

4/17/08

Research Proposal Submission Guidelines

The U.S. Poultry & Egg Association is dedicated to the growth, progress, and welfare of the poultry industry and all of its individual and corporate interests. The promotion of problem-related research and the concomitant training of graduate students is high on the association's agenda.

Each year, the association allocates approximately \$1.2 million for the funding of research projects that benefit the poultry and egg industry. Research results are publicized in the industry press and made available to potential users.

Who selects the projects that are funded?

Research proposals are judged by a 15-member panel composed of industry scientists and technical specialists representing a cross section of disciplines and responsibilities. Panelists evaluate more than 100 proposals each year to determine their value and potential benefit to the poultry and egg industry.

The committee's recommendations are referred to the association's board of directors for funding. In the past, 30 percent of proposals submitted to USPOULTRY have received funding. This funding rate exceeds that of most other research grant programs.

Are there guidelines to follow?

Researchers should only submit a one-page preproposal summary that describes the problem(s) they wish to address and what they propose to do. Details of procedures or budget specifics should not be included in the submissions.

The outcome of the preproposal review will be one of three responses:

- 1.** Send a full research proposal for consideration.
- 2.** USPOULTRY is not interested in funding research on the proposed subject; or
- 3.** Please make some modifications in what you are proposing and then send a full proposal. Preproposals should address any important area, including poultry management, nutrition, food safety, processing, disease, and waste disposal.

Full proposals should be prepared according to published USPOULTRY guidelines. All proposals should be written with minimal jargon so that professionals from all disciplines can understand them. Successful proposals are directed toward an important industry problem; clearly written with well defined objectives; and reasonably priced with realistic budgets.

How can the money be used?

Funds can be used for graduate students, postdocs, technicians, research supplies, and work and meeting travel. Up to 15 percent overhead is allowed. Funds cannot be used for professional (faculty) salaries or equipment.

What are the deadlines for applying?

Fall 2008 Competition:

- Preproposals due: Monday, April 21, 2008
- Requests for full proposals e-mailed to researchers: Tuesday, May 20, 2008
- Full proposals due: Wednesday, July 16, 2008

Spring 2009 Competition: TO BE ANNOUNCED

Identified Research Needs

What needs have been identified?

Proposed research projects should be designed to provide information that has the potential to resolve real industry problems. The following list is organized by overall subject area. Items within each list are presented in priority order.

USPOULTRY realizes that new issues are always emerging and that scientists may see the importance of a potential problem that has not been recognized or cited as an industry research need. USPOULTRY invites proposals that address problems outside the industry lists but urges the submitter to provide ample background and justification to explain the need for the research.

Genetics

1. Disease: Define the role of genetics in ascites. Devise ways to improve the immune response of poultry through genetics. Develop Marek's resistance in chickens through genetics.

2. Production: Define the role of genetics in egg shell quality. Use molecular genetics as a tool for improving desirable market traits in poultry. Provide genome mapping support.

Nutrition

1. Diet Formulation: Define diets to allow complete withdrawals and good gut condition at processing. Develop diets to reduce fat pad. Devise formulations for "best yield."

2. Nutritive Requirements: Determine digestible amino acid requirements for broilers, breeders, and turkeys, especially lysine, methionine, and cystine. Requirements (energy and A.A.) for different strains for yield and efficiency. Establish nutritive needs with low selenium diets. Determine dietary requirement changes for up to 6.5 lb. broilers in controlled environments. Establish selenium requirements for poultry. Determine effects of "high" protein diets on egg production, hatchability, and livability. Define trace mineral and vitamin needs of breeder turkeys in late lays. Determine the influence of breeder nutrition on chick performance and effect of high dietary iron levels on breeder and broiler production.

3. Ingredients: Study impact of ingredients on environment (P, Se, Cu). Impact of biogenic amines in ingredients; (levels, type, synergism, better assays). Develop use for byproducts and determination of their ME values (DAF, sludge, deboning byproducts). Determination of interactive effects of different

mycotoxins and intervention methods. Determine effect of feed ingredient quality on performance: how extremes in least-cost formulation alter FCR's and weights.

4. Miscellaneous: Determine influence of nutrition on dyschondroplasia. Define relationship of diet and ascites. Explore cellular mechanisms involved in nutrient absorption/biochemistry.

Feed Mill Operations

1. Pelleting: Determine cost/benefit for pelleting/crumbling all pullet/breeder feed in improved health/performance. Establish the effects of post mix grinding on pellet quality and feed efficiency. Determine effects of ingredients and their combination on pelleting. Determine optimum ratio between pellets and mash in on-farm broiler diets.

