as separate experiments. Plant growth, seed yield, and oil content for the two direct-seeded lines tended to be distinctly greater in MN and ND than IL and IA. These observations were related more to growth temperature than soil environment. The three wild species generally performed similarly across the four different environments. *Cuphea wrightii* had the greatest content of oil, ranging from 320 to 360 g kg⁻¹, which comprised 59–64% lauric acid. For each genotype, the content of its most prominent saturated medium-chain fatty acid (e.g., C10:0 or C12:0) increased with decreasing latitude of field site. Seed yields for *C. wrightii* and *C. lutea* were as high as 1,116 kg ha⁻¹. Combined with relatively high seed oil contents (280–350 g kg⁻¹), these species may be good candidates for domestication. Results indicate that PSR23 and HC-10 are more regionally adapted than the wild species studied, which tended to exhibit a greater range of adaptability to climate and soil conditions.

Adaptability of irrigated spring canola oil production to the US High Plains

Pavlista, A.D., *Ind. Crops Prod.* 33:165–169, 2011.

Canola oil is high in oleic acid, which is commonly used for food and industrial purposes. To determine adaptability of spring canola (*Brassica napus* L.) to the High Plains for industrial oil production, 26 irrigated trials were conducted from 2005 to 2008. Trials were divided into five regions—1: 36–37°N, 108°W; 2: 39–40°N, 101–103°W; 3: 41–42°N, 102–103°W; 4: 41–42°N, 104°W; 5: 43–44°N, 106–108°W. Cultural practices were based on site-specific protocols. Four cultivars, Hyola 401, Hyola 357 Magnum, SW Marksman, and SW Patriot, were planted in replicated plots in April or May under standard irrigation and harvested in July to October depending on region. Seed yields of Hyola 401 and Hyola 357 Magnum were higher than of SW Marksman and SW Patriot across the five regions and within Regions 1, 2, 3, and 5. Regions 1, 2, and 3 had significantly greater yields than did Regions 4 and 5. Samples from 18 trials were examined for their oil content and fatty acid distribution. The four cultivars had greater than 38% oil content; SW Marksman and SW Patriot had higher oil content than Hyola 401 and Hyola 357 Magnum. Higher oil content was achieved in Regions 1, 4, and 5. Across and within regions, the percentage of oleic acid did not differ for the four cultivars. The mean content of oleic acid decreased going north from Region 2 to Region 5, as did seed yield in the High Plains. Linoleic acid increased going north from Region 1. Linolenic acids showed little variation across regions. In considering yield and total oil content together, growing spring canola would be excellent in the High Plains.

Effects of refining and removal of persistent organic pollutants by short-path distillation on nutritional quality and oxidative stability of fish oil

Oterhals, Å., and M.H.G. Berntssen *J. Agric. Food Chem.* 58:12250–12259, 2010.

Food and feed legislations are implemented to control the level of unwanted persistent organic pollutants (POP) below health risk concerns. Short-path distillation

is established as the most effective industrial process to remove POP in fish oil. However, the technology involves heating of the oil to high temperature levels (>200°C) that possibly give unwanted heat-induced side reactions and co-evaporation of minor compounds of importance for the nutritional quality of the oil. The effects on retention of vitamins, cholesterol, and unsaponifiable compounds, geometrical isomerization, loss of polyunsaturated fatty acids (PUFA), oxidation level, and oxidative stability have been studied on the basis of experiments designed to optimize and model the effect of process conditions (i.e., evaporator temperature, feed rate, and addition of working fluid) on the reduction of POP. Loss of volatile nutrients was observed, but the extent will depend on the process conditions needed to obtain target decontamination level, as well as the concentration ratio and difference in vapor pressure between free and esterified forms of the studied compounds. Some reduction in oxidation level was documented with preservation of PUFA level and quality. Oxidative stability was influenced both positively and negatively depending on the applied process conditions. Generally, no adverse negative effects on the nutritional quality of the fish oil could be documented. Optimal process conditions were modeled that ensure removal of POP to within legislated levels while retaining most of the vitamin levels in fish oil. A 76% reduction of the WHO-PCDD/F-PCB-TEQ [World Health Organization] level in the used feedstock was needed to be in accordance with the voluntary industrial monograph of GOED [Global Organization for EPA and DHA]. This could be achieved on the basis of operation conditions giving <20% loss of vitamins. A 90% decontamination rate gave vitamin retentions in the 60–90% range.

Fatty acids, epicatechin-dimethylgallate, and rutin interact with buckwheat starch inhibiting its digestion by amylase: Implications for the decrease in glycemic index by buckwheat flour

Takahama, U., and S. Hirota, *J. Agric. Food Chem.* 58:12431–12439, 2010.

Glycemic indexes of bread made from mixtures of wheat flour and buckwheat flour are lower than those made from wheat flour. As a means to discuss the mechanism of the

buckwheat flour-dependent decrease in glycemic indexes, we studied the formation of a starch-iodine complex and amylase-catalyzed digestion of starch using buckwheat flour itself and buckwheat flour from which fatty acids, rutin, and proanthocyanidins including flavan-3-ols had been extracted. Absorbance due to the formation of a starch-iodine complex was larger in extracted than control flour, and starch in extracted flour was more susceptible to pancreatin-induced digestion than starch in control flour. Fatty acids, which were found in the buckwheat flour extract, bound to amylose in the extracted flour, inhibiting its digestion by pancreatin. Rutin and epicatechin-dimethylgallate, which were also found in the extract, bound to both amylose and amylopectin in the extracted flour, inhibiting their digestion induced by pancreatin. We discussed from these results that the lower glycemic indexes of bread made from mixtures of wheat flour and buckwheat flour were due to binding of fatty acids, rutin, and epicatechin-dimethylgallate, which were contained in buckwheat flour, to wheat flour starch.

Effects of the planting density on virgin olive oil quality of "Chemlali" olive trees (*Olea europaea* L.)

Guerfel, M., et al., *J. Agric. Food Chem.* 58:12469–12472, 2010.

Here, we report the characterization of virgin olive oil samples obtained from fruits of the main Tunisian olive cultivar (Chemlali) grown in four planting densities (156, 100, 69, and 51 trees ha⁻¹). Olive oil samples obtained from fruits of trees grown at 100 trees ha⁻¹ had a higher content of oleic acid (65.5%), a higher content of chlorophyll and carotenoids, and a higher content in total phenols (1,059.08 mg/kg). Interestingly, olives grown at the two highest planting densities yielded more stable oils than olives grown at the two lowest ones. Thus, planting density is found to be a key factor for the quality of olive oils in arid regions.

Evaluation of the antioxidant activity of vegetable oils based on luminol chemiluminescence in a microemulsion

Pulgarín, J.A.M., et al., *Eur. J. Lipid Sci. Technol.* 112:1294–1301, 2010.

