

National Research Support Project-9 National Animal Nutrition Program

Midterm Report

EXECUTIVE SUMMARY

The work of National Research Support Project-9 (NRSP-9), National Animal Nutrition Program) was initiated in 2010 and has been established with a solid foundation and thoughtful planning for the future. The project's numerous accomplishments and impacts during its short existence are outlined briefly below. Specific detail is provided in the sections that follow this Executive Summary.

Year 1: 2010-2011

Activities: Several meetings of the administrative advisors and project personnel took place to extensively revise and tailor National Research Support Project-9 (NRSP-9) to be commensurate with the budget provided. Meetings were held with staff of the National Academies to outline potential collaboration. Project planning was turned toward the priority of developing a structure that would allow and encourage leveraging of financial, technical, and scientific resources.

Accomplishments: The project was refined, reduced in scope, and focused on the most immediate national critical needs in animal nutrition: coordination of responses to national animal nutrition issues, consolidation and updating of feed composition information, and improved accessible tools for modeling nutrient requirements and performance. The National Academies agreed to collaborate on the project and work with NRSP-9 to enhance the efficiency and effectiveness of the process for developing the "gold standards" for animal nutrition, which are used by researchers, educators, regulators, and industry. Working in close coordination with the National Academies' National Research Council toward mutual goals in animal nutrition, \$150,000 was leveraged from industry sources (e.g., American Feed Industry Association, National Pork Board, and several corn growers associations) and government (i.e., FDA) in support of nutrient requirements and modeling technologies to advance swine research.

Impacts: A forum for national collaboration and resource sharing was developed that was previously lacking. As a result, NRSP-9 leveraged funds from the National Academies to create the only functional, nationally coordinated approach to support animal nutrition research, modeling, and feed data efforts.

Year 2: 2011-2012

Activities: Nominations for membership were widely solicited, reviewed, and a diverse membership representing three of four regions was appointed to the Coordinating Committee. During 2012, the Coordinating Committee held one in-person meeting and two teleconference meetings. Nominations were widely solicited, reviewed, and diverse memberships were appointed to the Feed Composition and Modeling Committees.

Accomplishments: Three new NRSP-9 committees were appointed. Goals and objectives were defined for each of the committees. Specific charges to the feed and modeling committees were developed. Extensive networking was accomplished by meeting with organizations of similar and complementary interests to strengthen NANP's network of contacts and ability to leverage potential resources. Working in close coordination with the National Academies toward mutual goals in animal nutrition, over \$150,000 was leveraged from industry sources (e.g., American Feed Industry Association IFEEDER foundation, and various associations) in support of nutrient requirements and modeling technologies to advance beef research.

Impacts: NRSP-9 is now recognized as the national public forum and key source of expertise in supporting the national animal nutrition research agenda. As such, NRSP was invited by the International Life Science Institute (ILSI) to participate in a workshop to identify and address topics related to plant composition from a scientific perspective to bring together experts in animal nutrition with plant breeding and crop composition from all over the world. NRSP-9 also has been welcomed to work with ILSI's Crop Composition Database Working Group. Finally, the reach of NRSP-9 extends beyond national boundaries with requests from and interactions with representatives of organizations in China (i.e., Director of the Ministry of Agriculture Feed Industry Center in Beijing China and professor at China Agricultural University) and Europe (i.e., French National Institute for Agricultural Research, [INRA], the French Agricultural Research Center for International Development, [CIRAD], French Association for Animal Production [AFZ] and the Food and Agriculture Organization of the United Nations [FAO]) to invite collaboration and complementary efforts.

Year 3: 2012-2013

Activities: The Coordinating Committee held two teleconference meetings. Each of the modeling and feed committees held one in-person meeting and one conference call meeting.

Accomplishments: Deliverables and timelines were defined for each of the committees. An NRSP-9 website has been created (see <http://www.ca.uky.edu/nrsp-9>).

Impacts: Two authoritative nutrient requirement models, which were previously of limited use to the research community, have been corrected and recompiled into readily accessible formats so they may now be used as the research support tools that they were designed to be.

OVERVIEW

Below are specific details on the work of the NRSP-9. Included are committee membership rosters of the Coordinating Committee, the Feed Composition Committee, and the Modeling Committee, a detailed overview in chronological order on the activities of these committees and minutes of all meetings of the committees.

NRSP-9 Committee Rosters

Coordinating Committee

Gary Cromwell, Chair, University of Kentucky – swine nutrition
Jack Odle, North Carolina State University – swine nutrition
Michael Galyean, Texas Tech University – beef cattle nutrition
Mark Hanigan, Virginia Tech and State University – dairy cattle nutrition
William Weiss, The Ohio State University – dairy cattle nutrition
Todd Applegate, Purdue University – poultry nutrition
Don Beitz, Iowa State University – nutritional biochemistry
Mary Beth Hall, ARS and the University of Wisconsin – dairy cattle nutrition

Feed Composition Committee

Phil Miller, Chair, University of Nebraska – swine nutrition
Ryan Dilger, University of Illinois – swine nutrition
Mark Nelson, Washington State University – beef cattle nutrition
Alexander Hristov, Pennsylvania State University – beef and dairy cattle nutrition
Vinicius Moreira, Louisiana State University – dairy cattle nutrition
Normand St-Pierre, Ohio State University – statistics
Bill Dozier, Auburn University – poultry nutrition
Bill Weiss, Ohio State University – dairy cattle nutrition
Mary Beth Hall, USDA/ARS and University of Wisconsin – dairy cattle nutrition

