

Non-Technical Summary

Older Americans are the fastest growing segment of the U.S. population; the U.S. Census Bureau projects that the older adult population will comprise 20% of the population by 2030, up from 12.4% in 2006 [1]. Older adult wellness is a growing public health concern as Baby Boomers approach retirement age. The National Institute on Aging (2011 – ref needed) estimates that by the year 2040, there will be a doubling of adults age 65 to 84 and a quadrupling of those age 85+ by 2050. However, there is limited research with respect to dietary and other lifestyle factors involved in achieving or optimizing their health status.

Fruit, vegetables and whole grains contain numerous bioactive compounds that are involved in reducing oxidative damage in tissues, improving gastrointestinal function, and other physiological processes. There is a growing body of evidence from human and animal studies that fruit and vegetable consumption reduces risk for various age-related diseases [2] including heart and vascular disease [3-6], some cancers [7, 8] and eye diseases [9].

Approximately 35% of adults over the age of 75 have 3 or more chronic conditions, including, hypertension, heart disease, diabetes, arthritis, and macular degeneration/blindness (citation). Poor physical health and negative health outcomes exacts an economic toll, as older adults who are disabled by or hospitalized for largely preventable, diet-related diseases represent a disproportionate amount of national health care costs [10].

Currently, modifiable lifestyle practices are placing older adults at risk of chronic disease and disability. Over half (58.2%) of older adults are not meeting the intakes of fruit while over two-thirds (70.4%) are not consuming the recommended vegetable intakes (<http://www.cdc.gov/aging/pdf/state-aging-health-in-america-2013.pdf>). Additionally, only 4% of older women and 11% of older men consumed at least six daily servings of grain products (with at least three being whole grain) (citation). Physical activity participation declines prior to age 64 (Schoenborn & Adams, 2010) such that, by age 65, 87% of adults are physically inactive (CDC, 2007). Currently, only 10% of adults 64-74 years, and 7% of those 75+ years engage in physical activities that enhance and maintain strength and endurance 2+ days per week. Similar statistics describe those who engage in physical activities promoting development and maintenance of cardiorespiratory fitness. This physical inactivity is an important contributor to many of the age-associated declines that affect quality of life and severity of chronic diseases (Romack, 2004). Evidence is mounting to demonstrate that changes in diet and exercise that are implemented in the later years can be effective in both extending life and improving quality of life.

The NE 1039: Changing the Health Trajectory for Older Adults through Effective diet and Activity Modifications multistate project takes an interdisciplinary approach toward older adult wellness through nutrition and physical activity interventions. **The key objectives of this multistate initiative are: (1) Explore environmental changes to increase fruit, vegetable, and whole grain intakes in older adults; (2) Examine the effect of combined physical activity and dietary interventions on body composition, physical performance, and coronary heart disease (CHD) risk factors in overweight and obese older adults; and (3) Investigate determinants of macular pigment density as a biomarker of carotenoid status and eye disease risk in older adults.** There is clearly a need for additional research that will lead to improvements in both diet and exercise behaviors in older Americans, and that will address health disparities that exist among the elderly, particularly those from minority groups and of lower socioeconomic status.

Some of the projects objectives and related experiments are listed below.

1. Environmental changes to increase fruits, vegetables, and whole grain intakes and physical activity in older adults.
2. Evaluation of education programs on whole grain, fruit and vegetable consumption and/or physical activity in older adults.
3. Design and evaluation of a motivational curriculum and modified recipes to increase fruits and vegetables in a multicultural population of older adults.
4. Maximizing the benefits of fruits, vegetables, and whole grains by keeping foods safe among recipients of home delivered meals.
5. To develop effective intervention strategies to improve physical performance and reduce CHD risk factors in overweight and obese older adults.
6. Investigating determinants of macular pigment density as a biomarker of carotenoid status and eye disease risk in older adults.

Measurement of Progress and Results

Outputs:

- “Is it Whole Grain? Three Steps to Three Servings of Whole Grains” curriculum developed and tested
- Culturally sensitive recipe book with traditional recipes was created
- Intergenerational exergaming physical activity program with accompanying curriculum and website was developed and pilot-tested
- URIDEAL CURRICULUM
- Anthropometric tools to use with the Mini Nutritional Assessment were created and validated
- Socioecological model for environmental factors affection older adult nutrition and food selected developed
- Generated an antibody for the clock protein BMAL1, which will help with future biomedical research pertaining to telomere length assays.

