Women's Health & Reproductive Nutrition Report

A quarterly publication of the Women's Health and Reproductive Nutrition Dietetic Practice Group

Winter 2007

Soyfoods and the Health of Menopausal Women

Mark Messina, PhD, MS and Virginia Messina, MPH, RD

Inside this Issue:

Introduction

Soyfoods have played an important role in the diets of many Asian countries for centuries and have been embraced as a source of protein by vegetarians and other health-conscious individuals in non-Asian countries for several decades. But within the past 15 years, soyfoods and soybean constituents have attracted widespread research attention for a variety of purported health benefits unrelated to their nutrient content. Much of this interest can be attributed to the fact that soyfoods are a uniquely rich dietary source of isoflavones. The protein component of the soybean has also been the subject of much research.

Isoflavones exhibit estrogen-like effects under certain experimental conditions, so it is not surprising that there has been particular interest in the impact of soyfoods and isoflavones on the health of menopausal women. In fact, isoflavones have been proposed as alternatives to conventional menopausal hormone therapy. The search for these alternatives has intensified as a result of the disappointing findings from the Women's Health Initiative (WHI).[1, 2] Hormone therapy was associated with increased risks of breast cancer and stroke and had no impact on cognitive function although fracture risk was reduced.

On the basis of nutritional attributes alone – high-quality protein, low saturated fat content, good sources of both essential fatty acids and a variety of vitamins and minerals--it is clear that the soybean and foods made from this legume warrant a larger role in Western diets. Currently, legumes make only a negligible contribution to overall protein intake in Europe[3] and the United States[4]. Among the various legumes, the soybean is an especially good choice because it is extremely versatile and, as discussed below, may have some unique benefits.

Background on Isoflavones

Isoflavones are a subclass of flavonoids that have a very limited distribution in nature.

The three soybean aglycone isoflavones are genistein (4' 5, 7-trihydroxyisoflavone), daidzein (4', 7-dihydroxyisoflavone), and glycitein (7, 4'-dihydroxy-6-methoxyisoflavone). However, in the soybean and non-fermented soyfoods, the isoflavones are present primarily as beta-glycosides (genistein, daidzein, and glycitin) to which is generally attached to the glucose molecule either as an acetyl or malonyl group, making a total of 12 different soybean isoflavone isoforms. Typically, more genistein exists in soybeans and soyfoods than daidzin, whereas glycitin comprises less than 10% of the total isoflavone content of the soybean.[5]

Each gram of protein in soybeans and in traditional soyfoods contains approximately 3.5 mg of isoflavones (isoflavone weight throughout this paper refers to the aglycone weight).[5] However, processing reduces the isoflavone content of some nontraditional soy protein products (such as many meat analogs) by as much as 80%.[5] Mean isoflavone intake of older Japanese adults ranges from 25 mg to 50 mg.[6] The United States Department of Agriculture and Iowa State University collaborated to develop a free, online database of isoflavone content, searchable at: http://www.ars.usda.gov/Services/docs.htm?docid=6382

Isoflavones bind to both estrogen receptor alpha and estrogen receptor beta (ERb) and, for this reason, they are commonly referred to as phytoestrogens. But, because they preferentially bind to and activate ERb,[7-9] they are often classi-

(Continued on page 3)

Women's Health & Reproductive Nutrition Report

Publications Coordinator
Krista Neal, MS, RD, LD

Editorial Board
Jeanne Blankenship, MS, RD, CLE
Sandra Eardley, PhD, RD
Susan DuPraw, MPH, RD
Cathy Fagen, MA, RD

Resource Review
Heather Baden, MS, RD, CDN

Lactation Case Study Coordinator
Karen *Peters, MBA, RD, IBCLC*

Calendar of Events
Allison Starr

The Women's Health & Reproductive Nutrition Report (ISSN 1081-3233) is a quarterly publication of the Women's Health and Reproductive Nutrition Dietetic Practice Group (WHRN DPG) of the American Dietetic Association. The WHRN Report features articles, as well as information on programs, materials, positions, and products for use of its readers. News of members, book reviews, announcements of future meetings, requests for information, or other items of interest to women and reproductive nutrition dietetics practitioners should be sent to the Publications Editor by January 18, 2007.

Subscription information:
Subscriptions are available for those who are ineligible for ADA membership for $32 (domestic); $35 (international) by sending a check to the WHRN Secretary made payable to: ADA WHRN DPG. Back issues of the publication may also be ordered. Members: $5 each; Non-members: $10 each.

We're on the web!

www.whrndpg.org

From the Chair-*Jeanne Blankenship, MS RD*

Although I was too young to appreciate the social climate, I've heard that the 60's marked a period of liberalization for women. One of the most notable women's health changes during this period was the advent and widespread availability of oral contraceptives which led to unprecedented sexual exploration and freedom for women. While oral contraceptive use aided in preventing pregnancy, it did not protect against the dangerous transmission of bacteria and viruses that we continue to see today.

Today we have our own significant revolutions in women's health, though we may not fully appreciate their contributions for years to come. Recently, the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices made the recommendation that all 11-12 year old girls, and possibly those as young as 9 years of age, be vaccinated for the prevention of Human Papilloma Virus (HPV). Along with being associated with genital warts, approximately 70% of cervical cancers can be linked to types 16 and 18 of HPV. The committee also recommended "catch-up" vaccination for females 13-26 years of age. While it won't fully eradicate cervical cancer given the multiple etiologies, this vaccine will greatly reduce this form of women's cancer and will undoubtedly give this generation of females' parents "food for thought."

A more controversial issue in women's health this fall was the approval of emergency contraception (EC) pills as over the counter medications. EC's are drugs taken with 72 hours of intercourse that act both to prevent ovulation or fertilization and possibly post-

(Continued on page 10)

From the Editor—*Krista Neal, MS, RD, LD*

Hello! I hope you are staying warm this winter! This issue brings you articles related to WHRN's activities at FNCE 2006. The first article is from Mark Messina, PhD and Virginia Messina, MPH, RD. Mark Messina presented a very informative lecture on soy products and women's health. Both Mark and his wife, Virginia, have written extensively about soyfoods and vegetarian nutrition. We also have an editorial from Dr .Bruce Hollis, PhD of the Medical University of South Carolina. In Honolulu Dr. Hollis gave an educational session on rethinking vitamin D recommendations. I, personally, was shocked to learn how our current recommendations were determined. In this issue Dr. Hollis gives us a summary of those recommendations. During the member reception, Carol Lammi-Keefe, PhD, RD spoke about perinatal DHA intake. Her article can be found in the fall issue, which is online at www.whrndpg.org. During the WHRN leadership meeting we discussed the results of the membership survey. We are using those results to make future newsletters feature the information you requested. At the Breastfeeding Task Force meeting I learned we have several members who are quite influential in the world of breastfeeding promotion and education. WHRN members also volunteered in the Mother's Room. As a breastfeeding mom, I'd like to thank everyone who was involved. I'd also like to encourage you to volunteer at future FNCEs, it's a fantastic place to take a break and meet other dietitians. I can't wait until next fall when I can meet more of you in Philadelphia!

Soyfoods and the Health of Menopausal Women

(Continued from page 1)

fied as selective estrogen receptor modulators (SERMs).[10-12] However, isoflavones also exhibit a variety of non-hormonal effects in vitro and in some animal models, so even their classification as SERMs does not fully capture all of their properties.[13-19]

Finally, it is important to recognize that, despite sharing some common properties with estrogen, isoflavones and estrogen are quite different molecules and often, in clinical studies, neither soyfoods nor isoflavones affect biological parameters known to be affected by estrogen. For example, whereas estrogen increases levels of C-reactive protein (CRP) and triglycerides (TG) soyfoods and/or isoflavones either have no effects on CRP and TGs or lower them..[12, 20, 21] Therefore, conclusions about the health effects of both isoflavone and soyfoods can accurately be reached only on the basis of direct experimentation.

