DEPARTMENT OF POULTRY SCIENCE
TEXAS A&M UNIVERSITY

GRADUATE PROGRAM REVIEW

SELF STUDY
MARCH 23-26, 2003
<p>| | | |</p>
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<tbody>
<tr>
<td>1</td>
<td>Schedule</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Introduction and Background</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Strategic Plan</td>
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<tr>
<td>4</td>
<td>Related Program Information</td>
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<td>Facilities</td>
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<td>6</td>
<td>Student Information</td>
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<td>Curriculum</td>
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Department of Poultry Science
Texas A&m University
DOCTORAL REVIEW SCHEDULE

Sunday March 23, 2003

Arrivals

12:46 p.m.  Dr. Mary Ann Ottinger, University of Maryland, arrives in Houston on United Flight #1163. Dr. Ottinger will drive to College Station.

4:30 p.m.  Dr. Brian Sheldon, North Carolina State University arrives on Continental Airlines Flight 2794. Dr. Sams will escort Dr. Sheldon to the Quality Suites.

4:30 p.m.  Dr. Kirk Klasing, University of California, Davis, arrives on Continental Airlines Flight 2794. Dr. Walzem will escort Dr. Klasing to the Quality Suites.

Review Team will be housed at the at the Quality Suites. Welcome packets containing information, campus maps, and meal tickets will be in Review Team’s rooms upon arrival. To facilitate preparation of the draft report, Dr. Ottinger’s suite will have an IBM Thinkpad laptop computer, printer, and supplies for use by the Review Team. Also the Poultry Science Conference Room, Rm 103 Kleberg Center, will be available for use by the Review Team.

6:00 p.m.  Alan Sams meet Review Team at the front desk of the Quality Suites and escort them to dinner at Christopher’s World Grill

Contact Information

Alan Sams  Robert Pottberg
Professor and Head Administrative Services Officer
Office: (979) 845-1931 Office: (979) 845-1931
Home: (979)690-2242 Home: (979)775-0320
Email: asams@poultry.tamu.edu Email: rpotberg@poultry.tamu.edu
Monday 3/24/03

7:20 am  Alan Sams will meet Review Team at front desk of Quality Suites and escorts them to Provost's Office, 9th Floor, Rudder Tower.

7:30 am  Breakfast Entry Meeting with Dr. William Perry, Executive Associate Provost and Dr. Richard E. Ewing, Vice President for Research, Rudder Tower, 9th Floor Conference Room.

8:30 am  Alan Sams meets Review Team at Rudder Tower and escorts them to the Jack Williams Administration Building, Room 113.

9:00 am  Meeting with Dr. Fuller Bazer, Associate Vice Chancellor and Executive Associate Dean, College of Agriculture and Life Sciences, Room 113, Jack Williams Administration Building.

10:00 am  Alan Sams meets Review Team at the Dean's Office and escorts them to the Kleberg Center, Room 101.

10:30 am  General Department and Curriculum Overview: Alan Sams, Kleberg Center, Room 103.

12:00 p.m.  Lunch with COALS Department Heads, Faculty Club, escorted by Dr. Alan Sams

1:30 p.m.  Meet with Poultry Science General faculty group:, Room 126.

3:00 p.m.  Meet with POSC Life Sciences faculty group:, Room 126.

4:00 p.m.  Return to the Quality Suites, escorted by faculty member.

5:10 p.m.  Dr. Sams will pick team up at Quality Suites to escort to Reception at the Kyle Field Stadium Press Box.

5:30 p.m.  Reception at the Kyle Field Stadium Press Box

7:00 p.m.  Dinner at Café Eccell with POSC Faculty Advisory Committee, Drs. Birkhold, Caldwell, Carey, Ricke, and Walzem
Tuesday 3/25/03

7:00 am  Breakfast – Review Team at Quality Suites

8:30 am  Dr. Sams escorts Review Team from Quality Suites to Kleberg Center for tour of Kleberg Center facilities, Poultry Science Center, Veterinary Park, USDA and Campus

11:30 am  Discussion Lunch with Graduate Students, Kleberg Center, Room 126, catered by Jason's Deli

1:00 p.m.  Meet with Poultry Health Group, Kleberg Center, Room 126.

2:00 p.m.  Meet with Adjunct and Related Faculty (USDA, CVM, etc., FSTC, NUTR, etc.), Kleberg Center, Room 126

3:00 p.m.  Follow-up Questions & Answers, meet with Poultry Science Faculty general, Kleberg Center, Room 126

4:00 p.m.  Faculty member escorts Review Team to Quality Suites to begin preparing their report. Computer equipment and supplies will be available in Meeting Room. Alan Sams will be available via phone (see page 1) to answer any questions until 9:00 p.m.

7:00 p.m.  Dinner catered by Epicures and delivered to Quality Suites where the reviewers will be preparing their report.

Wednesday 3/26/03

7:15 a.m.  Reviewers check out of Quality Suites, Alan Sams meets reviewers at Quality Suites and escorts them to the 9th floor Conference Room of Rudder Tower.

7:30 a.m.  Exit Interview – Review Team meets with Drs. William Perry, Rick Giardino and Fuller Bazer, Breakfast catered by Food Services.

9:00 a.m.  Alan Sams meets Reviewers on 9th Floor Rudder Tower and escorts them to Kleberg Center.

9:15 a.m.  Review Team debriefs Department Head, Room 101.

10:00 a.m.  Review Team presents their report to the faculty, staff, and students in Kleberg Faculty Lounge, Room 126.

11:30 a.m.  Alan Sams will take the Review Team to lunch.

Review Team Departs
DEPARTMENT OF POULTRY SCIENCE
TEXAS A&M UNIVERSITY
Graduate Program Review
March 23-26, 2003

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review Team</td>
<td>1</td>
</tr>
<tr>
<td>Introduction and Charge to the Review Team</td>
<td>2</td>
</tr>
<tr>
<td>Department History and Background</td>
<td>3</td>
</tr>
<tr>
<td>Administrative Structure</td>
<td>5</td>
</tr>
<tr>
<td>Texas A&amp;M University Structure and Graduate Program Organization</td>
<td>5</td>
</tr>
<tr>
<td>Department Structure</td>
<td>5</td>
</tr>
<tr>
<td>Intercollegiate Faculties</td>
<td>7</td>
</tr>
<tr>
<td>Departmental Committees</td>
<td>8</td>
</tr>
</tbody>
</table>
Poultry Science Department
Texas A&M University
Graduate Program Review Self-Study
March 23-26, 2003

Review Team

Dr. Mary Ann Ottinger, Team Chair
Professor, Department of Animal and Avian Sciences
University of Maryland

Dr. Kirk Klasing
Professor, Department of Animal Science
University of California – Davis

Dr. Brian Sheldon
Professor, Department of Poultry Science
North Carolina State University
Introduction and Charge to the Review Team

The administration of Texas A&M University conducts periodic (every ten years) external reviews of all programs that confer doctoral degrees. These reviews are coordinated by and conducted under the authority of the Dr. J. R. Giardino, Dean of Graduate Studies in the Office of the Vice President for Research. The Poultry Science Department offers doctoral degrees and has been selected for review in March of 2003.

The Poultry Science Department views its doctoral program as being inextricably linked to its Masters program and would therefore like to consider the graduate program in general during this review. For this reason, information will in some cases be presented as pooled for the entire graduate program. Additionally, they feel that the undergraduate program is the source of many of their graduate students and that faculty responsibilities usually span both graduate and undergraduate teaching or advising. For this reason, the review team is requested to consider the undergraduate program as major factor influencing the graduate program and as a source of future graduate students.

Specifically, the review team is charged with evaluating the strength and future potential of the graduate program in the Department of Poultry Science. The faculty is interested in the Team’s opinion in the areas of recruiting, enrollment, financial support, curriculum, facilities and resources, support staff, and programmatic priorities. The Department sees these as key areas for the success of graduate students and the future of our program. This self study document is a compilation of information to provide an overview of the Department’s past, present, and future so that the review team can understand where we have come from and best advise us on our future directions. It is expected that through a review of this document and a series of interviews and meetings, that such an opinion and the appropriate recommendations for future strategies can be developed.
Department History and Background

Although the Department of Poultry Science at Texas A&M University was not officially formed until 1923, there was an identifiable poultry program as early as 1910. It has occupied a series of research stations but has evolved into a completely centralized faculty and facility located on the College Station campus. This centralization has facilitated collaboration between faculty and provided a single point resource for clientele. Graduate work in the Department of Poultry Science was initiated in 1924 with the establishment of the Master of Science program. The Doctor of Philosophy program was established in 1946. Some forty years later, the Department added a professional graduate degree called the Master of Agriculture to serve the need to improve the professional qualifications and training of students.

Poultry is the leading source of meat in the American diet. Annually, the Texas poultry industry generates over $1.428 billion in cash receipts, has a statewide economic impact of $1.926 billion, and employs over 11,000 Texans and many more contract growers and related business personnel. Texas poultry comprises 5.5% of the national production and ranks 6th in broiler production, 7th in egg production, and 10th in turkey production among all states in the U.S..

Although the poultry industry is not our only clientele group, it is one of the largest and has some unique characteristics that should be considered. This industry is a pioneer in the concept of vertical integration in which a single corporate entity owns all aspects of the production, processing, and marketing for a product. For poultry, the same company owns the live birds, Feed mill, transport trucks, processing plant, and distribution fleet. This unique integration improves production efficiency and product uniformity. Because of vertical integration, the poultry industry has shifted from many, small, independent operations toward fewer, more highly concentrated production companies. This is the model for the broiler and turkey meat industries and to a lesser extent the egg industry. Because these large companies control a relatively large proportion of the industry's birds, it allows faster and broader impact of our research, extension and teaching programs to the industry. On the other hand, these larger companies have more intense needs that span all facets of the industry. Evolving along with this vertical integration has been an allied industry that services the nutritional, pharmaceutical, and equipment needs of the large companies. Together, this industry represents a broad, yet concentrated set of research, teaching, and extension needs.

Our Department currently has fifteen faculty representing thirteen FTE's in POSC. Three of these positions are joint appointments in the Department of Veterinary Pathobiology. These 13.8 FTE's split into 5.23 for teaching, 5.04 for research, and 3.53 for extension (Appendix I). The Department has seventeen permanent staff members and its facilities consist of various laboratory and office suites in the Kleberg Center, the Poultry Health Building in the Veterinary Research Complex; and the Poultry Science Teaching, Research, and Extension Center on FM 2818. In addition to the personnel located in the POSC Department, we have several affiliated scientists at USDA, TVMDL, and numerous other related private and public organizations such as the Texas
Natural Resource Conservation Commission. Our Department has collaborative research agreements with several institutions such as the National Autonomous University of Mexico, University of Arkansas, University of California-Davis, University of San Francisco, University of Maryland, University of Nebraska, West Virginia University, and Virginia Tech University, and the USDA-ARS laboratories at College Station (TX), Beltsville (MD) and Athens (GA).

We currently enroll 156 undergraduates and 30 graduate students. It is interesting to note that enrollment has increased to this level from 40 in the mid 80's with the addition of only 0.55 net increase in teaching FTE's. This explosive student growth has resulted in our Department having the lowest teaching cost in the College and the fourth lowest teaching cost per semester credit hour of any Department in the University. We have accommodated this growth through the dedication of our faculty and staff to teaching excellence and to providing a meaningful, quality education. Further growth in undergraduate student numbers can only be achieved through larger classroom settings, which may not be the best format, or expanding the faculty to accommodate emerging areas of need and greater student numbers.
Administrative Structure

Texas A&M University Structure and Graduate Program Organization
Like most other land grant universities, The Texas A&M University System (TAMUS) houses Texas A&M University (TAMU), The Texas Agricultural Experiment Station (TAES), and Texas Cooperative Extension (TCE). As a component of this System, the Poultry Science Department has the multiple missions of teaching, research and extension/public service through these three respective agencies. Although the majority of agricultural research is conducted through TAES, TAMU also maintains a research component that is administered through the office of the Vice President of Research (VPR), Dr. Richard Ewing. Because of the integral role of research in the education of graduate students, the graduate programs are administered through this VPR office by the Office of Graduate Studies (OGS). The OGS is administered by Dr. John R. Giardino who carries the title of Dean to indicate the equivalent authority and responsibility of this position compared to the deans of the individual colleges. The OGS is vested with the authority to oversee degree and curriculum requirement compliance aspects of graduate education at TAMU. They are also involved in most other aspects of graduate education through an advisory or consulting role during policy development or enforcement.

The individual colleges also have a role in graduate education. Each college maintains a graduate council that contains a representative from each component department or interdepartmental faculty group (a grouping to be explained later). The chair of each of these college councils is a member of the TAMU Graduate Council, which has approval authority over courses and university-level degree requirements (e.g. credits, residency, examinations, timeline, etc.). The Dean of OGS is the Chair of the TAMU Graduate Council. Because each college maintains its own requirements for graduate faculty membership (with a certain minimum set of requirements set by the TAMU Graduate Council), membership on the Graduate Faculty is determined by the college-level graduate council. The college councils also review and approve courses (new and revised) and degree curricula, and are advisory on other matters related to graduate programs at the TAMU level. The Deans (or their representatives) of the respective colleges also have a separate Graduate Operations Committee (GOC) which has similar advisory and approval roles in graduate programs. Above these respective programmatic ladders are the Faculty Senate and the Provost (who advises the President on academic matters) in a relationship of shared governance of the University and its graduate programs. The President reports to the TAMUS Board of Regents and the governing body for higher education in Texas is the State Higher Education Coordinating Board in Austin.

Department Structure
The Poultry Science Department (POSC) contains teaching, research and extension components, all physically located on the College Station campus. The Department has 20 faculty members with almost all having joint responsibilities of some combination of teaching, research, and extension. Table 1 displays the mixture of appointments among the faculty. Additionally, six of these faculty members have joint appointments with the Department of Veterinary Pathobiology (VTPB). Three of these have the majority of
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their appointment in POSC while the remaining three are minority appointments in
POSC.

In addition to these 20 budgeted faculty positions, there are three USDA-ARS
scientists at the College Station laboratory, one professor from Prairie View A&M
University, and one scientist from the NASA Jet Propulsion Laboratory who are
formalized Associate or Adjunct Members of the POSC Graduate Faculty. These
Associate and Adjunct members can serve on student advisory committees and can co-
chair the committee with a full member of the graduate faculty. Please see the faculty
listings section of this self-study document for the specialization and qualifications of
each faculty member. All current faculty members have a Ph.D. degree.

Graduate faculty full membership is limited to TAMU faculty holding
professorial rank (Assistant Professor, Associate Professor, or Full Professor). Other
scientists of equivalent training and qualifications to professorial TAMU faculty are
eligible to contribute to the graduate faculty by becoming Associate or Adjunct members,
depending on their geographical location or institutional affiliation. In addition, scientists
can be made a special appointment to a graduate student advisory committee for a one-
time contribution. All levels of membership on the graduate faculty are reviewed
periodically for involvement and continued productivity (teaching, advising, publishing,
etc.). Essentially, continued contribution to the graduate program in the form of teaching
or research, along with continued involvement in the advising of graduate students, are
the two criteria that should be reviewed for continued graduate faculty membership.

Intercollegiate Faculties

At TAMU, some subject areas are organized into intercollegiate faculties that
attempt to provide a network of organization and collaboration. Although these faculties
were organized and primarily function to operate academic functions, their very
collaborative nature makes them good vehicles for research and extension collaboration
too. These faculties determine their own curriculum requirements and provide advice to
the relevant Department Heads on curriculum offerings, instructor assignments and
faculty hiring/evaluations. While they are fairly autonomous in determining their degree
requirements, their degrees are granted only with the co-approval of the home department
of the major professor. In this sense, the students have both a major through the
intercollegiate faculty AND a home department (they are frequently not the same).
This structure is an attempt to build on the disciplinary strengths in areas such as
nutrition, food science, genetics, toxicology, and biotechnology while maintaining the
traditional and strong commodity orientation of the departmental alignments at TAMU.
Faculty members can grant degrees in the major of their home department or in the major
of any intercollegiate faculty of which they are a member.

The Poultry Science Department is involved in all these faculties and has
historically been a strong supporter of their programs and of interdisciplinary activities in
general. We are the home Department for the intercollegiate Faculty of Nutrition. Many
of the graduate students studying under POSC faculty members are majoring in their
intercollegiate faculties because these other majors offer a range of career opportunities
which is perceived to be broader than just poultry science as a major. In reality, almost all of the coursework and research topics are the same, regardless of major, only the major's name is different. However, the perception with students and some employers makes the interdisciplinary major (e.g., nutrition or food science) more attractive. Although most of the teaching formula funding is routed to the Department budget according to the instructor's home department (the home of their teaching appointment in the case of a joint appointment), a significant portion of the formula subvention funding is sent to the intercollegiate faculty on the basis of their credit hour generation. This provides the intercollegiate faculty with a source of funding to support their own graduate student teaching activities such as seminars, stipends, and scholarships.

This dual alignment of disciplines and commodities has, at times, been a point of conflict for faculty members. Some Departments do not award stipends to students who are not majoring in that department's major. However, the POSC Department provides stipends for the graduate students of its faculty members, regardless of their major. Thus, some of the Department funds are being spent to support a student in another major. However, the rationale for this is that the department benefits from the research being done in its labs and by the advancement of its faculty members' program (grants, research advancements, publications, etc.). This POSC practice is an effort to support the faculty member's productivity as we recognize the value of the interdisciplinary nature of our field. The Department has a required core curriculum for all students in the major and the Department also requires this core for all students receiving a stipend or fellowship from the POSC Department. This serves to ensure a poultry-orientation for those students receiving financial support from POSC but pursuing another major. Because of the POSC philosophy of supporting interdisciplinary majors with POSC as their home, this self-study will include all graduate students who had POSC as their home department. This operating philosophy may change with the formation of a proposed new Department of Nutrition and Food Science at TAMU. These plans are too premature to make any such plans.

Departmental Committees:

The Department has a number of standing committees that serve to set policy and provide advice to the Department Head. The first of these is the faculty advisory committee, composed of five faculty members and the Department Head. This committee is chaired by the Department Head and provides advice and input from the faculty on issues of programmatic priorities and operational policies. Another committee is the curriculum committee which oversees our undergraduate and graduate curricula by conducting periodic, comprehensive reviews (about every 5 years) and addressing individual issues as they arise (e.g., new courses, new requirements, etc.). Additional committees are the awards committee, which serves to submit nominations for various awards, and the social committee, which coordinates functions. Other committees are appointed and dissolved as the need arises. Specific recent examples include committees on graduate student office space and the distance education committee. Faculty position search committees are another type of temporary committee but frequently have members from other departments or from the industry.
DEPARTMENT OF POULTRY SCIENCE
TEXAS A&M UNIVERSITY
Graduate Program Review
March 23-26, 2003

Strategic Plan

Texas A&M University Vision 2020 9
Agriculture Program 21 10
Poultry Science 21 11
Vision 12
Mission 12
Visionary Goals 12
Priorities, Needed Resources, and Partnership Opportunities 12
   1. Environmental Impact 13
   2. Food Safety 14
   3. Molecular Genetics and Bioinformatics 15
   4. Health and Welfare 16
   5. Process and Ingredient Technologies 17
   6. Educational Programs 18
Additional Resource Needs 20
Strategic Planning

Texas A&M University Vision 2020

In 2000, Texas A&M University announced its strategic plan, Vision 2020, which was intended to elevate the University to one of the top 10 universities in the country by the year 2020. A full report can be found at http://www.tamu.edu/vision2020. This plan has twelve imperatives as follows:

1. Elevate Our Faculty and Their Teaching, Research, and Scholarship
2. Strengthen Our Graduate Programs
3. Enhance the Undergraduate Academic Experience
4. Build the Letters, Arts, and Sciences Core
5. Build on the Tradition of Professional Education
6. Diversify and Globalize the A&M Community
7. Increase Access to Intellectual Resources
8. Enrich Our Campus
9. Build Community and Metropolitan Connections
10. Demand Enlightened Governance and Leadership
11. Attain Resource Parity with the Best Public Universities
12. Meet Our Commitment to Texas

Since assuming the TAMU Presidency in 2002, Dr. Robert Gates has announced his intention to focus on the first three of these and on improving the physical facilities.
Agriculture Program 21

Likewise, the Agriculture Program of the Texas A&M University System underwent a strategic planning exercise and developed a plan entitled Ag Program 21. Its full report can be viewed at http://agprogram.tamu.edu. It contains the following eleven priorities:

1. Educate students for tomorrow's workplace
2. Capitalize on information technologies
3. Realize the benefits of biotechnology
4. Create new foods that improve health and nutrition
5. Add value to plant and animal products and processes
6. Build Leaders for tomorrow
7. Strengthen Texas families
8. Strengthen the vitality of Texas communities
9. Enhance Texas's water resources
10. Improve and sustain Texas' environment and natural resources
11. Enable Texas agriculture to thrive in a global marketplace
Poultry Science 21

STRATEGIC PLAN FOR TEXAS A&M UNIVERSITY
POULTRY SCIENCE DEPARTMENT
(2000-2010)

PREAMBLE:

Although it is divided into six specific focus areas, our Departmental vision embraces the cross-cutting themes outlined in the Agriculture Program 21 plan. This Department will seek excellence in all its functions, diversity in its personnel and programs, objectivity in its findings and activities, efficiency through its partnerships, and a global perspective in its programs and faculty. These are themes that permeate all the priority areas and Departmental programs. We are also dedicated to the broader goals of the Texas A&M University Vision 2020 plan in which priorities are to foster excellence in our faculty, students, facilities, and programs.

Throughout the coming decade, we seek to create a seamless Department in which there are no visible boundaries or distinctions between teaching, research, and extension. The vertical integration of much of our industry and the centralized organization of our Department require and facilitate close interaction between the three land grant missions. Integration of teaching, research, and extension improves teaching and research relevance while better enabling extension programs to relate results to clientele. Because of this philosophy, this strategic plan is not segmented by teaching, research, and extension; but is presented as a single, integrated program. Likewise, this strategic plan is organized according to the issues being addressed and not by scientific discipline. This reflects our effort to address these priority needs through interdisciplinary teams within our Department and in collaboration with other departments and institutions.
VISION:

The TAMU Poultry Science Department Aspires to Provide "Premiere Poultry and People for Texas and the World"

MISSION:

Our mission is to be a leading source for the discovery and dissemination of information, technology, and experience to students, the poultry industry, and society.

VISIONARY GOALS:

We strive to accomplish this through programs that:

1. **Facilitate** the positive interaction between the poultry industry, society, and the environment
2. **Ensure** a safe supply of poultry products for consumers
3. **Maximize** societal and industrial benefits from molecular sciences
4. **Provide** accurate, objective information about poultry care and well-being for the development of appropriate decisions and policies
5. **Enhance** the value and quality of poultry products through better processes and ingredients
6. **Continue** excellence in all of our educational programs

PRIORITIES, NEEDED RESOURCES, AND PARTNERSHIP OPPORTUNITIES:

Many of the following priority areas are interrelated. For example, molecular genetics and bioinformatics are used for the study of pathogenic bacteria in a poultry waste stream that may possibly impact the environment. These relationships facilitate interaction within our Department but also represent opportunities for collaboration outside of our Department. It should also be noted that within each priority area, there is an entire range of scientific depth, from the most applied information and technology to the most cutting-edge molecular biotechnology. This represents part of the challenge in our Department, meeting the needs of a field that requires both everyday operations and pioneering new scientific knowledge. This document is our plan for addressing these needs for the coming decade. Although we will strive to expand our faculty with new positions, the reality may be that the needed expertise may come from redirection of existing faculty and partnering with expertise already present in other departments at TAMU.

**PRIORITY AREAS:**
- Environmental Impact -
- Food Safety -
- Molecular Genetics and Bioinformatics -
- Health and Welfare -
- Process and Ingredient Technologies -
- Educational Programs -
1. **Environmental Impact**

Poultry production impacts the environment in many ways such as dust, odors, flies, and manure/litter accumulation. These factors affect the quality of air, soil, and water. While most methods have focused on disposal methods, newer concepts such as precision nutrition are directed at prevention. More precise nutrient management and utilization will focus on the bird to reduce the production of problematic waste components. A more attractive approach to environmental impact will be to develop alternate uses for the waste products produced by the poultry industry. This will make a potentially negative issue into a positive, value-added product.

Our Department has one faculty member with expertise in the environmental impact and regulatory needs of our industry. His specific area of study is the land/air/water environmental impact. This person also has a majority TAEX appointment and cannot address all the teaching, research, and extension needs in this important area. Furthermore, our Department lacks the appropriate commercial waste handling facilities with which to conduct studies and educate students in this area.

**Needed Resources:**
- One faculty member in precision nutrition to reduce pollutant production
- One faculty member in waste product utilization
- Commercial facilities in College Station area

**Potential Partners:**
Agricultural Engineering, Biochemistry, Soil and Crop Sciences, Wildlife and Fisheries Departments; EPA, USDA, TCEQ, Poultry Industry

**Benchmarks for Success:**
- Add two faculty by 2005
- Development of waste handling facilities within five years
- Have national recognition for excellence in environment and waste management
- Industry feedback that we are having a positive impact
- Publications, student graduations, extramural funding, impactful extension programming
2. **Food Safety** – Food safety will continue to be an issue as we strive to understand the many factors affecting it. While the most immediate solution is to focus on interventions at the processing plant and consumer levels, a more effective plan needs to include a focus on the role of the live production factors that contribute to the initial contamination. Another area is to develop a more complete understanding of the risks involved from specific hazards so that procedures, policies and legislation can be based on science. Excellent faculty (2 research/teaching, 1 extension/research) exists in the Department but there is a lack of a biohazard-contained processing facility to evaluate pathogen behavior in real world settings. Such facilities are rare and would offer an excellent opportunity for our Department to expand our leadership in this area.

**Needed Resources:**
- Biohazard-contained processing facility

**Potential Partners:**
TAMU Institute of Food Science and Engineering, Animal Science Department, USDA, corporate sponsors

**Benchmarks for Success:**
- Develop biohazard-contained processing facility within five years
- Have national recognition for excellence in food safety
- Industry feedback that we are having a positive impact
- Publications, student graduations, extramural funding, impactful extension programming
3. Molecular Genetics and Bioinformatics – As the sciences of genomics and proteomics continue to provide increasing knowledge and technology about biological processes, we are presented with opportunities to improve poultry production and products. Areas of potential improvement include production of biologically active compounds from poultry systems, preservation of endangered species, and acceleration of genetic improvement for commercial poultry (disease resistance, reproductive efficiency, growth, stress susceptibility, etc.). Using transgenics for the molecular manipulation of animal systems is one of the fastest developing fields in biology. Due to the unique anatomy of the avian egg and embryonic development, avian species present unique opportunities and challenges in the field of transgenics. Although our Department has molecular expertise in related fields such as endocrinology, immunology, and metabolism, we have only recently added one faculty member in genetics. Because of the importance of this field to the future of agriculture and health, additional faculty in this area are needed. We are collaborating with faculty in Colleges of Medicine and Veterinary Medicine and the Departments of Animal Science and Biology.

Needed Resources:
- One faculty position in molecular genomics or proteomics

Potential Partners:
TAMU Institute of Biosciences and Technology; TAMU Life Sciences Initiative, Veterinary Pathobiology, Animal Science, Wildlife, and Biochemistry Departments; Biotech companies

Benchmarks for Success:
- Hire molecular faculty within three years
- Have national recognition for excellence in molecular biology
- Publications, student graduations, extramural funding
4. **Health and Welfare** – Human/animal diseases and poultry welfare are important to poultry companies and the general public. Controlling animal diseases is critical to commercial production, but also impacts food safety and the international trade. Furthermore, animal health impacts human health in areas of Texas where poultry and humans live in close proximity such as the *colonias* of south Texas. In these and other areas, poultry could be indicators of the impact of livestock on human health. Transport of poultry and other birds across the Texas-Mexico border continues to be a public and poultry health concern for the Texas poultry industry. Our Department has an immunologist, a molecular immunologist, and has just added three avian disease faculty in joint positions with the Veterinary Pathobiology Department. We have access to a biohazard isolation poultry grow-out facility adjacent to the poultry health research lab. This isolation facility has applications in preslaughter food safety studies as well.

