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NutritionNotes

Daily

2017 Scientific Sessions at Experimental Biology



HIGHLIGHTS

TODAY

The Presidential Symposium: Nutrition and Carcinogenesis: Mechanisms, Clinical Care and Population Strategies for Prevention and Control
8:30am - 10:00am
Room S100BC

The Gilbert A. Leveille Lecture
1:45pm - 2:30pm
Room S100BC

ASN Business Meeting
5:30pm - 6:30pm
Room S106

Kellogg International Prize in Nutrition Lecture and Global Nutrition Council Business Meeting

6:00pm - 8:00pm
Hilton Chicago, Williford A

TUESDAY

Implementation Research in Nutrition: Purposes, Methods and Applications

8:00am - 10:00 am
Room S100A

History of Nutrition Forum: History of the Dietary Guidelines for Americans

8:00am - 10:00am
Room S105A

W.O. Atwater Lecture
1:00pm - 2:00pm
Room S100B/C

STAY CONNECTED



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Nitrate and nitrite: Do they deserve their bad reputation?

Popeye was right: The nitrate and nitrite found in spinach and other plants may be valuable nutrients, according to presenters during a Sunday morning APS-ASN symposium.

Norm Hord, PhD, Oregon State University, said dietary nitrogen

comes from bacteria (often from animal manure and fertilizer) and lightning. There could be up to 20-30 pounds of nitrate per acre of soil, he said.

Hord said the World Health Organization's acceptable maximum daily intake is 22 mg of nitrates and

4.2 mg of nitrites for a 60 kg adult. But the DASH diet could have up to 1.2 grams of nitrates per day, he said. The Mediterranean diet has 1.0, the average American diet has 100 mg and human milk has 50 mg of nitrates.

There have been many medical uses for nitrates and nitrites throughout history, but they fell out of favor 50-70 years ago due to their side effects, Hord said.

Methemoglobinemia (blue baby syndrome) and gastrointestinal cancer risk are the chief arguments against

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The sunrise greets ASN Sunrise Boot Camp participants on Sunday morning.

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21st century food systems need to consider more than just nutrition, urge workshop panelists on Friday

ASN can be an important collaborator in creating a multidisciplinary “systems” approach that integrates nutrition, public health, environmental science and agricultural science in order to create a sustainable food system, said panelists and audience members during Friday’s “Food Systems, Nutrition and Health in a Changing Environment” workshop.

Twentieth-century food systems have not provided adequate nutrition for all people, because they were never designed explicitly to do so, said workshop presenter Gerald Combs, PhD, Cornell University.

Since much of the world now suffers from inadequate nutrition, it’s crucial that we take a more holistic view of agri-food systems, Combs said. But in order to do so, we need to gather people from a variety of scientific and social disciplines to address food, nutrition and health in the context of climate change.

“We have to consider the environmental impacts of crops, food traditions and dietary guidance,” Combs said. “It seems to me that our expertises are shining, effective and diverse, but how do we string them all together?”

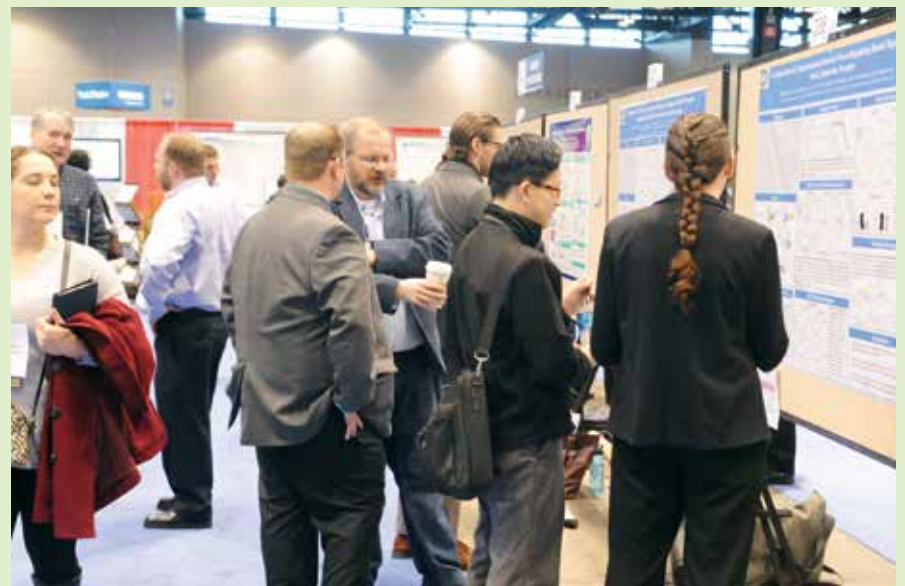
The daylong workshop addressed that question in three different sessions that featured a variety of presenters.