Coronary Heart Disease (CHD)

In 1999, the U.S. Food and Drug Administration, based on soy protein's cholesterol-lowering effects, approved a health claim for soy protein and coronary heart disease.[22] Soy protein first received widespread attention for its hypocholesterolemic property in 1995, but it now appears the initial estimate of the cholesterol-lowering effects was too high.[23] Recent meta-analyses indicate that soy protein lowers low-density lipoprotein cholesterol LDL from 3 to 5%.[24-27]

Although modest, according to estimates by Law et al.,[28, 29] each 1% reduction in LDL can, over a period of many years, reduce CHD risk from 2-5%. Thus, soy protein can help to reduce CHD morbidity and mortality. Furthermore, in addition to lowering LDL, soy protein lowers serum triglyceride levels ~7%[26] and raises high-density lipoprotein cholesterol 3%,[26] two lipid effects that should further reduce CHD risk.[30, 31]

There are also more speculative data suggesting soyfoods favorably affect several other CHD risk factors, likely because of their isoflavone content. For example, some evidence suggests isoflavone-rich soy protein or isoflavones themselves lower blood pressure,[32, 33] improve systemic arterial compliance[34] and vascular reactivity,[35-38] inhibit LDL oxidation,[39, 40] reduce LDL particle number[41] and increase LDL size.[42] Although the limited or inconsistent data in each of these areas prohibit conclusions from being drawn, intriguing epidemiologic findings support some non-lipid coronary benefits of soyfoods. For example, in a prospective study involving nearly 65,000 postmenopausal Chinese women, risk of non-fatal myocardial infarction was reduced by 86% among women in the fourth quartile of soy protein intake.[43] Such a marked protective effect could not be due to cholesterol reduction alone.

Finally, as recently highlighted by the American Heart Association, many soyfoods contain a heart-healthy balance of fatty acids, high in polyunsaturated fat (78% of total fat) and low in saturated fat (15% of total fat).[44, 45] Furthermore, the soybean is one of the few good plant sources of the essential fatty acid, alpha-linolenic acid,[46] an omega-3 fatty acid that may have independent coronary benefits.[47] Thus, when considering all of the properties of soyfoods, it is clear they can play important roles in heart-healthy diets.

Osteoporosis

Not surprisingly, the estrogen-like effects of isoflavones prompted speculation about their skeletal benefits, although the nonhormonal properties of these soybean constituents may also be relevant to bone health.[48] Epidemiologic studies tend to support this speculation since they generally show that soy intake is positively associated with bone mineral density (BMD)[49] among Asian women. Also, in the only epidemiologic study to include fractures as an end-point, relative risk was reduced by approximately one-third when comparing postmenopausal Chinese women in the 1st and 5thsoy protein intake quintiles.[50] Soy protein intake was especially beneficial among women in this study who were no more than 10 years postmenopausal.

Of course, conclusions about skeletal benefits can be based only on the results from randomized clinical trials. The first human intervention study suggesting isoflavones favorably affect bone health was published in 1998.[51] Since then, more than 25 clinical trials have examined the impact of consuming soyfoods or soy isoflavones on BMD in postmenopausal women. The results from these trials, although inconsistent, generally show reduced bone loss in the intervention group in comparison to the control.[49, 52-55] Interestingly, some studies show bone loss is reduced at both the hip and spine whereas others have found it is re-

(Continued on page 4)

Soyfoods and the Health of Menopausal Women

(Continued from page 3)

duced at one site but not the other. Evidence suggests that soy has the potential to both increase bone formation and decrease bone resorption.[50]

However, the clinical trial results must be interpreted cautiously because most of the trials involved relatively small sample sizes and were conducted for no more than one year in duration. Currently, three large, long-term (2-3 years in duration) trials are underway. These are sponsored by the U.S. government, at a cost of more than $10 million. Findings from these trials may allow more definitive conclusions about the skeletal effects of isoflavones.

Finally, aside from the possible effects of isoflavones, soyfoods can contribute to bone health by providing high-quality protein. Evidence increasingly suggests that adequate protein intake is essential for optimal bone health.[56, 57] Approximately one-third of women in the United States do not meet the recommended dietary allowance for protein; this figure is even higher for older women.[58]

Hot Flashes

Hot flashes are the classic sign of menopause, as well as the most common reason for seeking treatment. A hot flash produces a sudden sensation of warmth or even intense heat that spreads over various parts of the body, especially the chest, face, and head. The hypothesis that isoflavones alleviate hot flashes was first proposed in 1992.[59] In part, this hypothesis was based on the low incidence of hot flashes among women in Japan.[60] Women of Chinese and Japanese ancestry residing in the United States are about one-third less likely to report experiencing hot flashes compared to Caucasian women, as well.[61] In addition, there is limited epidemiologic data indicating high-soy consumers in Japan are less likely to have hot flashes than low-soy consumers.[62, 63]

Despite the intriguing epidemiologic data, only data from clinical trials can firmly establish the ability of soyfoods and isoflavones to alleviate hot flashes. The first such trial was published in 1995.[64] Since then, at least 40 additional clinical trials have examined the impact of isoflavone-rich soy protein or isoflavone supplements (derived from soybeans or red clover) on the alleviation of menopause-related hot flashes. The results from this research have been inconsistent, but several reviews have concluded that there is at least suggestive evidence that these products are efficacious.[65-67]

Furthermore, several explanations for the inconsistent trials results have been proposed. For example, some research suggests that only women with frequent hot flashes will benefit from soy.[68] Other research indicates efficacy may depend upon the way in which a particular person metabolizes isoflavones,[69] which varies greatly among individuals.[70] Finally, a recent analysis concluded that much of the inconsistency in study results is due to the differing content of isoflavone supplements.[71] Clinical trials have used isoflavone supplements varying greatly in genistein content, and only the high-genistein supplements have demonstrated efficacy.

In conclusion, the existing data although inconsistent, provide sufficient support for health professionals to recommend that women try isoflavones (from foods or supplements) for the relief of hot flashes, but not to definitively conclude that these soybean constituents are efficacious.

Breast Cancer

The possibility that soyfoods reduce cancer risk first attracted widespread attention in 1990.[72] Several factors sparked interest in the soy and breast cancer relationship. These include the historically low breast cancer incidence rates in Asia,[73] research demonstrating the potential for soybean isoflavones to exert antiestrogenic effects,[74] and early epidemiologic[75] and rodent[76] studies showing soy intake was protective against breast and mammary cancer, respectively. However, despite the impressive amount of research conducted during the past 15 years, no clear consensus has emerged regarding whether adult soy intake reduces breast cancer risk.[77-95]

Nevertheless, considerable enthusiasm remains for the possibility that soyfood intake contributes to the low breast cancer rate in Asia. But increasingly it appears that the critical period of exposure to soy for breast cancer prevention is childhood and/or adolescence, more so than adulthood. The hypothesis that early soy intake reduces later risk of breast cancer is supported by both epidemiologic[96-98] and animal[99, 100] data and is consistent with mounting evidence that early life events greatly impact breast cancer risk.[101]

Finally, in recent years, the estrogen-like effects of isoflavones have raised concern that soyfoods are contraindicated for women at high risk of breast cancer and breast cancer patients with estrogen-sensitive tu-

(Continued on page 6)

Cast Your Vote!

This year Women's Health and Reproductive Nutrition Dietetic Practice Group will conduct its election of offices online. Please exercise your right to vote to select your future WHRN DPG leaders.

The online polls will open January 15, 2007 (12 a.m. CT) and will close on February 28, 2007 (11:59 p.m. CT).

Visit http://www.eatright.org/elect to view candidate bios and to cast your vote online.
Paper ballots are available upon request by contacting ADA's Practice Team Coordinator, Carl Scott at practice@eatright.org or 800/877-1600 ext. 4815
For Paper Ballot requests: Please include the following information in your requests: Name, Member #, DPG(s) for which you would like to vote, and address.

Paper ballots must be postmarked or faxed by February 23, 2007.

Elections for ADA leadership positions will be held February 1-March 3, 2007.

Legislation Update--*Dee Sandquist, MS, RD*

The American Dietetic Association holds a public policy workshop in Washington DC every Spring. The ADA Public Policy Workshop (PPW) is scheduled for April 23-25, 2007 at the Renaissance Hotel, Washington, DC. Download the PPW Registration form at http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/advocacy.html (scroll to the bottom of the page). The PPW is an important grassroots effort and is hosted by ADA Washington's office, Policy Initiatives & Advocacy Team. This workshop is designed to provide attendees the opportunity to visit Capitol Hill and discuss ADA's priority issues with their Representatives and Senators. The Public Policy Worship will brief ADA members on congressional action related to food, nutrition and health.

