

MINUTES
NCCC-42 SWINE NUTRITION COMMITTEE
Rosen Plaza Hotel, Orlando, Florida
January 3-4, 2008

Chair: Sung Woo Kim
Department of Animal Science
North Carolina State University, Raleigh, NC 27695

Vice-Chair: Layi Adeola
Department of Animal Sciences
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Secretary: Michael Azain
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Administrative Advisor: Neal R. Merchen, Head, Dept. of Animal Sciences,
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CSREES Representative: Charlotte Kirk Baer, National Program Leader, Animal Sciences,
USDA-CSREES, 3440 Waterfront Center, 800 Ninth St., S.W.
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NCCC-42 Members Present:

Michael Azain (GA), Neal R. Merchen (IL, Administrative Advisor), Hans H. Stein (IL),
Olayiwola Adeola (IN), Jim L. Nelssen (KS), Gretchen M. Hill (MI), Phil S. Miller (NE),
Don C. Mahan (OH), Scott D. Cater (OK), Sung Woo Kim (NC), Gary L. Cromwell (KY),
Sam Baidoo (MN),

NCCC-42 Members Absent:

Debra Aaron (KY), Tom D. Crenshaw (WI), Jim E. Pettigrew (IL), Xingen Lei (NY),
Marcia C. Shannon (MO).

Invited Participants:

Dr. Jim Sullivan (International Ingredient Corporation, St Louis, Mo; representing AFIA),
Dr. Qingping Liu (International Ingredient Corporation, St Louis, Mo, guest), Dr. Brian
Kerr (USDA-ARS, Ames, IA; guest, to become member in 2009), Dr. Gustavo de Lima
(Embrapa, Concordia, Brazil, guest, to become member of S-1012 in 2009)

S-1012 Members Present:

Lee I. Chiba (AL), Charles V. Maxwell (AR), Joel H. Brendemuhl (FL), C. Robert Dove
(GA), Nancy Cox (KY, Administrative Advisor), Merlin D. Lindemann (KY), L. Lee

Southern (LA), Eric van Heugten (NC), Allen Harper (VA), Alan Mathew (TN, Department head monitor).

S-1012 Members Absent:

J. Scott Radcliffe (IN), Jose A Cuaron (INIFAP), Ronald A. Fleming (KY), Miguel Cervantes-Ramirez (Univ. of Baja; MX), Mark Estienne (VA)

Thursday – January 3, 2008

Joint Session

(8:00 a.m.) The joint session of the NCCC-42 and S-1012 committees opened with a welcome and introductory remarks by Dr. Sung Woo Kim. Officers for NCCC-42 are Dr Adeola, Vice-Chair and Dr. Azain, Secretary. Dr. Dove introduced the officers from S-1012: Dr. Dove, Chair, Dr Lindemann, Vice-Chair, and Dr Radcliffe, Secretary. Dr Dove took minutes in Dr Radcliffe's absence.

Comments from the Administrative Advisor(s)

Dr. Neal Merchen (NCCC-042) welcomed everyone. The NCCC-042 project is up for renewal and so this is a writing year for the committee. The current project expires in September of 2009. The new proposal should be submitted by December 1, 2008 in order to have the new project in place by September of 2009. The current project was initially approved for 3 years, but was extended to 5 years. The main criticism of the last review was that the project looked like more of the same work that the group had done previously. It had also been recommended that the committees merge. The new proposal needs to reflect the new direction of the committee. The committee needs to identify the primary writers for the new proposal at this meeting. Dr Merchen reminded the officers that the meeting report needed to be filed within 60 days of the meeting. The officers were urged to write and circulate the minutes as soon as possible.

Dr. Merchen reminded the group of the passing of long time NCCC-042 member Tim Stahly in February of 2007. Dr. Cromwell made a motion that the committees observe a moment of silence to honor Dr Stahly. The group did so. Dr Cromwell then gave an update on the efforts to establish a memorial for Dr Stahly. He has been in contact with Dr Meghan Wulster-Radcliffe at ASAS. Materials were being express mailed to the hotel and options for the committees to support the memorial would be discussed later in the meeting. There was a motion for members of both committees to contribute to the memorial gift that would be coordinated by Dr Cromwell; the motion was unanimously approved.