Animal welfare is also a growing concern of both the public and the poultry industry. Whether the issue is perceived or real, we need to provide objective information about the treatment and conditions of the animals upon which we depend. There is a critical need for expertise in the physiology of stress and welfare. Some expertise exists in our Department in behavior, but we need a biochemical/anatomical approach to understanding bird welfare to help establish a healthy bird phenotype for use in situational assessment and policy development. This would ideally replace the evaluation of stress based on human perceptions of discomfort as the primary indicators of welfare.

**Needed Resources:**
- 1 faculty member in behavior physiology

**Potential Partners:**
USDA, NIH, Vet School, Bush School, rural public health authorities, poultry industry

**Benchmarks for Success:**
- Add behavior physiologist within five years
- Have national recognition for excellence in poultry diseases and health
- Publications, student graduations, extramural funding
- Establish a program to study the impact of poultry on avian and human health in rural communities such as the *colonias*
5. **Process and Ingredient Technologies** - The processing sector is the largest employer in the poultry industry. It also imparts the greatest modifications to the product and is the product's last point of contact with the company before it reaches the retail market. The processing plant is the focus of the industry's effort for increased efficiency to reduce labor costs and for meeting the ever-changing demands of consumers for variety, nutrition, safety, and value. In an effort to increase efficiency, the poultry industry has moved toward automation. More recently it has embraced robotics as a possible way to reduce labor costs. With its vast engineering programs, TAMU is well-positioned to participate in this robotic development by the poultry industry.

Nutriceuticals and functional foods are related areas in which foods and ingredients elicit beneficial effects on human health. These areas have tremendous potential for growth in our Department considering that the egg is a unique biological packaging system for a wide variety of nutrients and bioactive compounds. There are also obvious links in this priority area with the areas of food safety, animal health, molecular genetics, and environmental impact. Our Department has only one faculty member (extension/research) in processing and one other partially in functional foods. A teaching/research position has been approved and a national search is underway.

**Possible Partners:**
Engineering Program (TEES, TEEX), Agricultural Engineering, USDA, NSF, NIH, poultry and food industries

**Needed Resources:**
- One faculty position in processing technology

**Benchmarks for Success:**
- Add faculty member within the next two years
- Have national recognition for excellence in processing and product quality
- Industry feedback that we are having a positive impact
- Publications, student graduations, extramural funding, impactful extension programming
6. Educational Programs - Providing a supply of well-trained professionals for the poultry industry, graduate/professional schools, and related public service organizations is a main function of our Department. Maintaining these future professionals will require a base level of teaching excellence in poultry science. Just because these base areas may not entirely fit in a priority area does not mean they are any less essential to the future success of poultry science. Furthermore, these educational programs are not limited to classroom teaching. Youth education is important in creating informed consumers and potential future poultry science majors. Likewise, consumers need information about their food and environment and the lack of it is a major factor in the negative perception of agriculture and related new technologies such as genetically modified organisms.

a. Departmental Web Site - In today's technological society, the Departmental Web Site is a primary means of exposure and contact with prospective students as well as the various clientele groups. It is a portal through which we recruit students and through which external parties can access our expertise/programs and those of the entire University System. Our Department Web Site has always been a leader in innovation and productivity. We need to constantly reevaluate its design and function to assure that it is achieving our goals.

b. Distance Education Coordinator - Our Department will be a leader in the delivery of continuing education training and professional Masters degrees by distance education. While the faculty will be ultimately responsible for developing and teaching the courses, their efforts are greatly facilitated (and their time saved) by a staff member dedicated to the programming involved in the development and maintenance of the computer-based/assisted courses. Time and computer knowledge are usually the most limiting factors in the implementation of distance education courses. This staff member will help reduce that barrier.

c. Student Coordinator - As our Departmental enrollment has expanded, our advising and coordinating capacity has not. Crucial to an effective teaching program and to a positive student educational experience in college is readily available academic advice and guidance. Additionally, our many student activities help to provide the "other education" so sought after by the TAMU Vision 2020 plan. Our student activities are currently all independent and the lack of adequate coordination has reduced their impact. Additional personnel to help coordinate academic and other student activities, as well as recruit, would greatly enhance our Department. Students would still be encouraged to seek faculty contact for experience and career guidance.

d. Teaching Program Evaluation and Development - To insure that our students are receiving the best, latest, and most useful education, we feel that our teaching effectiveness needs to be routinely evaluated for quality and timeliness. This is also important because the quality of our educational programs will impact its appeal to potential students in recruiting efforts. Toward this end, our curriculum will be annually evaluated and adjusted appropriately. Furthermore, we will encourage qualified students to pursue a basic science curriculum within our
Department in preparation for graduate study. This will not replace the existing curriculum that provides a solid and marketable training in poultry science. Instead, it will target those students who would already be going into graduate or professional school and provide them a curriculum to better meet their future needs.

e. Life Sciences Graduate Students - As the basic life sciences become a greater part of poultry science, our graduate programs will have an increasing need for students trained in basic sciences and techniques. We will develop a recruiting program for non-poultry students from basic life science backgrounds to pursue graduate degrees in poultry science. Such students are often looking for a field in which they can apply their basic skills and knowledge in a marketable way.

f. Graduate Student Stipends - With addition of the proposed faculty positions in this plan and the associated expansion of our programs will come the need for additional graduate student positions. While many of these will need to be funded from contracts and grants, there will also be a need for a core supply of graduate funding to maintain a base level of teaching, research, and extension operations.

g. Youth Programming - Our Department recognizes that educating youth in poultry, and life in general, is a critical to the entire field of poultry science. Specifically, the livestock shows, judging teams, and related school programs such as FFA and 4H will continue to be priorities in our mission and in our recruiting effort.
ADDITIONAL RESOURCE NEEDS:

New building space for laboratories/offices - The Kleberg Center is currently shared by the Departments of Poultry Science and Animal Science. These Departments have coexisted and collaborated in a number of important areas. However, growth in both Departments has made classroom, laboratory and office space a limiting factor in future growth. In fact, our Department has begun renovating bird housing space at our research center into classroom and laboratory space. Such conditions are not conducive to teaching, tissue/cell culture or sensitive analytical equipment. Additional laboratory/office/classroom space is desperately needed for the future growth of our Department.

Research/Teaching/Extension Center - As our "farm" approaches seventeen years of age, the need for repairs and renovations of the buildings and equipment are becoming more frequent. Although these can sometimes be paid for with one-time funds as they occur, we recognize that the long term future operations of the farm will depend on the availability of adequate resources to maintain it.

Commercial Poultry Facilities - The Department needs commercial scale and design facilities for growing poultry. One possibility is that commercial integrators could be sought to build and supply a 2-4 house farm near Texas A&M University on land leased by the University. The Department would operate the farm in the same way any other contractor does for the company. Students can get valuable internship experience working on the farm, scientists (POSC and others) will have commercial facilities in which to conduct research, and the company has intimate contact with and feedback from the University, Experiment Station, and Extension Service. Birds, feed, and technical service would be provided by the company. This and other ideas will be pursued to increase our access to commercial facilities in which to conduct research and educate students.
DEPARTMENT OF POULTRY SCIENCE
TEXAS A&M UNIVERSITY
Graduate Program Review
March 23-26, 2003

Related Program Information

Projected Changes in Graduate Programs 21
Faculty and Student Awards and Professional Recognition 23
Encouraging Excellence in Teaching, Research, and Public Service 28
Joint Programs 29
  Poultry Health 29
  Food Safety 29
  Nutrition 29
  Environmental Stewardship 30
  Other Cooperative Programs 30
    -Outside TAMUS 30
    -Texas A&M University Collaborations 31
Strengths of the Program and Opportunities for Improvement 32
  Strengths 32
Projected Changes in Graduate Programs

- Life Sciences Working Group
  The Department has formed a life sciences working group to increase the synergistic use of equipment, facilities, and expertise toward proposal development and multidisciplinary collaboration. Initially, the focus of this group has been in two areas. First, the group has developed plans for a joint cell culture room in Kleberg using mostly equipment donated from the various team members. Another areas of activity has been the initiation of two multidisciplinary genomics research proposals/collaboration projects, one on the interaction between animals and intestinal parasites or pathogens and the second on the role of lipid metabolism in animal development and health.

- Poultry Health Working Group
  Because the Department has many joint appointments with the CVM and there are many non-POSC programs in the CVM that have relevance and potential synergy with poultry health, a working group in this area has been formed. This group meets once per month, is developing a website, is working to improve communication between faculty, and is adding to their already long list of joint research projects. Future areas they will address are the professional (DVM) and non-professional teaching program and the extension/service/outreach activities in the area of poultry health and disease.

- Online Learning
  The Department has developed an online learning program with student opportunities toward a university degree, individual courses for TAMU credit, and university-certified continuing education courses. The degree opportunity, a Masters of Agriculture professional degree, is a non-research degree seeking to further the students' academic base of knowledge. The MAG degree requires 36 credit hours beyond the BS degree and also requires an original, professional paper. An internship or professional experience is an option but will be satisfied by the work experience possessed by many expected students. See http://posc.tamu.edu for more information. The formal announcement of this program is in the winter of 2003 with applications accepted through spring for the first classes in the fall 2003 semester. The Department maintains a full-time distance education program coordinator (Ms. Elizabeth Hirschler) who assists faculty in their course conversions and facilitates online teaching by being the interface with both the computer technology and university resources.

- Formation of Nutrition and Food Science Department
  After 1.5 years of discussion and debate involving input from faculty, students, administrators, and industry clientele, the Vice Chancellor announced in December of 2002 that a new Department of Nutrition and Food Science will be formed in the College of Agriculture and Life Sciences. The impact of this on our POSC graduate program has the potential to be immense. However, because the current scenario
has the intercollegiate faculties to remain separate from this new department, it may not have such a substantial effect. It is just too early to tell.
Faculty and Student Awards and Professional Recognition

The Department recognizes excellence in teaching, research and extension through a variety of awards both within the University and Agriculture Program as well as through professional organizations. The following is a listing of the Agriculture Program, TAMU, and professional society awards our faculty, staff, and students have received in the past ten years:

Poultry Science Department Faculty Awards and Honors:

Dr. John Carey received the 1997 American Egg Board Research Award which is given by the Poultry Science Association to increase the interest in research pertaining to egg science technology or marketing, which has a bearing on egg or spent hen utilization. The award is given to an author for a manuscript published during the preceding year.

Dr. John Carey received the 2001 Poultry Science Association Phibro Extension Award.

Dr. Lee Cartwright was the Winner of the 2001 Poultry Science Association Broiler Research Award sponsored by the National Chicken Council.

Dr. C. R. Creger was inducted as a 1997 Fellow of the Poultry Science Association.

Dr. Billy Hargis received the 1994 Poultry Science Association Research Award.

Dr. Billy Hargis won the 1998 Poultry Science Association Broiler Research Award given for distinctive research work that has a strong economic impact on the broiler industry.

Dr. W. F. Krueger was inducted as a 1995 Poultry Science Association Fellow.

Dr. Bill Krueger was been selected by the Texas FFA Association to receive their prestigious 1998 “Blue and Gold” Award for his many years of service to agricultural youth at their annual Convention in Ft. Worth.

Dr. John Manning was chosen by the students in the College of Agriculture and Life Sciences as the 1996 “Honor Professor” for the year. The award was presented at the Ag Convocation luncheon.

Dr. Suresh Pillai was named Texas Agricultural Experiment Station Faculty Fellow in 2002.

Dr. Pillai has been selected to serve on a National Academy of Science-National Research Council committee on bioaerosols and microbial pathogens. The National Research Council is the research arm of the National Academy of Science. The committee to prepare a report on the topic of bioaerosols, pathogens, human exposure, etc.
Dr. Tom Porter received the 1996 Poultry Science Association Research Award.

Dr. Steve Ricke was selected to receive the 1999 Poultry Science Association Research Award.

Dr. Steve Ricke has been nominated as a Distinguished Fellow for the 1999 International Workshop on Rapid Methods and Automation in Microbiology held in Kansas State University, Manhattan, KS, July 9-16, 2001.

Dr. Alan Sams was one of three recipients of an International Excellence Award presented by Dr. Ronald G. Douglas, Executive Vice President and Provost during a reception on Thursday, April 16, 1998, honoring contributions of faculty and staff to the Texas A&M international program efforts.

Dr. Alan Sams received the 2001 Poultry Science Association Poultry Products Research Award and the 2002 Poultry Science Association Broiler Research Award.

The Poultry Science Aggie REPS won the 2001 Student Recruitment Award at the Poultry Science Association meetings.

The Department of Poultry Science received the 1996 Poultry Science Association Student Recruitment Award at the annual Poultry Science Association Meetings. Team consisted of C. R. Creger, J.B. Carey, R.C. Fanguy and Dale Hyatt.

Poultry Science Department Graduate Student Awards and Honors:

Awards received by students at the National Poultry Science Association Meetings: for research papers or posters presented at meetings:

1993 -- Autumn C. Marshall - Products and Processing

1994 -- David Caldwell - Environment and Management Section
         Akaram-ul Haq - Nutrition Section
         Marisol Lopez - Physiology Section
         Audrey McElroy - Products and Processing Section
         Shelly McKee - Products and Processing Section
         William Wright - Genetics Section

1995 -- David Caldwell - Immunology Section
         Gerardo Rameriz - Environment and Health Section

1996 -- Shelly McKee -- Physiology Section
         Audrey McElroy - Physiology Section
         Shalene Heber - Nutrition Section
         David Gamboa - Nutrition Poster Section
1993 -- Mary Van Elswyk received the Poultry Science Association American Egg Board Research Award

Autumn C. Marshall received the Poultry Science Association Purina Mills Research Fellowship

1994 -- Audrey McElroy received the Poultry Science Association Purina Mills Graduate Student Fellowship Award

1995 -- Audrey McElroy received the Poultry Science Association Maurice Stein Graduate Student Fellowship Award. This award recognizes graduate research associated with eggs and egg products with special emphasis on the incorporation of business and marketing concepts.

Audrey McElroy received the Poultry Science Association National Egg Board Fellowship

1997-- Laura Sarlin — Processing-Products, Product Microbiology Section
      Clint Skarovsky — Processing-Products, Processing Section
      Jerry Ramirez — Pathology Section
      Randall Moore — Immunology, Immune Responses to Pathogens Section

Shalene McNeil received the Poultry Science Association Maurice Stein Fellowship Award

1998 – Luis Martinez — Physiology Section
       Ann Erickson — Nutrition Section

1999 -- Christine Zocchi Alvarado — Processing-Products, Processing Section

2002 -- Justin Cavitt — Processing-Products, Processing Section

Carl Dean received the 1993 Texas A&M University College of Veterinary Medicine John Paul Delaplane Award for outstanding research

Allen Byrd received the 1993 College of Agriculture and Life Sciences Vice Chancellor’s Award in Excellence for Graduate Student Research

Edward McGruder received the Southern Poultry Science Society Graduate Student Competition Award in 1993 for outstanding research and presentation in Poultry Pathology

Carl Dean received the inaugural 1994 George W. Kunze Prize for a doctoral student nearing completion of the degree program
Marian Taub won 1st Place for best scientific poster at the 1994 TAMU poster Competition (undergraduate section) sponsored by the TAMU Graduate Student Council.

Autumn Marshall received the 1994 Association of Former Student Distinguished Graduate Student Awards for Research for Master’s Candidates.

Sarah Birkhold received the 1994 Association of Former Student Distinguished Graduate Student Awards for Research for Doctoral Candidates.

Denise Caldwell received the Southern Poultry Science Society Graduate Student Competition Award in 1994 for outstanding research and presentation in Poultry Physiology.

Randall W. Moore was the recipient of the 1996 John Paul Delaplane Award given at the College of Veterinary Medicine Honors Convocation. The award is based on graduate research with poultry or livestock.

Eric Barnhart received third place in the Speaking Competition of the Graduate Student Council’s 3rd Annual Research Competition (1997) at Texas A&M University.

Casey Owens received an 1997 Academic Excellence Award scholarship from the University for $1000.

Casey Owens was selected by the TAMU Association of Former Students to receive the 1997 Graduate Student Research Award for Masters’ Candidates.

Casey Owens received second place in the Agriculture and Ecology Graduate section of the 1999 Student Research Week Competition.

Audrey McElroy received the 1997 Vice Chancellor’s Award in Excellence for Graduate Research.

Richard Burgess, undergraduate student worker for Dr. Carey, received a Certificate of Excellence for his presentation/paper at the Southern Poultry Science Association Meeting during the January 1997 International poultry exposition in Atlanta, GA.

Eric Barnhart received third place in the 1997 Speaking Competition of the Graduate Student Council 3rd Annual Research Competition.

Anne Erickson received the American Feed Industry Association Scholarship for $1000 for the 1998-99 academic year.

Anne Erickson received the 1999 Association of Former Students Graduate Research Award for Masters Candidates.
Anne Erickson received an American Association of Cereal Chemists Foundation graduate fellowship for $2000.

Clifford Froelich was awarded a 2001 Texas Public Education Grant from the Texas Higher Education College Board.

Irene Diaz Zabala was selected to receive the Good neighbor Scholarship for the 1999-2000 Academic Year by the Texas Higher Education Coordinating board.

Xin Li was awarded a 2001 Longhorn Section Institute of Food Technologists (LIFT) Scholarship.

Xin Li received 1st place in the 2002 Institute of Food Technologists Food Microbiology Division's poster competition in Anaheim, CA.

Erica Rayburn, undergraduate student working in Dr. Pillia’s lab, won a student presentation award at the Research Poster session of the 2001 Ag Program Conference.

Cherie Oubre, graduate student in Dr. Berghman’s lab, won a student presentation award at the Research Poster Session of the 2001 Ag Program Conference.

Everardo Vega, graduate student in Dr. Pillai’s laboratory was awarded a 2002 NASA Graduate Student Research Fellowship to study virus attachment to biological tissues.

Nahum Puebla, graduate student in Dr. Berghman’s lab, was awarded a travel grant to make a presentation at the 2002 Gordon Research Conference on Mechanisms of Toxicity.

Pilar Casteneda in Dr. Sams' lab just received a 3 year scholarship from Mexico’s CONACYT.

Ken Maciorowski was awarded a $2000 HEEP Foundation Internship to conduct a portion of his graduate research in Dr. Suresh Pillai’s lab at the Texas A&M University Research Center in El Paso. Ken is a Ph.D. candidate in Dr. Ricke’s program.

Cheng Zhang was awarded a Regents’ Graduate Fellowship for the FY 2000-2001.

Dwayne Bandy was awarded a Graduate Merit Fellowship for FY 2001-2003 and an Association of Former Students Graduate Fellow award.

Daad Abi Ghanem was awarded Regent’s Graduate Fellowship for FY 2001-2002.

Asawari Chru was awarded a Regent’s Graduate Fellowships for 2002-2003.
Encouraging Excellence in Teaching, Research, and Public Service

The Department encourages good teaching by supporting all faculty improvement activities such as financially and administratively supporting participation in teaching conferences such as The Wakanse Fellows Conference and the Center for Teaching Excellence seminars and workshops. These are in addition to annual performance reviews, curriculum evaluations, and department head classroom observations. Excellence in research and public service are encouraged in a similar manner through support for conferences, multi-State research groups, financial program support (staff, materials, infrastructure such as computers and network) and annual performance reviews.

Measuring our Effectiveness.
According to our recent Southern Association of Colleges and Schools (SACS) accreditation review, the TAMU Poultry Science Department uses enrollment, placement, research productivity, and recognition as measures of if we are meeting our goals. Please refer to the SACS information pages in the student information section of this self-study document.
Joint Programs

Poultry Health

The most extensive cooperation we have is in the area of poultry health. Six of our faculty have formal partial appointments in the Veterinary Pathobiology Department in the College of Veterinary Medicine. Dr. Ricke also has a formal, adjunct, courtesy (no-cost) appointment in the VTPB Department to facilitate his interaction with their faculty on issues regarding bacterial pathogenesis. In addition to these appointments, the POSC and VTPB departments have jointly renovated two buildings and are preparing to undergo the renovation of a third. Building 990 is the Poultry Health Laboratory and houses the offices and labs of Drs. Caldwell and El Attrache (and Dr. Naqi who is an emeritus VTPB faculty member and poultry veterinarian). The operational expenses of 990 are also jointly shared between departments. Building 1508 is the Poultry Isolation Building and is a biological safety level 2 isolation building. A previous poultry building is now slated for renovation into a viral disease facility to support the three new faculty hires in poultry virology. Overall, POSC and VTPB have made a concerted effort to build a faculty and set of facilities for a poultry health program. In addition to the joint faculty positions, we have cooperative activities with other VTPB faculty (Collinson, Tizard, Stiles, Wagner) and scientists from Texas Veterinary Medical Diagnostic Lab (Wigle, Lineras, Golan). These activities include formal research proposals/projects, teaching courses, mentoring students, and field assistance with diagnostics.

Food Safety

Our Department maintains close joint programs in food safety with the Institute of Food Science and Engineering and with the USDA-ARS Food and Feed Safety Unit in College Station. Dr. Suresh Pillai serves as the Associate Director of the IFSE and as such is intricately involved in the planning and administration of their food research programs, including the irradiation center. Our joint programs with the USDA lab are many. Two of their faculty have formal appointment as adjunct graduate faculty members and as such can serve on graduate student committees. Furthermore, several graduate students receive training at the USDA labs through their research on joint projects between POSC faculty and USDA scientists. In addition to also providing direct funding of targeted research activities, the USDA lab provides ready access to some equipment or expertise not available in POSC. A few examples of the projects are:

- Salmonella colonization of the crop
- Competitive exclusion cultures and techniques
- Campylobacter contamination of products
- Campylobacter genetic fingerprinting
- Salmonella Enteritidis Genomics

Dr. Pillai has established a close working relationship with NASA scientists in the Jet Propulsion laboratory. This has resulted in joint research projects funded by JPL, a graduate student funded on a NASA fellowship, and an involvement of a NASA-JPL scientist as an associate graduate faculty member in our Department.
Dr. Ricke is chairman of the FDA Science Board-advisory subcommittee for the Center for Food Safety and Applied Nutrition: Subchairman-Antimicrobial Resistance and Tolerance Panel.

Nutrition
The POSC Department is the home department for the Intercollegiate Faculty of Nutrition. In addition, Dr. Rosemary Walzem is the Director of the Center of Nutrition, Health and Food Genomics in the IFSE. Her role is to foster and support collaborations in nutrition-related research through the Institute.

Environmental Stewardship
Dr. Carey works extensively with faculty from the Departments of Biological and Agricultural Engineering and Soil and Crop Science on projects related to waste management and dust/odor emissions. This work has even received legislative recognition in the form of research funding from a State Senator's office and Dr. Carey’s inclusion in a federally funded Center for Agricultural Air Quality.

Other cooperative programs
The Department has many other cooperative research, teaching and extension activities. Please see faculty vita listings for specific information. Below is a listing of other collaborative organizations with which we have and are working. Poultry Science faculty are actively engaged in collaborative projects with scientists from many agencies and institutions nationwide as well as other departments within the Texas A&M University System. These relationships represent mutual, creative input in the research or teaching enterprise, not solely the exchange of funds.

- Outside TAMUS
USDA-ARS, College Station
USDA-ARS, Beltsville, MD
USDA-ARS, Purdue, IN
University of Arkansas
Virginia Tech University
Prairie View A&M University
University of Leuven, Belgium,
University of Maryland
The Fred Hutchinson Cancer Research Center
National Autonomous University of Mexico
University of Texas - El Paso
University of California
University of Connecticut
North Carolina State University
Illinois State University
Penn State University
Purdue University
University of Arkansas
University of Delaware
Georgia Southwestern State University
Lipomics, Inc.
IAMS Corporation
Nextec, Inc.
Texas Animal Health Commission
Texas Commission on Environmental Quality
Texas Food for Health Council
NASA Jet Propulsion Laboratory

- Texas A&M University Collaborations:
The Schubot Center of Exotic Bird Health
Animal Science Department
Biological and Agricultural Engineering Department
Veterinary Pathobiology Department
Veterinary Physiology and Pharmacology Department
Veterinary Anatomy and Public Health Department
Veterinary Small Animal Medicine and Surgery
Department of Biology
Department of Biochemistry and Genetics
Soil and Crop Science Department
Texas Engineering Experiment Station Food Protein Research and Development Center
Chemical Engineering Department
Institute of Food Science and Engineering
Center of Food Safety
Texas Agricultural Experiment Station - San Angelo Research and Extension Center
Texas Agricultural Experiment Station - El Paso Research and Extension Center
Strengths of the Program and Opportunities for Improvement

Strengths

1. #1 Ranking
   Our Department is very proud of the fact that the meat and poultry programs at Texas A&M University have been ranked the best in the nation by Meat and Poultry magazine for the past two years (the only two years that the rankings have been done). While this is more of a comprehensive view of our program and not solely focused on our graduate program, it speaks highly of our faculty, students, and external relations.

2. Excellence of faculty expertise
   Our faculty represents an excellent, and comprehensive mix across the many facets of poultry science. There are many disciplines that contribute to the poultry industry and to the application of avian sciences to other fields such as human/veterinary medicine, biology, the environment, etc. We have many of the top scientists in their respective sub-disciplines as indicated by the many awards they have won and the professional societies of which they are members.

3. Student base from which to draw
   Our undergraduate and graduate student body is an excellent source of graduate students. Our undergraduate enrollment is more than twice the second largest poultry program in the country. Additionally, they are in high demand by employers and other universities as prospective graduate students. Our graduate students have won many awards at professional meetings and are also in high demand by employers such as industry, the government, and other universities. Both of these student groups feed into our graduate program. However, we do not rely solely on these internal sources and recruiting is essential to maintaining a healthy mix of ideas in the Department.

4. Industry involvement
   Our Department is very involved with the poultry industry of Texas and the country. Much of our research is done with their involvement and/or funding. They have sponsored several scholarships and fellowship endowments in the Department to further assist our graduate programs. They realize the importance of this relationship at both the undergraduate and graduate levels and that they will benefit from a strong department and supply of technically excellent employees. This relationship and industry involvement was cited as one of the main reasons our Department has been ranked best in the country by Meat and Poultry magazine for the past two years (the only years such rankings have been done).

5. Financial base of the department
   As previously stated, the industry partners have been quite instrumental in establishing three graduate fellowship endowments to provide sustained funding. We are extremely grateful and fortunate to have such base of funding. Another endowment will mature in five years to add to this base for future security.
6. Life science infrastructure of TAMUS in which to participate

TAMU has identified the life sciences as a strength that it wishes to elevate. As a member of the life science community at TAMU, the POSC Department stands to benefit from the resources, facilities and synergies being directed toward the life sciences. We have faculty participating on a TAMU VPR Office NIH grant proposal intensive workshop, we have received start-up assistance for a faculty member in molecular genetics, we have submitted several proposals to the life sciences task force initiative, and several faculty have established fruitful research collaborations in many colleges and departments as a result.

Opportunities for Improvement

1. Space (laboratory, office and commercial-scale farm space)

By far, the main limitation to our prolonged productivity is laboratory and office space. Our Department has grown substantially in the past thirty years with very little addition of space (only one lab was recently transferred from ANSC to POSC). The addition of the new Nutrition and Food Science Department will only squeeze space more. There is considerable underutilized space in Kleberg that could be better allocated. Tradition, not current need and productivity, seem to dictate the current system of space allocation.

