

National Program 107 – Human Nutrition Assessment Report

EXECUTIVE SUMMARY

Panel Members: Drs. G. Harvey Anderson, Eric Hentges, Sheila Innis, Barbara Schneeman, and Connie Weaver, Panel Chair

The National Program (NP) 107 Human Nutrition Retrospective Review Panel met in Beltsville, Maryland on July 9-10, 2012, to conduct a review of USDA, ARS NP 107 research and progress through 2011. The members of the Review Panel were five scientists external to the ARS, with expertise in various aspects of human nutrition including obesity, nutrition, metabolism, physiology, and public health. The Review Panel was provided with an accomplishment report that focused on four major components within the ARS program. Individual projects were not assessed, but this was an overall review of progress made with representative references from each component that were selected by the National Program leadership staff. The Review Panel was informed that the accomplishments of the National Program as a direct result of the research activities from 2007 through 2011 should be assessed against commitments and goals identified in the Action Plan created at the beginning of the National Program cycle.

Each Component of the Program was assigned a primary and secondary reviewer. All Panel members participated in the discussion of each component. Members of the Panel wrote a document on their primary and secondary Component assignment and these were collated into a draft report by the Chair. The draft report was critiqued, edited, and approved by all members of the Panel before submission of the Final Report.

The Review Panel is very grateful to the National Program Leaders and members of the ARS staff including David Klurfeld, John Finley, Molly Kretsch, Christina Woods, Betsy Wiley, and Tracy Havermann for their expert and friendly assistance during the preparation and write up of this report. These individuals provided information, advice, and their expertise, and they were outstanding in their efforts to help the members of the Review Panel assess the NP107 program.

General Comments:

There were a number of general observations regarding the Research Report. The first was that the report represents only part of the considerable accomplishments by ARS during this five year period. As a result, our assessment is based on the report and may not reflect the true total contribution of ARS. Second, ARS could take more credit for accomplishments for certain programs than is currently done. The most important recommendation is a great need for strategic planning to identify relevant priority questions/gaps, to develop a plan for an approach to address them as a whole system, and to communicate accomplishments. Increased emphasis on strategic planning is invaluable for maximizing efficiency of resources, avoiding duplication, leveraging outputs and succession planning. Individual scientists and teams should be encouraged to develop career paths and research plans that identify the important problems in their area and to systematically answer the questions. The success of this approach is uneven in the system, with some areas doing this exceptionally well and others seeming to jump from one topic to another without an evident logical next step identified or an informed conclusion to a

project being identified. Specific overall strengths, weaknesses, and recommendations were identified by the panel.

The criteria used to assess the impact of research activities included:

- Relationship to action plan
- Quality of research-how well did we do it?
- Relevance to customer's needs-Were customer's needs met?
- Technology transfer and adoption-were the products of NP107 research delivered and adopted?
- Impact-Did NP107 research impact the scientific community, agricultural producers, and/or regulatory agencies?
- Based on the impact of NP107 research, should ARS continue the kinds of research that is in NP107?

With regard to the relationship to the action plan, the panel concluded that for the most part, the research described in the Accomplishment Report aligned with the stated program in NP107. However the impact of the accomplishments in some crucial sections was low. With regard to the quality of the research, some programs are stellar, showing excellent, timely research and leadership. Many of the scientists are highly successful in obtaining competitive grants that are relevant and contribute to the ARS program success. However, for many programs, there is little evidence of knowledge translation and program impact. With regard to meeting customer's needs, the databases and monitoring food and nutrient intake are crown jewel examples of serving customers' needs. The documentation does not adequately highlight partnership with the producers, food industry, or regulators nor impact on these sectors. Similarly, consumer needs fell short in the absence of evaluation of the Dietary Guidelines recommendations. With regard to technology transfer and adoption, the sustaining programs have made excellent progress, but have not developed translation of their work to the fullest potential. With regard to impact, the programs were uneven. Some had high scientific merit and lead the field. Many interesting questions were asked and addressed. However, the vision for the approach to solutions was not presented.

Strengths:

- What We Eat in America (WWEIA), Food Consumption and Composition Databases, nutrient analyses and Automated Multiple Pass Method (AMPM) are unique, essential high impact programs that are on track and accessible.
- The ability to do long-term, longitudinal studies in sub-populations and to partner on the development of databases with long-term impact are strengths.
- ARS is uniquely positioned to combine nutrition and plant science to improve the food supply.
- ARS is also uniquely positioned to develop research programs that bridge from basic exploratory research through human studies and application.
- The use of animal models has been innovative and creative for certain program areas, i.e., immunology, amino acid metabolism, bioavailability, nutrient-gene interactions, and has even more potential.

- Some, but not enough, programs reflect a systematic approach to identifying relevant gaps and addressing important questions in a field over the long-term such as vitamin K, vitamin D and calcium, and muscle and protein metabolism.
- ARS is developing theory-based and evidence-based research to support behavior modification.
- Where ARS has cooperated with production agriculture, it leverages resources.

Weaknesses:

- Some projects have not capitalized on high impact developments. For example, further development of AMPM by ARS and its application had to rely on other entities, thus a lost opportunity for ARS and potentially for all stakeholders.
- The inconsistency of translating knowledge and developing products from longitudinal studies such as The Delta Obesity Prevention Research Unit (DOPRU) limit the impact of those projects.
- The report highlights several studies showing proof of concept but lacks research roadmap for long term impact. For example, plant genetics and nutrition are not sufficiently integrated and the fetal programming animal research has not been translated to applications in humans.
- Some areas appear to have disjointed, one-off approaches to addressing the stated problem.
- It is unclear which projects are terminated and why. For example, when there is a single citation of a publication early in the reporting cycle, specifying whether the project is ongoing or is no longer being pursued because it came to a logical conclusion would be helpful.
- Studies on interventions that are unlikely to be sustainable weaken the ARS portfolio.

Recommendations:

- The essential unique programs are so important that resources need to be allocated for translation and application when relevant to core mission.
- More strategic planning and better integration in several areas is recommended including nutrition and plant sciences and filling in the relevant gaps of nutrient requirements and physiological processes throughout the life cycle.
- ARS (scientists/leaders/directors) needs better coordination and direction for a path to get meaningful results among ARS scientists and with partners in some areas. For example, ARS scientists should work with stakeholders toward their long-term goals rather than focusing on a single study.
- In situations where ARS has the opportunity to partner in developing databases with long-term impact, relevant resources need to be made available for their application.
- Better systematic approaches are needed to identify the role of food and nutrients for promoting health, using a continuum of *in vitro*, animal models and studies in humans.
- Demonstration that a particular approach or project should not be pursued is useful information and should be noted as an accomplishment and reported.
- The research to develop evidence-based dietary behavior modifications needs to incorporate multi-disciplinary input.

- The Dietary Guidelines serve as the basis for Federal Nutrition Policy. ARS is uniquely positioned to evaluate the impact of following the Dietary Guidelines on public health. ARS needs to strategize within its resources in order to accomplish the needed research. This strategy applies to other programs as well.