Dr. Merchen also introduced Dr Brian Kerr from the USDA-ARS lab in Ames, Iowa. Dr Kerr will be added as a member of NCCC-042 for 2009.

Dr. Merchen discussed a report from the Food and Agricultural Education Information System (FAEIS) documenting the continued decrease in graduate students in the Animal Sciences. The number of M.S. and Ph. D. students has decreased 10-15% in the last 2 years. This is a significant concern to AFIA and will be discussed later in the meeting. The group discussion that followed tried to identify some reasons for the decline. These include decreased funding, decreases in the number of students interested in graduate education and decreases in the number of faculty.

Comments from the Department Head Monitor:

Dr. Alan Mathew (department head monitor for S-1012, TN) greeted the group and expressed his appreciation for the work and dedication of the committees.

Station Reports I:

Drs. Stein, Nelssen, Miller, van Heugten, Brendemuhl, Harper, and Maxwell highlighted current research efforts and other developments of interest from their respective stations.

Comments from CSREES Representative

The CSREES representative, Charlotte Kirk Baer, updated both committees on activities related to the Federal budget and USDA. The budget was signed in December and is similar to last year. The Farm Bill was extended through March of 2008. There are House and Senate proposals to reorganize USDA science agencies into an Institute for Food and Agriculture.

Baer provided handouts with personnel updates within CSREES and NRI Grant Program submission dates. Drs. Larry Miller and Basil Eastwood have retired from CSREES. A new position has been created and will be advertised to recruit someone knowledgeable in adaptive animal agriculture. This position will coordinate various animal programs including contemporary issues in animal production such as organic foods and environmental issues within the agency. The NRI Growth and Nutrient Utilization program proposals are due June 8, 2008. There is \$4.5 million in funding this year. Last year, 14% of the proposals submitted were funded.

Baer discussed interactions CSREES has with stakeholder groups. One example is the USDA funding for the US Pork Center for Excellence Swine School. Other areas of interest include providing support for a workshop to address the future of animal nutrition, particularly in light of the FAEIS report documenting the decrease in graduate enrollment. USDA CSREES has an interest in supporting the publication of the "NRC Nutrient Requirements" series, but it is unlikely that sufficient funding will be available through USDA alone. This topic will be discussed again later in the meeting.

The meeting adjourned for a break at 9:50.

NCCC-42 Committee Session

The NCCC-42 session convened at 10:10 a.m. with presentation of updates on studies in progress.

Nursery-Grow-Finish Sub-Committee:

Dr. Mahan updated the committee on completed projects. The B-vitamin paper was published in the Journal of Animal Science (85:2190-2197) in 2007. The work clearly demonstrates that in the finishing phase: 1) the indigenous B vitamins in corn and soybean based diets are adequate to

meet the requirements, 2) the NRC likely overestimates the requirements and 3) that excess amounts are not needed. Discussion from the group followed. There may be a need to determine the B vitamin requirements at various growth stages, particularly in grow-finish. The difficulties in measuring indigenous vitamin content were also discussed.

Dr Hill also reminded the committee of the publication of the lysine for nursery pigs study in the Journal (85:1453-1458, 2007).

Dr Cromwell updated the committee on the DDGS study that is underway. There are 10 stations participating. Pigs will be fed 0, 15, 30 or 45% DDGS from 30-40 kg to 120 kg. Representative pigs from each treatment at each station will be processed and the effect of diet on the fatty acid profile in adipose tissue will be determined. The DDGS used is from a single source. National Pork Board is providing partial support (\$52 k) for the project. There was discussion as to conduct of a belly firmness determination and the need to standardize the test across stations. Several stations have started the trial and have pigs on test. Others will start shortly.

