



# MIDWEST POULTRY RESEARCH PROGRAM

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## MPRP RESEARCH PRIORITIES

### BROILER

1. Food Safety
  - a. Salmonella, Campylobacter
  - b. Air chilling
2. Meat Quality (color, texture, taste)
  - a. Effects of gas stunning
  - b. Effects of air chilling
  - c. Pale, soft, & exudative (PSE) meat issues
3. Gut Health
  - a. Probiotics/prebiotics as alternative to antibiotics
  - b. Gut microflora/gut integrity
4. Broiler Breeders
  - a. Vaccines with minimal effects on egg production and fertility (frequent vaccinations currently used for replacement pullets and for production of antibodies for deposition in hatching eggs)
5. Bird Weight Uniformity

### TURKEY

1. Disorders
  - a. Skeletal and connective tissue disorders (spiral fracture in turkey toms)
2. Animal Welfare
  - a. Proactive scientific evidence on impact of management practices on the bird (housing systems, density, transportation, stunning, beak/toe nail trim).
  - b. Measurable/reliable indicators of stress
3. Reproduction
  - a. Photorefractoriness and heat stress
  - b. Light management (impact of wavelength on reproduction)
4. Growth & Body Composition
  - a. Genetics – inheritance of muscle morphology
  - b. Myosin expression
  - c. Muscle
  - d. Skeleton
  - e. Stem cell
5. Food Safety (Pre and Post Harvest)
  - a. Salmonella
  - b. Campylobacter
  - c. Listeria
  - d. Antibiotic usage and pre, probiotics, other (herbal, enzymes)
  - e. Alternative feed ingredients, feed additives
6. Diseases
  - a. Cellulitis/dermatitis – clostridial, challenge model development, immunosuppression
  - b. Poult enteritis (hi path E. coli) – mixed infection with bacteria and enteric viruses
  - c. Solutions for administering live and killed vaccines to turkey breeder replacements
  - d. Avian Influenza

- i. Epidemiology and prevention H3N2 in turkeys
    - ii. DIVA vaccine
    - iii. Screening techniques
  - e. APV Control, prevention, epidemiology
    - i. DIVA vaccine (APV)
    - ii. Screening different APV types
- 7. Nutrition
  - a. Alternative feed ingredients, feed additives
  - b. DDGS utilization
    - i. Antibiotic residuals in DDGS
    - ii. Ammonia emissions
  - c. Utilization of energy in turkeys
    - i. Substrate interactions
  - d. Systems approaches
    - i. Biological modeling
    - ii. Growth
    - iii. Compositional change (whole body)
- 8. Antibiotics
  - a. Gut health
  - b. Cellulitis
  - c. Environment
  - d. Interaction with other feeds
  - e. Additives and diet composition
  - f. Lack of alternatives
  - g. Possible loss of ionophores
- 9. Meat Quality
  - a. Maintaining quality with further processing, stress, multiple locations of processing
  - b. Pale, soft and exudative (PSE) meat issues

## **LAYER**

- 1. Health-Related Issues
  - a. E. coli Peritonitis
    - i. Define the causative organisms (primary and secondary pathogens)
    - ii. E. coli vaccine development
  - b. Fowl Pox
    - i. Characterizing new pox isolates
    - ii. Developing new vaccines
  - c. Infectious Laryngotracheitis
    - i. Diagnosis and control
    - ii. Vaccination procedures and strategies
- 2. Performance
  - a. Identification of performance characteristics and management techniques to maximize performance of layer strains
- 3. Welfare Issues
  - a. Guidelines for cage free/organic layers for housing and management systems
  - b. Mass euthanasia for cage layers, for spent hens and during eradication
  - c. Beak trimming management techniques and genetic selection to minimize
  - d. Techniques to objectively define stress in cage environments
  - e. Genetic and nutritional techniques to enhance skeletal integrity in layers
  - f. Cage-space requirements for optimum performance
- 4. Nutrition
  - a. Determining amino acid availability in feed ingredients
  - b. Determining amino acid requirements in pullets and laying hens (different ages), focus on methionine, lysine, tryptophan, threonine
  - c. Use of enzymes to reduce nutrient excretion and enhance performance and increase nutrient digestibility
  - d. Carbohydrate enzyme evaluations for energy value and production performance
  - e. Techniques to allow maximizing DDGS use in layer rations, inclusion level and performance vs. conventional corn DDGS
  - f. Trace mineral additives for pullets, effects on immune function
  - g. Dietary/supplemental magnesium effects on shell quality of nonmolted birds 65+ weeks of age