A flow injection analysis (FIA) methodology has been developed for the estimation of the radical-scavenging activity (RSA) of edible oils as a measure of their antioxidant activity. The RSA determination was based on the inhibition of the luminol chemiluminescence (CL) induced by Fenton's reagent in a microemulsion (*n*-hexane in water). At the optimum operational conditions, the RSA of gallic acid and butylhydroxyanisole, usually employed as antioxidant in vegetable oils, as well as corn, sunflower, olive, soybean and sesame oils, was measured in terms of the IC₅₀ (the concentration required to reduce by 50% the CL emission measured in the absence of antioxidants in the organic phase). For this purpose, the percentage of the CL inhibition (%Inh) was plotted against the sample concentration. Virgin oils of sesame and olive showed the greatest RSA, which was associated with their elevated concentration of natural antioxidants, such as phenols, tocopherols, and lignans. The refined soybean oil also has an important antioxidant activity due to the addition of synthetic antioxidants after the refining process, while the lower RSA activities were found in the refined corn and sunflower oils. The results of the proposed

method showed good agreement with those obtained by the DPPH [diphenylpicrylhydrazyl radical] test, which suggests that it could be used as a complementary method for the evaluation of hydrophobic substances with antioxidant properties.

Research in olive oil: Challenges for the near future

García-González, D.L., and R. Aparicio, *J. Agric. Food Chem.* 58:12569–12577, 2010.

Olive oil, a traditional food product with thousands of years of history, is continually evolving toward a more competitive global market. Being one of the most studied foods across different disciplines, olive oil still needs intensive research activity to face some vulnerabilities and challenges. This perspective describes some of them and shows a vision of research on olive oil for the near future, bringing together those aspects that are more relevant for better understanding and protection of this edible oil. To accomplish the most urgent challenges, some possible strategies are outlined, taking advantage of the latest analytical advances, considering six areas: (i) olive growing; (ii) processing, by-product, and environmental issues; (iii) virgin olive oil sensory quality; (iv) purity, authentication, and traceability; (v) health and nutrition; and (vi) consumers. The coming research, besides achieving those challenges, would increase the understanding of some aspects that are still the subject of debate and controversy among scientists focused on olive oil. ■

Notice of Annual Business Meeting

The annual business meeting of the American Oil Chemists' Society will be held on Tuesday, May 3, 2011 at 7:30 a.m. at the Duke Energy Convention Center, Cincinnati, Ohio, 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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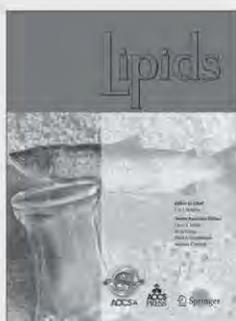


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Short- and long-term price forecasting for palm and lauric oils

Dorab E. Mistry

Note: The following paper represents excerpts from a talk delivered by Dorab E. Mistry at the 6th Indonesian Palm Oil Conference (IPOC) & 2011 Price Outlook, organized by the Indonesian Palm Oil Association (GAPKI) and held December 1–3, 2010, at the Westin Resort Nusa Dua, Bali.

Ladies and gentlemen:

The year 2010 has been a very happy one for the palm oil industry. The GAPKI conference is well timed and for me personally, some of my most successful forecasts happen to be made at GAPKI conferences. At this conference in December 2009, I forecast that growth of crude palm oil (CPO) production in Indonesia would be curtailed in 2010 by the developing El Niño, occurring at the same time as the low turn of the biological cycle, despite a rise in mature acreage. This combination of events would also push Malaysian production into negative territory. As a result I gave a bullish prognosis for 2010.

At the Palm and Lauric Oils Conference & Exhibition (POC) held in Kuala Lumpur in March 2010, I forecast 2010 Malaysian production at just 17.2 million metric tons (MMT) and Indonesian production to grow by only 1.5 MMT. I also forecast CPO prices to exceed 3,000 ringgits (\$1,000) per metric ton in the second half of the year.

I also forecast a decline in the US dollar starting July 1, 2010.

All three of my forecasts have come true. The CPO production model that I have developed and refined over my 30 years in this industry has performed extremely well this year.

Measures taken by China

As we all know, the Chinese government has become very concerned at domestic inflation and announced several measures to tackle it. The Chinese government has over the years displayed remarkable foresight and determination, and therefore its actions have earned the respect of the market.

To my mind, a wise and astute government has four basic measures to undertake when it wishes to clamp down on domestic inflation:

1. Curb and wipe out local speculation, black marketing, and profiteering.
2. Tighten money supply and remove or rein in excess liquidity in the local market. Excess liquidity leads to speculation and hoarding.
3. Allow the exchange rate to rise, or raise interest rates to control money supply and liquidity.
4. Most importantly, raise the supply of goods and commodities in the local market.

The fourth measure is the best and most potent weapon that government has. Supply can be increased by releasing State Reserve Stocks or by undertaking large imports. An increase in supply can

be made more effective by subsidizing imports, by removing import taxes, or by the government's importing these commodities and selling them at a loss. All these measures are very effective and will lower inflation very quickly. Subsidies may be wasteful, but for a short period they can be very effective. The Chinese government also has one other useful weapon. In 2009, it bought a large stock of domestic rapeseed oil as a price support measure. It can now release that stock to increase supply at reasonable prices.

There is a fifth measure, price control, which is usually effective in the very short term but is very damaging in the long run. This measure will lower prices for a few weeks, but it will damage producers, lower future production, and consign the country to shortages. It is not a market-based solution and must be avoided at all costs. People and producers are not stupid. They will stop producing if they have to incur losses. People will consume more and hoard if they find prices artificially low.

The government of China is wisely undertaking the first four of the five measures I have outlined. The first three have a mildly bearish effect on world prices. The fourth measure, of increasing supply and undertaking large imports, will have a positive impact on world prices. So on balance, the effect of all four measures on world prices should be neither positive nor negative in the medium term.

Prices will be made by fundamentals of supply and demand plus external factors such as worldwide investment funds and exchange rates.

My conclusion is that the Chinese government's measures should not be viewed as bearish or bullish except in the very short term. It takes the market a few weeks to absorb the shock and for the fundamentals to re-assert themselves.

With those remarks on the immediate worry of the market, I shall speak on the Incremental S&Ds for the oil year October 2010 to September 2011.

Incremental S&Ds for 2010–2011

In both 2008–2009 and 2009–2010, Incremental Demand outstripped Incremental Supply and we had to draw down stocks. Let us see if we have to draw down stocks further for the third year in succession.

Palm: As I have been explaining over the last 12 months, the biological low cycle will run from September 2010 until at least March–April 2011. Hence CPO production in the first quarter of 2011 will continue to underperform, and stocks will continue to be drawn down. Supply will be most critical and tight during this period. We can expect a recovery to begin from April 2011, but this recovery will be neither as strong nor as impressive as previous ones. As time goes by and I have more data in hand, I shall expand on this in my paper at POC in Kuala Lumpur March 8–9, 2011.

Last year as we were experiencing an El Niño, the signals of a pending shortfall in production were very strong. This year has been more nearly normal, and therefore the signals are not as strong. If last year my production forecast was made with a 90% confidence level (that is why I never changed my forecast despite universal disagreement), this year the confidence level is lower, at about 75%.