2. Salmonella: Determine extent and source of Salmonella contamination in feed and if it relates to the flora of the birds. Determine parameters of conditioning and pelleting to kill Salmonella.

3. Equipment: Evaluation of expanders and seamless hammermills in feed manufacture.

4. Formulation: Compare effects of new crop grains/meals versus old crop on performance. Establish net energy guidelines for feed ingredients (primary grains vs. liquid fat).

5. Mycotoxins: Develop methods for detection of mycotoxins in ingredients before delivery to the feed mill.

6. Production: Devise methods to maximize quantity of feed produced per hour.

Poultry Housing

1. Ventilation: Develop systems for black-out pullet houses. Devise techniques to reduce summer heat stress. Evaluate oxygen and ammonia sensors to monitor air quality. Determine optimal relative humidity.

2. House Type: Study curtain-sided versus totally enclosed houses on broiler performance. Determine optimal house for different climates, i.e., deep south, north, etc.

3. Broiler Breeders: Determine optimal slat height. Compare built-in electronic versus manual system of weighing. Conduct evaluation of cooling systems.

4. Miscellaneous: Develop energy efficient housing programs for pullets and broilers. Provide overview of different housing systems across the United States.

Pullet Management

1. Body Weight: Determine desired weights at different ages for optimum production and hatchability. Determine feeding programs to achieve desired weights. Evaluate frame size, conformity, and its relationship to weight in yield type broiler breeders. Determine optimal male weights throughout life for best hatch. Correlation of frame size with early egg size. Prescribe optimal body weights of males with mixed rearing. Determine if pullet uniformity is related to production.

2. Nutrition: Determine optimal feed formulation for high-yielding lines. Determine optimal feeding techniques, especially through six weeks of age. Define feed restriction effects on skeletal development and protein/fat deposition.

3. Lighting: Determine lighting, light restriction in relation to weight, uniformity,

and maturity. Determine when light restriction should begin. Determine if debeaking is needed in black-out housing.

4. Density: Determine optimal density for black-out housing.
5. Develop new vaccination techniques to improve protection and lessen stress on the bird. Compare performance of separate and mixed rearing of males. Determine effect of house temperature on immune response.

Breeder Management (Broiler/Turkey)

1. Nutrition: Determine influences of male/female weight on production/hatchability. Define role of diet in heat stress.
2. Lighting: Establish schedules for pullets/hens for maximum production/hatchability.
3. Nests: Maximize design/operation for optimal production/hatchability.
4. Vaccines: Compare effectiveness by injection site (breast vs. neck or leg). Develop vaccines that avoid need for mid-lay injection.
5. Broodiness: Develop strategies for control in turkey hens.
6. Egg Rooms: Develop methods for control of bacteria/molds.
7. Prevention of early male aggressiveness; establish ideal male-female ratios; provide means of prevention of floor/slat eggs; semen preservation/storage; determine ideal pullet age for moving to breeder house; determine role of feeder type; devise better egg hauling methods.

Hatchery Management

1. Incubation: Determine optimal RH and temperatures for different chicken and turkey breeds. Investigate the benefits of manipulating carbon dioxide and oxygen levels in single-stage incubation. Determine impact of increased turning intervals during early incubation. Determine fresh air requirements during incubation to avoid oxygen deprivation. Determine effect of incubation time because of breeder flock age on mortality.
2. Sanitation/Disinfection: Determine optimal practices for effectiveness and employee safety. Explore alternatives to formaldehyde and methods for safe use of formaldehyde.
3. Operations: Explore opportunities for more automation. Establish the true incidence of repetitive motion disorders. Evaluate the in ovo injection system for vaccines and other products. Improve accuracy of candling for fertility. Develop improved chick delivery methods to lessen chick and employee stress.
4. Facilities: Devise methods to improve air management in older hatcheries using updated air control devices. Energy conservation systems development for hatcheries.
5. Miscellaneous: Determine relationship of egg size, chick size, and first-week mortality. Determine effect on hatchability of picking up and setting eggs twice weekly if eggs are held at 70 - 75 F. Determine the incidence and causes of losses in hatchery due to chick abnormalities.

Commercial Egg Production

1. Dead Birds: Devise economical and environmentally acceptable means of disposal.
2. Spent Hens: Develop alternative methods for disposal of spent fowl other than slaughter/processing for human food.
3. Manure: Develop economical and environmentally acceptable management

and disposal/utilization program.

