

SAES-422 Multistate Research Activity Accomplishment Report

Project No. and Title: NCCC-042 Committee on Swine Nutrition

Period Covered: 01-2014 to 01-2015

Date of Report: March, 2015

Annual Meeting Dates: January 7 and January 8, 2015

Participants:

Dr. Scott Carter (Oklahoma – President), Dr. Jim L. Nelssen (Kansas State University – Secretary), Michael Azain (Georgia), Samuel Baidoo (Minnesota), Thomas Crenshaw (Wisconsin), Ryan Dilger (Illinois), Gretchen Hill (Michigan), Rajesh Jha (Hawaii), Crystal Levesque (South Dakota), Phillip Miller (Nebraska), John Patience (Iowa), Marcia Shannon (Missouri)

Brief Summary of Minutes:

Annual Meeting Agenda

NCCC-042 and S-1061

January 7 - 8, 2015

Rosen Plaza Hotel – 9700 International Drive, Orlando, FL 32819

Morning Session: Wednesday, January 7, 2015

Joint Session

NCCC-042 Members present: Michael Azain, Samuel Baidoo, Scott Carter, Thomas Crenshaw, Ryan Dilger, Gretchen Hill, Rajesh Jha, Crystal Levesque, Phillip Miller, Jim Nelssen, John Patience, Marcia Shannon

NCCC-042 Members absent: Layi Adeola, Gary Cromwell, Brian Kerr, Sun Woo Kim, Chad Paulk, Hans Stein

Administrative Advisor: Neal Merchen

Guests: Charlotte Kirk Bauer, USDA-NIFA (phone); Chris Hostetler, National Pork Board; Kevin Touchette, AFIA and Ajinomoto

Introduction of officers, committee members, and guests: S-1061: Merlin Lindemann – Chair; Charles Maxwell - Vice-Chair; Crystal Levesque – Secretary; NCCC-042: Scott Carter – Chair; Jim Nelssen – Vice-Chair; Brian Kerr - Secretary

The meeting was called to order at 8:13 am by Scott Carter. Introductions of both committees followed. Merlyn Lindemann indicated that Charlotte-Kirk Baer will join us at approximately 8:30 am.

Comments from Administrative Advisors: NCCC-042: Neal Merchen: Neal provided a brief update. The big accomplishment was that the NCCC-042 project was reviewed and approved. He acknowledged Marcia Shannon for her efforts. The committee's project was favorably received and the links to the swine industry were acknowledged during the project review. It appears that all members have been added as participants to the committee with the new committee project. Sixty days after the meeting the annual report of the accomplishments must be filed.

S-1061: Nancy Cox: No new administrative advisor has been named or identified. Neal Merchen indicated that suggestions would be welcomed for the administrative S-1061 advisor.

Several station reports were given.

Program Update - NIFA: Charlotte Kirk Baer joined at 8:30 am. Charlotte Kirk Baer distributed a handout regarding USDA/NIFA activities. She highlighted changes and new staff.

A new program leader for aquaculture was hired. The budget information (distributed) is from December 4. Funding to NIFA has increased from 2014. This increase was also associated with an increase in administrative allocations. AFRI budget was increased as well.

Strategic plan: New strategic plan has become more comprehensive – includes science goals, processes, communications, and people.

Competitive Programs: New program last year – Exploratory research program (page 2 on the handout). This year the max amount will increase from \$100 to \$200,000. Charlotte Kirk Baer will be running this project and encourages individuals to submit letters of intents ASAP. Neal Merchen: NIFA just released a call for training pre- and post-graduate students working in the more traditional science areas. There is also a component of the program for undergraduate students.

NSRP-9/NANP – 5th successful year. Funded from HATCH funds. Concentrating on feed composition and animal modeling areas. Charlotte Kirk Baer described the accomplishments of the NANP specifically in regards to the modeling and feed composition committees. The NRSP-9 is under review. Some changes include: including aquaculture, and a modest increase in funding. Recruiting new members for the committees and a call for new members will go out soon. Activities: Presenting a summit in March in DC to define nutritional research priorities to support Health. Invitations will be going out shortly for the meeting. The NANP project will have a booth at IPPE meeting in Atlanta later in January.

