

**REQUEST FOR PROPOSALS**  
**National Pork Board**  
**Research Proposal Information for 2007 Funding**

***DEADLINE: Tuesday, November 28th, 2006 – 5:00 p.m. CST***

The National Pork Board is soliciting research proposals dealing with **A – Environment**, **B – Swine Health**, **C - Animal Welfare and Animal Science**, **D - Pork Safety** and **H - Environment/ Public Health**. Please read carefully the individual solicitation descriptions for project proposals. If you have questions related directly to the description of a specific solicitation, contact the staff member listed in charge of the program area. For questions on the general submission process, contact Bev Everitt at 515/223-2750.

To be considered for committee review, **all proposals must be submitted via the website by 5:00 p.m. CST on Tuesday, November 28th, 2006** (see [www.pork.org](http://www.pork.org) for links). Proposals will be reviewed by both technical advisors and pork producers prior to the committee selection meetings.

**Animal Science**

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**Animal Welfare**

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**Environment**

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**Pork Safety/Environment-Public Health**

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Or

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**Swine Health**

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**NOTES:**

Proposal selection will occur in February 2007.

Notification of grant awards will be done in March, 2007.

Project funding will begin May 1, 2007.

Requests for second-year funding must be resubmitted.

## **A. Environment**

*The Environment Committee is soliciting proposals in the following targeted areas. Consideration for funding subsequent year(s) of multi-year research efforts may be considered based upon demonstrated accomplishments of previously funded research efforts toward success of the overall research project as described in interim or final research reports and submittal of a new proposal covering the current funding requested. Funding for each project will generally be limited to not exceed **\$40,000** unless documentation of need and compelling justification for a greater amount is provided.*

*Proposals will be reviewed by panels for scientific soundness and for industry priority. Proposals may be returned to the investigator with suggested/requested revisions prior to making a final funding decision. Funding for accepted projects will follow final approval by the National Pork Board. For information regarding this solicitation, please contact Allan Stokes by Email at [AStokes@pork.org](mailto:AStokes@pork.org) or by phone at (515) 223-3447.*

Proposals are solicited in the following areas:

- 1. Ecologically sound and economically sustainable manure treatments to simultaneously reduce odor, conserve nutrients, reduce air emissions and generate renewable energy.**

Research has been done in the past on management practices and technologies to achieve single objectives of either controlling odor, controlling air emissions, conserving nutrients or creation of renewable energy sources. The focus of this effort is to investigate either through literature review of information derived from scientific literature or original research or both management practices and technologies that if employed at swine production operations could result in simultaneously achieving the multiple objectives of controlling odor, controlling air emissions, conserving nutrients and creation of renewable energy sources. This work should also address potential economic impact on producers of the practices and technologies investigated. If the proposal is to include a literature review the proposals should include a description of the proposed literature review process including the databases and sources to be queried.

- 2. Control / mitigation of odor.**

Conducting original research for developing management practices and technologies to control, mitigate or eliminate odors from swine production operations. This work should also address potential economic impact on producers of the practices and technologies investigated.

- 3. Effectiveness of vegetative wind break/buffers for capturing particles and reducing odors from swine production facilities.**

Documenting either through literature review of information derived from scientific literature or original research or both effectiveness of vegetative wind breaks or buffers in

mitigating off-site dust and odor migration from swine production operations. This work should also address the potential economic impact on producers from the implementation and maintenance of vegetative windbreaks and buffers designed for dust and odor mitigation purposes. If the proposal is to include a literature review the proposals should include a description of the proposed literature review process including the databases and sources to be queried.

**4. Alternative products from swine manure.**

Conducting original research for developing management practices and technologies to generate alternative products from further processing manure from swine production operations. This work should also address the potential markets for the alternative products and economic impacts on producers of the practices and technologies investigated.

**5. Methods for stabilizing and capturing or reclaiming nutrients.**

Conducting original research for developing management practices and technologies to capture or reclaim nutrients including nitrogen (ammonia) and phosphorous from excreted manure at swine facilities for further processing or use. This work should also address the potential economic impact on producers of the practices and technologies investigated.

**6. Technically feasible and economically sustainable methods for offsite export of nutrients.**

Conducting original research for developing management practices and technologies that can be employed on-farm for the economically sustainable exportation of nutrients from excreted manure from pork production operations for commercial or other uses. This work should also address the potential economic impact on producers of the practices and technologies investigated.

**7. Alternative uses for on-farm bio-gas other than generation of electricity.**

Conducting original research for developing management practices and technologies alternative uses for on-farm generated bio-gas other than for on-farm generation of power generated on swine production operations. This work should also address the potential economic impact on producers of the practices and technologies investigated.