Congress returns to Washington before changing of the "Guard"
The 109th Congress has much leftover business to tend to before the new Congress takes over. Some of the bills are upcoming with hope of passing include most of the appropriation bills to fund the government. It now appears that Congress will be unable to reach agreement on most of these bills and will pass a continuing resolution to fund the government until February or March.

There was considerable hope that the Senate would pass the Ryan White CARE Act reauthorization. The House passed the bill making Medical Nutrition Therapy a Core Medical Service. However, it now appears that this bill will not pass, meaning that the Congress will have to start from scratch and draft a new bill in January.

Editor's Note: Just before this newsletter went to print, Congress did pass the Ryan White Care Act reauthorization. For more information on the RWCA, please contact ADA's Director of Government Relations, Ron Smith at rsmith@eatright.org.

Soyfoods and the Health of Menopausal Women

(Continued from page 4)

mors. These concerns exist despite the better survival rates of Japanese, in comparison to Western breast cancer patients, even after controlling for stage of diagnosis.[102-106] Although the isoflavone genistein does stimulate the growth of existing mammary tumors in ovariectomized athymic mice implanted with estrogen-receptor positive mammary cancer cells, animal studies often poorly predict results in humans.[107] Even in this rodent model, unprocessed soyfoods do not stimulate tumor growth,[108] and the addition of flaxseed or flax lignans inhibit the tumor stimulatory effects of genistein.[109, 110]

Furthermore, recent human evidence, although not definitive, suggests neither soyfoods nor isoflavone supplements are contraindicated for breast cancer patients or women at high-risk of breast cancer. For example, unlike conventional hormone therapy,[111] neither soyfoods nor isoflavones increase breast tissue density.[90, 91, 112] Also, in a small one-year study, isoflavones were found not to increase breast cell proliferation in breast cancer patients.[94] In addition, over a five-year period, soyfood intake was not associated with the disease-free survival of Chinese breast cancer patients, the majority of whom were estrogen-receptor positive.[113] Nevertheless, until more definitive data are available, breast cancer patients should discuss any dietary changes with their primary health care practitioner.

Intake Recommendations

Mean daily adult Japanese soy protein intake is approximately 8 to 10 g,[6] but there is epidemiologic evidence indicating the health status of Asian men and women who consume above average amounts of soy is superior to those who consume the average amount or less.[114] On the basis of clinical and epidemiologic data and the importance of consuming a varied diet, a reasonable soy intake goal is 15 to 20 g protein and 50 to 75 mg isoflavones per day. These amounts are provided by approximately two to three servings of traditional foods. A serving is for example, 3-4 ounces of tofu, 8 ounces of soymilk, and 2 ounces of soynuts.

References

1. Cauley JA, Robbins J, Chen Z, et al. Effects of estrogen plus progestin on risk of fracture and bone mineral density: the Women's Health Initiative randomized trial. JAMA 2003;290(13):1729-38.

2. Writing Group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmeno-

(Continued on page 12)

Upcoming Conferences—

Taken from NIH – Division of Nutrition Research Coordination: http://www.dnrc.nih.gov/dnrc/calendar.htm

JFebruary 2007

-21 - **Proven Approaches to Nutrition Education: The Johns Hopkins Hospital Continuing Nutrition Education Series 2006-2007.** Baltimore, MD; (410) 955-6716

-22-24 - **2007 Active Living Research Conference.** Coronado, CA; http://www.activelivingresearch.org/index.php/Annual_Conference_2007/386

March 2007

-29-30 - **4th Annual Pediatric Healthy Weight Summit "Childhood Obesity: Prevention and Treatment Using Cognitive and Behavioral Tools to Motivate Behavioral Change".** Greenville, NC. Contact Yancey Crawford; crawfordy@ecu.edu; http://http://www.ecu.edu/pedsweightcenter/

April 2007

-12-17 - **Annual Meeting of the American Alliance for Health, Physical Education, Recreation, and Dance.** Baltimore, MD; http://www.aahperd.org/convention

-17 - **29th Annual Nutritional Concerns Conference .** Albany, NY. Contact Diane Whitten; 518-885-8995; dsh23@cornell.edu

-23-25 - **American Dietetic Association's 2007 Public Policy Workshop .** Renaissance Hotel, Washington, DC; http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/events.html

-27 -2 May 2007 - **"Great Ideas Converge - Bridging the Gap" - Annual NWA Conference 2007 .** David L. Lawrence Convention Center , Pittsburgh, PA; http://www.nwica.org/

Join the WHRN list serve by sending a message to

WHRN_list-subscribe@yahoogroups.com

EXECUTIVE COM MITTEE

Chair
Jeanne Blankenship, MS, RD, CLE
916/739-0461
jbship@att.net

Chair-Elect
Cathy Fagen, MA, RD
562/595-7930 (Work)
562/989-8679 (Fax)
cfagen@memorialcare.org

Secretary
Egondu Onuoha, RD
Emo9004@nyp.org

Treasurer
Jamillah Hoy-Rosas, MPH
jrh218@nyu.edu

COORDINATORS AND COMMITTEE CHAIRS

Nominating Committee Chair
Barbara Dubois, DTR
860/302-0893 Cell
rdubois03@snet.net

Nominating Committee Chair-Elect
Judith E. Brown, PhD, RD
Brown_j@epi.umn.edu

Awards Chair and Industry Relations
Darlene Husch, MA, RD, CDE
908/654-7098 H
darhusch@verizon.net

FNCE Coordinator
Laura Couillard, MS, RD
757/599-7917 Home
Lcouillard@ace-rd.com

Reimbursement/Legislation Coordinator
Dee Sandquist, MS, RD
dsandqui@swmedctr.com

Membership Committee Coordinators
Margarette Williamson, MPH, RD, LD
404/377-4099 W
404/377-3364 Fax
wrmargar@bellsouth.net

Heather Baden, MS, RD, CDN
914/481-6138
heather@hbnutrition.com

Lara Englebardt Metz, MS, RD
lara@kkgbodyfuel.com

Web Site and List Serve Coordinator
Kathleen Pellechia
301-504-6096
kpellechia@nal.usda.gov

Publications Coordinator
Krista Neal, MS, RD, LD
512/341-4400 ext 2309
kristakaye@hotmail.com

Calendar of Events and Member Publications
Allison Starr
212/327-3046 (H)
646/245-7874 (cell)
abd237@nyu.edu

Resource Review
Heather Baden, MS, RD, CDN
914/481-6138
heather@hbnutrition.com

ADA Professional Issues Delegate
Alyce Thomas, RD
973/754-2596
973/754-9773 (Fax)
thomasa@sjhmc.org

ADA Practice Team Liaison
Susan DuPraw, MPH, RD
800/877-1600 ext 4814
SDuPraw@eatright.org

WHRN Membership Reception, Honolulu, Hawai'i

Back row: Barbara DuBois, Krista Neal, Cathy Fagen, Laura Couillard, Jamillah Hoy-Rosas, Susan DuPraw, Alyce Thomas.

Front row: Ginger Carney, Egondu Onuoha, Margarette Williamson,

Would you like to see your name on this page? We're looking for an Assistant Publications Coordinator. For more information, contact Krista Neal, kristakaye@hotmail.com or Cathy Fagen, cfagen@memorialcare.org

Invited Editorial: Vitamin D Requirements for Optimal Human Health: Now Is the Time to Make a Realistic Recommendation—Bruce W. Hollis, PhD,

Medical University of South Carolina, Department of Pediatrics, Darby Children's Research Institute

In 1963, Drs. Blumberg, Forbes and Fraser convened a meeting to make recommendations with respect to vitamin D intake (1). From that conference came the recommendation that infants and children consume 400 IU/d vitamin D to prevent rickets. The scientific basis for that dose was that it approximated what was in a teaspoon of cod liver oil, and this had long been considered safe and effective in preventing rickets (2). This was actually a very good recommendation for infants and children given the scientific method of the day. However, the additional recommendation that followed was arbitrary and, in my opinion, very detrimental to human health. That recommendation was based on "the hypothesis of a small requirement" for vitamin D in adults, and it recommended one-half the infant dose to ensure that adults obtain some vitamin D from the diet (1). In England, the adult requirement of only 100 IU/d was substantiated on the basis of findings in adult women with severe nutritional osteomalcia whose bones demonstrate a response when given this amount (3). As a result, a 200 IU/d recommendation was made, which still stands today (4).