Several station reports were given.

Break-out Sessions

S-1061

NCCC-042

Review and approval of the 2014 minutes: Motion to approve the minutes was made by Gretchen Hill; second Rajesh Jha. PASSED.

Scott Carter reviewed the committee's membership and who was not able to attend. Mississippi apparently could not get listed on the committee. Don Mahan is not on the list and the Ohio State's future participation is uncertain. Gary Cromwell is no longer participating on the committee. UK has a new faculty member that has interest in poultry and swine and may be interested in being a member of NCCC-042. Ryan Dilger will be added and Hans Stein will stay on the committee. Chad Paulk is also on the committee and will remain so.

Research Discussion - Update, review, planning, execution, publication

Gary Cromwell (via Scott Carter): Distillers paper is complete and needs some discussion added. It should be submitted this calendar year. Layi Adeola presented an abstract on the phytase work at JAM and possibly it will be developed into a full manuscript later this year.

Marcia Shannon: Distributed the results for the NCCC-042 phytase superdosing trial. Results indicate that pigs receiving treatment 5 (negative control + 3,000 FTU/kg of Ronozyme) exhibited the greatest growth performance. Pigs receiving treatment 2 (negative control – no dicalcium phosphate) had the poorest growth performance. Tommy Crenshaw suggested that the growth rate might amplify the issue(s) with the negative control poor performance. Should see a nice response to bone ash, but Ca and P as a percentage of ash should not be different among treatments. Tommy Crenshaw reviewed the phytase analysis results. All premixes were mixed at the same time and were sent out for analysis in a concentrated basis. The analysis results appear to change with respect to time, but not in a predictable pattern. There does appear to be variation (lab) according to day of analysis. John Patience suggested examining the growth response data relative to phytase additions (i.e., regression analysis). Oklahoma St. will be conducting their replicates for the phytase study this coming year.

Next steps: Submit an abstract for JAM. March 3 is the deadline for JAM abstract submission. Marcia Shannon will distribute additional results and solicit input for the JAM abstract.

Ryan Dilger (for Hans Stein) – no additional info on the phytase study.

Ryan Dilger (for Hans Stein): 45 samples of Bakery waste. All analysis are done except fiber. Hans Stein hopes to have the fibers completed in the next couple of months – results are categorized according to region.

Afternoon Session: Wednesday, January 7, 2015

Joint Session

Update: National Pork Board: Chris Hostetler, Director of Animal Science

National Pork Board (NPB) – Investment in Research: Chris Hostetler reviewed the general organization of the NPB, funding, and how NPB interacts with the State organizations. He reviewed the annual producer survey and outlined the areas defined under NPB science and technology research programs. The animal science committee is interested in all areas, but focuses on genetics, nutrition, reproduction and production. The budget for NPB 2015 will be \$83.5 million. Only about 10% of the annual budget is invested in research Science and Technology = \$7.4 million and animal science receives 19% (1.38 million) of the science and Technology budget. Sow lifetime productivity and high feed cost mitigation account for almost 60% of the animal science budget.

Animal Science Funding 2015:

Feed efficiency Research (name change from High Feed Cost Mitigation): \$400,000. Chris Hostetler solicited help with a literature review documenting the research done in collaboration with funding from this area since 2011. The RFP closed November 15, 2014. Twenty-three proposals were submitted and are currently in scientific review. Funding decision will be made by the end of February 2015.

Improving Sow Lifetime Productivity: \$575,000. It was originally outline as a 1\$ million/year project. It appears that funding is going down each year. A preliminary study was just completed and the main project will start in May of 2015.

Reducing the Impact of Seasonality on Productivity: \$250,000: Funds 3 maybe 4 projects. This was developed because producers have relatively few tools to effectively combat seasonality. Eleven proposals were submitted and are currently in review.

The 2014 Animal Science Committee Annual Report is available at www.pork.org/animalscience.