Dr Stein presented a proposal developed by Dr Pettigrew that will evaluate the effect of diet acidification in the nursery on growth performance. Dr Pettigrew has submitted the proposal to the National Pork Board for funding. The objective is to determine if there are beneficial effects of diet acidification under typical U. S. conditions. There are 6 treatments in the proposal as it was written: 1) control, 2) 0.1% phosphoric, 3) 0.2% phosphoric, 4) 1% organic, 5) 2% organic and 6) 0.1% phosphoric and 1% organic. All diets would contain antibiotic (Mecadox) and zinc oxide in the first 2 phases. There was some discussion as to whether antibiotics should be included. It was suggested that a 7th treatment be added that has no acidifier but has antibiotics. The industry is currently using both antibiotics and acidifier and the purpose is to determine if acidification has a benefit under conditions in the industry. It was agreed that both zinc oxide and antibiotics should be left in and that a 7th treatment would be added. Treatment 7 would be diet 6 with no antibiotics or zinc oxide. It was also agreed that all stations should use Mecadox. Michigan State's feed mill cannot mix Mecadox into diets, so diets for Michigan State will be prepared at Ohio State. There were 11 stations that indicated they would participate (OH, KS, MI, IN, NC, GA, MN, OK, IL, NE, KY).

Nutrient Metabolism Subcommittee:

Dr Stein updated on projects. The P digestibility manuscript needs to be re-written. There has been no action on Ca digestibility project discussed last year.

Sow Subcommittee:

Dr Baidoo indicated that the committee had not met. The subcommittee will develop some ideas and report back to the full committee. Projects from NCCC-042 need to be different than those in S-1012. The project proposed last year by Dr Stahly was not funded and so no further development has occurred.

Some general discussion on potential sow projects followed. One proposal could be to evaluate 1x

vs 2x feeding in gestation. Both groups would be fed the same diet and same amount. Dr Baidoo indicated that there was a paper in JAS (Holt et al., 84:946-955) that found no effect of feeding frequency on sow performance. A second potential project would be to evaluate the use of DDGS in sow diets.

Previously, the NCCC-042 committee had agreed to focus their sow research on more basic areas. However, basic projects generally have low participation. There was a motion to open research to applied or basic areas that was unanimously approved.

Other potential areas of research were discussed. The issue of fiber in sow diets, time of vaccination relative to farrowing, and nutritional management of different parities were discussed. The sow subcommittee will develop proposals for next year and have something to present at the next meeting.

The meeting adjourned for lunch at noon.

Joint Session

The joint session convened by Dr Dove at 1:10 p.m. There was a short discussion of potential meeting dates for 2009. Based on anticipated teaching schedules, the first choice given to Dr Brendemuhl was Jan 6-7.

Dr Cox, administrator for S-1012, thanked the committees for their efforts and pointed out that the joint meetings had been occurring continuously since 1995 (The first joint meeting was in 1993. The NCR-42 met separately in 1994.).

Station Reports II:

Drs. Azain, Dove, Hill, Chiba, Cromwell, Lindeman and Lima highlighted current research efforts and other developments of interest from their respective stations.

Nutrient Requirements of Swine: The NRC and Beyond

Charlotte Kirk Baer made a presentation to the group on the value and status of nutrient requirement publications and noted that a number of organizations have highlighted the need to revise several of the species publications. She explained the mission and role of the National Research Council has been to monitor and report advances and to provide updated recommendations for the feeding of various livestock and research animal species, but funding these activities has become a challenge. Neither USDA nor FDA has enough discretionary funds to support a new guide. The estimate from the NRC is that each publication costs approximately \$400,000. She reminded the group that a 2002 review of the Committee on Animal Nutrition (CAN) reported that the primary users of the guides wanted updated revisions, but were not willing or able to pay the cost for such efforts and it was not likely that sufficient funding could be secured from external sources to keep the series viable. The review done at that time indicated that the report series could be self-supporting; however, it is not clear that a completely self-supporting

framework has been developed today. The USDA and FDA stakeholders are asking for action on the part of the agencies to assume greater responsibility for developing nutrient requirement recommendations. The agencies have limited funds that could potentially be directed toward a modified process.