As science became more sophisticated with regard to vitamin D nutriture our guidelines and recommendations did not, basically because of ignorance and inappropriate interpretation of data. In 1971, Haddad and Chyu (5) published a remarkable paper that described a method to measure circulating 25-hydroxyvitamin D [25(OH)D], the biomarker of nutritional vitamin D status (6). In this paper they assessed circulating 25(OH)D levels in normal volunteers, biliary cirrhosis patients and lifeguards. Since the "normal volunteers" were asymptomatic for disease, their circulating 25 (OH)D level was designated as "normal" while the sun-drenched lifeguards possessed circulating 25 (OH)D levels 2.5 times "normal". I contend that the data were interpreted inappropriately. The lifeguards' circulating levels of 25(OH) D should have been defined as "normal" and thus a target level to be achieved by the population in general. One can forgive the misinterpretation of the data 35 years ago but to carry it forth to the present day is negligence and a convenient way to justify the current AI of 200 IU/d for vitamin D. To properly define "normal" 25(OH)D status in humans, it makes more sense to measure 25(OH)D in "healthy subjects" who are sunbathers, fieldworkers, or other individuals who work outside, who are not overly clothed, and who are without sun block. Humans did not evolve in today's sun-shy culture, so "normal" with respect to circulating 25(OH)D levels should not be defined by the current average or median population level. In sun-rich environments where clothing or cultural practices do not prevent sun exposure, circulating 25(OH)D ranges from 54-90 ng/ml (5, 7, 8). Thus, we must be very careful how we define "normal" or adequate or sufficient with respect to circulating 25(OH)D.

Humans receive almost all of their vitamin D from solar exposure. A total body exposure to noon-day sunlight in the summer in North American for 10-12 minutes in a Caucasian will generate and release 10,000-20,000 IUI of vitamin D_3 into the circulation (6). This amount will vary by season, latitude, time of day and skin pigmentations (8-13). I have always been flabbergasted that the human body is capable of making these levels of vitamin D_3 while people have been advised to avoid the sun or wear sunscreen, and are recommended to take the AI of 200 IU/d for vitamin D replacement. This has been a perfect recipe for the current epidemic of vitamin D deficiency. This epidemic can and is being addressed at several levels. First, clinical reference laboratories are no longer using the Gaussian distributions for the reporting of "normal" circulating vitamin D levels. They are now based on the current biomarker data (6). Thus, a report from these laboratories will now tell the physician that a 25(OH)D level <32 ng/ml (80 nmol) is deficient and must be dealt with. Also, there is serious consideration at government levels to review the current AI's and actually establish a much higher DRI for vitamin D. Let us all hope that this happens in the near future. In the meantime I would suggest that everyone take the upper safe intake level for vitamin D which is 2,000 IU/d. You and your patients will be healthier for it.

References

1. Blumberg, R., Forbes, G., and Fraser, D. 1963. The prophylactic requirement and the toxicity of vitamin D. *Pediatrics* 31:512-525.
2. Park, E.A. 1940. The therapy of rickets. *JAMA* 115:370-379.
3. Smith, R., and Dent, C.E. 1969. Vitamin D requirements in adults. Clinical and metabolic studies on seven patients with nutritional osteomalacia. *Bibl Nutr Dieta* 13:44-45.
4. 1997. Standing Committee on the Scientific Evaluation of Dietary Reference Intakes. Dietary Reference Intakes: Calcium, Phosphorus, Magnesium, Vitamin D and Fluoride. Washington, D.C.: National Academy Press.
5. Haddad, J.G., and Chyu, K. 1971. Competitive protein-binding radioassay for 25-

(Continued on page 9)

(Continued from page 8)

hydroxycholecalciferol. *J Clin Endocrinal Metab* 33:992-995.
6. Hollis, B.W. 2005. Circulating 25-hydroxyvitamin D levels indicative of vitamin sufficiency: Implications for establishing a new effective DRI for vitamin D. *J Nutr* 135:317-322.
7. Haddock, L., Corcino, J., and Vazquez, M.D. 1982. 25(OH)D serum levels in the normal Puerto Rican population and in subjects with tropical sprue and parathyroid disease. *Puerto Rico Health Science* 1:85-91.
8. Matsuoka, L.Y., Wortsman, J., Hanifan, N., and Holick, M.F. 1988. Chronic sunscreen use decreases circulating concentrations of 25-hydroxyvitamin D: A preliminary study. *Arch Dermatol* 124:1802-1804.
9. Clemens, T., Henderson, S.L., Adams, J., and Holick, M.F. 1982. Increased skin pigment reduces the capacity of skin to synthesize vitamin D_3. *Lancet* 9:74-76.
10. Matsuoka, L.Y., Wortsman, J., and Hollis, B.W. 1990. Use of topical sunscreen for the evaluation of regional synthesis of vitamin D_3. *J Amer Acad Dermatol* 22:772-775.
11.Webb, A.R., Kline, L., and Holick, M.F. 1988. Influence of season and latitude on the cutaneous synthesis of vitamin D_3 synthesis in human skin. *J Clin Endocrinal Metab* 67:373-378.
12. Matsuoka, L.Y., Wortsman, J., Haddad, J.G., and Hollis, B.W. 1989. *In vivo* threshold for cutaneous synthesis of vitamin D_3. *J Lab Clin Med* 114:301-305.
13. Matsuoka, L.Y., Wortsman, J., Haddad, J.G., Kolm, P., and Hollis, B.W. 1991. Racial pigmentation and the cutaneous synthesis of vitamin D. *Arch Dermatol* 127:536-538.

What Nutrition Professionals Need to Know about Breastfeeding Multiples—*April Rudat, MS Ed, RD, LDN*

Did you know 128,665 sets of twins were born in the U.S. alone in 2003 (1)? In addition, 7,110 mothers bore triplets, 468 bore quadruplets, and 85 bore quintuplets or more (1). Added together, 136,328 mothers had the opportunity to provide their babies—over 270,957 of them—with the best possible start in life by breastfeeding. How many of these women breastfed or attempted to breastfeed their multiples? How many were told that they "couldn't" breastfeed by their families, by health care practitioners, and by society?

Breastfeeding initiation rates are indeed on the rise with 71% of women beginning breastfeeding (1,2). However, only 36% of women are breastfeeding at the six-month mark (2). There is no official data available showing how many mothers of multiples initiate and continue breastfeeding. Therefore, it is imperative for dietitians to engage in the promotion of breastfeeding for all mothers for as long as possible.

Advantages of Breastfeeding

The advantages of breastfeeding multiples are similar to breastfeeding singletons. Breastfeeding has advantages for babies to include optimal and customized nutrition, immune enhancing properties, protection against infectious and non-infectious disease, protection against allergies and intolerances, decreased risk of diarrhea and respiratory infections, decreased risk of childhood obesity, increased cognitive function, decreased risk for heart disease, an increased bond with their mother, and many other benefits (3).

Some of the advantages of breastfeeding can be even more important to the mothers of multiples. Immediately following labor, breastfeeding has been shown to promote faster shrinking of the uterus and reduce postpartum bleeding (3). Prospectively, breastfeeding delays the return of the menstrual cycle, which in turn, delays the risk of breast and ovarian cancers (3). For chronic disease prevention, breastfeeding can help improve bone density, decrease the risk of a hip fracture, and improve blood glucose control in those with gestational diabetes (3). Emotionally, breastfeeding provides a strong bond between mother and

(Continued on page 10)

What Nutrition Professionals Need to Know about Breastfeeding Multiples

(Continued from page 9)

babies, and it enhances the self-esteem of the mother (3). Finally, breastfeeding saves on time since mothers do not have to prepare and mix formula, and it saves dollars spent on formula (3).