**8. Energy offset savings from using manure as a nutrient source for crop production.**

Documenting through literature review of information derived from scientific literature or original research or both the extent to which swine manure has currently replaced/offset the use of commercially manufactured nutrients (nitrogen, phosphorous, potassium) and the extent to which swine manure could be used to further replace or offset the use of commercially manufactured nutrients. This should include volumes of manure used and the volumes of commercially manufactured nutrients replaced/offset as well as the market costs for those commercially manufactured nutrients. This investigation should also quantify the potential energy savings from use of swine manure to replace/offset the use of commercially manufactured nutrients. If the proposal is to include a literature review

the proposals should include a description of the proposed literature review process including the databases and sources to be queried.

**9. State of knowledge on manure application to grasses for bio-fuels.**

Documenting through literature review of information derived from scientific literature or original research or both the current state of scientific knowledge regarding the environmental impacts to water quality and land quality from land application of swine manure to lands used for growing grasses utilized in the production of bio-fuels relative to the effects of varying rates of swine manure on plant growth, plant nutrient uptake, soil nutrient content, mobility of nutrients applied and yield rates. If the proposal is to include a literature review the proposals should include a description of the proposed literature review process including the databases and sources to be queried.

**10. Alternative feedstuffs and their impact on manure nutrient quality and the environment.**

Documenting through literature review of information derived from scientific literature or original research or both the use of alternative feedstuffs, other than corn, soy beans and DDGS, in a swine feeding program for potential impacts on the character of manure excreted, the formation of odor causing compounds and the health and efficiency of the animals. This will include a comparison of each of these attributes to a program using traditional feedstuffs (corn & soy beans). This effort work also address the potential economic impact on producers of utilizing alternative feedstuffs in feeding programs. If the proposal is to include a literature review the proposals should include a description of the proposed literature review process including the databases and sources to be queried.

**11. Manure impacts of bio-fuel by-products in swine feeding programs.**

Conducting original research on the use of by-products from the formulation of alternative energy source bio-fuels including bio-fuels created from corn, soybeans and cellulose materials including switch grass, in a swine feeding program for potential impacts on the character of manure excreted, the formation of odor causing compounds and the health and efficiency of the animals. This will include a comparison of each of these attributes to a program using traditional feedstuffs (corn & soy beans). This work should also address the potential economic impact on producers of utilizing alternative feedstuffs in feeding programs.

**12. Environmental impact & economic feasibility (cost–benefit analysis) on environmental practices & technologies.**

Documenting through literature review of information derived from scientific literature or original research or both the effectiveness and costs of implementing environmental management practices and technologies for mitigating or eliminating odors at swine production operations. If the proposal is to include a literature review the proposals should include a description of the proposed literature review process including the databases and sources to be queried.

**B. Swine Health**

The Swine Health Committee is soliciting proposals on issues and conditions affecting the health of swine. Funding is \$50,000 per project. A larger funding request may be considered if appropriate justification is provided. Projects that link swine practitioners and research laboratories in field studies are especially encouraged. Research initiatives for each of the following complexes, syndromes, or pathogens should address the epidemiology of the individual agents and their interactions with other pathogens and/or proposed control or practical eradication strategies. For further information regarding this solicitation can be directed to Pamela Zaabel by email at [pzaabel@pork.org](mailto:pzaabel@pork.org) or by phone at 515/223-2791.

## 1. Porcine Respiratory Disease Complex

PRRS – PRRS-specific projects will not be considered for this RFP.

Mycoplasma -Specific priorities for mycoplasma research include the following:

- Elimination
- Diagnostics
  - Development of a quantitative diagnostic assay
  - Improvement of the currently available diagnostic reagents
  - Development of a test to measure antibody response
- Strain variability and the effect on virulence and pathogenicity
- Control
  - Management factors of the sow herd
  - Impact of passive transfer
  - Quantify vaccine effect on colonization

Influenza -Specific priorities for influenza research include the following:

- Determine role and mechanisms in PRDC
- Stability issues / New strains / What drives drift and mutations (Can vaccine be a driver?)
- Variation in pathogenicity in different isolates / Effect of herd immunity on virulence variance / What causes the varying virulence of strains in different herds?
- Role in reproductive disease? (especially the newer strains)
- Development of practitioner based diagnostics (+/- diagnostics)
- Vaccination and levels of antigenic difference
- Discovery of the shedding period in the field (Do carrier animals occur?)
  - Discovery of reservoirs of the virus (rodents, wild fowl, etc.)

Pasteurella and other Bacteria

- Quantitative epidemiology of PRDC mixed infections
  - Role of secondary bacterial components in PRDC

## 2. Breeding Herd Syndromes

Reproductive

- Influenza
- Erysipelas

## 3. Biosecurity

Research initiatives for biosecurity issues should relate each with the risk of domestic or foreign animal disease transmission into and/or within the herd. Interest in this area is

focused on the development of scientifically sound biosecurity protocols through practical field demonstrations.