My prognosis for the 2011 calendar year is for Malaysian production to recover by 500,000 MT and for Indonesian production to recover by 2 MMT. Most of this recovery will be seen in the second half of 2011 and will spill over into 2012.

Generally the recovery after an El Niño year is fueled by two powerful engines—higher fertilizer application during the period of high prices, which kicks in during the later part of the production decline, and the new acreage that begins to produce once rainfall improves.

This time around, the extra kick provided by accelerated fertilizer use will not be so strong because too much fertilizer has already been applied, thanks to very high CPO prices throughout 2010. In fact we may see the law of diminishing returns come true! Acreage expansion has also slowed dramatically owing to the activities of NGOs (nongovernmental organizations) and the regulations enacted by the Indonesian government.

Soybeans: The world is anxiously watching the current growing season in South America. La Niña is in force, but we have to see if it results in dry weather and how much that impacts soybean yields. Currently, world S&Ds are based on a crop of 67 MMT in Brazil and 52 MMT in Argentina. Yet the S&Ds are very tight. If we lose a few million metric tons, the soybean S&Ds will get to rationing levels. We shall then have to rely on a big expansion in acreage in the United States in 2011 plus almost ideal growing weather.

For the present, the world is also focused on Chinese monthly imports of beans. If the Chinese government releases State Reserves and skips one month's imports, these actions will have a bearish impact on prices in the short term. The recent downswing in prices has already perhaps taken that into account. If, on the other hand, Chinese monthly bean imports remain at their level of the past few

months, prices will quickly recover and resume their upward march. For world prices to be driven down and kept down, the Chinese government has to demonstrate convincingly that estimates of Chinese bean imports are exaggerated by 3–4 MMT and that they can skip one month's imports without replacement.

So the fate of prices in the short term rests on Chinese import demand and on South American weather.

I must draw your attention to the fact that the current La Niña is one of the strongest in recent decades. It must affect crops in South America. The present indications are that we shall lose at least 5 MMT of soybeans as compared to earlier crop expectations. We cannot be complacent on this score. Most analysts underestimated the effects of the 2009 El Niño and appear to be doing the same with this La Niña.

In this day and age, we are making our farms and plantations perform almost to perfection. By piling on fertilizers and growth promoters, we have pushed yields to extremely high levels, depending on growing conditions to be almost ideal. Any disturbance by drought or flood leads to a disproportionate effect on yields. I invite you to imagine an old truck that is being run around the clock. It will run well on good roads in good conditions, but give it some rough terrain and it will break down. As world climate gets more capricious, world agriculture will fail to keep producing record high yields. And we have come to rely on super-high yields. I have already lopped 5 MMT from current South America soybean crops, and I stand ready to reduce estimates further as the season progresses.

And after the harvest, we shall have to crush an additional 8–10 MMT of beans to find the extra soybean oil required by the world.

Rapeseed: Production numbers for rapeseed have improved



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slightly in the last few weeks, and prospects for the Indian crop are distinctly brighter. I am therefore reducing the shortfall in rapeseed oil production this year to 800,000 MT from my earlier estimate of 1 MMT.

Sunflowerseed: Prospects for sunflowerseed production have also improved in the last few weeks in Ukraine. I am still wary of the Argentine production. Therefore, I am keeping the shortfall in sun oil production at 300,000 MT.

I continue to believe that groundnut oil and cottonseed oil production will increase by about 500,000 MT due to higher crush.

I also continue to believe that coconut oil production will decline and will balance the additional availability of palm kernel oil (PKO).

Demand scenario

It now looks as though the dreaded double dip recession is not going to happen. The calendar year 2010 will end with the world economy growing on average in excess of 4%, with a forecast of even better growth in 2011. Biodiesel mandates in several countries will continue to expand and so will growth in population and in per capita consumption in the developing world. However, we are at very high levels in terms of price, and hence we must estimate growth in world demand to be 4.5–5 MMT only for oil year 2010–2011.

TABLE 1. Incremental S&Ds for 2011

	Oct. '10 to Sept. '11 ('000 metric tons)
Soybean oil	+ 1,600
Rapeseed oil	800
Sunfl werseed oil	300
Groundnut (peanut) & cottonseed oil	+ 500
Palm oil	+ 2,500
Lauric oils	—
Total increase	+ 3,500
Demand	+ 4,500

Now we can see the developing Incremental S&Ds for next year (Table 1).

The US Congress reassembled on November 29 and we must watch its actions on the ethanol subsidy and the Blenders Credit for biodiesel. The implementation of RFS2 (Renewable Fuels Standard 2) also needs to be watched. Even if only one of these three factors comes into play, it will be very bullish for corn, beans, and bean oil.

At present, it looks like for the third year in a row, Incremental Supply will not match Incremental Demand. There is a shortfall of at least 1 MMT.

While palm production will recover, we shall encounter lower production of soybeans and sunflowerseed in South America.

Overall, oilseed and oil production will not have a chance to recover strongly.

Price outlook

I expect prices to rise from current levels in the next six months. Any price decline will have to wait until June–July when Northern Hemisphere crop prospects can begin to weigh on the market. My price outlook extends to the next six months. I also expect Inverses to assert themselves because stock levels in the next few months will be extremely tight.

I presume that there will be no unexpected war (North Korea

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or Iran?), that the US dollar will run out of steam by January 2011, that mineral oil prices will hold at current levels and gradually move higher, that the Euro zone will be stable, and that monetary policy in the United States and Europe will be easy and relaxed.

Palm: My November prognosis for CPO futures on the BMD [Bursa Malaysia Derivatives] to reach 3,300 ringgits was fulfilled within two days of the forecast. These are days of instant gratification. So I have to be extremely careful as to what I say. However, it is better to be forewarned than to be surprised. Too often the market gives out wrong signals. I repeat: The price declines of May and June 2010 were based on wrong production forecasts by overoptimistic pundits. Demand boomed at lower prices, and we now have to ration demand with higher prices.

Based on my production prognosis, the period of greatest tightness will be between February and May 2011, and we need prices to rise now to rein in demand and to stimulate plantings. At some stage in December–January I expect RBD [refined, bleached, deodorized] palm olein to trade at US\$1,250 per metric ton FOB with CPO futures on the BMD trading at 3,600 ringgits.

Other oils: Soybean oil prices also need to rise because too much incremental demand from sunflowerseed and rapeseed oil consumers is migrating in its direction. A level of US\$1,250–\$1,300 FOB Argentina is to be expected.

Sunflowerseed oil will maintain a premium of about US\$200 over soybean oil prices.

I expect rapeseed oil prices also to maintain a premium of US\$100–\$150 over soybean oil.

PKO has already touched US\$1,650 CIF (cost, insurance, freight)

Rotterdam. Demand for FMCG (fast-moving consumer goods) products in the West as well as the East is very strong, and it is quite possible that PKO prices will go close to an unprecedented level of US\$1,800 CIF Rotterdam. The outlook is the same for coconut oil.

What are the threats to this forecast?