Outcomes or projected Impacts:

- The physical activity interventions resulted in:
 - Improved functional fitness and physical activity participation for those who participated in an exergaming physical activity program
 - URIDEAL SUMMARY OF PHYSICAL ACTIVITY OUTCOMES
- The nutrition education interventions resulted in:
 - Improved their whole grain knowledge and increased intention to consume whole grains following a three-week whole grain program
 - Lowered nutritional risk six months following a monthly nutrition program through the congregate meal program
 - Improved fruit and vegetable intakes
- Found that as a woman’s age, body mass index (fatness), and number of pregnancies increased, the probability of being diagnosed with adult macular degeneration increased.

Although not a project objective several needs and preference assessments were conducted to assist with the completion of Objectives, 2, 3 and 5.

- Nutritional risk was assess in 992 community-residing older adults to identify needs for future nutrition education interventions
- The environmental factors affecting older adult nutrition that can help direct communities to promote healthy foods in older adults were assessed in four states.

Accomplishments

Major goals of the project

Objectives

1. To examine novel interventions to increase fruit, vegetable and whole grain intake and physical activity in older adults.
 - a. Objective 1, Experiment 1: Environmental changes to increase fruits, vegetables, and whole grain intakes and physical activity in older adults.
 - b. Objective 1, Experiment 2: Pre-testing a whole grain foods education program
 - c. Objective 1, Experiment 3: Design and evaluation of a motivational curriculum and modified recipes to increase fruits and vegetables in a multicultural population of older adults
 - d. Objective 1, Experiment 4: Maximizing the benefits of fruits, vegetables, and whole grains by keeping foods safe among recipients of home delivered meals.
2. To identify effective biomarkers and other indicators that reflect improvement in diet (fruit, vegetables, and whole grains) and physical activity and chronic disease risk in older adults.
 - a. Objective 2, Experiment 1: The effect of combined physical activity and dietary interventions on body composition, physical performance, and CHD risk factors in overweight and obese older adults.
 - b. Objective 2, Experiment 2: Investigating determinants of macular pigment density as a biomarker of carotenoid status and eye disease risk in older adults.
 - c. Objective 2, Experiment 2a: To determine the impact of pregnancy and lactation on lutein status, retinal health and MPOD; Does number of pregnancies impact lutein/n-3 FA status and health risk with aging?
 - d. Objective 2, Experiment 2b: To assess the impact of exercise and weight loss on carotenoid status and macular pigment optical density (MPOD); to characterize the transport of lutein and MPOD as impacted by exercise and/or weight loss.

What was accomplished under these goals?

Collectively, this project provided approximately 5,135 older adults access to nutrition and/or physical activity interventions that lead to improved lifestyle practices (e.g., increased physical activity, increase produce intake, increased whole grain knowledge, etc). Over 900 older adults were screened for nutritional risk. Early identification of nutritional risk could potentially save about \$1,500 annually in health care cost for these individuals if they made lifestyle changes to lower their nutritional risk as the interventions recommended. Numerous curriculums and educational materials were developed.

What opportunities for training and professional development has the project provided?

Summary Table for Training Opportunities and Professional Development

Site	Type of Training	Who was Trained and Number Trained	Type of Professional Development	Who Received Professional Development and Number Receiving It
ISU	LIFE Program delivery	20 Extensions Staff	NA	NA
ISU	LIFE Program delivery	79 younger adults/college students	NA	NA
ISU	WIN Program Delivery	7 Extension Staff	NA	NA

ISU	Graduate research	3 MS Students	NA	NA
ISU	NA	NA	EB Conference	1 PI (Dr Francis) 2 MS Student
ISU	NA	NA	Society of Nutrition Education and Behavior	1 PI (Dr Francis)
LSU	Graduate research	MS Students	NA	NA
LSU	Undergraduate training	Undergrad Students	NA	NA
LSU	NA	NA	EB Conference	1 PI (Dr Lammi-Keefe) Grad and Undergrads
LSU	NA	NA	American Oil Chemists Society's Annual Meeting	1 PI (Dr Lammi-Keefe) Grad and Undergrads
NYU	Graduate research	MS Students	NA	NA
NYU	Undergraduate training	Undergrad Students	NA	NA
Rutgers	Validation of antibody, telomere length, ChIP assay with ChIP-slot blot	1 PI (Dr Belden) 1 PhD student	NA	NA
UDC	Graduate research including "cognitive interviewing" and SPSS	2 MS Students 3 Undergrad Students	NA	NA
UMass	Graduate research	1 PhD Student	NA	NA
UMass	NA	NA	EB Conference	1 PI (Dr Cohen) 1 PhD student
UNH	Graduate research	1 MS Student	NA	NA
UNH	Research Methods and Protocols	5 Undergrad Students	NA	NA
URI	Graduate Research	3 MS Students 5 Undergrad Students	NA	NA
URI	NA	NA	EB Conference	1 MS Student
URI	NA	NA	ACSM Conference	1 PI (Dr Delmonico) 2 MS Students
WVU	Nothing to report.	Nothing to report.	Nothing to report.	Nothing to report.