#### Transmission of Domestic or Foreign Animal Diseases

- Animals/Genetic Material
- Fomites, including transmissibility through fresh or processed meat products
- Pig-free or Downtime Issues
- Feral swine

#### Cleaning and Disinfection

- Facilities/Equipment
- Transport Vehicles, Personnel, and Equipment

#### **4. Foreign Animal Diseases**

##### Diagnostic tests

#### **5. Epidemiology**

##### Domestic disease surveillance

##### Growing pig mortality

#### **6. Segregated Early Weaning Disease Issues**

##### Strep. suis

##### Actinobacillus suis

##### Haemophilus parasuis

#### **7. Emerging Diseases and Syndromes**

**Porcine Circovirus-associated Diseases- PCVAD**-specific projects will not be considered for this RFP.-

##### Hepatitis E Virus

#### **8. Enteric Disease Syndromes**

##### Post-weaning Diarrhea

- Post-weaning *E. coli*

##### Grow/Finish Diarrhea

- Salmonella
- Gastric Ulcers
- Lawsonia (Ileitis)
- Brachyspira (Colitis)
- Hemorrhagic Bowel Syndrome

### **C. Animal Welfare**

*The Animal Welfare Committee, along with the Animal Science Committee, is soliciting proposals on issues affecting the welfare of swine. Research topics are listed below in priority order. Researchers are encouraged to find matching funds and projects that are multidisciplinary in their approach are encouraged. Principal investigators are strongly encouraged to describe behavioral methodology in detail. Behavioral methods and physiological assays used in the studies need to be validated. Further enquiries can be directed to Sherrie*

*Niekamp by email [sniekamp@pork.org](mailto:sniekamp@pork.org) or by phone: 515/223-3533 or Mark Boggess by email [mboggess@pork.org](mailto:mboggess@pork.org) or by phone: 515/223-2606.*

## **C1. Sow Gestation Housing**

- C1.1** Optimize management practices for a specific sow housing system to ensure welfare and productivity.
- C1.2** Evaluate the relative production efficiencies associated with open or free-stall gestation housing facilities in integrated production systems. Directly improve the industry's ability to mitigate animal well-being concerns as well as enhance production efficiencies for pork producers by addressing industry issues relating to sow stay-ability and lifetime productivity.

## **C2. Handling / Transport**

- C2.1** Define the relationship of prolonged transport time (8 to 28 hours) with pig well-being. Management practices that promote pig well-being during long transport times should be included.
  - Weaned pigs (2-4 wks of age)
  - Feeders (10-12 wks of age)
  - Market hogs (market weight pigs)

## **C3. On Farm Euthanasia**

- C3.1** Developing criteria for timely euthanasia decision-making
- C3.2** Develop new or refine current techniques that are effective to humanely euthanize pigs.
  - For individual on-farm euthanasia
  - For mass euthanasia in emergency incidences

## **C4. Production Practices**

- C4.1** Define appropriate measures of well-being for all phases of production
- C4.2** Evaluate swine well-being during production

## **D. PORK SAFETY**

## 1. Impact of production practices on carcass defects and physical hazards.

Funding limit is **\$40,000** per project. A larger funding request may be considered if appropriate justification is given, especially for farm level trials with numerous replicates. Researchers are encouraged to find matching funds or work on collaborative projects.

- Studies to determine the impact of alternate injection methods and/or techniques (such as hip injection or needle free injection systems) on carcass defects and/or physical hazards. Studies that are representative of production system practices with the mentioned techniques are desirable.
- Studies to determine the causes of, and farm-level interventions for, carcass defects such as abscesses.

## 2. Pre-harvest reduction of food borne pathogens with potential public health significance.

Pre-harvest food safety research for the following agents or pathogens should include the areas of epidemiology, pathogenesis, prevalence, on-farm risk factor management, monitoring and measurement, and/or intervention or control strategies. Funding limit is **\$40,000** per project. A larger funding request may be considered if appropriate justification is given, especially for farm level trials with numerous replicates. Researchers are encouraged to find matching funds or work on collaborative projects. Novel approaches and concepts are encouraged even if they do not fit into a specific priority area. Salmonella research is the top priority for the industry. Specific topics of interest with regard to Salmonella are described below (please note that these are **not** in priority order):

Pre-harvest Salmonella Research:

Method development:

- Development and evaluation of cost-effective quantitative methods for enumerating *Salmonella*.
- Development and evaluation of evolving molecular, and other, diagnostic tools and monitoring techniques that can be used in epidemiological investigations.

