

International Animal Agriculture Symposium: Increasing Undergraduate and Graduate Student Training in International Animal Agriculture

119 What type of employee will international agribusiness companies be seeking? K. A. Jacques* and K. A. Dawson, *Alltech Center for Animal Nutrigenomics & Applied Animal Nutrition, Nicholasville, KY.*

The globalization of agricultural markets and resources has driven up the importance of having a broad-based understanding of the rate-limiting steps that govern food production. Employers look to hire people who command an overall knowledge of an increasingly complex food chain, from production to consumption. The market importance of consumer demands has risen in response to the growth of living standards in emerging nations and worldwide food safety concerns. These considerations are re-shaping the industry and mandate that the ag industry employees of the future be capable of presenting their message across cultures. Moreover, with the rapid emergence of industry-changing biotechnologies, such as nutrigenomics, it is increasingly essential that prospective employees have the communication skills to enable them to explain sophisticated science to a diverse audience. These job demands have important implications for undergraduate and graduate programs in agriculture. Course plans must encourage students to build a wide knowledge base of the economic and cultural, as well as the scientific factors, that drive the industry's future. Today's animal science graduate, for example, comes best equipped with cross training beyond the traditional single species/sector focus and an understanding of the issues that affect the value chain at each stage between farm and consumer. The ability to look beyond a regional or species-based focus is of special value to international companies that typically work in multiple aspects of grain and animal protein production. Partnerships between industry and academia that provide students internship experience will be of increasing value to both employers and students.

Key Words: globalization, education, agribusiness

120 The role of animal scientists in assuring food security in developing countries. J. Turk,* *U.S. Agency for International Development, Washington, DC.*

The objectives of this presentation are to 1) highlight the values of livestock in economic growth and human nutritional security in developing countries; 2) relate how animal scientists are important to this security; 3) describe what skills are required to work in the field; and 4) introduce the international donor livestock community, i.e., the multilateral institutions, bilateral organizations, government agencies such as the European Union and BRIC governments, private foundations (e.g., Rockefeller Foundation, Bill and Melinda Gates Foundation), and non-government organizations (NGOs). The global livestock sector employs 1.3 billion people directly or indirectly. Approximately 70% of households living on less than US\$1 per day are fully or partially dependent on livestock for their livelihoods. The largest single sector of agricultural economies, it accounts for up to 50% of agricultural GDPs in most developing and transition countries. As a repository for rural capital livestock provide often more than 10%. For poor households, livestock are key to managing risk, protecting savings, and offering insurance against drought or crop failure. Livestock represent diversified values—social, environmental, economic and nutritional—but not all can be measured in hard numbers or equated across cultures and ecosystems. Although livestock's economic value is usually regarded as the primary benefit, nutritional value of animal source foods is one

of the most difficult to assess. Traditional diets often lack critical micronutrients essential for children's physical and cognitive development. Improving livestock production and health throughout the value chain requires the knowledge to address major challenges. These include: low animal productivity; disease transmission; weak or non-existent national policies regarding disease control; weak service delivery caused by lack of trained providers; lack of inputs and supplies; inability of producers to pay for services; lack of production, health and market information; and impacts of climate change on all production systems. This paper relates how animal scientists are important to the international livestock community and food security.

Key Words: livestock production, food security, developing countries

121 Implementing new technologies in developing countries: Intellectual property, patent laws, and technology transfer agreements. K. Krafka,* *Kemin Industries Inc., Des Moines, IA.*

As new graduates seek and secure employment in animal agriculture and work in a more global economy, there is an emerging need for today's scientific professionals to become more familiar with a basic recognition of intellectual property. Those professionals who are proficient in operating with knowledge of intellectual property issues will become more poised to contribute to new product development. The objective of this abstract is to increase both awareness and understanding of intellectual property, including trade secrets, patents, patent laws, registrations and technology transfer agreements, as they may relate to the use of innovative technology on a more global basis. Intellectual property is often misunderstood and consequently overlooked as part of technology transfers from one geography to another. Certain rights are inferred with patents, and those may or may not be applicable across different geographies. Patent terms or lengths may also vary among world geographies. A case study will be presented using an example novel product developed in one geography that is desired for transfer and use in a secondary geography. Intellectual property rights, freedom to operate strategies and licensing options will be discussed. The use of patents as a core strategy and revenue stream for both universities and industry will be explained. The case study will demonstrate how a successful technology transfer can be approached and properly executed on a timely basis. In conclusion, careful management of roles and responsibilities as they relate to intellectual property may result in an increased ability to conduct business in multiple geographies, enhanced research and manufacturing partnerships and most importantly, full utilization of cutting-edge technologies to further improvements and maximize value in livestock and poultry production globally.