Modeling Committee

Mark Hanigan, Chair, Virginia Tech University – dairy cattle nutrition
Mike VandeHaar, Michigan State University – dairy cattle nutrition
Luis Tedeschi, Texas A&M University – beef cattle nutrition
John McNamara, Washington State University – ruminant nutrition
Kees de Lange, University of Guelph – swine nutrition
Nathalie Trottier, Michigan State University – swine nutrition
Bill Roush, Pennsylvania State University – poultry nutrition (later resigned)
Roselina Angel – University of Maryland – poultry nutrition
Ermias Kebreab – University of California-Davis – nutrition modeling

NRSP-9 Activities

Year 1 12/1/10 to 9/30/11

Following approval to fund the project at one-half of the amount requested, most of the first year was spent in revising the project in order to reduce the 7 original committees to 3 revised committees. In addition, a meeting was held with members of the Board on Agriculture and Natural Resources (BANR) of the National Research Council (NRC) of the National Academies in Washington DC in an attempt to involve the NRC in the project.

Year 2

10/1/11 to 9/30/12

After the revised project was approved, announcements were posted on the FASS web site and letters were sent to chairs of Animal, Dairy, and Poultry Science Departments to inform members of the three professional societies of the project. People who were interested in serving on one of the three committees were asked to apply. Approximately 50 people sent e-mails or letters indicating an interest. They were then asked to submit a letter of application, a current CV, and a letter of recommendation. Twenty people responded.

Project leader Gary Cromwell, Administrative Advisors Nancy Cox and Bret Hess, and NIFA National Program Leaders Charlotte Kirk Baer and Steve Smith met with BANR Director Robin Schoen, and several other members of the BANR committee of the National Academies in October, 2011, to discuss how the two groups could work together to enhance the production of the NRC's Nutrient Requirement Series and address issues of national concern dealing with animal nutrition.

In the spring of 2012, the Coordinating Committee was appointed by the Administrative Advisors of NRSP-9. The committee consists of representatives from three of the four regions with backgrounds in beef cattle, dairy cattle, swine, and poultry nutrition.

Several attempts were made to have a face-to-face meeting of the newly appointed Coordinating Committee along with NRC and NIFA personnel. After several attempts, we were finally able to get a majority of the committee together in Washington DC on June 11-12, 2012, for a 1-day, noon-to-noon meeting. The purpose of this initial meeting was to familiarize the committee members with our proposed activities and responsibilities, to develop and refine charges for the Feed Composition Committee and the Modeling Committee), and to identify people with expertise in feed composition and modeling to serve on these two committees. The committee considered people who had applied, but also considered others who had not applied but who were considered as experts. Attempts were made to have representatives from each of the regions, to have members with background in the four major species, and to have young, upcoming scientists as well as mature scientists with abundant experience. In addition, we invited several outside groups from the modeling industry and feed industry to meet with us and give brief presentations (see minutes of the meeting) on how we might interact with the industries. Following the meeting, candidates for the Feed Composition and Modeling

Committees that were recommended by the Coordinating Committee were circulated to the Administrative Advisors for their approval and official appointment.

Year 3
10/1/12 to 9/30/13

Overview of First Three Months of Year 3

Much activity occurred during the first three months of Year 3. The Coordinating Committee had two conference calls (minutes follow), the Feed Composition and Modeling Committees held their first meetings in Chicago and Detroit, respectively, and both of them are actively pursuing their charges given to them by the Coordinating Committee (minutes follow). A web site for NRSP-9 has been established (see <http://www.ca.uky.edu/nrsp-9/>) which gives the membership, activities, and deliverable of the three committees. A few links have been established and more will soon be forthcoming. The modeling committee has corrected the NRC's beef and dairy models and they are now posted on the web site. The feed composition committee has begun to develop a data base of commonly use feeds that will eventually be used by the NRC in their publications. Plans are underway to make presentations of NRSP-9 at meetings of the professional societies. A policy was established by the Coordinating Committee for approving requests for funding of NRSP activities.

NRSP-9 Committee Meeting Minutes

Minutes of the Coordinating Committee meetings, the Feed Composition Committee meetings, and the Modeling Committee meetings are provided below. The meeting minutes of these three committees give additional details on NRSP-9 activities.

Minutes of the National Animal Nutrition Program (NRSP-9)
Coordinating Committee
June 11-12, 2012
National Institute of Food and Agriculture
Washington, DC

In attendance:

Members:

Todd Applegate, Purdue University
Don Beitz, Iowa State University
Gary Cromwell, University of Kentucky
Mike Galyean, Texas Tech University (via teleconference)
Mary Beth Hall, USDA/ARS
Jack Odle, North Carolina State University
Bill Weiss, Ohio State University

Administrative Advisors:

Nancy Cox, University of Kentucky (via teleconference)
Bret Hess, University of Wyoming

USDA:

Charlotte Kirk Baer, USDA/NIFA

National Academies:

Austin Lewis, Board on Agriculture and Natural Resources
Robin Schoen, Board on Agriculture and Natural Resources

Invited Guests:

Dewayne Dill, Dalex
Laurie Bennett, International Life Sciences Institute
Kate Walker, International Life Sciences Institute
Chuck Scwab, former FeedAc (via teleconference)
Donald Sapienza, former FeedAc (via teleconference)

The first meeting of the National Animal Nutrition Program's (NANP) Coordinating Committee was opened by Chair, Gary Cromwell at approximately 1:15 pm. Members were welcomed and thanked for their willingness to serve on the committee.

Opening remarks were provided by the project's Lead Administrative Advisor, Nancy Cox, who thanked the group and expressed apologies for not being able to meet in person. She commended the group for meeting, noting it was a great first step and she emphasized the need to move ahead. She informed the group that the project will be discussed at the next Experiment Station Directors' meeting in September.

