NC State Poultry Science: Where Are We Headed?

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What had begun as a small barnyard enterprise among many North Carolina farm families has now evolved into a dynamic multi-billion dollar poultry industry. In 1950, worldwide production of poultry equaled approximately 4.4 million metric tons. In 2004, poultry meat production had risen to an astonishing 77.2 million metric tons (FAO, 2004). In the last 55 years, beef, pork, and poultry production has increased globally by 222, 544, and 1,651 % respectively. For the first time in recorded history, poultry production exceeded that of beef on a global basis in 1995!

Essentially every phase of poultry production has undergone a remarkable transformation since the Second World War. Advances in feed and water delivery systems, automation of ventilation and environmental controls, the development of *in ovo* vaccination, improved brooding equipment, and a revolution in processing technology have contributed greatly to the growth of the North Carolina and global poultry industries.

Through the adoption of a management philosophy that embraces technology, the poultry industry has witnessed advances in efficiency and uniformity of production that are unparalleled. Perhaps more than any other segment of animal agriculture, poultry has relied on technological innovation made possible through scientific inquiry. The poultry industry was also an agri-business that originated out of the visionary leadership of fiercely independent individuals who worked tirelessly to transform their dreams into reality. There is an old proverb that admonishes us to remember that as we drink the water to honor those who dug the well. In that sense, the North Carolina and global poultry industry owes a tremendous debt to the entrepreneurs who sought a more efficient way to produce poultry meat and eggs. Today, the poultry industry has become the model that is rapidly being emulated in other animal sectors, from swine to aquaculture.

State of the North Carolina Industry

Today, poultry is North Carolina's #1 source of farm revenue. According to the most recent NCDA reports, poultry represents more that a third [33.8%] of the state's ag economy. The value of NC poultry (farm gate) exceeds $2.7 billion dollars annually. Broiler production exceeds 4.5 billion pounds and approximately 1.1 billion pounds of turkey are produced annually. Nearly 10% of US poultry is produced in North Carolina. The state ranks second in turkey production, third in total poultry receipts, fourth in broiler production, and tenth in egg production. Approximately 5,000 farm families are

poultry growers in North Carolina. An additional 25,000 North Carolinians are directly employed by the poultry industry.

State of Poultry Science

The number of departments of Poultry Science at US universities has declined by more than 84% since 1960. Forty five years ago there were 44 independent departments of Poultry Science. During the decade of the 1960s alone, 20 departments were either merged or abolished. Today only 7 departments exist: NC State, Georgia, Auburn, Mississippi State, Arkansas, Texas A&M, and Penn State. However, Penn State's program no longer offers a BS degree in Poultry Science.

While the number of departments dwindled, poultry personnel and research support also declined. From 1966 to 2003, the number of research scientist positions devoted to poultry, declined by approximately 46% (Pardue, 1997, USDA, 2004). The number of poultry related projects declined by 73%. When comparing the four major animal sectors [beef, dairy, swine, and poultry] in US ag research support, poultry declined from 23.9% in 1966 to 18.4% in 2003. These declines occurred during a time when per capita consumption of poultry meat in the USA had increased by approximately 201%. Nearly 10 years ago, I wrote a paper that asked about the consequences of reductions in poultry support: "*…where will the poultry nutritionists, geneticists, and physiologists of the future be trained if the relative support of poultry research at land-grant universities continues to decline?"* (Pardue, 1996. Feedstuffs 68(#36) 1, 16-18). The answer to that question is today even more problematic.

Locally, NC State's Poultry Science department has undergone a number of personnel changes in 2005. Dr. Gerry Havenstein stepped down as Head after 16 years. He has opted to take "phased retirement" and will be working half time. As of July 1st, 2005, Dr. Carm Parkhurst also began his phased retirement. Dr. Parkhurst has agreed to continue teaching the introductory poultry course [PO 201] and will coach the judging teams. In July, I was named as the twelfth Department Head of Poultry Science at NC State in the past 110 years. The first Department Head, Frank E. Hege, served from 1895 to 1898 and received an annual salary of $720.

In 2005 we also welcomed Dr. Edgar Oviedo to the department. Dr. Oviedo, an assistant professor and extension specialist, will focus on nitrogen and amino acid utilization, growth models for optimal management practices, and intestinal pathobiology of broilers. A native of Columbia, Dr. Oviedo served on the faculty at Stephen F. Austin University prior to joining us at NC State.

Challenges, Opportunities, & Initiatives

During the interview process for Department Head, I stated that the NC State Department of Poultry Science exists for one reason only: "To serve the citizens of North Carolina by enhancing the economic competitiveness of the poultry industry." Faculty in our department represent nearly a dozen disciplines. Despite this diversity, our common focus must be on poultry. While there are unique challenges that we face as a public academic institution, to be responsive to the industry's needs we must adopt their challenges as our

own. The department addresses these needs in two major areas: the education of potential management personnel and producers through its Academic Programs and the generation of new technology and its transfer or application by Research and Extension faculty.

Student Enrollment

Historically, the loss of an effective undergraduate program in Poultry Science signaled the beginning of the end of a department. Students are a major link between the department and the industry. Ideally, Poultry Science alumni would become the decision makers and managers of the future for poultry companies. Their absence or diminished numbers jeopardizes the department's ability to fulfill its mission. Changing demographics [see below] impacts our recruiting strategies.

The department currently has 62 undergraduate students enrolled in its two BS degree options (TPS, Technology; SPS, Science). While this is significantly below the peak of approximately 120 students in the mid-1970s, it is more than double the low of the early 1990s. Of these 62 students, 35 (56.4%) are male and 27 (43.6%) are female. This is the second year in a row where we observed a reversal of the trend of increasing numbers of female students joining our programs.