Session I: The integration of agriculture, environmental change and nutrition in shaping public health—a global perspective

Dan Raiten, PhD, Eunice Kennedy Shriver National Institute of Child Health and Human Development, said

under- and over-nutrition are global health challenges, accounting for more than half of the world’s diseases and hundreds of millions of dollars in public expenditures. Infectious diseases like malaria, noncommunicable diseases, and the microbiome and inflammation are also factors.

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ASN Scientific Sessions attendees reviewed hundreds of posters during the Poster Session Sunday.

Partnership for Healthier America shares its success stories

Representatives from a global food company, a Midwest convenience store chain, a Southern university and a nationwide childcare provider discussed their successful Partnership for a Healthier America initiatives during a Sunday afternoon session.

Lawrence A. Soler, Partnership for a Healthier America, said PHA was started seven years ago by a group of food and health foundations. The goal is to focus on private-sector initiatives to make public health changes. PHA now has over 225 partners, including food, exercise, retail and childcare companies.

Since the advent of PHA, Soler said there has been a significant change in consumer interest in being healthy. And 12 of the nation's largest food companies have cut more than 6 trillion calories from their products.

PHP specializes in marketing campaigns that are designed to make healthy initiatives fun, innovative and interesting. For instance, Soler said PHP's Drink Up campaign showed celebrities drinking water. "It resulted in a 5 percent increase in water sales, and Nielson said it was one of the strongest campaigns they've seen," he said.

Another PHP initiative is creating a brand for fruits and vegetables called

FNV. FNV has a logo, a website and celebrity advertising that's designed to help fruits and vegetables compete with food brands. According to an FNV video, "We completely, unabashedly did what every brand has been doing for years—we shoved marketing down their throats. Gave kids a brand to like."

Philippe Caradec, DanoneWave, said since 1996, his company has transitioned from 39 percent healthy food categories to 100 percent.

In 2013, DanoneWave cut the amount of sugar in its kids' yogurt from 14 to 10 grams. In 2015, it partnered with PHP and announced a goal to improve nutrient density of its products by 10 percent, make 75 percent of its portfolio low-fat or fat-free, and use less than 23 grams of

sugar per 6 ounces in 100 percent of its kids' products and 70 percent of its overall portfolio. It also pledged to invest \$3 million in product research and development.

Caradec said June 2016 data showed that 87 percent of the DanoneWave portfolio was low-fat or fat free. All of its kids' products hit the reduced-sugar goal, along with 78 percent of its overall portfolio. And the company spent \$3.3 million on R&D.

Erica Flint, RD, Kwik Trip, said this chain of convenience stores in Wisconsin, Minnesota and Iowa serves many rural communities, so the stores also serve as a grocery option. Kwik Trip started a healthy-food initiative by selling bananas, but realized it needed

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Don't forget these Monday events!

Sports Nutrition Networking Event

6:30pm - 8:00pm

Hilton Chicago, Boulevard A

Supported by DuPont Nutrition
& Health

Global Nutrition Council Reception

8:00pm - 10:00pm

Hilton Chicago, Waldorf

ASN Postdoc and Young Professional Networking Event

9:30pm - 10:30pm

Hilton Chicago, Joliet Room

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POST-DOCTORAL FELLOWSHIP IN OBESITY RESEARCH UAB OBESITY TRAINING PROGRAM

The Nutrition Obesity Research Center (NORC) at the University of Alabama at Birmingham announces the availability of post-doctoral fellowships funded through the NIH T32 grant (T32DK62710) awarded to Dr. David Allison by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK).

The funds from this grant may be used only for US Citizens or permanent residents. In very rare cases we are able to identify additional funds for the exceptional applicant who is neither a US Citizen or permanent resident, but this is a rarity.

Objective: The purpose of the Training Program is to offer fellowships that prepare post-doctoral scientists for scientific careers as independent investigators in obesity-related research.

Support provided for trainees: Stipends (typically for a two/three-year period), tuition and fees for all required courses, health insurance, books & supplies for educational purposes, and travel to at least one national meeting in the trainee's field of expertise to present their work.

Some disciplines represented in training offered: Biostatistics, Economics, Epidemiology, Exercise Physiology, Genetics, Medicine, Molecular Biology, Nutrition, Physiology, Psychology and Sociology.

Key program components: Mentoring by program directors and major professors who have a strong track record in science and mentorship; Coursework available; Interdisciplinary research training; Weekly Nutrition Seminar Series; Hands-on intervention experience, as appropriate; and Clinical research opportunities for those interested.