Additional remarks were provided by Administrative Advisor, Bret Hess, from the Western Section. He described the genesis of the project as it moved through the NRSP approval process. He noted that it took significant effort to secure approval and funding for the project. Matching funds were a concession to get the project off the ground. He emphasized the importance of setting the project in motion and expending the funds on the relevant activities and deliverables. He also noted the need for participants to fill out Appendix E in the NIMSS project site.

Gary Cromwell provided a timeline and background on the project. He described the proposal approval process and the intended structure of the program: a coordinating committee, a modeling committee, and a feed composition committee. He distributed materials that were used to recruit potential members and to provide information to interested parties.

Charlotte Kirk Baer, USDA National Program Leader, provided remarks. She described the concepts that led to the development of the NANP and the various organizational partners and their roles:

- University of Kentucky – where the program is housed
- USDA – oversight and approval of program activities
- Experiment Stations/Administrative Advisors – general oversight and advice, review and approval processes, national perspective relative to research support, monitor progress
- NRC – liaison and partner

Charlotte also described the function of an NRSP, which focuses on research support activities like developing enabling technologies, collecting, assembling, storing, and distributing materials, resources and information, or sharing of facilities needed to accomplish high priority research, but which is not of itself primarily research.

Finally, she emphasized the need for the group to demonstrate accomplishments, noting that these funds were precious in the current fiscal environment. She encouraged the group to think creatively about how it accomplishes its goals, using different forums and formats to tackle some of the challenging issues it will address.

Austin Lewis provided perspective from the National Research Council (NRC). He focused on potential areas where the NANP could facilitate NRC efforts. He noted that some of the major challenges for the NRC include: identifying members, format of publication, modeling, feed composition, continuity and balance (static versus dynamic nature of products). He mentioned that the NRC has done focused reports in the past (e.g., on chromium) and we should think about their use and what group might write these in the future.

After a break, the committee heard from several invited guests who provided information relevant to the tasks of the two new committees yet to be appointed. Guests were invited to remain with the group for its discussion of the charge to the two new committees.

Dewayne Dill from Dalex Livestock Solutions provided an overview of the ration balancing software developed by Dalex, which incorporates feed ingredient data and all of the equations from the NRC beef, swine, and dairy publication, as well as the Cornell CNCPS and the CPM models. He also shared information on a potentially useful tool to the modeling committee called the “Collaboration Sandbox” that allows users to compare, contrast and run models in a collaborative environment. After his presentation, the committee briefly discussed the charge to the modeling committee, noting that models are developed using a range of platforms and are applied in different scenarios and for various purposes (ration formulation,

evaluation, and prediction of requirements and animal performance). It was mentioned that crop modelers should also be consulted for information that may be useful.

Representatives of the International Life Sciences Institute (ILSI), Kate Walker and Laurie Bennett, joined the committee to provide information on ILSI's Crop Composition Database. In addition to an overview of the Crop Composition Database, they alerted the committee to the existence of several other major databases. They also invited the committee to participate in a workshop to identify and address topics related to plant composition from a scientific perspective. This workshop will be held in Washington, D.C. in September, 2012. The scientific sessions will bring together experts in plant breeding and crop composition from all over the world to discuss the use of compositional comparison in the development of new crop varieties, the analytical methodologies used for compositional analyses, and the interpretation of the compositional data obtained. They also welcomed participation of members of the National Animal Nutrition Program in ILSI's Crop Composition Database Working Group

Following ILSI's presentation, representatives of the former Feed Analysis Consortium (FeedAc), Chuck Schwab and Donald Sapienza, joined the discussion by teleconference. They described the mission, organization, and approach taken by FeedAc to advance feed analysis and nutrition modeling. They accomplished much during their years of existence and the feed industry was initially very supportive, but support waned and ultimately the effort was terminated. They provided candid thoughts for the group's consideration on lessons learned when going about trying to assimilate and coordinate feed composition information. Retrospectively, they indicated that the mission of FeedAc may have been too broad, and perhaps what should have been done was to focus on tables of feed composition, hoping this insight would be of value as the new feed composition committee's charge was discussed. They offered assistance to the NANP wherever it might be useful.

The group adjourned at 5:45 pm for dinner.

Tuesday, June 12, 2012

Shortly after 8:00 a.m. a brief discussion took place on what was learned the previous day. Some members asked about the purpose of the Dalex presentation. Dalex had expressed interest in meeting with the NANP and wished to remind the committee of how models are used in practical application in industry and make NANP aware of the various platforms used and the tools that will be available for "online" collaboration. Similar to ILSI's presentation, the act of information exchange helps to ensure that others are informed about NANP and that NANP is responsive to interested organizations. These interactions strengthen NANP's network of contacts and ability to leverage potential resources.

Another organization that had expressed interest in NANP, was the Institute for Feed Education and Research (IFEEDER), a nonprofit foundation of the American Feed Industry Association whose mission is to sustain the future of food and feed production through education and research. The chair of the board of trustees of IFEEDER, Bill Braman, joined the group by teleconference. He explained that the foundation was created in May 2009 as a 501(3)c foundation and is structured to broadly represent the feed industry, including academia and

experts in science and technology. The foundation has supported NRC activities as well as industry-based initiatives to educate school children. He recognized the similar roles that the foundation and the NANP serve in support of the NRC and invited the NANP to meet with the Nutrition Group of AFIA in July and the Board of Trustees in September.

