
Memorial Resolution of the Faculty of the University of Wisconsin-Madison On the Death of Professor Emeritus Milton L. Sunde

Milt L. Sunde, professor emeritus of the Poultry Science Department died October 2, 2015 in Madison Wisconsin at the age of 94. Professor Sunde was born January 7, 2021 near Brookings South Dakota on the family farm. In his youth Milt was an avid breeder of show chickens, which received top rankings in shows across the Midwest. On entry to South Dakota State University in 1940 he decided to turn his hobby into a career by studying in the Department of Poultry Science with minors in Chemistry and Rural Sociology. His undergraduate education was interrupted by his enlistment in World War II on April 12, 1943. He entered as a Private, but quickly rose to Captain within his three years of military service. Professor Sunde received the Bronze Star for Valor for his leadership and bravery in the Allied offensive at the Siegfried line, and the Battle of the Bulge. After his discharge from the service in June 1946, he returned to South Dakota State University to complete his BS degree. While SDSU attempted to retain him as an instructor, University of Wisconsin was paying \$8/month more for assistantship, so off to Wisconsin he went for graduate studies.

At UW-Madison, Professor Sunde joined the Poultry Science Department, August 23, 1947, where he worked on his degrees under Professors Cravens and Elvejhem. He received an MS in Poultry and Biochemistry in 1949 and a Ph.D. in 1950. His graduate studies resulted in 9 published papers. He was retained at UW-Madison as an instructor (1949-1951) and he received an assistant professorship in Poultry Science shortly thereafter. By 1957 he was promoted to Professor. One of his proudest achievements was the training of his 74 MS and PhD students. Many of his students went into academia and populated east coast universities. Professor Sunde was a polymath and his research had one foot in real world problems and the other in basic research. His research had a major impact on the growth and development of commercial poultry production and the allied industries that served it.

Professor Sunde began his academic career just as all of the nutrients required for animal growth had been discovered (approximately 1957, selenium). Discovery of the essentiality of nutrients also required discovery of how to formulate a diet to meet the requirement. The first decade of Professor Sunde's research was dedicated to determining the optimal dietary levels for nutrients required for animal productivity and exactly how to formulate these nutrients such that they did not interfere with other nutrients or nonnutritive feedstuff components. One of his early studies focused on how feeding the vitamin, choline, could spare the dietary levels of the amino acid methionine. His initial report in 1951 spawned 3 decades of study at many universities, where choline found a place in reducing feed cost. Another one of his early findings was that nutrient requirements were dependent on caloric density of the diet. Today all diet are formulated based on caloric density. During the late 60s and early 70s Professor Sunde increasingly studied the role of environmental toxicants on health. He published works on the effects of malathionine, polychlorinated biphenyls, and methyl mercury (more later). Throughout the 70's and into the 80's, Professor Sunde did considerable research on the use of crystalline amino acids in poultry diets to reduce the cost of feeding high protein diets. While establishing the requirement for specific amino acids was essential, Professor Sunde showed numerous interactions between amino acids, which could impact requirements. These findings support the concept of a "balanced diet" which proved to be much more complex than simply feeding a nutrient adequate diet. Toward the end of his career, Professor Sunde began to focus on alternative ingredients used in poultry diets. Some of the ingredients studied were not readily available in the US (e.g., Rice Bran) and, part of his motivation for their study was to improve poultry production in developing countries. Wheat middlings, a byproduct of wheat starch production was Professor Sunde's major focus for a number of years, and by the time he completed his research, the value of wheat middlings rose 3 fold. Another unique focus of his was the study of insects as poultry feedstocks. While still not commonly used in animal agriculture, his work showed the immense value of feeding Mormon Crickets; a species well known to swarm to 100 individuals/m².

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Professor Sunde's most highly cited works involved enzymes in animal feeds, vitamin D metabolism, and the interaction of selenium and methyl mercury. His early work on the use of enzymes for improving the use of barley as an animal feedstuff undoubtedly impacted the growth of a \$1B dietary enzyme market developed in the 2000s. His work with Professor Hector DeLuca, developed a core understanding of Vitamin D metabolism and embryonic development. In collaboration with Professor Howard Ganther and using avian models, they uncovered a novel interaction between methyl-mercury in fish and the value of selenium in reducing its toxicity. This work was critical in showing why high levels of methyl-mercury in a product (e.g. fish) could be safe depending on the level of selenium found in the fish. He also did a study with caged birds that showed that if the birds had more exercise, their bone strength could be improved. The founding basis for the welfare of the cage free hen is largely based on bone strength. Today many researchers still reference his 1974 research paper on this topic. Over his 38 years at UW-Madison, Professor Sunde published over 325 articles, many which provided new ways of thinking, and have caused changes in practices or how we view the world. Even though he retired 30 years ago, his works still average about 60 citations per year. Hence his work continues to have impact today.

Professor Sunde lit up the room when he taught. Alumni that took a course under Professor Sunde still reminisce about the fun that they had under his direction. By the end of his career he had taught nearly every course offered by the Poultry Science Department for at least one semester. He was always willing to fill teaching vacancies. His teaching materials on the fundamental biology of the chicken that he developed over his career continue to be used in the classroom today. His love for teaching led to a continuous lecture in Animal Sciences 101 on the role that College of Agricultural and Life Sciences faculty played in state development; a lecture he taught until his death. For his excellence in teaching, Professor Sunde received both college and national award recognition. His teaching extended far from the boundaries of campus. Like an extension specialist, Professor Sunde traveled the state to hold workshops and training sessions involving poultry nutrition. His diet formulas, for many years, were the basis for feeding commercial poultry production, pheasants, pigeons, pet birds and birds in zoological gardens. Needless to say, his phone constantly rang with requests for additional insight into avian problems throughout the state and the U.S. He also served as a leader in national organizations. He served as president of the Poultry Science Association, Chair of the National Research Council's Subcommittee on Poultry Nutrition, President of the American Poultry Historical Association, President of the World's Poultry Science-US Branch, and Vice President of World's Poultry Science Association.

Professor Sunde continued to be active even after his retirement. Due to budget cuts, Professor Sunde taught the freshman class in poultry science for 5 years with no reimbursement. He wrote a book entitled *History of the University of Wisconsin Poultry Department since it's 1909 founding until its merger with Meat and Animal Sciences in 1996*. It was his love of all things in academia and poultry that made him a campus ambassador. He simply was the flame that ignited any gathering and his laughter and sense of goodness in the world will always be cherished.

In the end of his joyous life, Professor Sunde was survived by his three children, Professor Roger Sunde, Madison, Wisconsin, Scott Sunde, Albuquerque, New Mexico and Robert Sunde, Fort Worth Texas. Also surviving were six grandchildren Gavin, Colin, Eric, Kevin, Nicole, and John, and two great grandchildren, Dean and Rose. His wife, Genevieve, preceded him in death. An oral history of Professor Sunde's life is archived at Steenbock Library on the University of Wisconsin-Madison's campus.