USDA Agricultural Research Service

Retrospective Assessment of National Program 101 – Food Animal Production

February, 2011

Executive Summary

The retrospective assessment of the USDA Agricultural Research Service National Program 101 in Food Animal Production was conducted by a review team of nine scientists external to ARS with expertise in areas of animal physiology, nutrition, meat science, genetics, immunology and animal production. The team met in Beltsville, MD on February 9 and 10, 2011 to conduct a 5 year retrospective review. It is noted that the current 5 year program is three years into the 5 year program and the review is based on the activities and accomplishments of the 3 year period. The NP 101 is one of the largest programs in the USDA Agricultural Research Service.

The Review Team members thank ARS Program Staff Mark Boggess, Tracy Botelho-Havermann and Lolita Mangra for their efforts in organizing our review, providing information, arranging transportation and lodging and generally helping make the work of the review team to be very efficient and effective.

The National Program 101 has three components. These are:

1. Component 1. Understanding, Improving and Effectively Using Animal Genetic and Genomic Resources
2. Component 2. Enhancing Animal Adaptation, Well-Being and Efficiency in Diverse Production Systems
3. Component 3. Measuring and Enhancing Product Quality

The accomplishment reports of NP101 were developed by the National Program leadership based on impact statements submitted by ARS scientists. These impacts were assessed against the anticipated impacts for each problem statement listed under the three component areas. The review team was asked to review the anticipated impacts and reported accomplishments with the following challenges:

- Will the production practices, technologies and decision-support tools that were developed enable private producers and industry stakeholders to improve economic viability and competitiveness?
- Will the identification and development of genetic/genomic tools and technologies enable private producers and industry stakeholders to improve economic viability and competitiveness?
- Do the advances in scientific knowledge and development of new research methods, tools and technologies have the potential to influence current research approaches and promote new lines of scientific inquiry?

- Are the long term benefits derived from the accomplishments in the three program components (genetics, production and welfare, product quality) likely to be commensurate with the investment of time and resources?
- What are the primary areas of deficiency in the NP101 research portfolio with to regard to productivity and impact for both the scientific community and industry producers/stakeholders? How/where would resources (funding and expertise) have been more ideally allocated to maximize impact and technological advancement for the food animal production industries?
- How well did ARS meet what it set out to do
- How well does ARS, industry and universities make use of resources
- What are the research gaps?
- How well does research work reflect the goals?

The review team was provided documents by the National Program Team of NP101 that included the Action Plan for 2007-2012, Accomplishment Report for NP101 and NP101 Review Panel Evaluation Criteria. In addition, a list of publications for NP101 was also provided. These documents were the basis that the review team used to evaluate accomplishments and impacts relating to the five year plan. Additionally, the team held two conference calls, one in late November 2010 for orientation and organization and another prior to the panel meeting to answer questions from panel members and to emphasize the purpose of the retrospective review. Panel members requested and were provided copies on recent retrospective review from other national programs to help reviewers understand the final product desired. Primary and secondary reviewers were assigned to each problem statement within component areas. Each component area had from two to four problem statements with anticipated impacts.

Each problem statement's impact was rated from low to high by the team. This rating reflects how the review team felt the accomplishments met the anticipated impacts achieved for that problem statement. The rating should not be interpreted as a level of support by the review team for the problem statement but rather the impact evident in the materials presented to the review team. In addition, the team did not evaluate or rate individual projects but provided an overall rating for the problem statement area.

At the start of the 1 ½ day review process the National Program Leader and Deputy Administrator reemphasized the purpose of the review to the panel. During the review process, the primary reviewers provided their assessment followed by the secondary reviewers' assessment. Other panel members were then provided opportunities to comment and ask questions relating to the problem statement being discussed. This resulted in a robust discussion of each problem statement and also identified areas where research related to multiple problem statements. The review panel was able to

complete the assessment of all problem statement areas in the first day and each primary reviewer was charged to draft the review team assessment for their assigned areas. The second day was spent in jointly reviewing and modifying these draft assessments. A draft report was provided to all panel members at the end of the panel meeting. The draft report was combined into a single document by the Review Team Chair and this document was then sent to the review panel for final review. Suggestions for revisions were provided to the Review Team Chair.

At the end of the review panel meeting the review team met with Mark Boggess, National Program Leader for NP101 and Tracy Botelho-Havermann, Retrospective Review Officer to communicate their conclusions of the review. Overarching and general comments were provided by Maynard Hogberg, Review Team Chair. Each review team member communicated primary assessment points for their respective problem statement area followed by questions and comments on each problem statement area.

General issues and comments

The choice to summarize accomplishments as selected vignettes of impactful research made some aspects of the review difficult. Although the examples given were appropriate, in the instances in which there were no reported accomplishments for specific problem areas, it was sometimes not possible to discern if this was because no work had been done, because work was unsuccessful in that area, or because accomplishments were not reported by the scientist(s). Because the accomplishments section organization did not always match that of the problem statements and anticipated impacts, it gave the impression that the researchers did not prioritize or conduct their research in reference to the NP 101 Action Plan. The review team also noted that there were areas of anticipated impacts in the NP101 Action Plan but reviewers could not identify ARS scientists with expertise to work in these areas. The area of dairy reproductive physiology appears to be one of these areas.

The review team strongly suggested that future reporting by scientists should be done annually by anticipated impact area within each problem statement. When the call for accomplishment reports is issued, the scientists could update their annual accomplishments and publications toward the anticipated impacts. This alignment would be easier for the ARS administrators, center directors, research leaders and NPL to evaluate the ongoing accomplishments anticipated impact as well as identify the research gaps. It would be also useful if the publication references were aligned with the individual problem statements and anticipated impact areas. The Retrospective Accomplishment Report should list publications immediately following each report rather than in an appendix.

There appeared to be some duplication of accomplishment reports, such as gene expression in broiler breeder hens on different feeding regimes, and use of the bovine

50K and poultry 3K SNP chips, appearing in different sections of the Retrospective Accomplishment Report.

It is important for ARS administrators to align scientists to cover the entire pipeline of research from fundamental studies to application. Reporting of fundamental research could be enhanced if it was conveyed how this could move to translational research and application. Conversely, the application of research should show how the fundamental research made this application possible.

The review team found it difficult to see where there was collaboration with industry or university scientists in various problem areas or what these scientists might have contributed to some of the anticipated impacts. Sources of funding from outside ARS that contribute to ARS accomplishments should also be acknowledged. Partnering with those outside USDA/ARS is an important way to enhance rapid progress toward anticipated impacts and to leverage the limited resources within the agency. With limited funding in all areas of animal production research today, it is important that all segments work closely together to enhance efficiency and good stewardship of funds. The review panel also recognized that there is a great opportunity and need to communicate and coordinate research within ARS. This will be essential to make sure that future research programs avoid duplication of effort and resources and are as efficient and effective as possible. ARS administrators must take a strong leadership role to make this happen. The review team understands that new technologies are being implemented to help match scientist interests and expertise within the USDA/ARS system. This can greatly aid in bringing scientists together on projects from different disciplines and different locations. Partnering both within and outside ARS can be beneficial in addressing significant problems with multi-disciplinary approaches in a timely manner.

Public research in general would benefit if ARS prioritizes those activities that it is uniquely qualified to do. In today's changing landscape of funding for public research, the infrastructure and stable base funding of ARS makes it an ideal entity for development, long-term maintenance, and deep phenotyping of animal resource populations. These could serve as center-points for collaborative research with scientists throughout ARS and the world. The NP 101 does this to some extent and could expand these activities. The review panel challenges ARS to define their role in areas where they can be the best.