2. Recruiting Strategy

The Department has no centralized recruiting activity with a review of applicant pool and a limited number of acceptances. Applications are reviewed throughout the year and the only limitation to a qualified applicant is the faculty or Departmental funding for a stipend. We have found this system to be the most flexible. Our field has been very focused and thus the individual faculty members are best positioned to fill their own needs. However, we may be able to have a greater national presence with at least some sort of centralized source point of information and advertising. Such an effort may improve our recruiting activities, particularly as we seek students in non-traditional poultry science fields like microbiology and environmental sciences and for diversity.

3. Graduate Seminar

Graduate seminar has remained underdeveloped in our Department as the faculty has preferred to engage their programs and students in several of the many other seminar series in other departments and faculties. Another similar setting is a graduate student symposium we have each summer in preparation for the Poultry Science Association meeting presentations. But since not all students go to this meeting, not all benefit from it. Also, it does not create the academic culture a seminar series would. Our seminar has been limited to just our graduate students and just the spring semester. However, graduate seminar could be one of the few events in the Department in which the entire Department comes together in an academic spirit and focuses on the benefit of the graduate students. Recently, several of our faculty members have expressed a desire to improve our seminar program to include a diverse perspective with such topics as faculty international travels, off-the-track opportunities, and related disciplines/programs. This
would improve the graduate student experience and the sense of collegiality in the Department.

4. Teaching experience for graduate students

Our Department has no formal mechanism for providing teaching experience to graduate students. Graduate students that want to teach and are qualified (with language and academics) are encouraged to assist faculty in teaching laboratories and lectures. The Department recognizes the value of this and the time it requires by extending the maximum funding duration for these students. All graduate students are encouraged to seek training in teaching from the several workshops offered on campus. Nonetheless, there has been debate for some time among the faculty about a more structured and formal teaching requirement for our graduate students. The idea is that many go into academic positions and formal teaching experience would help prepare them and increase their competitiveness.
The **Kleberg Animal and Food Sciences Center** is the home of the Poultry Science Department and the Animal Science Department. It is also the home of the Intercollegiate Faculty of Nutrition and the Intercollegiate Faculty of Food Science.
More Kleberg Labs
The **Poultry Health Research Laboratory** is located in the Veterinary Medical Complex and is jointly operated by the Poultry Science Department and the Veterinary Pathobiology Department. This building is also associated with a BL-2 isolation facility.
The **Poultry Science Research, Teaching, and Extension Center** ("The Farm") is located on campus, less than a mile from the Kleberg Center. It provides excellent facilities for all aspects of the production and processing of poultry, meat, and eggs. It also contains two classrooms and a demonstration pavilion.
The **Veterinary Research Building** is one of many in the Veterinary Medical Complex. It is the location of many of the research laboratories in the Veterinary Pathobiology Department, many of which focus on poultry. The Poultry Science and Veterinary Pathobiology have five faculty members with joint appointments and benefit from joint research programs and cross-listed courses.

The **USDA Southern Plains Agricultural Research Center** ("SPARC") is the home of the Food and Feed Safety Unit that conducts a wide variety of research programs involving poultry. There are numerous joint research projects between the Poultry Science Department and USDA-SPARC. USDA scientists also serve on the Poultry Science Department's Graduate Faculty and several Poultry Science Department students and post-docs train in USDA-SPARC laboratories.
Qualifications and performance for M.S. and Ph.D. students in POSC

<table>
<thead>
<tr>
<th></th>
<th>MS</th>
<th></th>
<th>PhD</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Former Students</td>
<td>Current Students</td>
<td>Former Students</td>
<td>Current Students</td>
</tr>
<tr>
<td>GRE</td>
<td>1058</td>
<td>1136</td>
<td>1018</td>
<td>1144</td>
</tr>
<tr>
<td>GPA Start</td>
<td>3.25</td>
<td>3.49</td>
<td>3.48</td>
<td>3.52</td>
</tr>
<tr>
<td>GPA Finish</td>
<td>3.54</td>
<td>3.71(^2)</td>
<td>3.58</td>
<td>3.45(^2)</td>
</tr>
<tr>
<td># months to complete degree</td>
<td>31.1</td>
<td>--</td>
<td>57.9</td>
<td>--</td>
</tr>
<tr>
<td># Students</td>
<td>61</td>
<td>11</td>
<td>34</td>
<td>19</td>
</tr>
</tbody>
</table>

\(^1\)All Students graduating 1993-2002.
\(^2\)GPA Finish for current students only reflects those students who have completed one or more years (n = 2 for MS and 13 for PhD).
Time to Completion for the Last 61 Masters Students to Receive Degrees from POSC

\[
(\bar{x} = 31.1)
\]
Time to Completion for the Last 34 Doctoral Students to Receive Degrees from POSC

\( \bar{x} = 57.9 \)
POSC GRADUATE STUDENT GENDER DISTRIBUTION

**FORMER (93-02)**
- Masters Students
  - Male: 33 (54%)
  - Female: 28 (46%)
- PhD Students
  - Male: 22 (65%)
  - Female: 12 (35%)
- Total Graduate Students
  - Male: 55 (58%)
  - Female: 40 (42%)

**CURRENT**
- Masters Students
  - Male: 4 (36%)
  - Female: 7 (64%)
- PhD Students
  - Male: 13 (56%)
  - Female: 6 (44%)
- Total Graduate Students
  - Male: 17 (56%)
  - Female: 13 (44%)
**Funding Sources for Current POSC Graduate Students**

### Masters Students (n = 11)
- Dept Stipend: 4 (36.6%)
- Fellowship: 3 (27.2%)
- Grants: 2 (18.1%)
- Dept Employed: 2 (18.1%)
- Other: 1 (5.2%)
- No Funding: 1 (9.1%)

### PhD Students (n = 19)
- Dept Stipend: 9 (47.3%)
- Fellowship: 4 (21.1%)
- Grants: 2 (10.5%)
- Dept Employed: 1 (5.2%)
- Other: 2 (10.5%)
- No Funding: 2 (10.5%)

### Total Graduate Students (n = 30)
- Dept Stipend: 13 (43.3%)
- Fellowship: 7 (23.3%)
- Grants: 3 (10%)
- Dept Employed: 2 (6.7%)
- Other: 4 (13.3%)
- No Funding: 1 (3.3%)
Comparative financial support data for graduate students in all Poultry Science Departments across the U.S.

<table>
<thead>
<tr>
<th></th>
<th>Auburn</th>
<th>Arkansas</th>
<th>Georgia</th>
<th>MSU</th>
<th>NCSU</th>
<th>TAMU</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.S. Stipend</td>
<td>13,650</td>
<td>11,000</td>
<td>12,891</td>
<td>10-12 K</td>
<td>11,000</td>
<td>13,560</td>
<td>12,168</td>
</tr>
<tr>
<td>Ph.D. Stipend</td>
<td>15,210</td>
<td>13,000</td>
<td>13,934</td>
<td>12-14 K</td>
<td>15,000</td>
<td>15,960</td>
<td>14,351</td>
</tr>
<tr>
<td>Health Insurance Provided</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Tuition Provided(^1)</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>P</td>
<td>(out-of-state)</td>
</tr>
</tbody>
</table>

\(^1\)F = Full, P = Partial, N = None.
Poultry Science Former Student, Major Professor and Placement

**M.S. 1993**
- Aldo Bianchi Mosquera, Dr. Lee Cartwright and Dr. John Carey
- Auturo German Borbolla, Dr. Billy Hargis, Professor, Poultry Science, University of Mexico
- Jennifer Lee Stolz, Dr. Ted Odom
- Daniel Shafer, Dr. John Carey. Ph.D. program, TAMU
- Randle Moore, Dr. Billy Hargis, Ph.D. Program

**Ph.D. 1993**
- Mary Van Elswyk, Dr. Pam Hargis, Omega Tech, Boulder, Colorado
- Sarah Birkhold, Dr. Alan Sams, Assistant Professor/Extension Specialist, Texas A&M Poultry Science
- Goodluck Okotie-Eboh, Dr. Chris Bailey, Houston, TX
- Hyginus I. Chukwu, Dr. W. F. Krueger

**M.S. 1994**
- Autumn Marshall, Dr. Pam Hargis, Madison, TN has Ph.D.
- Shelly McKee, Dr. Alan Sams, Ph.D. program, TAMU
- Fred Prochaska, Dr. John Carey, Ph.D., Program
- Kenneth Conrad, Dr. John Carey, Elanco Inc.
- Ying-Jen Wu, Dr. Lee Cartwright, Ph.D. Program, TAMU
- Gerardo Ramirez, Dr. Billy Hargis, Ph.D. program, TAMU

**Ph.D. 1994**
- Jerry Daniels, Dr. Fred Gardner, Vo-Agricultural Instructor, Kempner High School, Sugarland, TX
- Carlton Dean, Dr. Billy Hargis, Post-doc, New York
- James Allen Byrd, Dr. Billy Hargis, USDA Research Scientist, College Station, TX
- Sang-Do Ha, Dr. Steve Ricke, Senior Research Scientist in the Food Division of Health Science and Technology Planning and Evaluation Board, Korea Institute of Health Services Management
- Akram Haq, Dr. Chris Bailey, Research Assistant, Poultry Science Dept., TAMU
- Nurmahmudi, Dr. Alan Sams, Minister of Forestry and Estate Crops, Indonesia Government
- Giridaran J. Veeramuthu, Dr. Alan Sams, Technical Manager, J. Rettenmaier U.S.A.

**M.S. 1995**
- Marisol Lopez, Dr. Fred Gardner
- Belinda Savage, Dr. Fred Gardner, Ph.D. program, Florida
- William Aymond, Pam Hargis, Pilgrim's Pride, Inc., Food Technologist, Prepared Foods Division, Mt. Pleasant, TX
- Brad Isenhart, Dr. Lee Cartwright, Pfizer Pharmaceuticals, Sales Executive
- Carrie Hisel, Dr. Steve Ricke, Dietician, Olin E. Teague Veteran's Administration,
Temple, TX
William W. Wright, Dr. Lee Cartwright, Genetic Counselor, Laboratory Corporation of America

Ph.D. 1995
Yoshitaka Ono, Dr. Chris Bailey, Ghen Corporation, Japan

M.S. 1996
Patricia Mayo, Dr. Pam Hargis, Registered Dietician
Christopher Dzuik, Dr. Alan Sams, HEB Foods, TX
Casey Owens, Dr. Alan Sams, Ph.D. program, TAMU
Beth Baltmanis, Dr. Chris Bailey
Charles Gregory, Dr. Tom Porter
Kevin White, Dr. Chris Bailey, La Jolla, CA

Ph.D. 1996
Ik Soon Kang, Dr. Alan Sams, Senior Research Scientists, Oscar Mayer Corp, Madison, WI
Benjamin Morpurgo, Dr. Tom Porter, Senior Proposal Administrator, TAMU Research Foundation
Daniel Shafer, Dr. John Carey, Maple Leaf Farms, Milford Indiana, Corporate Nutritionists, Feed Milling Operations Manager
Fueng-Lin Kuo, Dr. John Carey, Taiwan Government
Bobby Lassiter, Dr. Chris Bailey, deceased

M.S. 1997
Laura Sarlin, Dr. Chris Bailey,
Sandra Hatch, Dr. Pam Hargis, Registered Dietician
Abigail Kennedy, Dr. Mary Van Elswyk, Teaches Nutrition Class for Nursing Students at Cy-Fair college in Houston, TX
Clinton Skaroswky, Dr. Alan Sams, Cargill, Inc., Waco, TX
Christine Zocchi, Dr. Alan Sams, Ph.D. program, TAMU

Ph.D. 1997
Shalene Herber-McNeill, Dr. Mary Van Elswyk, Senior Manager, Nutrition Communications, Texas Beef Council, Austin, TX
Shelly Rhea McKee-Hensarling, Dr. Alan Sams, Asst. Professor, University of Nebraska

M.S. 1998
Eric Barnhart, Dr. Billy Hargis, MS BioScience
Benjamin Wheeler, Dr. Alan Sams, Seaboard Farms R&M
Lynette Ryan, Dr. John Carey, Tyson Foods, QA Supervisor, Carthage, TX
Jason Krupala, Dr. Alan Sams, Quick-to-Fix Foods R&D, Dallas, TX

Ph.D. 1998
Luis Arturo Martinez Lemus, Dr. Ted Odom, Post-doc TAMU College of Medicine
Juliet A. Durant, Dr. Steve Ricke, Assistant Professor, Biology Department, Oakwood College, Huntsville, AL
Audrey McElroy, Dr. Billy Hargis, Asst. Professor, Virginia Tech University
Jerry Fred Prochaska III, Dr. Sarah Birkhold, Sara Lee Corporation, Ohio

M.S. 1999
Amy Carpenter, Dr. Ted Odom, Nutritionist, US Air Force. Alaska
Anne Erickson, Dr. Steven Ricke, Development Technologist, Pizza Hut Center of Excellence, Dallas, TX
Morgan Farnell, Dr. Billy Hargis, Research Associate, USDA-ARS, College Station
Johnny Fazzino. Jr., Dr. Chris Bailey, Ph.D. program, TAMU
Richard Reinap, Dr. Billy Hargis, TAMU Vet School
Scott Ziehr, Dr. Chris Bailey, San Angelo, TX

Ph.D. 1999
Juliet Ann Durant, Dr. Steve Ricke, Assistant Professor, Oakwood College, Huntsville, AL
David Gamboa, Dr. Chris Bailey, Nutritionist, Italcol, Bogata, Columbia
Gregory Martin, Dr. Chris Bailey, Poultry Extension Agent, Penn State Cooperative Extension, Lancaster, PA
Casey Owens, Dr. Alan Sams, Assistant Professor, U. of AR
Ying-Jen Wu, Dr. Lee Cartwright, Research Associate in Molecular Medicine Division, Oregon Health & State University, Portland, OR

M.S. 2000
Cain Cavitt, Dr. Alan Sams, Ph.D. candidate, U. of AR
Deborah Stanush, Dr. Billy Hargis, TAMU Veterinary School
Cesar Chavez, Dr. John Carey, Ph.D. candidate
Craig Coufal, Dr. John Carey, Ph.D. candidate
Kellie Herron, Dr. Billy Hargis
Koyle Knape, Dr. Billy Hargis
Nahum Puebla, Dr. Luc Berghman, Ph. D. candidate
Jack McReynolds, Dr. David Caldwell, Ph. D. candidate
Suzanne Young, Dr. Billy Hargis, TAMU Vet School

Ph.D. 2000
Minnar Sattar, Dr. Chris Bailey, Post Doctorate, Baylor college of Medicine, Houston, Tx
Young Min Kwon, Dr. Steven Ricke, Assistant Professor, University of Arkansas
Kenneth Maciorowski, Dr. Steven Ricke, Asst. Professor, Delaware State University

M.S. 2001
Jessica Barloon, Dr. Rosemary Walzem, Research Dietitian, Dallas Veterans Administration Hospital
Kathleen Clements, Dr. Luc Berghman, Sanderson Farms, Bryan, TX
Kimberly Floren, Dr. Ted Odom, Nutritionist, Tyler, Texas
Rebecca Russo, Dr. John Carey, school teacher, Houston, TX

Ph.D. 2001
Christine, Z. Alvarado, Dr. Alan Sams, Asst. Professor, Poultry Science, Virginia Tech

MS. 2002
Ruben Beltran, Jr., Dr. David Caldwell
Jason Lee, Dr. Lee Cartwright, Ph.D. candidate
Paige Reynolds, Dr. John Carey, Ph.D. candidate
Stephanie Simeral, Dr. Rosemary Walzem, Registered Dietitian, WIC Program, Folsom, CA
Michel Ann Thompson, Dr. Ted Odom, Nutritionist, San Jose, California
Melinda Valdez Corcoran, Dr. Lee Cartwright, Nutritionist/Clinic Manager, University of Texas Health Sciences Center, Houston, TX
Truitt Niemeyer, Dr. John Carey, Sanderson Farms, Inc.
Jeffrey Nutt, Dr. Steven Ricke, Quality Assurance Laboratory Manager, Freedman Meats, Houston, TX
Matthew Roe, Dr. Suresh Pillai, Ph.D. candidate
Mikheal Wallowitz, Dr. Rosemary Walzem, Ph.D. Student, University of California, Davis

Ph.D. 2002
Stacie Conner, Dr. Chris Bailey, Purina Mills, Inc.
Gerardo Ramirez, Dr. Ted Odom, USDA, Maryland
Maria del Pilar Castanado Serrano, Dr. Alan Sams, Asst. Professor, University of Mexico
Xin Li, Dr. Steven Ricke, Post-Doctorate, North Carolina State University, Poultry Science
Irene Zabala Diaz, Dr. Steven Ricke, Post-Doctorate, Poultry Science, Texas A&M
<table>
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<tbody>
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<td>MS</td>
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<td>4</td>
<td>6</td>
<td>9</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>PhD</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
### Intended Outcome vs. Actual Results

<table>
<thead>
<tr>
<th>Intended Outcome</th>
<th>Means of Assessment</th>
<th>Criteria for Success</th>
<th>Actual Results Obtained</th>
<th>Use of Results for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase enrollment in the M. Agr. program.</td>
<td>Faculty survey</td>
<td>At least 50% of faculty will be involved in the development and delivery of distance education courses.</td>
<td>30% of the faculty enthusiastically support the distance education concept.</td>
<td>Promote to faculty the benefits of distance education for increasing graduate enrollment.</td>
</tr>
<tr>
<td>Training in Poultry Science will be available via distance education.</td>
<td>Course offerings</td>
<td>2 Courses will be offered via distance education.</td>
<td>No Poultry Science courses have been offered via distance education.</td>
<td>Encourage and provide support to faculty to offer courses via distance education.</td>
</tr>
<tr>
<td>Equip classroom(s) in Kleberg for delivery of courses via distance education methods.</td>
<td>Classroom survey</td>
<td>At least one classroom with distance education capabilities.</td>
<td>There are no classrooms in the Kleberg Center that are equipped for delivery of courses via distance education methods.</td>
<td>Work with the Animal Science Department, College and University administration to identify resources for classroom renovation.</td>
</tr>
<tr>
<td>Intended Outcome</td>
<td>Means of Assessment</td>
<td>Criteria for Success</td>
<td>Actual Results Obtained</td>
<td>Use of Results for Improvement</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3 - 5 major outcomes for each degree program or administrative unit recommended.</td>
<td>How will you measure this outcome? (Multiple measures may be used)</td>
<td>At what level, or to what degree, do you expect these outcomes to be present?</td>
<td>When you measured (or observed or surveyed, etc) what did you find?</td>
<td>What impact did this have on the program or unit and how will it be used for program or unit improvement? (this should lead to next year plan)</td>
</tr>
<tr>
<td>Students will be marketable upon graduation.</td>
<td>Survey of graduates</td>
<td>80% of graduates will be employed or will continue in graduate/professional school upon completion of their degree.</td>
<td>87% of graduates are employed or will continue in graduate/professional school upon completion of their degree.</td>
<td></td>
</tr>
<tr>
<td>Students will graduate in a timely manner</td>
<td>Graduate survey</td>
<td>75% of students will complete their M.S. degree within 2 years.</td>
<td>63% of students completed their M.S. degree within 2 years.</td>
<td>Educate faculty on the need for timely student progress.</td>
</tr>
<tr>
<td>Students should be exposed to the larger scientific community.</td>
<td>Graduate survey</td>
<td>90% of graduates should have made a presentation at a national, professional scientific meeting.</td>
<td>87% of graduates made a presentation at a national, professional scientific meeting.</td>
<td>Educate faculty on the value of student experience at such meetings and financially support associated expenses.</td>
</tr>
<tr>
<td>Intended Outcome</td>
<td>Means of Assessment</td>
<td>Criteria for Success</td>
<td>Actual Results Obtained</td>
<td>Use of Results for Improvement</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Students will be marketable upon graduation.</td>
<td>Survey of graduates</td>
<td>80% of graduates will be employed or will continue in graduate/professional school upon completion of their degree.</td>
<td>100% of graduates are employed in related field.</td>
<td>Monitor trend to determine if benchmark is too low.</td>
</tr>
<tr>
<td>Students will graduate in a timely manner</td>
<td>Graduate survey</td>
<td>75% of student will complete their Ph.D. degree within 3 years of their M.S. or 4 years of their B.S.</td>
<td>25% of students completed their Ph.D. degree within 3 years of their M.S. or 4 years of their B.S.</td>
<td>Educate faculty on the need for timely student progress.</td>
</tr>
<tr>
<td>Students should be exposed to the larger scientific community.</td>
<td>Graduate survey</td>
<td>90% of graduates should have made 2 presentations at national professional scientific meetings.</td>
<td>100% of graduates made 2 presentations at national, professional, scientific meetings.</td>
<td>Continue to promote the value of student experience at such meetings and financially support associated expenses.</td>
</tr>
<tr>
<td>Student should publish their results in refereed journals.</td>
<td>Graduate survey</td>
<td>90% of students should have published at least one article from their research in a refereed journal by the time they graduate.</td>
<td>100% of students published at least one article from their research in a refereed journal at the time they graduated.</td>
<td>Education faculty on the value of publishing scientific results by students.</td>
</tr>
<tr>
<td>Intended Outcome</td>
<td>Means of Assessment</td>
<td>Criteria for Success</td>
<td>Actual Results Obtained</td>
<td>Use of Results for Improvement</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
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<td>-------------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Students will be marketable upon graduation.</td>
<td>Survey of graduates</td>
<td>80% of graduates will be employed or will continue in graduate/professional school upon completion of their degree.</td>
<td></td>
<td>Monitor trend to determine if benchmark is too low.</td>
</tr>
<tr>
<td>Student will graduate in a timely manner</td>
<td>graduate survey</td>
<td>75% of students will complete their M.S. degree within 2 years.</td>
<td></td>
<td>Educate faculty on the need for timely student progress.</td>
</tr>
<tr>
<td>Students should be exposed to the larger scientific community.</td>
<td>graduate survey</td>
<td>90% of students should make presentation at a national or professional scientific meeting.</td>
<td></td>
<td>Educate faculty on the value of student experience at such meetings and financially support associated expenses.</td>
</tr>
</tbody>
</table>
Continual growth in the poultry industry increases the need for technical knowledge in the various fields of science needed for a successful poultry business. In no field of agriculture is an understanding of the fundamental and applied sciences more marketable or more rewarding that in the modern intensive production of poultry meat and eggs. Because the bird is the basis for the department's graduate program, additional areas of interest include exotic and wildlife species as well as cellular and molecular studies using avian models. A major objective of the department is to offer training for work in research, teaching, extension or industrial operations. We also strive to bridge the gap in both directions between courses in fundamental biochemistry, genetics physiology and economics and their practical application to the production of poultry and the care of all avian species.

The department offers graduate studies leading to the Master of Agriculture, Master of Science and Doctor of Philosophy degrees. In addition to a major in poultry science, students may pursue majors through many intercollegiate faculties including nutrition and food science and technology. Faculty expertise exists for study in genetics, reproduction, nutrition, biochemistry, physiology, environment, management, microbiology, processing and marketing for all commercially-important species. The faculty are also actively involved in many of these disciplines for other avian species and in the pursuit of basic cellular and molecular knowledge.

Graduate Courses

603 Avian Incubation and Embryology (3-3) Credit 4. Embryonic development of bird eggs under both commercial and experimental incubation conditions; developmental processes are evaluated relative to various environmental and genetic parameters.

609 Avian Physiology (3-3) Credit 4. Basic physiological principles pertaining specifically to avian species; cardiovascular, neural, respiratory, digestive, endocrine and reproductive systems; physiological experiments use various avian species as laboratory animals.

611 Poultry Processing and Distribution Technology (3-2) Credit 3. Poultry and egg composition, mechanisms of poultry and egg quality preservation, effects of storage environments, time and product treatment; evaluation of commercial methods of product assembly, processing, distribution and quality control; evaluation of physical, microbiological, functional and chemical methods of quality determination.
Fermentation and Gastrointestinal Microbiology. (3-0). Credit 3. Fermentation and gastrointestinal ecosystems in terms of microorganisms present, their activities and requirements and their interactions in a dynamic system. Prerequisite: Beginning microbiology and/or biochemistry or approval of instructor. Cross-listed with NUTR 614.

Avian Nutrition (3-0) Credit 3. Metabolism and nutritional requirements of domestic fowl including proteins, carbohydrates, fats, minerals, vitamins and related feed additives. Prerequisites: CHEM 228 or 232; POSC 411 or approval of instructor.

Molecular Methods for Microbial Characterization (2-2) Credit 3. Underlying principles of molecular methods for microbial detection and characterization in natural and man-made ecosystems; Emphasis on method application and data interpretation; Emphasis on microbial pathogens and indicator organisms in foods and environment; Laboratory covers select protocols. Prerequisites: POSC 429, FSTC 326, AGRO 405, approval of instructor. Cross-listed with FSTC 619/AGRO 619.

Least-Cost Feed Formulation (2-2) Credit 3. Theoretical and applied principles associated with least-cost feed formulation, ingredient inventory, farm and feed mill management; computer optimization of resources for most efficient least-cost production with applications to all domestic farm animals; applications of micro-computer technology. Prerequisites: POSC 411, ANSC 309.

Nutrition and Metabolism of Vitamins (3-0) Credit 3. Chemistry and metabolism of the fat soluble and water soluble vitamins and their roles in animals; integrates cellular biochemistry and metabolism of the vitamins in the vertebrates animals. Prerequisites: POSC 411 or ANSC 303; BICH 410 or 603. Cross-listed NUTR 645

Immunology (3-0). Credit 3. Cellular basis of the immune response; relationships between inflammation and acquired immunity, MHC and cell activation; the role of cytokines in immunoregulation and hypersensitivity, vaccines and the mechanism of immunity to viruses, bacteria and parasites. Prerequisite: VTPB 409 or equivalent. Cross-listed with VTMI 649.

Nutrition and Metabolism of Minerals (3-0) Credit 3. Nutritional significance of minerals in animal metabolism; chemical, biochemical and physiological role of minerals and homeostatic control in animal metabolism. Prerequisites: POSC 411 or ANSC 303; CHEM 410 or 603. Cross-listed NUTR 650.

Experimental Immunology. (3-3). Credit 4. Familiarization, development and integration of techniques into experimental design of immunologic investigation; antibody production, protein purification, immunofluorescence, agar-gel diffusion, immuno-electrophoresis and specialized serologic tests. Prerequisites: BICH
419 or equivalent; 8 hours of microbiology. Cross-listed with VTMI 650.

681 **Seminar.** Credit 1 each semester. Intensive review of literature of feeding, breeding, incubation, marketing, and management; development of familiarity with journals, organizations, agencies and personnel working on poultry problems. May be repeated as many semesters as desires.

685 **Directed Studies.** Credit 1 to 6 each semester. Individual problems involving application of theory and practice in the various disciplines of poultry Science.

689 **Special Topics in ...** Credit 1 to 1. Selected topics in an identified area of poultry science. May be repeated for credit.

691 **Research.** Credit 1 or more each semester. Research methods and techniques in breeding, nutrition, physiology, marketing, management and products technology. Students must conduct experiments in one of these fields. Design of experiments, collection, analysis and presentation of experimental data. Designed for thesis or dissertation credit.

**Special Topics Courses:**

689 **Poultry Health** (3-0) Credit 3. This course will conduct a comprehensive review of current and emerging issues that are of importance to poultry health in the commercial poultry industry. Topics which focus on the impact of pathogens and disease resistance and treatment will be discussed, with particular emphasis on the prevention, identification, and control of current and emerging pathogens.

689 **Immune Technology** (3-0) Credit 3. The aim of this course is to provide students with the basic knowledge of modern immuno-chemical technology, including the production of antibodies and their application in a wide array of techniques, such as immunoassays, immuno-histochemistry, affinity chromatography etc. Practical sessions are provided where students and apply the newly acquired knowledge.

689 **Microbiology of Food Irradiation** (2-2) Credit 3. Primary objective of this course is to provide students with a working knowledge of e-beam-based food irradiation. In this lecture-laboratory course, the students will get hands-on experience in determining the D_{10} values of specific microorganisms, dosimetry, and evaluating effectiveness of e-beam food irradiation. Cross-listed with FSTC 689.