How have the results been disseminated to communities of interest?

The results from the various research projects have been disseminated in the communities of interest via press releases, professional poster and oral presentations (e.g., Experimental Biology, Food and Nutrition Conference and Expo, Society of Nutrition Education and Behavior, Gerontological Society of America, etc.), professional journals (e.g., Journal of Nutrition in Gerontology and Geriatrics, Journal of Aging and Physical Activity, Medicine & Science in Sports & Exercise, etc), websites (e.g., www.extension.iastate.edu/life), news shows (e.g., <http://whotv.com/2014/02/25/weekly-workout-breathing-life-into-exercise/>), and community interest groups (e.g., food policy council).

What do you plan to do during the next reporting period to accomplish the goals?

Nothing to report as this was the final year of the NE1039.

How many students (graduate and undergraduate) were involved?

Student Category	ISU	LSU	NYU	Rutgers	UDC	UMass	UMN	UNH	URI	WVU
PhD Grad Student				1		1				
MS Grad Student	2	1	3		2			1	2	
Undergrad Student	3		4		3			2	5	

Target Audience

The target audience for the whole project was older adults. The different institutions targeted various sub-populations within that group. Iowa State University targeted older adults 50+ years of age. Louisiana State University looked at young adults to see how early life habits, including nutrition, may be determinants of health and wellness later in life. New York University The target population for Rutgers at this point is other researchers looking at the biology of aging. The targeted population at UDC was those 60+ years of age, who were primarily African-American men and women in senior congregate sited. The Office of Aging and urban communities were the targeted populations for outreach and extension work. The University of Massachusetts targeted community leaders that work directly with older adults (in a broad sense); senior center directors, researchers, etc. University of New Hampshire targeted older adults, 65+ years of age. The researchers at URI targeted older, obese women in the state of Rhode Island. The WVU site also targeted the same community leaders in older adult health as UMass.

Products

Summary Table of Products

Citation	Type	Status	Year	Acknowledge NIFA Support	Site
Strand KA, Francis SL, Margrett JA, Franke WD, Peterson MJ. Community-based exergaming program increases physical activity and perceived wellness in older adults. <i>Journal of Aging and Physical Activity</i> , 22(2), 364-371. http://dx.doi.org/10.1123/JAPA.2012-0302	Journal Article	Published	2014	Yes	ISU

Citation	Type	Status	Year	Acknowledge NIFA Support	Site
Francis SL, MacNab L, Shelley M. A theory-based newsletter nutrition education program reduces nutritional risk and improves dietary intake for congregate meal participants. <i>Journal of Nutrition in Gerontology and Geriatrics</i> , 33:91-107. http://dx.doi.org/10.1080/21551197.2014.906336	Journal Article	Published	2014	Yes	ISU
Francis, S.L., Margrett, J.A., Hoerr, K., Heinz, M., Peterson, M., Franke, W. (Under review). Intergenerational exergaming program effects on functional fitness and well-being among rural-residing older adults. <i>Journal of Aging and Physical Activity</i> .	Journal Article	Under Review	NA	Yes	ISU
Hoerr, K., Francis, S.L., Margrett, J., Peterson, M., & Franke, W. (Under review). Promoting the Congregate Meal Program to the Next Generation of Rural-Residing Older Adults. <i>Journal of Nutrition in Gerontology and Geriatrics</i> .	Journal Article	Under Review	NA	Yes	ISU
Francis, S.L. & MacNab, L. Is It Whole Grain?" program improves older adult whole grain knowledge and increases the desire to eat more whole grains. 2014 Annual Conference Society for Nutrition Education's 40 th Annual Conference, Milwaukee, WI.	SNEB Abstract	Publised	2014	Yes	ISU
Francis, S.L, MacNab, L. Dietary intake frequencies and nutritional risk in community-residing older adults. <i>FASEB J</i> . (28): 1026.6. Poster presentation given at Experimental Biology Conference, San Diego CA 2014.	EB Abstract	Published	2014	Yes	ISU
Francis, S.L, VanHauen, A., Margrett, J., Franke, W., Shelley, M. Predictors of physical activity self-efficacy change for rural-residing older adults. <i>FASEB J</i> . (28): 1021.9. Poster presentation given at Experimental Biology Conference, San Diego CA 2014.	EB Abstract	Published	2014	Yes	ISU
http://www.extension.iastate.edu/life/	Website	Active			ISU
Buck, M, Lewis, M, Durham, H, Childress, C, Gaitan, A, Drewery, M, Pinkston, R, Lammi-Keefe, C. Lifestyle behaviors in early adulthood may be important risk factors for age-related macular degeneration. <i>FASEB J</i> , 2014;28:1025.12.	EB ¹ Abstract	Published	2014	No	LSU
Woolf K, Kiely M, Yazici Y. The relationship between body composition,	EB Abstract	Published	2014	Yes	NYU