AFIA – Non-Ruminant Committee Update: Kevin Touchette, Swine Nutrition Manager, Ajinomoto: Kevin provided an overview of AFIA. AFIA represents 75% of the commercial feed industry. Top priorities: food safety, ingredient approval (AAFCO & FDA), trade promotion authority, and veterinary feed directives.

iFeeder – relatively new (existed for about 4-5 years). A Separate foundation that companies can support research (AFIA does not fund research). Research themes: Legislative and regulatory issues, feed safety, nutrition, sustainability. Funded a project in PED (NPB), NRC, FAO, Salmonella feed sampling project, CAST report (Animal feed vs. Human Food).

AFIA Research Needs (as reported by Kevin Touchette)

Feed safety (origin of disease, transport of disease)

Ingredient evaluation

Environment/sustainability

NRC education/promotion

Feeding sick pigs (general understanding, new FDA guidance policy regarding antibiotic use, etc).

Growing-finishing

Feed efficiency

Alternative feedstuffs nutrient valuation

Ideal amino acid profile

Meat/carcass quality

Feeding heavy pigs

Feeding sick pigs

Enzymes – carbohydrases specifically

Sows

Alternative feedstuffs nutrient valuation

Ideal amino acid profile

Essential fatty acids

Sow lactation model

Longevity

Mineral nutrition – both metabolic and functional needs

Phase feeding

Breeding herd feed efficiency

Discussion of J. Animal Science – changes in the review process: Tommy Crenshaw

Tommy Crenshaw distributed the old and new Journal of Animal Science editorial structure. He reviewed the new structure and discussed the review process. The new structure will help facilitate the review process and shorten up the review time. Section editors will not be required to spend a great deal of time of editing (spelling, grammar, form, etc). Review process: In some instances it is difficult to get reviewers. There is a declining pool of reviewers – this is problematic inasmuch as the number of paper submissions is increasing.

The review process appears to be an issue in some instances and papers may be getting rejected for criteria that are not listed in the guidelines for accepting/rejecting manuscripts.

Key issues brought forth:

Inconsistency and incompetency of reviews

Turnaround time of the review

Training of reviewers

The meeting was adjourned at 5:03 p.m.

Morning Session: Thursday, January 8, 2015

Breakout sessions

NCCC-042

Committee Business meeting: Meeting was called to order at 8:11 am by Scott Carter

Election of officers for the next year: Rajesh Jha was nominated for secretary by Tommy Crenshaw, Jim Nelssen moved nominations cease; Sam Baidoo seconded. The nomination was unanimously supported by the committee. Jim Nelssen will move up to chair and Brian Kerr as Vice-Chair for the 2016 meeting.

Continue and finalize discussions on research plans for the coming year

Possibly 2 abstracts for submission (bakery waste analysis and phytase superdosing experiment). The metabolism subcommittee does not have any plans for studies. May need to wait to see the final results for the superdosing experiment before additional plans can be made. Tommy Crenshaw: Is there a quick assay procedure that can determine nutrient availability at the feed mill? Gretchen Hill: Is there a follow up with the superdosing study, e.g., a product comparison? Ryan Dilger: Is there any way we can follow up on the questions with the phytase assay? Tommy Crenshaw: What do we do with the Ca:P ratio and phytase addition? Scott Carter: 1. Follow up source study, 2. Follow up with Ca:P ratio. 3. Follow up with current study.

Scott Carter (follow up on the superdosing study): Positive control, negative control, negative control with phytase (3 levels of Ca:P). This looks like a possibility. Interested stations: Minnesota, Nebraska (possible), Georgia, Michigan State, Missouri, Illinois, Wisconsin. Marcia Shannon will develop a proposal

Marcia Shannon: There is very little data available to estimate nutrient (amino acid requirements) for “heavy pigs.” Sam Baidoo – the response will depend highly on the genetic background of the pigs. Feeder space is also a critical issue.

Sam Baidoo and Marcia Shannon will develop a proposal.

Joint Session

Dates for next year's meetings: Wednesday January 6 and Thursday January 7. Lodging for the 5th and 6th.