The threat of contagion is the most prominent. Equity and bond markets need to be stable and must not fall. Countries such as Ireland, Greece, Portugal, Spain, or Belgium need to keep their house in order. The flow of investment money into commodities must also remain stable.

RSPO

Over the years I have remained a strong supporter of the Roundtable on Sustainable Palm Oil (RSPO). Much progress has been achieved. On the other hand, the uptake of certified sustainable palm oil has been disappointing. Those who talk of sustainability need to put their money where their words are. And finally, it is time for the Executive Board of the RSPO to reflect more proportionately the interests of all stakeholders, not merely in terms of functionality but also in terms of geography. Asia produces 95% of the world's palm oil and consumes 80% of it. Asia has preserved most of its forests, and millions of its people depend on this industry for their livelihood. Yet on the RSPO, Asia is in a minority. Make no mistake. There is no forum other than RSPO to handle this agenda, but RSPO needs to be reformed. I sincerely hope such reform will be taken up without delay.

CONTINUED ON PAGE 113

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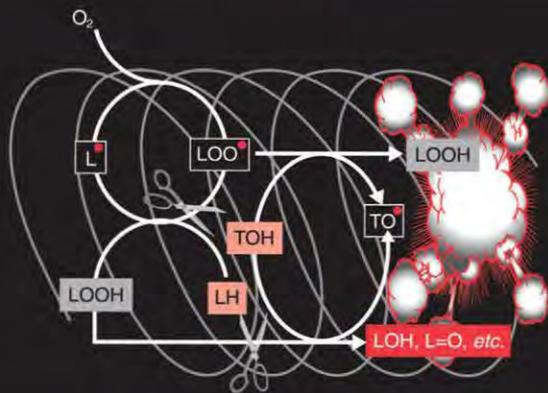
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Foam control for single-rinse fabric conditioners in Latin America

Laurence Gallez

Expressions of environmental concerns about water conservation are becoming more frequent, and water scarcity is a growing issue globally. In response, the detergent industry is seeking solutions to reduce water consumption in laundry applications. The last steps in a wash process normally involve several rinse cycles, which represent up to 80% of the water consumed over the entire laundry cycle. Reducing the number of rinses would allow significant water savings. In addition, fewer rinse cycles would enable shorter cycle times and less effort and be particularly beneficial for consumers who do not have easy access to water.

The role of silicones

Silicones have been associated with household cleaning applications for more than 50 years, particularly in the laundry area, where the primary use of silicone is foam control in consumer washing machines

and fabric softening. Silicone antifoam compounds are mixtures of polydimethylsiloxane polymers and finely dispersed silica particles. Owing to its low surface tension, the silicone fluid spreads at the air/solution interface and exposes the hydrophobic silica particles that act as foam breakers.

In a washing machine, steady control of foam is needed, rather than its complete elimination or prevention. Correct foam control is essential, because consumers perceive foam as an indicator of the efficiency of the liquid or powder cleaning agent. Moreover, imprecise foam levels can reduce cleaning efficiency of the detergent. In developing and emerging markets where semiautomatic washing machines or hand washing predominate, the level of lather in the wash must remain high, as consumers are very sensitive to foam levels and associate foaming with detergent activity. In contrast, foam must be completely eliminated in the rinsing step.

To meet these needs, adding silicone antifoams to fabric softeners seems particularly appropriate as a way to reduce the number of rinses without impacting the foam level in the washing step. The following Dow Corning® brand antifoams were selected and evaluated at approximately 0.25% active level: Dow Corning® DSP Antifoam (14% active), an emulsion characterized by its excellent long-acting foam control; Dow Corning® 1430 Antifoam (30% active), an emulsion designed to control foam in aqueous systems; Dow Corning® FB 50 Plus (50% active), an easily dispersible concentrate; and Dow Corning® AC 8066, a 100% active antifoam that is efficient even at very low concentrations.

The antifoams were evaluated in standard fabric softener formulations comprising esterquat Stepantex® VT-90 (3.34 or 6.67%), Kathon™ LX (0.1%), and water. Washing operations were carried out in semiautomatic machines (Brazilian *tanquinhos*), using a commercial powder detergent at 3 g/L and 1 kg of colored towels.



FIG. 1. Rinse water at the end of the first rinse, using commercially available single-rinse fabric softeners. From left, commercial benchmarks 1, 2, and 3.



FIG. 2. Rinse water at the end of the first rinse, using silicone antifoams added to a standard 3% esterquat fabric softener. From left to right: control (3% esterquat), Dow Corning® DSP Antifoam, Dow Corning® 1430 Antifoam, Dow Corning® FB 50 Plus, and Dow Corning® AC 8066.



FIG. 3. Rinse water at the end of the first rinse, using silicone antifoams in a standard 6% esterquat fabric softener. From left to right: control (6% esterquat), Dow Corning® DSP Antifoam, Dow Corning® 1430 Antifoam, Dow Corning® FB 50 Plus, and Dow Corning® AC 8066.

The fabric softener formulations were added in the rinse at 1 g/L. These are typical use conditions in Latin America, especially Brazil.

Assessing optimal foam control

Figure 1 illustrates the results obtained with three commercial fabric softeners claimed as single rinse fabric softeners. The rinse waters are viewed from the top of the *tanquinhos* at the end of the first rinse. In most cases, the surface was still covered with foam, indicating the need for additional rinses.

Figure 2 shows the results when Dow Corning® brand anti-foams are added to the control standard fabric softener containing 3% esterquat.

In Figure 3, the same antifoams were added to the control fabric softener, but containing 6% esterquat. In both cases, a significant reduction of the foam level was obtained compared to the controls and the single-rinse fabric softener benchmarks.

Conclusions

From these experiments, one can see that the antifoams in this study allow significant reduction of foam in the first rinse in a typical Latin American laundry process. Furthermore, higher efficiency is achieved compared with commercial benchmarks. Because fewer rinses are needed, less water is required for rinsing and less time and effort are necessary to complete the laundry cycle.

These attributes would be of particular interest where water scarcity is a concern, as well as in areas where water is not easily accessible. The results of this study could be extrapolated to other washing processes such as the semiautomatic top loaders used in Asia, or to hand washing. Indeed, a large percentage of the world's population still washes clothes by hand. It is suggested that consumers in these areas would value solutions that allow a reduction of effort associated with doing laundry.



Laurence Gallez joined Dow Corning in 1995 with a master's degree in chemistry from the University of Mons (Belgium). She has held positions with the company's Packaging Innovation Team, Silicone Modified Organics Team, and the Sealants Technology Center. In 2007, Gallez joined Dow Corning's Antifoam and Granulation Team, where her responsibilities as a developmental chemist focus on developing and evaluating new antifoams. She can be contacted at laurence.gallez@dowcorning.com.

SHORT- AND LONG-TERM PRICE FORECASTING (CONTINUED FROM PAGE 110)

Conclusion

I once again congratulate GAPKI on making this conference such an important event on the palm oil calendar. I shall conclude by reminding you of what the Sage of Omaha (Warren Buffett) said once: "Only when the tide goes out do you discover who has been swimming naked." Swimmers need to be aware that the palm oil tide is running out.