689 **Nutrition and Food Chemistry in Lipids** (3-0) Credit 3. An overview to chemical and physical properties that underlie the behavior of lipids in food and living systems. Following the establishment of a common basis for understanding the physical/chemical properties of lipids, the relationship of these functional properties to metabolism and distribution of lipids within the body will be introduced. Basic principles developed in lecture will be illustrated during
roundtable discussions of relevant research articles.
Graduate Curricula in Poultry Science

Continual growth in the poultry industry increases the need for technical knowledge in the various fields of science needed for a successful poultry business. In no field of agriculture is an understanding of the fundamental and applied sciences more marketable or more rewarding than in the modern intensive production of poultry meat and eggs. Because the bird is the basis for the department's graduate program, additional areas of interest include exotic and wildlife species as well as cellular and molecular studies using avian models. A major objective of the department is to offer training for work in research, teaching, extension or industrial operations. We also strive to bridge the gap in both directions between courses in fundamental biochemistry, genetics, physiology and economics and their practical application to the production of poultry and the care of all avian species.

The department offers graduate studies leading to the Master of Agriculture, Master of Science, and Doctor of Philosophy degrees. In addition to a major in poultry science, students may pursue majors through many intercollegiate faculties including nutrition and food science and technology. Faculty expertise exits for the study in genetics, reproduction, nutrition, biochemistry, physiology, environment, management, microbiology, processing and marketing for all commercially-important species. The faculty are also actively involved in many of these disciplines for other avian species and in the pursuit of basic cellular and molecular knowledge.

Master of Science Curriculum
(For all students with POSC as a home department)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
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<td>Statistics</td>
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<td>Biochemistry Physiology</td>
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<tr>
<td>Biochemistry Physiology</td>
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<td>Selected from POSC 609, FSTC 607 or NUTR 641</td>
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<tr>
<td>Poultry Science</td>
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<td>600 + level (excludes 681, 684, 685, &amp; 691 or other courses cross listed with these)</td>
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<tr>
<td>Other courses of interest</td>
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<td>At least 50% of the formal coursework credit hours must be in POSC, FSTC, or NUTR courses</td>
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<tr>
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TOTAL OF 32 HOURS

Doctor of Philosophy Curriculum
(For all students with POSC as a home department)
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<td>STAT 651, STAT 652</td>
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<td>Biochemistry</td>
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<td>BICH 601, BICH 602</td>
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<td>600 + level (excludes 681, 684, 685, &amp; 691 or other courses crosslisted with these)</td>
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Equivalent courses used at another university for an M. S. degree may be substituted for some required courses.

**TOTAL OF 96 HOURS**
## Department of Poultry Science Teaching Schedule

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<tr>
<th>Faculty member</th>
<th>Fall odd years</th>
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<td>D. Caldwell</td>
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<td>J. Zhu</td>
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This does not include all 489/689 classes which may be in development.
# Poultry Science Graduate Classes

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<thead>
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<td>POCS 611 -- Poultry Processing &amp; Distribution Technology (vacant faculty position)</td>
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<td>POCS 614 -- Fermentation and Gastrointestinal Microbiology</td>
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<td>- Nutrition and Metabolism of Minerals ** Alternates with POSC/NUTR 645</td>
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<td>6/7</td>
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<td>- Experimental Immunology</td>
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</table>
POULTRY SCIENCE - 603

Title: Principles and Practices of Incubation (3-3) Credit 4

Basic references:
4. Journals to be used:
   a. Poultry Science
   b. Journal of Morphology
   c. Journal of Experimental Biology and Medicine
   d. Journal of Anatomy and Physiology
   e. Journal of Experimental Zoology.

Objectives of the course:
1. To familiarize the student with the developmental embryology of the chick in order that he may appreciate the biological aspects of the incubation process.
2. To study the various factors influencing the developmental process.
3. To familiarize the student with current literature in this field, research needs, and trends in incubation procedures.

Lecture Outline:

I. Formation of the egg (Romanoff and Romanoff, cl. 4)
   A. Morphology of the ovary and oviduct
   B. Development of the Yolk
   C. Albumen secretion
   D. Shell formation
   E. Ovaposition
   F. Ecological significance of egg structure

II. Biophysicochemical. Constitution of the egg
   A. Chemical composition (Romanoff and Romanoff, 1949. ch.6)
   B. Physiochemical properties (Romanoff and Romanoff, 1949. ch. 7
   C. Biochemical properties (Romanoff and Romanoff, 1949. ch.8)

III. Gametogenesis and fertilization in birds
   A. Continuity of germ plasm
   B. History of the sex cells
   C. Maturation
   D. Fertilization process in birds
   E. Competitive fertilization in the fowl. (Poultry Sci. 34:1332)
   F. Duration of fertility in fowl. (Poultry Sci. 34:228)
IV. Process of cleavage (Joun. Morph. 70:513)
   A. Effect of yolk on cleavage
   B. Sequence and orientation of the cleavage divisions in birds.

V. Formation of the germ layers
   A. Morula Stage
   B. Blastula
   C. Gastrulation
   D. Development of the primitive streak
   E. Discussion of the embryological importance of the germ layers.

VI. Development from fifteen to twenty—four hours of incubation.
   A. Formation of the notochord
   B. Formation of the neural plate
   C. Development of neural groove and head
   D. Establishment of the primitive gut
   E. Early differentiation of the mesoderm
   F. Development of the area vasculosa
   G. Regression of primitive streak

VII. Changes between twenty-four and thirty-three hours of incubation
   A. Closure of the neural groove
   B. Differentiation of the brain region
   C. Formation of the heart and omphalomesenteric veins
   D. Lengthening of the foregut.
   E. Formation of the eye

VIII. Changes between thirty-three and thirty-eight hours of incubation
   A. Divisions of the brain
   B. Development of the auditory pits
   C. Formation of the extra and intra-embryonic blood vessels
   D. Further development of the heart

IX. Changes between thirty-eight and fifty-five hours of incubation.
   A. Flexion and Torsion
   B. Completion of the vitelline circulation
   C. Extra-embryonic membranes
   D. Nervous system
   E. Digestive system
   F. Circulatory system
   G. Differentiation of the somites
   H. The urinary system

X. Development during the third and fourth days of incubation.
   A. External features
   B. Nervous system
   C. Sense organs
   D. Digestive and respiratory system
   E. Circulatory Systems
   F. Urinary System
   G. Coelom and mesenteries
XI. Development from four days through twenty-one days of incubation.
   A. Digits
   B. Beak
   C. Feather germs
   D. Webs between digits
   E. Claws on toes
   F. Scales on shanks
   G. Orientation of the embryo prior to batching. (Poultry Sci. 32:202)

XII. Peaks in embryonic mortality
    A. Three days of incubation
    B. Nineteenth day of incubation

XIII. Physical environment of hatching eggs
    A. Prior to incubation
    B. During incubation
    C. Incubation systems

XIV. Chemical environment during incubation

XV. Egg traits which influence hatchability
    A. Size
    B. Shape
    C. Shell characters
    D. Albumen characters
    E. Yolk characters

XVI. Nutritional factors in hatchability
    A. Vitamins
    B. Minerals
    C. Proteins
    D. Fatty acids
    E. Hormones
    F. Medicants

XVII. Genetic factors affecting hatchability
     A. Lethels
     B. Sex of embryo
     C. Inbreeding and heterosis
     D. Relative contribution of mother and father
     E. Irradiation of the egg, sire, or dam

XIX. Reproductive activity of parent stock, and metabolism of the hen as factors in hatchability
     A. Age
     B. Antecedent and current egg production
     C. Time of day egg is laid
     D. Interval between laying of eggs
     E. Position of egg in clutch
     F. Fertility and age of sperm cells
     G. Environmental and body temperature
Embryo development and hatchability
A. Embryo growth and hatchability
B. Malpositions
C. The occurrence of embryo malformations as an index of incubation conditions
D. Prenatal and postnatal mortality
SYLLABUS
CHEMISTRY OF FOODS
FSTC 605

Lecture: MWF 9:10-10:00 AM Room 121 Kleberg Center

COURSE DESCRIPTION

Chemistry of Foods. (3-0). Credit 3. Chemical covalent and non-covalent interactions in food systems; the glass transition and moisture in foods; carbohydrate chemistry; reactions of food lipids; protein functionality; chemistry of flavor; processing chemistry; food additives; and nutraceutical phytochemicals. Prerequisites: BICH 410 or 603 or approval of the instructor.

OBJECTIVES

Students will be able to:

1. Understand food chemistry structures, symbols, terminology and reaction concepts such as bonding, oxidation, free radical reactions, enzymatic reactions, free energy, energy of activation, and reaction rates in food systems.

2. Identify functional groups and describe the reactions and mechanisms important in molecular mobility and transitions.

3. Describe the structure, function and reactions of carbohydrates, lipids, proteins, vitamins and minerals in food systems as they relate to the functional properties, nutritional value, processing conditions and product characteristics.

4. Understand the chemical interactions in dispersed systems and describe the effects of colorants, flavorants and food additives on product properties.

Instructors
See Instructors in Topical Outline. Schedule conferences by appointment as needed.

REFERENCE MATERIALS

Required Textbook


Reference Textbooks


Proceedings and Symposia

Advances in Food Research. Yearly editions. (Main Library)

Scientific Journals (West Campus Library)

American Journal of Clinical Nutrition – American Society for Clinical Nutrition (ASCN)
Canadian Journal of Food Science -- Canadian Institute of Food Technologists (CIFT)
Journal of Food Science; Food Technology -- Institute of Food Technologists (IFT)
Journal of Agriculture and Food Chemistry -- American Chemical Society (ACS)
Journal of Nutrition – American Society for Nutritional Sciences (ASNS)
Journal of the American Dietetic Association – American Dietetic Association (ADA)
Journal of Animal Science -- American Society of Animal Science (ASAS)
Poultry Science -- Poultry Science Association (PSA)
Journal of Muscle Foods
Journal of Food Biochemistry
Journal of Food Protection
Journal of Food Quality
Journal of Food Texture

International Journals

Meat Science – American Meat Science Association (AMSA)
Journal of Food Technology
Journal of Science, Food and Agriculture

Government Publications (See website listings)


Federal Register. General Services Administration. Washington, DC. (Daily proceedings of public regulations and legal notices issued by Federal Agencies)

USDA-Agricultural Marketing Service. Superintendent of Documents, Washington, DC. (Statistical data on livestock and crop markets)

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<th>GRADING SYSTEM</th>
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Attendance/Audit Policy and Make-Up Exams

Regular attendance and participation in the course is expected of all students. Anticipated absences should be cleared with the instructor prior to the absence. Emergency absences (serious illness, injury, death, etc.) should be reported as soon as possible. An excuse may be necessary for more than three absences. Those students auditing the course are expected to participate in lecture sessions. Make-up work and exams will be allowed under extenuating circumstances for which written excuses are provided.
## LECTURE OUTLINE

**CHEMISTRY OF FOODS**

**FSCT 605**

**Fall Semester 2002**

<table>
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<th>Lecture</th>
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<td>Introduction/Coordinator</td>
<td>Read the topical chapters in Fennema before each lecture. Quizzes can be given at any time and will cover lecture material as well as book chapters.</td>
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<tr>
<td>4</td>
<td>2</td>
<td>Chemical Bonding/S. Smith</td>
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<tr>
<td>6</td>
<td>3</td>
<td>Energy of Activation/S. Smith</td>
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<td>Molecular Mobility/R. Waniska</td>
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<td>Carbohydrates/R. Waniska</td>
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<td>Lipids/R. Miller</td>
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<td>Enzymes/J. Keeton</td>
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<td>Food Additives/L. Rooney</td>
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<td>Dispersed Systems/R. Richter</td>
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<td><strong>Thanksgiving Holidays</strong></td>
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<td>9-10</td>
<td>42</td>
<td>Redefined Day, Friday Classes</td>
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<td>Course/Instructor Evaluation,</td>
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<td>Review Session</td>
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<td>11-12</td>
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<td><strong>Reading Days - No Classes</strong></td>
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**Exam 4**
Monday, December 16th, 8-10 AM
Room 121 Kleberg Center
AVIAN PHYSIOLOGY  
POSC 609  
Dr. David J. Caldwell  
Spring Semester, 2002

I. Lectures

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Lecture topic</th>
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<tbody>
<tr>
<td>Week 1 (1/14/02)</td>
<td>Introduction to Course</td>
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<tr>
<td>Week 2 (1/21/02)</td>
<td>Basic Cell Biology and Introduction to Nervous System Physiology</td>
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<td>Week 3 (1/28/02)</td>
<td>Peripheral Nervous System</td>
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<td>Week 4 (2/4/02)</td>
<td>Skeletal and Smooth Muscle physiology</td>
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<td>Week 5 (2/11/02)</td>
<td>Immunophysiology and Components of Blood</td>
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<td>Week 6 (2/18/02)</td>
<td>Respiratory Physiology</td>
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<td>Week 7 (2/25/02)</td>
<td><strong>Midterm Exam I</strong> (25% of final grade)</td>
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<td>Week 8 (3/4/02)</td>
<td>Endocrine System (including adrenal gland/stress physiology)</td>
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<td>Week 9 (3/11/02)</td>
<td><strong>Spring Break</strong></td>
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<td>Week 10 (3/18/02)</td>
<td>Renal Physiology</td>
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<td>Week 11 (3/25/02)</td>
<td>Gastrointestinal Physiology</td>
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<td>Week 12 (4/1/02)</td>
<td>Thermoregulation and Physiology of flight and diving</td>
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<td>Week 13 (4/8/02)</td>
<td><strong>Midterm Exam II</strong> (25% of final grade)</td>
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<td>Week 14 (4/15/02)</td>
<td>Male and Female Reproductive Endocrinology</td>
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<td>Week 15 (4/22/02)</td>
<td>Photoperiod, Photoresponsiveness, and Physiology of egg laying</td>
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<td>Week 16 (4/29/02)</td>
<td>Bone Physiology and Special Senses</td>
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<td>Week 17 (5/6/02)</td>
<td><strong>Term Paper</strong> (20% of final grade)</td>
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<td><strong>Final Exam</strong> (30% of final grade)</td>
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Class Meeting Time: TBA

Office hours: My door is always open. If you can find me, I will do my best to meet with you.
Office: Room 108B Poultry Health Laboratory (Vet. Research Park)
Phone: 845-4288
email: caldwell@poultry.tamu.edu
II. Textbooks

Students should be prepared to discuss the material in each lecture by completing any required reading prior to each class.

Required reading:
1. Avian Physiology, P.D. Sturkie (strongly suggested, available in book store and library)

Optional reading:
3. Avian Biology, v. 2-6, D.S. Farner and J.R. King, editors.
5. Medical Physiology, Ganong, editor.

III. Term Papers

Each student must submit one term paper during the final week of classes. The topic of each paper must be approved by the instructor. The body of the term papers must be 5 to 10 pages in length (double spaced with 1-inch margins), not including the title page and references. Use of original figures is encouraged when it improves the presentation of the paper (especially when the paper proposes a new model). Figures do not count toward page limit. All papers must deal primarily with avian physiology. The topic of the paper can be related to, but not identical to, the research interest of the student. Term papers should be in the form of a short contemporary review. For suggestions in style, see reviews in *Journal of Biological Chemistry, Cell,* or *Trends in Endocrinology and Metabolism.* All papers must concentrate on advances in the field made during the past four years. The paper should not be simply a summary of facts; it should be a synthesis of recent findings into an up-to-date model that describes the physiology of the system. All reviews should conclude with a brief discussion of key areas in the field that require additional work. Try to be comprehensive, concise and insightful. In short, after writing the paper, the student should be capable of discussing the topic with the leading experts in the field. Comments made by the instructor on the first term paper will be considered when grading the second term paper. Lack of improvement will reduce your grade. Papers are due on the date listed, no exceptions, no excuses. Late papers will be marked down a letter grade for each day they are late.

IV. Plagiarism and Copyrighted Materials

The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism
if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. Anyone suspected of plagiarism will be given an oral exam on the material in question. Anyone committing plagiarism will receive a grade of "F" in this course.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

V. Grading

1. Midterm Exams (2) 50% of final grade
2. Final Exam 30% of final grade
3. Term Paper 20% of final grade

Total 100%

All makeup exams will be given orally.
Poultry Processing and Distribution Technology

Course Instructor: Dr. Alan Sams (secretary: JoAnn)  
101 Kleberg  
845-1931  
Office hours by appt.

Lab TA's: Christine Alvarado  
327 Kleberg  
845-4818

Course Objective:  
To provide students an in-depth, mechanistic understanding of the production and marketing of poultry meat and egg products in preparation for a corporate or academic research career. A second objective is to provide exposure to advanced lab techniques.

Grading:  
The grading will be calculated as the average of exams (3), research presentation(s), and a lab grade. The lab grade will be calculated from attendance, participation and the average of three lab reports. The numeric grading scale for the course will be at the discretion of the instructor but will be no higher than the following:  
90+% = A, 80-89% = B, 70-79% = C, 60-69% = D, <60 = F

Suggested Material for Reference:
2. Physiology and Biochemistry of Muscle as a Food, Briskey et al. (1970).
11. Handouts

Field Trip:  
The class may make a 1 day field trip to tour a poultry processing plant. This trip will be required and will be covered on the final exam. The trip will be the week of May 1.
Topic Outline

I. Eggs
   A. Formation, Structure, and Composition (1 wk)
   B. Quality (1 wk)
      1. Exterior
      2. Interior
         a. Mechanism of Deterioration
         b. Maintenance of Quality
         c. Microbiological Quality
            - Salmonella enteridis
   C. Functionality and Products (2 wk)
      1. Gelation
      2. Surface activity
      3. Color
      4. Fat-modified Eggs and Egg Products
      5. The Cholesterol Issue (or Non-Issue)

II. Meat
   A. Muscle Structure and Function (1 wk)
      1. Gross & Ultrastructure of Muscle
      2. Biochemistry of Muscle
      3. Contraction
   B. Product Quality (1 wk)
      1. Types - Quantitative, Qualitative, Hidden
      2. Sensory Quality - Theory & Methodology
         a. Flavor - Fat, Species Specific, Oxidation
         b. Color
         c. Juiciness
         d. Tenderness - Contractile, Connective
   C. Poultry Processing and its Quality Impact (3 wk)
      1. Feed Withdrawal
      2. Catching / Live Haul / Unloading
      3. Poultry Stunning
      4. Kill / Bleed
      5. Scald / Pick
      6. Evisceration
      7. Chilling
      8. Rigor Mortis and Aging
      9. Electrical Stimulation and Its Use in Poultry Processing
     10. Water Use and Wastewater Management in Poultry Processing
         continued
D. Processed Poultry Meat Products (3 wk)
   1. Marketing Concepts
   2. Mechanically Deboned Meat
   3. Formed Products
   4. Emulsified Products
   5. Fat Reduction in Processed Poultry Meat Products
   6. Washed Meat Products
   7. Curing, Smoking, and Cooking
   8. Extruded Products
   9. Enrobed Products
   10. Monitoring and Detection of Endpoint Cooking Temperature

E. Microbiology (2 wk)
   1. Spoilers vs. Pathogens
   2. Processing and Packaging Effects
   3. Control of Pathogens on Poultry (competitive exclusion, irradiation, other post-slaughter treatments)
   4. SOP's, HACCP and Their Implementation (C. Alvarado)

Research Presentations:
The bolded topics in the above topic outline will be assigned to students for presentation to the class in the form of a lecture. The topic coverage should be an in-depth summary and analysis of the research that has and is being conducted on the topic. This should be a complete and technical presentation of the published literature. Also, most of these topics are being studied by a faculty member at TAMU, another potential source of information.

Lab Reports:
The purposes of the lab exercises are the science involved as well as the practical experience of the processing and laboratory techniques. Three lab exercises will be conducted (one for eggs and two for meats) with reports to be written for each. Structure and grading of lab reports will be covered in the laboratory section of the course. Each laboratory exercise will be 3 weeks in length and there will be a week in between each to prepare the lab report manuscript. The topics are:

   1. Broiler processing, rigor mortis development, and meat quality

   2. Further processed meat products and mixed-species meat products

   3. Egg protein chemistry and functionality
FERMENTATION AND GASTROINTESTINAL MICROBIOLOGY
NUTR/POSC 614
Fall 2002

Instructor: Dr. Steven C. Ricke
Poultry Science Dept.
338F Kleberg Center
862-1528
Email sricke@poultry.tamu.edu
Class time: TR 11:10-12:25 am
Location: 200 Kleberg
Office Hours: By appointment

Teaching Assistant: Irene Zabala-Diaz/Kristin Medvedev
Poultry Science Dept.
338E / 327 Kleberg Center
845-4818
Email: irene-zabala@neo.tamu.edu
K-medvedev@neo.tamu.edu
Office Hours: Tues/Thur 9:00-10:00

Prerequisites: Biochemistry 410 (or equivalent) or consent of the instructor.

Course objectives: To analyze anaerobic and fermentation microbial ecosystems in terms of microorganisms present, their activities and requirements and their interactions.

GRADING:

1) Exam I 100 pts.

2) Exam II 100 pts.

3) Review paper (undergraduates) or research proposal (graduates)

Rough draft = 20 pts due by October 31

Paper =100 pts. due by November 26

4) Problem Sets (80-100 pts)

5) Final Examination 100 pts

Total pts in course: 500-520 possible
**Absentee Policy:** This policy is drafted in accordance with the Texas A&M University regulations Manual. Absences will be excused for reasons including the following:

1. Participation in an activity appearing on the University authorized activity list.
2. Death or major illness in a student’s immediate family.
3. Illness of a dependent family member.
4. Participation in legal or administrative procedures that require a student’s presence.
5. Religious holy day.
6. Confinement because of illness.
7. Required participation in military duties.

The student must notify the instructor of the excused absence, in person or by telephone, within 48 hours of the last date of absence. Makeup exams will be scheduled and must be completed within 30 days of the last date of absence. Unexcused absences from exams will result in an F (0 points) on that exam.

**Disabilities:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room 126 of the Koldus Building. The phone number is 845-1637.
General References:


Drasar, B. S. and Barrow, P. A. Intestinal Microbiology. Amer. Soc. for Microbiol., Washington, D. C.


My Philosophy on What You Should Know for this Course:

1) Exams will be a mixture of matching, short answer and essay, closed book and notes. You will have the class period to complete the exam and the final will not be comprehensive.

2) Problem sets are designed to help you understand and study the current literature that is discussed in class. The material covered on the problem sets will be used for constructing the exams.

3) A graduate level course by necessity requires familiarity with the scientific literature in the respective research areas discussed in class. I will make every attempt to introduce you to current and past literature to illustrate concepts and teach you how to integrate the information.

4) A graduate level course requires participation from the class. Lively discussion makes the material more enjoyable to learn from everyone. Do not be surprised if there is not a right answer.
Potential Topics

Habitats

Introduction and comparative ecology
Physico-chemical characteristics of anaerobic ecosystems
Methods for bacterial culture which simulate anaerobic ecosystems
Consequences of anaerobiosis

The Inhabitants

Saccharolytic bacteria
Methanogens

Enzymatic Hydrolysis of Polymers

Review of plant anatomy and cell wall structure
Hydrolysis of plant polysaccharides
Current perspectives on polysaccharide degradation
Proteolysis
Lipid hydrolysis

Metabolism of Monomeric Components

Fermentation pathways and sites of ATP formation - pentose phosphate, Embden-Meyerhoff, acetate
Fermentation pathways and sites of ATP formation - propionate, butyrate, branched-chain VFA
Carbon and redox balance
Interspecies hydrogen transfer

Bacterial growth kinetics in batch and continuous cultures

Utilization of energy for growth and maintenance

Preferences for carbon and energy substrates

Energetics and regulation of nutrient transport

Nitrogen requirements and amino acid biosynthesis for microbial function

*Modification and Applications of Anaerobic Microbial Ecosystems*

Metabolic manipulation of anaerobes

The role of probiotics and other additives in the gastrointestinal tracts

The role of anaerobes in human nutrition and foods

Genetics and molecular biology of anaerobes

Industrial applications of anaerobes

Waste recycling applications of anaerobes

Review
POSC 615 - Avian Nutrition

Syllabus

Course Description

This course is designed for Graduate Students majoring in Poultry Science or Nutrition and is designated POSC 615. Avian Nutrition (3-0). Credit 3. Metabolism and nutrient requirements of domestic fowl, including proteins, carbohydrates, fats, minerals, vitamins and related feed additives. Prerequisite: POSC 411 and CHEM 228 or approval of instructor.

To send an email click below
Dr. Christopher Bailey (242 Kleberg)

Course Format and Scheduling:

POSC 615 will meet twice per week; in room 200 Kleberg Wednesday mornings from 9:45 to 11:00 and in the POSC computer lab Friday mornings from 10:30 to 12:00 noon. On Wednesdays we will focus on classical poultry nutrition with emphasis on nutrient metabolism. On Fridays we will focus on commercial poultry nutrition with emphasis on feed manufacture, least cost diet formulation and specific nutrient requirements for the various classes of poultry. Each student will be responsible for presenting a seminar/lecture on a topic approved by the instructor and of current interest to poultry scientist. Course materials will be available over the internet via the Poultry Science Home Page.

GRADING POLICY:

- 2 Midterm Exams 50 %
- 1 Oral Presentation 25 %
- Homework Assignments 25 %

Reading assignments may be given throughout the course of the semester. All homework is due within 7 days of its assignment unless otherwise stated.

Required Text:
Nutrient Requirements of Poultry
9th Revised Edition, 1994
National Academy Press
Washington, D.C.

Text books are available at the Texas A&M University MSC Bookstore, Memorial Student Center, TAMU College Station, TX 77843. They can be contacted online at the following URL: http://tamu.bkstore.com/

Suggested Text:

Commercial Poultry Nutrition, 2nd Edition
S. Leeson and J.D. Summers, 1997
University Books,
P. O. Box 1326,
Quelph, Ontario N1H 6N8

Scott's Nutrition of the Chicken, 4nd Edition
S. Leeson and J.D. Summers, 2001
University Books,
P. O. Box 1326,
Quelph, Ontario N1H 6N8

Poultry Feeds & Nutrition
Homer Patrick and Philip Schaible
AVI Publishing Company, Inc.
Westport, Connecticut

Course Materials Disclaimer:

Lecture notes and other materials discussed in this class come from a variety of sources including various text books, journal articles, trade periodicals, internet sources and Dr. Bailey's lecture notes from when he too was a student. Good faith attempts have been made to credit the original sources of information. Material gleaned from text books is usually credited to the text book itself rather than to the original author who may or may not be cited in the originating text. If anyone viewing these course materials feels specific information is not properly cited please let Dr. Bailey know and he will address the issue.

by Dr. Christopher Bailey
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Christopher A. Bailey & Texas A&M University
POS 625

Spring 2002 Syllabus

- Class Time
  - Wednesday: 2:00 – 5:00 PM

- Meeting Room
  - Room 101, Kleberg Building

- WWW Address
  - http://posc.tamu.edu/625/

- Professor
  - Dr. Christopher A. Bailey
  - Room 242A, Kleberg Building
  - Office Hours: M-F 9:00 – 5:00

- Telephone:
  - Office: 845-7537
  - Fax: 845-1921

- E-Mail:
  - Cbailey@poultry.tamu.edu

Course Description:

In this course we will explore the theoretical and applied principles associated with least-cost feed formulation including optimization of resources for least-cost production, ingredient inventory, farm and feed mill management. Microcomputers will be used extensively throughout the semester to access a variety of network resources.

Prerequisites:
The prerequisite for this course is POSC 411 or ANSC 309 or approval of the instructor. All students should have taken one or more general nutrition courses prior to taking this course.

**Textbooks:**

There will not be a required textbook for this course. A number of suggested text's are listed below.

