I am honored to receive the 2014 H. Allen Tucker Lactation and Endocrinology Award from the American Society of Animal Science. This award, named after my graduate mentor, recognizes mentoring of students in the fields of lactation and endocrinology. I thank those that nominated me and the Awards Committee for selecting me for this honor. I thank Dr. Tucker and the students, postdoctoral fellows, and other colleagues that I have had the good fortune to work with since the beginning of my career in Animal Science, all of whom had an impact on my development as a scientist. In early 1980, as I began searching for graduate programs in Animal Science, one of my undergraduate advisors suggested that I apply to Michigan State University. Later that spring when I accepted the offer from Dr. H. Allen Tucker (“Tuck”) to begin my Master’s degree in his laboratory, I had no clue as to the positive impact that decision would have on my professional and personal life. Nor, at the time, did I really understand how strong an influence his training would have on my own philosophy of mentoring students. Later in my graduate career, I began to understand his philosophy on graduate student training and why he was such an effective mentor for so many scientists. Fortunately, as I moved through the professional ranks at the University of Connecticut, he continued to be my mentor.

Each of us develops an approach to mentoring students in research that is usually based on our own experiences as a trainee that gets modified and refined with each student that we interact with over the years. As I reread Dr. Tucker’s philosophy on graduate training (Tucker, 1988), I realized how much my own philosophy parallels the training that I received in his laboratory, a philosophy that focuses on communication, reading the scientific literature, enthusiasm for the science, presenting and publishing data, developing a work ethic, and the importance of teaching.

As in most relationships, clear communication is a key. Students need to understand that the door is open for questions and to discuss issues and problems. Moreover, each student must understand that their contributions in the laboratory are an important part of the research process. Furthermore, it is critical that very early in their training a description of the overall program and research interests (and research impact) is presented to them. However, the most important items to communicate to new students are an enthusiasm for research and expectations for success. That is, explain what drives your excitement for your research and what it takes for a student to be successful in your program. The communication between mentor and student should continue throughout their graduate career and beyond. Celebrate their successes, but be direct in identifying weaknesses without belaboring them (but remind them that weaknesses should all be fixed!). The relationship between student and mentor should be able to withstand criticism and review. In fact, the response to a thorough review is often telling how a student will “mature” as a scientist.

An important part of Tuck’s mentoring of students focused on reading the scientific literature. He expected us to know the literature and contributions of past scientists in the broadest sense of the field. In fact, I can recall my written comprehensive exams,
when he asked me to identify the contributions to the field of a long list (n = 20) of distinguished scientists, including Frederick Banting, A. T. Cowie, Elwood Jenson, Ferdinand Labrie, Vincent du Vigneaud, Yale Topper, L. E. Casida, and others, with a wide array of contributions ranging from metabolism and feed intake to control of hormone secretion and hormone action to mammary gland development and breast cancer. Interestingly, during my career, I had the opportunity to meet about one-half of the individuals on the list and had the good fortune to work for one of them (Ian Hart). Although recalling the exam is a fond memory, it instilled the importance of reading, not only the current literature, but the discoveries of those who preceded the current generation of scientists. I encourage students to read the literature by suggesting specific papers and participating in journal club (and I include a similar question on the written qualifying exam of my students). It helps students interpret, understand, and explain their own data, and it certainly helps them improve their future experiments. Diligent reading of the literature helps them understand the background for their research and learn who else is working in their specific area. And most importantly, it improves experimental design and understanding of new techniques, offers a “view” of how others addressed similar research questions, and may identify potential pitfalls in future experiments. It also helps students think about the “next step” in their research and how it may contribute to the field. Eventually, they start suggesting papers for me to read, and they lead journal club discussions.