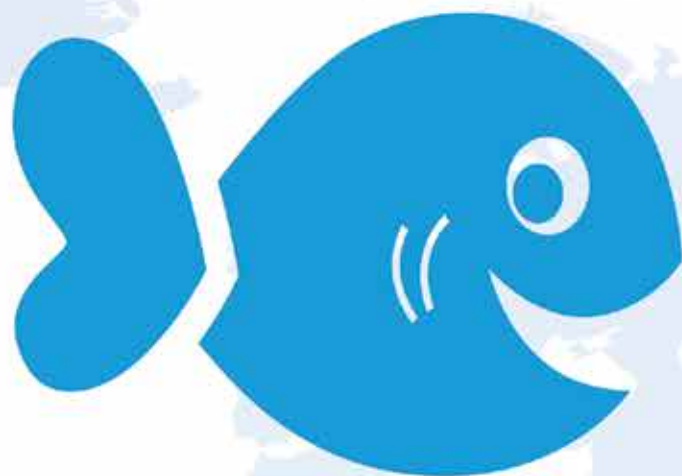
Eligibility: Individuals with a doctoral degree from any scientific field are eligible. • UAB is committed to providing educational, employment, and enrichment opportunities for members of underrepresented groups. Women, individuals from traditionally disadvantaged groups, and individuals with disabilities are encouraged to apply.

Application Procedures: Send full CV, brief (1-page) letter describing interest, and a completed application form which can be found here: <http://www.norc.uab.edu/opportunities/post-doc> as email attachments to David B. Allison, PhD at dallison@uab.edu



The Ohio State University Food Innovation Center and ASN co-hosted a Pediatric Nutrition Networking Reception that immediately followed a robust afternoon of pediatric nutrition programming. This gathering recognized the emerging network of public and private partners seeking to complement the work of the USDA B-24 month project, with a special emphasis on developmentally appropriate foods and feeding behaviors for parents and caregivers to successfully feed infants and toddlers. Nutrition influencers from across the spectrum attended the event.

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foods and beverages to supplements and infant formulas worldwide, DSM has a solution to fit every omega-3 need.



HEALTH • NUTRITION • MATERIALS

Nitrates and Nitrites

Continued from page 1

nitrate and nitrite ingestion. Hord said methemoglobinemia has been attributed to excess nitrates in well water, but exposure studies found that nitrate alone does not cause methemoglobinemia. “It’s not at a level where would see symptomatic levels of cyanosis,” he said.

But despite these findings, groundwater nitrate standards have stood for years. “Many people in this field believe this is really a hypothesis that’s been turned into dogma,” Hord said.

He did caution that infants up to 6 months of age have not developed the capacity to process dietary nitrate, so should not be exposed to it.

There has also been recent news about the carcinogenic activity of nitrates in processed meat. “A recent report from AICR (the American Institute of Cancer Research) contained the strongest language I’ve ever heard” about limiting or not eating processed meats, Hord said.

Overall, he said additional studies are needed to properly assess the health benefits and risks of dietary

nitrate and nitrite. But the good news is the USDA has agreed to establish a database for nitrate and nitrite concentration in foods. This would entail an independent panel of experts from academia, industry, governmental and nongovernmental sectors undertaking the first comprehensive, systematic review of the potential health risks and benefits of food sources of nitrates and nitrites.

Rakesh Patel, PhD, University of Alabama at Birmingham, discussed how nitrite can be reduced back to nitric oxide (NO) in some situations. In the last 10 to 20 years, there’s been an increased understanding of how this works. Nitrite reduction to NO and modulation of NO signaling has been demonstrated to occur at low nitrite concentrations, he said.

Patel cited studies showing how low-dose nitrite therapy can protect against hepatic ischemia-reperfusion injury and ischemic angiogenesis. Nitrite can be metabolized to other mechanisms to activate NO signaling.

He also discussed questions about the entero-salivary nitrate-nitrite circuit, including how nitrate concentrates into saliva. Research shows

the circuit can be modified by diet, over-the-counter mouthwash use and smoking. And an unpublished study on aging and oral NR activity shows substantially less nitrite formation in people over age 60.

“We don’t know much about the mechanisms of stimulating NO bioactivity,” Patel said. Data suggests stomach pH is a key regulator in peripheral effects of nitrate and nitrite, so perhaps probiotics could be an option.

Andrew Jones, PhD, University of Exeter, said NO is important for exercise in a variety of ways, including regulation of vascular tone and flow; mitochondrial respiration; vasodilation and muscle oxygen uptake, metabolism and efficiency.