The group turned its attention to finalizing charges to the feed composition and modeling committees, which was deemed essential before the group could consider potential membership of the committees. After lengthy and thoughtful exchange among the group, the following draft charge was developed for the modeling committee:

Charge to the Modeling Committee

- Establish a process for evaluation of models with respect to accuracy, sensitivity, ability to obtain needed inputs, etc. The evaluation should be at both the component (e.g., ability to predict digestible lysine) and at final end-stage level (e.g., ability to estimate milk yield). *The users of these models could be researchers, practicing nutritionists or both and different criteria may be applicable for the different models. For example, if a very expensive assay is needed for an input, under field conditions, a book value will likely be used whereas under research conditions, the input may actually be measured.*
- Provide guidance on potential common platforms for models developed by the NRC.
- Identify gaps in knowledge that are limiting model development and evaluation. This is needed for both research and field use models. Prioritize the needed information if possible. *Uncovering gaps in knowledge in the models is a valuable resource for identifying researchable areas.*
- Evaluate needed inputs with respect to sensitivity and ability to obtain the information.
- Serve as a resource to the NRC for beta testing of models.

Charge to the Feed Composition Committee

- Assimilate information on feed composition from recently published literature and maintain a current collection of that information as a resource to the research community. This type of information will be valuable to the NRC as the produce updated reports on their nutrient requirements series.
- Develop a forum (e.g., website or other) to exchange and collate information on methods of analysis, with links to sources and critiques to provide a resource to the research community and identify gaps in our ability to analyze feeds to stimulate development of new techniques.
- Identify assays or methods that have proven or to have potential benefits to diet formulation. *Just because we can measure something doesn't mean it has any relevance to animal nutrition.*

After the committee was comfortable with draft charges, a discussion of potential members of the feed composition and modeling committees took place. A list of individuals who had expressed interest in serving was circulated. A table of potential committee membership was discussed. Several overarching considerations were raised: (1) the need reach a wider pool of applicants, (2) the need for geographic diversity and inclusion of all regions/sections, (3) the need for diversity, and (4) the need to appoint membership within budget realities. After discussion there was general agreement on some members of the two committees.

The last item of discussion was what the Coordinating Committee should define as its goals. The keys points in development of the group's work were to leverage, collaborate, and build on networks to provide deliverables that support the research community.

The Coordinating Committee will hold monthly conference calls to continue its work and meet again before the end of the year. The meeting was adjourned.

ACTION ITEMS:

- Follow up with ILSI on participation in September workshop on plant composition and on potential membership on the Crop Composition Database Working Group.
- Follow up with AFIA on participation in Nutrition Committee meeting in July.
- Follow up with IFEEEDER on participation in Board of Trustee's meeting in September.
- Obtain a list of registered participants in the Modeling Session at ASAS from Ermias Kebreab to consider for committee membership. Share information on NANP at that Modeling Session.
- Share information on NANP at the ASAS session on the new NRC Nutrient Requirements of Swine report.
- Draft slates of potential committee members.
- Set times and dates for monthly conference call and next on-site meeting.

Minutes of the Coordinating Committee National Animal Nutrition Program – NRSP-9 Conference Call – August 14, 2012

The August meeting of the Coordinating Animal Nutrition (CAN) Committee of the National Animal Nutrition Program (NANP) was called to order at 2:30 pm by Chairman Gary Cromwell. Those in attendance were Mark Hanigan, Jack Odle, Todd Applegate, Bill Weiss, Mary Beth Hall, and Gary Cromwell (Committee Members), Bret Hess and Cameron Faustman (Administrative Advisors), Charlotte Kirk Baer (USDA/NIFA), and Austin Lewis (NRC).

The minutes of the June 11-12, 2012 meeting in Washington DC (with revised charges to Feed Composition and Modeling Committees) were approved.

Administrative Advisor Nancy Cox has submitted a report of our activities to the Station Directors requesting approval for Year 3 of NRSP-9. A letter from Robin Schoen of the NRC indicating that the funds obtained for support of the new Nutrient Requirements of Beef Cattle Publication be considered as the matching requirement was included in Cox's report to the Station Directors. Hess indicated that the Directors will act on the approval of Year 3 funding at their annual meeting, September 24-29, 2012. Charlotte asked if it might be useful to obtain similar letters of support from industry to demonstrate the funds that are leveraged through NRSP activities to meet the common goal of developing nutrient requirements. The Administrative Advisors concurred.

Members of the Feed Composition and Modeling Committees have been appointed by the Administrative Advisors based on the recommendations of this committee. Chairmen Phil Miller and Mark Hanigan are in the process of setting up meetings for their committees (see attachment for list of committee members).

The following updates were provided by Cromwell on actions items from the June 11-12 meeting.

ILSI – Cromwell contacted Kate Walker regarding participation in the International Life Science Institute's (ILSI) International Food Biotechnology Committee (IFBiC) Plant Composition Workshop to identify and address topics related to plant composition from a scientific perspective in Washington, D.C., from 13th to 15th September, 2012. Experts in plant breeding and crop composition from all over the world will attend to discuss methods of analysis and interpretation of composition data, among other things. Cromwell will contact Phil Miller to see if he or one of his members would like to attend. An on-line application is required.

AFIA – Cromwell contacted Bill Braman regarding the AFIA Nutrition Committees that will meet in March, 2012. Cromwell will attend and acquaint the groups with the NANP.

IFEEDER – Braman requested that Cromwell (or someone from our committee) and Kirk Baer join their Board of Trustees meeting on September 25-26 in Minneapolis via conference call for a short presentation of the NANP.