4. Fly Control: Devise environmentally acceptable and residue-free systems of fly control.
5. Egg Size: Devise practices to prevent the production of excessively large eggs, especially in molted flocks.
6. Nutrition: Determine the role of diet on the extent of feather cover.
7. Lighting: Determine lighting needs as influenced by strain of hen.

Broiler Management

1. Optimum Lighting: Determine influence of spectrum, intensity, length for different ages on performance and on development of ascites. Determine if the benefits from new lighting control systems justify increased compensation to growers to cover their costs for the improvement.
2. Temperature/Humidity: Determine optimum temperature and RH for broilers from day of age to processing.
3. Ventilation: Comparison of different types of systems on performance in different seasons/climates.
4. Brooding: Comparison of different methods using energy use, mortality, and growth rate as criteria.
5. Feeding: Comparison of full feed to meal time programs (grade, feed conversion, rate of gain). Determine quantities of starter, grower, finisher for optimal results.
6. Sanitation: Determine relationship of different practices to house performance.
7. Devise ways to control early body weight in open-sided houses. Develop methods to improve grower - integrator relations. Determine the influence of body weight and density on leg problems.

Market Turkey Management

1. Early Poult Mortality: Determine causes and prevention.
2. Ventilation: Provide house design, compare natural versus power systems, provide convenient means for measurement of ventilation.
3. Darkling Beetles: Provide methods for control.
4. Breast Blisters/Buttons: Determine causes and prevention.
5. "Flip Over" Syndrome: Determine causes and prevention.
6. Leg Deformities In Toms: Provide methods for prevention.
7. Determine oxygen/temperature requirements of embryos of modern turkey breeds.
8. Develop bioengineered vaccines to immunize turkeys against various diseases at hatch.

Live Haul

1. Catching/Loading: Devise mechanical catcher/loader and houses compatible with the equipment. Devise efficient way of handling larger chickens (5.5 - 6.8 lbs.) that will cause less mortality.
2. Cages: Develop improved cages that are lighter weight with more durable doors. Devise cage dumping systems that do not hang cage doors or damage cage bottoms.
3. Feed Withdrawal Time: Study times versus bird quality, yield, and shrink in hot weather and cold weather.

4. Cooling Sheds: Provide design for better, more efficient and uniform cooling of birds.
5. Miscellaneous: Evaluate effect of catcher pre-work warm-up exercises in reducing catching injuries. Impact of cleaning catching/hauling equipment on bacterial load on carcasses, especially Salmonella. Determine causes of DOAs. Develop methods to determine whether condemned turkey parts are associated with loading or processing.

Diseases

1. Infectious Bronchitis: Develop rapid, precise methods for identification of isolates. Develop vaccines against variants.
2. Mareks Disease: Develop vaccines against new variants. Determine causes of "late breaks." Explore feasibility of genetic resistance.
3. Ascites: Determine if it is pathological or physiological. Define wholesomeness of affected carcasses. Devise prevention strategies.
4. Mycoplasma: Determine role of vertical transmission with recent isolates in broilers for MG and MS. Develop improved methods of diagnosis, prevention, treatment; controlling/eradicating in turkeys and chickens.
5. Infectious Bursal Disease: Develop methods for variant detection and develop vaccine with cross protection capabilities.
6. Fowl Cholera: Define extent of variation among isolates. Devise methods for determination of extent of post vaccinal immunity.
7. Turkey Poult Enteritis: Determine etiology, nutritional influences, epidemiology. Develop vaccines.
8. Layer Hepatitis Syndrome: Develop methods for prevention and control.
9. Avian Influenza: Develop methods for rapid detection and determination of pathogenicity. Develop cross protective vaccine.
10. Squamous Cell Carcinoma: Determine if neoplasm or inflammation. Define the etiology and provide prevention/control strategy.
11. Colibacillosis: Determine if primary or secondary pathogen. Define the role, if any, of poor ventilation.
12. Spiking Mortality, Stunting In Broilers: Determine etiology and devise methods of prevention and control.
13. Food Safety Microbes On Poultry: Devise methods for prevention/reduction of pathogenic bacteria colonizing poultry.
14. Alternative Dewormers For Poultry: Develop and evaluate new dewormers in chickens and turkeys.
15. Newcastle, Bordetella, Reoviruses, IP Syndrome, CAA, Scabby Hips: Acquire data on the prevention/control of these diseases.