His research shows that compared to controls, people who took nitrate (either directly or from beetroot juice) had 5 percent lower oxygen uptake when moderately exercising, and were also able to exercise 16 percent longer. Time trials show nitrate can improve performance by 2.8 percent. It also improves high-intensity exercise performance and muscle power.

The literature suggests that consuming nitrate two to three hours prior to exercising might be the best approach. The effects are also dose dependent—Jones cited one study showing that 8 to 16 nmol is most effective.

Elite athletes use beetroot juice regularly, Jones said. But the research on its effectiveness is mixed. A Danish study showed no significant difference in performance in elite cyclists after taking 6-8 nmol of nitrate. But an Australian study showed lower oxygen uptake in elite kayakers who took nitrate, and they were 2 percent faster compared to the placebo group.

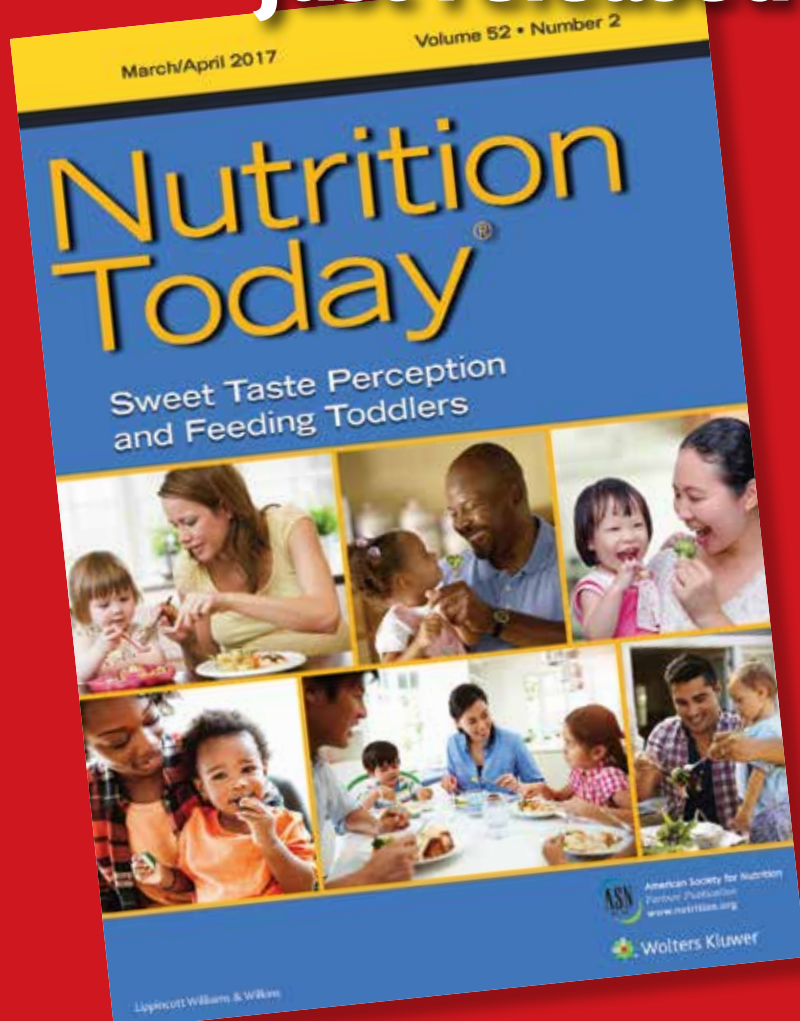
Other studies show beetroot improves performance in people with lower fitness status more significantly than it does for people with high fitness status. This could be because elite athletes have higher nitric oxide synthase activity, higher baseline plasma nitrite, better muscle oxygenation and higher proportions of type I muscle fibers, Jones said.

Amrita Ahluwalia, PhD, Queen

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We are seeking an experienced nutrition product development manager to join our Research and Development team. Beachbody is a rapidly growing, \$1 billion company that’s revolutionizing the future of fitness. The position centers on managing a technologist and/or technician-level team in development of new and improved dietary supplements, from concept to commercialization – including representing R&D in cross-functional meetings and planning/executing plant trials and start-ups. Requirements: BS degree in Food Science, Engineering, Chemistry or Equivalent, with a strong preference for a higher degree and 4-7 years of product development experience.

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Postdoctoral Position in Nanomedicine and Obesity

University of Illinois at Urbana-Champaign

An NIH-funded postdoctoral position focused on nanomedicine and obesity is available in the laboratory of Dr. Kelly Swanson at the University of Illinois at Urbana-Champaign (<https://nutrsci.illinois.edu/directory/ksswanso>).