Pre-harvest *Salmonella* interventions:

- Test the impact of *Salmonella* on-farm reduction programs on the amount of *Salmonella* arriving at the plant in the swine, on the carcass, or in the final product.
- Field studies on specific group level *Salmonella* intervention strategies (such as, but not limited to: housing, management, hygiene, transport, lairage, pig flow, other products) for reduction of *Salmonella*.

After *Salmonella*, the following issues are in industry priority order. Studies of multiple potential pathogens are encouraged and may be considered for an increase level of funding:

- Toxoplasma – specific topics of interest with regard to Toxoplasma are described below:
  - Development of management and/or facility strategies for outdoor or bedded pigs to reduce the risk of Toxoplasma.
  - Identification of previously unrecognized risk factors for infection with Toxoplasma, and interventions to address those risks.
  - Controlled studies to determine the relative contribution of water sources on Toxoplasma infection in swine and effective interventions at the producer level. This may include studies to determine the stability of oocysts in water.
- *Campylobacter*
- *Yersinia*
- Trichinae
- Other Zoonotic Pathogens

### **3. Post-harvest reduction of food borne pathogens with potential public health significance.**

Post-harvest food safety research for food borne pathogens should include the areas of prevalence, monitoring and measurement, intervention and/or control strategies. Funding limit is \$40,000 per project. A larger funding request may be considered if appropriate justification is given, especially for farm level trials with numerous replicates. Researchers are encouraged to find matching funds or work on collaborative projects. Novel approaches and concepts are encouraged even if they do not fit into a specific priority area. Specific topics of interest are described below:

- Studies to enumerate *Salmonella* before and after interventions to determine their effectiveness.
- Studies to characterize multi drug resistant (MDR) bacteria in pork and to determine their susceptibility to post-harvest interventions.
- Studies of stress adaptation and cross protection of pathogens.
- Evaluate/validation new and existing process technologies that reduce/eliminate pathogens (*Salmonella*, *Listeria monocytogenes*, *Campylobacter*) in fresh and processed pork products.

## **H. PUBLIC HEALTH**

### **1. Antimicrobial Use and Resistance**

Funding limit is **\$50,000** per project. A larger funding request may be considered if appropriate justification is given. Researchers are encouraged to find matching funds or work on collaborative projects. Novel approaches and concepts are encouraged even if they do not fit into a specific priority area.

- Studies of the pharmacology of Penicillin (Procaine Penicillin G, Potassium Penicillin G, and Penicillin G Benzathine) that would provide recommended withdrawal periods to meet Japanese maximum residual levels of 0 ppm in muscle, fat, liver, kidney and byproducts at the range of doses likely to be used in pork production and similar studies on other compounds for which there is not available data to determine withdrawals to meet the Japanese MRL (for Japanese MRL information see <http://www.pork.org/Producers/JapanMRL.aspx>).
- Studies to identify potential benefits to food safety and public health during modern pork production that includes the use of antimicrobials.
- Pilot projects or develop models for a comprehensive method to assess the animal health, food safety, environmental, and economic effects of the removal of growth promoting and herd-level use of antimicrobials in US pork production systems.
- Comparisons of antimicrobials to alternative products claiming therapeutic effects.

## 2. Zoonotic pathogens with potential public health significance

Research should include the areas of epidemiology, pathogenesis, prevalence, risk factor management, monitoring and measurement, and/or intervention or control strategies. Funding limit is \$50,000 per project. A larger funding request may be considered if appropriate justification is given. Researchers are encouraged to find matching funds or work on collaborative projects. Novel approaches and concepts are encouraged even if they do not fit into a specific priority area.

- Studies and/or risk assessments of pathogens of potential public health significance that are related to pig production and/or pork products which could include, but is not limited to, Influenza A, Hepatitis E, *Streptococcus suis*, *Clostridium difficile*, *Salmonella* and *Erysipelothrix*. It is desirable for these studies to quantitate exposure and assess potential risk.
- Studies to evaluate intervention methods to protect humans from zoonotic diseases that may be present in pork production facilities.

## 3. Occupational Health and Safety

Research should include the areas of risk management, monitoring and measurement, and/or intervention or control strategies. Funding limit is \$50,000 per project. A larger funding request may be considered if appropriate justification is given. Researchers are encouraged to find matching funds or work on collaborative projects. Novel approaches and concepts are encouraged even if they do not fit into a specific priority area.

- Studies to identify effective and practical interventions to protect the health and safety of workers in pork production facilities. This could include, but not be limited to, studies to identify potential engineering interventions that would reduce occupational exposure to hazards such as, but not limited to, noise, gases, and dust.
- Studies to identify and quantitate the potential health hazards of working in pork production facilities including a comparison of different facility types.

