Women in Nutrition

Introduction

This article is in response to the 150th anniversary of women entering UC Berkeley. The work of three female nutritionists who made significant contributions to nutritional sciences at Berkeley will be reviewed. Those three nutritionists are Doctors Agnes Fay Morgan, Doris Howes Calloway and Janet Carlson King. Their major research accomplishments will be discussed along with their challenges and opportunities.

Nutritionists

Agnes Fay Morgan, who had completed a Ph.D. in organic chemistry at the University of Chicago, was hired as an assistant professor of nutrition in the college of Agriculture at the University of California, Berkeley in 1914. At that time, nutrition departments were not established within Universities. At UC Berkeley, courses in nutrition were offered in the early 1900s, and Myer E. Jaffa, thought to be the first person to hold the title of professor of nutrition, chaired the Committee on Home Economics starting in 1913. Thus, Dr. Jaffa hired Agnes Fay Morgan to join him in the College of Agriculture; she was paid $1800/year. In 1916, President Wheeler authorized erecting a building for the Domestic Science Department on the northeastern corner of the campus. It was completed in six weeks for $15,000 and Dr. Morgan was moved into the new Department. In 1918, the Department split into Household Arts and Household Science. Dr. Morgan chaired the Household Science Department for 36 years. However, she organized the material at hand and taught the first scientific human nutrition course at this University.[1] Professor Morgan then moved the Department of Nutrition in the College of Agriculture to the Home Economics Department in 1918 and became the chair, continuing until

1954, the year Professor Morgan retired.[2] Dr. Morgan was known for her excellent administrative skills. The construction of Morgan Hall started in 1949, but was stopped until 1952 because of the Korean War. The building was completed in 1954, the year Dr. Morgan retired. The new Chair of the Department, Dr. George Briggs, had the building named after Dr. Morgan due to her outstanding contributions and achievements. The building included a 3-bedroom Penthouse located on the top floor for teaching a required home management course. Dr. Doris Calloway then turned the Penthouse into a novel human nutrition research laboratory after she was hired in 1963.

Doris Howes Calloway, like Dr. Agnes Fay Morgan, completed her Ph.D. at the University of Chicago. But, unlike Morgan, her Ph.D. was in Nutrition. She completed a dietetic internship at Ohio State and interned at Johns Hopkins Hospital in Baltimore before going to Chicago. Dr. Calloway served as chief of the Nutrition Branch at the Armed Forces Food and Container Institute in Chicago until she relocated to the Stanford Research Institute (SRI) in 1961 as Chair of the Department of Food Science and Nutrition. Dr. George Briggs recruited her to UC Berkeley in 1963 where she remained for the rest of her career. Delroy Brown, her technician at SRI came with her to Berkeley and assisted with all of her research and the training of her graduate students. Professor Sheldon Margen, a physician with a strong interest in nutrition and metabolism, joined Dr. Calloway at UC Berkeley and collaborated with her on all of the Penthouse studies.

Although Dr. Calloway did not enjoy administration, she served effectively in multiple administrative capacities. For example, Dr. Calloway was the first woman to break into the ranks of senior administrators at University of California, Berkeley, as Provost for UCB's Professional Schools and Colleges from 1981 to 1987.[3] She was a strong proponent of diversity

and hired the first woman Dean of the School of Public Health and the first African-American as Dean of the School of Education. She did not believe that one's race or sex was an excuse for lesser performance, only that it could make the road more difficulty. Professor Calloway retired in 1990 and she gave the UC Berkeley Faculty Research Lecture, "Maintaining Balance," in 1992. She passed away August 31, 2001, after a long battle with Parkinson's disease.

Janet Carlson King, a former graduate student and colleague of Professor Calloway, is now a Professor of the Graduate School in the Department of Nutritional Science and Toxicology. Professor King chaired the Department from 1987-94. Thereafter she served as Director of the USDA Western Human Nutrition Research Center located at UC Davis from 1995-2003. She then joined Children's Hospital Oakland Research Institute, better known as CHORI as a Senior Scientist; she served as the Executive Director of CHORI from 2013-16..

Professor King received her Ph.D. in Nutrition from UC Berkeley in 1972. She was immediately appointed as an Assistant Professor in the Department to establish a Coordinated Program in Dietetics. At that time, the American Dietetic Association began requiring practical experience as part of the academic training for dietitians. Since Dr. King had worked for three years as a practicing dietitian before coming to Graduate School, she was given a faculty appointment to establish the Coordinated Dietetics Program at UC Berkeley. Professor King has maintained an active research program throughout her career in two areas: protein and energy during pregnancy and human zinc nutrition and metabolism. Her doctoral work focused on the protein requirements of pregnant teenagers. Shortly after becoming an Assistant Professor at UC Berkeley, Dr. Sheldon Margen supplied funding for her to establish a zinc research program in humans, the first of its kind in 1974. In 2003, Dr. King was invited to chair the 2005 US Dietary

Guidelines Advisory Committee and she has served on numerous committees of the Food and Nutrition Board including chairing the Board in 1994.