Dorab E. Mistry is director, Godrej International Ltd., Mumbai, India. He may be contacted at dorab.mistry@godrejinternational.com.

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Health Ingredients Europe 2010

EU health claim program progresses slowly

Willem van Nieuwenhuizen

The biennial Health Ingredients Europe (HiE) exhibition and conference was held November 16–18, 2010, in Madrid, Spain. With 500 booths (of these, 100 were new exhibitors), the exhibition was of the same size as in 2008. There were country pavilions for the United States, with 25 company booths, and France and China with 50 booths. The event was balanced and not too hectic, which made intensive professional technical discussions possible.

Two years ago we reported about the critical attitude of the European Food Safety Authority (EFSA) in the evaluation of first scientific opinions about submitted health claim dossiers, and this scenario has continued. To date, EFSA has assessed over 1,700 health claims of the total of 4,600 submitted dossiers. Fewer than 10% of the dossiers have been accepted. Outcomes of the evaluations were usually favorable when there was sufficient scientific evidence to support the claims. These related mainly to vitamins and minerals; specific dietary fibers related to blood glucose control, bowel function, or weight management; fatty acid claims related to brain function, vision, or heart health; or claims related to live yogurt cultures and lactose digestion.

Many ingredients dossiers have a long way to go for approval. Submitters of disapproved dossiers may work on new clinical trials with well-defined products. With this information in mind, the HiE was a challenging meeting place.

HiE 2010 Award Winners

For the Hi-Excellence Innovation Award, the 12 short-listed nominees presented their ingredients to judges and the public. The nominees were divided into five categories: heart health, digestive health, nutrition for the young and old, sports performance, and weight management.

DSM Nutritional Products (Basel, Switzerland) triumphed again at this year's HiE Excellence Awards Competition with Fruitflow®, the first natural, scientifically substantiated solution for the promotion of healthy blood flow. As well as winning the Overall Excellence Innovative Health Ingredient Award, the product also won an Excellence Award in the category of Heart Health.

To date, Fruitflow® is the only ingredient with an approved health claim from EFSA under Article 13.5, opening the way for it to be marketed with the claim "Helps maintain normal platelet aggregation, which contributes to healthy blood flow," a claim that some believe will save lives. Fruitflow helps maintain a healthy cardiovascular system by keeping platelets smooth and reducing platelet aggregation. A natural tomato extract and safe ingredient, Fruitflow does not disrupt the blood clotting process following injury. Published clinical studies

have demonstrated that Fruitflow reduces platelet aggregation in 97% of individuals within 1.5 hours of consumption and that its beneficial effect lasts up to 18 hours. No side effects, allergenic reactions, or incompatibility with other medication has been reported following its prolonged use in 10 clinical studies.

Danisco (Copenhagen, Denmark) won the award in the digestive health category for Grinsted® Fibreline, its healthier bread technology. In their award statement, the judges had high praise for the ingredient system, which, they stated, "brings the benefits of fiber to a broader audience, enabling bakers to create products with real processing and health benefits."

Innophos (Cranbury, New Jersey, USA) succeeded in the nutrition for young and old category with VersaCal Clear Phosphates for Beverages; and Chr. Hansen's (Horsholm, Denmark) L. Fermentum PCC won in the category of sports performance, finally bringing the benefits of probiotics to the sports industry, supporting the immune health of athletes. Probiotics are used today in more mainstream products such as yogurts and standard dietary supplements, but the sports nutrition industry has not yet recognized their benefits. PCC® is a probiotic strain showing effect within sports nutrition and is clinically documented in placebo-controlled studies to reduce illness in athletes after training.

No award was made in the category of weight management as the judges, while praising the potential of the entries, felt that none of the entrants met their strict criteria. One member of the short list of nominees was Clarinol CLA (conjugated linoleic acid) from Lipid Nutrition, Wormerveer, Netherlands. This company was surprised by the judges' decision.

In cooperation with the Union for Ethical Bio Trade for the first time, the Biodiversity Awards were launched. The Biodiversity Leadership award went to Coop (Basel, Switzerland), with honorable mentions to Lotus Foods (San Francisco, California, USA) and Marks & Spencer (London, United Kingdom). Coop, the largest supermarket in Switzerland, was awarded in the leadership category for its commitment to regional produce, rare species, and its support for organic farmers.

Unilever's *Allanblackia* project won the Biodiversity Innovation award, with an honorable mention being given to Ecoflora (Bogotá, Colombia). In the *Allanblackia* project, Unilever is working with rural producers and local biodiversity in Africa with the aim of bringing to market a new vegetable oil. Named after 19th century Scottish botanist Allan Black, the *Allanblackia* tree produces seeds whose oil is composed almost entirely of triglycerides of stearic and oleic fatty acids. The oil was granted a positive novel foods opinion by EFSA in 2007 for use in yellow fat and cream-based spreads. Although it is not yet being used in products, Unilever is involved in a public-private partnership in Ghana called the Novella Project to develop the supply chain.

The IUFOST (International Union of Food Science and Technology) Award for Young Scientist of the Year was given to Peng Zhou, China, with the IUFOST Lifetime Achievement going to Ralph Blanchfield, United Kingdom.

Conferences, Showcase, New Product Zone

The exhibition organizer offered 20 health-related seminars in two parallel sessions over the three days, dealing with topics such as salt reduction, allergenicity, and (natural) health claim issues.

In the Showcase area, companies presented their products with emphasis on technological and nutritional functions. In the New Product Zone, 13 ingredient innovations were shown. Among them were the awarded DSM Fruitflow product, DSM's Lipidfizz Omega and polyunsaturated fatty acids in powder and tablets, Clarinol CLA of Lipid Nutrition, and NKO Neptune Krill Oil from Neptune Technologies & Bioresources (Laval, Québec, Canada).

The special pavilion "Ingredients in Action" was organized by Innova Market Insights (Duiven, Netherlands). Newly launched consumer products, new products developments in the tasting bar panels, and the access of databases were demonstrated there.

Exhibition

In over 500 booths, health ingredients companies and scientific institutes exhibited their products, processes, and expertise. This report concentrates on products derived from oils and oilseeds, which may meet the principal interest of *inform* readers.

Oils and fats. In this sector a number of suppliers prefer exposing their products at the bi-annual Food Ingredient Europe exhibition and not at the HiE. Therefore, the promotion of bulk oils and fats was not prioritized

Oils containing omega-3 and -6 fatty acids, however, were presented actively. The use of omega oils is one of the fast-growing areas in functional foods, supporting heart health and brain health. This sector works hard on obtaining more approvals of Health Claims by the European Union (EU). Marine oils containing DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid) are offered by a number of companies including Ocean Nutrition (Dartmouth, Nova Scotia, Canada), DSM, Cognis (Düsseldorf, Germany), EPAX (Aalesund, Norway), Denomega (Sarpsborg, Norway), and Lipid Nutrition. Martek Biosciences Corp. (Columbia, Maryland, USA) promoted their bland-tasting *life'sDHA* brand omega-3, extracted from algae.