Processing

1. Repetitive Motion Disorders: Development of preventative measures/ programs.
2. Microbial Contamination: Develop methods for prevention of cross contamination, prevention of ingesta contamination leading to elimination of contamination on final product. Determine the actual feasibility of irradiation of poultry meat. Methods for the reduction of microbial levels in plant, optimal levels of chlorine (gas vs. liquid), development of automated inside-outside washer for reprocessing, verification of contamination levels on poultry meat. Evaluate effect of wrap paper treated with bacteriocins.

- 3. Killing/Stunning:** Relate methods to blood removal and feather release. Explore feasibility of carbon dioxide stunning.
- 4. Bone Fragments:** Development of automated, rapid, and accurate detection methods.
- 5. Equipment:** Develop equipment for harvesting giblets with both yield and microbial load considered. Devise an efficient and stress-free way to cool birds prior to processing. Develop deboning equipment to eliminate hand operations that are acceptable, based on yield and quality.
- 6. Stress:** Determine effects of preslaughter stress on feather release, moisture gain/retention, and muscle tissue quality.
- 7. Miscellaneous:** Determine the effect of electrical stimulation on muscle tissue quality, tenderness, and taste.

Food Safety

- 1. Microbial Contamination:** Preharvest - Determine effectiveness of "Nurmi" undefined flora for competitive exclusion in broilers administered in hatchery. Devise prevention strategies for *Campylobacter* infection of broilers. Define roll of contaminated feed in colonizing broilers with *Salmonella*. Define roll of *Salmonella* colonized breeders in producing colonized broilers at processing. Processing - Develop rapid, cost-effective, and specific methods of detecting microbial contamination. Study the feasibility of using chlorine on pickers to reduce contamination. Develop post-chill handling methods to reduce microbial contamination. Evaluate effectiveness of carcass dips/sprays in reducing microbial contamination. Evaluate the microbial benefits of HACCP implementation in processing plants.
- 2. Post Processing:** Determine how to get consumer acceptance of irradiated food. Determine effectiveness of irradiation: microbiologically and organoleptically. Develop reliable and cost effective methods of bone fragment detection in deboned meat.

Further Processing

- 1. Products:** Devise methods to prevent the red bone splashing on fully cooked bone-in chicken while maintaining good yields. Develop improved predest, batter, and breaders to enhance adhesion to product. Develop consumer oriented packaging systems. Relate to yield the processing techniques such as length of age, meat temperature, and prior storage. Explore chilling alternatives as they relate.
- 2. Safety:** Devise improved and rapid methods for the detection of metal fragments, bone, and other foreign materials in meat. Compare the different levels of bacterial contamination on salvage and fresh product after different handling techniques. Evaluate the effectiveness of chlorine as a sanitizer, comparing gas versus liquid systems.
- 3. Genetics:** Develop a process that may be used for evaluating chicken lines for their marination absorption levels. Compare the different broiler lines for debone breast yield.
- 4. Miscellaneous:** Develop ergonomic scissors, probably pneumatic, that can be used to trim small bones. Explore cellular/molecular biochemistry that may relate to meat toughness.

Packaging

- 1. Materials:** Develop packaging materials that are recyclable or compatible with waste management systems. Develop a temperature-abuse evident packaging film. Develop a more breathable film that would hinder ice crystal formation without reducing shelf-life. Develop stretch wrappers that function in cold and wet environments. Develop a waterproof box coating that will allow recycling of the box.
- 2. Packaging:** Develop packaging for livers and gizzards to extend shelf-life. Develop large containers (70 pound capacity) that are reusable and that can be ergonomically transported and stacked. Develop recyclable dry-pack bags. Develop a less expensive CVP bag with increased shelf-life capabilities, durability, and puncture resistance. Develop poly bags that are lighter, stronger, and recyclable.
- 3. Miscellaneous:** Acquire data on proper box stacking. Research migratory chemicals moving from the packaging material to the product, evaluating for possible detrimental effects on the product and consumer.

Rendering

- 1. Carcass Disposal By Rendering:** Develop alternative methods for disposal of light spent fowl instead of processing and for disposal of mortality. Evaluate composting compared to rendering. Provide an economic study on consequences of slaughtering layers at different ages.
- 2. Products:** Improve digestibility of feather meal. Define optimal feeding rates for feather meal in the different cattle diets. Explore possibility of edible products from rendered poultry materials.
- 3. Environmental Impact:** Develop best practices for waste water and air quality compliance. Develop methods for odor control in the rendering process.
- 4. Process:** Devise methods for processing lower grade items such as waste water by product, grow-out mortality, hatchery waste. Develop methods for handling and reducing skimmings. Devise methods to neutralize corrosive effects of waste water sludge in rendering plants.