- h. Bakery meal – ME value and evaluation of safe inclusion level
  - i. Gut health/performance – DFMs (w/ or w/o Pediococcus), plant extract products
  - j. Corn oil evaluation – compare vs. choice white grease, A/V blend
5. Egg Products
    - a. Continued development of value added uses for egg and egg products
  6. Egg Safety
    - a. Salmonella enteritidis (SE) control and monitoring
  7. Environment
    - a. Techniques to minimize environmental impacts of egg farms

## **DUCK**

1. Environment
  - a. Reducing phosphorus excretion
  - b. Small flock biomass converter for on-farm energy production to provide supplemental brooding in modern and Amish (non-electric) operations
  - c. Evaluate the potential for recycling of bedding materials for duck rearing operations
2. Nutrition
  - a. DDGS
  - b. Role of fiber to improve gut health
  - c. Microbial ecology
  - d. Evaluate nutritional remediation of “sitter duck” syndrome (reluctance to walk after extended periods of walking when being herded to transportation vehicles)
  - e. Evaluate the impact 25OH vitamin D on early bone formation in ducks
3. Animal Welfare
  - a. Eliminate bill searing
    - i. Eliminate associated behavioral effects
  - b. Evaluate the welfare issues of minimum/maximum temperatures for market duck transportation
  - c. Evaluate the welfare issues of electrical and gas stunning in ducks
  - d. Evaluate the welfare issues of duck drinking systems – behavioral, disease prevention and environmental mgnt
  - e. Evaluate incubation temperature related leg problems in ducks
4. Genetics
  - a. Evaluate differences in genetic expression maternal effects on breast muscle quality in different strains of duck

## **PHEASANT**

1. Development of Dietary Strategies to Feed Pheasants as a Meat Bird
  - a. Most productive phase feeding systems
2. Flight Speed in Hunting Pheasants
3. Characterize and Evaluate the Flight Characteristics of Various Species of Hunting Types of Pheasants
4. Shelf-life of Further Processed Pheasant Products
5. Fertility of Hunting Stock
  - a. With addition of new males
  - b. Lighting program
6. Tail Feathering (tail feather strength)
  - a. Nutritional, management or breeding techniques to grow stronger tail feathers

## **ALL /GENERAL**

1. Avian Influenza
  - a. Control
  - b. Vaccines
  - c. Surveillance
2. Consumer Preferences/Education
  - a. Organic
  - b. Free range
  - c. What are consumer preferences and why?
  - d. Are there regional differences in preference?

- i. Morality and food issues
  - e. Are consumers open to change if they are educated about the issues?
    - i. How can we most effectively educate consumers?
    - ii. What can we do to be pro-active in educating consumers?
  - f. Should we be tailoring our production to the current fad or be thinking long term?
    - i. Is what we are doing to the animals in 'the best interest of the animals'?
- 3. Environment
  - a. With movement toward 'sustainable' agriculture and moving animals outside what will the effect be on the environment?
- 4. Nutrition
  - a. Improving soybean energy utilization
  - b. Understanding the ability to utilize fibrous feedstuffs, not just DDGS but ne co-products from milling, to reduce costs and maintain production performance
- 5. DDGS
  - a. How can DDGS be most effectively used in poultry feeds?
  - b. What can we use instead of corn since it is getting so expensive with corn going into ethanol production?
- 6. What is the Economic Impact of the Poultry Industry in the Midwest?