- Animal Feed Formulation (Optional)
  - By Gene M. Pesti and Bill R. Miller, 1993
    An AVI Book Published by Van Nostrand Reinhold, New York, New York

- Commercial Poultry Nutrition 2nd Edition (Optional)
  - By S. Leeson and J. D. Summers, 1997
    University Books, Guelph, Ontario, Canada

- National Research Council Publications on Nutrient Requirements (Optional)
  - Poultry, Beef Cattle, Dairy Cattle, Swine, Horses, Sheep, Fish, etc.
    National Academy of Sciences, Washington, D.C.

**Course Grading**

- Homework 50%
- Midterm 25%
- Final Project 25%

Homework assignments will be assigned weekly and due the following week.

**Course Outline**

- Feed Manufacturing Technology (January 16)
  - An Historical Perspective
  - Feed Mill Flow
  - Categorizing Manufactured Feeds
  - Calculating Nutrient Content

- Producing a Quality Mixed Feed (January 16)
  - Poisson Distribution in Mixtures
  - Factors Affecting Uniformity
- Optimizing Ingredient Selection
- Ingredient Mixing Considerations
- Mixer Considerations

- Grain Processing Technology (January 23)
  - Particle Size Reduction
  - Uniformity of Particle Size
  - Roller Mills vs. Hammermills
  - Pelleting and Expanding

- Quality Assurance Procedures (January 23)
  - Statistical Measures
  - Sampling
  - Flowability
  - Physical and Chemical measures of Quality

- Commercial Feeds: Laws and Regulations (January 30)
  - Mr. Roger Hoestenbach - Head of Feed and Fertilizer Control for Texas

- Feed Formulation Software (February 6)
  - The Brill System

- Formulating Feeds for Poultry (February 13)
  - Pullets
  - Layers

- Formulating Feeds for Poultry (February 20)
  - Broilers
  - Turkeys

- Formulating Feeds for Swine (February 27)
  - Dr. Darrell Knabe

- Feeding Aquatic Species (March 6)
  - Dr. Delbert Gatlin
• Formulating Feeds for Horses (March 20)
  o Dr. Gary Potter
• Ration Balancer Software for Ruminants (March 27)
  o Dr. Gordon Carstens
• Formulating Feeds for Beef Cattle (April 3)
  o Dr. Gordon Carstens
• Formulating Feeds for Feedlot Cattle (April 10)
  o Dr. Gordon Carstens
• Formulating Feeds for Dairy Cattle (April 17)
  o Dr. Gordon Carstens
• Formulating Feeds for Sheep and Goats (April 24)
  o Dr. Gordon Carstens

  Take Home Final Exam - Part 1 due May 6th

Last Modified by Dr. Christopher Bailey : 1/02/02
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POSC/NUTR 645

"Vitamins"

LECTURE OUTLINE

Course Organizer: Rosemary L. Walzem
Lectures: Tuesday & Thursday, 12:45 – 2:00 PM, Room 200 Kleberg Center
Final: Wednesday, December 15, 8:00 – 10:00AM

Office Hours: Tuesday & Thursday 2:00 – 4:00 PM

Address: 242D Kleberg Center
rwalzem@poultry.tamu.edu
last resort, 845 – 7537

Course Text and Student Preparation

Basic information for this course is taken from "The Vitamins: Fundamental Aspects in Nutrition and Health" by G.F. Coombs, Jr.. Supplemental information is taken from current reviews and literature. Students are expected to read outside of the text, including both historic and current literature. Some references will be given during the course of lecture. Some supplemental reading materials are listed later in this section and a number of good general sources are to be found in the Appendices of the text. It is assumed that students have had courses in chemistry and biochemistry and are familiar with the definitions or functions of nucleophilic agents, electrophilic agents, carbonium and carbanion ions, Schiff-base reactions and hydride ions. Knowledge of physiology and physiological regulation will be helpful.

Course Goals and Logic

This is a survey course taught at an intermediate to advanced level. Students should develop a clear understanding of the mechanisms of vitamin action as well as experimental strategies employed to identify and characterize mechanisms of action. Towards this end, discussion will begin with water soluble vitamins with co-enzyme activities. The class will transition from water to fat soluble vitamins through the theme of oxidative metabolism, its necessity and potential deleterious effects. "Non-essential" antioxidant compounds will be discussed in connection with oxidative metabolism. Students should recognize that historic information is often used to demonstrate principles that underlie hypothesis driven mechanistic research. Phenomenological, clinical, and survey aspects will be included to the extent necessary to discuss approaches to establishing requirements, secondary metabolite regulation, and disease relationships. It is hoped that students will emerge with a knowledge base and paradigms for understanding and evaluating a constantly evolving vitamin-related literature that is ever-changing with regards to specific topics and techniques.
Course Schedule
Note: the last 3 lecture periods are reserved for presentation of research papers (plan to present within a 15 min time frame)

Exams and Grading
There will be 2 – 3 take home problems sets, a final exam and project. The final project will consist of a short research paper (8-10 pages, 15-20 original references) that is to be translated into a Web-page presentation. During the latter part of the course, several lectures will be devoted to in class critique and discussion of recent literature, active participation in this portion of the course is mandatory and your readiness and ability to participate will be a component of your final grade.

- Final 40%
- Project ~ 30%
- Quizzes ~ 30%

Preparation for and participation in the current literature discussion portion of the course can alter grading by 10 – 15%.

Research Project
A research paper will be required, and due by the 12th week of class. The paper should be 8 – 10 pages (12 font, double spaced) and be supported by about 20 original references (3-5 of these references should be historic, i.e. pre 1960). Approach your topic by posing a hypothetical question followed by addressing this question as a scholarly mini-review. You may use any of the following mini-review formats: Am. J. Clin. Nutr., J. Nutr., J. Biol. Chem., Biochemistry, or Proc. Soc. Exptl. Biol. A second aspect of this project is to translate your arcane academic ponderings into an “electronic nutrition nugget” suitable for consumption by other erstwhile nutrition graduate students, health professionals (and hopefully average web surfers!). More on this aspect of the project will be provided in class.

Possible Topics – These are only suggestions!

- Vitamin A and cellular regulation
- Vitamin D and immune function
- Vitamin E and neuropathies
- Vitamin K requirements, current recommendations
- Bio-organic chemical mechanisms
- Ascorbic acid and glutathione
- Thiamin and sodium channeling
- Pyridoxine (B-6): role in glycogen synthetase
- Biotin-related genetic disorders
- Riboflavin: Metabolic turnover
- Folic acid and homocysteine regulation
- B12 and aging
- Wine and health? (dietary sources of “non-essential” nutrients), alcohol on vitamins
- Mechanisms of nutrient absorption
- B-vitamins and heart disease
- Choline and cancer
- Measures of nutrient status
- Supplements: Necessary or needless?
## Schedule (Approximate)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>August 31</strong></td>
<td>Introduction, Evolution of Vitaminology</td>
<td></td>
</tr>
<tr>
<td><strong>September</strong></td>
<td><strong>VITAMINS ACTIVE IN SPECIFIC ASPECTS OF CARBOHYDRATE, PROTEIN AND LIPID METABOLISM</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Thiamin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pantothentic Acid, CoASH</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Pyridoxine, B&lt;sub&gt;6&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td><strong>September</strong></td>
<td><strong>VITAMINS ACTIVE IN SINGLE CARBON METABOLISM</strong></td>
<td>Preproposal for topic selection</td>
</tr>
<tr>
<td>14</td>
<td>Biotin</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Folate</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Vitamin B&lt;sub&gt;12&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Lipotropic agents: choline, inositol</td>
<td><strong>PROBLEM SET 1</strong></td>
</tr>
<tr>
<td>28</td>
<td>Homocysteine, sulfur amino acids, folate and B&lt;sub&gt;12&lt;/sub&gt;</td>
<td>* Attend 4PM Nutrition Seminar, “New Colors for the Gray Areas of Nutrition”</td>
</tr>
<tr>
<td><strong>VITAMINS ACTIVE IN OXIDATIVE METABOLISM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Niacin</td>
<td><strong>PROBLEM SET 1 - DUE!!</strong></td>
</tr>
<tr>
<td><strong>October</strong></td>
<td><strong>NIAIN AND TRYPTOPHAN RELATIONSHIPS</strong></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Niacin and tryptophan relationships</td>
<td></td>
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<tr>
<td>7</td>
<td>Riboflavin</td>
<td><strong>Schedule proposal appointment</strong></td>
</tr>
<tr>
<td>12</td>
<td>Ascorbic Acid</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Ascorbic Acid, continued</td>
<td></td>
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<tr>
<td>19</td>
<td>Vitamin E oxidant defense</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Phytochemicals and oxidant defense</td>
<td><strong>PROBLEM SET 2</strong></td>
</tr>
<tr>
<td><strong>OTHER FAT SOLUBLE VITAMINS AND PROVISIONAL NUTRIENTS</strong></td>
<td></td>
<td></td>
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<tr>
<td>26</td>
<td>Vitamin K</td>
<td></td>
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<tr>
<td>28</td>
<td>Vitamin D – Calcium relationships</td>
<td><strong>PROBLEM SET 2 - DUE!!</strong></td>
</tr>
<tr>
<td><strong>November</strong></td>
<td><strong>VITAMIN D – IMMUNITY AND GENE REGULATION</strong></td>
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</tr>
<tr>
<td>2</td>
<td>Vitamin D – immunity and gene regulation</td>
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<tr>
<td>4</td>
<td>Vitamin A – vision, epithelial function and differentiation</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Retinoid and steroid receptor regulation / Manglesdorf?</td>
<td></td>
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<tr>
<td>11</td>
<td>Vitamin-like compounds; carnitine, taurine</td>
<td></td>
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<tr>
<td><strong>INTEGRATION OF INFORMATION - EVALUATION OF CURRENT RESEARCH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Discussion – B-Vitamins</td>
<td></td>
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<tr>
<td>18</td>
<td>Discussion – Fat Soluble Vitamins</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Discussion – Nutracines</td>
<td><strong>Proposal paper - DUE!!</strong></td>
</tr>
<tr>
<td>25</td>
<td><strong>THANKSGIVING HOLIDAY – NO CLASS</strong></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Test Review – Questions.</td>
<td></td>
</tr>
<tr>
<td><strong>December</strong></td>
<td><strong>PRESENTATION OF STUDENT PROJECTS</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Presentation of Student Projects</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Presentation of Student Projects</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Presentation of Student Projects</td>
<td></td>
</tr>
</tbody>
</table>

**FINAL EXAMINATION:** Wednesday December 15, 8AM - 10AM.
Immunology

POSC / VTMI 649 (3-0)

Credit: 3 hours

Meeting Time: To be determined

Meeting Place: Room 331 VMA – College of Veterinary Medicine

I. Instructor
Dr. David J. Caldwell—Assistant Professor
Departments of Poultry Science and Veterinary Pathobiology
Office: Room 108B – Bldg. 990 Vet Med Research Park
Phone: 845-4288
E-mail: caldwell@poultry.tamu.edu

II. Lectures

Week 1: - Course introduction and reading assignments
Week 2: - Introduction to the immune system (overview)
Week 3: - Innate vs. specific mechanisms of immunity
Week 4: - Primary and secondary lymphoid organs / tissues
Week 5: - Mononuclear and polymorphonuclear phagocytic systems
Week 6: - Mammalian / Avian B-cell development and antibody production
Week 7: - Mammalian / Avian immunoglobulin structure
Week 8: - T-cell development and effector function
Week 9: - MIDTERM EXAM
          - T-Cell receptor and MHC structure
Week 10: - Mammalian / Avian cytokines and lymphokines
Week 11: - Antigen processing and T-cell presentation
Week 12: - Integrated immune responses
Week 13: - Mechanisms of immunity
Week 14: - CLASS PRESENTATIONS ON TERM PAPER SUBJECT
Week 15: - TERM PAPER DUE
Week 16: - FINAL EXAM
II. Textbook

Students should be prepared to discuss the material in each lecture by completing the required reading prior to each class.

Required reading:


2. Instructor Prepared Handouts, Notes, and Published Research Manuscripts.

Supplemental Reading:


III. Term Paper

Each student must submit a term paper on the subject of mammalian or avian immunology. Papers which propose an innovative model or mechanism by which to investigate novel approaches to immunological research are encouraged. Ideally, papers which take or utilize techniques and models presently utilized in mammalian immunological research and apply them to the field of avian immunology, in an attempt to answer questions that have not previously been investigated, will be welcomed. The paper should not simply be a summary of facts, but a synthesis of recent findings into an up-to-date model that describes the physiology of the system.

IV. Oral Presentations

Each student will be required to present to the class an overview of his/her term paper. This will allow for general discussion of the research chosen by the student prior to the submission of the term paper to the instructor for grading.

V. Grading

1. Midterm Exam 25%
2. Final Exam 25%
3. Term Paper 25%
4. Oral Presentation 10%
5. Class participation 15%
VI. Absentee Policy

Since this is a graduate course that places a great deal of emphasis on class participation, attendance of all lectures is required. This absentee policy is drafted in accordance with the Texas A&M University Regulations Manual.

Absences from exams and quizzes will be excused for reasons including the following:

1. Participation in an activity appearing on the University authorized list.
2. Death or major illness in a student's immediate family.
3. Participation in legal or administrative procedures that require a student's presence.
4. Illness of a dependent family member.
5. Religious holy day.
6. Confinement because of illness.
7. Required participation in military duties.

The student must notify the instructor of the excused absence, in person or by telephone, within 48 hours of the last date of absence. Makeup exams will be scheduled and must be completed within 30 days of the last date of absence. Unexcused absences on dates of quizzes or exams will result in grades of F (0 points) on that exam.

Academic Integrity

Plagiarism and Copyrighted Materials

The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. Anyone suspected of plagiarism will be given an oral exam on the material in question. Anyone committing plagiarism will receive a grade of "F" in this course.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."
ADA Statement

The American with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life for Students with Disabilities in Room 126 of the Koldus Building, or call 845-1637.
Course Text and Student Preparation

*Handbook of Nutritionally Essential Mineral Elements*, editors: B. L. O'Dell, R. A. Sunde, 1997. ISBN: 0824793129. This can be purchased at MSC Bookstore for $78.75, at amazon.com for $225.00, or checked out at Medical Science Library.

*Dietary Reference Intakes from the Institute of Medicine*. Reports on Calcium, Phosphorus, Magnesium, Vitamin D and Fluoride. ISBN: 0-309-06403-1, $27.96 in paperback or, the report on Vitamin C, Vitamin E, Se, β-carotene and other carotenoids. ISBN: 0-309-06935-1, $31.96 in paperback. Both books can be ordered or read free online at [www.nap.edu](http://www.nap.edu), or checked out at Medical Science Library along with other DRI related texts.

Supplemental information provided during the lecture is taken from current reviews and research literature. Students are expected to read outside of the text, including both historic and current literature. Supplemental references may be given during the course of lecture. Reference and supplemental reading materials are listed in the webpage, you are responsible for content in reading materials assigned to a specific lecture. Note also that the text chapters are referenced and can be consulted for more in depth information when needed. It is assumed that students have had courses in chemistry, biochemistry, and physiology. Knowledge of physiological regulation will be helpful. If you find yourself struggling with fundamental nutritional physiology concepts texts such as *Modern Nutrition in Health and Disease*, ME Shils, JA Olson, M Shike, AC Ross (Eds.), 1999. The library will have many basic nutrition texts focused to particular animal species that can also be of help.
Course Goals and Logic

This is a survey course taught at an intermediate to advanced level. Students should develop a clear understanding of the mechanisms of mineral action in the body. Students should recognize that historic information might be used to demonstrate principles that underlie hypothesis driven mechanistic research. Phenomenological, clinical, and survey aspects will be included to the extent necessary to discuss approaches to establishing requirements, secondary metabolite regulation, and disease relationships. It is hoped that students will emerge with a knowledge base and paradigms for understanding and evaluating a constantly evolving mineral-related literature that is ever-changing with regards to specific topics and techniques.

Course Schedule

Follow the link to the schedule. Some lectures will only be provided as video streams. Information on how to access this material from the course web page will be given in the first lecture period.

Exams and Grading

There will be three in class examinations, the last of which will be a comprehensive examination.

In class exam 30%
In class exam 30%
Final exam 40%

NOTE: Final exam is December 18, Wednesday, 8AM – 10AM.

Grading: ≥ 90% = A
80 - 89.5% = B
70 - 79.5% = C

The first exam is on October 15. If you do not score at least 80% on that first exam consider seriously whether you can improve your grade. Students experiencing difficulty with the course material should see Dr. Walzem as soon as possible for help.
<table>
<thead>
<tr>
<th>Lecture No.</th>
<th>Date</th>
<th>Lecture Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(T) Sep 3</td>
<td>Introduction / Establishing Mineral Requirements History &amp; Concepts</td>
</tr>
<tr>
<td>2</td>
<td>(R) Sep 5</td>
<td>Guest Lecture: Dr. Ed Harris, &quot;Principles of Chemical Bonding&quot;</td>
</tr>
<tr>
<td>3</td>
<td>(T) Sep 10</td>
<td>Introduction / Establishing Mineral Requirements Methods</td>
</tr>
<tr>
<td>4</td>
<td>(R) Sep 12</td>
<td>Introduction / Establishing Mineral Requirements Methods</td>
</tr>
<tr>
<td>5</td>
<td>(T) Sep 17</td>
<td>Calcium Digestion and Absorption</td>
</tr>
<tr>
<td>6</td>
<td>(R) Sep 19</td>
<td>Calcium Sensing and Cell Signaling</td>
</tr>
<tr>
<td>7</td>
<td>(T) Sep 24</td>
<td>Calcium /Endocrinology/Interactions with Phosphorous, other minerals &amp; Vitamin D = Bone Health</td>
</tr>
<tr>
<td>8</td>
<td>(R) Sep 26</td>
<td>Phosphorus</td>
</tr>
<tr>
<td>9</td>
<td>(T) Oct 1</td>
<td>Magnesium</td>
</tr>
<tr>
<td>10</td>
<td>(R) Oct 3</td>
<td>Calcium /Endocrinology Interactions with mineral and non-mineral nutrients Obesity/Diabetes</td>
</tr>
<tr>
<td>11</td>
<td>(T) Oct 8</td>
<td>Iron</td>
</tr>
<tr>
<td>12</td>
<td>(R) Oct 10</td>
<td>Iron</td>
</tr>
<tr>
<td>EXAM 1</td>
<td>(T) Oct 15</td>
<td>In class Exam 1 (Through Lecture 10)</td>
</tr>
<tr>
<td>14</td>
<td>(R) Oct 17</td>
<td>Guest Lecture: Dr. Ed Harris, &quot;Past and Present History of Copper&quot;</td>
</tr>
<tr>
<td>15</td>
<td>(T) Oct 22</td>
<td>Guest Lecture: Dr. Ed Harris, &quot;The Future of Copper&quot;</td>
</tr>
<tr>
<td>16</td>
<td>(R) Oct 24</td>
<td>Zinc - Enzyme Co-Factors</td>
</tr>
<tr>
<td>17</td>
<td>(T) Oct 29</td>
<td>Zinc - Gene Expression</td>
</tr>
<tr>
<td>18</td>
<td>(R) Oct 31</td>
<td>Selenium - Oxidative Biology</td>
</tr>
<tr>
<td>19</td>
<td>(T) Nov 5</td>
<td>Iodine</td>
</tr>
<tr>
<td>20</td>
<td>(R) Nov 7</td>
<td>Ultra Trace Minerals - Manganese</td>
</tr>
<tr>
<td>EXAM 2</td>
<td>(T) Nov 12</td>
<td>In class Exam 2 (Lectures 11 - 20)</td>
</tr>
<tr>
<td>21</td>
<td>(R) Nov 14</td>
<td>Ultra Trace Minerals Mo, Co, Ni, Hg, Pb, Ar, Cd</td>
</tr>
<tr>
<td>22</td>
<td>(T) Nov 19</td>
<td>Ultra Trace Minerals - cont.</td>
</tr>
<tr>
<td>23</td>
<td>(R) Nov 21</td>
<td>Electrolytes</td>
</tr>
<tr>
<td>No Lecture</td>
<td>(T) Nov 26</td>
<td>Walk</td>
</tr>
<tr>
<td>No Lecture</td>
<td>(R) Nov 28</td>
<td>Happy Thanksgiving!</td>
</tr>
<tr>
<td>24</td>
<td>(T) Dec 3</td>
<td>Electrolytes</td>
</tr>
<tr>
<td>25</td>
<td>(R) Dec 5</td>
<td>Electrolytes</td>
</tr>
<tr>
<td>Review</td>
<td>(T) Dec 10</td>
<td>Review Session (No Exams)</td>
</tr>
<tr>
<td>No Lecture</td>
<td>(R) Dec 12</td>
<td>Reading Day</td>
</tr>
<tr>
<td>Final Exam</td>
<td>(W) Dec 18</td>
<td>8-10 AM (Lectures 21-25 emphasized &amp; 1-20 revisit weak areas)</td>
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</tbody>
</table>
COURSE OBJECTIVE

Antibodies are extremely powerful, often indispensable tools in today’s modern bioscience laboratories, regardless of the discipline a laboratory is specialized in: endocrinology or ecology, agriculture or medicine, physiology or systematics. A basic understanding of how antibodies are produced and exploited in a plethora of applications has become vital for scientists active in agricultural and biomedical sciences. This knowledge not only helps to produce innovative research but also to interpret our present scientific literature.

The objective of this course is to provide the students with the basic building blocks of immunochemistry and to teach them how to use this knowledge to understand and develop a wide variety of applications, from hormone assay to protein purification, from neuropeptide localization to muscle protein characterization. The necessary theoretical background information will be provided in approx. 2 hours of lecture weekly; synchronized with the lectures, approx. 4 hours of lab sessions are scheduled weekly, in order to further demystify immunochemical technology.

COURSE TOPICS WILL BE SELECTED FROM THE FOLLOWING LIST

1. Introduction to the humoral immune system: the cells and organs of the humoral immune system, the dogmas of modern immunology
2. Introduction to the humoral immune system: the structure of antibodies and antigens
3. Antigen-antibody interactions, specificity and affinity
4. Production of polyclonal antisera in mammals and chickens, developing a successful immunization strategy
5. Immunodiffusion tests, micropurification by immunoprecipitation, immunoaffinity chromatography.
6. Localization of antigens by immunocytochemistry
7. ELISA (enzyme immunoassay), western blotting and related techniques
8. Development and interpretation of radioimmunoassays
9. Monoclonal antibodies: production and applications
10. Vaccination strategies and antibodies to “literature antigens”: synthetic peptides and DNA immunization

**LAB SESSIONS WILL BE SELECTED FROM THE FOLLOWING LIST**

1. Purification of chicken immunoglobulins and structural study by use of SDS-PAGE electrophoresis and enzyme digestion techniques.
2. Purification of goat and/or rabbit immunoglobulins by differential precipitation and affinity chromatography.
4. Protein derivatization strategies, including biotinylation.
5. Agglutination and immunodiffusion techniques.
6. Immunoaffinity purification of chicken hypophysial growth hormone.
7. Sandwich ELISA for the quantification of chicken luteinizing hormone.
8. ELISA for the detection of anti-Salmonella antibodies in chicken serum
9. Immunocytochemical detection of chicken pituitary hormones by single (immunoenzymatic) and double (immunofluorescence) staining methods.
10. Ultrastructural immunocytochemistry

Topics may be added to both lists depending on opportunity or special requests by the students.

Students will work together on laboratory projects, that is, in teams of two (exceptionally three) people. The idea is that they try to “give themselves a demonstration” of the principles taught during the lectures. In addition, 3 individual reports (prototype research papers) will be expected from each of the students in which they: (1) introduce the experiment performed, (2) describe the methods used and (3) the results obtained and (4) add a discussion to it, using the format of modern scientific papers. Students can make their own choice as to which of their experiments they want to describe in their reports. Due dates for the papers will be announced 2 weeks ahead of time, at regular intervals during the semester. These reports will account for 30% of the final grade. In addition, 20% of the final grade will go the lab notebook (see additional information packet) and the obtained results, to be presented to the instructor at the end of each lab session. *Lab notebooks need to be presented to and signed by the instructor at the end of each week. Lab notebooks will be collected by the instructor for grading several times during the semester.* Finally, 50% of the final grade will be earned in two exams.

**DETERMINATION OF COURSE GRADE**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>EXAM I (scheduled halfway the semester, date TBA)</td>
<td>200</td>
</tr>
<tr>
<td>EXAM II (final exam)</td>
<td>300</td>
</tr>
<tr>
<td>Individual Lab Reports (= prototype research paper) 3 x 100</td>
<td>300</td>
</tr>
<tr>
<td>Daily lab activity, including lab notebooks and presented results</td>
<td>200</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
</tr>
</tbody>
</table>

The exams are cumulative: they will include the material presented in all preceeding lectures. Students will also be questioned about the *methodology* used in the practical sessions and about the interpretation of their *results.*
Point Total | Grade
--- | ---
850-1000 | A
700-849 | B
600-699 | C
500-599 | D
Below 500 | F

Extra points

Each student has the option of earning extra points by writing a paper on a modern, immune technology-related subject to be determined in consultation with the instructor. By doing so, a student can earn an extra 50 points, which is up to ½ of a grade level!

Students need to announce their choices during week 8 or earlier. Late registrations will not be accepted; "Buy insurance before the accident!". Since it is within the power of the students themselves to avoid "borderline cases", there will be no discussion about 1 or 2 points on any particular part of the grading process.

RESOURCES

There is no official text for this course. Course notes will be provided by the instructor. The following are suggested sources of information during the semester and can be borrowed from the library, or if necessary, from the instructor:

- The Journal of Immunological Methods.

ABSENTEEISM POLICY

This policy is drafted in accordance with the Texas A&M University Regulations Manual. Absences from exams and lab sessions will be excused for reasons including the following:
1. Participation in an activity appearing on the University authorized list
2. Death or major illness in a student's immediate family
3. Participation in legal or administrative procedures that require a student's presence
4. Illness of a dependent family member
5. Religious holy day
6. Confinement because of illness
7. Required participation in military duties

The student must notify the instructor of the excused absence, in person or by telephone, within 48 hours of the last date of absence. Makeup exams will be scheduled and must be completed within 30 days of the last date of absence. Unexcused absences on dates of exams will result in grades of F (0 points) on that exam.

In addition to these University mandated regulations, the following policies also apply to absenteeism in this course:

1. Unexcused absences on days of exams or lab sessions will not be made up.
2. All makeup exams excused or otherwise, will have an oral question component in addition to the written portion of the exam.

ACADEMIC INTEGRITY

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own. even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. Anyone suspected of plagiarism will be dealt with according to University policy, which may result in an "F" in the course and even expulsion. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

ADA STATEMENT

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life Services for Students with Disabilities in Room 126 of the Koldus building, or call 845-1637.
Laboratory Notebook

The laboratory notebook is in essence a journal which you will be keeping current throughout the course. It must be an accurate account of everything that you do in the lab. Lab/research notebooks represent the primary notes and original documentation of all work conducted in a laboratory. Your notebook entries must follow the format below:

1. Introduction - What is the purpose/objective of this exercise?
2. Materials & Methods - A step by step account of what you did and how it was done. If mistakes are made during an experiment, these must be included here.
3. Results - A record of the data obtained. Tables and figures can be used if supplemented with an explanation.
4. Discussion - What do the results mean and what is there significance?

Lab notebooks need to be presented to and signed by the instructor at the end of each week.

Laboratory Safety

The immunochemical laboratory is under most circumstances a safe place to work. The degree of safety is entirely dependent on the competency and judgement of the people who work there. You will be working with hazardous chemicals during the coming weeks. It is therefore essential that you adhere to the following rules to ensure your safety and that of your classmates.