Modeling Meeting at Joint Annual Meeting (JAM) of ASAS and ADSA – Hanigan was unable to attend this year. Some others were there but nothing was said about the NANP efforts.

NRC Swine Symposium at JAM – Odle gave a short presentation of the NANP efforts at the end of the symposium. A considerable amount of positive feedback was heard the following several days. Dr. Defa Li from China commented to Odle that a Chinese working group was doing a similar thing in China and would like to interact with our group when possible.

Lewis indicated that the NRC is continuing to receive nominations for the Beef committee. Members of our committee should indicate that they are members of NANP/NRSP when they make recommendations to Schoen. Applegate is working with Lewis, Schoen, and a few others in planning a targeted symposium at the PSA meeting next summer in San Diego dealing with the production of a possible poultry NRC publication. They are also considering a

workshop/forum of some kind to involve leaders of the poultry industry, nationally and internationally, to encourage buy-in for a new poultry NRC publication.

The next monthly conference call will be on September 27, 2012 at 2:30 – 3:00 pm EDT (1:30 CDT).

The meeting was adjourned at 3:15 pm.

**Minutes of the Coordinating Committee
National Animal Nutrition Program – NRSP-9
Conference Call – September 27, 2012**

The September conference call meeting of the Coordinating Animal Nutrition (CAN) Committee of the National Animal Nutrition Program (NANP) was called to order at 2:30 pm by Chairman Gary Cromwell. Those in attendance were Mike Galyean, Mark Hanigan, Jack Odle, Don Beitz, Todd Applegate, Bill Weiss, Mary Beth Hall, and Gary Cromwell (Committee Members), David Benfield (Administrative Advisor), Charlotte Kirk Baer (USDA/NIFA), and Austin Lewis (NRC).

The minutes of the August 14, 2012 conference call meeting were approved.

Cromwell received word from Bret Hess and Cameron Faustman that the Experiment Station Directors approved our project for Year 3. The committee was very pleased to receive this good news.

Hanigan, chair of the Modeling Committee, indicated that their committee will hold its first meeting at the Courtyard Marriot Hotel near the Detroit Airport on October 16, 2012, beginning at 8:30 am. All but one committee member will be attending.

Cromwell indicated that the Feed Composition Committee will hold their first meeting at the Intercontinental Hotel near the Chicago O'Hare Airport on October 18, 2012, beginning at 9:00 am. Phil Miller, chair of the committee has made arrangements for the meeting. Cromwell, Lewis, and Kirk Baer plan to attend both committee meetings.

Applegate, Bill Saylor (University of Delaware), and Roselina Angel (University of Maryland) have been in discussions with Austin Lewis and Robin Schoen of the NRC regarding a possible symposium at the PSA meeting in July, 2013, that would address a revision of the NRC publication on Nutrient Requirements of Poultry. Applegate has proposed the symposium to the PSA Board, and they will respond following their meeting this weekend. They are also proposing holding a workshop/forum in March, 2013, that will involve leaders of the poultry industry to encourage buy-in for a new poultry NRC publication.

Cromwell indicated that he offered to give a short report via telephone about the NANP/NRSP-9 program to the Board of Trustees of IFEEDER at their meeting in Minneapolis this week, but he has not been contacted.

Lewis indicated that there has been some activity by the NRC on initiating a revision of Nutrient Requirements of Beef Cattle. A current staff officer will be taking the lead on this project.

The next two conference calls will be on October 25 and November 29 at 2:30 Eastern time. A face-to-face meeting of the Coordinating Committee in January, 2013 was suggested. Committee members were asked to be thinking of plans for the committee in 2013.

The meeting was adjourned at 2:52 pm.

**Minutes of the Coordinating Committee
National Animal Nutrition Program – NRSP-9
Conference Call – October 25, 2012**

The October conference call meeting of the Coordinating Animal Nutrition (CAN) Committee of the National Animal Nutrition Program (NANP) was called to order at 2:30 pm EDT by Chairman Gary Cromwell. Those in attendance were Mike Galyean, Mark Hanigan, Jack Odle, Don Beitz, Todd Applegate, Bill Weiss, Mary Beth Hall, and Gary Cromwell (Committee Members), Bret Hess (Administrative Advisor) and Austin Lewis (NRC).

The minutes of the September 27, 2012 conference call meeting were approved.

Cromwell confirmed that NRSP-9 was approved for Year 3. He reviewed the changes in the review process of NRSPs and indicated that NRSP-9 will have a midyear review in the spring of 2013. Materials must be posted by December 31, 2012.

Hanigan, chair of the Modeling Committee, covered highlights of the first meeting of the Modeling Committee in Detroit on October 16, 2012. Minutes have been circulated to our Committee.

Hall reviewed Phil Miller's notes from the first meeting of the Feed Composition Committee in Chicago on October 18. Several members were unable to attend. Meeting notes have been circulated.

Applegate updated the group on the activity planned at the next Poultry Science meeting.

Cromwell indicated that a temporary web site will be established at the University of Kentucky for the Modeling and Feed Composition Committees.

There was discussion about having an event highlighting the National Animal Nutrition Program (NRSP-9) at the ASAS/ADSA meeting in Indianapolis in July, 2013. It was decided that having short presentations in some of the already-planned symposia that deal with ruminant and/or nonruminant nutrition would be a better approach. Cromwell will send the slides that

Odle used at the 2012 ASAS meeting to Hanigan and Miller and have them update them for presentations this summer.

Several names of poultry nutritionists were mentioned as possible additions to the Modeling Committee. Cromwell will follow up.

The next conference call is scheduled for November 29, 2012 at 2:30 pm EST.