The funded research aims to develop and test nanomaterial-based prodrugs that efficiently target adipose tissue macrophages to reduce inflammation, diabetic phenotype, and off-target side effects (ACS Nano; 2016; 10:6952-6962). Ideal candidates will have a PhD with a background in rodent model experimentation and molecular techniques.

To apply, send a cover letter and CV including the names of 3 references to Kelly Swanson (ksswanso@illinois.edu).

Nitrates and Nitrites

Continued from page 4

Mary University of London, said endothelial dysfunction plays a key role in cardiovascular disease, and a deficit in bioavailable NO contributes to that dysfunction. Specifically, nitrite has been shown to be anti-thrombotic, anti-inflammatory, vasodilatory and cytoprotective.

Ahluwalia cited studies showing that raising circulating levels of nitrite can protect against damage caused by myocardial IR injury. Her clinical studies on administering a relatively high intracoronary dose of nitrite prior to balloon angioplasty showed a trend of increased protection of the heart.

Nitrite has a very short half-life—in the range of 30-40 minutes—so infusing high-concentration nitrite into an artery isn't feasible, Ahluwalia said. But dietary nitrate might be an option.

Her study using high-nitrate-dose beetroot juice in healthy volunteers found that nitrate is almost 100 percent bioavailable, and quickly leads to a tenfold increase in nitrite plasma and saliva concentration that lasts up to six hours. This increases the half-life of nitrite and is an effective way to raise NO levels in the body, she said.

The study also showed that beetroot juice decreased blood pressure for up to 24 hours, and 4 nmol is the

threshold dose in a healthy person.

Another of Ahluwalia's double-blind studies showed that in people with stage 1 hypertension, both nitrate and nitrite had increased potency. This is likely because nitrate reductase is elevated in hypertensives, she said.

Ahluwalia also cited her study showing that dietary nitrate does not alter plaque burden, but it does reduce inflammation within the plaque. Nitrate may be preventing plaque from turning into an unstable phenotype, she said.

2017 SPONSORED SATELLITE PROGRAMS

Onsite registration is available. Arrive early to guarantee your spot. Seating is limited.

TODAY

Science-Based Distinctive Nutritional Requirements for Disease States
1:30pm - 2:45pm • Room S105BCD

Sponsored by ASN's Food For Health Working Group

This session will provide a dialogue on the establishment of science-based distinctive nutritional requirements for disease states, the subject of a National Academies of Science, Engineering and Medicine workshop currently being planned.

Nutrition expertise in food movement topic of afternoon session, live Twitter discussion

Topics related to food and nutrition are popular in today's discussions but experts are notably absent or, at best, in the minority. Do you believe it is time to Restore Relevancy of Nutrition Expertise in the Current Food Movement? If so, join us on Monday, April 24 at 3:15 pm CT in Room S105BCD. If you can't make the session in person, follow along on Twitter with @FoodInsight using the hashtag #SciCommStyle. The live Twitter chat will be sharing speaker perspectives, as well as posing and taking questions from the audience, which may even be relayed in real-time to the session moderator and panelists.

SPEAK UP FOR SCIENCE

Congress faces an April 28 deadline to finalize 2017 budgets for government agencies — including proposed increases for several research funding agencies.

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Use the link below to ask your Representative and Senators to vote in favor of robust funding increases for biomedical research at the National Institutes of Health, National Science Foundation, Veterans Administration, and the Departments of Agriculture and Energy.

www.experimentalbiology.org/speakup

You must be a U.S. resident to email Members of Congress.



Sustainability

Continued from page 1

“And all of this is happening with climate and environmental change superimposed over it,” he said. “You can’t deal with only one thing at a time, and I know that can be difficult for people to accept.”

Stuart Gillespie, PhD, International Food Policy Research Institute, said his research shows that malnutrition is by far the biggest driver in the global burden of disease, and results in an annual global gross domestic product loss of up to \$2 trillion.

He said the push to link nutrition with agriculture policy and practice began about 10 years ago, and follows six core pathways in the categories of food production; income that can be spent on food and non-food categories like public health; and female empowerment, including women’s ability to manage their resources such as time, income and energy expenditure.

Gillespie said 12 of 19 studies found that agricultural intervention had an impact on diet and nutrition. But early agricultural commercialization studies showed that when income went up, sometimes food expenditures went up—but nutrition didn’t improve.

Walter Willett, MD, DrPH, Harvard T.H. Chan School of Public Health, said achieving a healthy and sustainable diet worldwide by 2050 is probably one of the biggest challenges facing mankind.

For instance, “the U.S. food system is remarkably dysfunctional,” Willett said. But the good news is that Harvard research shows that small diet changes, like reducing trans-fat and sugary beverage consumption, can have major impacts on diseases.