1. DO NOT BRING FOOD, DRINK, OR TOBACCO INTO THE LAB; AND DO NOT BRING FAMILY OR FRIENDS INTO THE LAB.
2. WEAR A PROTECTIVE LAB COAT AT ALL TIMES, BUT DO NOT WEAR IT OUTSIDE OF THE LAB.
3. WEAR DISPOSABLE PLASTIC/LATEX GLOVES WHEN WORKING WITH HAZARDOUS ORGANISMS OR CHEMICALS.
4. WIPE THE BENCH TOPS DOWN WITH DISINFECTANT BOTH BEFORE YOU BEGIN YOUR WORK AND AFTER YOU HAVE COMPLETED YOUR WORK.
5. WASH YOUR HANDS WITH SOAP AND WATER BEFORE AND AFTER YOU WORK IN LAB, OR IF YOU LEAVE THE LAB FOR ANY REASON.
6. DO NOT MOUTH PIPET.
7. BE CAREFUL NEAR BUNSEN BURNERS.
8. REPORT ANY ACCIDENTS (SPILLS, BROKEN GLASS, CUTS OR INJURIES) TO YOUR INSTRUCTOR IMMEDIATELY.
9. DISPOSE OF CONTAMINATED OR USED MATERIALS QUICKLY AND IN THE MANNER SET FORTH BY YOUR INSTRUCTOR.
Laboratory Etiquette

1. Return things where you found them;
2. Remove label tape from dirty glassware, rinse the glassware, and place in the tub by the sink;
3. Empty ALL reagents that you will no longer need at the end of your lab exercise and handle glassware as described above;
4. Discard your leftover reagents from the refrigerator at the end of each lab exercise or the end of the week, whichever is appropriate; If you are unsure about discarding a reagent, check with Dr. Berghman.
5. Discard your biohazard appropriately, this includes items left in the incubator;
6. Refill empty pipette tip boxes and microfuge tube containers as needed and prepare them for sterilization;
7. Be sure to leave the countertop, balance, pH meter, etc. clean after preparation of solutions;
8. Graduated cylinders used to measure a volume of distilled water should be left on the countertop during lab to be used by all students;
9. Do Not leave stir bars in solutions that you have prepared; Rinse the stir bar with distilled water, dry with a kimwipe and place in back in the drawer by the balance.

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POSC 681 - Graduate Seminar
(How to Develop Scientific Presentations for Different Purposes)

Spring 2002

Course Description: An introduction to the consideration and techniques used to develop effective scientific seminars of different time lengths and for different purposes.

Credits: 1 credit (1 hour lecture)

Objectives:

1. Gain an understanding of how to effectively convey scientific information in presentations of different time lengths. Specifically a short, 15 minute, and a long, 45 minute presentation.

2. Increase your understanding of scientific research.

3. Improve oral communication skills through presentation assignments and seminar attendance.

4. Develop ability to critically evaluate presentations and make constructive suggestions for improvement.

Evaluation:

Attendance and participation in weekly research presentations 110 points

Submission of Power Point draft **14 days prior to 45 minute talk** 50 points

TOTAL 150 points

Time and Location: W 11:30 - 12:20 KLCT 117

Instructor: Dr. Rosemary L. Walzem
Associate Professor
Department of Poultry Science
242 Kleberg
Email: rwalzem@poultry.tamu.edu
Phone: 845-7537
Class Policies

1. Attendance will be taken during each class period. It is the student's responsibility to sign the attendance sheet. Although one unexcused absence is allowed, a deduction of 5 points will be made for each subsequent unexcused absence. Please see the Texas A&M Home Page (www.tamu.edu), Student Rules, Academics, and Excused Absences for a list of University excused absence categories.

2. Plagiarism. The handouts used in this course are copyrighted. By “handout”, I mean all materials generated for this class, which include but are not limited to syllabi, in-class materials, and handouts. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism or cheating please consult the Texas A&M University Student Rules, under the section Scholastic Dishonesty.

3. Cheating: For many years, Aggies have followed a Code of Honor in an effort to unify the aims of all Aggies toward a high code of ethics and dignity. It functions as a symbol to all Aggies, promoting understanding and loyalty to truth and confidence in each other. Aggies do not lie, cheat or steal; nor do they tolerate those who do.

4. The consumption of food and beverages is not allowed in classrooms in the Kleberg Center. The use of all tobacco products is prohibited in university facilities.

Seminar Course Requirements

During the semester, you will give two (2) presentations. The first presentation will be 15 minutes long and in this time you will present one research article. The second presentation will be 45 minutes long and must integrate into a single talk, 3 research articles on your selected topic. Topics must have something to do with domestic fowl, but are otherwise not restricted. Therefore the talks can address classic poultry husbandry, nutrition, food science and technology, biomedical applications, genetics, biotechnology, or perhaps social issues. You may not present your own research, but you can use articles from your research area.

The 15 minute seminar will be presented in front of class members only. The 45 minute seminar should be designed for students AND faculty. Members of the Poultry Science faculty will attend the longer seminar.

Talks will be given as Power Point presentations, and the text and figures for your longer talk must be submitted to Dr. Walzem at least 14 days before your talk. See front page for contact information.
Course Schedule

Week 1 (1/15/03)  Introduction to Course

Week 2 (1/22/03)  Preparation Week

Week 3 (1/29/03)  Turn in paper for 15 minute talk and tentative 45 minute talk title

Week 4 (2/5/03)  15 minute presentation on selected research article

1. Cesar Chavez
2. Justin Cavitt

Week 5 (2/12/03)  15 minute presentation on selected research article

1. Shuen-Ei Chen
2. Cheng Zhang

Week 6 (2/19/03)  15 minute presentation on selected research article

1. Keith Ameiss
2. Nasril Surbakti

Week 7 (2/26/03)  45 minute integrated research topic (1) presentation

Speaker: Keith Ameiss

Presentation Title: Use of Cholera Toxin as an Adjuvant in the Vaccination of Chickens

Week 8 (3/5/03)  Walk - Deuel Conference

Week 9 (3/12/03)  SPRING BREAK

Week 10 (3/19/03)  45 minute integrated research topic (2) presentation

Speaker: Cesar Chavez

Presentation Title: Alternative Management Strategy to Ammonia Emissions from Poultry Farms
Week 11 (3/26/03) 45 minute integrated research topic (3) presentation

Speaker: Shuen-Ei Chen

Presentation Title: Induction of Cell Death by Exogenous Ceramide in Hen Granulosa Cells

Week 12 (4/2/03) 45 minute integrated research topic (4) presentation

Speaker: Cheng Zhang

Presentation Title: Use of Mannosidase in Poultry Diets

Week 13 (4/9/03) 45 minute integrated research topic (5) presentation

Speaker: Justin Cavitt

Presentation Title: Preharvest Intervention Strategies in Reducing Bacterial Incidence

Week 14 (4/16/03) Walk - Experimental Biology Week

Week 15 (4/23/03) 45 minute integrated research topic (6) presentation

Speaker: Nasril Surbakti

Presentation Title: Strategies to Improve the Nutritive Value of Rice Bran in Poultry Diets

Final Examination: NO FINAL IS GIVEN IN THIS CLASS

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Special Topics in Poultry Health

POSC 689

Fall 1998

Credits: 3 hours

Meeting Time: Mondays from 5 to 7:50 in 400 KLCT

Instructors: Dr. David J. Caldwell and Dr. Billy M. Hargis

I. Lectures:

Week 1  Pathophysiology of Salmonellosis in Poultry
Week 2  Pathophysiology of Coccidiosis in Poultry
Week 3  Effects of Nutritional Deficiencies on Poultry Health
Week 4  Mechanisms of Immunosuppressive Diseases in Poultry
Week 5  Avian Lymphoid Leukosis virus strain J in Commercial Poultry Production
Week 6  Mechanisms of Competitive Exclusion in Poultry
Week 7  Mechanisms of Immunomodulation in Poultry
Week 8  Vaccination Strategies in Commercial Poultry
Week 9  Identification of Pathogens in Commercial Poultry: Molecular vs. Classical Procedures
Week 10  Pros and Cons of Antibiotic Usage in Commercial Poultry
Week 11  Route of Exposure of Commercial Poultry to Pathogens
Week 12  Effects of Animal Husbandry Practices on Poultry Health
Week 13  Genetic Resistance to Disease in Commercial Poultry
Week 14  Host-Parasite Interactions in Poultry: Unexplained Phenomena
Week 15  Role of Pathogens in Establishment of Immunity in Poultry

II. Required Reading:

Pertinent articles from recent scientific journals will be distributed the week before each class meeting. All students are responsible for reading distributed articles and should be prepared to discuss the content of each upon each class meeting.

III. Grading:

Class participation 33.3%
Term paper #1 33.3%
Term paper #2 33.3%

IV. Term Papers:

Each student must submit a total of two term papers throughout the course of the semester. The first will be due approximately mid-term and the second will be due before the end of the semester. Papers must
cover a subject area which is relevant to the area of Poultry Health and may be similar to those topics which are discussed in class. Papers which propose an innovative model or mechanism by which to investigate novel approaches to research which would result in an overall improvement in Poultry Health are encouraged. The paper should not simply be a summary of facts but a synthesis of recent findings into an up-to-date model that describes the topic.

V. Plagiarism and Copyrighted Materials

The handouts used in this course are copyrighted. By "handouts," we mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless we expressly grant permission.

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If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

VI. Absentee Policy

Since this is a graduate course that places a great deal of emphasis on class participation, attendance of all lectures is required. This absentee policy is drafted in accordance with the Texas A&M University Regulations Manual.
POSC/FSTC 689
Fall, 2003
MICROBIOLOGY OF FOOD IRRADIATION

Instructor:
Suresh D. Pillai
Poultry Science Department
(979) 845-2994
Email: spillai@poultry.tamu.edu

Course Objectives

The primary objective of this course is to provide students with a working knowledge of using Electron Beam irradiation as a means of irradiating foods to destroy microbial pathogens or retard microbial spoilage. In this lecture-laboratory course, the students will get hands-on experience in determining the \(D_{10}\) values of specific microorganisms, dosimetry, and evaluating effectiveness of e-beam food irradiation. Additionally, the students will obtain state of the science information on the microbiological principles underlying food irradiation, the criteria used in deciding irradiation dose, criteria used in choosing packaging materials and current consumer attitudes towards irradiated foods. A secondary objective of the course is to train students to be competitive for employment in the food irradiation industry.

The course will include a laboratory component at Kleberg Center and hands-on experiments at the Electron Beam Food Research Facility on Discovery Drive.

Course Outline

1) Rationale for Food Irradiation
2) Principles of irradiating technologies
3) Mechanisms of microbial inactivation under irradiation conditions
4) Biological effects of irradiation on microorganisms, insects and parasites
5) Food irradiation Dosimetry
6) Microbial Inactivation kinetics and calculation of \(D_{10}\) values
7) Detection of Irradiated Foods
8) Packaging issues in food irradiation
9) Consumer Acceptance of Irradiated Foods and Market Trends

Laboratory work Outline

1) Dose-mapping of beef patties and ready to eat meats.
   a. Data analysis and interpretation
2) Irradiation of pathogen-spiked food products to calculate \(D_{10}\) values.
   a. Data Analysis and Interpretation
3) Irradiation of dried fruits and nuts to reduce fungal infestation
   a. Data Analysis and Interpretation
Grading

Grading will be separate for graduate and undergraduate students. Graduate students will have an option of preparing a brief white-paper on a food-irradiation related topic, or prepare a brief research proposal. There will not be a final exam for the graduate students.

Examinations
Exam 1: 25%
Exam 2: 25%
Laboratory Reports: 25%
White Paper/Research Proposal 25%

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Graduate Course Outline

Instructor: Dr. Suresh D. Pillai, Associate Professor, Poultry Science Dept.

Office Hours: By appointment, Tel: 845-2994

Course Description: The presence of microbial pathogens in foods is a significant problem globally. Thus, the ability to rapidly detect and characterize these microbial pathogens is of paramount importance. Specific limitations of culture-based methodologies have led to the development of molecular methods for pathogen detection. However, many of these methods have not been tested on a variety of different food matrices, nor have they been tested using naturally contaminated samples. This course will discuss the molecular methodologies that are available to detect and characterize microbial pathogens in foods and related matrices. Emphasis will be placed on discussing the potential limitations of the various methods, approaches to make these methods applicable to the food industry and data analysis. This graduate level lecture/laboratory course would cover not only the principles and protocols, but would also deal with why and how molecular data should be used in conjunction with conventional methods.

Credit Hours: Three

Class Schedule: To Be Arranged

Prerequisites: Prior microbiology course work necessary. Basic molecular biology course work desirable. Applicable courses include POSC 429, POSC 614, FSTC 326, or FSTC 606 or approval of the instructor.

Suggested Readings: Emphasis will be placed on discussing the current literature and the reading materials that will be announced in class.

Grading
Grades will be based on the following:
Mid-Term Exam 20%
Problem Sets 20%
Laboratory Reports 20%
Proposal presentation 20%
Final Exam 20%

Grade A: 90-100%
Grade B: Average –90%
Grade C: below average
Lecture Topics
1. Basic molecular biology principles
2. Indicator organisms and pathogens
3. Sampling and sample processing issues
4. Nucleic acid probes and probe detection
5. Target amplification techniques
6. Probe amplification techniques
7. DNA microarrays and biosensors
8. Sensitivity and specificity threshold issues in rapid methods
9. Molecular typing methods and molecular ecology applications
10. Quality control and data analysis
11. Future advances in rapid methodologies

Laboratory Topics
1. Genomic and plasmid DNA extraction
2. Non-isotopic probe labeling and slot-blot hybridization protocol
3. PCR amplification of specific and conserved sequences
4. Genetic fingerprinting of bacterial isolates

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NUTR/POSC 689 – Nutritional and Food Chemistry in Lipids

TuTh 12:45-2 PM, Room 300 Kleberg

Spring 2002

Course Description: An overview to chemical and physical properties that underlie the behavior of lipids in food and living systems. Following the establishment of a common basis for understanding the physical/chemical properties of lipids, the relationship of these functional properties to metabolism and distribution of lipids within the body will be introduced. Basic principles developed in lecture will be illustrated during roundtable discussions of relevant research articles.

Credits: 3 cr (3 hours lecture)

Objectives:

1. Develop an awareness of the chemistry of lipids, their unique structural and associative properties that distinguish them as a class.

2. Develop a chemical basis to understand the nutritional biochemistry, physical and biological functions of lipids in living tissues.

3. Develop a knowledge of the molecular mechanisms used to transport and regulate lipid movements within living systems.

4. Develop an ability to critically evaluate research or presentations related to lipids in food and biological systems.

Evaluation:

Take home exams, 75 points each 150 points
Research proposal and review 150 points
Prepared and active in discussion 50 points

TOTAL 350 points

A = >314; B = 314 - 279; C = 278 - 244; D = <200, No one better go that low!

Instructor: Dr. Rosemary L. Walzem, Associate Professor
Department of Poultry Science, 242 Kleberg
Email: rwalzem@poultry.tamu.edu
Phone: 845-7537
Course Requirements

During the semester, you will take two (2) take home exams. These tend to be integrative in that you must use what you learn in class and from your reading to answer questions that rely on your understanding of the principles involved. Take home exam 1 will be handed out in class, while Take home exam 2 must be picked up in 242 Kleberg from Mrs. Jo Ann Sanders on April 23 or after. This second exam will constitute the final examination and must be turned in by 10AM on May 8.

A portion of your grade will be determined by the quality of a research proposal that you will prepare, and the quality of the reviews you return on proposals assigned to you. The proposal must address some area of lipids. Importantly, the proposals will be peer reviewed in that your classmates will also evaluate your proposal. Many research applications fail because reviewers do not understand what the applicant is proposing to do. For this reason it is critical that you first develop a “very good question.” The best questions are ones that can be answered (yes or no) by the experiments proposed. It is essential that your reviewers understand what you are asking, how you will ask, how you will tell what the answer will be. I will free from the real-life constraints of proving a track record in the area and budget limits, that is, we will assume that you can do what you say and will give you money to do it.

You will review 3 proposals and submit your reviews to me. Reviews, minus the reviewer’s name, will be returned to each applicant. The total number of points for the project is 150, the grade will be comprised of 100 points for your proposed research, and 50 points for your reviews.

The third component of your grade will be participation in the discussion of the research articles provided in class. It is expected that you will come ready to discuss the article after reading it critically. You should expect to speak in class and to be asked to go to the board to illustrate certain points. Scientists must critically discuss research and be comfortable stating opinions in public. These are skills you should strive to develop in order to enhance your professional potential.

Reading materials will be provided in class or references provided. You should expect to read original research articles in order to learn new information.
**Course Schedule**

**Note:** This schedule is necessarily a tentative ideal. This is a new course and the time slot provided does not give me a full 3 hours each week. We will have to see how well your learning progresses and make adjustments as needed. At present it is my intention to lecture for ~1.5 hours each week and leave ~ 45 minutes for discussion of the research article. I will need your co-operation to make this work.

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<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
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<td>2</td>
<td>1/17/02</td>
<td>Solubility and association properties/ Discuss research article</td>
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<tr>
<td>3</td>
<td>1/22/02</td>
<td>Fatty acids:</td>
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<td>4</td>
<td>1/24/02</td>
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<td>5</td>
<td>1/29/02</td>
<td>Lipid Oxidation</td>
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<td>2/12/02</td>
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<td>2/19/02</td>
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<td>2/21/02</td>
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<td>15</td>
<td>3/5/02</td>
<td>Walk - Deuel Conference</td>
<td>Turn in grant proposal to reviewers</td>
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<td>29</td>
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<td>Walk - Experimental Biology Week</td>
<td>Take home EXAM 2</td>
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<td>30</td>
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<td>Review session,</td>
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**Final Examination:** **Wednesday May 8, 8-10 AM.**

EXAM 2 DUE

The final examination will be a comprehensive examination of all materials. Questions will require that you understand structure/function relationships, how to test for them and how they can be used to achieve certain biological or biomaterial properties. As a result, what you learn in the first part of the course will help you answer questions that will likely involve aspects of what is presented in the latter part of the course.
<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Title</th>
<th>Tenured/ Tenure-Track</th>
<th>Date of Tenure/ Promotion</th>
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<tr>
<td>Alan Sams</td>
<td>Professor and Head</td>
<td>Tenured</td>
<td>9/99 Professor</td>
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<td>Chris Bailey</td>
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<td>Luc Berghman</td>
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<td>Sarah Birkhold</td>
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<tr>
<td>David Caldwell</td>
<td>Assistant Professor</td>
<td>Tenure-track</td>
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<td>John Carey</td>
<td>Professor/Extension Program Coordinator</td>
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<td>9/1/93 Professor</td>
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<td>Lee Cartwright</td>
<td>Associate Professor</td>
<td>Non-tenure track</td>
<td>9/1/91 Associate Professor</td>
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<tr>
<td>Ted Odom</td>
<td>Professor</td>
<td>Tenured</td>
<td>1/95 Professor</td>
</tr>
<tr>
<td>Suresh Pillai</td>
<td>Associate Professor</td>
<td>Tenured</td>
<td>8/16/99 Associate Professor</td>
</tr>
<tr>
<td>Steven Ricke</td>
<td>Associate Professor</td>
<td>Tenured</td>
<td>9/98 Associate Professor</td>
</tr>
<tr>
<td>Rosemary Walzem</td>
<td>Associate Professor</td>
<td>Tenured</td>
<td>9/99 Associate Professor</td>
</tr>
<tr>
<td>James Zhu</td>
<td>Assistant Professor</td>
<td>Tenure-track</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Faculty Members**

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Title</th>
<th>Tenured/ Tenure-Track</th>
<th>Date of Tenure/ Promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fred Thornberry</td>
<td>Professor/ Extension Specialist</td>
<td>Non-tenure track</td>
<td>12/94 Professor</td>
</tr>
<tr>
<td>Jerry Daniels</td>
<td>Lecturer</td>
<td>Non-tenure track</td>
<td></td>
</tr>
<tr>
<td>Name</td>
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</tr>
<tr>
<td>Roy Fanguy</td>
<td>Associate Professor</td>
<td>½ time</td>
<td></td>
</tr>
<tr>
<td>Bill Krueger</td>
<td>Professor</td>
<td>½ time</td>
<td></td>
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</tbody>
</table>

**Joint Appointed Graduate Faculty with Veterinary Pathobiology Department**

<table>
<thead>
<tr>
<th>Name</th>
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<th>Status</th>
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<tbody>
<tr>
<td>John El-Attrache</td>
<td>Assistant Professor</td>
<td>Tenure track</td>
</tr>
<tr>
<td>Blanca Lupiani</td>
<td>Assistant Professor</td>
<td>Tenure track</td>
</tr>
<tr>
<td>Sanjay Reddy</td>
<td>Associate Professor</td>
<td>Tenure track</td>
</tr>
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**Adjunct Graduate Faculty Members**

<table>
<thead>
<tr>
<th>Name</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Allen Byrd</td>
<td>Research Microbiologist, USDA</td>
</tr>
<tr>
<td>Michael Hume</td>
<td>Research Biologist, UDA-ARS</td>
</tr>
<tr>
<td>Leon Kubena</td>
<td>Research Animal Scientist &amp; Project Leader– Microbial Ecology Research, USDA</td>
</tr>
<tr>
<td>Victor Stanley</td>
<td>Professor, Prairie View Texas A&amp;M University</td>
</tr>
</tbody>
</table>
# TAMU Poultry Science Department Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Specializations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alan R. Sams</strong></td>
<td>Professor and Head; Processing and Product Quality</td>
</tr>
<tr>
<td><strong>Clarence R. &quot;Dick&quot; Creger</strong></td>
<td>Associate Dean, College of Agriculture and Life Sciences; Professor of Poultry Science Nutrition</td>
</tr>
<tr>
<td><strong>Christopher A. Bailey</strong></td>
<td>Professor, Nutrition and Distance Learning</td>
</tr>
<tr>
<td><strong>Luc R. Berghman</strong></td>
<td>Assistant Professor, Immunology, Endocrinology, Transgenics</td>
</tr>
<tr>
<td><strong>Sarah G. Birkhold</strong></td>
<td>Assistant Professor and Extension Specialist, Processing and Products Quality</td>
</tr>
<tr>
<td><strong>David J. Caldwell</strong></td>
<td>Assistant Professor, Pathobiology, Immunology</td>
</tr>
<tr>
<td>Name</td>
<td>Title and Specialization</td>
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</tr>
<tr>
<td>Allen Byrd (USDA)</td>
<td>Graduate Faculty Member, Endocrinology, Food Safety</td>
</tr>
<tr>
<td>John B. Carey</td>
<td>Professor and Extension Specialist Associate, Head for Extension, Egg Production Waste Management</td>
</tr>
<tr>
<td>A. Lee Cartwright</td>
<td>Associate Professor and Extension Specialist, Growth and Development, Nutrition</td>
</tr>
<tr>
<td>Jerry Daniels</td>
<td>Lecturer and Academic Advisor</td>
</tr>
<tr>
<td>John El-Attrache</td>
<td>Assistant Professor, Diseases and Health</td>
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<tr>
<td>Michael Hume (USDA)</td>
<td>Graduate Faculty Member, Food Safety Microbiology</td>
</tr>
<tr>
<td>Roy C. Fanguy</td>
<td>Associate Professor, Genetics, Incubation, Embryology</td>
</tr>
<tr>
<td>Willie F. Krueger</td>
<td>Leon F. Kubena (USDA)</td>
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<tr>
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</tr>
<tr>
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<tr>
<td>Genetics, Management Systems</td>
<td>Microbiology</td>
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<td>Blanca Lupiani</td>
<td>Ted W. Odom</td>
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<tr>
<td>Assistant Professor</td>
<td>Professor</td>
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<tr>
<td>Virology and Disease</td>
<td>Environmental Physiology</td>
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<tr>
<td>Suresh D. Pillai</td>
<td>Sanjay Reddy</td>
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<tr>
<td>Associate Professor</td>
<td>Assistant Professor</td>
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<td>Food and Environmental Microbiology</td>
<td>Virology and Disease</td>
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<tr>
<td>Steven C. Ricke</td>
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<tr>
<td>Associate Professor</td>
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<tr>
<td>Food and Gastrointestinal Microbiology</td>
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</tr>
<tr>
<td>Name</td>
<td>Position</td>
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<td>---------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>Fred D. Thornberry</td>
<td>Professor and Extension Specialist</td>
</tr>
<tr>
<td></td>
<td>Gamebirds &amp; pet birds, waste management, pest control, youth programs</td>
</tr>
<tr>
<td>Rosemary L. Walzem</td>
<td>Associate Professor</td>
</tr>
<tr>
<td></td>
<td>Nutritional Biochemistry</td>
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<tr>
<td>James Zhu</td>
<td>Assistant Professor</td>
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<td>Molecular Genetics</td>
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</table>
CURRICULUM VITAE

Alan R. Sams
Professor and Head
Department of Poultry Science

Education:

1987 Ph.D., University of Florida, Food Science and Human Nutrition; Dissertation: The Effect of Fiber Type on the Rate of Rigor Mortis Development in Broiler Muscles.

Professional and Academic Appointments:

Professor and Department Head, Texas A&M University, 1999-present
Associate Professor, Texas A&M University, 1993-1999
Assistant Professor, Texas A&M University, 1987-1993
Graduate Research Assistant, University of Florida, 1985-1987
Graduate Research Assistant, University of Florida, 1983-1984

Administrative Responsibilities:

Poultry Science Department Head (September 1999-present)
Chairman of Poultry Science Department Curriculum Committee (1994-present)
Chairman of Poultry Science Department Faculty Advisory Committee (1994-present)
Poultry Science Representative to College of Agriculture Graduate Program Council (1995-present)
Member of TAMU Intercollegiate Faculty of Food Science and Technology (1990-present)
  - Executive Committee (1993-1996)
  - Curriculum Committee (1991-present)
Formation Committee for the TAMU Institute of Food Science and Engineering (1993)
  - Founding Core Member of the Center for Food Processing in the Institute (1993-present)
  - Founding Core Member of the Center for Food Safety in the Institute (1993-present)
  - Institute of Food Science and Engineering International Activities Committee (1997-present)
Texas A&M University Core Curriculum Development Committee (1990-1991)
Agriculture Program (College, Exp. Station, Ext. Service) Strategic Planning Committee (1994-1995)
Agriculture Program Food Processing/Value Added Directional Emphasis Team (1995-1996)
Agriculture Program Curriculum Development Directional Emphasis Team (1996-1997)
TAMU Faculty Senate (1995-1997)
TechCom, Inc. Board of Directors (1998-present) - management company for a $15M venture capital fund
Class 8 ESCOP/ACOP Leadership Development Program (Sept. 1998-June 1999) – National leadership program by the Experiment Station and Academic Committees on Organization and Policy
Professional Activities:

Poultry Science Association
- Section Editor for the Processing and Products Section of Poultry Science (1993-1996)
- Associate Editor for Poultry Science (1991-present)
- Broiler Research Award Committee (1998-1999) (Chair 1999)

Institute of Food Technologists - Professional Member

Phi Tau Sigma, Sigma Xi, Gamma Sigma Delta, Phi Kappa Phi, Alpha Zeta

- Accelerated Processing Coordinator (1990-1998)
- Coordinator for Biological Impairment of Meat Quality (1999-2002)


Associate Editor of Broiler Industry and Watt Poultry USA (1994-present)
Recipient of 2001 Poultry Science Association Poultry Products Research Award
Recipient of 2002 National Chicken Council Broiler Research Award

Teaching Responsibility:

POSC 611 - Poultry Marketing and Distribution Technology - A graduate course that is the sequel to POSC 406. It is taught alternating spring semesters with an average enrollment of 10 students. This course also covers meat and eggs and has weekly laboratory exercises but it focuses more on current developments in research and the industry.

Research Funding and Emphasis:

Direct an annual budget exceeding $250K from industry, federal, and state sources for muscle biology and meat quality research. Specific areas of study are the effect of pre-slaughter environment and processing techniques on muscle metabolism and subsequent meat quality.

International Activities:

Conducted research, given invited conference presentations, organized scientific symposia, conducted training workshops in eight foreign countries on four continents. Extensive work in Mexico and Brazil.

