NATIONAL PORK BOARD
Request for Proposals
Spring Call - 2008

DEADLINE: Tuesday, May 6th – 5:00 p.m. CST

The National Pork Board is soliciting research proposals dealing with:

A – Environment
B – Swine Health-PCVAD
C - Animal Welfare
T – International Trade

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 submission process, contact Bev Everitt at beveritt@pork.org or 515/223-2750.

STAFF MEMBERS:

Environment	**Allan Stokes**	**astokes@pork.org**	**515/223-3447**
Swine Health-PCVAD	**Paul Sundberg**	**psundberg@pork.org**	**515/223-2764**
Animal Welfare	**Sherrie Niekamp**	**sniekamp@pork.org**	**515/223-3533**
International Trade	**Steve Larsen**	**slarsen@pork.org**	**515/223-2754**
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To be considered for committee review, **all proposals must be submitted via the website by 5:00 p.m. CST on Tuesday, May 6th, 2008 (see www.pork.org for links).** Proposals will be reviewed by both technical advisors and pork producers prior to the committee selection meetings. Final funding is subject to approval by the National Pork Board and USDA.

NOTES:
Proposal selection will occur in late June 2008.
Notification of grant awards will be done in late July 2008.
Project funding will begin September 2008.
Requests for second-year funding must be resubmitted.

A. ENVIRONMENT

The Environment Committee is soliciting proposals in the following targeted areas only. Proposals *must be submitted following the attached format to be considered. Projects are funded on a one-year basis. Consideration for funding subsequent years of multi-year efforts may be considered based on 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 new 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 or by phone at (515) 223-3447.

Proposals are solicited in the following areas:

1. Quantify background concentrations of potential air contaminants in rural agricultural environments and differentiate between background levels and contributions from pork production operations. Contaminants to be studied are to include ammonia, hydrogen sulfide, methane and particulate matter. Particulate matter will look at particle sizes less than 2.5 microns, 2.5 to 10 microns and greater than 10 microns.
2. Quantify contributions and effects on outdoor air quality external to neighboring residences, schools, recreation areas and other public use areas from emissions of methane, ammonia, hydrogen sulfide and particulate matter due from pork production operations. Studies are to include contributions and effects from operations using different manure storage technology including lagoon/earthen basin, below building deep pit and above ground formed storage systems.
3. Quantify the relative contribution and water quality impacts of nutrients, hormones and common antibiotics used in swine operations to surface and groundwater water due to land application of swine manure to crop ground. The study will be based on land application of manure at agronomic rates appropriate to the crops to be grown and in consideration of the soil types and evaluate contribution and effects from both surface applied and injection land application methods.
4. Identify currently available and technologically feasible on-farm water conservation management practices and quantify their effectiveness in terms of reduction in overall water consumption on an operation. The study will also identify the economic cost for installation, operation and maintenance and the economic benefits of the conservation practices. This study will address both finishing operations and sow farm operations.

B. SWINE HEALTH-PCVAD

Introduction

It has not been unusual for clinical PMWS to be diagnosed on farms in the U.S. based on the case definition published by Sorden. (Sorden, S.D., 2000. Update on porcine circovirus and post-weaning multisystemic wasting syndrome (PMWS). Swine Health Prod. 8, 133-136.) These affected farms have historically been positive for Porcine Circovirus type 2 (PCV2).

However, an increase in the incidence of the severe form has been reported in the U.S. since the fall of 2005. Clinical signs of the more severe form of PMWS include anorexia, rapid weight loss, enlarged lymph nodes, and respiratory signs. PMWS, now referred to Porcine Circovirus Associated Disease (PCVAD), is still spreading in the United States swine population.

Scientific researchers, veterinarians, allied industry representatives, and producers met to discuss and vote on PCVAD research priorities. A summary of the meeting and ranked research priorities were published in the Journal of Swine Health and Production 15.1, 47-51. The information gathered during this meeting was used to develop the 2008 PCVAD Call for proposals.

