

ADSA FOUNDATION SYMPOSIUM: MEETING THE PRESENT AND FUTURE DEMAND FOR EMPLOYEES WITH A PhD IN DAIRY SCIENCE

0001 Current problems with funding PhD programs.

L. H. Baumgard* and M. G. Hogberg, *Iowa State University, Ames.*

The dairy industry's need for scientifically trained personnel is increasing, whereas academic output of PhD graduates with a dairy emphasis is decreasing. This enhanced requirement for industry scientists is the obvious result of a maturing, evolving, and increasingly educated global dairy industry. Reasons for the reduction in the number of PhD candidates are less apparent and multifaceted. First, the field of dairy science is becoming more geographically regionalized and thus many U.S. land grant institutions have either de-emphasized or eliminated their dairy curriculum and dairy research capabilities. Second, the means by which graduate students are funded has markedly changed over the last 30 yr. In the past, most faculty members were "allocated" state-appropriated monies that were used to pay graduate student stipends and fund research projects. At most universities, these state "lines" have either experienced severe attrition or, in most cases, have completely been eliminated. Although variable among universities, current graduate student stipends (direct and indirect costs) range between \$25,000 and \$40,000 annually. Consequently, faculty are required to generate approximately \$70,000 or \$140,000 in stipend funds for a M.S. or PhD student, respectively, to graduate students in a timely manner. Funds to support research are necessary in addition to the stipend, raising total training costs for a PhD to < \$300,000. Federal grants (USDA, NSF, NIH, etc.) are often monetarily large (i.e., \$300,000 to \$1 million), typically run for 3 to 5 yr, and are generally "focused" on a specific area of biology. However, the likelihood that a PI can continuously fund a research program based on competitive funding is low, as success rates on federal grants are commonly < 10%. This is especially true for applied researchers. Alternate sources of research funding are commodity groups and allied industry. However, relying on industry funding to train a PhD student requires successfully obtaining at least 4 yr' worth of industry grants large enough to complete a student's degree. Further, research revenue from different aspects of the industry will undoubtedly create inconsistencies in the area and type of research that the student conducts. Consequently, the experiments are less likely to "build on each other" and lack biologi-

cal continuity; circumstances that compromise critical thinking and jeopardize scientific independence. Therefore, untraditional and creative funding strategies are urgently needed to meet the global demand for technically trained dairy scientists. Potential strategies will be provided in the presentation.

Key Words: funding

0002 Current situation for finding qualified people with a PhD; an industry perspective, dairy production.

W. C. Weldon*, *Elanco Animal Health, Greenfield, IN.*

A population growing to 9 billion people and 3 billion people moving to the middle class is projected by 2050. These global trends are increasing milk demand globally. Milk demand is projected to exceed supply, as people drink milk and eat dairy products to improve their nutrition, as their economic status improves. The increased need for milk will drive a significant demand for individuals with a PhD in dairy science. Industry roles for PhD graduates span a significant spectrum, including leading research, providing nutrition, reproduction, health, and management consulting services. There is also significant advancement in the underlying technology being used to produce milk and dairy products, requiring a continual investigation and learning over the course of an entire career. The demand for milk globally is significantly increasing the demand for qualified PhD graduates across the globe, in an effort to develop products, practices, and genetics that can rapidly improve productivity. In our experience, the most successful PhD scientists have a broad view of the industry, coupled with deep technical training. Including real life experiences through industry cooperation can help students develop key industry knowledge that will be critical for their future. These experiences will enhance their career. Our industry is becoming more complex with multiple partnerships. This requires students that are not only good in the lab but are very effective at collaboration and transferring knowledge. Finding PhD scientists with these qualities is difficult. In many cases, it can take a year or more to fill a position with a qualified candidate. The long searches can negatively impact the hiring companies. Significant opportunities exist to increase global milk production by increasing the population of PhD dairy science graduates to help meet the global demand for the nutrition from milk and dairy products. These scientists will be most effective if PhD programs focus on sound scientific training but also expose and train students in interpersonal skills, economics, and dairy industry fundamentals.

