

Got kelp? Study finds seaweed may help reduce risk of breast cancer

by Sarah Yang

A type of vegetation that can often be found washed ashore on beaches may soon emerge as a new player in the field of cancer-fighting foods. A new study led by researchers at the UC Berkeley School of Public Health has found that a diet containing kelp seaweed lowered levels of the potent sex hormone estradiol in rats, and raised hopes that it might decrease the risk of estrogen-dependent diseases such as breast cancer in humans.

"This study opens up a new avenue for research leading to cancer preventive agents," says **Martyn T. Smith, Ph.D.**, professor of environmental health sciences and coauthor of the study. "There's good reason to look at kelp more closely."

"Brown kelp seaweed makes up more than 10 percent of the Japanese diet. Soy has gotten most of the attention, but our study suggests that kelp may also contribute to these reduced cancer rates among Japanese women."

These results, published February 2, 2005, in the *Journal of Nutrition*, shine a new light onto the Japanese diet. Prior studies have shown that Japanese women have longer menstrual cycles and lower serum estradiol levels than their Western counterparts, which researchers say may contribute to their lower rates of breast, endometrial and ovarian cancers. Scientists have been searching Asian diets for clues to the lower rates of cancer.

"Brown kelp seaweed makes up more than 10 percent of the Japanese diet," says **Christine Skibola, Ph.D.**, assistant research toxicologist at the School of Public Health and lead author of the study. "Soy has gotten most of the attention, but our study suggests that kelp may also contribute to these reduced cancer rates among Japanese women."

Skibola says she began the animal study after obtaining encouraging results from earlier case studies of women with highly irregular menstrual cycles.

"The most profound thing I found was that two women with endometriosis and a lot of menstrual irregularities experienced significant improvement in their symptoms after three months of taking 700 milligrams of seaweed capsules per day," says Skibola. "It reduced much of the pain associated with endometriosis and significantly lengthened the total number of days of their menstrual cycles. In one of these women with high estrogen levels, I also saw a drop in blood estradiol levels....That led me to believe it was worth doing further controlled studies on kelp."

For the new study, the researchers randomly divided 24 female rats into three groups. One group was fed a high daily dose of 70 milligrams of dried, powdered kelp for four weeks, while a second group was fed a low daily dose of 35 milligrams. Both groups were compared with a third control group of rats that did not receive kelp. To ensure that all the kelp was eaten, Skibola and study coauthor **John Curry, Ph.D.**, a UC Berkeley postdoctoral fellow in molecular and cell biology, sprinkled the powdered kelp onto apple wedges, one of the rats' favorite foods.

The researchers say the experimental doses of kelp consumed by the rats were roughly equivalent to the amount of brown seaweed eaten by people in Japan. Skibola and Curry took daily vaginal swabs to monitor the rats' menstrual cycles. The researchers found that the rats' estrous cycles increased from an average of

4.3 to 5.4 days for the low dose kelp group, and to 5.9 days for the high dose kelp group. Overall, dietary kelp resulted in a 37 percent increase in the length of the rat estrous cycle.

Studies in humans have linked longer menstrual cycle lengths to lower risk of breast, ovarian and endometrial cancers. "If you have longer cycles, you actually have fewer periods over a lifetime, which means less time is spent overall in the phases where hormone levels and breast and endometrial cell proliferation are at their highest," says Skibola.

During the early part of a woman's menstrual cycle, estradiol levels remain relatively constant. Almost halfway through the cycle, estradiol levels surge, peaking just before ovulation. These cyclic periods of high estrogen, which continues over a span of about 40 years from puberty to menopause, stimulates the division of breast cells that already have DNA mutations, as well as increases the chances of developing new mutations, factors that may increase one's risk of breast cancer.

To test the impact of dietary kelp on estradiol levels, researchers took baseline blood samples from 19 rats immediately before their low dose diet of kelp began.

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On the back page:
Commencement '05



Dean's Message

The challenge for any organization is to achieve its potential while setting the bar even higher. Examples of our School's success in living up to its potential in the past year include the graduation of 70 new undergraduate majors in public health; recruitment of the most diverse class in recent School history; several innovations in the curriculum; the development of the Berkeley Consortium on Population and Human Development; a new partnership with the College of Natural Resources to cosponsor the Center for Weight and Health; the creation of 22 health disparities related internships; and launching the Bay Area Coalition to Increase Diversity in the Health Professions.

The School's contributions are perhaps best reflected in the accomplishments of its faculty and alumni. This year, Professors Barbara Abrams, Richard Scheffler, and Mark van der Laan each received major awards from the American Public Health Association. Among our alumni, Dr. Susan Desmond-Hellman, copresident of Genentech, was named one of the top five women executive leaders in the Bay Area; Dr. Julie Gerberding, director of the CDC, was honored by the California Alumni Association with an Excellence in Achievement Award; Dr. Harrison Spencer, president of the Association of Schools of Public Health, was elected to the Institute of Medicine; and Dr. Barbara Staggars, director of adolescent medicine at Children's Hospital and Research Center in Oakland, received the campus's Peter E. Haas Public Service Award.