Approximately 21% of Poultry Science undergraduates are double majors. Nearly 60% of all our double majors were enrolled in an Animal Science curriculum. Chemistry, Ag Business Management, Pre-veterinary studies, and Agricultural Extension & Education represent the remaining double majors. With one exception, all of our undergraduate students in Poultry Science are from North Carolina. The lack of out-of-state students differs from our recent history where students from multiple states were enrolled. Tuition barriers contribute to the lack of out-of-state students. We will begin investigating the potential for regionalizing our academic programs through organizations such as the National Student Exchange Program and the Academic Common Market.

Academically, Poultry Science students continue to perform well. Poultry Science majors possess a mean overall GPA of 2.88 and 3.31 GPA within their major. The mean SAT score for the undergraduate population in Poultry Science exceeds 1100. Poultry Science undergraduates were also well represented in the 2005 entering class of the College of Veterinary Medicine at NC State. Of the 70 students admitted, three were from Poultry Science.

A total of 25 students [13 male and 12 female] applied for admission into the Poultry Science program for the Fall 2005 semester. Of these, 19 [12 male and 7 females] were accepted and 12 (63%) ultimately enrolled. Freshmen accepted for admission in the Fall of 2005 possessed an average of 1084 on the SAT [1093 in 2004] and a high school grade point average of 3.61 [3.71 in 2004].

As the academic profile of the freshman class at NC State rises, admission to the university becomes more difficult. In the College of Agriculture and Life Sciences the entering freshman class had a mean SAT score of 1156 and a high school GPA of 4.09

(weighed). Nearly 40% of freshmen were ranked in the top 10% of their high school. Recruiting remains a top priority for the department.

Budgets

Years of state budget reversions and escalating costs have created challenges within the department. These cuts have impacted people, programs, and operating resources. Despite these issues, our faculty has responded in a positive manner by obtaining significant funding from public and private granting agencies. In the future, the department will need to become less reliant on state appropriated funding. It is a reality that we must embrace if we are to remain viable. For example, the newly established C.R. "Carm" Parkhurst Poultry Science Teaching Program Endowment is an innovative approach to address our future funding needs. Income from this endowment will be used to provide flexible funds to enhance teaching in the department of Poultry Science.

Demographics

While many still view North Carolina as a rural state, we are rapidly becoming a state dominated by urban centers. In 2004, North Carolina was the 11th most populous state in the US with more than 8.5 million citizens. We not only have a large state population but one that is growing at a rapid rate. From 2003 to 2004, our state's absolute population increase was the sixth highest in the nation (http://demog.state.nc.us/). Some projections have North Carolina becoming the 7th most populous state, surpassing the likes of New Jersey and Ohio, in a few decades.

In 1820, more than 70% of US citizens lived "on farm." Today that percentage is less than two. How do these population shifts influence the Poultry Science department and the North Carolina poultry industry? One example of the effects of urbanization on ag policy was demonstrated by the decision of the Mecklenburg County commissioners to cut more than 40% from the Cooperative Extension budget in 2004. As fewer North Carolinians have direct ties to production agriculture, the understanding of issues important to animal agriculture by the general public also declines. Where there is a lack of understanding, the opportunity for misinformation to influence public opinion grows. We live in a nation where elections and public policy are decided by voters and taxpayers of which 98% are not directly in agriculture.

Animal Welfare / Well-being

Shifts in demographics have profound effects on attitudes relative to animal welfare. Whether it is cage densities or gas stunning, consumer attitudes toward bird welfare not only influences their own buying patterns, but those of national grocery and restaurant chains. Frequently, changes in production practices to accommodate welfare concerns impact the cost of production. When consumers demand low cost, safe, high quality, food that is available year round and also require production systems that are more costly, the potential for adversarial relationships increases.

We have begun preliminary discussions with Mississippi State University's Department of Poultry Science to explore ways to partner with them in their emerging program in bird

welfare and well-being. Exposing our students to science-based welfare decision making processes is essential to prepare them to interact with consumers.

Feed Milling Program

In the US, approximately 3,000 primary mills produce 120 million tons of animal feed annually. The value of these feeds exceeds $25 billion. For a number of years we have been attempting to develop a comprehensive feed milling program. We are optimistic that the feed milling program will soon become a reality. Currently, we offer an undergraduate minor in feed milling. This is a jointly administered program affiliated with Poultry Science, Animal Science, and Biological & Agricultural Engineering departments. The cornerstone of the milling program's Academic, Extension, and Research initiatives will be the mill itself. The vast majority of the essential milling equipment is now on site. We anticipate installation to begin in the near term. We greatly appreciate the on-going support and expertise of numerous companies and organizations in developing this unique and crucial program.

Poultry Processing Laboratory

A number of years ago the North Carolina Legislature appropriated funds to build a multi-species abattoir at NC State. Permitting for the project encountered resistance from constituencies internal and external to the university. Eventually, attempts to build the facility were abandoned. Human resource professionals indicate that two thirds to three fourths of all positions in the poultry industry are directly related to the processing plant. The curriculum in Poultry Science at NC State has historically emphasized various aspects "live production." To address our acknowledged deficiency in poultry processing, we have obtained processing equipment through a generous donation from Tyson Foods that will allow us to greatly expand our capability in this area. Currently, existing space is being renovated to accommodate the equipment. We have set a goal of early 2006 to have this facility on line.

Conclusion

Just as a mutual fund prospectus provides a disclaimer, so too must the poultry industry; "Past performance is no guarantee of future success". The challenges facing the poultry industry are formidable. Of particular concern will be environmental and welfare issues, food safety, international competition, maintenance of strategic partnerships, acquisition of alternative feed ingredients, and access to free markets. For the Poultry Science department to be effective we must partner with the industry to find solutions to these and as of yet unseen challenges.

References

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