Omega-3 Smart Short Course. Independently from the HiE, a successful two-day Omega-3 Fatty Acid Short Course was put on by Smart Short Courses organizers Ignace De Bruyne & Associates and Sefa Koseoglu's Membrane World Inc. Speakers from academia and industry presented 25 papers about the market, production, development, clinical science, and health claims of omega fatty acids, oils, and phospholipids. Thanks to the excellent program, the short course saw intensive participation and discussions.

Lecithin. European retailers and food processors continue to require non-GMO (genetically modified organism), identity-preserved (IP) lecithin. The consequence is that lecithin manufacturers and specialized trading companies source soy lecithin worldwide. Excellent soy lecithin qualities from GM beans are not used anymore in foods and are being replaced partially by soy lecithin from shrinking areas of traditional soybean crops or sunflower and canola (rape-seed) lecithin. The large crushing groups did not pay special attention to lecithin in their booths.

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Specialty firm Lecico CY (Hamburg, Germany) presented a brochure reporting the issues in sourcing good qualities of lecithin, derived from soya and sunflower seeds. They presented egg phospholipid in cooperation with BNL–Belovo (Wiltz Luxemburg) and introduced a milk phospholipid concentrate LIPAMIN M for functional foods and health supplements. Novastell (Étrépagny, France) also had a dedicated booth with lecithins.

Neptune Biotech continues to report new facts on its Neptune Krill Oil NKO containing 40% phospholipids, of which 80% is phosphatidylcholine with high omega-3 fatty acid content. It has received approval from Canada Health. Aker BioMarine (Oslo, Norway) progresses as well with new scientific reports on the Superba Krill Omega-3 Phospholipids.

Vegetable Proteins. Exhibiting suppliers ADM, Cargill, and Solbar offered soy protein concentrates (SPC) and isolates (SPI). Solae (Geneva, Switzerland) launched its new protein multigrain nugget Supro Nugget 173, consisting of 60% soy protein plus 40% multigrain, and the Supro Nugget 570 made with mainly SPI for bars, snacks, and cereals. In 2010 Solae also announced the launch of two new Alpha Functional SPC, made by membrane filtration, and a HVP (hydrolyzed vegetable protein) Hydrolyzed Soy Protein Flavoring.

The Israeli SPC/SPI producer Solbar (Ashdod, Israel) recently acquired the Green Planet Farms Plant to produce SPI in South Sioux City, Nebraska, USA. The company's present corporate rebranding focuses on SPC growth in the meat sector in China, SPI growth in the health food sector in the United States, and continuing growth in the meat and health sectors in Europe. They launched a new Solbar Q

842 SPI for soy crisps, extruded snacks and cereals as well as Solbar Q735 SPI for beverages.

Various Chinese suppliers presented IP non-GMO soy proteins for export to Europe. Among them were Linyi Shansong Biological Products (Linyi City, Shandong); Shandong Banye Co. (Qingdao Shandong); and Sinochem Ningbo (Ningbo Zhejiang). This sector has grown to a global competitive market.

But competition is not only coming from the soybeans. Slowly, producers of other vegetable protein sources are trying to get a part of the meat replacer and vegetarian markets. For some decades meat replacers have been processed by combining soy proteins and wheat gluten in order to obtain good chewing and elastic fiber properties. Roquette (Lestrem, France) promoted their pea protein, whose sales turnover is developing well. Lupine protein may be another interesting source for vegetarian meat replacers.

Looking Forward to HiE 2012

The next HiE & Natural Ingredients (Ni) will be held November 13–15, 2012, in Frankfurt Germany. No doubt it will again be an important platform for B2B (business-to-business) meetings and discussions. In 2011, the Food Ingredients Europe (FiE) & Ni (Natural Ingredients) will be held in Paris, France, November 29–December 1. See <http://hieurope.ingredientsnetwork.com> for more details.

inform Contributing Editor Willem van Nieuwenhuyzen is director of Lecipro Consulting, Netherlands, and can be reached by email at willem@lecipro.nl.



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BIOFUELS NEWS (CONTINUED FROM PAGE 84)

barley straw, hulls, and dried distillers grains (DDGS). All three are by-products of fermentation of barley grain for ethanol.

Oil was produced from each of these by-products via fast pyrolysis. The researchers found that, in the laboratory, a kilogram of barley straw and hulls yielded about half a kilogram of bio-oil, with an energy content about half that of No. 2 fuel oil. The energy content of bio-oil from barley DDGS—including DDGS contaminated with mycotoxins, which cannot be used to supplement livestock feed—was even higher, about two-thirds that of No. 2 fuel. On the other hand, it was more viscous and had a shorter shelf life than the oil produced from straw or hulls.

The scientists suggested that co-locating fast-pyrolysis units in commercial barley grain ethanol plants could be advantageous. Barley grain could be used to produce ethanol, and the by-products could be used to produce oil either for transportation fuels or for production of heat and power needed for the grain-to-ethanol conversion.

Some of this research appeared in *Energy & Fuels* 24:699–706 (2010).

ETHANOL

Groups appeal higher ethanol blend ruling

Twenty-four organizations asked the US Environmental Protection Agency on December 16 for an additional 60 days for public comment on proposed regulations designed to prevent misfueling with gasoline containing 15% ethanol (E15).

A letter to EPA Administrator Lisa Jackson requested the extension beyond the original deadline of January 3, 2011.

Many of the 24 organizations are manufacturers of small-engine equipment, such as boat motors, lawn mowers, snowmobiles, generators, chain saws, and the like. These organizations contend that gasoline containing up to 10% ethanol is safe to run in their products, but fueling with E15 could permanently damage the engines they make.

In the *Milwaukee Journal Sentinel* (December 20, 2010), Kris Kiser, executive vice president of the Outdoor Power Equipment Institute (which includes Briggs & Stratton Corp.), said, “The problem is that

people will choose whatever fuel is cheapest, and that’s likely to be the 15% ethanol.”

“Groups concerned about [E15] require more time to evaluate the problem so they can give EPA their best ideas on how to prevent misfueling,” said Charles T. Drevna, president of the National Petrochemical & Refiners Association.

Seaweed as feedstock for biofuel?

Producers of ethanol from terrestrial biomass crops must devise methods to break down resistant fibers and extract fermentable sugars. The harsh pretreatment processes used to release sugars also result in toxic by-products that inhibit subsequent microbial fermentation according to Yong-Su Jin, of the University of Illinois (Urbana-Champaign, USA) Institute of Genomic Biology.

“Making biofuels from red seaweed has been problematic,” said Jin, “because the process yields both glucose and galactose, and until now galactose fermentation has been very inefficient.”

Jin and co-workers have identified three genes in *Saccharomyces cerevisiae*, the yeast most often used industrially to ferment sugars, whose overexpression increases galactose fermentation by 250% when compared with a control strain.