Research Work and Major Contributions

Agnes Fay Morgan

Professor Morgan studied broad topics within human nutrition, animal nutrition and food technology areas. Her basic work was concentrated in three primary fields: (1) The effect of heat upon the nutritive value of proteins, (2) the effect of Vitamin D and parathyroid hormones on calcium and phosphorus metabolism, and (3) the metabolic functions of the B Vitamins, ascorbic acid, Vitamin A, and carotene. She was the first to observe that a commonly used food preservative, sulfur dioxide, on preserved the vitamin C and thiamin content of foods. Professor Morgan was also the first to demonstrate that a pantothenic acid deficiency causes severe damage to the adrenal gland and that administering vitamin D produces marked changes in the physiological activity of parathyroid extracts.[6]

Dr. Morgan also published many articles relating to the practical as well as medical aspects of nutrition. Her 254 research publications focus on a wide variety of topics: the effect of heat on the nutritive value of proteins, the stability of vitamins in the processing and storage of foods, the metabolic functions of B vitamins, ascorbic acid and carotene, and the feeding of underweight children. She also published a textbook on *Food Preparation* and 77 professional or review articles.[7] More than 40 of her papers were written after her official retirement.

From 1946 to 1950, Professor Morgan was the only woman on a Committee of nine selected from USA Agricultural Experiment Stations to provide guidance to a national research program.[8] In 1962, she received the first research award from the Society of Medical Friends of

Wine for her studies on the vitamins in wine.[9] The next year, she was awarded the Phoebe Apperson Hearst gold medal from the San Francisco Examiner as one of the ten Outstanding Bay Area Women in 1963.

Doris Howes Calloway

Leonard Bjeldanes, Professor Emeritus of the Department of Nutritional Sciences & Toxicology (DNS&T) at UC Berkeley made the following comment regarding Professor Calloway. " She was one of the greats. She was a superbly trained, highly respected scientist who had great courage about what she took on. Yet, she was also insightful, a warm person you could have fun with. I was in awe of her abilities." Professor Calloway's "penthouse" studies from 1964 to 1981 provided the basis for the national standards for dietary allowances, called the Recommended Dietary Allowances (RDAs). Her initial scientific studies of human nutrition has strongly influenced most subsequent studies of diet, nutrition, and health in humans.

Janet King, Professor Emerita of DNS&T said, "one of Professor Doris Calloway's missions in life was to improve opportunities for women and members of minority races and, the scientific issues she undertook were often linked with, but not limited by, their needs." Her international studies measured the social and economic context of mild to moderate malnutrition among individuals in marginally adequate environments. In the late 1980s, Dr. Calloway led a large international research program aimed at understanding the causes and consequences of moderate malnutrition. This 9-university, $14 million research project in Kenya, Egypt and Mexico not only uncovered the physical and cognitive consequences of undernutrition but pinpointed the poor education and low empowerment of women as a contributor.[10]

Professor Doris Calloway was internationally recognized for her expertise in nutrition through service on numerous advisory boards and councils, including the Food and Agriculture

Organization and the World Health Organization. In addition to her the academically brilliant achievements, Dr. Calloway was the first woman appointed to a senior administrative position, as Provost of the Professional Schools and Colleges at UC Berkeley. In 1999, the Regents of the University of California created an endowed chair in human nutrition at UC Berkeley in her name.

Janet Carlson King

During an interview, Professor King said that among her research achievements in many scientific fields, the work demonstrating the use of zinc stable isotopes to understand zinc metabolism and nutrient requirements meant the most to her. As a new Assistant Professor, Dr. King initiated studies of zinc metabolism. In that work, Dr. King used stable isotopes and kinetic modeling techniques to study how zinc utilization is affected by various physiological states, such as pregnancy, lactation, aging or insufficient or excessive intakes. Her research also demonstrated serum zinc concentrations are not sensitive to typical differences in zinc intakes seen around the world. This is because the total endogenous zinc losses in the urine and stool declined markedly when the dietary levels are low.[11] After completing several detailed studies of zinc homeostasis and metabolism, Professor King developed a compartmental model of zinc metabolism.

Similar to Professor Doris Calloway, Professor Janet King also had an interest in international nutrition research studies. In Brazil, Dr. King's group studied the effects of pregnancy and lactation on calcium and bone metabolism in adolescent and adult women consuming low-calcium diets.[13] Another research team focused primarily on studies of zinc

nutrition, absorption, and status as previous surveys had shown that dietary zinc intakes were below recommended levels. [14]

Challenges They Met

Sexism is always a social issue, whether in the past or now. During the early years, Professor Morgan endured many unfair treatments and evaluations when she fought for the name of the Department of Nutrition with UC Berkeley official senior leaders. However, what she tried her best to achieve was readily accomplished when the next Chair, a man named Jessie Coles took office in 1954.

Today, prejudice is not as serious as the past. The common challenges today for both male and female scientists are research funds, tight schedules, and troubles in maintaining balance between personal life and academic research. Both Professors Doris Calloway and Janet King were experts at maintaining balance, which is evident from their personal and professional accomplishments. As Dr. King said, "the courage to keep going in a variety of circumstances is as important today as decades ago in scientific research."

Expectations and Messages

The women nutritionists contributed to an unusual nutrition history at Cal over the past 150 years. In an interview with Professor King, she provided the following suggestions and messages for future nutritionists and students who in nutrition.

Firstly, nutrition is not a science of its own. It builds on connections to other sciences, like physiology, chemistry, biochemistry. Today, the public tends to focus more on the application in nutrition and public health rather than nutrition scientific theories and research. But the most

importance aspect is for Americans to understand more the importance of good nutrition. For scientists and nutritionists who pursue work in the field in nutrition, they need to identify a focus for their work and to build strings, connections and expertise to enable their efforts in that area.

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