Research Priority

The National Pork Board is calling for research proposals addressing five priority areas including Immunology, Epidemiology, Pathogenesis, Diagnostics, and Prevention and Treatment. The research priorities to be addressed in this call for proposals are outlined below. To encourage creativity and collaboration, no funding limit is being set. Full and transparent justification for budgets with proposals is expected.

1) Immunology
    a. Investigate the effect of strain variation on cross-protection and on cell mediated immunity and humoral immunity.
    b. Determine cross protection and whether immunogenic epitopes need to be conserved among different strains.

2) Epidemiology
    a. Investigate and identify factors influencing transmission:virus type, pig genetics, herd size, and production system (number of sites).
    b. Molecular epidemiology—establish a PCV2 sequence database that links strain sequence with clinical disease, infectious co-factors, management practices, chronology and geographic locale.
        i. Investigate how much genetic variation there is within a genotype
        ii. Determine if that genetic variation is also reflected as antigenic variation
    c. Develop checklists of risk factors, management approaches, and roles of other agents, cofactors, and serum therapy.
    d. Evaluate current practices
        i. Evaluate what biosecurity practices may prevent infecting a herd.
        ii. Evaluate if injections with antibiotics, vaccines, and serum therapy transmit disease.
    e. Estimate whether susceptibility, transmissibility and persistence change with age, PCV2 strain, various co-factors and management factors.
    f. Define the role of the sow herd in an outbreak
        i. In a cleanup program
        ii. Identify the criteria for determining when an unaffected farm should begin vaccination (geospatial factors, when undertaking “risky” practices, cost-benefit in an unaffected farm)

g. Define the duration of PCV2A and PCV2B infection and the ability to be transmitted when:
    i. Young pigs are infected.
    ii. When older pigs are infected.

3) Pathogenesis
    a. Develop tools for pathogenesis research, including source of PCV1-and PCV2-negative pigs (all ages), reproducible disease model, and technology to look for other agents.
    b. Determine variability in disease expression due to host variation, ie, genotype-phenotype, age-parity, management, and gender.
    c. Determine the role of PCV2 in vertical transmission:
        i. The frequency of vertical transmission
        ii. If it is constant or changing as a function of the PCV2 genotype and antibody status of the breeding herd
        iii. Semen transmission in PCVAD—viral loads and frequency and identification of contaminated semen.
        iv. Effect of sow/gilt exposure to PCV2
    d. Characterize diseases caused by PCV2 and selected co-factors:
        i. Does co-infection with specific co-factors result in a specific disease syndrome—PCVAD model systems to investigate include: PDNS, Shaker Pigs, PRDC, PMWS —agents to investigate include: PCV2A & 2B, PRRS, Teschovirus, Parvovirus, others.

4) Diagnostics
    a. Develop standardized diagnostic tools for use the diagnostic laboratories in North America. Tools and Tests include:
        i. Tissue Culture adapted PCV2a, and PCV2b,
        ii. Monospecific polyclonal and monoclonal antibody,
        iii. Standardized IFA and serum neutralization serology,
        iv.
    b. Develop protocols for monitoring boar studs and breeding herd, especially for the purpose of producer surveillance and import criteria.

5) Prevention and Treatment
    a. Investigate the relationship of maternal/passive antibody and:
        i. Vaccination interference—Determine if high levels of maternal antibody interfere with vaccination
        ii. Investigate how much antibody variation exists in the breeding herd and how this might impact maternal antibody transfer
            1. Determine if that variation is a function of parity
            2. Determine if it would be beneficial to have the same level of antibody in the breeding herd
        iii. Cross serotype/genotype infection—Investigate if maternal antibody have the same “protective” effect on PCV2A and PCV2B (i. e. does one virus get in and infect baby pigs sooner than the other one in pigs that have the same levels of passive antibody)
        iv. Determine if passive antibody against one genotype promotes infection at a younger age with the other genotype
    b. Determine vaccine efficacy in the face of PCV2 and cofactors.
    c. Determine the most facility decontamination procedures to reduce or eliminate PCV2 from the environment.

d. Investigate ability to produce PCV2 negative pigs from positive herds. If possible, determine ramification of repopulating with PCV2 negative pigs.