Update on S-1061: Eric van Huegten will be the new secretary

NCCC-042: Rajesh Jha is the new secretary

S-1061 no new projects. They are conducting a Cu sow study. If interested contact Merlin Lindemann to acquire the protocol and(or) Cu premixes.

NCCC-042 – Scott Carter reviewed the publications/activities for the committee. Once the phytase data are complete another study investigating the Ca:P ratio with phytase addition will be developed. Gretchen Hill asked (informally) if members would be interested in a quick study to elucidate if there are difference for heavy pigs for requirements, i.e., 10, 12, and 14% CP.

Completed stations reports:

A special thank you to the National Pork Board for covering registration costs. Also, a thank you to Joel Brendemuhl for his efforts to line up arrangements at the hotel for lodging and the meeting.

The meeting was adjourned at 11:49 a.m.

Accomplishments:

Accomplishments since last approval:

A. Completed and initiated the following studies:

1. Completed: Digestible P requirements of growing pigs (Coordinated by Dr. Adeola) .
2. Initiated: Superdosing of phytase for nursery pigs (Coordinated by Dr. Shannon)
3. Initiated: Bakery by-product variation survey.

B. Met jointly with the Southern Regional Sow Nutrition Committee (S-1061) to discuss research topics of common interest.

- C. A representative from the American Feed Industry Association (AFIA) and National Pork Board has been invited every year since 2006 to propose and discuss research priorities in the feed industry. This led to exchange of ideas between the industry representative and the committee members.
- D. Dr. Cromwell is preparing a manuscript on the effect of phasing of distillers dried grains with solubles on grow out performance. Dr. Adeola is preparing a manuscript of the superdosing phytase for nursery pigs experiment.

Impacts:

- A. Coordinated research studies among participating stations using common protocols.
- B. Provided essential opportunity for communication and co-ordination among swine nutritionists at Land Grant Universities, leading not only to joint NCCC-042 projects, but other collaborations as well.
- C. Met annually since 2006 to exchange information and ideas. Met jointly with S-1061 committee during this same period.
- D. Published research articles based on joint research in the Journal of Animal Science and submitted information the key extension and industry publications such as the National Hog Farmer to ensure dissemination of research results to a broad audience.
- E. Invited the National Program Leader – Animal Production Systems – USDA –National Institute of Food and Agriculture (USDA-NIFA) in 2015 9 (joined by teleconference) to provide an update and discuss the current research, education and extension priorities.
- F. Committee members are actively involved in the National Animal Nutrition Program.
- G. Majority of the 10-member NAS-NRC Swine Nutrient Committee are members of NCCC-042 committee.
- H. Members are active in American Society of Animal Science Editorial Board (Division, Section Editors and Board Members) and in regional and national meetings as speakers and coordinators.

Publications:

Mahan, D. C., Azain, M., Crenshaw, T. D., Cromwell, G. L., Dove, C. R., Kim, S. W., Lindemann, M. D., Miller, P. S., Pettigrew, J. E., Stein, H. H., van Heugten, E. 2014. Supplementation of organic and inorganic selenium to diets using grains grown in various regions of the United States with differing natural Se concentrations and fed to grower–finisher swine. *J. Anim. Sci.* 92:4991–4997.

Adeola, O., M. J. Azain, **S. D. Carter**, T. D. Crenshaw, M. J. Estienne, B. J. Kerr, M. D. Lindemann, C. V. Maxwell, P. S. Miller, M. C. Shannon, E. van Heugten, NCCC-042 and

S-1061. 2014. Digestible phosphorus requirement of 20-kg pigs – A cooperative study. J. Anim. Sci Vol. 92, E-Suppl. 2:222.

Joint research projects developed with common research protocols and conducted at the multiple research stations has resulted in manuscripts being prepared for submission to the Journal of Animal Science:

1. Withdrawal of distillers dried grains with solubles on belly fat composition in finishing pigs (Coordinated by Dr. Cromwell).
2. Superdosing of phytase for nursery pigs (Coordinated by Dr. Adeola)