CSREES Portfolio Review Expert Panel Report

Portfolio 1.3 Agricultural and Food Processing / Bio-based Products
CY 1999 - 2003

REPORT

External Review Completed: May 2004

Portfolio Overview

The team recognizes that the long-term goals of the programs within F&NFPP can best be achieved through strong research, extension and education programs that are clearly integrated with one another. While the portfolio represents a very complex system in terms of functions and integration of these functions, there is a critical need to develop new models and delivery systems that are effective and performance based. Integrated program functions for the F&NFPP include:

- Generating originate fundamental knowledge on the development of new processes and new or improved food and nonfood products through basic research.
- Developing new processes and value added food and nonfood products through applied research.
- Conduct outreach programs for the commercialization of the newly developed processes and products.
- Providing leadership in the delivery of research-based knowledge through extension, outreach, and information dissemination in order to strengthen the capacity of public and private decision makers impacting agriculture.
- Strengthening the capacity of institutions of higher education to develop the skills of the Nation's workforce in the food and agricultural sciences.
- Assuring the quality, relevancy, and performance of programs supported through Federal funding in the development of new processes and new or improved food and nonfood products.
- Optimizing collaboration and cooperation across institutions and agencies in order to achieve broad strategic goals that address the needs of farmers, ranchers, and the American consumer.

This portfolio is comprised of the following Knowledge Areas (KA):

- KA 501 New and Improved Food Processing Technologies
- KA 502 New and Improved Food Products
- KA 503 Quality Maintenance in Storing and Marketing Food Products
- KA 504 Home and Commercial Food Service
- KA 511 New and Improved Non-Food Products and Processes
- KA 512 Quality Maintenance in Storing and Marketing Non-Food Products

Comments on Research & Development Criteria and Dimensions

In 2004 a panel comprised of independent experts from the field was convened to assess and score the current state of the Agricultural and Food Processing / Bio-based Products Portfolio. A discussion of specific comments and recommendations related to each of the dimensions of the three Office of Management and Budget (OMB) research and development (R&D) criteria used (relevance, quality, and performance) is provided below.

<u>Relevance</u>

Overall, the Review Panel believes that the relevance of the Food and Non-Food Products Portfolio is good. The chief weakness relates to the integration of education and extension with research. This is partly, though not entirely, due to the current reporting systems. Improvement in the collection of appropriate outcomes and impacts for extension and education will greatly improve the overall issue of integration discussed in more detail below.

Scope

The scope of the portfolio is very good, especially given the available resources. This is an emerging portfolio, though, so there is room for improvement. Even so, the Portfolio is not falling behind in coverage and some areas are exceptional. For example, the Portfolio is moving into nanotechnology, and some older programs have been dropped. In the Panel's opinion, while spread thin, the Portfolio is very deep and has exceptional breadth.

Focus

The descriptor language was unclear and the Panel recognizes that NPLs have little control over what happens at the state level. The Portfolio was focused—every Program Area (PA) presentation included contemporary issues and cutting edge technology, and is consistent with the Science Roadmap—but could be better integrated as a portfolio instead of as individual Pas. The Panel believes NPLs may be operating individually, instead of as a team. Obesity is misplaced as an issue in this portfolio. The Panel believes that the portfolios need to be reviewed and integrated to make sure all appropriate areas are in the correct portfolios (e.g., food safety, economics, policy, international trade, and market development). The Panel believes that the Portfolio showed evidence of curiosity in seeking out what new knowledge needs to be found. The Portfolio process is new, and the progress is positive. Based on the descriptor language, though, the Portfolio was not fully focused.

Emerging Issues

There are formal linkages with U.S. Department of Energy regarding bio-based energy issues, and the Panel encourages further coordination with other agencies working with bio-based technologies, bio-products and energy. The NRI Request for Applications shows appropriate changes over time; nanotechnology, for example, has been identified as an emerging issue. The ability to identify emerging issues depends on NPLs having the time to meet with people doing work on the "cutting edge" of the fields encompassed by this Portfolio. A process needs to be devised to keep the Portfolio current.

Integration

The Review Panel was presented with separate projects for education and extension but was shown little evidence of integration (the best job was done by the SBIR program). Although there were a few anecdotal examples of funding, there was an apparent disconnect between education and extension in the Portfolio. This was due in part to the nature of the Portfolio. It has greater challenges than most in matching education and extension to research because of a general lack of curricula dealing with bio-based resources. On the other hand, emerging food-processing centers in states are and example of a success story in this arena and represent integrated, multidisciplinary activities. Figuring out how to capture appropriate, integrated data represents an opportunity for this relatively new portfolio.

Multidisciplinary Balance

The topical areas covered in this portfolio make it an opportunistic one for multidisciplinary activities. Other areas for inclusion in this Portfolio include business and managerial activities, economics, and competitive impacts.

<u>Quality</u>

This is the weakest portion of the Portfolio and due, for the most part, to the fact that definitions on the scoring sheet for OMB were difficult to understand. In the future, with better clarity around these definitions, panels should see what is needed to achieve scores in the highest category. The data presented showed high quality, but metrics were limited and CSREES needs to have very clear examples of performance indicators for future reviews. The evaluation process needs work.