Citation	Type	Status	Year	Acknowledge NIFA Support	Site
disease activity, and functional status in adults with rheumatoid arthritis. <i>FASEB Journal</i> 28:1031.15, 2014.					
Woolf K. Gaucher Wellness Day. Center for Musculoskeletal Care. NYU Langone Medical Center. "Incorporating a Healthy Diet into your Life." July 2014.	Community Presentation	NA	2014	No	NYU
Woolf K. Osteoarthritis Wellness Day. Center for Musculoskeletal Care. NYU Langone Medical Center. "Incorporating a Healthy Diet into your Life." October 2014.	Community Presentation	NA	2014	No	NYU
NE-1039 Technical Committee Presentation	Other	Posted on NIMMS	2014	Yes	UDC
Sylvie, A.K., Jiang, Q., and Cohen, N. Identification of environmental supports for healthy eating in older adults. <i>J Nutrition Gerontol Geriatrics</i> 32(2): 161-174, 2013. Reprinted in the Acad of Nutr and Dietetics Healthy Aging Dietetic Practice Group publication, The Spectrum, Fall 2013.	Other	Published	2013	Yes	UMass
LoBuono D, Taetzsch A, Quintanilla D, Maris S, Letendre J, Picard A, Delmonico MJ, Xu F, Lofgren IE, Mahler L. Cognition, Nutrition and Physical Function in Obese Older Women. <i>FASEB J.</i> 2014;28:124.7.	EB Abstract	Published	2014	Yes	URI
Maris SA, Quintanilla D, Taetzsch A, Picard A, J letendre, Mahler L, Lofgren IE, Xu F, Delmonico MJ. Effects of Tai Chi, Resistance Training, and Diet on Physical Function in Obese Older Women. <i>Medicine & Science in Sports & Exercise.</i> 2014;46(5S):133-134.	ACSM ² Abstract	Published	2014	Yes	URI
Quintanilla D, Maris S, Taetzsch A, Picard A, Letendre J, Mahler L, Lofgren IE, Xu F, Delmonico MJ. Effects of Combined Tai Chi, Resistance Training and Diet on Percent Body Fat in Obese Older Women. <i>Medicine & Science in Sports & Exercise.</i> 2014;46(5S).	ACSM Abstract	Published	2014	Yes	URI
Taetzsch A, Lobocono D, Quintanilla D, Maris D, Letendre J, Picard A, Mahler L, Xu F, Delmonico M, Lofgren I. Nutritional Assessment and Status in Older Populations. <i>FASEB J.</i> 2014 28:1026.7.	EB Abstract	Published	2014	Yes	URI
Maris S. The Effects of Tai Chi, resistance training, and diet interventions on physical function in obese older women.	Masters Thesis	Other - Bound	2014	Yes	URI