The next face-to-face meeting will be held in the early spring of 2013 in Washington DC, Chicago, or Detroit. Cromwell will send a poll to the group to establish dates for the meeting.

The meeting adjourned at 3:20 pm EDT.

**Minutes of the Coordinating Committee
National Animal Nutrition Program – NRSP-9
Conference Call – November 29, 2012**

The November conference call meeting of the Coordinating Animal Nutrition (CAN) Committee of the National Animal Nutrition Program (NANP) was called to order at 2:30 pm EDT by Chairman Gary Cromwell. Those in attendance were Mike Galyean, Mark Hanigan, Jack Odle, Don Beitz, Todd Applegate, Bill Weiss, Mary Beth Hall, and Gary Cromwell (Committee Members), David Benfield (Administrative Advisor), Austin Lewis (NRC), and Phil Miller (Chair of Feed Composition Committee).

The minutes of the October 25, 2012 conference call meeting were approved.

Cromwell reminded the group that the Midterm review of NRSP-9 would occur in January, 2013, and that materials must be posted by December 31, 2012. Cromwell and Charlotte Kirk-Baer will take care of the details on posting accomplishments.

Cromwell indicated that the NANP/NRSP-9 web site is up and running. The address of the site is: <http://www.ca.uky.edu/nrsp-9>.

Hanigan, chair of the Modeling Committee, covered highlights of a recent conference call of the Modeling Committee. The committee is very active and has several projects underway. The dairy and beef models are now fully operational thanks to the work of committee member Luis Tedeschi. Bill Roush has resigned from the committee due to health reasons. Cromwell recommended Dr. Roselina Angel, Professor at the University of Maryland with expertise in poultry nutrition as a replacement for Roush. The committee agreed. The Administrative Advisors will be contacted for approval.

Phil Miller, chair of the Feed Composition Committee reported that the committee will have a conference call on November 30. The committee is moving ahead with developing a data base system. Committee member Ryan Dilger has some experience in this area and has been very helpful in working with Miller.

A policy on requests (see below) for funding of NRSP activities was circulated and approved. Anyone requesting NRSP-9 funding (other than travel expenses) needs to follow the process and address the criteria issues. The Coordinating Committee will make decisions and inform the person making the request within 30 days following the request. The Committee approved a request from Luis Tedeschi for software that was necessary to make the beef and dairy models usable.

Short presentations will be made in appropriate symposia at the ASAS/ADSA meeting in Indianapolis this summer. Galyean indicated that he will make a presentation in the ARPAS symposium. Bret Hess is checking on opportunities in a beef cattle symposium. Weiss and Odle will check on opportunities to make presentations in dairy and beef symposia. Hanigan and Miller are adding a few slides to the set that Odle used in the Swine NRC symposium this past summer. The slides will show objectives and accomplishments of the committees.

The Coordinating Committee will have an on-site, 1-day meeting in Washington DC on February 7, 2013. This was the only date that everyone on the committee, along with Kirk Baer and Lewis could attend.

The next conference call will be on January 10 at 2:30 pm EST.

The meeting was adjourned at 3:30 pm EST.

**Policy Adopted by the Coordinating Committee for
Approval of Funding Requests for NRSP Activities**

A process has been put in place to ensure that all requests for funding of NRSP-9 activities can be considered on a fair and equitable basis. Documentation of the requests and justification of the funding will be accomplished using a defined process with relevant criteria to inform decision making.

Process

- Requests for reimbursement for travel, lodging, and meals (within guidelines established at the University of Kentucky) to attend committee meetings will be automatically approved.
- All other requests will be submitted in writing to the coordinating committee chair prior to incurring any expenses.
- Requests will be considered by the entire (or majority of the) coordinating committee.
- Responses to requests will be provided within 30 days.

Criteria

When considering requests, the coordinating committee will consider whether the requested funds:

- contribute directly to the work of the NRSP and its community

- generate benefits that do not presently exist
- contribute long-term solutions to issues
- foster the development of skills and capacity
- requestor has demonstrated the ability to make effective use of the funds
- anticipated outcomes of the funding are clearly described and performance measures to ensure funds accomplished goals are in place
- provide promotional opportunities
- help leverage additional funding for the NRSP

Minutes of the

NRSP-9 Modeling Committee Meeting – Oct. 16, 2012, Detroit

Present: Mark Hanigan, Bill Roush, Kees de Lange, Austin Lewis, John McNamara, Gary Cromwell, Luis Tedeschi, Mike VandeHaar, Natalie Trottier, Charlotte Kirk-Baer

Background: Gary Cromwell

1. Challenges with NRC
 - i. Funding
 - ii. Loss of USDA support
 - iii. Long intervals between releases
2. Purpose of NRSP-9 is help the NRC, not take it over
3. Approved in 2011 for 2 years. Delay in approval so we are already in year 3.
4. Year 3 of the project was just approved.
5. Goal of NRSP are to enable and facilitate research.
6. We need to submit a renewal for station director review by year's end.
 - i. Charlotte and Gary will handle with input from us
7. Google NIMSS, enter the site, and click on search and look for NRSP-9
 - i. http://nimss.umd.edu/search_form.cfm

Austin Lewis Comments

1. Challenge maintaining model code between revisions because NAS does not have a structure to achieve that
2. Perhaps this committee could provide the interim support for maintaining models
3. Challenges include software maintenance, continuity from committee to committee
4. Any new release would have a high degree of review and rigor
5. More frequent updates are a challenge because of cost and regulatory concerns over very frequent changes

Charlotte Kirk-Baer Comments

1. Industry has expressed concerns over the length of time between releases, continuity of the process
2. USDA is willing to devote resources to helping support this process

