Helen E. Clark (1912–2001)

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Helen Clark is remembered as an internationally recognized and highly respected nutrition scientist and teacher. She was one of the giants of human nutrition/metabolic research in her era along with W. C. Rose, L. E. Holt and May Reynolds. She was dedicated to excellence in research and teaching, and students prized her personal and professional advice. She corresponded on a regular basis with many former students and, after her retirement, they frequently visited at her West Lafayette, Indiana home. Her genuine concern about former students' welfare and professional development continued until her death.

Clark was born February 4, 1912 in Edam, Saskatchewan, Canada. Her early childhood education was in a one-room school. After graduation from high school, she taught in one-room schools in Edam until she was financially able to enroll in the University of Saskatchewan. In 1939 at the age of 27, she earned a Bachelor of Science degree with distinction. After teaching Home Economics in high school in Victoria, British Columbia, she began to think seriously about pursuing graduate education in the United States, and chose Iowa State University because of her interest in its nutrition program. She accepted a research associate position to work with Dr. Pearl Swanson, who would later serve as major professor of her doctoral program. Swanson invited Clark to coauthor a review she was preparing to write on the metabolism of proteins and amino acids, which resulted in Clark's first scientific publication (1). Clark's admiration for Swanson and the contributions to her career continued over her lifetime.

After earning a doctorate at Iowa State University in 1950, Clark joined the faculty at Kansas State University as an Assistant Professor of Foods and Nutrition. During her 4-year tenure there, a lifelong friendship began with Gladys E. Vail, a professor and head of the Department of Foods and Nutrition at Kansas State. In 1954 Vail became head of the Foods and Nutrition Department at Purdue University and invited Clark to join the faculty at Purdue as Associate Professor of Foods and Nutrition. Clark accepted and built a distinguished career as a researcher and mentor to graduate students, remaining at Purdue until her retirement in 1977.

Excellence in human nutrition research

Beginning in the 1950s while at Iowa State University, Clark became interested in the improvement of protein and amino acid combinations in human nutrition. From 1954–1956, while at Purdue, she was involved in planning and equipping a human nutrition research metabolic unit. At the time, only a few institutions had a human metabolic unit as well-designed and equipped to conduct human nutrition experiments as the unit at Purdue. Clark organized a team of technicians and graduate research assistants who focused on carrying out careful investigations of human requirements for proteins and amino acids. This combination of excellent staff and facilities contributed substantially to the quality and productivity of her research. Clark was respected for the meticulous attention she paid to planning and conducting human experiments at the highest level of excellence. Such studies were not easily achieved because they involved recruiting

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human subjects who were disciplined and conscientious about their roles in research, and maintaining a well-trained staff who performed consistently as a team.

Clark and her colleagues worked continuously in investigations of essential amino acid requirements of human adults, the relative importance of nitrogen from essential and nonessential amino acids, proportions among essential amino acids and the nutritive quality of protein sources. Initially, much of Clark's research was directed toward determining human needs for two particular amino acids, lysine and methionine. These amino acids are especially critical in developing countries where the primary sources of proteins are cereals and legumes. Clark's research unveiled many of the mysteries relating to lysine availability and utilization that led to more effective use of plant proteins (2–6). Her work on human adult requirements for lysine is truly distinguished and has been widely used by national and international policy-making groups in formulating changes for improved nutrition.

Subsequently, Clark and her co-workers focused on bridging the gap that existed between knowledge about minimum requirements of human adults for essential amino acids and theoretical estimates of their protein needs. They accomplished this by testing various staple foods singly or in combinations that were likely to be consumed by people in various areas of the world, that is, large quantities of cereals, legumes and vegetables with limited amounts of animal-source food (7). Clark's experiments provided basic information concerning the utilization of essential amino acids in foods and their combinations that has been useful in making predictions and developing combinations of foods for population groups (8). Clark is widely recognized for human nutrition research related to genetically improved cereals and legumes such as Opaque-2 maize, sorghum vulgare and high protein rice (9,10). As promising lines of genetically improved grains became available, she directed a part of her research effort toward investigating their usefulness in human nutrition.

Clark's research in human nutrition substantially contributed not only to basic nutrition knowledge but also to the solution of world food problems. Her work led to publication of 55 scientific papers in refereed journals. In addition, she presented many papers to the American Institute of Nutrition and the International Congress on Nutrition. She became one of the leading authorities on protein and amino acid requirements of humans and was recognized by several awards and honors. In 1968 she received the Borden Award, the highest honor bestowed by the American Home Economics Association, in recognition of outstanding fundamental research in nutrition related to protein and amino acids. In 1971 she received the Centennial Award of the College of Home Economics at Iowa State University in recognition of outstanding professional accomplishments by an alumnus. In 1974 she was honored as Meredith Distinguished Professor of Foods and Nutrition at Purdue University, and was the first woman professor at Purdue to be named a distinguished professor. In 1979 she was selected as a Fellow of the American Institute of Nutrition. In 1994 she was awarded an honorary Doctor of Science degree, the highest honor bestowed by Purdue University.

An excerpt from one of several letters received from distinguished nutrition scientists in support of Clark's nomination for an honorary degree from Purdue University summarizes the importance of her contributions:

In brief, it is not an overstatement to say that Helen Clark is among the world's top leaders and also at the cutting edge of human metabolic research in relation to amino acids and protein nutrition for a period of about twenty-five years beginning in the late 1950s. This was at a time before there were reasonable quantitative estimates of the requirements for indispensable (essential) amino acids in healthy human subjects and she established her laboratory as one of the most important worldwide locations for critical and excellent work on the quantitative aspects of human amino acid nutrition and metabolism. As a young postdoctorate in 1965, I definitely felt that Helen Clark was a major contributor to the advancement of knowledge in the area of human protein nutrition and I have never had reason since to change my view. Her work, at this time, was not only state of the art but was of international significance. Indeed, we still have frequent occasion to refer to her published work, despite all of the technical sophistication and intellectual progress that has been achieved in the past twenty years. In short, . . . I can honestly say that Dr. Clark continues to impress me as a beacon of commitment, dedication and contribution to her chosen field to academic/intellectual enquiry, her professional field of nutrition and to her University through teaching and training of a younger generation.

