Orville A. Levander, PhD: 1940–2011
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Biographical Article

The nutrition community will remember Orville Arvid Levander for his pioneering research on human selenium nutrition and his public health-related research (Supplemental Text 1). Orville was born on April 6, 1940 in Waukegan, Illinois. His father, Oscar, was a Finnish immigrant who was a career employee of the local co-op. His mother, Emilia, was the daughter of Finnish immigrants. She was active in the community and had a strong artistic bent, singing and performing in local theater groups. Orville was their only child and, influenced by his mother, he played piano and clarinet in school music groups. As a schoolboy, Orville developed a strong interest in classical music that he maintained throughout his life.

Upon graduating from Waukegan Township High School in 1957, Orville entered Cornell University intending to study chemical engineering. During his freshman year, however, he was introduced to organic chemistry and became fascinated with it. As a result, he shifted his career focus from engineering to biology, graduating from Cornell in 1961 with a major in chemistry.

After college, Orville entered graduate school at the University of Wisconsin to study biochemistry. He joined the group of Carl A. Baumann, a nutritional biochemist. Dr. Baumann had studied the metabolism of a number of nutrients and was beginning to investigate selenium, because it had just been shown to protect animals against several nutritional diseases and was suspected to be an essential micronutrient. In the Baumann group, Orville joined Howard Ganther, Leon Hopkins, and others as they initiated the study of selenium metabolism at Wisconsin.

After postdoctoral work at Columbia and Harvard Universities, Orville joined the FDA as a research chemist in 1967. Two years later, when Walter Mertz created an environment for the study of trace elements at the Agricultural Research Service (ARS) of the USDA in Beltsville, MD, Orville took a position there. He remained at USDA until his retirement 38 y later.

Orville’s focus during his graduate studies had been on metabolic interactions of selenium with arsenic, presaging some of his later investigations on interactions of nutrients with toxic chemicals. However, while continuing his research on selenium biochemistry, Orville charted a new course by developing a research program in human selenium nutrition. Thus, early in his career, Orville recognized that understanding the importance of selenium in human health would require determining human selenium intakes and the human selenium requirement. He began by studying the selenium content of foodstuffs and dietary intake of the element. His early work helped determine that normal selenium intakes in the US were ~100 μg/d.

Soon thereafter, in a bold move, Orville undertook a selenium balance study with the goal of determining the human selenium requirement. He arranged a 1-y sabbatical leave with Janet King at the University of California at Berkeley, where the “pent-house” provided a clinical facility to carry out his study. In collaboration with Janet in 1978–1979, Orville was able to feed a low-selenium diet to healthy participants for 45 d and a repletion diet for the following 25 d. The length of the study was too short to achieve more than mild selenium depletion, but it allowed Orville to estimate that a selenium intake of 70 μg/d could maintain body stores (1). To my knowledge, that was the first estimation of the human selenium requirement that was based on human research results. Importantly, this balance study supported the designation of 50–200 μg/d as the official safe and adequate intake range of selenium that was issued by the NRC in 1980.

Orville’s return drive from California to Maryland in 1979 allowed him to visit Leon Hopkins, a close friend from graduate school days, and, at that time, a professor at Texas Tech University in Lubbock. Although he had had an active social life, Orville had not met the right woman with whom to share his life until that visit. Ruth Novelli, a native of Uruguay, was a postdoctoral fellow with Leon, and she and Orville were attracted to each other on that visit. After a long-distance courtship, Ruth and Orville married in 1981. Ruth, a veterinarian by training, took a job with the Pan American Health Organization when she moved to the Washington area.

Around 1980, Finland, a low-selenium country with a high cardiovascular disease incidence, began to contemplate supplementing its food supply with selenium in hopes of improving public health. Professor Pekka Koivistoinen of the University of Helsinki invited Orville to advise Finnish investigators on this project because of his research experience in human selenium nutrition. Orville worked with the Finns on studies to determine the amounts of selenium in foodstuffs that would be needed to achieve selenium adequacy in their country. Prominent in those studies was Orville’s innovative use of selenium biomarkers in blood. He measured glutathione peroxidase activity in different blood compartments and concluded that its activity in platelets was the best available biomarker of selenium nutritional status (2). The use of selenium biomarkers in blood has proven to be the most accurate means of assessing human selenium status.

Not only did Orville impart his knowledge of selenium nutrition to the Finnish investigators, he also served as a mentor to...
Orville was proud of having attended over 30 consecutive FASEB meetings (now Experimental Biology). He and I met at one of those meetings in the early 1970s when I was trying to join the “selenium group.” Having trained at the University of Wisconsin, Orville was well connected in the relatively small selenium world. He went out of his way to introduce me to other selenium researchers and help me become a member of the group. We remained close friends and colleagues from that time.

In preparing this brief biography, I communicated with many people who knew Orville well. Friends and professional colleagues all recognized Orville’s serious approach to his work, but they also valued his curiosity about the world that led him to hike in New Zealand, explore the San Francisco bay area, and get to know Finland. Time with Orville was always rewarding because of his diverse interests, serious conversation, and subtle sense of humor.

Although he started his family later than most, Orville was a proud and successful family man. Ruth and Orville graciously opened their home to friends and colleagues visiting the Washington, DC area. When encountering friends, Orville always gave updates on the achievements of his and Ruth’s 2 children, Ximena and Alejandro. Both of them earned doctorates in May 2012. Ximena received an MD from Cornell University School of Medicine and Alejandro received a PhD from the University of California at Berkeley.

Parkinson’s disease made Orville’s last years difficult. In spite of his infirmity, he worked as long as his health allowed and, after he retired in 2007, he maintained friendships and scientific interests even though his travel was severely restricted. Orville is missed by his friends and by the nutrition community to which he contributed so much.

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Literature Cited