Key Words: intellectual property, patents, technology transfer

122 A theme-based approach in smallholder dairy training through a partnership between Malawi and Scotland. M. G. G. Chagunda*¹, T. N. Gondwe², and D. J. Roberts¹, ¹*Scottish Agricultural College, Edinburgh, UK*, ²*Bunda College of Agriculture, Lilongwe, Malawi.*

Over the past decade the Malawian agrarian policy has been shifting from what was predominantly tobacco based industry into other enterprises. The Department of Animal Health and Livestock Development

(DAHLD) has identified dairy farming as its flagship due to its potential to substantially contribute to sustainable household income, food and nutritional security. However, acute staff shortages and inadequate expertise within DAHLD and other non-governmental organizations has been a major challenge (Mtukuso, 2006, CISANET, 2006). Capacity building and skill development are needed for adequate human capital to complement technical interventions (World Bank, 2009). The national livestock policy and DAHLD strategic plan (DAHLD 2004, 2006) identified the following 6 specific issues in the area of dairy in Malawi. These are, a) inadequate availability of improved breeding stock and inefficient insemination program b) high cost of veterinary drugs and health care c) feed and nutritional problems d) low levels of husbandry e) inadequate production and marketing infrastructure and f) milk keeping quality. Since 2008, Scottish Agricultural College and Bunda College of the University of Malawi have been working on a theme-based program for smallholder dairy training with the 6 specific issues turned into training themes. Each theme is dealt with at different levels reflecting the trainees' prior knowledge, function and commonality of practice. Each training session is delivered by the appropriate resource person, for example, trainers, facilitators and innovators depending on need. Scientists and development workers are sent on either top-up courses or graduate programs and hence integrate training into the sustainable smallholder dairy development initiative. Courses are obtained either locally in Malawi or through sandwich programs in Scotland. Currently, 586 farmers, 28 lead farmers, 43 extension workers, 6 postgraduates, and 16 senior staff have been trained. Through this initiative, a practical diploma course in dairy science has been established in Malawi. A hop-on hop-off program for life-long learning is envisaged in the future.

Key Words: training, partnership, smallholder dairy

123 Preparing students for a changing world: Employer prioritized attributes from international engagement. L. J. Unruh Snyder,* J. M. Fernandez, and M. A. Russell, *Purdue University, West Lafayette, IN.*

As educators, we want to brace students for a changing world to address the needs for our global society. As agriculture students complete their baccalaureate degrees to enter the workforce, we anticipate they will embrace this with a skill set to overcome challenges and to be successful with their new careers. In 2009, the NRC highlighted the need for a new focus in the undergraduate agricultural education experience, and Purdue's College of Agriculture's strategic goal stated that every undergraduate student graduating will participate in at least one transformational learning experience—study abroad, undergraduate research, or internship, etc. Studies have shown that through international engagement students have a deeper understanding and respect of global issues, cultures, stronger intercultural communication skills, increased ability to problem solve more effectively (Table 1). These set of transformational skills are highly prized by future employees. In 2011, APLU and UIC reported that international experiences consistently rank the lowest for preparing students to enter the workforce; however, study abroad literature demonstrates positive effect on learning. The disconnect needs to be brought to the attention of the educators and students on how to articulate these experiences to gain the employers attention. Thus, there is a need to help students report self-efficacy based on these experiences

affecting their career development. Preparing students for leadership in animal sciences through exemplary teaching, and learning experiences helps to set the stage for their career advancement.

Table 1. A three-year study comparison of cultural awareness in Costa Rica (Pre-Test N = 43; Post-Test N = 43; Six-Month N =25)

Statement	Pre-test (M, SD)	Post-test (M, SD)	Six month (M, SD)
As a student studying agriculture, it is important for me to understand issues related to international agriculture	4.79 (0.47)	4.60 (0.70)	4.40 (0.96)
Participating in this program will/has enhance(d) my cultural awareness	4.65 (0.53)	4.42 (0.82)	4.12 (1.01)

Note: * < 0.05 and denotes a significant difference between the signified mean and that on the pre-test.

Key Words: international, education, employment

124 In-country partnering needed for successful international service learning. P. Ebner*¹, H. Oliver², and M. Russell¹, ¹*Department of Animal Sciences, Purdue University,* ²*Department of Food Science, Purdue University.*

Service learning is a form of experiential learning that integrates community service by the students with the skill development and learning of course content through that service. Purdue Animal Sciences now offers an "Animals & Food Security" undergraduate-level service learning course that take place each year in 2 international settings (Romania and Haiti). In each course, students are introduced to Extension methodologies, communication strategies and resource management by working directly with food animal producers in the respective countries. Integral to service learning is the identification and development of community partners. An ideal community partner relationship is cooperative, producing equitable benefits for both parties. The success of both service learning courses offered by Purdue Animal Sciences has relied heavily on fostering close and functional relationships with their community partners and similar models are used by each course to identify such partners. A total of 72 Purdue students and 28 host-university students have participated in this community- and student-development course. In each case, Purdue partners with a host-country university (Banat University of Veterinary Medicine and Agricultural Sciences in Romania and the University of Antenor Firmin in Haiti). Working directly with host country universities offers connections to students, shared educational and human capital development, and the capacity to incorporate research components into the service learning courses. Likewise, each course partners with Heifer International, a non-governmental organization devoted to global hunger and food security issues. These partnerships offer connections to local farmers and farmer groups and the ability to integrate into a successful development model and use it as an educational tool. Taken together, these partnerships ensure not only the successes and sustainability of the actual working projects, but the continued functionality of courses themselves. We will elaborate on the values and challenges of working with local partners to make the experience educational for the students and of definite benefit to the host community.

Key Words: international, service-learning, extension