3. USDA would like to see:
 - i. Identify and develop tools and technologies that support the process
 1. Common platforms across species on a national scale
 2. Recommendations on model develop
 3. Bring consistency in the process
 - ii. Engage in providing support of the NRC
 1. Facilitate and enhance their processes
 2. Provide support between releases
 - iii. Provide a forum and a conduit for increasing efficiency in the process
 1. We should become a resource for others
 2. Convene workshops
 3. Website for compiling information and exchanging information and tools
4. We need to be inclusive and reach out to others
5. Make every dollar count as the resources are scarce
6. We can't compete with the NRC for resources

Identify Goals, Objectives, Tasks, and Deliverables

1. Goal: Make up-to-date animal nutrition models available for academic use
 - i. Factors to consider for long-term model outcomes
 1. Animal impact on the environmental
 2. Environmental impact on the animal
 3. Switch from requirement models to response models
 4. System optimization to achieve desired end-products
 5. Stochastic considerations
2. Objectives
 - i. Broad NRSP-9 Objective: Improve use of predictive technologies and tools, available platforms, and work with researchers to effectively share, combine, manage, manipulate, and analyze models and modeling information.
 - ii. Coordinate with the NRC to support model development for industry use.
 - iii. Identify common elements describing biological processes that can be used across species
 - iv. Establish a relationship between the NRC and NRSP-9 to achieve continuous updates
 - v. Identify methods to allow use of a common software platform across species
 1. Academic version with maximum transparency for research and teaching use
 2. Locked version for end-users
 - vi. Provide guidance regarding deployment methods, i.e. open source vs locked code
 1. How does one deploy the knowledge to make the biggest impact
 - vii. Provide guidance for development of nutrient supply models
 - viii. Identify needs for a common but comprehensive feed database
 - ix. Provide guidelines for assessing data reliability for use in model development
 - x. Develop a database of observed data that could be used for model testing

- xi. Develop guidelines for data reporting in publications to better serve nutrient response model development
3. Deliverables (AA delivered by end of 2012; A=high priority; B=moderate priority; C=low priority). We will address items in order of priority.
- i. Academic Community Support/Education
 - 1. AA: Develop a website for the NRSP-9 modeling committee to provide resources (GC)
 - 2. AA: Upload observed data used by the dairy and swine NRC committees for the last revisions to the NRSP-9 website (NT,KL,MH,AL) . AL will check with NAS.
 - 3. AA: 2013 FASS talk to raise awareness (GC,NT, MH, MV)
 - 4. A: Develop a database structure for storing observed data (NT, LT,MH,BR,MV)
 - 5. A: Create a database for observed data and populate with existing data (NT,KL,MH)
 - 6. B: Raise awareness regarding the data needed to be put in publications to support nutrient modeling
 - 7. B: Collect user information that identifies deficiencies in the model or the software, i.e. a bug report. Needs to make sure the user gets some feedback. Also could collect suggestions regarding what is desired. Need to make sure user expectations are met/modulated. Could also include anecdotal or research trial information from professional nutritionists and scientists.
 - a. Would need to identify professionals to handle some of the questions.
 - ii. Model Development
 - 1. AA: Summarize evaluations of existing models. Could post links to all of the source articles to the web site. Identify gaps in knowledge that are limiting model development and evaluation. This is needed for both research and field use models. Prioritize the needed information if possible. *Uncovering gaps in knowledge in the models is a valuable resource for identifying researchable areas.*
 - 2. A: Develop a white paper identifying components that must be included in the feed and the observed data libraries/database and summarize methods to evaluate data reliability. Evaluate needed inputs with respect to sensitivity and ability to obtain the information. (JM, All)
 - 3. A: Develop examples of data analyses approaches (BR)
 - 4. A: Develop a white paper summarizing acceptable approaches to evaluating models. Establish a process for evaluation of models with respect to accuracy, sensitivity, ability to obtain needed inputs, etc. The evaluation should be at both the component (e.g., ability to predict digestible lysine) and at final end-stage level (e.g., ability to estimate milk yield). *The users of these models could be researchers, practicing nutritionists or both and different criteria may be applicable for the different models. For example, if a very expensive assay is needed for an*

- input, under field conditions, a book value will likely be used whereas under research conditions, the input may actually be measured. (LT,BR)*
5. A: Develop a set of guidelines for publishing nutritional data in publications to ensure complete data are available - republish the old article from energy symposium (JM, NT)
 6. C: Develop a review article comparing model components across species
 7. C: Develop a white paper summarizing components of nutrient supply models across species
- iii. Platform Development
1. AA: Fix the NRC 2001 Dairy (AL/LT)
 2. AA: Provide guidelines for using the original Beef NRC with DOSBox (LT/AL)
 3. B: Develop a white paper examining approaches to a common platform
4. Conference Call
- i. Nov. 20 @ 1:00 PM EST

**NSRP-9 Feed Composition Committee
October 18, 2012 – Chicago, IL
Minutes**

Handouts: Charge to the modeling and feed composition committees, expense guidelines, NANP history, NSRP-9 modeling committee minutes, NRC PowerPoint, NRC ingredient database history.

Members present: Hall, Dilger, Moreira, Miller, Nelson (phone), Dozier (phone), Kirk Baer, Lewis, Cromwell

Members absent: Hristov, St-Pierre, Weis, Waldroup

AGENDA

Introductions

Gary Cromwell: Defined NSRP-9 and included a listing of members.

