

RNR

U.S. Department of Agriculture Accomplishments Report AD-421 U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year) 03/22/2012
1. Accession 0223617	Agency Identification No. 2. NIFA 3. LA.B	5. Work Unit/Project No. LAB94050	6. Status Annual Report
7. Title Utilization of the Antioxidant Polyphenolics from Agricultural Byproducts as a Health Promoting Ingredient and Preservative for Food Products			
12. Investigator Name(s) (Last Name and Initials) Xu, Z.			
20. Termination Date 06/30/2015		40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011	
Outputs: These research results were presented in the American Chemical Society National Meeting and several refereed journals. Also, the PI was invited by foreign countries to present the research results in their Universities and international conferences. The research achievements have been widely shared by the national and international scientists in this research area and with the general public who are interested in the health promoting food products.			
Outcomes/Impacts: The significant outputs of this project during 2011 include 1) evaluated the effects of pesticides and organic and inorganic nitrogen fertilizer on the content of vitamin E, gamma-oryzanol, and total antioxidants in rice grain and grain quality; 2) compared the antioxidant activity of the polyphenolics in red and white wine and determined their capability in inhibiting cholesterol oxidation; 3) evaluated the change of the health promoting compounds, isoflavones, in soybean using different drying and extraction methods. The effects of pesticides and organic and inorganic nitrogen fertilizer on the content of vitamin E, gamma-oryzanol, and total antioxidants in rice grain and grain quality were evaluated. It was found that application of organic and inorganic fertilizer and pesticides to the rice crop had no consistent effect on the content of vitamin E and γ -oryzanol of the brown and milled rice. Total phenolics content of the brown rice was lower in organic rice than in rice treated with inorganic fertilizer and pesticide. The study concluded that cultural practices did not significantly affect the major antioxidants in rice. The capabilities of two red and two white wines in inhibiting cholesterol oxidation were evaluated using a cholesterol emulsion system. The results demonstrated that red wine possesses great anti-cholesterol oxidation capability, which may contribute to health benefits in preventing cardiovascular diseases. This study establishes that moderate red wine consumption is beneficial to health. It also demonstrated that the health beneficial function may be directly contributed by the antioxidant activity of wine polyphenolics. Consumption of isoflavones was potentially associated with human health benefits and prevents various chronic diseases. In general, the results of this year are extremely useful for our agriculture state to obtain important information about the health-promoting compounds in its products and byproducts, such as rice, muscadine and soybean. The information could be used to expand the market of the agricultural products because more and more consumers are recognizing the benefits of the health promoting grains and fruits. It would increase economic benefits and expand the utilization of Louisiana commodities and their byproducts as value-added materials.			
Publications: L. Tian, H. Wang, A. M. Abdallah, W. Prinyawiwatkul, and Z. Xu. 2011. Red and white wines inhibit cholesterol oxidation induced by free radicals. <i>Journal of Agricultural and Food Chemistry</i> . 59 (12), pp 6453-6458. S. Tipkanon, P. Chompreeda, V. Haruthaithanasan, W. Prinyawiwatkul, H. K. No, and Z. Xu. 2011. Isoflavone content in soy germ flours prepared from two drying methods. <i>International Journal of Food Science and Technology</i> . 46(11):2240-2247. C. M. Sabliov, Z. Xu, D. Boldor and M. Lima. 2011. Continuous microwave extraction of soy isoflavones for food application. <i>Louisiana Agriculture</i> , Spring 2011. L. Tian, H. Wang, and Z. Xu. 2011. Antioxidant activities of red and white wine in inhibiting cholesterol oxidation, 241th American Chemical Society (ACS) National Meeting, Anaheim, CA. A. S. Rodriguez Gil and Z. Xu. 2011. Effect of cooking on anthocyanins of purple rice (<i>Oryza sativa</i>). 2011 Institute of Food			

Technologists Annual Meeting.

L. A. Alfaro Sanabria, S. Sathivel, J. M. King, and Z. Xu. 2011. Development of sonication-assisted method to extract rice bran oil. 2011 Institute of Food Technologists Annual Meeting.

J. D. Estrada, S. Sathivel, Z. Xu, J. M. King, C. Boeneke, P. W. Wilson, P. J. Bechtel, and J. Stine. 2011. Developing a plain stirred yogurt fortified with fish oil and vitamin E. 2011 Institute of Food Technologists Annual Meeting

L. Tian, H. Wang, and Z. Xu. 2011. Capabilities of muscadine and merlot wines in preventing cholesterol oxidation. 7th International Symposium on Viticulture and Enology.

Z. Xu. 2011. Effect of organic and inorganic fertilizers and pesticides on the content of antioxidants in brown rice. In Agricultural and Food Chemistry Division Symposium - Effect of Agricultural Practices and Growth Conditions on Bioactive Compounds, 241th American Chemical Society (ACS) National Meeting

Participants:

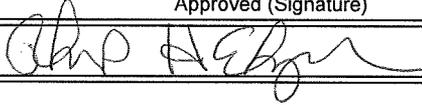
Z. Xu (PI, LSU AgCenter.

Target Audiences:

Nothing significant to report during this reporting period.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date
		3/23/12