The Role of the Dietitian

Registered dietitians need to be able to provide individuals and communities with information on how to breastfeed successfully, including information on how to breastfeed multiples successfully. With their knowledge and some additional training in lactation, RD's can provide mothers with support, education, and the message that they *can* breastfeed their multiples. While lactation consultants teach mothers *how* to breastfeed, dietitians can encourage mothers so they will *continue* to breastfeed.

Obtaining Lactation Training

Since Dietetics Programs and Dietetic Internships/Coordinated Programs of Study often provide little training in the area of lactation education, registered dietitians must seek additional training in order to support breastfeeding mothers. To date, there are several options available, discussed below, and new opportunities are constantly arising.

Registered Dietitians can contact their local La Leche League to obtain information on local educational opportunities. In addition, interested individuals can become La Leche League leaders, which include training to help other breastfeeding mothers (www.lalecheleague.org). Some state WIC and Extension programs offer lactation trainings. For example, UCLA Extension offers lactation training in 32 states (www.uclaextension.edu/healthsci), and the WIC program in Texas offers breastfeeding courses (www.dshs.state.tx.us/wichd/lactate/courses.shtm). Dietitians can also check out the International Lactation Consultant Association's (ILCA) website at: www.ilca.org. The association provides a complete listing of lactation trainings and continuing education opportunities. ILCA also conducts trainings and meetings.

Finally, to become an "International Board Certified Lactation Consultant" (IBCLC), interested parties must obtain continuing education hours in lactation management, obtain practice hours, and sit for an exam. Complete guidelines for becoming an IBCLC are available at The International Board of Lactation Consultant Examiners' website: www.iblce.org.

References

1. Martin, JA, Hamilton, BE, Sutton, PD, Ventura, SJ, Menacker, F, & Munson, ML. Births: Final data for 2003. National Vital Statistics Reports 2005; 54(2): 1-116. Retrieved February 22, 2006 from http://www.cdc.gov/nchs/data/nvsr/nvsr54/nvsr54_02.pdf.

2. Centers for Disease Control and Prevention. Breastfeeding: Frequently asked questions. Retrieved March 13, 2006, from http://www.cdc.gov/breastfeeding/faq/index.htm.

3. Journal of the American Dietetic Association. Position of the American Dietetic Association: Promoting and supporting breastfeeding. J American Diet Assoc 2005; 105: 810-18.

April Rudat is currently working to publish her book, "Oh Yes You Can Breastfeed Twins." Visit April's website at:
www.ohyesyoucanbreastfeedtwins.com

Chairs's Column

fertilization implantation of a blastocyst (embryo). The Food and Drug Administration approved the use of Plan B (two 750 µg levonorgestrel pills) from pharmacies staffed by a licensed pharmacist for women 18 or older; a prescription-only form of Plan B will remain available for young women aged 17 and younger. The availability of EC's increases a woman's options when faced with a potential unwanted pregnancy.

Finally, breast cancer rates in the US are down by as much as 11%. Researchers postulate that discontinuation of hormone replacement therapy (HRT) may be a major reason for the decline. Many women stopped taking HRT after the results of the Women's Health Initiative Study were announced in 2002.

In this issue, issues affecting women such as menopause and vitamin D are addressed by our FNCE speakers, Drs. Messina and Hollis. These topics, like those above, are hot topics in women's health. Don't forget, the Listserv is a great place to weigh in on these and other topics and is one of the many benefits of membership! One more reminder, please remember to cast your vote for the next class of WHRN leaders!

Breastfeeding Case Studies– Egondu Onuoha, MS, RD, CDN, IBCLC, RLC, CDE

CASE I

Candice is an 18-year-old mother and is nursing her child Jane. Jane is only two weeks old and her mother indicated she feels "gas bubbles coming from her breast" as well as "a tingling sensation in both breasts after every feeding." Mother has also complained of pain in both breasts, under the nipple and areola for the past three days.

Upon clinical observation, you have noticed the baby latches on correctly and sucks for 15-20 minutes on one breast and about 10 minutes on the other. However, after nursing the baby, the mother feels a "tingling sensation" which lasts for approximately two minutes. During this "tingling sensation" she tenses her face and her body and has to bend over. She has come to you asking for help.

EXPLANATION

Do a physical examination of mother and baby. If latch is okay, rule out other possible causes of pain:

- Poor latch
- Vasospasm/Raynauld's phenomenon
- Eczema, Psoriasis, dermatitis
- Mastitis
- Thrush – candidiasis or bacterial infection

Check mom for:

- Traces of white fungus in the folds of nipple or breast
- Cracked nipples
- Nipples may appear normal, red, pink, shiny, flaky and/or have a rash with tiny blisters
- Vaginal yeast infection

Check baby for:

- White patches on baby's gums, cheeks, palate, tonsils and/or tongue surrounded by diffuse redness
- Diaper rash
- Whitish sheen to the inside of the lips or saliva
- Gassiness and fussiness

Treatment

- Usually with antibiotics – referral to the primary care provider may be necessary
- Air dry nipples and when possible, expose them to the sun for a few minutes
- Throw away disposable breasts pads as soon as they become wet
- Wear 100% cotton underpants and bras that can be washed in hot water and/or bleach to kill spores.
- Take 1 tablet acidophilus daily for 2 weeks beyond disappearance of symptoms.
- Restrict alcohol, cheese, honey, sugar, etc. – referral to the RD may be necessary.
- Breastfeeding should continue while under treatment.

CASE II

Nena's baby, Didi is six weeks old and was born on the day of a blizzard (January 7, 1996). She was delivered by a midwife, weighed 7lbs. 2ozs. at birth and has been exclusively nursing without any problems. Nena has an older child Janet who was born June 1992 and was also delivered by the midwife. Nena did not take any of her daughters to the doctor until they were six weeks old.

At the six-week check up for Didi, the doctor told her that the baby was jaundiced and had a total bilirubin concentration of 10mg/dl. The doctor advised her to discontinue breastfeeding for five days and return the following week. After seeing the doctor, she frantically called indicating that "her breastmilk is poisoning her baby" and she must stop breastfeeding.

After calming down, she also revealed that she had noticed a similar yellowing of the skin and mucous membranes after Janet was born.

EXPLANATION

In very rare instances, jaundice is believed to be caused by a factor present in the mother's milk. This type of jaundice is referred to as breastmilk jaundice or late-onset jaundice. It occurs in less than one percent of infants.

Late-onset jaundice develops extremely slowly and may not become apparent until between the fourth and seventh days of life, after mature milk has begun to replace colostrum. Bilirubin reaches a maximum concentration by the second or third week and may persist through the sixth week of life. The baby is lively and does not appear to be sick. No correlation exists with weight loss or gain, and stools are normal.

Late-onset jaundice is a self-limiting and benign condition. Diagnosis depends on circumstantial evidence, because no easy, rapid laboratory test exists. All other causes, including infection, should be ruled out in the usual manner and a thorough history taken, including medications and family history. Usually, 70% of the previous children of the given mother whose infant has breast milk jaundice have been jaundiced.

The mother admits that the first child, Janet had a similar condition, but was born in the summer months and the situation resolved by itself.

(Continued on page 16)

Soyfoods and the Health of Menopausal Women

(Continued from page 6)

pausal women: principal results From the Women's Health Initiative randomized controlled trial. JAMA 2002;288(3):321-33.

3. Schneider AV. Overview of the market and consumption of pulses in Europe. Br J Nutr 2002;88 Suppl 3:S243-50.

4. Smit E, Nieto FJ, Crespo CJ, Mitchell P. Estimates of animal and plant protein intake in US adults: results from the Third National Health and Nutrition Examination Survey, 1988-1991. J Am Diet Assoc 1999;99(7):813-20.

5. Murphy PA, Song T, Buseman G, et al. Isoflavones in retail and institutional soy foods. J Agric Food Chem 1999;47 (7):2697-704.

6. Messina M, Nagata C, Wu AH. Estimated Asian adult soy protein and isoflavone intakes. Nutr Cancer 2006;55(1):1-12.

7. An J, Tzagarakis-Foster C, Scharschmidt TC, Lomri N, Leitman DC. Estrogen Receptor beta -Selective Transcriptional Activity and Recruitment of Coregulators by Phytoestrogens. J Biol Chem 2001;276(21):17808-14.