C. ANIMAL WELFARE

The Animal Welfare Committee is requesting proposals on issues affecting the welfare of swine; particularly on-farm euthanasia and gestation sow housing. 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 will need to describe research methodologies in detail.*** *Behavioral methods and physiological assays used in the studies need to be validated. The budget request of the proposal should be appropriate for the work that is proposed. Further enquiries can be directed to Sherrie Niekamp by email sniekamp@pork.org or by phone: 515/223-3533.*

1) **On-Farm Euthanasia** - It is inevitable that in every swine production system animals will become ill or injured in such a way that euthanasia will be necessary. Specific research topics of interest with regard to euthanasia are:
   a. Determine the necessary characteristics - such as length, velocity, diameter, etc. - of a penetrating captive bolt to ensure death for different ages of pigs
   b. Develop and evaluate new effective methods of euthanasia for each age of pig.
   c. Characterize the ballistics of firearms needed for safe and humane euthanasia.

2) **Gestational Sow Housing** - Housing of gestating sows has been and continues to be an important question for the swine industry. Specific research topics of interest with regard to housing and management of gestating sows are:
   a. Evaluate the impact that various components of the sow's physical environment – such as flooring, bedding, air quality, pen shape, resource location, etc. - have on maternal performance/efficiency, lifetime productivity and overall well-being. Determine how to optimize these various components to improve maternal performance/ efficiency, lifetime productivity and overall well-being.
   b. Develop and evaluate new and innovative alternative housing and management systems for gestating sows not currently in use in the U.S., that optimize individual well-being, management/labor, lifetime productivity and reproductive performance/efficiency.
   c. Determine ideal criteria for creating groups of sows – such as grouping by age, size, degree of relatedness, BCS, etc. - to optimize individual well-being, lifetime productivity and reproductive performance/efficiency.

T. INTERNATIONAL TRADE

The National Pork Board is soliciting research proposals to address issues affecting international trade of U.S. pork products. Solutions for PRRSv, PCv, and food borne pathogens limiting international marketing opportunities are top priorities for the industry.

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****. Specific research priorities are:*

1) **Porcine Reproductive and Respiratory Syndrome virus (PRRSv) and Porcine Circovirus (PCv)**

    a. **FRESH AND PROCESSED/CURED MEATS**
        i. How long will PRRSv and PCv at titers representative of natural infection survive and remain infectious in fresh and frozen pork products (such as hams, loins, bellies, picnics and variety meats)?
            a. Examples of factors to investigate:
                i. Time and temperature range of storage.
                    1. Temperatures of interest are:
                        a. Refrigeration (33^{O}F to 42^{O}F)
                        b. Frozen (20^{O}F to 30^{O}F)
                    2. Times of interest are:
                        a. Refrigeration (1 day to 21 days)
                        b. Frozen (1 day to 42 days)
                ii. Dose of product fed to swine after temperature/time interaction.

        ii. How long will PRRSv and PCv at titers representative of natural infection survive and remain infectious in processed/cured products (such as ham, bacon, sausage, etc.)?
            a. Examples of factors to investigate:
                i. Type of processed/cured products.
                ii. Formulation of the products.
                iii. Processing procedures which will also include time and temperatures of storage.

2) **Pathogens in variety meats**

    a. PATHOGEN CONTROL IN VARIETY MEATS
        i. What are the most effective interventions for reducing/eliminating pathogens in pork variety meats?
            1. Salmonella is the top pathogen of concern; the following pathogens are in industry priority order: Toxoplasma, Campylobacter and Yersinia.
                a. Variety meats to investigate:
                    i. Liver
                    ii. Kidney
                    iii. Heart
                    iv. Stomach
                    v. Intestine
                    vi. Bung