Citation	Type	Status	Year	Acknowledge NIFA Support	Site
Quintanilla D. Effects of Combined Tai Chi, Resistance Training and Diet on Percent Body Fat in Obese Older Women.	Masters Thesis	Other - Bound	2014	Yes	URI
Taetzsch A. Impact on Nutrition Risk in Community Dwelling Obese Women with a Nutrition and Physical Activity Intervention.	Masters Thesis	Other - Bound	2014	Yes	URI
Beebe N, Magnanti S, Katkowski L, Benson M, Delmonico MJ, Xu F, Lofgren IE. Effects of the Addition of Tai Chi to a Dietary Weight Loss Program on Lipoprotein Atherogenicity in Obese Older Women. <i>J of Alter & Complem Medicine</i> , 19:759-66,2013.	Journal Article	Published	2013	Yes	URI
Maris SA, Quintanilla D, Taetzsch A, Picard A, J letendre, Mahler L, Lofgren IE, Xu F, Delmonico MJ. The Effects of Tai Chi, resistance training, and diet interventions on physical function in obese older women. <i>Journal of Physical Activity and Health</i> .	Journal Article	Resubmit	2013	Yes	URI
Taetzsch A, Quintanilla D, Maris D, Letendre J, Picard A, Mahler L, Xu F, Delmonico M, Lofgren I. Impact on Diet Quality in Community Dwelling Obese Women with a Nutrition and Physical Activity Intervention. <i>Journal of Aging: Research and Clinical Practice</i> .	Journal Article	Accepted	2013	Yes	URI
Xu F, Letendre J, Bekke J, Beebe N, Mahler L, Lofgren IE, Delmonico MJ. The Effects of Tai Chi plus behaviorally-based dietary weight loss on physical functioning and coronary heart disease risk factors in community-dwelling obese older women. <i>Age and Aging</i> .	Journal Article	Under Review	2013	Yes	URI
Delmonico MJ. Guest Speaker, Health Care Services Company: Exercise for seniors	Community Presentation	NA	2013	No	URI
Delmonico MJ. Guest Speaker, Young at Heart Club of Quidnessett Baptist Church: Exercise for Seniors	Community Presentation	NA	2014	No	URI
Delmonico MJ. Guest Speaker, Greater Providence Retired Teachers Association: Exercise for Seniors	Community Presentation	NA	2014	No	URI

¹EB – Experimental Biology Conference, ²ACSM – American College of Sports Medicine Conference

Other Products

Summary Table of Other Products

Product Type	Description	Date and Location	Site
Other: Extension Publication	Francis, S.L., Noterman, A., Heuer, A., Bahls, L. Wellness and Independence through Nutrition (WIN) Guide. 11 pages, revised publication. WIN materials (SNAP funded): Provides information about benefits to SNAP (food assistance) and budget-friendly nutrition tips and are used during WIN outreach sessions.	January 2014	ISU
Other: Extension Publication	Francis, S.L., Heuer, A., Bahls, L. Gardening: Grow Your Wallet Memory game. Activity with card set, new program.	March 2014	ISU
Other: Extension Publication	Francis, S.L. Wellness in Retirement. 4 pages, revised publication. Wellness in Retirement (ISU Extension funded): provides general wellness tips to remain healthy during retirement. It's used as a supplemental material for general Extension programs targeting older adults.	March 2014	ISU
Other: Extension Publication	Francis, S.L. WIN Program Manual. 50 pages, new publication.	May 2014	ISU
Other: Extension Publication	Francis, S.L. WIN Gardening DVD. 6 gardening vignettes, adopted from University of Illinois Extension.	May 2014	ISU
Other: Extension Publication	Francis, S.L. WIN Training DVD. 3 training videos, new product.	May 2014	ISU
Educational Aids or Curricula	Survey instrument to collect quantitative and qualitative data Survey instrument is an interview protocol that uses cognitive interview techniques		UDC
Educational Aids or Curricula	Hands-on and engaging curricula designed to increase consumption of fruits, vegetables, and whole grains		UDC
Educational Aids or Curricula	Support devices and educational aids that help maintain proper consumption of fruits, vegetables, and whole grains Examples include placemats, charts and serving size estimators		UDC
Educational Aids or Curricula	Curriculum designed to encourage elderly to develop good nutritional habits of children for whom they provide care		UDC
Educational Aids or Curricula	Recipe booklet with traditional recipes and life stories of African American elderly men and women Traditional recipes have been modified to increase nutritional density and health. Life stories are used to connect eating traditions and cultures.		UDC
Other: Poster Presentation	Jiang Q, Cohen N. Community Leaders' Perceptions of Important Environmental Factors to Support Healthy Eating among Older Adults. The 17 th Annual School of Public Health and Health Sciences Research Day.	April 2014 UMass Amherst	UMass
Other: Poster Presentation	Metabolic Syndrome and Whole Grain Intake in UNH Men and Women – Gabrielle Mele, Joanne Curran Celentano	May 2014	UNH