8. Margeat E, Bourdoncle A, Margueron R, Poujol N, Cavailles V, Royer C. Ligands Differentially Modulate the Protein Interactions of the Human Estrogen Receptors alpha and beta. J Mol Biol 2003;326(1):77-92.

9. Kostelac D, Rechkemmer G, Briviba K. Phytoestrogens modulate binding response of estrogen receptors alpha and beta to the estrogen response element. J Agric Food Chem 2003;51 (26):7632-5.

10. Brzezinski A, Adlercreutz H, Shaoul R, et al. Short-term effect of phytoestrogen-rich diet on postmenopausal women. Menopause 1997;4:89-94.

11. Diel P, Geis RB, Caldarelli A, et al. The differential ability of the phytoestrogen genistein and of estradiol to induce uterine weight and proliferation in the rat is associated with a substance specific modulation of uterine gene expression. Mol Cell Endocrinol 2004;221(1-2):21-32.

12. Yildiz MF, Kumru S, Godekmerdan A, Kutlu S. Effects of raloxifene, hormone therapy, and soy isoflavone on serum high-sensitive C-reactive protein in postmenopausal women. Int J Gynaecol Obstet 2005;90(2):128-33.

13. Constantinou A, Huberman E. Genistein as an inducer of tumor cell differentiation: possible mechanisms of action. Proc Soc Exp Biol Med 1995;208(1):109-15.

14. Sarkar FH, Li Y. Soy isoflavones and cancer prevention. Cancer Invest 2003;21(5):744-57.

15. Barnes S. Soy isoflavones--phytoestrogens and what else? J Nutr 2004;134(5):1225S-8S.

16. Akiyama T, Ogawara H. Use and specificity of genistein as inhibitor of protein-tyrosine kinases. Methods Enzymol 1991;201:362-70.

17. Akiyama T, Ishida J, Nakagawa S, et al. Genistein, a specific inhibitor of tyrosine-specific protein kinases. J Biol Chem 1987;262(12):5592-5.

18. Constantinou A, Kiguchi K, Huberman E. Induction of differentiation and DNA strand breakage in human HL-60 and K-562 leukemia cells by genistein. Cancer Res 1990;50(9):2618-24.

19. Kim H, Peterson TG, Barnes S. Mechanisms of action of the soy isoflavone genistein: emerging role for its effects via transforming growth factor beta signaling pathways. Am J Clin Nutr 1998;68(6 Suppl):1418S-25S.

20. Teede HJ, Dalais FS, McGrath BP. Dietary soy containing phytoestrogens does not have detectable estrogenic effects on hepatic protein synthesis in postmenopausal women. Am J Clin Nutr 2004;79(3):396-401.

21. D'Anna R, Baviera G, Corrado F, Cancellieri F, Crisafulli A, Squadrito F. The effect of the phytoestrogen genistein and hormone replacement therapy on homocysteine and C-reactive protein level in postmenopausal women. Acta Obstet Gynecol Scand 2005;84(5):474-7.

22. Food Labeling: Health Claims; Soy Protein and Coronary Heart

Disease. In: Federal Register: (Volume 64, Number 206)]; 1999:57699-733.

23. Anderson JW, Johnstone BM, Cook-Newell ME. Meta-analysis of the effects of soy protein intake on serum lipids. N Engl J Med 1995;333(5):276-82.

24. Balk E, Chung M, Chew P, et al. Effects of soy on health outcomes. Evidence report/technology assessment No. 126 (prepared by Tufts-New England Medical Center Evidence-based Practice Center under Contract No. 290-02-0022.) AHRQ Publication No. 05-E024-2. Rockville, MD Agency for Healthcare Research and Quality; July 2005.

25. Weggemans RM, Trautwein EA. Relation between soy-associated isoflavones and LDL and HDL cholesterol concentrations in humans: a meta-analysis. Eur J Clin Nutr 2003;57 (8):940-6.

26. Zhan S, Ho SC. Meta-analysis of the effects of soy protein containing isoflavones on the lipid profile. Am J Clin Nutr 2005;81(2):397-408.

27. Sacks FM, Lichtenstein A, Van Horn L, Harris W, Kris-Etherton P, Winston M. Soy protein, isoflavones, and cardiovascular health: an American Heart Association Science Advisory for professionals from the Nutrition Committee. Circulation 2006;113(7):1034-44.

28. Law MR, Wald NJ, Thompson SG. By how much and how quickly does reduction in serum cholesterol concentration lower risk of ischaemic heart disease? BMJ 1994;308(6925):367-72.

(Continued on page 13)

Soyfoods and the Health of Menopausal Women

(Continued from page 12)

29. Law MR, Wald NJ, Wu T, Hackshaw A, Bailey A. Systematic underestimation of association between serum cholesterol concentration and ischaemic heart disease in observational studies: data from the BUPA study. BMJ 1994;308(6925):363-6.

30. Toth PP. High-density lipoprotein and cardiovascular risk. Circulation 2004;109(15):1809-12.

31. Jeppesen J, Hein HO, Suadicani P, Gyntelberg F. Triglyceride concentration and ischemic heart disease: an eight-year follow-up in the Copenhagen Male Study. Circulation 1998;97 (11):1029-36.

32. He J, Gu D, Wu X, Chen J, Duan X, Whelton PK. Effect of soybean protein on blood pressure: a randomized, controlled trial. Ann Intern Med 2005;143(1):1-9.

33. Yang G, Shu XO, Jin F, et al. Longitudinal study of soy food intake and blood pressure among middle-aged and elderly Chinese women. Am J Clin Nutr 2005;81(5):1012-7.

34. Nestel PJ, Yamashita T, Sasahara T, et al. Soy isoflavones improve systemic arterial compliance but not plasma lipids in menopausal and perimenopausal women. Arterioscler Thromb Vasc Biol 1997;17(12):3392-8.

35. Colacurci N, Chiantera A, Fornaro F, et al. Effects of soy isoflavones on endothelial function in healthy postmenopausal women. Menopause 2005;12(3):299-307.

36. Squadrito F, Altavilla D, Crisafulli A, et al. Effect of genistein on endothelial function in postmenopausal women: a randomized, double-blind, controlled study. Am J Med 2003;114 (6):470-6.

37. Squadrito F, Altavilla D, Squadrito G, et al. Genistein supplementation and estrogen replacement therapy improve endothelial dysfunction induced by ovariectomy in rats. Cardiovasc Res 2000;45(2):454-62.

38. Lissin LW, Oka R, Lakshmi S, Cooke JP. Isoflavones improve vascular reactivity in post-menopausal women with hypercholesterolemia. Vasc Med 2004;9(1):26-30.

39. Wiseman H, O'Reilly JD, Adlercreutz H, et al. Isoflavone phytoestrogens consumed in soy decrease F(2)-isoprostane concentrations and increase resistance of low-density lipoprotein to oxidation in humans. Am J Clin Nutr 2000;72(2):395-400.

40. Tikkanen MJ, Wahala K, Ojala S, Vihma V, Adlercreutz H. Effect of soybean phytoestrogen intake on low density lipoprotein oxidation resistance. Proc Natl Acad Sci U S A 1998;95 (6):3106-10.

41. Allen JK, Becker DM, Kwiterovich PO, Lindenstruth KA, Curtis C. Effect of soy protein-containing isoflavones on lipoproteins in postmenopausal women. Menopause 2006.

42. Desroches S, Mauger JF, Ausman LM, Lichtenstein AH, Lamarche B. Soy protein favorably affects LDL size independently of isoflavones in hypercholesterolemic men and women. J Nutr 2004;134(3):574-9.

43. Zhang X, Shu XO, Gao YT, et al. Soy food consumption is associated with lower risk of coronary heart disease in Chinese women. J Nutr 2003;133(9):2874-8.

44. Kris-Etherton PM. AHA science advisory: monounsaturated fatty acids and risk of cardiovascular disease. J Nutr 1999;129 (12):2280-4.

45. Kris-Etherton PM, Krummel D, Russell ME, et al. The effect of diet on plasma lipids, lipoproteins, and coronary heart disease. J Am Diet Assoc 1988;88(11):1373-400.