Selected Publications:


Books and Book Chapters:


Curriculum Vita

Christopher A. Bailey
Professor

Education
B.S. Biochemistry, Texas A&M University, 1977. Cum Laude Graduate

Professional Experience
1982 - Date Texas A&M University, Department of Poultry Science, and Intercollegiate Faculty of Nutrition
1977 - 1982 Texas A&M University, Department of Poultry Science, Graduate Research Assistant
1976 - 1977 Texas A&M University, Department of Developmental Biology, Laboratory Assistant

Teaching Activities
POSC 411 - Poultry Nutrition. (3-0). Credit 3
POSC 412 - Poultry Feed Formulation. (1-0). Credit 1.
POSC 485 - Problems. Credit 1 to 4 each semester.
POSC 615 - Avian Nutrition. (3-0). Credit 3
POSC 625 - Least-Cost Feed Formulation. (2-2). Credit 3
POSC 650 - Nutrition and Metabolism of Minerals. (3-0). Credit 3 (Taught 1987 - 1992)
POSC 685 - Problems. Credit 1 to 6 each semester.
POSC 691 - Research. Credit 1 or more each semester.

Direction of Total Graduate Students

<table>
<thead>
<tr>
<th></th>
<th>M.S.</th>
<th>Ph.D.</th>
<th>M.A.</th>
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<tr>
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<td>2. Committee Member</td>
<td>16</td>
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Grants Received:
- Characterization of chodia Guar Meal. Rhodia Inc.
- Master of Agriculture in Poultry Science at a Distance. Texas A&M University
- Classroom Instructional Technology Matching Grants, TAMU

Additional Research Proposals Submitted:
- Environmental Impact of Poultry Production Using a Litter-Free Rearing System. CSREES/IAFS
- Decreasing Phosphorus Runoff from Confined Animal Feeding Operations. Co-P.I. - CSREES Water Quality


- Reducing the Environmental Impact of Broiler Production Using An Innovative Litter-Free Floor System. ATP.


- Precision Nutrition to Minimize Ammonia Emissions from Animal Production Facilities. Life Sciences Training Program - Research Instrumentation

One Time Competitive Proposals for Strengthening Academics Infrastructure in Support of Vision 2020 - Distance Learning, 2001

Selected Service Activities

1. Faculty of Nutrition Executive Committee: 1990 - 1996
2. Associate Editor - Nutrition Section of Poultry Science: 1990 - 1996
3. PSA Committee on Electronic Publishing: 1994 - To Date
5. Agriculture Program Faculty Advisory Committee: 1999 – 2002

Selected Publications


Recent Abstracts


* Student for which I serve as Committee Chairman (**) Laboratory Technician
Curriculum Vitae

Luc R. Berghman
Assistant Professor

Education
B.Sc., University of Leuven, Belgium, 1978-1980  Biology
M.Sc., University of Leuven, Belgium, 1980-1982  Zoology
Ph.D., University of Leuven, Belgium, 1982-1988  Zoology
Postdoc, University of Leuven, Belgium, 1988-1994  Zoology

Positions and Honors
1988: Postdoctoral Research Fellow, National Fund for Scientific Research, Belgium
1994: Senior Research Associate, National Fund for Scientific Research, Belgium
1994: Assistant Professor, Department of Zoology, University of Leuven (partim)
1998 – present: Assistant Professor, Department of Poultry Science, TAMU
1998 – present: Assistant Professor, Department of Veterinary Pathobiology, TAMU (joint appointment)

Teaching Activities
POSC 414, Avian Genetics and Breeding
POSC 660/VTMI 650, Experimental Immunology

Direction of graduate students

<table>
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<th>Ph.D.</th>
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<tr>
<td>Graduate Council Representative</td>
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Research Activities
Grants, contracts and other funded research activities

A. External
- USDA, “The regulation of FSH secretion in birds”
- USDA, “Verification of safe cooking endpoints in beef and pork by multiple antigen ELISA”

B. Internal
- Texas A&M University- Faculty Minigrant, “Follicle-Stimulating Hormone (FSH)-specific regulation mechanisms in the chicken”
- Texas A&M University- International Travel Research Assistance Grant, “Chicken Bursal Anti-Steroidogenic Peptide (BASP): Structural Characterization By Nanoflow Q-TOF Mass spectrometry”
- Texas A&M University/College of Veterinary Medicine Signature Program Funding, “Enhanced Immunity through Specific Neonatal Clonal Lymphocyte Selection: A Novel
Approach to Improving Disease Resistance in Chickens (and Other Vertebrate Animals?)

- Schubot Exotic Bird Health Center: "Feasibility study for avian chimerism and cloning as a way of rescuing endangered bird species".
- A&M Research Enhancement Programs, "Hormonal regulation of growth in Channel Catfish"
- Schubot Center for Exotic Bird Health Center, "Development of primordial germ cell transfer technology in birds"
- Center for Environmental and Rural Health, "The avian bursa of Fabricius: a novel toxicogenomic tool?"
- Texas A&M University/College of Veterinary Medicine Signature Program Funding, "Innovative approaches to the control of Coccdiosis"
- Center for Environmental and Rural Health, "The immunotoxic mechanism of polycyclic hydrocarbons: a comparative approach based on gene expression profiling in the chicken embryo model"

Publications


Eens, M., Van Duyse, E., Berghman, L. & Pinxten, R. (2000). Shield characteristics are
testosterone-dependent in both male and female moorhens Hormones and Behavior 37(2):126-134.


García, R. W. Moore, L. R. Berghman, and B. M. Hargis (2002). Relationship of Bursal Anti-Steroidogenic Peptide (BASP) and Histone H1. Life Sciences, In press.


Other representative publications


Curriculum Vitae

Sarah G. Birkhold
Assistant Professor and Extension Poultry Specialist

Education:

1993  Ph.D. in Food Science and Technology, Texas A&M University
1989  M.S. in Poultry Science, University of Florida
1988  B.S. in Poultry Science, University of Florida

Teaching Activities:

POSC 481, Poultry Science Systems
POSC 406, Poultry Processing and Products
POSC 611, Poultry Processing and Distribution Technology

Direction of current graduate students

<table>
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<th>Ph.D.</th>
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<tr>
<td>Major Professor</td>
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<tr>
<td>Member graduate committees</td>
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<tr>
<td>Graduate Council Representative</td>
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Research Proposals Submitted:

- The effect of KLS on Salmonella counts of raw poultry. Mionix Corporation
- Development of a rapid, user-friendly test to determine when an egg is SE “growth permissive”. American Egg Board
- The impact of developmental age and muscle type on poultry meat quality functionality. U.S. Poultry and Egg Association

Publications:

Journal Articles:


Abstracts and Conference Proceedings:


Extension Programming

Organize and conduct the Annual Poultry Processor’s Workshop.
Organize and conduct the Quality Processors HACCP Roundtable.
Assist poultry and egg processors in HACCP development and associated regulatory compliance.
Provide support on poultry processing to the International Agriculture Office.
Curriculum Vitae

David J. Caldwell
Assistant Professor

Education:
1991  B.S.  Texas A&M University, poultry science
1994  M.S.  Texas A&M University
1997  Ph.D.  Texas A&M University

Teaching Activities:
POSC 308, Avian Anatomy and Physiology
POSC 281, Sophomore Seminar
POSC 609, Avian Physiology
POSC/VTMI 649, Immunology

Direction of current graduate students:

<table>
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<tr>
<th>Major advisor</th>
<th>M.S.</th>
<th>M.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member of committee</td>
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</tr>
<tr>
<td>Graduate council representative</td>
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</table>

Research Grants Received:
- Recovery Incidence of Salmonella and Campylobacter Gastrointestinal Colonization in Broilers and Turkeys. USDA
- Measurement of Gut-Immunological/Physiological Response to Avian Coccidiosis. USDA
- Effect of carcass chilling on Salmonella or Campylobacter recovery incidence in commercial turkey processing plants – Phase II: Impact of chiller management. National Turkey Federation.

Publications:
Journal Articles:
regimes on chick preening behavior and competitive exclusion culture efficacy. J. Appl.
Poultry Res. 10:107-111.
Photo intensity on preening behavior and ingestion of sprayed-applied biologics. J. Appl.
Poultry Res. 10:112-116.
of crop and upper gastrointestinal leakage in poultry processing plants. Poultry Sci.
81:70-74.

Abstracts and Conference Proceedings:
Caldwell, D.J., and A.P. McElroy, 2002. Pre-slaughter control of food borne pathogens with
non-antibiotic feed additives. 2nd Annual ANECA Symposium on Poultry Processing,
February 6-8, 2002, Mexico City, Mexico.
and Campylobacter contamination of processed carcasses during turkey processing.
2nd Annual ANECA Symposium on Poultry Processing, February 6-8, 2002, Mexico
City, Mexico.
Cavitt, J.L., J.A. Byrd, K.D. Knape, J.L. McReynolds, R.W. Moore, A.P. McElroy, and D.J.
Caldwell, 2002. Comparison of carcass rinse volume and selective culture methods for
Salmonella recovery from post-chill turkey carcass. Poultry Science Association
Meeting.
Association of anaphylaxis-mediated ion secretion in chicken intestine with antibody
titer following oral or intraperitoneal administration of BSA. Poultry Science
Association Meeting.
prophylactic and therapeutic dietary administration of capsaicin for resistance to
Salmonella or coccidia in broiler chickens. Poultry Science Association Meeting.
Curriculum Vitae

John B. Carey
Professor and Associate Department Head for Extension

Interdepartmental Activities:
Faculty of Food Science and Technology
Agricultural Policy Board for Texas State Legislature
Advisory Council for Environmental Protection Agency/National Chicken Council
Animal Welfare Advisory Board for Perdue Farms, Inc.

Teaching Activities:
POSC 427, Animal waste management
POSC 326, Commercial egg production
POSC 209, Poultry meat production

Direction of Current Graduate Students

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<th>Major Advisor</th>
<th>M.S.</th>
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<td>Member graduate student committees</td>
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<tr>
<td>Graduate council representative</td>
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Current Grants Received:
- Turkey Yield Study. Cargill Turkey Products
- Egg Temperature Survey. American Egg Board
- Assessing nitrogen balance in accumulated broiler litter. U.S. Poultry and Egg Association

Publications:

Journal Articles:

Abstracts and Conference Proceedings:
Carey, J. B., and numerous poultry industry personnel, 2001. Memorandum of Understanding Implementing the Assessment for Emergency Avian Influenza and Velogenic (Exotic) Newcastle Funds.

Extension Activities:
As Associate Department Head and Extension Program leader, oversight is provided into all aspects of extension educational programs related to poultry. Program planning and implementation is coordinated with Extension Specialists, county Extension educational programs and other faculty. The Texas Poultry Federation, Texas Animal Health Commission, Texas Natural Resources Commission, Texas State Soil and Water Conservation Board, Natural Resource Conservation Service and other state and federal agencies utilized the Associate Department Head and Extension Program Leader as the first point of contact with the Poultry Science Department.

Extension Publications and Conference Proceedings:
Curriculum Vitae

Dr. Lee Cartwright
Associate Professor and Extension Poultry Specialist

Education:
1972 A.S., College of the Albemarle
1975 B.S. in Animal Science, North Carolina State University
1979 M.S. in Nutrition (Major), Biochem. and Physiol. (Minors), North Carolina State University
1982 Ph.D. in Nutrition (Major), Physiology (Minor), North Carolina State University
1991 M.B.A., Salisbury State University

Professional History:
1982 - 1984 Research Physiologist (Poultry)
USDA, Agricultural Research Service, Athens, GA.
1984 - 1991 Research Physiologist at the USDA Poultry Research Laboratory at Georgetown, Delaware. There he was appointed Lead Scientist, and soon became the Research Leader and Director of the laboratory.
Graduate faculty appointments in: -Poultry Science and Nutrition

Current Position: Associate Professor/Poultry Extension Specialist
Department of Poultry Science
Texas A&M University

Teaching Activities:
Direction of Graduate Students

M.S. Ph.D.
Major advisor 1
Member of graduate committee 3

Professional Activities: Dr. Cartwright has presented numerous invited seminars at Universities and industry meetings. He has participated in several departmental reviews, and workshops. He also served as a member of industry and university advisory committees:

Research Advisory Committee of DPI, Inc.
Nutrition and Feeds Advisory Committee of the Delmarva Poultry Industry, Inc.
Adjunct Professor and graduate faculty member of the University of Delaware, Animal Science and Agricultural Biochemistry Department.
Advisory Committee for Department of Animal Science, Rutgers University.
Advisory Committee for Department of Poultry Science, University of Maryland.
Advisor to the Texas Broiler Council and the Texas Gamebird Association.
Executive Committee of the Nutrition Program at Texas A&M University
Publications:


and β-mannanase content of feeds. (Submitted to Poultry Science, February 2003).
examination of anti-nutritive factors in guar meal. (In preparation)
meal and beta-mannanase feeding. (In preparation)
and in vivo pectoral fat pad mass by anti-adipocyte monoclonal antibodies in 
chickens. Poultry Sci. 79: (in preparation)

Book Chapters, Etc.:
Cartwright, A.L. The relationship of thyroid hormones and energy utilization in mice 
1979.
Cartwright, A.L. Insulin resistance of muscle tissue and adipose cellularity in polygenic 
obese and nonobese mice and diet effects. Ph.D. Dissertation, North Carolina 
State University. 172 pp., 1982.
Cartwright, A.L. Research on abdominal fat in broilers. 1985 Delmarva Poultry 
Nutrition short courses, pages 1-15. (Conference Presentation)
Cartwright, A.L. Determination of adipose tissue cellularity. In The Biology of the 
Adipocyte (G.J. Hausman and R.J. Martin, ed.) Van Nostrand, Reinhold and 
plane of nutrition on enzyme systems and subsequent tissue deposition. 
Proceedings of the Beltville Symposium in Agricultural Research XII. 
Biomechanisms regulating growth and development (G.L. Steffens and T.S. 
del estatus estrogeno sobre la adiposidad del pollo de engorda. XVIII 
Convencion Nacional Aneca 27-32

Patent:
U.S. Patent Application 09/913,643; Methods and compositions for reducing fat 
accretion; Inventors Cartwright, Wu and Wright.
CURRICULUM VITAE

Ted William Odom  
Professor, Department of Poultry Science

EDUCATION:
1974  B.S., Eastern Illinois University, in Zoology
1978  M.S., Eastern Illinois University, in Zoology
1981  Ph.D., University of Illinois, in Animal Science

ASSOCIATIONS:
International Society for Developmental Biology
Gamma Sigma Delta
Poultry Science Association
World Poultry Science Association
Texas Poultry Federation

MANUSCRIPT AND GRANT REVIEW:
USDA Competitive Grant Program (ad Hoc)
BARD Grant Program (ad Hoc)

PUBLICATIONS ON PULMONARY HYPERTENSION (ASCITES) SYNDROME:


OVER 25 PUBLISHED ABSTRACTS ON PULMONARY HYPERTENSION SYNDROME

INVITED PRESENTATIONS:

Odom, T.W. Ascites Syndrome in Broilers: Genetics, Cellular and Hemodynamic Implications. 9th World Poultry Science Association Conference, Glasgow, Scotland. pp. 57-60 1994


OUR NEW WEB SITE MANUAL:

This publication is the cooperative effort of avian physiologists and agricultural engineers from across the United States, working at Land Grant Universities who have worked together. Research Project NE-127, Biomethreasurements and Experimental Techniques for Avian Species www.canr.uconn.edu/ansci/ne127d.htm
CURRICULUM VITA

Suresh D. Pillai
Associate Professor

Education
1989 Ph.D. Microbiology and Immunology, University of Arizona, Tucson.
1985 M.Sc. Industrial Microbiology, University of Madras, India.
1983 B.Sc. Botany, University of Madras, India.

PROFESSIONAL APPOINTMENTS
2000- Associate Professor & TAES Faculty Fellow, Poultry Science Department
Associate Director, Institute of Food Science & Engineering, Texas A&M University
Graduate Faculty Member, Biotechnology Program, Veterinary Pathobiology, Soil and Crop Sciences, Food Science & Technology
Senator, Faculty Senate, Texas A&M University

1998-1999 Associate Professor, Texas A&M Univ. Research Center, El Paso
Graduate Faculty Member, New Mexico State University, Las Cruces, NM
Graduate Faculty Member, University of Texas at El Paso, TX

1992-1998 Assistant Professor, Texas A&M Univ. Research Center, El Paso

1991-1992 Research Scientist, Accelerated Products Development Program, Naval Medical Research Institute, National Naval Medical Center, Bethesda, MD.


HONORS AND AWARDS
2002 TAES Faculty Fellow, Agriculture Program, Texas A&M University
2001 Member, National Academy of Science/National Research Council Committee on Toxics and Pathogens in Biosolids.

Teaching Activities:
POSC/SOSC/FSTC 619, Molecular Methods of Microbiological Characterization
POSC 489/689, Microbiology of Food Irradiation
BIOT 603, Applied Principles of Biotechnology

Direction of current graduate students

<table>
<thead>
<tr>
<th>Major advisor</th>
<th>M.S.</th>
<th>Ph.D.</th>
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<tbody>
<tr>
<td>Committee Member</td>
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<td>4</td>
</tr>
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</table>

Active Research Projects:
- Microbial pathogens and transfer of antibiotic resistance determinants associated with the poultry industry and the environment (H-8708)
- Occurrence of microbial pathogens and antibiotic resistant microbial populations in irrigation water and vegetables along the US-Mexico border
- Transport and removal of viruses
- Detection of bioaerosolized viruses in poultry houses
- Coliphage method optimization and field testing for groundwater
- Improving the safety of fruits and vegetables: a tri-state consortium project
- Evaluating drip irrigation as a tool to reduce water quality and microbial contamination
- Field testing the effectiveness of riverbank filtration in an arid environment
- Efficacy of E-beam irradiation to inactivate enteric viruses and protozoa

Grants Funded:
- Coliphage method optimization and field-testing. US Environmental Protection Agency
- Occurrence of microbial pathogens and antibiotic resistant microbial populations in irrigation waters and vegetables along the US-Mexico border. Texas Advanced Technology Program
- Field-testing the effectiveness of riverbank filtration in an arid environment. US Environmental Protection Agency
- Water quality protection by drip irrigation. USDA
- Efficacy of E-beam irradiation to inactivate enteric viruses and protozoa. Sure-Beam Corporation.
- Transport and removal of viruses. EPA.
- Improving the safety of fruits and vegetables: a tri-state consortium proposal. USDA
- Detection of bioaerosolized viruses in poultry houses. Mesosystems, Inc.
- Development of standardized E.coli genetic fingerprint and antibiotic resistance libraries for tracking sources of bacterial contamination of surface water. Texas Soil Conservation Board.

Additional Research Proposals Submitted:
- Microfluidic-based capture and concentration of microbial contaminants from recycled water. NASA.
- Solid substrates for plant growth on space vehicles and planetary surface systems. NASA.
- Genetic transfer of antibiotic resistance among bacteria within agricultural wastes. Advanced Technology Program.
- Evaluation of the effectiveness of riverbank filtration for removing Cryptosporidium parvum oocysts. National Science Foundation.
- Atmospheric Dispersion of Bioaerosols. TAMU.

SELECTED PUBLICATIONS (Total of 53 peer-reviewed publications, 6 review articles, 9 book chapters and 1 book)
Books

Peer Reviewed Journal Articles


Selected Review Articles


CURRICULUM VITAE

Dr. Steven C. Ricke
Associate Professor

Education
B.S., Agriculture, University of Illinois, 1979
M.S., Ruminant Nutrition, University of Illinois, 1982
Ph.D., co-major: Bacteriology and Animal Science, Univ. of Wisconsin, 1989

Professional and Academic Appointments
- Graduate Research and Teaching Assistant, University of Illinois, Animal Science Dept., 1979-1981
- Graduate Research Assistant, Univ. of Wisconsin, Bacteriology and Meat and Animal Science Dept., 1981-1988
- Research Associate, North Carolina State University, Department of Microbiology, 1989-1992
- Assistant Professor, Texas A&M University, Department of Poultry Science, 1992-1998
- Associate Professor, Texas A&M University, Department of Poultry Science, 1998-Present
- Graduate Nutrition Faculty - TAMU, 1993-Present
- Institute of Molecular Pathogenesis-TAMU, 1993-Present
- Graduate Food Science and Technology Faculty - TAMU, 1995-Present
- Institute of Food Science and Engineering-Food Safety Core Faculty-TAMU, 1995-Present
- Associate Professor, Texas A&M University, College of Veterinary Medicine, Department of Veterinary Pathobiology, 2001-Present
- Graduate Molecular and Environmental Plant Sciences Faculty - TAMU, 2002-Present
- TAES Faculty Fellow - 2003

Teaching Activities
POSC 429, Advanced Food Bacteriology
POSC/NUTR 614, Fermentation and Gastrointestinal Microbiology

Direction of current graduate students

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<thead>
<tr>
<th></th>
<th>M.S.</th>
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<tbody>
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<tr>
<td>Member of committees</td>
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Active Research Projects:
- Development of Protein Quality Assessment Methods for Pet Foods Using Hydroxyproline as an Indicator. The IAMS Company
- Microbial Pathogens and Multi-drug Resistant Bacteria in Irrigation Water and on Vegetables. Texas Advanced Technology Program
- Minimizing Salmonella Enteritidis Invasion in Hens During Induced Molting. USDA
- Effect of Diet on Microecology of Gastrointestinal Tract and Enteropathogen Colonization of Poultry.
- A Novel Approach for Functional Screening of Bacterial Genome for Virulence Genes. USDA
- Development of a Rapid Whole Cell Green Fluorescent Protein-Based Biosensor for Assessing Lysine Bioavailability. Texas Advanced Technology Program
- Potential for Zinc Propionate to Inhibit Salmonella spp. Growth and Induce Molting in Laying Hens.
Honors and Professional Recognition

Selected Papers-Last 4 Years (*denotes S.C. Ricke as major professor of student)
Total Publications: 112 refereed research articles; 15 in review; 12 review papers; 4 in review; 4 book chapters; 2 in review; 49 proceedings and symposia; 36 invited talks; 120 research presentations.


Curriculum Vitae

Rosemary L. Walzem
Associate Professor

Education

B.S., 1979, University of California, Davis in Clinical Dietetics
M.S., 1983, University of California, Davis in Nutrition
Ph.D., 1987, University of California, Davis in Nutritional Biochemistry

Professional Training

Dietetic Internship 1983 Sutter Hospitals Registration No. 669896
Postdoctoral Researcher 1987 - University of California, Davis
Physiological Sciences, 1990 School of Veterinary Medicine

Academic Appointments

Assistant Nutritional 1991 - University of California, Davis, in Molecular Biosciences,
Biochemist I - IV 1998 School of Veterinary Medicine
Associate Professor of 1999 Texas A&M University, Poultry Science Department,
Poultry Science/Nutrition and Intercollegiate Faculty of Nutrition
Center Director 2002 Center for Nutrition, Health and Food Genomics,
               TAMU Institute of Food Science & Engineering

Teaching Activities:

POSC/NUTR 645, Nutrition and Metabolism of Vitamins
POSC/NUTR 650, Nutrition and Metabolism of Minerals
POSC 681, Graduate Seminar
NUTR 681, Graduate Seminar
NUTR 689, Nutritional and Food Chemistry of Lipids

Direction of Graduate Students

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Active Research Projects:

- Citrus limonoid effects on plasma cholesterol reduction. USDA
- Critical literature review of grapefruit drug interactions. Texas Citrus Mutual
- Health Effects of Pecan Eating. Texas Department of Agriculture, National Shellers Association,
  Texas Pecan Board and Pecan Endowment
- Assessing lipid metabolism in pancreatic islet and myocyte cells in a microgravity model system. National
  Space Biomedical Research Institute
- Nutrition, Biostatistics and Bioinformatics. Training Grant. National Institutes of Health, National Cancer
  Institute.
- Apolipoprotein B-100 Assembly by Bird Hepatocytes. National Institutes of Health, Nutrition Study Section
- Generation of Isotopically Labeled Catechins in Plants for Use in Nutritional Investigations. TAMU Institute for Food Science and Engineering, Center for Nutritional Genomics
- Web-based recruiting materials and database development for recruiting statistics. TAMU Life Sciences Initiative Program
- Characterization and separation of isotopically labeled catechins for use in nutritional investigations. TAMU Institute of Food Science and Technology, Center for Nutrition, Health and Food Genomics.
- Vasorelaxation in pecan fed humans. Texas Pecan Growers
- Diet Effects on Yolk Cholesterol Concentration. Dupont Optimum Quality Grains
- Lipid metanomic analysis of plasma of pecan fed humans. Texas Pecan Growers
- Nutrient effects on the assembly and composition of triglyceride-rich apolipoprotein-B containing lipoproteins. Nestec Ltd., Inc.

**Additional Research Proposals Submitted:**

- Ag Canada. Identification of Early Indicators of Metabolic and Reproductive Dysfunction from Over-Feeding Female Broiler Breeders. Total requested $341,972 (Canadian)
- National Cattlemen's Beef Association Beef Enriched in Monounsaturated Fatty Acids Reduces Cardiovascular Disease Risk Factors in Human Subjects. Total request $85,579.
- Identification of gene products involved in the assembly of apoB-containing lipoproteins.
- Stabilizing pecan color, flavor and nutritional content by cold pasteurization processes.
- Functional genomics of the domestic fowl: An important biomedical and agricultural model system.

**Publications:**


Curriculum Vitae

James J. Zhu
Assistant Professor

Education
1995 Ph.D., Avian Molecular and Quantitative Genetics, Ohio State University, Columbus, OH
1991 M.S., Avian physiology and immunology, Virginia Tech, Blacksburg, VA
1983 B.S., Veterinary Medicine, Fujian Agricultural College, Fuzhou, China
2000 Statistical genetics and bioinformatics, North Carolina State University, Raleigh, NC
2001 Oracle database, UNIX, and Java Programming, Rock Computer Institute, Gaithersburg, MD
2000 Current topics in genome analysis, National Institute of Health, Bethesda, MD

Professional Appointments
2002-present Assistant professor, Departments of Poultry Science and Veterinary Pathobiology, Texas A&M University, College Station, Texas
1998-2001 Research Associate, Immunology and Disease Resistance Laboratory, USDA-ARS, Beltsville, Maryland
1996-1998 Postdoctoral Researcher, Poultry Microbiological Safety Research Unit, USDA-ARS, Athens, Georgia
1995-1996 Postdoctoral Researcher, Food Animal Health Research Programs, Ohio State University, Wooster, Ohio
1991-1995 Graduate Research Associate, Ohio State University, Columbus, Ohio
1989-1991 Graduate Research Associate, Virginia Tech, Blacksburg, Virginia
1983-1988 Teaching and Research Associate, Fujian Agricultural College, Fuzhou, China

Teaching Activities
POSC414, Avian Genetics and Breeding

Direction of current Graduate Students

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Research Projects:
- Association of myosin heavy chain gene and pulmonary hypertension syndrome
- Identification of genes associated with innate immunity from chicken EST database for marker development
- Cloning chicken IL-12 cytokines
- Genetic factors associated with differences in disease resistance between commercial chicken lines
- Improving reproduction of captive exotic birds using DNA Fingerprinting. Schubot Exotic Bird Health Center
Additional Research Proposals Submitted:
- A genetic factor of pulmonary hypertension syndrome. US Poultry & Egg Association (preproposal)
- Discovering genes underlying important economic traits. US Poultry & Egg Association (preproposal)
- Developing DNA markers for genes of innate immunity. Texas A&M University Office of the Vice President for Research (New Proposal Development Program)
- Program for functional and comparative genomics in birds. Life Sciences Task Force, TAMU

Honors and Awards:
2002  Associate Editor, Poultry Science
1997  Superior Performance Award, Russell Research Center, USDA-ARS
1995  Graduate Student Research Forum Award, Ohio State University
1994  Graduate Student Alumni Research Award, Ohio State University
1983  Outstanding Student Award, Fujian Agricultural College

Professional Societies:
2000-present  International Society for Animal Genetics
2002-present  Poultry Science Association

Publications:


primary breeding lines as estimated by DNA fingerprinting. Poultry Sci. 77:802-807.
selected for increased shank width and a commercial sire line on performance and walking ability of 
Zhu, J., K. E. Nestor, and Y. Moritsu, 1996. Relationship between band sharing levels of DNA 
fingerprints and inbreeding coefficients and estimation of true inbreeding in turkey lines. Poultry 
Nestor, K. E., D. O. Noble, and J. Zhu, 1996. Direct and correlated responses to long-term 
on resistance to Pasteurella multocida. Poultry Sci. 75:1161-1163.
major histocompatibility complex genotypes on resistance to Pasteurella multocida and 
of genetic parameters within and between turkey lines using DNA fingerprinting. Poultry Sci. 
75:439-446.
haplotypes in four turkey lines using restriction fragment length polymorphism analysis with a 
weight of turkeys on the major histocompatibility complex, disease resistance, and genetic 
Li, M., G. Li, Y. Huang, J. Chen, and J. Zhu, 1986. Preparation and application of an inactivated 
EDUCATIONAL BACKGROUND
B.S., Agricultural Education, 1960, Texas A&M University
Texas Teachers Certification, 1960, Texas A&M University
M.S., Poultry Science, 1963, Texas A&M University
Ph.D., Poultry Science, 1968, Texas A&M University
Postgraduate Studies: College of Education and Business, Texas A&M University
Business Management Seminar, Texas A&M University College of Business Administration
Executive Development Program, 1980
America's Clean Water Foundation On-Farm Assessment and Environmental Review (OFAER) course, 2001

EXPERIENCE
Dr. Fred Thornberry grew up on a livestock farm and has more than thirty-five years experience as a county Extension agent, area and state Extension Poultry Specialist, administrator, University educator and industry consultant. He has extensive in-depth experience in all phases of commercial broiler, egg, turkey, gamebird and pet bird production and is a recognized authority on production and industry problems. He has published more than 200 articles in his areas of expertise, including a chapter in the 1980 USDA Yearbook of Agriculture. Dr. Thornberry has traveled extensively in Latin and Asian countries including Communist China and Eastern Russia. He has provided scientific and business assistance to government officials and businessmen from more than forty countries.