		UNH Undergraduate Research Conference	
Other: Multistate Presentation	Is It a Whole Grain? Evaluating the Outcomes – Kristin Davis, Catherine Violette and Joanne Curran Celentano	June 2014	UNH
Other: Departmental Presentation	Graduate seminar – Kristin Davis	March 2014 UNH	UNH
NE1039 Sakai Information Management Site	Lofgren, Delmonico, Xu. It serves as the clearinghouse of our multistate project for all the investigators and USDA representatives. It is used to update members on progress in research, grant opportunities, etc.	First posted in 2010	URI

Changes/Problems (if appropriate, Nothing to Report)

The following sites had no changes or problems to report: ISU, LSU, Rutgers, UDC, UMass, URI, and WVU. A member of the UNH group, Dr. Joanne Curran-Celentano was on medical leave for a portion of the project. The time away and transition back has influenced the ability to maximize involvement.

How the collaboration on NE1039 has benefitted the group members.

Participation in the multistate offers a number of benefits to all of the research team. In addition to share ideas on aging and health, networking with other faculty and students, learning from each other, and receiving constructive feedback. This project has been an excellent vehicle for training undergraduate students in research. Students have received awards from the universities for travel to national meetings to present findings. This has been an opportunity on the management and direction side to establish guidelines for the students working on the project so that there is continuity in laboratory coverage for subjects and communication amongst the students regarding recruitment and scheduling of subjects for assessments and interviews. Three sites utilized the Dietary Screening Tool from Pennsylvania State University (previous multistate member) and are currently working on a joint publication. The URI research team coordinated and actively maintain the multistate Sakai site to help communicate during the year with all the multistate members. The multistate has also provided the opportunity to increase sample size and generalizability by increasing diversity. Two sites took part in the evaluation of the Is it Whole Grains? Curriculum which has become an Extension-delivered program in Iowa. Additionally, four sites took part in the community assessment project coordinated by UMass. Multistate members also have taken advantage of other members expertise – UNH researchers trained two sites on cognitive interview protocols. Two sites provided a clear way to identify whole grains which improved research at the different sites.

1. LA W, S C, D G, W H: **65+ in the United States**. In *Current Population Reports* (Bureau USC ed. Washington DC: US Department of Health and Human Services; 2014).
2. Facchini FS, Humphreys MH, DoNascimento CA, Abbasi F, Reaven GM: **Relation between insulin resistance and plasma concentrations of lipid hydroperoxides, carotenoids, and tocopherols**. *Am J Clin Nutr* 2000, **72**:776-779.
3. Davy BM, Melby CL: **The effect of fiber-rich carbohydrates on features of Syndrome X**. *J Am Diet Assoc* 2003, **103**:86-96.
4. Fitzpatrick DF, Bing B, Maggi DA, Fleming RC, O'Malley RM: **Vasodilating procyanidins derived from grape seeds**. *Ann N Y Acad Sci* 2002, **957**:78-89.

5. Antoch MP, Song EJ, Chang AM, Vitaterna MH, Zhao Y, Wilsbacher LD, Sangoram AM, King DP, Pinto LH, Takahashi JS: **Functional identification of the mouse circadian Clock gene by transgenic BAC rescue.** *Cell* 1997, **89**:655-667.
6. Steinmetz KA, Potter JD: **Vegetables, fruit, and cancer prevention: a review.** *J Am Diet Assoc* 1996, **96**:1027-1039.
7. El-Soheily A, Baylin A, Kabagambe E, Ascherio A, Spiegelman D, Campos H: **Individual carotenoid concentrations in adipose tissue and plasma as biomarkers of dietary intake.** *Am J Clin Nutr* 2002, **76**:172-179.
8. Keevil JG, Osman HE, Reed JD, Folts JD: **Grape juice, but not orange juice or grapefruit juice, inhibits human platelet aggregation.** *J Nutr* 2000, **130**:53-56.
9. Fitzpatrick DF, Fleming RC, Bing B, Maggi DA, O'Malley RM: **Isolation and characterization of endothelium-dependent vasorelaxing compounds from grape seeds.** *Journal of Agricultural and Food Chemistry* 2000, **48**:6384-6390.
10. **Position of the American Dietetic Association: nutrition, aging, and the continuum of care.** *J Am Diet Assoc* 2000, **100**:580-595.