Various means to fund the NRC effort were discussed. A key factor is the NRC policy that dictates a specific limit on the amount of funding that can come from private, financially interested sponsors (e.g. industry). The previous Swine NRC publication took 2-3 years to complete with 8 committee members. On behalf of the 2 committees, Dr. Adeola commended the efforts of Charlotte Kirk Baer and thanked for her interests and support of this important undertaking. This was followed by a round of applause for Baer. Charlotte asked for volunteers to serve as contacts for future communications, and Gretchen Hill, Gary Cromwell, Robert Dove, and Lee Southern volunteered.

Remarks by AFIA Swine Subcommittee Representative

Dr. Jim Sullivan, current president of AFIA attended the meeting and made the presentation. Dr. Sullivan works for International Ingredient Corporation (IIC), based in St. Louis. The company specializes in byproduct recycling from the food and beverage industry. They have 160 employees and \$100 M in sales, primarily to the swine industry. He described a few of their products, as well as some other activities that IIC has become involved in.

He then made a presentation on AFIA. AFIA is celebrating its 100th anniversary this year and represents about 560 companies, these companies account for over 70% of the feed industry. Results of surveys asking the AFIA non-ruminant working group and the swine integrator nutritionists to list Swine Industry Research Priorities were presented. From the AFIA group, “alternative ingredients” was the top priority for nursery, grow/finish and sow research areas. Integrator nutritionists priorities and concerns were similar. Dr. Sullivan provided the committees with copies of his presentation. (An electronic version was sent by Dr. Merchen several days after the meeting.)

Station Reports III:

Drs. Adeola, Southern, Carter, Baidoo, and Mahan highlighted current research efforts and other developments of interest from their respective stations.

Dr. Mahan presented an update of the NCCC-042/S-1012 Se project. Dr Mahan distributed data tables and led a discussion of the results.

Dr. Dove adjourned the session at 5:35.

Friday - January 4, 2008

NCCC-42 Committee Session

NCCC-42 Committee Business Meeting

(8:00 a.m.) Dr. Kim opened the business meeting. Dr. Cromwell moved and Dr. Miller seconded a motion to approve last year's meeting minutes. The motion was passed unanimously. The chair in 2009 will be Dr. Adeola, with Dr. Azain as the vice-chair. There was discussion as to whether Dr. Kerr could serve as secretary since he was not yet a member. Dr. Merchen indicated that this would not be an issue and that the Experiment Station Director in Iowa can add Dr Kerr. Dr. Kerr was nominated and voted in as secretary for 2009.

There was some discussion as to how members that miss meetings should be handled. It was agreed that after 3 consecutive missed meetings that administrative advisor would contact the individual to confirm their interest in the committee and if necessary to find an alternate.

Dr. Cromwell discussed information received from ASAS on the Stahly fund. Funds collected will be used for a one-time symposium or to support an endowment for student travel to ASAS meetings. The NCCC-42 committee will make contributions to Dr Cromwell who will present the total to ASAS as a gift from the committee. Dr Cromwell offered to contact absent and former members for contributions.

The business meeting was concluded at 8:30 and there was further discussion of research projects.

New Research Proposals

Members of the S-1012 committee will be invited to participate in the diet acidification study. The sow committee will discuss research options, develop a proposal and distribute to the committee.

Last year's meeting minutes indicated that a "technical note" would be developed that summarized the results of the vitamin / trace mineral nursery study. The status of the manuscript is not known.

Dr Stein had distributed a draft manuscript summarizing the phosphorus digestibility in monocalcium phosphate last year and asked for comments. He is currently working on the revisions.