Dr. Tucker’s enthusiasm for research was infectious. He was as interested in the binding percentage of iodination of a protein for RIA and weekly BW as in final analyses of a large experiment. His door was always open to discuss results, and he would often come into the laboratory to ask about data. However, the most telling example of his enthusiasm was his willingness to help students conduct their research. He would be at the barn helping collect blood samples and BW; he would be at the abattoir floor helping collect muscle, adipose, and other tissue samples; and he would be in the laboratory helping with assays and tissue culture. We each had our own projects, but he encouraged each of us to lend a hand in each other’s projects. This effort not only created camaraderie among students, it expanded our research interests beyond our own research and gave senior students an opportunity to mentor newer students. Helping students feed animals, collect and analyze samples, and discuss data are still some of the most rewarding aspects of my job. Working with students in the barn or the laboratory also provides opportunities for “teachable moments” in a much less formal environment.

Tuck insisted that we assist with at least one course per year. Oftentimes we were the teaching assistants for his lactation physiology class, and he also encouraged us to assist with other courses in the department. These teaching experiences were very helpful when it became time to teach my own classes, especially with regard to classroom management, drafting a syllabus, and grading exams and term papers. In Animal Science at the University of Connecticut, all graduate students are required to assist with one course per year so they all receive teaching experience. My senior graduate students have assisted with my undergraduate writing course, including critiques of first submissions and small group meetings to address specific problems in a paper. This gives the graduate student experience in grading and an understanding of the spectrum of undergraduate writing abilities. It also provides the undergraduate with another critique of the paper and another voice in the room to help them improve their writing. Overall, it is great experience for the student to get in front of a class and seems to be an important “extra” in a CV when it comes time for the next step in a student’s career.

Dr. Tucker was adamant that we present our data in public. These presentations could be in formal or informal settings, including presentations at in-house seminars and at national meetings. However, regardless of the setting, he had high expectations for our seminar preparation; the objectives had to be clear and stated early in the talk, materials and methods had to be organized, the results needed to be easily visualized, and the discussion had to be pertinent to the data. Importantly, he expected a level of preparation such that questions from the audience could be addressed. Practicing a talk in front of Tucker for the first time was always more nerve-racking than presenting at a national meeting. Similarly, my students present in formal and informal settings. Students present their experimental plans and data in laboratory meetings, and we have a formal seminar requirement in the Department that includes a 1-credit course on presentation skills. Students must present in weekly departmental seminars 1 or 2 times for MS and PhD programs, respectively, and PhD students must also present their graduate plan of work in a public presentation. I also encouraged (i.e., required) students to present their data at national meetings. And based on my experience with Dr. Tucker, each student practices, revises, and re-revises (and sometimes re-revises again) their presentations for the laboratory group before they present to a wider audience at a scientific meeting.

Certainly it is in a scientist’s best interest to publish his or her data. The key is for the student to write the paper, especially the first draft, and then for the mentor to carefully critique that draft with the student. I recall getting first drafts back from Dr. Tucker that looked like he
used up the ink of several red pens, including one of my first introductions that came back with a very large hole in it, identifying that et al. was an abbreviation and a period needed to be inserted at the end. Following a revision or two, I remember going over papers in Tuck’s office and reading each line out loud, which clearly identified grammatical and other mistakes in my writing. It is also important that students learn to respond to reviewer’s comments. Another lesson from Tuck was to make sure students had an opportunity to review manuscripts before they were submitted. It really does improve their own writing when they can “see” mistakes in someone else’s paper. I have students review papers for publications, and I have incorporated peer-review in my undergraduate writing course, which seems to improve their writing as well.

Perhaps the most lasting lesson from Tuck was his continued connection to his students. This connection was not just between Tuck and the student; it was a connection he created between his students, even those that were never in the laboratory at the same time. There were many students that finished before I got to his laboratory, and many that finished after I left, but through Tuck, we all became part of the extended Tucker family.

Lastly, I am humbled to join the distinguished list of Animal Scientists invited to write on graduate education in the Animal Sciences (e.g., Drs. Casida [1966], Ulberg [1986], Tucker [1988], Hafs [1990], Foote [1992], Day [1994], Bazer [1996], Thatcher [1998], Inskeep [2000], Stormshak [2004], Saacke [2007], Reeves [2010], and Randel [2013]) as well as the first recipient of this award (R. C. Hovey). It was certainly an honor and privilege to be one of H. Allen Tucker’s graduate students and an honor to have been selected to receive the award that bears his name.

LITERATURE CITED