Galactose is one of the most abundant sugars in marine biomass, according to Jin, so its enhanced fermentation will be industrially useful for seaweed biofuel producers. Marine biomass is an attractive renewable feedstock for biofuels for these reasons:

- Production yields of marine plant biomass per unit area are much higher than those of terrestrial biomass.
- Marine biomass can be depolymerized relatively easily compared with other biomass crops because it does not contain lignin and cellulose crystalline structures.
- The rate of CO₂ fixation by marine biomass is much higher than by terrestrial biomass, making it an option for sequestration and recycling of CO₂.

The research appeared in *Biotechnology and Bioengineering* in pre-publication format at <http://onlinelibrary.wiley.com/doi/10.1002/bit.22988/abstract>. ■

HEALTH & NUTRITION NEWS

(CONTINUED FROM PAGE 86)

in human studies. These results also suggest that reducing mitochondrial oxidative stress may be a novel therapeutic target to prevent age-associated insulin resistance and type 2 diabetes, which is now reaching epidemic proportions in this country and abroad.”

The study appeared in *Cell Metabolism* (12:668–674, 2010) and was supported by the US Public Health Service, German Research Foundation, a VA Merit Grant, and by the Yale Clinical and Translational Science Award (CTSA) grant from the National Center for Research Resources at the National Institutes of Health.

Olive oil favored by US dietitians

A small survey of US dietitians that examined their perspectives regarding dietary oils and fats revealed a strong preference for olive oil. When asked which food oils they “routinely recommend to . . . patients,” olive oil was first (95%). Canola oil was second (80%), with an 89.3% response rate. Soybean oil (8%), peanut oil (7%), safflower oil (7%), and flaxseed oil (7%) trailed far behind.

The survey of 168 attendees of a recent American Dietetic Association meeting was conducted by AOCS member Doug Bibus, a community faculty member at the Center for Spirituality and Healing at the University of Minnesota (Minneapolis, USA) and president of Lipid Technologies, LLC. In releasing the survey results, Bibus noted that the public has been confronted by confusing messages about the consumption of fat, and a survey of professional dietitians “should help provide some clarity.” The survey was sponsored by Pompeian, Inc., an olive oil importer and bottler based in Baltimore, Maryland, USA.

Among the key findings: Olive oil was considered by the survey respondents to be one of the top two “health[ful] foods and ingredients,” the first being fruits and vegetables, and the third being salmon and fish. Ninety-five percent of the dietitians routinely recommend olive oil to their patients.

The complete survey results may be found at www.pompeian.com/dietitiansurvey. ■

IS THERE A NEW NORMAL? (CONTINUED FROM PAGE 67)

Wireless World: Digitalization

My second point is the new Wireless World—the world of increasing digitalization. Here change is happening at a pace far beyond anything else we've seen—and again especially in D&E markets—not only California, as many believe. Consumers lead these changes faster than companies can spot the trends. Agility, fast learning, and adapting are key here as well. It is challenging all parts of our business model.

In 2010, already 42% of global Internet users are in Asia. That's 825 million people—the same as Europe, North America, the Middle East, and Australasia together. And that's with only 22% market penetration. There is still some way to go!

And it will go fast.

Twitter in Asia is growing at 10 times the rate it is growing in developed markets such as the United States. In Indonesia, for example, 21% of the domestic online population use Twitter.

And it's not just Twitter ... 1.7 billion people around the world use social networking sites. Facebook, with its over 500 million users, would be the third nation after China and India. And in India, with 400 million mobile phones—more people own a phone than have their own toilet. And the list goes on.

That scale and speed of digitalization are changing the very nature of our world, our relationships, and our business models. It has completely revolutionized the way Unilever brands are building relationships with our consumers. It revolutionizes the way consumers view and interact with brands and companies. I can say with confidence that we are embracing this part of the New Normal. We were proud to have made the first-ever television commercial in the UK—and now, more than half a century later, we are the first launch advertiser on Apple's new iAd platform.

Unilever's Ben & Jerry's has over a million fans on Facebook, regularly interacting with the brand and everything it stands for. But, again, the point is a broader one.

Digitalization means that the Wireless World of our children and our children's children will be unrecognizable compared to what we see now. And we all need to think through the consequences for our businesses and relationships.

The New Economic Order

The third point on my map, "North," is the New Economic and Financial Order. This is where we really need a new North Star to guide us as we seek to rebuild trust and stability in business and institutions. What happened during the sub-prime crisis took us all to the edge. We know the causes—and greed certainly had something to do with it! Fortunately, the biggest catastrophes appear to have been avoided.

But commodities and markets are still in flux. Public confidence is still understandably low, and all of us have a lot of rebuilding to do.

In Unilever we were protected from the most extreme effects of the crisis by the fact that our portfolio was broad based across

geographies, categories, and price points. But we also learned a hard lesson: The New Normal means you can take nothing—absolutely nothing—for granted.

For us it means taking an even longer-term focus—which is why we invest heavily in R&D and advertising, and why we have stopped giving quarterly guidance to the market. It also means an even greater determination to develop low-cost business models that serve the billions of consumers at the Bottom of the Pyramid.

It means the industry, together, taking greater responsibility in addressing some of the broader global issues surrounding food security, global warming, poverty, and water scarcity—areas where governments and institutions are struggling to make an impact.

That's why, for example, we have taken a tough and public stand to convert the market to sustainable palm oil. With deforestation accounting for up to 20% of global greenhouse gases, this is a must. As founding

members of the Round Table on Sustainable Palm Oil, we encourage others to make the same commitment.

New business models also mean switching the emphasis from short-term shareholder-value creation to long-term shared value creation with benefits for all, employees, customers, consumers, and society, across the entire value chain. That is the key to truly sustainable growth.

Sustainability

Unless we find ways to grow in a sustainable way, our markets will soon shrink and we will all be open to attack from sermons preaching reduced consumption to solve the world's problems. Working only to improve the parts of the supply chain directly under your control, such as factories, transport, travel, and the like, is not enough anymore. We have to start taking responsibility for the total value chain.

At Unilever we have launched an exciting new vision—to double our business while reducing our overall environmental impact. No other company has gone this far, and we need our suppliers to help us deliver. The New Normal must have Sustainability as a key foundation.

I've already referred to the huge population explosion driving the growth of the Expanding Markets. This population growth is putting huge strains on the environment and on natural resources. The World Business Council for Sustainable Development estimates that our natural resource consumption will rise to 170% of the Earth's biocapacity by 2040. Sustainability is a burning issue: We have no alternative but to act.

Since 1995, Unilever has achieved reductions (via our manufacturing process) of:

- 44% on greenhouse gases,
- 70% on waste, and
- 76% on water.

CONTINUED ON NEXT PAGE

We have taken a tough and public stand to convert the market to sustainable palm oil. With deforestation accounting for up to 20% of global greenhouse gases, this is a must.

Despite these plans, up to 70% of the carbon footprint of Unilever's Laundry products and up to 95% of the water impact are the direct result of consumers doing laundry at home.