1. Gary provided background on the formation of the committee. The inception of the idea stemmed from initial discussions with NCCC-042 and S-1012. There were concerns regarding lags between NRC (Swine) publications. Nancy Cox (UK) suggested developing a NSRP proposal. An extensive proposal was developed – It was deferred. A project was funded for 3 years at approximately ½ the amount.
2. A coordinating committee was appointed by station directors and met this past summer.

3. Gary defined the role of NSRP projects (see handout). There are 7 active projects (not 9). Gary highlighted the leadership of the NSRP-9 efforts.
4. The project can be renewed and the monies rolled over. The NSRP-9 project will be reviewed this year. A goal for our short-term activities will be to define activities and timelines (deliverables).

Austin Lewis (PowerPoint handout):

1. Austin has retired and is staying on as a consultant for NAS and working with NSRP.
2. Austin provided a review of the NRC and an overview of the National Academies.
3. NRC is a functioning group for the academies.
4. Described the strengths of the NRC (see handout).
5. Reviewed recent reports (major: beef, dairy, swine, poultry) + others.
6. The government funds most NRC reports; however, not the species requirement reports (maybe a bit from FDA). The species reports are usually revisions of previous reports. These reports are data heavy (supported by extensive references). Some reports come with computer models. There is a great deal of commonality among the species reports. ALL THE SPECIEIS REPORTS HAVE FEED COMPOSITION TABLES. NOT FUNCTIONING WELL! EACH GROUP TENDS TO START OVER AGAIN. THE PROCESS IS NOT EVEN CONSISTENT BETWEEN REVISIONS.
7. Austin provided a history of feed composition tables (3 slides; 1971, 1982, 1995). Charlotte described the 1995 report that was developed to generate a feed information system (feed database). She commented that the state of the issue is at a different place now versus after the 1995 report.
8. Austin briefly described the method each species report used to develop the respective ingredient databases. The Swine 2012 database was developed primarily from a literature review. This was an extensive process and at times a challenge to find composition information for all ingredients.
9. Ultimately, the processes used to compile the ingredient databases for the various species reports have not been efficient.

Charlotte Kirk Baer

1. Reviewed stakeholder issues: More timely NRC updates are anticipated. It is expected that increased coordination of ingredient databases and modeling will increase the visibility of nutrition as it relates to big issue problems, and will improve the consistency/continuity of reports (NRC).
2. USDA hopes we can develop a tool to define research on a feed ingredient database nationally. Our efforts should compliment/augment the efforts of NRC (i.e., identify reviewers, test models, provided advice, convene meetings, providing a forum/conduit to leverage resources and interact with other groups who could augment efforts).

Gary Cromwell reviewed the activities of the modeling meeting held on October 16 in Detroit. Gary highlighted that a website will be developed to document the activities of the modeling and feed composition committees.

CHARGES TO THE COMMITTEE:

The committee reviewed the charges set forth by the coordinating committee. Minor editing was proposed for the first charge. The following 3 charges (objectives) have been proposed; however, the committee recognized that the first charge will receive the majority of effort in the immediate future.

- Assimilate information on feed composition from the published literature and other critically-evaluated sources and maintain a current collection of that information as a resource to the research community. This type of information will be valuable to the NRC as they produce updated reports on their nutrient requirements series (Beef, Dairy, Poultry, and Swine).
- Develop a forum (e.g., website or other) to exchange and collate information on methods of analysis, with links to sources and critiques to provide a resource to the research community and identify gaps in our ability to analyze feeds to stimulate development of new techniques.
- Identify assays or methods that have proven or to have potential benefits to diet formulation. Just because we can measure something doesn't mean it has any relevance to animal nutrition.

FEED COMPOSITION DATABASE OBJECTIVE (NEED TO KEEP IN MIND HOW IT WILL FIT WITH NRC AND FUTURE RESEARCH EFFORTS).

1. Develop a database for each ingredient (everything for that ingredient) across species.
2. Define ingredients.
3. Define critical inputs.
4. Solicit input for the modeling committee.
5. Define supporting information for each ingredient.
6. Identify academic and industry partners.
7. Communicate efforts to companies, and, multistate, regional and research committees.
8. Identify critical researchable needs in terms of the ingredient database and feed analysis (where are the gaps in the understanding of feed composition).
9. Explore preparing a review paper discussing the use and development of feed composition databases.
10. Look into the feasibility of organizing mini-symposium and(or) a booth at national meetings.
11. Identify other national and international efforts that are developing feed ingredient databases.

FORUM TO EXCHANGE COLLATE INFORMATION ON METHODS OF ANALYSIS (CHARGE 2 AND 3)

1. Chronicle the history of "methods of analysis" and define the criteria of what gets into the database.

2. Can we identify key issues relative to the analysis used by each species or database?
3. Methodology must be included with the feed composition data.
4. Can this group facilitate the standardization of methodology?
5. Develop a collection of laboratory methods.
6. Develop recommendations for sampling and sample handling.
7. Identify generally recommended procedures.

DELIVERABLES:

1. List of input variables for each species – December 1.
 - a. Common and uncommon elements among species
2. Identify ingredients.
3. Solicitation of input from partners.
4. Visit with the modeling group to see what their needs are.
5. Describe how we interact with the modeling group.
6. Schedule monthly conference calls.
7. Pursue a forum/symposium at professional meetings with the modeling group.
8. Start developing a shopping list of research needs.
9. Pursue looking into a database platform.
10. Gather information regarding acquisition of feed sampling and handling. Let's find out what is out there!
11. One page summary of our committee charge and planned activities with timelines and dates of meetings. This can be shared with other groups.
12. Post existing ingredient databases (beef, dairy, poultry, swine) on the NSRP-9 website – Austin will look into what can be posted.