Last year a protocol for a calcium digestibility determination in limestone was presented. The objective is to determine the apparent total tract digestibility of calcium. The design was discussed further. Members of the committee discussed the importance of having a limestone source with defined trace mineral content. The appropriate Ca:P ratio and the need to utilize purified diets were discussed. Dr. Stein will update the protocol and distribute for review. The goal is to start in 2008.

Dr. Mahan will present the results of the selenium study in the joint session. His plan is to begin

preparation of the manuscript as soon as possible. He agreed to prepare an abstract for the ASAS summer meeting.

The design for a gestation phase feeding trial was discussed. This would be a two treatment study (control vs phase feeding). The focus of phase feeding would be on protein and energy. The objective is to determine if phase feeding improves piglet survival and sow productivity. The control group would receive the gestation diet until moved to the farrowing house. The phase-feeding group would be fed the lactation diet beginning on day 90 of gestation and continuing through weaning. The lactation diet would be fed at the same intake level, but would be expected to have a greater crude protein and energy density than the gestation diet. Birth and weaning weights of individual pigs would be obtained. There was some discussion of the best time to obtain sow body weight (after farrowing and at re-breeding). Data collection would also include subsequent litter size. There was discussion as to whether the study should include 3 farrowing groups or be conducted over 2 parities with sows maintained on the same treatment. Common diet composition and common premixes will be used across all stations. The sow sub-committee will prepare a protocol and distribute prior to the Midwest ASAS meeting in March.

The project re-write was discussed further. The new proposal will be due 12/1/08. Dr Cromwell coordinated the last re-write, which was initially approved for 3 years and extended to 5. Dr Merchen has a copy of what was prepared in 2003 and approved in 2004. Dr Merchen emphasized that the objectives for a coordinating committee are broader than for other types of projects. The purpose and objective of the sub-committees should be detailed. The project does not need to outline specific studies that will be conducted.

Dr Adeola will take the leadership role for the re-write. Drs Azain and Kerr will assist. The previous project will be used as a template. Other points to be emphasized are: 1) the constant and ongoing interaction with S-1012, the joint meetings as an example; 2) the interaction with AFIA and CSREES; 3) the input that the committee receives from the swine industry (AFIA survey represents 70% of pigs in the U.S.)

In separate issues, the committee agreed to forward future meeting dates to Dr Sullivan in the hopes that the AFIA Swine Sub-committee may also be able to hold their meeting at the same time and place in Orlando.

Joint Session

(10:40 a.m.) The joint session convened at 10:40 a.m. Projects from NCCC-042 were discussed first. Dr Stein outlined the nursery diet acidification study. Dr Maxwell (AR) indicated he would participate.

Dr Cromwell outlined the ongoing DDGS trial. Dr Baidoo mentioned that there would be a protocol forthcoming on the gestation phase feeding trial.

The S-1012 committee projects were then presented. This committee is writing a new project. The sow low crude protein study will start by July 1, 2008 with Dr Brendemuhl coordinating. The other new projects are: 1) organic minerals in gestation and lactation, 2) Appetin in lactation and

3) copper in lactation.

It was agreed that next year's meeting would be on Tuesday January 6th and Wednesday January 7th, with travel to the meeting on Monday the 5th. Room rates will be \$100.

Dr Cromwell indicated that \$620 had been collected from the 2 committees.

Dr Kim updated the committees on the upcoming symposia at the ASAS summer meeting. Dr Hill is an invited speaker for the mineral symposium and Dr Mahan the oxidative stress symposium. Dr Cromwell will make a presentation on the most significant contributions to Swine Nutrition in the last 100 years. He would appreciate input on ideas for the presentation. Dr Kerr updated the committees on the status of the Iowa State positions.

The joint committee expressed appreciation to Drs Kim and Dove for their efforts at organizing and chairing the meeting and to Dr Brendemuhl for his efforts to coordinate with the hotel.

The meeting adjourned at 11:25 a. m.

Respectfully submitted by
Michael Azain
2008 Secretary, NCCC-42