Functional Foods Breeding and Processing Program

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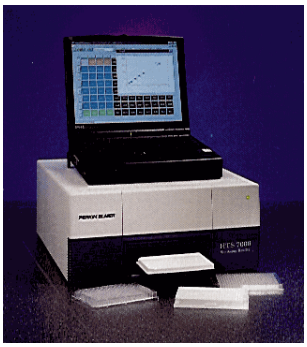
The Functional Foods Program at the University of Arkansas is designed to improve the awareness of the nutritional quality of processed foods. Our current research involves identification of bioactive components in foods, development of new technologies to improve their retention during processing and storage, and enhance biologically active component levels in new and existing food products. Our goal is to develop foods with elevated levels of these components that will ultimately reduce health care costs through prevention of degenerative diseases.



The Food Science Department at the University of Arkansas has excellent facilities and capabilities for conducting research on the health promoting compounds present in agronomic and horticultural crops. We not only have advanced analytical equipment available for measuring the concentrations and antioxidant activity of these compounds, but processing systems are also available for evaluating effects of a broad range of post-harvest treatments on these levels. Affiliated scientists have expertise in production, post-harvest handling, food processing systems, and sensory evaluation of numerous commodities, with emphasis currently being placed on rice, soybeans, small fruits and vegetables.

Our program fostered by its involvement in the Institute of Food Science and Engineering (IFSE), a multi-disciplinary industry-focused entity at the University of Arkansas, is unique in that it involves a systems approach to solving food research problems. Researchers cooperate in studies throughout the food processing system, from breeding and varietal enhancement through processing and storage to enhance the sensory properties, nutrition and safety of processed foods. We plan to utilize our systems approach to identify and quantify important bioactive compounds in foods, and develop technologies to retain or enhance their levels throughout the food system. This effort will comprise collaboration between geneticists, postharvest physiologists, food chemists, food engineers, nutritionists and sensory scientists.

Our research will also focus on the development of new valued added products with disease-preventative and health promoting benefits. Utilization of the systems approach will effectively enable us to improve both the nutritional and sensory quality of processed foods. Development of methods and technologies to improve the color, flavor and texture of functional foods will be a critical component of our research effort. The success of

functional foods, with enhanced levels of health promoting compounds, will largely be dependent on consumer acceptance through improvements in sensory quality.

Programmatic Goals:

1. Identify and quantify bioactive compounds in agronomic and horticultural crops.
2. Determine the effects of genotype, postharvest handling and storage, processing and packaging on levels of bioactive compounds in foods.
3. Develop new technologies, including agitated thermal processing, edible coatings and membrane separation to retain and enrich bioactive compounds in foods.
4. Develop new value added foods with elevated levels of bioactive compounds

We have several projects in progress that are investigating varietal differences in levels of bioactive compounds in numerous crops, and the effects of processing technologies on retention of bioactive compounds in foods. Examples of current research projects include:

1. Identification and quantitation of bioactive compounds and antioxidant activity in advanced breeding lines of spinach, Southern peas, Southern greens, peppers, tomatoes, blueberries, blackberries and red grapes.
2. Retention of bioactive compounds and antioxidant activity in processed spinach, sweet potatoes, green beans, carrots, Southern peas, and Southern greens as affected by agitated thermal processing.
3. Retention of bioactive compounds and antioxidant activity in blueberries, blackberries and strawberries as affected by dehydration.
4. Retention of bioactive compounds and antioxidant activity in pre-cut fruits and vegetables as affected by edible coatings and modified atmosphere packaging.
5. Retention of bioactive compounds in rice bran as affected by post-harvest handling and processing.
6. Retention of bioactive compounds in soy products as affected by different extraction techniques and enzyme treatments.
7. Concentration of lutein from degummed soy oil.