Over 40% of our R&D budget for Laundry is being invested in developing more sustainable habits across the value chain with reduced impact on both the sustainable sourcing of materials and sustainable living by consumers, while obviously still providing outstanding results. Of the 14 million people washing with a Unilever laundry detergent in the next hour, 12 million will be washing by hand. With our improved rinsing products, we will be saving over 25 million liters of water during this talk alone.

Once again, sustainability is where suppliers and manufacturers need to collaborate, be it from less rinsing and more concentrated detergents to reductions in washing temperatures and, ultimately, packaging waste.

Ben & Jerry's is one of our wonderful ice creams. They have moved to a carbon-neutral model, despite the supply chain requiring refrigeration, and are using Fair Trade and sustainably sourced ingredients. If Ben & Jerry's sets the standard, that's a good challenge for the soap and detergent industry to beat.

The Impact on Our Industry

What this adds up to is an enormous impact on our industry—an impact that offers huge potential for positive change and growth in both the short and longer term. If there really is a New Normal, then it certainly includes at least the four points of the map: “East” and “West,” “North” and “South.”

What are the business realities we need to embrace if we are to make the most of that potential?

For a start, assume lower economic growth in the developed markets for some time to come, and slower growth in the emerging markets. Innovation will be key. With governments committed to reducing deficits and protecting jobs, we see a future of increased regulations and higher taxes.

We need to align to ensure we act in the best interests of the industry and consumers and proactively influence the debate.

Increased local pressures will encourage protectionism. Our industry needs to continue to demonstrate the benefits of globalization, which has served the world so well. A lot of effort will be put into fixing short-term challenges—no bad thing, but we need also to keep the focus on the bigger strategic longer-term vision.

Business models need to be sustainable to be around in 10, 20, 50 years time. Growth has to be done in a responsible way, built on the principles of long-term shared value and not just shareholder value. As an industry, we act on the big stage—and we have many audiences. With that comes responsibility.

The recent economic crisis deepened the suspicion and mistrust with which many regard big business. We will need to continue to voice our arguments clearly and patiently with governments, non-governmental organizations, consumer groups, and the media. It requires alignment, cooperation, resources, and commitment from all of us. There could be no better challenge than to be part of reshaping the map at this time of dynamic change.

Working Together

Given the size of the challenges, we cannot act alone. We need to work together.

As manufacturers and suppliers, we should strive for increased cooperation to ensure that sustainable sourcing of raw materials brings environmental as well as economic and social benefits. Our industry is ideally placed to fuel economic empowerment. We need to move much faster than today in converting entire markets to more compacted and concentrated products. We know how to do this.

Collaborations among suppliers are also needed to create new sources of raw materials and ingredients to satisfy the emerging market growth. We also have an opportunity to further build alliances that will spark and accelerate new innovations, offer more performance, and at the same time provide more affordability for emerging consumers.

All this requires a change in mindset toward an approach based on a joint alignment on underlying consumer needs and opportunities so that we can work together in a spirit of trust and openness to co-create a solution that works for the consumer.

As manufacturers and suppliers, we should strive for increased cooperation to ensure that sustainable sourcing of raw materials brings environmental as well as economic and social benefits. Our industry is ideally placed to fuel economic empowerment.

Conclusion

We already provide products that make life easier on an everyday basis for millions of people around the world. We already play an important part in making this a cleaner, healthier, more hygienically safe world. And we have shown that we have the potential to do much more to shape what I have called the New Normal, which is full of opportunities for those willing

to grasp them.

When we meet next, in four years' time, the statistics underpinning the four points of my map will be even more striking. We have a unique opportunity to seize what is literally the chance of a lifetime and to demonstrate that our industry is in the forefront of rebuilding consumer trust on a truly global scale.

But if we are serious about reshaping the future of our industry in the ways I've outlined, then we shall want to focus on the key expanding markets.

So, no more Montreux? But Mumbai in 2014? São Paulo in 2018?

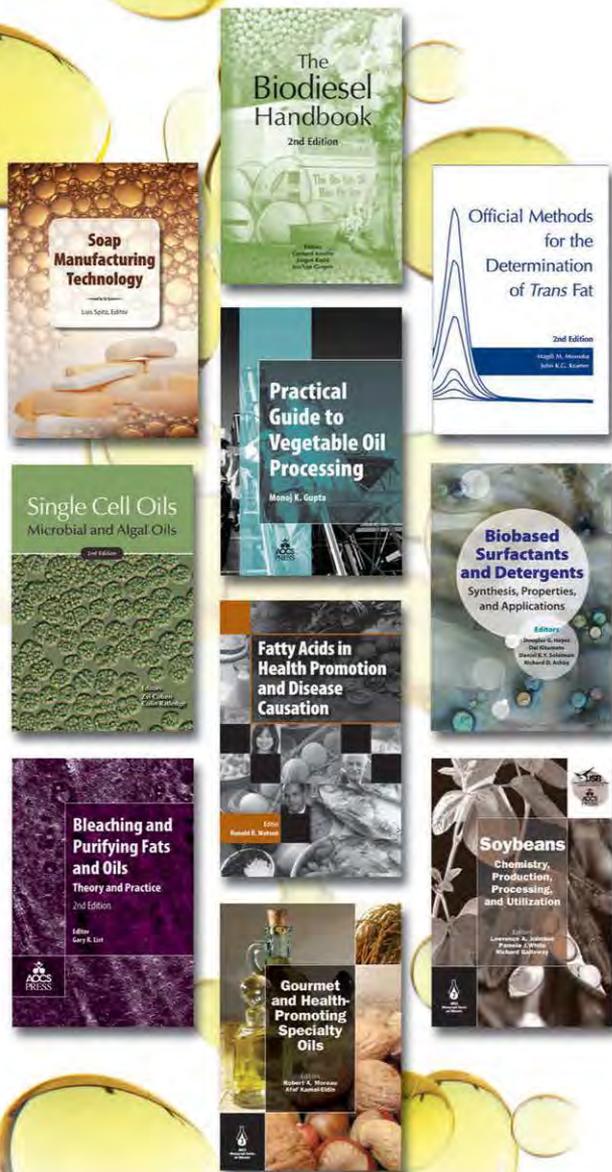
This is a great time—an inspiring time—to be part of the Detergents Industry.

Thank you.

Top 10 of 2010



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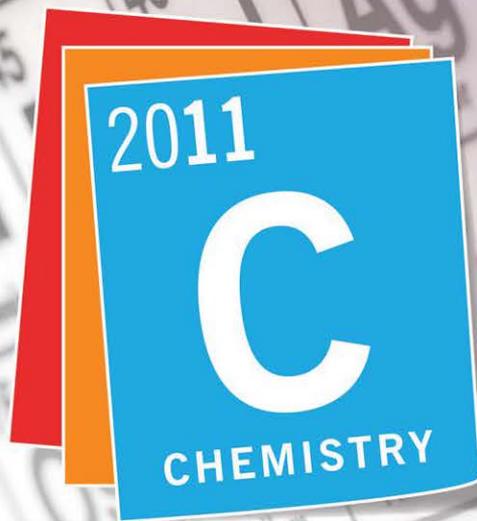


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