Willett noted that only about 10 percent of grains grown in the U.S. are eaten by humans. The majority

are used for animal feed, so if we lower meat consumption, that can decrease monocultural grain production that’s devastating our environment, he said. However, in China and India, about half of all grain produced is consumed by humans.

Overall, a shift toward a more plant-based diet will have important health and planetary benefits, Willett said.

Matt Smith, PhD, Harvard T.H. Chan School of Public Health, said humankind has made remarkable progress in dealing with environmental changes, but that level of progress may not be sustainable in the future.

Smith’s research shows higher carbon dioxide levels could lower iron levels in plants. This is key because iron deficiency currently affects 1.4 billion children and women of childbearing age worldwide. The poorest countries derive most of their dietary iron sources from plants, Smith said, and also suffer from high rates of anemia.

Pollinator losses can also affect fruit, vegetable, nut and seed production, Smith said. Pollinated foods are major sources of vitamin A, and some zinc and folate. According to his research, low intake of pollinated foods would increase annual global deaths by 2.7 percent (1.4 million people), and disability-adjusted life years would decrease by 1.1 percent.

“Many of the impacts of environmental change on the food system will be large, unpredictable and rapid, requiring ongoing monitoring of food access in vulnerable locations worldwide,” Smith said.

Session II: Meeting the challenge: Sustainable food/agricultural solutions for improving nutrition and public health; possibilities and pitfalls

Moderator Barbara Schneeman, PhD, Department of Nutrition, University of California, Davis, said the 20th century reliance on micro-nutrient focus is antiquated, and there

Twentieth-century food systems have not provided adequate nutrition for all people, because they were never designed explicitly to do so.

“We have to consider the environmental impacts of crops, food traditions and dietary guidance. It seems to me that our expertises are shining, effective and diverse, but how do we string them all together?”

—Gerald Combs, PhD, Cornell University

needs to be a new paradigm.

“Another problem is we tend to define a problem from our own expertise, rather than understanding what the nature of the problem is and how we can add our expertise to the discussion,” she said.

Everyone needs to have an equal stake at the table, with respect for people from other disciplines and a desire to look for common ground and build a common language, Schneeman said.

Lindsay Allen, PhD, University of California, Davis, U.S. Department of Agriculture-Agricultural Research Service Western Human Nutrition Research Center, said adverse consequences or failed impacts of nutritional interventions can occur due to failure to measure food and nutrient intake before making decisions, along with inadequate assessment of pre- and/or post-nutritional status of intended recipients. Allen said good nutritional status biomarkers include folate; vitamins B1, B2 and B6; and B-carotene. Poor or slow biomarkers include retinol, zinc and B12.

Other issues include lack of knowledge about biological effects of interventions, poor knowledge of requirements and adequate/optimal/excessive dose or amounts of foods and best target groups, and interventions with limited impact on status or biology. “We need to use new tools to deter-

mine true biological responses; don’t limit tools to anthropometry, vitamin A and iron,” Allen said.

Ross Welch, PhD, Cornell University, said agriculture is no longer solely commodity driven. Instead, it’s becoming demand driven, controlled by consumer food preferences. Consequently, there’s a need to give farmers the ability to profit from improved nutritional quality. This includes developing ways to protect product identity, along with testing products to show nutrient content.

Welch also discussed agricultural tools that have been proven to be effective at improving nutrition, including biofortification of crops with vitamin A, iron and zinc; selenium fertilizers; iodine in irrigation water; and zinc foliar sprays and soil fertilizers.

Animal geneticist and cattle breeder Alison Van Eenennaam, PhD, University of California, Davis, said there are three, often contentious world views regarding animal proteins.

The production challenge, also called sustainable intensification, focuses on improving the unit efficiency of food production. Little attention is paid to the potential negatives of overconsumption of animal products in the developing world.

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Postdoctoral position in Iron Metabolism and Erythropoiesis

UW-Madison-Nutritional Sciences

Applicants are sought for studies on how dysregulation IRP1-HIF-2 α axis contributes to diseases of erythropoiesis and iron metabolism (Cell Metabolism 17:282). We study the iron- and oxygen regulated RNA binding protein IRP1 that coordinates the fate of mRNA controlling iron metabolism with those involved in erythropoiesis. A central focus is how IRP1 links alterations in cellular iron and oxygen status to changes in the translational of the mRNA encoding the transcription factor HIF-2 α and the ensuing transcriptional output it dictates. Goals of our studies include new paradigms through which integrated control of HIF-2 α synthesis and action in physiological and pathophysiological scenarios influences human health. Contact: Prof. Rick Eisenstein, UW-Madison-Nutritional Sciences; (Eisenstein@nutrisci.wisc.edu).