46. Wu Z, Rodgers RP, Marshall AG. Characterization of vegetable oils: detailed compositional fingerprints derived from electrospray ionization fourier transform ion cyclotron resonance mass spectrometry. J Agric Food Chem 2004;52 (17):5322-8.

47. Brouwer IA, Katan MB, Zock PL. Dietary alpha-linolenic acid is associated with reduced risk of fatal coronary heart disease, but increased prostate cancer risk: a meta-analysis. J Nutr 2004;134(4):919-22.

48. Branca F. Dietary phyto-oestrogens and bone health. Proc Nutr Soc 2003;62(4):877-87.

49. Messina M, Ho S, Alekel DL. Skeletal benefits of soy isoflavones: a review of the clinical trial and epidemiologic data. Curr Opin Clin Nutr Metab Care 2004;7(6):649-58.

50. Zhang X, Shu XO, Li H, et al. Prospective cohort study of soy food consumption and risk of bone fracture among postmenopausal women. Arch Intern Med 2005;165(16):1890-5.

51. Potter SM, Baum JA, Teng H, Stillman RJ, Shay NF, Erdman JW, Jr. Soy protein and isoflavones: their effects on blood lipids and bone density in postmenopausal women. Am J Clin Nutr 1998;68(6 Suppl):1375S-9S.

52. Ye YB, Tang XY, Verbruggen MA, Su YX. Soy isoflavones attenuate bone loss in early postmenopausal Chinese women : A single-blind randomized, placebo-controlled trial. Eur J Nutr 2006.

53. Wu J, Oka J, Tabata I, et al. Effects of Isoflavone and Exercise on BMD and Fat Mass in Postmenopausal Japanese Women: A 1-Year Randomized Placebo-Controlled Trial. J Bone Miner Res 2006;21(5):780-9.

54. Newton KM, Lacroix AZ, Levy L, et al. Soy protein and bone mineral density in older men and women: A randomized trial. Maturitas 2006.

55. Huang HY, Yang HP, Yang HT, Yang TC, Shieh MJ, Huang SY. One-year soy isoflavone supplementation prevents early postmenopausal bone loss but without a dose-dependent effect. J Nutr Biochem 2006.

56. Roughead ZK. Is the interaction between dietary protein

(Continued on page 14)

Soyfoods and the Health of Menopausal Women

(Continued from page 13)

and calcium destructive or constructive for bone? J Nutr 2003;133(3):866S-9S.

57. Dawson-Hughes B. Interaction of dietary calcium and protein in bone health in humans. J Nutr 2003;133(3):852S-4S.

58. Kerstetter JE, O'Brien KO, Insogna KL. Low protein intake: the impact on calcium and bone homeostasis in humans. J Nutr 2003;133(3):855S-61S.

59. Adlercreutz H, Hamalainen E, Gorbach S, Goldin B. Dietary phyto-oestrogens and the menopause in Japan. Lancet 1992;339(8803):1233.

60. Obermeyer CM. Menopause across cultures: a review of the evidence. Menopause 2000;7(3):184-92.

61. Gold EB, Sternfeld B, Kelsey JL, et al. Relation of demographic and lifestyle factors to symptoms in a multi- racial/ethnic population of women 40-55 years of age. Am J Epidemiol 2000;152(5):463-73.

62. Nagata C, Takatsuka N, Kawakami N, Shimizu H. Soy product intake and hot flashes in Japanese women: results from a community-based prospective study. Am J Epidemiol 2001;153(8):790-3.

63. Nagata C, Shimizu H, Takami R, Hayashi M, Takeda N, Yasuda K. Hot flashes and other menopausal symptoms in relation to soy product intake. Climacteric 1999;2:6-12.

64. Murkies AL, Lombard C, Strauss BJ, Wilcox G, Burger HG, Morton MS. Dietary flour supplementation decreases postmenopausal hot flushes: effect of soy and wheat. Maturitas 1995;21(3):189-95.

65. Howes LG, Howes JB, Knight DC. Isoflavone therapy for menopausal flushes: A systematic review and meta-analysis. Maturitas 2006.

66. Treatment of menopause-associated vasomotor symptoms: position statement of The North American Menopause Society. Menopause 2004;11(1):11-33.

67. National Institutes of Health State-of-the-Science Conference statement: management of menopause-related symptoms. Ann Intern Med 2005;142(12 Pt 1):1003-13.

68. Messina M, Hughes C. Efficacy of soyfoods and soybean isoflavone supplements for alleviating menopausal symptoms is positively related to initial hot flush frequency. J Med Food 2003;6(1):1-11.

69. Setchell KD, Brown NM, Lydeking-Olsen E. The clinical importance of the metabolite equol-a clue to the effectiveness of soy and its isoflavones. J Nutr 2002;132(12):3577-84.

70. Wiseman H, Casey K, Bowey EA, et al. Influence of 10 wk of soy consumption on plasma concentrations and excretion of isoflavonoids and on gut microflora metabolism in healthy adults. Am J Clin Nutr 2004;80(3):692-9.

71. Williamson-Hughes PS, Flickinger BD, Messina MJ, Empie MW. Isoflavone supplements containing predominantly genistein reduce hot flash symptoms: a critical review of published studies. Menopause 2006;13(5):831-9.

72. Messina M, Barnes S. The role of soy products in reducing risk of cancer. J Natl Cancer Inst 1991;83(8):541-6.

73. Pisani P, Bray F, Parkin DM. Estimates of the world-wide prevalence of cancer for 25 sites in the adult population. Int J Cancer 2002;97(1):72-81.

74. Folman Y, Pope GS. The interaction in the immature mouse of potent oestrogens with coumestrol, genistein and other uterovaginotrophic compounds of low potency. J Endocrinol 1966;34(2):215-25.

75. Lee HP, Gourley L, Duffy SW, Esteve J, Lee J, Day NE. Dietary effects on breast-cancer risk in Singapore. Lancet 1991;337(8751):1197-2000.

76. Barnes S, Grubbs C, Setchell KD, Carlson J. Soybeans inhibit mammary tumors in models of breast cancer. Prog Clin Biol Res 1990;347:239-53.

77. Yan L, Spitznagel E. A meta-analysis of soyfoods and risk of breast cancer in women. Int J Cancer Prevention 2005;1(4):281-93.

78. Trock BJ, Hilakivi-Clarke L, Clarke R. Meta-analysis of soy intake and breast cancer risk. J Natl Cancer Inst 2006;98(7):459-71.

79. Messina MJ, Loprinzi CL. Soy for breast cancer survivors: a critical review of the literature. J Nutr 2001;131(11):3095S-108S.

80. Magee PJ, Rowland IR. Phyto-oestrogens, their mechanism of action: current evidence for a role in breast and prostate cancer. Br J Nutr 2004;91(4):513-31.

81. Yan L, Li D, Yee JA. Dietary supplementation with isolated soy protein reduces metastasis of mammary carcinoma cells in mice. Clin Exp Metastasis 2002;19(6):535-40.

82. Constantinou AI, Lantvit D, Hawthorne M, Xu X, van Breemen RB, Pezzuto JM. Chemopreventive effects of soy protein and purified soy isoflavones on DMBA-induced mammary tumors in female Sprague-Dawley rats. Nutr Cancer 2001;41(1-2):75-81.

83. Shao ZM, Wu J, Shen ZZ, Barsky SH. Genistein exerts multiple suppressive effects on human breast carcinoma cells. Cancer Res 1998;58(21):4851-7.

84. Zhou JR, Yu L, Mai Z, Blackburn GL. Combined inhibition of estrogen-dependent human breast carcinoma by soy and tea bioactive components in mice. Int J Cancer 2004;108(1):8-14.

85. Gallo D, Ferlini C, Fabrizi M, Prislei S, Scambia G. Lack of stimulatory activity of a phytoestrogen-containing soy extract on the growth of breast cancer tumors in mice. Carcinogenesis

(Continued on page 15)

Soyfoods and the Health of Menopausal Women

(Continued from page 14)

2006.

86. Cohen LA, Zhao Z, Pittman B, Scimeca JA. Effect of intact and isoflavone-depleted soy protein on NMU-induced rat mammary tumorigenesis. Carcinogenesis 2000;21(5):929-35.

87. Day JK, Besch-Williford C, McMann TR, Hufford MG, Lubahn DB, MacDonald RS. Dietary genistein increased DMBA-induced mammary adenocarcinoma in wild-type, but not ER alpha KO, mice. Nutr Cancer 2001;39(2):226-32.

88. Thomsen AR, Mortensen A, Breinholt VM, Lindecrona RH, Penalvo JL, Sorensen IK. Influence of Prevastein(R), an Isoflavone-Rich Soy Product, on Mammary Gland Development and Tumorigenesis in Tg.NK (MMTV/c-neu) Mice. Nutr Cancer 2005;52(2):176-88.

89. Allred CD, Allred KF, Ju YH, et al. Dietary genistein results in larger MNU-induced, estrogen-dependent mammary tumors following ovariectomy of Sprague-Dawley rats. Carcinogenesis 2004;25(2):211-8.

90. Atkinson C, Warren RM, Sala E, et al. Red-clover-derived isoflavones and mammographic breast density: a double-blind, randomized, placebo-controlled trial. Breast Cancer Res 2004;6 (3):R170-9.

91. Maskarinec G, Takata Y, Franke AA, Williams AE, Murphy SP. A 2-year soy intervention in premenopausal women does not change mammographic densities. J Nutr 2004;134 (11):3089-94.

92. Kurzer MS. Hormonal effects of soy in premenopausal women and men. J Nutr 2002;132(3):570S-3S.

93. Maskarinec G, Franke AA, Williams AE, et al. Effects of a 2-year randomized soy intervention on sex hormone levels in premenopausal women. Cancer Epidemiol Biomarkers Prev 2004;13(11):1736-44.

94. Palomares MR, Hopper L, Goldstein L, Lehman CD, Storer BE, Gralow JR. Effect of soy isoflavones on breast proliferation in postmenopausal breast cancer survivors. Breast Cancer Res Treatment 2004;88 (Suppl 1):4002.

95. Brown BD, Thomas W, Hutchins A, Martini MC, Slavin JL. Types of dietary fat and soy minimally affect hormones and biomarkers associated with breast cancer risk in premenopausal women. Nutr Cancer 2002;43(1):22-30.

96. Shu XO, Jin F, Dai Q, et al. Soyfood Intake during Adolescence and Subsequent Risk of Breast Cancer among Chinese Women. Cancer Epidemiol Biomarkers Prev 2001;10(5):483-8.

97. Wu AH, Wan P, Hankin J, Tseng CC, Yu MC, Pike MC. Adolescent and adult soy intake and risk of breast cancer in Asian-Americans. Carcinogenesis 2002;23(9):1491-6.

98. Korde L, Fears T, Wu A, et al. Adolescent and childhood soy intake and breast cancer risk in Asian-American women. Breast Cancer Res Treat 2005;88 (suppl 1):S149.

99. Lamartiniere CA, Zhao YX, Fritz WA. Genistein: mammary cancer chemoprevention, in vivo mechanisms of action, potential for toxicity and bioavailability in rats. J Women's Cancer 2000;2:11-9.

100. Hilakivi-Clarke L, Onojafe I, Raygada M, et al. Prepubertal exposure to zearalenone or genistein reduces mammary tumorigenesis. Br J Cancer 1999;80(11):1682-8.

101. Russo J, Mailo D, Hu YF, Balogh G, Sheriff F, Russo IH. Breast differentiation and its implication in cancer prevention. Clin Cancer Res 2005;11(2 Pt 2):931s-6s.

102. Meng L, Maskarinec G, Wilkens L. Ethnic differences and factors related to breast cancer survival in Hawaii. Int J Epidemiol 1997;26(6):1151-8.

103. Yonemoto RH. Breast cancer in Japan and United States: epidemiology, hormone receptors, pathology, and survival. Arch Surg 1980;115(9):1056-62.

104. Morrison AS, Lowe CR, MacMahon B, Ravnihar B, Yuasa S. Some international differences in treatment and survival in breast cancer. Int J Cancer 1976;18(3):269-73.

105. Ohsumi S, Sakamoto G, Takashima S, et al. Long-term results of breast-conserving treatment for early-stage breast cancer in Japanese women from multicenter investigation. Jpn J Clin Oncol 2003;33(2):61-7.

106. Kanemori M, Prygrocki M. Results of breast conservation therapy from a single-institution community hospital in Hawaii with a predominantly Japanese population. Int J Radiat Oncol Biol Phys 2005;62(1):193-7.

107. Hsieh CY, Santell RC, Haslam SZ, Helferich WG. Estrogenic effects of genistein on the growth of estrogen receptor-positive human breast cancer (MCF-7) cells in vitro and in vivo. Cancer Res 1998;58(17):3833-8.

108. Allred CD, Allred KF, Ju YH, Goeppinger TS, Doerge DR, Helferich WG. Soy processing influences growth of estrogen-dependent breast cancer tumors. Carcinogenesis 2004;25 (9):1649-57.

109. Power KA, Saarinen NM, Chen JM, Thompson LU. Mammalian lignans enterolactone and enterodiol, alone and in combination with the isoflavone genistein, do not promote the growth of MCF-7 xenografts in ovariectomized athymic nude mice. Int J Cancer 2006;118(5):1316-20.

110. Saarinen NM, Power K, Chen J, Thompson LU. Flaxseed attenuates the tumor growth stimulating effect of soy protein in ovariectomized athymic mice with MCF-7 human breast cancer xenografts. Int J Cancer 2006;119(4):925-31.

111. Greendale GA, Reboussin BA, Slone S, Wasilauskas C, Pike MC, Ursin G. Postmenopausal hormone therapy and change in mammographic density. J Natl Cancer Inst 2003;95 (1):30-7.

(Continued on page 16)

Breastfeeding Case Studies

(Continued from page 11)

The difference between the two children may also be related to the greater maturity of the liver of a given infant who then is able to handle the increased demands on the glucuronyl transferarase system. The parent needs the reassurance that nothing is wrong with either the mother's milk or the baby. Prepare the mother for a long period of resolution.

Treatment includes:

- Increased feeds along with exposure to sunlight
- When necessary, if levels continue to rise (usually 16-20 mg/dl), arrangements can be made to place the baby in a fiberoptic blanket for phototherapy at home, as long as the baby is otherwise healthy.
- Temporary cessation of breastfeeding is indicated usually at bilirubin levels above 16 mg/ dl for more than 24 hours. Note that although an interruption in breastfeeding may confirm the diagnosis of late-onset jaundice, this has no reported benefits to the baby.

References

1. Lawrence R.A., Lawrence R.M. Breastfeeding - A Guide for the Medical Profession 6th edition 2005 Elsevier Mosby Press.
2. Riordan J. - Breastfeeding and Human Lactation 3rd edition 2004 Jones and Bartlett.
3. Newman T. M.D., and Pitman, T. The Ultimate Breastfeeding Book of Answers 2000 Prima Publishing.
4. Lauwers J. and Shinskie D. Counseling the Nursing Mother. A Lactation Consultants Guide 3rd edition 2000 Jones and Bartlett.
5. LaLeche League International – The Breastfeeding Answer Book 2003 3rd edition.

Egondu Onuoha, MS,RD,CDN,IBCLC,RLC,CDE
525 Marlborough Road
Brooklyn, NY 11226

Mailing Address Line 1
Mailing Address Line 2
Mailing Address Line 3
Mailing Address Line 4
Mailing Address Line 5

Soyfoods and the Health of Menopausal Women

(Continued from page 15)

112. Maskarinec G, Williams AE, Carlin L. Mammographic densities in a one-year isoflavone intervention. Eur J Cancer Prev 2003;12(2):165-9.

113. Boyapati SM, Shu XO, Ruan ZX, et al. Soyfood intake and breast cancer survival: a followup of the Shanghai Breast Cancer Study. Breast Cancer Res Treat 2005;92(1):11-7.

114. Messina M, Messina V. Provisional Recommended Soy Protein and Isoflavone Intakes for Healthy Adults: Rationale. Nutr Today 2003;38(3):100-9.

Remember to vote to select your future WHRN DPG Leaders.

The online polls will open January 15, 2007 and will close on February 28, 2007.

Visit http://www.eatright.org/elect to view candidate bios and to cast your vote online.