Key Words: dairy, PhD

0003 Current situation for finding qualified people with a PhD; an industry perspective, dairy foods.

C. Allen*, *Kraft Foods, Glenview, IL.*

The current situation for finding qualified PhD graduates with dairy foods experience is bleak. There are limited experienced people in the industry and an even smaller amount coming out of the universities. The trends in dairy that are continuing to influence the dynamic evolution of employee requirements are: economic shift to the extremes and decline of the middle, continual push to drive for sustainable products, and global shifts in the commodity market. Dairy foods are complex matrices and span a wide range of food systems. The need for dairy talent with deep and varied expertise is urgent, but academic institutions shouldn't lose sight of the need to produce talent with a strong base in fundamental sciences and strong technical rigor. Companies are often recruiting, developing, and retaining their specific talent, but this approach is minimally successful and often leaves gaps in expertise. Suggestions to close this gap are: applied internships within strong fundamental programs or joint university programs (degreed or specialty) that combine strong fundamentals with application.

Key Words: dairy foods, internships

0004 Current situation for finding qualified people with PhDs; an academic perspective. V. V. Mistry*,

South Dakota State University, Brookings.

The tripartite mission of teaching, research, and extension established 150 yr ago remains at the core of land grant universities today, but numerous structural differences today have an impact on programs. The PhD-holding candidates at universities may find positions, such as post-doctoral research associates, faculty members, and later in their careers, administrative positions, such as department head, associate dean, and dean, that help define academic programs. University programs that were typically funded by state and federal funds in the form of teaching, Hatch, and extension funds have seen a substantial reduction in dependency on these funds due to competition from other local (state) and national needs. Therefore, dependency on other non-appropriated funds has become essential (e.g., competitive grants, tuition and fees, and discretionary funds). Expectations of research output from faculty members have also increased. Thus, dependency on competitive grants for supporting research programs, graduate students, and portions of faculty salaries has become imperative. Simultaneously, non-university research programs, as in industry, have also become more sophisticated and, in many cases, targeted at long-term research efforts. Consequently, only those high quality PhD graduates that have a strong desire to develop a

career in academia become candidates for faculty positions. Salaries in industry are usually higher than academic faculty positions. It is essential for universities to fill faculty positions with highly competitive individuals that in today's climate are not just excellent researchers that have an interest in teaching but are also competitive entrepreneurs. Such individuals if provided the right resources through start-up funds, grant writing training, and research resources will be well positioned to develop research programs that will train graduate students. Opportunities provided in a university environment are sometimes not known by prospective faculty members, such as the ability to consult, ability to share royalties from patents and licensed intellectual property they develop, and the general fulfilling nature of training students. It is therefore imperative that industry, universities and state and federal governments jointly develop efforts to help make the academic career attractive for PhD-holding candidates. Further, university graduate programs should be encouraged to design curricula that will help students position themselves for a successful academic career. Examples include courses or training in teaching, grant writing, and publications. Also important is the ability for students and faculty to develop relationships with industry.

Key Words: faculty, recruitment, university

0005 Short-term employment opportunities in industry for people pursuing graduate degrees. C. Johnson*,

Land O'Lakes, Inc., Arden Hills, MN.

Short-term employment opportunities offer companies seeking to employ people with graduate degrees and people seeking graduate degrees several key benefits. First, short-term employment opportunities allow potential employers to determine what the graduate degree candidate can bring to the table before extending an employment offer. Graduate degree candidates can acquire valuable skills and training in practical, "real world" work settings. Acquired skills and training can complement the candidate's academic education and increase the candidate's market value when pursuing employment. These short-term employment opportunities also allow the graduate candidate to determine if a position and/or company are a right fit for the candidate's career goals, further solidifying career direction and understanding broader applicability of one's education. Another benefit of short-term employment opportunities for graduate degree candidates is the ability to expand their business network, which is not only beneficial in the short term when seeking employment but also throughout one's career. Finally, short-term employment opportunities allow graduate candidates to add depth and breadth to their curriculum vitae, setting themselves apart from other candidates.

Key Words: careers, dairy, graduate degrees