Don't forget to visit the ASN booth in the Exhibits today.

Sustainability

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The consumption challenge requires changes to the dietary drivers that determine food production. It places strong emphasis on first-world chronic diseases rather than third-world hunger and micronutrient deficiencies.

The serio-economic challenge considers both production and consumption and sees the problem as one of imbalance. More localized, diverse systems are seen as better able to deliver the full range of micronutrients needed for good health. This challenge also considers the role livestock plays in the livelihoods of poor people.

“It’s important to have a nuanced conversation about animal proteins,” Eenennaam said. “There is no one perfect or sustainable source of food. If you look at input and emissions per calorie, you can make even fruits and vegetables look bad.” And research shows that sugars, fats and oils have the lowest energy use, blue-water footprint and greenhouse gas emissions compared to other foods.

Greg Miller, PhD, National Dairy Council, said the dairy sector employs 1 billion people worldwide. According to research conducted by the NDC’s Sustainability Alliance, dairy accounts for about 2 percent of U.S. greenhouse gas emissions, and 5 percent of total water use.

The NDC’s goal is to reduce dairy’s greenhouse gas consumption by 20 percent by 2020, through feed efficiency, herd management and animal health, manure management, product transport route design and efficiency, and energy efficiency, Miller said.

This is part of an ongoing effort to reduce dairy’s ecological impact, he said. From 1944 to 2007, the dairy industry cut its cropland requirements by 90 percent, slashed water use by 65 percent and reduced its carbon footprint by 63 percent.

A group of dairy farms has also created a manure-management company called Newtrient. “Dairy farmers think in the future, they’re going to make more money from manure than from milk,” Miller said.

Miller said new research, which will be presented during the poster session, shows that increasing total dairy consumption in the U.S. to three servings daily would result in \$17.7 billion in cost savings for treatment of coronary heart disease, stroke, hypertension and type 2 diabetes.

Sonny Ramaswamy, PhD, National Institute of Food and Agriculture, USDA, said nutritional security isn’t a problem for the distant future; it’s happening right now. Climate change,

land and water constraints, increasing urbanization, environmental degradation, changing income and diets, conflict and migration, trade and globalization, positive health incomes, and an anti-science environment are all existential threats.

Food and agriculture accounts for 80 percent of all fresh water use, 80 percent of ammonia, 17 percent of energy and 25 percent of all greenhouse gases, Ramaswamy said. NIFA’s goal is to cut that ecological footprint by at least 50 percent by 2030.

Another NIFA initiative is reducing food waste, which Ramaswamy said will cut water use and greenhouse gases. Americans waste about \$120 billion worth of food a year, he said. NIFA’s goal is to reduce this by 50 percent in 2030.

Ramaswamy also discussed NIFA’s interest in funding technological

Little attention is paid to the potential negatives of overconsumption of animal products in the developing world.

“It’s important to have a nuanced conversation about animal proteins. There is no one perfect or sustainable source of food. If you look at input and emissions per calorie, you can make even fruits and vegetables look bad.”

—Animal geneticist and cattle breeder Alison Van Eenennaam, PhD, University of California, Davis

advances, including precision foods, which combine human, plant and animal genomic, epigenomic and microbiome data with wearable sensors like Fitbit that analyze food consumption, lifestyle and behavior.

Naomi Fukagawa, MD, PhD, Beltsville Human Nutrition Research Center, USDA, said challenging questions involving food quality vs. quantity include: What constitutes a healthy diet that is available, affordable and culturally sensitive? How do agricultural practices and climate change affect the nutrient content of foods? How do functional foods enhance health? Will genetically modified organisms used in animal feed affect the quantity and quality of animal foods? What is the appropriate balance between plant and animal-based foods from the perspective of choice, climate, land and water availability? And finally, what about pollinators?

Session III: Considerations for success, engagement and resource development to move forward

John Finley, PhD, USDA-ARS, said a systems approach to agri-nutrition-health research quantifies inputs and outputs, is realistic about challenges, integrates environmental variables and is economically sustainable. And rather than the old reductionist approach, a systems approach integrates data to achieve a higher maximum.

Finley said the ARS is quickly learning lessons associated with this approach, including: public-private partnerships are important, stakeholder input is critical, integrated data is not easy to come by, and developing a 30,000-foot strategy while still encouraging innovation is key.

Rob Bertram, PhD, Bureau for Food Security, U.S. Agency for International Development, said in terms of nutrition, there is a lot to be happy about: worldwide hunger and poverty rates are declining, although they’re lagging in Africa; stunting rates are dropping, but are still high; there is now global commitment to the United Nations’ Sustainable Development Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture; and the U.S. Congress passed the Global Food Security Act last year.