Significance

The Panel saw evidence of research findings that influence industry definitions, including commercially-viable products, curricula, and patents. There is an opportunity to engage in outreach to capture and integrate teaching and extension, with research.

Stakeholder Input

The Portfolio was presented with well-developed evidence for stakeholder input, but little evidence was presented regarding stakeholder feedback. Though the PAs have existed for some time, there was no stakeholder assessment of the Portfolio. The Panel feels that the rubrics of this aspect of evaluation need to be broken apart; input, feedback, and assessment are different.

Alignment

Peer-reviewed publications are an indication of the quality and currency of the Portfolio alignment with current science. The Portfolio appears to be well aligned.

Appropriate Methodology

The methodology shown for peer-reviewed research projects is good, but the Review Panel would like to see examples of cutting-edge methodologies highlighted.

<u>Performance</u>

Performance indicators such as Timeliness, Agency Guidance, and Accountability are management issues and should not be questions for a Panel to consider. The Review Panel has rated the general Portfolio performance as adequate, though this was done mostly on the basis of personal experience, instead of presented evidence. The Portfolio needs to address the issue of documentation and evidence and implement a better reporting system before the next review. In the future, evidence should be stronger as mapping and assessment efforts identify outputs and linkages.

Portfolio Productivity

Anecdotal examples of Portfolio productivity were presented to the Panel, but there was no evidence of productivity on a significant enough scale to permit analysis. The Panel has made an intuitive evaluation of this Portfolio aspect to be adequate at this time, given current resources and portfolio mix. This represents an opportunity for CSREES to provide portfolio analysis for future portfolio reviews.

Portfolio Completeness

The Review Panel's comments for this area are similar to those expressed in Portfolio Productivity. The Review Panel did not see the sufficient evidence of completeness necessary to permit analysis. As stated in the Multidisciplinary Balance section (above), the Panel recommends that a cross-walk of portfolios be done to ensure that all relevant subjects, such as economics, are included in this Portfolio. In addition the wording of the evaluation definitions for this aspect were confusing. The Panel believes the definitions should be reworded so that a score of three would indicate, "All Portfolio projects accomplished stated objectives," and a score of two would indicate, "Most Portfolio projects accomplished stated objectives." If outputs are redefined in this manner then the Panel believes that the Portfolio is fairly complete, but

ignores some critical areas. Better post-award management is necessary to garner the requisite data. This represents an opportunity for improvement.

Portfolio Timeliness

There was a lack of evidence presented for this aspect. The Panel was not even provided with anecdotal evidence of timeliness and believes that no-cost extensions are common to competitive grants programs, due to funding availability, in a fiscal year. CSREES needs to present evidence of system timeliness and completeness.

Agency Guidance

Based on the Panel's experience, the Portfolio is judged to be excellent as it relates to the solicitation process. CSREES has provided a number of grants workshops and many have been targeted towards specific audiences, such as 1890 institutions. CSREES also has encouraged diverse partnerships among grant applicants.

Portfolio Accountability

The Panel was not provided with any evidence of accountability. Accountability metrics also appear to be lacking and there is room for improvement in the quality of the self-study document, and supporting materials.

Comments on Future Directions Presented by CSREES

The Panel suggests that the name of this Portfolio be changed to "Bio-Based Products." This change will reflect usage preferences within the disciplines. It is the view of the panel that the portfolio is spread too thin and that it needs to refocus its efforts to be more effective.

Data Issues

The Panel applauds CSREES for moving to integrate and automate the reporting system. This should allow for the retrieval of uniform, meaningful, and quantifiable data, which will provide the basis for accountability within CSREES portfolios.

Evaluation Issues

The Review Panel noticed that a distinction between research and extension outlooks remains apparent ten years after the formation of CSREES from the Extension Service and CSRS making evaluation difficult.

The Panel recognizes that this is a new process and that CSREES has made progress in evaluating programs. This includes the establishment of a Planning and Accountability unit within the agency which is an important step in achieving uniform, meaningful program assessments in the future.

Summary of Comments and Recommendations

The Review Panel agrees with the overall goals of this Portfolio which are to:

- Advance science-based knowledge in the areas of food chemistry, food biology, and food engineering, processing, and quality maintenance during storage and marketing to improve the quality of foods by supporting research, education and extension in the Land-Grant University System and other partner organizations in the public and private sectors.
- Improve methods of preparing, holding, and serving food, including automation and/or computerization.

- Develop methods to provide effective, efficient management in institutional and commercial food services.
- Improve consumer information about product quality, preparation and storage, nutritional values, and unit cost of foods for home and commercial use.
- Advance knowledge and technologies to generate new or improved high quality products and processes to expand markets for the agricultural sector.

These Portfolio goals support the overall CSREES Strategic Objective 1.3: “Provide the Science-Based Knowledge and Technologies to Generate New or Improved High Quality Products and Processes to expand markets for the Agricultural Sector.”

Portfolio Score

Portfolio 1.3 received a total score of 80 from the panel. This score places the portfolio in the category ‘moderately effective in supporting CSREES objectives.’