Waste Management

- 1. Litter:** Develop improved, economical, and environmentally acceptable ways of disposal/use. Evaluate burning for brooding. Evaluate composting in houses, composting and retailing, materials designed to drive off the nitrogen from litter.
- 2. Dead Birds:** Devise better methods of disposal such as composting, fermentation, and other options.
- 3. Processing Water:** Develop new, less expensive methods to clean up water. Determine effects of liquid egg on municipal sewage treatment systems. Determine appropriate areas for water reuse. Devise method for substituting UV treatment for chemical water treatment. Devise ways to reduce BOD from processing plants and TSS in treatment plants. Reduce costs of biomonitoring for state agencies, methods for cleaning out anaerobic lagoons and disposing of waste. Develop methods to calculate water usage. Evaluate effectiveness of spray irrigation with treated waste water.
- 4. Other:** Develop methods for disposal of hatchery waste, ways to reduce quantity of hatchery waste, and how to dispose of waxed boxes.

Human Nutrition

- 1.** Conduct an economic analysis of the value of eggs and egg products in the human diet relative to other foods.
- 2.** Establish the relationship, if any, between egg consumption and serum cholesterol levels and type in healthy humans.

In what format should I submit my proposal?

Applicants must submit 20 copies of proposals to the association. Failure to do so will result in delays in the grant evaluation and funding consideration process.

Cover Sheet

Title of Project (limit of 180 characters/spaces)
Name of University (or research organization)
Principal Investigator (project leader or contact person)
Complete Address and Telephone Number
Department
Co-investigators
Date Submitted
Total Funds Requested
Duration of Project
Keywords (up to four) optional

If the project will be administered by a university or an experiment station official, give the name and address of the official.

Abstract

The second page of a proposal is an abstract limited to one page of double-spaced typing. It should include the following:

A brief statement of the industry problem to be investigated;
The objectives of the research;
The approaches to be used to achieve the objectives; and
The probable value to the industry if the research objectives are achieved.

Proposal

Every effort should be made to limit the number of pages of Items 1-6 to 10 or less. Items 1-20 should be copied front and back, and must have page numbering.

- 1.** Title of Project
- 2.** Investigator(s)
- 3.** Objectives: List the specific goals of the project.
- 4.** Justification: Justify the proposal in light of current industry practice or problems, and discuss the short- and long- range cost-benefit potential of achieving the objectives.
- 5.** Procedures: Outline the protocol designed to achieve the objectives, including the experimental design, replications, etc. If confidential or proprietary information is contained in the proposal, it must be noted in bold type on the first sheet referencing page and paragraph. Pages and paragraphs must also be similarly highlighted.

- 6. Literature Review:**
 - (a) Please cite known research on the same subject (reference key investigators only).
 - (b) Indicate how this proposal differs from previous or current research.
- 7. Resume of Investigator (one page)**
- 8. Current Research on Subject (if any) by Investigator**
- 9. Facilities and Equipment Required and Available for This Project**
- 10. Research Timetable:**
 - (a) Date project is scheduled to begin.
 - (b) Date project is scheduled to end.
- 11. Personnel Support Provided by the University (or research organization)**
- 12. Financial Support:**
 - (a) From the university (or research organization).
 - (b) From other sources, including those from whom other funds for this project are requested.
- 13. Institutional Units Involved**
- 14. Budget: Direct cost factors attributed to the project. Please itemize all areas of need. Include cost per animal unit, if any.**
- 15. Total Funds Requested: Unexpended funds at the termination of the project may be used at the discretion of the principal investigator if these funds are no more than 5 percent of the total award or \$1,000. Funds in excess of 5 percent of the award or \$1,000 should be returned to USPOULTRY.**
- 16. Indirect Costs: The industry generated funds that support USPOULTRY research projects are not intended to provide the general overhead costs of research institutions. Proposals must allocate the lowest possible percentage of the funding for indirect costs, if at all. Indirect costs must be held to a minimum but never exceed 15 percent.**
- 17. Receipt of Funds Needed (quarterly, six months, annually):** If not specified, funds will be paid as follows throughout the term of the project: 25 percent of total allocated funds at beginning of project; 25 percent of funds at end of first quarter-term (six months for two-year projects, etc.); 25 percent of funds at mid-term (one year for two-year projects, etc.); and Final 25 percent of funds at completion of project and receipt of final report. Include Make Check Payable To... and to whom the check is to be mailed (with a complete address).
- 18. USPOULTRY will provide funding only to those scientists at universities or research organizations who comply with the provisions of the Institutional Animal Care and Use Committee as specified by the Animal and Plant Health Inspection Service, USDA in 9 CFR Part 1 (1-91).**
- 19. The following statement is required with all proposals and must be signed by an official of the university (or research organization) and the project leader. This statement must accompany the original proposal or the proposal will be returned before committee action.**