But we must also raise the bar if we are going to successfully address the public health challenges of the 21st century. This will require increased resources and space to train greater numbers of public health professionals in California (and the nation), enhancing our effectiveness in recruiting a

diverse student body, faculty, and staff; increased attention to eliminating health disparities; and achieving a deeper understanding of how our biology, environment, and behavior interact over our lifespans to restore, maintain and enhance our health and that of our communities.

Our biggest challenge is to raise the financial bar. State funds will continue to provide the foundation for our success. But as the past four years have shown, we cannot depend on the state for the overall resources needed to maintain and enhance our excellence. We must take it upon ourselves to raise the financial bar.

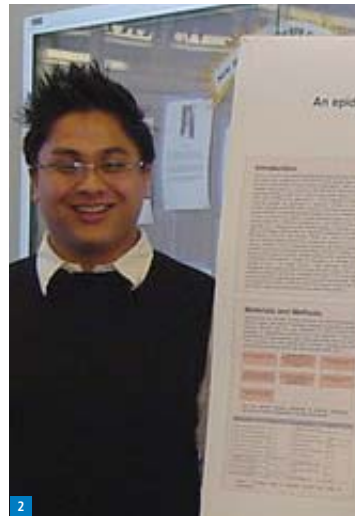
You have recently read about the \$40 million gift the campus received to build a new interdisciplinary wet lab building on the current site of Warren Hall, the School's primary home. While all of us interested in promoting the health sciences are very grateful for this gift, it will not provide funds to construct the new building for the home of the School of Public Health. Instead, the School will move to University Hall as an interim location until the necessary funds can be raised to build a new home for the School. You will be hearing more about the exciting plans for this fundraising campaign over the coming year. It will be a challenge reflective of our past achievements and worthy of our future aspirations.

Sincerely,

Stephen M. Shortell, Ph.D., M.P.H.

*Dean, School of Public Health
Blue Cross of California Distinguished Professor of Health Policy & Management
Professor of Organization Behavior*

News and Notes



Gerberding Presents Symposium at Chancellor's Inauguration

1 Julie Gerberding, M.D., M.P.H. '90, director of the Centers for Disease Control and Prevention (CDC), presented a symposium titled "Are We Ready? The Fight Against Avian Flu, Bioterrorism and Other Public Health Threats," on April 16, 2005, as part of a series of events surrounding the inauguration of UC Berkeley Chancellor Robert J. Birgeneau.

Berkeley Students Honored by State Public Health Organizations

2 At this past April's joint annual meeting of the California Public Health Association-North (CPHA-N) and Southern California Public Health Association, UC Berkeley's Public Health Alumni Association sponsored the attendance of eight students, who also presented posters at the meeting. Students John Garcia (pictured with poster) and Elizabeth Noth received first and second prizes respectively in the poster competition, and Jenny Hyun and Brian Quinn received third prize. In addition, Peggy Sue Wright was named CPHA-N's 2005 Student of the Year.

Center for Weight and Health Celebrates New Partnership

3 On June 2, 2005, the Center for Weight and Health (CWH) celebrated its new status as a joint center of the School of Public Health and the College of Natural Resources. Pictured (left to right): CWH codirector May Wang, School of Public Health Dean Stephen Shortell, College of Natural Resources Dean Paul Ludden, and CWH codirector Patricia Crawford.

Awards Presented at Commencement 2005

Congratulations to the following individuals who received awards at the School's 2005 commencement: Walter Dunn, Margaret Beattie Award; Katherine Holden, Brian Ridpath Award; Madhukar Pai, Warren Winkelstein Award; Merrill Birkner, Joelle Brown, Sheryl Magzamen, Vivienne Ng, and Brian Quinn, Outstanding GSI Awards; Katherine Schlaefel, Henrik L. Blum Award for Distinguished Social Action; and Professor Cheri A. Pies, Distinguished Teaching and Mentorship Award.

Undergraduate Public Health Program Inspires Future Leaders

This past April, undergraduate public health major Virginia Nguyen addressed the closing plenary at the joint annual meeting of the California Public Health Association—North and the Southern California Public Health Association. Speaking as a member of a panel on innovations in public health training approaches, Nguyen described the impact of the School's undergraduate major and the Health Career Connection program on her career goals.



I used to work as a salesperson before entering UC Berkeley—a car salesperson to be specific. And do you know the difference between being a public health agent and a salesperson? Sleep. It is the peaceful sleep that you can't get as a salesperson. I didn't feel good about myself, letting the car industry train me to rip people off—so I quit and started school, discovering that I wanted to devote my life to public health.

Ralph Nader says, "The function of leadership is to produce more leaders, not more followers." Not only has the public health major been efficient in disseminating information, it has been great in supporting its students to become leaders. Not only have we been taught by people at the top of their field, but they've inspired us to work towards social justice, address disparities in health, and analyze problems in hopes of finding feasible solutions.