Feed the Future, the U.S. Government’s Global Hunger and Food Security Initiative, is looking at both the human impact and economic cost of poor nutrition. “Nutrition is not one-size-fits-all at the global level,” Bertram said. For instance, he cited a Lancet paper showing that nutrition-specific interventions only cut under-nutrition by 20 percent. Other research shows that increasing women’s education and status accounts for 33 percent of improved nutrition outcomes; better water and sanitation accounts for 35 percent; and agricultural interventions account for 32 percent.

Sander Janssen, PhD, Earth Informatics, Alterra Centre for Geoinformation, Wageningen University, said agriculture, nutrition and public health is like a multi-headed hydra. Integrating the trio includes speaking a common language and creating “big data” out of open data.

Janssen said big data challenges include the three V’s: volume, variety and veracity. He’s working with GODAN (Global Open Data for Agriculture and Nutrition) to address this through initiatives like improved interoperability of data and tools for assessment.

“The whole chain from data to wisdom needs to be working,” he said. “Users and beneficiaries need to be incorporated in developing data-

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—Rob Bertram, PhD, Bureau for Food Security, U.S. Agency for International Development

intensive applications.”

Sylvia Rowe, MA, Tufts University, discussed how to achieve a transparent, actionable framework for public-private food and nutrition research.

Key criteria include having a clearly defined goal for benefitting the public, objective measures that can be tracked, and distinct rules of who’s going to do what. “Acknowledge there may be deal breakers precluding the formation of an effective partnership in the first place,” Rowe said.

Other principles include balanced decision-making and input; and clearly articulated, fundable and doable research questions. “Everyone may have a bias; acknowledge it and figure out how to work with those biases,” Rowe said.

Combs concluded the workshop with a look at the next steps for achieving the session goals. He suggested assembling and tasking multidisciplinary research teams; creating multi-institutional consortia of academic, government and corporate research institutions, and developing a new pedagogy for holistic thinking about agriculture-food-nutrition health systems.

ASN can assist by establishing a new RIS and figuring out ways to effectively work together with scientific societies in agriculture, ecology and climate fields, Combs said.

Partnership

Continued from page 2

a more cohesive plan. So it partnered with PHP.

Since then, Kwik Trip has increased the amount of produce, whole-grain items and low-fat dairy it carries in its stores. It has its own bakery and kitchens, so has worked on creating healthier recipes. And it restocks produce daily in each store.

“We’re trying to change a perception of what a convenience store sells,” Flint said.

In the first year of its partnership with PHP, Kwik Trip increased pro-

duce sales by 5 percent. The company has also served as a leader for other convenience stores interested in healthy initiatives. Now 1,100 convenience stores partner with PHP, Soler said.

Prudence Pollard, PhD, MPH, RD, Oakwood University, said this historically black university in Huntsville, Alabama, is located in CDC region 4—the least-healthy region in the U.S. Oakwood has been a meat-free campus for 120 years, but wanted to help its students become healthier and more productive citizens.

“It is not just four years, but 40 years we are preparing our students

for,” Pollard said, quoting Oakwood’s president.

This is particularly key for Oakwood, Pollard said, because in 2015, pre-diabetes incidence for the freshmen class was 21 percent, overweight/obesity was 40 percent, prehypertension/hypertension was 25 percent and borderline LDL cholesterol was 16 percent.

Through its partnership with PHA, Oakwood hosts a yearly health fair, stocks vending machines with “healthy” and “healthier” options, teaches personal health, and issues free “health transcripts” to students that cover things like metabolic profiles.

The university also developed eight

principles to guide its curricular and co-curricular environment: sunlight, temperance, adequate rest, nutrition, water consumption, being outdoors, physical fitness and trust in God.

Donna Pomerson, Learning Care Group, said her organization is the second-largest for-profit childcare company in the U.S., encompassing brands like Montessori. It joined PHA in 2014 and identified five healthy-living focus areas for its childcare facilities:

- Menu upgrades: eliminating fried foods, making 88 percent of its grains whole grains, including more fresh fruits and vegetables (even at breakfast) and offering more vegetarian options

- Beverage options: providing 1 percent milk for kids age 2 and older, eliminating all juice

- Physical fitness: instituting a 3 pm daily dance break, adding structured playground activities, and launching an electives program with soccer and other physical activities

- Screen time: engaging parents in strategies to cut screen time

- Infant feeding: providing breastfeeding areas in all schools, partnering with states to be certified as breastfeeding-friendly childcare centers

“Many families come to us because of the progress we’ve made in the last few years” on these initiatives, Pomerson said.



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