STATEMENT OF DR. PATRICIA D. MILLNER
RESEARCH MICROBIOLOGIST, AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

BEFORE THE
UNITED STATES HOUSE OF REPRESENTATIVES
SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

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Mr. Chairman and Members of the Committee, I am Patricia D. Millner, a Research Microbiologist with the Agricultural Research Service's (ARS) Sustainable Agricultural Systems Laboratory at the Henry A. Wallace Research Center in Beltsville, Maryland (BARC). ARS is the primary intramural science research agency of the United States Department of Agriculture (USDA) with over 100 research laboratories throughout the nation.

Thank you for the opportunity to appear before the Committee today to present information on composting and its environmental benefits as related to food residuals management, 'greening' practices, and uses of the product. ARS operates a 3 acre Composting and Research Facility at BARC to recycle approximately 13,000 cubic yards per year of organic residuals from our 6,500 acre farm. Composting involves an aerobic, self-heating process in which microbes rapidly transform raw organic materials into humus, a critical component for soil health. Use of specific performance and testing criteria[1] ensures that the process and product achieve three main goals: nutrient stabilization, pathogen destruction, and odorant elimination. In addition to these three

direct benefits, mature compost provides stable organic carbon to agricultural and horticultural soils, thereby aiding landscape conservation by reducing soil erosion.

The stable organic carbon that compost brings to soil enhances its physical structure and tilth, deepens root penetration, and increases the soil water-holding capacity; all of which aid plant growth and increase resistance to drought and other stresses. Our research has shown that compost may be used as a soil fumigant by small local growers of strawberries. Compost provides some of all the major and minor plant nutrients, with nitrogen currently available slowly in low amounts. Research at BARC has shown that nitrogen in compost can substitute for one-third the amount of nitrogen fertilizer usually required for turf. This means that compost use on lawns in areas like metropolitan Washington, D.C. can help reduce the runoff of nutrients from lawns to storm drains and ultimately waterways such as the Potomac River and the Chesapeake Bay.

Recent estimates[2] indicate that aerobic composting of food residuals offers a significant advantage over anaerobic landfills in terms of greenhouse gases. By diverting food residuals from landfills to composting, major amounts of methane generation and release are avoided (6 metric tons of CO_2 equivalent per metric ton of food residuals).

Currently at BARC, we have been composting 40 cubic yards per week, approximately 24,000 pounds, of food residuals mixed with compostable bio-based cafeteria ware from the U.S. House of Representatives Longworth Building Cafeteria, the USDA cafeterias in the South and Whitten Buildings, and a commercial organic foods retailer. Presently, a

commercial provider, Bates Trucking Company, collects and hauls the materials 10 miles from Washington, D.C. to BARC. This has been a team effort among all the participants to ensure that staff is aware of the impact of non-compostable items on compost quality and to the greatest extent possible exclude metal, glass and plastic from the collections. Wood shavings and sawdust from the congressional woodworking shop, along with leaves and aged hay from our farm are added to achieve appropriate moisture, structural content, and carbon-to-nitrogen ratios as required for composting. As the seasons progress, the plan is to incorporate grass, landscape and floral trimmings from Congressional grounds and the U.S. Botanical Gardens into the compostable mix.

The food residuals from the Longworth Cafeteria are pulped before being collected and hauled. The handling characteristics of pulped and dewatered food residuals are favorable to all phases of the operation; this material composts especially rapidly. In addition, pulping and dewatering reduces the haul mass by approximately 70%. As more institutions use this technology, haulers will experience greater savings in hauling fuel as well.

All food residuals composted at BARC are currently used in several field-scale research studies including: 1) degradation of bio-based cafeteria-ware, including bags, plates, and utensils, as part of USDA's BioPreferred program; 2) the efficacy of compost bio-filtration on greenhouse gas emissions; 3) the amount of waste heat available for alternative uses; and 4) the safe production of leafy greens by local organic and

conventional producers. All other composts at BARC are used for soil improvement on the USDA farm and the U.S National Arboretum.

We have engaged several groups in Maryland including the Maryland Environmental Service, the Maryland Department of Environmental Protection, and members of the U.S. EPA Region III food recycling workgroup, to explore and encourage opportunities to develop more food composting and recycling capacity in the Baltimore-Washington greater metropolitan region. Currently, there is an urgent need for development of regional capacity to recycle food from numerous public and private institutions.

To address concerns with selecting sites for new facilities that avoid long-haul distances, we are pursuing, through our Cooperative Research and Development Agreements (CRADAs), a variety of in-vessel composting and processing options that show promise in overcoming some of the usual open-air system concerns by communities and provide opportunities for additional energy recovery, and sustainability. One CRADA project focuses on use of in-vessel composting to enhance process control and capture of fugitive ammonia emissions to further enhance the nitrogen content of compost to produce an organic fertilizer with stable soil carbon. The other CRADA project focuses on development of technologies for on-site use of cafeteria residuals as energy feed-stocks in rural community schools.

In summary, the ARS at BARC continues to press forward in its research and development of technologies that will utilize biological processes for energy capture and conservation of precious national resources: soil, water, and air. My colleagues and I at

BARC, USDA, and elsewhere appreciate the interest of your committee in the issue of recycling food residuals and compostable bio-based products. Mr. Chairman, this concludes my remarks. I would be happy to answer any questions.

References

[1] Thompson W, Leege P, Millner P, Watson M. 2002. *Test Methods for the Examination of Composts and Composting, 500 pp*.: *CD-ROM* by U.S. Composting Council.

[2] Brown S, Kruger C, Subler S. 2008. Green House Gas Balance for Composting Operations. Journal of Environmental Quality 37 (in press).