Dr. Thornberry serves as an advisory member on the Board of Directors of the Texas Poultry Federation (1971-1982, 1991-Present) and Texas Egg Council (1971-Present). He has been an appointed member of the Texas Poultry Improvement Board since 1971. Dr. Thornberry initiated the annual Texas Broiler Symposium and served as chairman of the Texas Commercial Egg Clinic for twenty-five years. He is currently program chairman of the Texas Gamebird Conference and the Texas Market Poultry Production and Selection Workshop.

In 1980, Dr. Thornberry was appointed by Governor Clements to represent agriculture on Texas' State Employment and Training Council. The Council had responsibility for monitoring and evaluating the more than $300 million in state programs funded each year under the federal Comprehensive Employment and Training Act.

In 1982, Thornberry was drafted by the Republican Party of Texas to be the Party's candidate for Texas Commissioner of Agriculture. He received more than one million votes in his losing bid for the office.

Dr. Thornberry's professional and industry affiliations include the Texas Poultry Federation, the North American Gamebird Association, the Texas Gamebird Association and Gamma Sigma Delta.

In 1999, Dr. Thornberry received the Texas Poultry Federation's annual Golden Feather award for service to the Texas poultry industry. In 2001, the Texas Gamebird Association presented him a plaque in appreciation of his contributions in the development of the industry.
Jerry M. Daniels
Lecturer/Advisor

Area of Expertise:
Student advising

Appointment:
Poultry Science Department (100%)
Teaching (100%)

Education:
1983 – B.S., in Ag Education, East Texas State University
1984 – M.S. in Interdisciplinary, East Texas State University
1990 – Teacher of Agriculture Science and Technology, Kempner H.S., Sugar Land, TX
1994 – Ph.D. in Food Science, Texas A&M University

Teaching Activities:
POSC 201, General Avian Science
POSC 202, Avian Science Lab
POSC 304, Poultry Judging

Dr. Daniels advises students in their pursuit of a degree through the poultry science department. He is the Departmental student recruiter, his contacts range from high school counselors, to county agents, and county fair coordinators to agriculture science teachers. He has receive a warm welcome from these groups being invited to speak at FFA Banquets and school assemblies.

Dr. Daniels serves as advisor to the Poultry Science Club and the Poultry Science Aggie REPS.
Roy C. Fanguy
Associate Professor

Area of Expertise:
Teaching and Student advising

Appointment:
Poultry Science Department (50%)
Teaching (100%)

EDUCATION:
1951 – B.S. in Horticulture and Poultry Science, Mississippi State University
1953 – M.S. in Poultry Breeding, Auburn University
1985 – Ph.D. in Immunogenetics, Texas A&M University

Teaching Activities:
POSC 201, General Avian Science
POSC 202, Avian Science Lab
POSC 603, Avian Incubation and Embryology

PROFESSIONAL AWARDS AND RECOGNITION:
American Association for Advancement of Science
American Genetics Association
American Institute of Biological Science
Gamma Sigma Delta
New York Academy of Science
Phi Delta Kappa
Phi Sigma
Poultry Science Association
W. F. Krueger
Professor

Area of Expertise:
Teaching

Appointment:
Poultry Science Department (50%)
Teaching (100%)

Education:
1943 – B.S. in Agriculture, Texas A&M University, 1943
1949 – M.S. in Poultry Science, Genetics and Physiology, Texas A&M University
1952 – Ph.D. in Poultry Breeding, Population Genetics, Physiology, University of Missouri

Teaching Activities:
POSC 304, Poultry Judging
POSC 313, Game Birds and Ornamental Fowl
POSC 402, Skills in Poultry Evaluation

PROFESSIONAL AWARDS AND RECOGNITION:
Distinguished Teaching Award (College of Agriculture and Life Sciences), 1991; The Association of
Former Students of Texas A&M University
Texas Golden Feather Award, 1990, given by Texas Poultry Federation for outstanding contributions to
the poultry industry of Texas
Phi Kappa Phi (President, Vice President, Secretary)
Sigma XI
Gamma Sigma Delta (President, Vice President, Secretary)
Phi Delta Kappa
Associate Editor, POULTRY SCIENCE
Program Chairman, POULTRY SCIENCE ASSOCIATION
President, Vice President, Secretary-Treasurer; Poultry Section, Association of Southern Agricultural
Workers Association
Distinguished Service Award, Memorial Student Center (Advisor to Great Issues and SCONA), Texas
A&M University
1989 recipient of the Purina Teaching Award, Poultry Science Association; presented during PSA annual
meetings (awardee selected from all Poultry Scientists in the United States and Canada)
1994 Received Vice Chancellor’s Award of Excellence in Student Counseling and Relations
1995 was inducted into the Poultry Science Fellows listing at the annual Poultry Science Association
meetings
1997 received an Ed Gurthrie Honorable Mention award at the University advisor and Counselors Awards
Ceremony which recognizes caring, skillful advisement and genuine concern for the welfare of
students at Texas A&M University. There were 350 nominations for this award and three awards
are presented (winner and 2 honorable mention).
John El-Attrache
Assistant Professor

Area of Expertise:

Appointment:
Veterinary Pathobiology Department
Poultry Science Department

Education:
1992, B.S. in Biochemistry, Texas Tech University
1999 M.S. in Medical Microbiology, University of Georgia, Athens, GA
2001 Ph.D. Medical Microbiology, University of Georgia, Athens, GA

Publications in the last 5 years
Banda, A., P. Villegas, A., and J. El-Attrache. Genotyping of infectious bursal disease virus by heteroduplex mobility


- Estevez, C., P. Villegas, and J. El-Attrache. Evidence of a recombination event induced in ovo between a low passage infectious bronchitis virus field isolate and a highly embryo adapted vaccine strain. To be submitted to Avian Diseases. 2002.

**Grants in the last 5 years**

- The effect of Sarafloxacin on the herpesvirus of turkeys vaccine. Abbott Labs.
- Studies on Marek's Disease. Pfizer, Inc.
- Studies on Marek's Disease. Pfizer, Inc.
- Studies on Marek's Disease. Pfizer, Inc.
- Studies on Marek's Disease. Pfizer, Inc.
- Further Studies on Marek's Disease. Pfizer, Inc.
- Further Studies on Marek's Disease. Pfizer, Inc.
- Further Studies on Marek's Disease. Pfizer, Inc.
- Adaptation of IBV strains to the intestinal tract. Merial – Select.
- Molecular and pathogenic analysis of coinfection with IBDV and CAV. USPEA.
- Pathological and serological assessment of a live avian adenovirus vaccine. Aviagen.

**Significant Research**

Current and future research will focus on avian viral diseases of economic importance affecting the state, national and international poultry industry, with emphasis on improving molecular viral diagnostics, vector-based vaccines, and viral therapeutics.
BIOGRAPHICAL SKETCH

NAME: LUPIANI, Blanca

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION | DEGREE | YEAR CONFERRED | FIELD OF STUDY
--- | --- | --- | ---
University of Santiago de Compostela, Spain | B.S. | 1988 | Molecular Biology
University of Santiago de Compostela, Spain | M.S. | 1989 | Microbiology
University of Maryland, College of Veterinary Medicine, College Park, MD | Ph.D. | 1994 | Molecular Virology

Professional Experience
1989-1991 Research Assistant, Department of Microbiology, University of Maryland, College Park, MD
1995 Volunteer Scientist, USDA/ARS, Beltsville Area Research Center, Beltsville, MD
1995-1997 Postdoctoral Research Associate, USDA/ARS, Beltsville Area Research Center, Beltsville, MD
1997-2000 Postdoctoral Research Associate, USDA/ARS, Avian Disease and Oncology Laboratory, East Lansing, MI
2000-2002 Research Associate, Animal Health and Diagnostic Laboratory, College of Veterinary Medicine, Michigan State University, East Lansing, MI
2002- Assistant Professor, Department of Veterinary Pathobiology, Texas A&M University, College Station, TX

Honors and Awards
Student Travel Award, American Society for Virology (1993)
Predoctoral Fellowship, Province of Galicia, Spain (1988-1989)

Publications in the last 5 years


Lupiani, B., Williams, S., Silva, R.F., Hunt, H.D. and Fadly, A. Biological characterization of two ALV A/J recombinant viruses generated in tissue culture. To be submitted to *Avian Diseases*.


**Grants in the last 5 years**

1991-1994x  

**Collaborations**

Study of the role of viral envelope, LTR and 3'UTR in the oncogenic properties of avian leukosis virus (ALV).  

Collaborators:  
Dr. Kathleen Conklin. University of Minnesota  
Dr. Robert Silva. ADOL, ARS, USDA East Lansing, MI  
Dr. Aly Fadly. ADOL, ARS, USDA East Lansing, MI
## BIOGRAPHICAL SKETCH

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<tr>
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<th>REDDY, Sanjay M.</th>
<th>POSITION TITLE</th>
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### EDUCATION/TRAINING

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<th>DEGREE</th>
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<th>FIELD OF STUDY</th>
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<tr>
<td>College of Veterinary Medicine, Andhra Pradesh Agricultural University, Rajendranagar, India</td>
<td>B.V.Sc.</td>
<td>1986</td>
<td>Veterinary Medicine</td>
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<tr>
<td>VA-MD Regional College of Veterinary Medicine, University of Maryland, College Park, MD</td>
<td>M.S.</td>
<td>1989</td>
<td>Virology</td>
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<td>VA-MD Regional College of Veterinary Medicine, University of Maryland, College Park, MD</td>
<td>Ph.D.</td>
<td>1994</td>
<td>Molecular Virology</td>
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### Professional Experience

- 1986-1987: Technical Service Representative, Venkateshwara Hatcheries, Hyderabad, AP, India
- 1994-1997: NIH fellowship, Laboratory of Clinical Investigation, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD
- 1997-2002: Veterinary Medical Officer, Avian Disease and Oncology Laboratory, Agriculture Research Service, United States Department of Agriculture, East Lansing, MI
- 2002-: Associate Professor, Department of Veterinary Pathobiology, Texas A&M University, College Station, TX

### Honors and Awards

- Bayer-Snoeyenbos New Investigator Award, American Association of Avian Pathologists (2001)
- NIH Fellowship, National Institute of Allergy and Infectious Diseases, Bethesda, MD (1994-97)
- Diplomate, American College of Veterinary Microbiologists (A.C.V.M., 1994)
- Student Travel Award, 11th Annual Meeting American Society for Virology (1992)
- Student Travel Award, 10th Annual Meeting American Society for Virology (1991)

### Publications in the last 5 years


Grants in the last 5 years


2002-2004 Principal Investigator: Development of recombinant Marek’s disease vaccines using the newly developed cosmid technology. USDA Post-doctoral Fellowship award, (2002-2004), $80,000.
Marck’s disease (MD) is the most common lymphoproliferative disease of chicken. It was first described as a paralytic syndrome of chicken characterized by gross enlargement of the peripheral nerves. The disease is characterized by lymphoid infiltration of the peripheral nerves and lymphomas in various organs. The causative agent is an alphaherpesvirus. MD is among the most important diseases to the broiler and layer industries. Eradication of MD under current management practices is not feasible because 1) the virus persists in the chicken in a latent phase, 2) the virus is very stable in the environment 3) the virus is efficiently spread through inhalation of feather dander. The poultry industry relies exclusively on the use of vaccines and selective breeding to control MD. Despite widespread use of vaccines, economic losses from mortality of breeders and layers and condemnation of broilers continue to plague the industry. It was clearly demonstrated that the virus continues to mutate to greater virulence, reducing the effectiveness of many existing vaccines and causing concerns that those vaccines still considered effective will not protect in the near future.

My current research is focused on the molecular mechanisms involved in the transformation of lymphocytes in MD infected chickens. We have recently generated a new technique that will facilitate the introduction of site-specific mutations into the genome of a very virulent strain of MD virus. By understanding the mechanisms involved in transformation one could envision the generation of recombinant vaccines that would protect against the newly emerging strains of MD virus.

COLLABORATIONS

Hsing-Jien Kung, Ph.D.
Deputy Director, UC Davis Cancer Center
UCDMC, Res. Bldg. III, Rm. 2400B
4645 2nd Avenue
Sacramento, CA 95817

PhD STUDENTS

Xioping Cui
Department of Pathobiology
College of Veterinary Medicine
Michigan State University

Expected graduation: 2003
CURRICULUM VITAE

James Allen Byrd II, Ph.D. D.V.M.

Title and Current Position: Research Microbiologist, USDA-ARS-Southern Plains Agricultural Center, 2881 F&B Road, College Station, TX 77845

Phone: (979) 260-9331 E-mail: byrd@ffsru.tamu.edu Fax: (979) 260-9332

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<th>Degrees</th>
<th>Field of Study</th>
<th>Received from</th>
<th>Date Received</th>
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<tr>
<td>D.V.M.</td>
<td>Veterinary Medicine</td>
<td>Texas A&amp;M University</td>
<td>May 1996</td>
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<td>Ph.D.</td>
<td>Poultry Science</td>
<td>Texas A&amp;M University</td>
<td>May 1994</td>
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<tr>
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<td>Veterinary Medicine</td>
<td>Texas A&amp;M University</td>
<td>May 1993</td>
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<td>M.S.</td>
<td>Nutrition</td>
<td>Texas A&amp;M University</td>
<td>August 1987</td>
</tr>
<tr>
<td>B.S.</td>
<td>Animal Science</td>
<td>Texas A&amp;M University</td>
<td>May 1984</td>
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EMPLOYMENT
1989-1990 Research Associate, Veterinary Pathobiology, Texas A&M University, College Station, TX
1990-1992 Research Assistant, Poultry Science, Texas A&M University, College Station, TX
1992-1996 Student Technician II, Poultry Science, Texas A&M University, College Station, TX
1996-1997 Postdoctoral Animal Scientist, USDA-ARS-Food Animal Protection Laboratory, College Station, TX
1997-2000 Research Microbiologist, GS-12, USDA-ARS-Food Animal Protection Laboratory, College Station, TX
2000-present Research Microbiologist, GS-13, USDA-ARS-Southern Plains Agricultural Research Center, College Station, TX

HONORS AND AWARDS
John Paul Delaplaine Award (Texas A&M Univ., College of Vet. Medicine), 1991
Poultry Science Association Gradute Student Outstanding Presentation Award, 1991
American Veterinary Medical Association Outstanding Poster Presentation Award, Co-author, 1992
Texas A&M Univ., Department Graduate Student Award, 1992
Community Hospital Foundation Scholarship, 1994-1996
Southern Poultry Science Society Outstanding Poster Presentation Award, Co-author, 1994
Texas A&M Univ., Vice Chancellor's Award in Excellence for Graduate Research, 1994
American Association of Avian Pathologists Foundation Externship, 1995
USDA-ARS Award of Merit "In Recognition for Superior Performance", 1996-2001

PUBLICATIONS

I. Books


II. Refereed Scientific Publications


GRANTS, CONTRACTS, FUNDED RESEARCH:

Risk Factors Analysis of Salmonella and Campylobacter Flock Status in Broiler Processing
$593,355 CREE/USDA/NRI 10/02 – 09/05

Understanding Competitive Exclusion Through Microbial Ecology
$934,679 USDA-ARS CRIS 10/00 – 10/05

Effect of Chlorate on Salmonella and E.coli in Food Animals
$168,205 USDA-ARS CRIS 10/01 – 09/03
Byrd, J.A., Anderson, R.C., Nisbet, D.J.

COLLABORATIONS:

Anderson, R.C. USDA-ARS-SPARC Research
Bailey, R.H. Mississippi State University Research
Graduate Students Advised as Committee Member

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Department</th>
<th>Level</th>
<th>Employed</th>
<th>Position</th>
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<tr>
<td>Eric Barnhart</td>
<td>Poultry Science</td>
<td>M.S.</td>
<td>B&amp;D</td>
<td>Sales</td>
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<tr>
<td>Denise Caldwell</td>
<td>*Pathobiology</td>
<td>M.S.</td>
<td>Immgen</td>
<td>DNA Technician</td>
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<td>Kelly Heron</td>
<td>Poultry Science</td>
<td>M.S.</td>
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<td>Deborah Stanush</td>
<td>Poultry Science</td>
<td>M.S.</td>
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<td>Jackson L. McReynolds</td>
<td>Poultry Science</td>
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<td>Ruben Beltran, Jr.</td>
<td>Poultry Science</td>
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<td>Matthew Roe</td>
<td>Poultry Science</td>
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<td>Jackson L. McReynolds</td>
<td>Poultry Science</td>
<td>Ph.D. Co-Chair</td>
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<tr>
<td>R.W. Moore</td>
<td>USDA-ARS-SPARC</td>
<td>Post-Doc</td>
<td>USDA-ARS</td>
<td>Microbiologist</td>
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<tr>
<td>M. Burnham</td>
<td>USDA-ARS-SPARC</td>
<td>Post-Doc</td>
<td>Started 09/02</td>
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**SUMMARY OF RESEARCH**

The incumbent led research that investigated cost-efficient ways to develop different approaches to reduce *Salmonella* and *Campylobacter* in broilers prior to entering the processing plant. Eight to twelve hours before entering the processing plant, broilers are deprived of food to reduce fecal contamination of the broiler carcasses. This results in conditions of the upper gastrointestinal tract becoming more favorable to colonization by pathogens. The incumbent used different approaches to reducing foodborne pathogens to help reverse the condition observed in the crop during feed withdrawal. The incumbent designed a fluorescent marker that allows producers to visually identify critical control points associated with varying feed withdrawal times which may help reduce the spread of potential food borne pathogens. **Role:** The incumbent designed a fluorescent marker system, led in the design of experimental protocols, data collection, analysis; coordinated farm and slaughter plant trials with commercial broiler production companies, and drafted the manuscripts. **Impact:** As a result of this research effort, several commercial poultry producers have used several compounds in the drinking water and have found significant reductions of *Salmonella* contaminated broiler carcasses. Several companies have used this intervention strategy to prevent government closures of their poultry processing plants that would have cost the companies and their employees millions of dollars. The fluorescent marker is a cost efficient approach for visually identifying potential sites of upper gastrointestinal leakage of contents from broiler carcasses in poultry processing plants. The potential use of the marker may allow for the development of new, more efficient, and more food safety enhancing processing equipment, facilitate the proper adjustment of existing processing equipment and allow training of processing personnel.
Curriculum Vitae

Michael Edwin Hume, M.S., Ph.D.
Research Biologist
United States Department of Agriculture
Agricultural Research Service
Southern Plains Area Research Center
Feed and Feed Safety Research Unit
College Station Texas, 77845

Education

1972-77 Virginia Commonwealth Univ.; major, Biology; B.S. 1977
1977-80 Virginia Commonwealth Univ.; major, Biology (Entomology); M.S. 1980
1983-85 Oklahoma State Univ.; major, Entomology (Physiology, Biochemistry); Ph.D. 1985

Work and Research Experience:

1978 Research Assistant (R&D), Student Summer Research Program, Phillip Morris International, Richmond, VA
1977-80 Graduate Research Associate, Virginia Commonwealth Univ., Biology Department
1980-82 Laboratory Technician and Manager, Department of Entomology, Oklahoma State Univ., Stillwater, OK
1983-85 Graduate Research Associate, Department of Entomology, Oklahoma State Univ., Stillwater, OK
1985-88 Post-doctoral Research Associate (Andrology Reproduction), Department of Obstetrics and Gynecology, Washington Univ., St. Louis, MO
1988-92 Post-doctoral Research Associate, USDA, ARS, SPARC, College Station, TX
1992-present Research Biologist, USDA, ARS, SPARC, College Station, TX
2001-present Associate Member of the Graduate Faculty, Poultry Science Dept. Texas A&M Univ.
2001-present Associate Member of the Graduate Faculty, Dept. of Veterinary Pathobiology, Texas A&M Univ

Current Graduate Student Committees:
Lingeng Lu, Ph.D. candidate, Poultry Science Department
Damon Drinnon, MS Candidate, Dept. of Veterinary Pathobiology
Recent Selected Publications:


Manuscripts submitted or in preparation

Hume, M. E., Poole, T. L., Pultz, N. J., and Donskey, C. J. Inhibition of vancomycin-resistant enterococci by an in vitro continuous-flow culture containing human stool flora with no anaerobic gas supplementation. Submitted.. Infect. Dis. 2002


CURRICULUM VITAE

Leon Franklin Kubena, Ph.D.
USDA, ARS, SPARC, Food & Feed Safety Research Unit, College Station, TX 77845

Education:

Ph.D., Texas A&M Univ., December 1970
B.S., Texas A&M Univ., January 1965

Experience:

- 1999-Present, Research Animal Scientist & Project Leader-Microbial Ecology Research, USDA, ARS, College Station, TX
- 1990-1998, Research Animal Scientist & Project Leader-Mycotoxin Research, USDA, ARS, College Station, TX
- 1976-1989, Research Animal Scientist, USDA, ARS, College Station, TX
- 1970-1975, Research Animal Scientist, USDA, ARS, Mississippi State, MS
- 1990-present, Member, Faculty of Toxicology, Texas A&M Univ., Interdepartmental
- 1980-present, Member, Graduate Faculty, Adjunct Professor, Texas A&M Univ., Poultry Sci. Dept.
- 1971-1975, Member, Graduate Faculty, Mississippi State Univ., Poultry Sci. Dept.

Honors, Awards, Professional Activities and Recognition:

- World's Poultry Science Association
- Poultry Science Association
- American Association for the Advancement of Science
- Council for Agricultural Science and Technology (CAST)
- Association of Official Analytical Chemists; U.S. Animal Health Association (USAHA)
- Environmental Residue Committee, USAHA
- S-175 Technical Committee on Mycotoxins of Food and Feed Grains
- Who's Who in the South
- Award of Merit for outstanding research in adsorptive technology leading to development of NovaSil™, Engelhard Corporation
- USDA Certificate of merit for Outstanding Accomplishment (16 occasions)
- 87-15 Southern Research Development Committee
- Associate Editor, Journal of Poultry Science
- Secretary-Treasurer, Vice-President, President of Southern Research Information Exchange Group 51: Mycotoxins in Food and Feed Grains
- Gamma Sigma Delta Honorary Society
- Sigma Xi Honorary Society
Professional Interests

Conduct research to determine the effects of specific dietary constituents on the efficacy of indigenous flora and competitive exclusion (CE) cultures to protect against colonization by salmonellae and other pathogens. Mechanism(s) by which indigenous flora and CE cultures are affected by these dietary modifications are being identified through analysis of the production of bacteriostatic VFA, confirmation of bacterial adherence to cecal mucosal epithelium, modulation of the oxygen-reduction potential of the anaerobic environment, and the competition of the CE cultures and salmonellae for limited nutrients. Enhancing the capabilities of commercially available CE cultures and new CE cultures to protect poultry and livestock against enteropathogens and the development of new intervention strategies to insure a continued safe food supply are major interests and high priority goals. Conduct research to determine the role of the GI tract and dietary alterations for enteropathogen virulence expression while chickens and turkeys are being reared under optimal conditions and while birds are being reared under stress conditions.

Conduct in vivo research for the development of adsorptive materials to reduce the adverse effects of enteropathogens and mycotoxins in poultry and livestock. The development of alternative methods to the commonly used practice of feed deprivation to induce molting for obtaining an additional egg laying cycle without appreciably increasing the stress level and susceptibility to gastrointestinal tract colonization and organ invasion by Salmonella enteritidis and other possible food pathogens is a high priority goal.

PUBLICATIONS:

Author, coauthor of over 250 publications. Publications (1996-present):


(Book Chapter)


CURRICULUM VITAE
VICTOR G. STANLEY

CURRENT POSITIONS:  Associate Professor/Research Scientist, Prairie View A&M University
Agriculture/Cooperative Agricultural Research Center
Adjunct Assistant Professor - Texas A&M University

EDUCATION:  1984 - Ph.D. Poultry Sciences; Texas A&M University
1967 - M.S. Poultry Science; Iowa State University
1965 - B.S. Animal Science; Tuskegee University
1959 - Diploma; Jamaica School of Agriculture

EXPERIENCE:  1959 - 63 - Veterinary Assistant, Government of Jamaica
1967 - 80 - Poultry Advisory Officer - Government of Jamaica
1980 - Present - Assistant Professor; Student Advisor and Mentor,
Coordinator, Animal Science Program; Research Leader, Poultry
Research Center; Research Scientist, Cooperative Agricultural
Research Center

MEMBERSHIPS:  American Society of Animal Science
American Poultry Science Association

AWARDS AND HONORS:
1986:  Distinguished Teaching Award - College of Agriculture - Prairie View A&M University.
1987:  Annual Humanitarian Award - Jamaican Association of Greater Houston.
1987:  Outstanding Research Scientist - Cooperative Agricultural Research Center - Prairie View A&M University.
1990:  National Award For Excellence in Teaching.
1991:  Academic Achievers Award - Prairie View A&M University.
1993:  Most Outstanding Faculty - College of Applied Sciences and Engineering Technology.

TEACHING RESPONSIBILITIES:

1.  Undergraduate Courses
ANSC 2523 - Introduction to Poultry Science
ANSC 2553 - Poultry Nutrition and Technology
ANSC 3503 - Feeds and Feeding

2. Graduate Courses
   ANSC 5543 - Non-Ruminant Nutrition
   ANSC 5553 - Ruminant Nutrition

SUCCESES IN STUDENT DEVELOPMENT:

1. Preparing students for graduate degrees.
2. Chairing the Animal Science Graduate Program.
3. Initiated the Animal Science Master of Science graduate program in 1984.
4. To date, prepared 44 students for the M.S. degree.
5. Prepared and promoted 11 students to successfully pursue Ph.D. degree program
6. Prepared and promoted 13 students to successfully pursue DVM program.

RECENT PUBLICATIONS:


