

Nutritional Sciences

Congratulations!



Dr. Houtkooper, left, with Interim Director of the Norton School of Family and Consumer Sciences Dr. Dan McDonald
Photo by Joanie Contreras

This fall, **Dr. Linda Houtkooper** received the Professional Achievement Award from the Norton School Council of Alumni and Friends.

Dr. Houtkooper has a long history with the College of Agriculture and Life Sciences, having joined the faculty of the Nutritional Sciences Department in 1986. She is currently a Cooperative Extension Specialist and Professor in the Department of Nutritional Sciences. Previously, she served as head of the Nutritional Sciences Department for 5 years and an Associate Director of Cooperative Extension (CE) for Family, Consumer & Health Sciences programs for 8 years. Dr. Houtkooper's leadership allowed for expansion of CE programs into the area of health through her role as Assistant to the Director of CE for the Community Health Advancement Program (CHAPS). The CHAPS partnership reached over a million people statewide through programs designed to promote health and prevent chronic disease. Another successful program, Walk Across Arizona, developed into a statewide program to encourage individuals and families to increase their physical activity.

Dr. Houtkooper's education and research programs focus on the integration of nutrition and physical activity to promote optimal health, osteoporosis prevention, and sports performance. She co-directed bone-health focused research studies including the Bone Estrogen and Strength Training (BEST) study and served as the director of the nutrition component of the

Combined Events Athlete Development Program, sponsored by USA Track & Field. In that role, Dr. Houtkooper developed methods and models for assessment of body composition in children and elite athletes in USA Track & Field development programs. Dr. Houtkooper was one of the first three nutrition professionals selected to serve on the Science Advisory Board of the President's Council on fitness, sports and nutrition to advance the integration of healthy nutrition into the mission of the Board.

Dr. Houtkooper can be reached at: houtkoop@cals.arizona.edu

Dr. Melanie Hingle was selected as one of four 2018-2019 Udall Center Fellows. The Udall Center for Public Policy has administered the Udall Center Fellows Program since its inception in 1990. The program promotes positive change in public policy by creating the space for faculty to prioritize their policy-relevant research for an entire semester.

Dr. Hingle's project, *Developing a model of diet-sensitive disease prevention for food insecure populations* aims to reduce chronic disease risk that is often increased in populations that experience food insecurity. She will partner with the Community Food Bank of Southern Arizona and El Rio Community Health Center to design a program for individuals at risk of type 2 diabetes. Hingle sees this effort as an opportunity to build a "culture of health" in southern Arizona to ensure communities have the opportunity to make healthy diet and lifestyle choices that are consistent with their beliefs and customs.

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THE UNIVERSITY OF ARIZONA
COLLEGE OF AGRICULTURE & LIFE SCIENCES
Nutritional Sciences

Graduate Programs

Alumni Spotlight: Dr. Emily Goldberg



Emily Goldberg, PhD is a postdoctoral associate at Yale University. After completing her BS with a double major in Biochemistry and Molecular Biophysics and Molecular and Cellular Biology at The University of Arizona, she continued with her PhD in Nutritional Sciences under the mentorship of Dr. Janko Nikolich-Zugich, chair of the Department of Immunobiology. Emily completed her dissertation in 2014, which focused on metabolic interventions that extend lifespan (including calorie restriction and rapamycin feeding) and their impacts on adaptive immunity during aging. Dr. Goldberg found that each of these manipulations impose distinct stress that further degrades the already deteriorated adaptive immune response in old mice. Her work underscores the importance of experimentally testing the function of the immune system in aging/lifespan studies, which are performed in specific pathogen-free facilities that do not model normal human exposure to environmental pathogens. Her research also highlights that immune function and metabolic status are intrinsically linked.

Dr. Goldberg's interest in immune-metabolic interactions has continued in her postdoc under the mentorship of Dr. Vishwa Deep Dixit in the departments of Comparative Medicine and Immunobiology at Yale University. Here she has focused on the anti-inflammatory mechanisms of ketone bodies on innate immunity. She has made the important discovery that the most abundant ketone body, β -hydroxybutyrate (BHB), specifically inhibits the NLRP3 inflammasome in macrophages and neutrophils to limit IL-1 β secretion and dampen excessive inflammation. This work has led to two postdoctoral fellowships from the American Federation for Aging Research and the American Heart Association. Dr. Goldberg has had numerous abstracts accepted for oral presentations and travel awards, and she was featured in the fall of 2018 as an invited speaker at the 6th Global Symposium on Ketogenic Therapies for Neurological Disorders in Jeju, South Korea. Most recently Dr. Goldberg has been awarded a K99 Pathway to Independence career transition grant from the National Institute on Aging to continue studying the anti-inflammatory mechanisms of ketone bodies and how this can be harnessed to alleviate age-related inflammation and chronic disease.

Dr. Goldberg's long-term vision is to understand how immune-metabolic changes during aging promote inflammation. She is particularly interested in immune-adipose interactions and how ectopic lipid accumulation in many tissues, including the thymus, bone marrow, lymph nodes, liver, and muscle contributes to local inflammation and functional decline. She hopes that by unravelling these mechanisms she will identify pathways that can be targeted to reverse dysregulated inflammation and improve immune responsiveness to infection and vaccination in the elderly.

When she is not in the lab Dr. Goldberg can usually be found in the pottery studio or exploring New England. As a Tucson native, she has been enjoying experiencing all four seasons in Connecticut, but ranks shoveling snow as her least-favorite activity.

PSM Alumni Spotlight: Viridiana Beltran, PSM, RDN

This November, Viridiana Beltran, PSM, RDN and Department of Nutritional Sciences alumnus, spoke at a health professions panel in Yuma at Kofa High School. The panel was to introduce students in HOSA (Health Occupations Students of America) to health professionals working in the community, learn about what they do, hear advice, etc. HOSA clubs all over the country engage high school students who have an interest becoming health professionals. In Yuma County alone, there are over 500 students involved in HOSA. Viridiana participated in the panel, in part, to help elevate awareness of the nutrition and dietetics profession to HOSA students in Arizona, and to speak about nutrition/dietetics as a career option within the health professions.



Viridiana Beltran, second from right, speaks to HOSA students in Yuma, AZ.

Undergraduates

Kayla Christiansen Works as a Student Tutor at the SALT Center



My name is Kayla Christiansen. I'm a junior here at The University of Arizona, and I'm majoring in Nutritional Sciences with a Dietetics emphasis and a minor in Psychology. I plan on attending graduate school after I graduate in 2020. I'm extremely passionate about the health sciences and hope to pursue a career in the medical field upon completing my graduate degree. I recently began working as a student tutor at the Strategic Alternative Learning Techniques (SALT) Center on campus. I have worked as a caregiver and a respite/habilitation provider since high school, but decided to apply for a tutoring position because I really enjoy helping others. I know from personal experience that the university's tutoring services can have a drastically positive impact on the academic success of students.

This summer, I was given the opportunity to receive training on specific strategies intended to help individuals with learning and attention challenges. Once I completed the necessary requirements, I was able to start holding individual tutoring sessions with students. I absolutely love my job. It's been an amazing learning experience and has not only pushed me to become a better person, but also provided me with insight into the unique struggles some students face in pursuing an undergraduate degree. I

love my students and admire their perseverance and ability to work hard despite the various challenges they face. I have a lot of respect for the staff members at the SALT center as well; I think they have a phenomenal program that benefits students and contributes substantially to the University's goal of facilitating an effective environment. I've really been blessed by the whole experience.

Contributed by NSC major Kayla Christiansen: kaylaac98@email.arizona.edu

Samuel Aigbogun Volunteers at Apollo Middle School

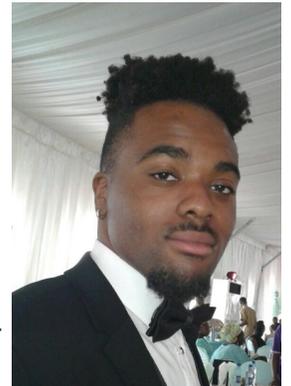
For the past semester, I have been volunteering as a teaching assistant for the home economics classroom at Apollo Middle School. The School is located on the south side of Tucson and includes predominantly Hispanic/Latino students aged 11-14. The students come from various backgrounds, and a small percentage are preparing themselves for ROTC. They even dress in military uniform!

I wasn't sure what to expect, as I didn't have prior experience with middle school students. But the teacher, Chef Wayne Marvin, was very welcoming and explained how the class goes and how to best interact with the students. He told me how middle school students act and what kind of foods the student are allowed to make.

When I arrive to volunteer on Fridays, I wait for the students to finish their bell work before coming into the kitchen to cook. Usually the students cook foods like potato cakes, pizza, pasta and occasionally macaroni and cheese. Chef Marvin gives the students instructions before cooking and then I help the students during cooking to make sure that they know what they're doing. I always emphasize that safety and cleanliness are most important while cooking. After everyone is finished cooking, we all enjoy the opportunity to experience the food that the students made.

My experience at the Apollo Middle School was an extremely enjoyable one. The school's faculty all have friendly, professional relationships and enjoy each other's company. I enjoyed all the conversations I've had with the students. The best way to talk to them is to never belittle them, because they're children. Even though they're young you can still have meaningful conversations with them. You can tell that most of these students have good people skills with colorful personalities. If I were to describe my experience at Apollo Middle School in one word it would be 'delightful'.

Contributed by NSC major Samuel Aigbogun:
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Research

Research Highlight: Dr. Floyd “Ski” Chilton



Dr. Chilton recently moved from Wake Forest School of Medicine to The University of Arizona where he is a Professor in Nutritional Sciences, Director of the Precision Wellness Initiative, and Associate Director of the BIO5 Institute. Dr. Chilton is passionate about providing solutions to overcome physical and emotional suffering so that people can live better, more joyful lives. He is a successful innovator in a wide range of areas including an academic professor (with over 140 scientific publications), an entrepreneur (starting several companies and one non-profit organization), and an inventor (holding over 25 patents). Dr. Chilton is widely recognized in academia and industry for his work on nutrition in the context of variation in the human genome and has been a pioneer in the areas of personalized or precision nutrition and wellness. Dr. Chilton has over 30 years of continuous funding from the National Institutes of Health.

Specifically, Dr. Chilton’s work examines how genetic and epigenetic variations interact with human diets (especially the modern Western diet) to drive inflammation and inflammatory disorders (including cardiovascular disease and cancer), as well as psychiatric/developmental disorders (ADHD, autism spectrum disorder, and depression). These precision-, individualized- and population

-based nutrition research approaches provide a wide range of opportunities to benefit humans that include: 1) providing long-sought pathogenetic mechanisms that underscores the different biologic behavior of inflammatory and metabolic diseases in different racial/ethnic populations; 2) discovering new biomarkers of disease aggressiveness for early diagnostic and therapeutic intervention; 3) revealing new therapeutic strategies using precision gene-based dietary and/or pharmacologic interventions; and 4) creating therapeutic foods that optimize immune system and brain development for different populations around the world.

In addition to his scientific work, Dr. Chilton is the founder and president of the not-for-profit, Heroes Helping Heroes and Chairman of the Board of the Persecution Project Foundation. Heroes Helping Heroes provides mentoring, health and wellness solutions to orphans and foster children in the US and Africa. The Persecution Project Foundation brings crisis relief, education and hope to victims of civil war, genocide and religious persecution within Sudan.

Dr. Chilton has also had the opportunity to touch hundreds of thousands of lives as an author of five lay books focused on nutrition, diet, and physical and mental health. These books include *Inflammation Nation* (Simon and Schuster), *Win the War Within* (Rodale), *The Gene Smart Diet* (Rodale) and *Made to Crave Action Plan* (Zondervan). His most recent book, *The Rewired Brain* addresses the issue of the unconscious mind, its capacity to negatively impact our lives, and how thought patterns induce genetic (epigenetic) changes that alter brain circuitry. This gives humans the capacity to rewire and change their minds and thus their lives.

Dr. Chilton can be reached at: fcchilton@email.arizona.edu

Recent Publications:

- Rahbar E, Waits CMK, Kirby EH Jr, Miller LR, Ainsworth HC, Cui T, Sergeant S, Howard TD, Langefeld CD, Chilton FH. (2018) Allele-specific methylation in the *FADS* genomic region in DNA from human saliva, CD4+ cells, and total leukocytes. *Clin Epigenetics*. 10:46.
- Reynolds LM, Howard TD, Ruczinski I, Kanchan K, Seeds MC, Mathias RA, Chilton FH. (2018) Tissue-specific impact of *FADS* cluster variants on *FADS1* and *FADS2* gene expression. *PLoS One*. 13(3).
- Wang M, Chen H, Ailati A, Chen W, Chilton FH, Todd Lowther W, Chen YQ. (2018) Substrate specificity and membrane topologies of the iron-containing ω 3 and ω 6 desaturases from *Mortierella alpina*. *Appl Microbiol Biotechnol*. 102(1):211-223.
- Chilton FH, Dutta R, Reynolds LM, Sergeant S, Mathias RA, Seeds MC. (2017) Precision Nutrition and Omega-3 Polyunsaturated Fatty Acids: A Case for Personalized Supplementation Approaches for the Prevention and Management of Human Diseases. *Nutrients*. 9(11): E1165.
- Rahbar E, Ainsworth HC, Howard TD, Hawkins GA, Ruczinski I, Mathias R, Seeds MC, Sergeant S, Hixson JE, Herrington DM, Langefeld CD, Chilton FH. (2017) Uncovering the DNA methylation landscape in key regulatory regions within the *FADS* cluster. *PLoS One*. 12(9).

Outreach

The University of Arizona Supplemental Nutrition Assistance Program—Education (UA SNAP-Ed)

SNAP-Ed is a nationwide nutrition education and obesity prevention program funded by the United States Department of Agriculture Food and Nutrition Service (USDA-FNS). In Arizona, the Arizona Department of Health Services' Arizona Health Zone administers the SNAP-Ed Program. The AZ Health Zone is a public/private partnership that operates throughout the state to implement policy, systems, and environmental change (PSE) interventions and nutrition and physical activity education to encourage healthy eating and increase physical activity to maintain healthy body weight. Programmatic activities engage people from low-income households that receive or are eligible to receive Supplemental Nutrition Assistance Program (SNAP) benefits. An integral partner in this statewide effort is the UA SNAP-Ed program, formerly known as the University of Arizona Nutrition Network.¹

The Co-Principal Investigator for the AZ Health Zone Cooperative Extension – Nutritional Sciences is Dr. Vanessa A. Farrell and the Principal Investigator of the UA SNAP-Ed is Dr. Scottie Misner.

Contributed by AZ Health Zone Program Coordinator Lauren McCullough: laurenmccullough@email.arizona.edu

1. Bickel, A., D. Duval, V.A. Farrell, L. Houtkooper, J. Vautour and S. Misner. (2018). The Annual Economic Contribution of the University of Arizona, Department of Nutritional Sciences-Cooperative Extension Supplemental Nutrition Assistance Program – Education Spending. University of Arizona College of Agriculture & Life Sciences Cooperative Extension (in review)



Based on the AZ Health Zone's focus group results, the Champions for Change logo was changed to reflect the new aspects of the SNAP-Ed program in Arizona.

Iskashitaa Refugee Network and NSC Team Up to Reduce Food Waste



The Department of Nutritional Sciences (NSC) and Iskashitaa Refugee Network (IRN) are combining efforts to increase involvement in

reducing food waste and increasing food security in communities throughout Tucson. The project, which was funded through a Haury Seed Grant, is aimed at expanding IRN's harvesting capabilities through pre-planned group harvests by contacting and building relationships with communities. The goal is to empower these communities to utilize the resources around them, facilitate bridges between refugees and Tucson's community and resources, and also empower students to be involved and take action.

The six NSC interns from Jennifer Ravia's NSC 395A: *Experiential Learning in Nutritional Sciences* class have had a variety of roles throughout the

semester. Four are harvest interns; they help in both harvest coordination and as harvest co-leads. The harvest interns have worked hard to canvas communities and reach out to neighborhoods. Another student serves as a garden intern; spearheading IRN's efforts to regrow their plot in the UA garden while inspiring refugees and volunteers to get involved. The sixth intern is the edible tree intern; she helps to complete IRN's edible tree book and is being trained to lead an edible tree tour on campus. So far, the project has been able to train interns in harvesting techniques, teach about fruit tree knowledge to both the interns and other community members, as well as form partnerships with several Tucson communities. Besides their individual work, interns also attend events together such as Tucson Botanical Gardens' Urban Garden Festival and Tucson Meet Yourself. Through events like these, the interns can educate the public about IRN's mission and talk about their roles within the organization. The NSC-IRN partnership has allowed for students to be better equipped to address environmental challenges and inspire community members to take action, not only strengthening the organization but also the greater Tucson community and our local food system.

Contributed by NSC major Cristina Moraga Franco: cristinam@email.arizona.edu



Extension

UA Cooperative Extension is Reducing the Risk for Diabetes in Arizona

One in three adults have prediabetes, which means around 1.8 million Arizonans are at high risk for developing type 2 diabetes. The good news is that simple lifestyle changes can greatly reduce the risk for type 2 diabetes. A year-long program called the National Diabetes Prevention Program (DPP) helps people eat healthier diets, be more active, and stay motivated. The DPP was created by the Centers for Disease Control and Prevention (CDC). It is based on research showing that people with prediabetes can cut their risk for type 2 diabetes **in half** by losing 5 to 7 percent of their body weight.

The University of Arizona Cooperative Extension is now offering the Diabetes Prevention Program across the state. Classes are led by trained Extension educators called lifestyle coaches. With classes in Casa Grande, Tucson, Phoenix, Prescott, Nogales, and Parker, Extension lifestyle coaches are helping people cut their risk of developing type 2 diabetes. **Program participants have already lost over 200 lbs!**

One participant said "Thanks to your class, I've become more mindful of what and how much food I eat and drink. I'm striving to be a healthier me. I'm now at a healthier weight, and I'm very glad about achieving that goal."

Contributed by Dr. Vanessa da Silva: vdasilva@email.arizona.edu

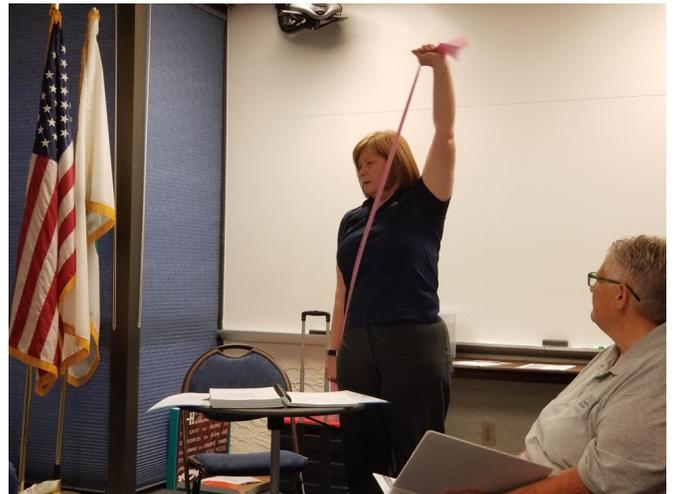


Photo: Lifestyle coach Dr. Cathy Martinez demonstrates the use of a resistance band to her DPP class in Casa Grande, Pinal County, AZ.

Photo credit: Chris Crockett, Multimedia Specialist, Pinal County Extension Office

Invest in Nutritional Sciences

Supporting the Department of Nutritional Sciences has never been easier! All contributions are made to the UA Foundation, a 501(c)3 organization. Through this foundation donors may choose how their gift is applied. All gifts are tax deductible. Visit <http://nutrition.cals.arizona.edu/invest> for direct links to the UA Foundation for secure, online giving.

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