Excellence in graduate education

Dr. Clark deserves recognition for the initial building of an excellent teaching and research program in nutrition at Purdue University. When she joined the faculty in the Department of Foods and Nutrition in 1954, very little research was being conducted in the department and course offerings in nutrition at the graduate level were extremely limited. She initiated the development of graduate-level nutrition courses and a research program involving graduate students that formed a solid basis for Purdue's strong program.

Clark inspired her students, many of whom are currently leaders in the field of nutrition throughout the world. During her tenure at Purdue University, Clark served as chair of the Graduate Degree Advisory Committee for 17 students who earned Doctor of Philosophy degrees and for 35 students who earned Master of Science degrees. In addition, she served as a member of numerous advisory committees for graduate students in the School of Home Economics and in the School of Agriculture. She supervised the research training of students from Brazil, Egypt, India, Iraq, Japan, Jordan, Korea and Taiwan. Most international students returned to their countries and are making important contributions as teachers, researchers and directors of human nutrition programs. For example, one student holds a position in the Ministry of Education, Curriculum and Books Department, Amman, Jordan; another is head of the Department of Home Economics, Alexandria University in Egypt; and another is head of the Department of Clinical Nutrition in the College of Medicine, University of Baghdad, Iraq.

Clark supervised the research training of many students from this country, who are now contributing as dietitians, teachers and researchers not only in various hospitals, universities and colleges but also in government and industry in the United States. Former students of Clark are professors and/or administrators at Cornell University, University of Florida, Kentucky State University, University of Illinois, Iowa State University, Pennsylvania State University, Purdue University, Tufts University, Virginia Polytechnic Institute and others. One former student was associate dean of the Graduate School and then became dean of the College of Human Development at Pennsylvania State University. Another is currently professor and chair of the Department of Food Science and Human Nutrition at Iowa State University.

In a letter supporting Clark's nomination for an honorary degree from Purdue University, one student attests to Clark's invaluable guidance: "I was fortunate enough to have had Dr.
Clark as my mentor through my graduate training. Never before or since have I been so enriched in an educational setting. She led by example and inspired in all of us the quest of excellence. She set high standards, but never failed to provide the utmost support for those in need of special assistance. She enabled all of us to flourish beyond our greatest expectations."

Another student remembers, “My strongest recollections of Dr. Clark during my training at Purdue involve her direction of the human metabolic experiments in the metabolic research unit. She gave attention to every detail of her experiments and I will be ever grateful that this characteristic was firmly imparted to me under her tutelage. Dr. Clark was a demanding classroom teacher, she expected excellence from her students and she gave whatever time or energy it took to help us achieve the highest standards. Although Dr. Clark was clearly most ‘at home’ in the classroom and laboratory, she served Purdue in several administrative positions, including interim department chair. She was insistent that such appointments should not take her too far from her prime mission in education and research.”

**Excellence in other activities**

Clark effectively served Purdue University on various committees, including the Executive Committee (before serving in the University Senate). Her contributions to the University Committee on Students of Superior Ability and the University Committee on the Status of Women are especially noteworthy.

She chaired the University Committee on Students of Superior Ability for 2 years. During this time she was instrumental in establishing a special convocation to honor undergraduate students who had achieved high levels of academic performance, and the Convocation for Distinguished Students is now an annual event at Purdue University. Clark also chaired the Undergraduate Honors Program of the School of Home Economics, and she substantially influenced the development of the program’s guidelines. Clark personally supervised the projects of two undergraduates who were among the first group to be admitted to the program.

The status of women was an area of special concern to Clark and she energetically championed this cause when she served on the University Committee on the Status of Women. She contributed to a report prepared by the committee regarding the status of women faculty and staff at Purdue University. She was recognized for her outstanding leadership and service to the University with the Helen B. Schleman Gold Medalion Award and the Women’s Caucus (Purdue University) Award.

Clark was involved in numerous activities at national and international levels. She participated in the first White House Conference on Food, Nutrition and Health in 1969, and then served as chair for local professional involvement in the state of Indiana. She served as the only female member of a committee appointed jointly by the U.S. Department of Agriculture and the National Academy of Sciences to make recommendations concerning research in food science and nutrition (1970). She chaired the research section of the American Home Economics Association (1970–1972), and while serving in this capacity, was instrumental in the initiation of the *Home Economics Research Journal*. She served as a member of a review team to evaluate task-force reports of food consumption, food service and nutrition at North Carolina State University (1972). She assumed major responsibility for the development of Regional Project NC-49, “Factors Affecting Requirements of Adult Human Subjects for Protein and Amino Acids.” She served as a member of the technical committee for 5 years and as chair for 1 year. She was also a member of the editorial boards of the American Journal of Clinical Nutrition (1969–1972) and *Nutrition Reports International* (1969–1972).

Her memberships included Sigma Xi, Phi Kappa Phi and Kappa Omicron Nu. She was a faithful member and elder of Central Presbyterian Church, Lafayette, IN.

Clark died on January 3, 2001 after a brief and sudden illness. There are no immediate survivors.

As increased attention is being given today to areas Clark championed, such as improvement of human nutrition through national and international policies based on nutrition research, recognition of distinguished scholarship and the status of women, her important contributions continue to have a far-reaching impact.

**LITERATURE CITED**