The (Department) of (University or Research Organization) agrees to provide the following to USPOULTRY:

- (a) Progress reports on the research project every six months until the project is completed;
- (b) Within three months following completion of the research funded, to provide the final project report (using the format for final reports) of the results;
- (c) The University (or Research Organization) understands that USPOULTRY will

retain 25 percent of the approved funds until the final report has been provided to the association; and

(d) Give permission to the association to provide the information to the industry.

20. Progress reports are required every six months. This can be a brief concise statement of progress toward the objectives of the project. This report does not need to include detailed charts or figures. A reminder of the progress reporting will be sent to the investigator just before the due date. If the progress report is more than 30 days late, an "alert" letter will be sent to the investigator and to the administrative office. Failure to reply within two weeks of this warning letter, a notification will be sent to the administrative officer and the investigator that no additional monies will be paid to that grant until the report has been received.

Final reports: A reminder will be sent to the investigator of the need to provide a final report at the completion date. Final reports are due within three months following completion of the research project as specified by the research proposal. If the final report has not been received in 90 days following the reminder notice, an "alert" letter will be sent to the investigator and the administrative office. Failure to reply within two weeks of this warning letter, a notification will be sent to the administrative officer and the investigator that no additional monies will be paid to that institution (or research organization) until the report has been received.

21. USPOULTRY makes no claim on discoveries or invention patents made by scientists/institutions utilizing USPOULTRY research funds. USPOULTRY assumes no liability associated with either the conduct of research or the outcome or use of research findings acquired with USPOULTRY funds.

22. Authorized Signatures:

- a. Project Leader
- b. Department Head
- c. University Official
- d. Research Organization President

Please address each item of the format completely, but briefly. Reprints of scientific or popular articles written by the investigator, dealing with prior research in the area of the proposal, are not required; however, if such reprints are supplied they will be circulated to the reviewers.

Submit projects to:

Charles Beard, D.V.M, Ph.D.

U. S. Poultry & Egg Association

1530 Coolegge Road

Tucker, GA 30084-7303

What is the format for final reports?

There are four separate parts to the final research report. These are:

- (1) cover sheet,
- (2) industry summary,
- (3) scientific report, and
- (4) list of presentations made and reports of publications. This final report should be loose, not bound. Please submit two copies.

(1) Cover Sheet

This single-page document provides the association with a means of filing and identifying the material. The arrangement of this page should be as follows:

Title

Investigator(s)

Name of University and University Address

Department

Date of Completion of Project

Statement: Funded by the U. S. Poultry & Egg Association

(2) Industry Summary (One Page)

This is a very important part of your final report and describes the potential usefulness of the research to the industry. It should briefly explain the conclusions that are drawn from the results. It should include few, if any, scientific tables but an evaluation of potential in terms of economics, increased quality, better performance, etc. Dollar figures are always valuable. The following format should be used with a minimum of technical terminology. This summary is intended for general industry consumption.

- a. Briefly describe the problem that was studied;
- b. Restate the objectives from the original proposal;
- c. In the same order, state briefly the results achieved toward each objective of the project; and
- d. Discuss the impact of the research results for industry.

(3) Scientific Report

The scientific report should be carefully written so as to substantiate the results and be of value to those who may wish to study the details of the experiment. There is no limit on the length of this report. The format is shown below.

- a. Materials and methods used in the study. Should be in sufficient detail to allow for repeatability. If new techniques or tests have been developed as part of the objectives of the project, the specific protocol for the technique or test should be included;
- b. Results and discussion;
- c. Tables and figures (can be inserted into the text where appropriate); and
- d. References.

(4) List of Presentations and Publications

Please list the publications which were a result of this research either entirely or in part by this grant. Reprints would be appreciated when available.

Please indicate the presentations with the date, place, name of meeting, and title when the presentation was related to the research funded by USPOULTRY.

Submit final reports to:

Charles Beard, D.V.M., Ph.D.

U.S. Poultry & Egg Association

**1530 Cooleage Road
Tucker, GA 30084-7303**