Leaders not only acknowledge problems they see, but also take action to bring order to the problem. The Health Career Connection (HCC) internship program allowed me to take classroom knowledge and apply it to a real life-situation. As I interned for a health disparities initiative leader, Jose Martin, at the Contra Costa County Department of Health Services, I was granted the opportunity to work on policy in low-income communities. I was able to initiate a project that investigated the health care needs of minorities by directing focus groups. The outcome of the project was thrilling, because my project will be used to develop policy and a new training manual for emergency responders. The new training methods will allow people from different ethnic backgrounds to receive culturally-sensitive care, which will improve their overall health status.

The undergraduate public health program and HCC have been vital in developing my interest in pursuing an M.D./ M.P.H. degree, in hopes that I can be a leader in public health as you all are here today.

I am proud to be a part of Berkeley's first generation of undergraduate public health majors. I hope that your example and our contribution will feed into the pursuit of a more just and a more healthy society. This will produce a pipeline with HCC and Berkeley's public health major as key players—producing not followers, but leaders in public health.

I've always been told that you never have to fear or look back if you walk in a straight path all your life. Public health is my path—a path that I shall take pride in, and it is a path that I hope to learn from many of you as the years go by.

—Virginia Nguyen received her B.A. in public health from UC Berkeley in May 2005. She is a recent recipient of UC Berkeley's Harry L. Morrison Distinguished Student Life Achievement Award and will be interning at the National Institutes of Health starting August 22.

Event Calendar

Fall 2005

October 11 (Tuesday), 4 p.m.

Penhoet Lecture

Speaker: Richard D. Klausner, M.D., executive director, global health, Bill & Melinda Gates Foundation
22 Warren Hall, Berkeley campus

October 25 (Tuesday), 1–5 p.m.

Fall Research Symposium

Faculty members present current research to provide a snapshot of the wide range of projects under way at the School.
Alumni House, Berkeley campus

November 1 (Tuesday), 4 p.m.

Regents' Lecture

Speaker: Leonard D. Schaeffer, chairman, Wellpoint, Inc.
22 Warren Hall, Berkeley campus

November 14 (Monday), 6–8 p.m.

Public Health Alumni Association Board Meeting

Quarterly meetings are open to all Berkeley public health alumni. RSVP to Eileen Pearl at (510) 643-6382, phaa@berkeley.edu.
714C University Hall, Berkeley campus

For the latest information about School of Public Health events, visit our web site: <http://sph.berkeley.edu>.

REGISTER NOW

American Public Health Association 133rd Annual Meeting and Exposition

November 5–9, 2005
New Orleans, Louisiana



Information: <http://www.apha.org>

November 7 (Monday), 6:30–8 p.m.

UC Berkeley Social Hour at APHA Meeting

Socialize with fellow School of Public Health alumni attending the APHA annual meeting.
Hilton New Orleans Riverside, Grand Salon 9

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Commencement Photo Gallery

The School of Public Health held its commencement on May 14, 2005. Paul Farmer, M.D., Ph.D., delivered the keynote address. Farmer is the Maude and Lillian Presley Professor of Social Medicine at Harvard Medical School; attending physician in infectious diseases and chief of the Division of Social Medicine and Health Inequalities at Brigham and Women's Hospital in Boston; medical director of the Clinique Bon Sauveur hospital in rural Haiti; and a founding director of Partners In Health, an international charity organization that provides direct health care services and undertakes research and advocacy activities on behalf of those who are sick and living in poverty.



1 (Left to right): Commencement speaker Paul Farmer, Dean Stephen Shortell, and SPH Alumnus of the Year Richard Jackson; 2 Sallie Yoshida and family; 3 Neha Chande and Anaiah Bournes. Page 1 inset: Kiyaki Getachew (foreground).




Got Kelp?..., continued from page 1

After just two weeks of eating 35 milligrams a day, estradiol levels were reduced from an average of 48.9 nanograms per liter to 40.2 nanograms per liter. After four weeks, estradiol levels dropped further to 36.7 nanograms per liter.

In a separate test of human ovarian cell cultures, conducted in collaboration with colleagues at UC Davis, dosing with kelp extract led to a 23 to 35 percent decrease in estradiol levels.

"One possibility is that the kelp may be acting as an estrogen antagonist by preventing estradiol from binding with its estrogen receptors," says Skibola. "Our next step is to try to isolate the active compound in kelp that is having this hormone-modulating effect." The researchers say there is hope that kelp could eventually be used as an anti-estrogen in the treatment of hormone-dependent cancers if further tests demonstrate its effectiveness in humans.

Despite the promise of these early results, Skibola cautions against excessive kelp intake. "The high levels of iodine and the low levels of heavy metals contained in kelp means that it's not recommended for people who are pregnant, nursing, or who have hyperthyroid conditions," she says.

The study was supported by the National Foundation for Cancer Research and the National Institutes of Health. 



Inside:
Fighting Cancer
with Seaweed



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