# FY 2015 RESEARCH PROJECT SUMMARIES

## NUTRITION RESEARCH PROJECTS

| Project Area | Researcher | Title | Duration | Funding Requested |
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| **Bio-availability/Mechanisms** | | | | |
| | **Del Rio, University of Parma, Italy** | The Protective Effects of Raspberry Polyphenol Metabolites | One year | $40,000 |
| ***Comments:*** *This study continues and completes funding for a current study that will establish baseline bio-availability data. In addition to looking at raspberries and cardiovascular health, it will address neurodegeneration mechanisms. Del Rio is a collaborator with Crozier.* | | | | |
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| | **Crozier, University of Glasgow** | Identification and Quantification of Potentially Protective Polyphenol Derivatives | One year | $21,000 |
| ***Comments:*** *This project would provide funds to complete his FY 2014 funded project. He is a prolific writer with multiple articles appearing in scientific journals from a single funded project. Access to ileostomy patients provides a unique real world look at how and where raspberry compounds are utilized in the body. Crozier also has been interviewed in numerous consumer and health care professionals' publications, both print and electronic.* | | | | |
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| | **Gill, University of Ulster** | Raspberry Consumption and Colonic Health | Second year | FY 2015: $15,000 |
| ***Comments:*** *Gill's project would utilize ileostomy patients in Crozier's study. This is a unique opportunity to investigate the impact of a raspberry diet on colonic micro-biota in samples that have been subject to human digestion rather than laboratory simulated digestive processes, and to determine potential protective effects. This research is important because it can demonstrate that the body absorbs important bio-actives and nutrients at a therapeutic level.* | | | | |
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| | **Zhu, Washington State University** | Dietary Raspberry, Gut Microbiota | Two years | FY 2015: $54,422<br>FY 2016: $54,422<br>Total: $108,844 |
| ***Comments:*** *Matching grant funds of $120,598 over the two-year study more than double funds available to support this project. It recognizes the need to study the impact of whole fruit (rather than an extract), and has as its goals: 1) the* | | | | |

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| *exploration of the impact of dietary raspberry consumption on gut Microbiota and the onset of irritable bowel disease, and 2) the role of gut Microbiota in mediating the beneficial effects of dietary raspberry, specifically as it pertains to Type I diabetes and other autoimmune diseases. Gut Microbiota and biological metabolites rather than consumed compounds are rapidly becoming recognized as the key to bioactivity. Creating a large body of science on biomechanisms will be critical to establishing any future health claim.* | | | | |
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| | **Shay, Oregon State University** | Defining the Metabolic Benefits of Raspberries and Raspberry Compounds | Two Years | FY 2015: $75,000<br>FY 2016: $75,000<br>Total: $150,000 |
| ***Comments:*** *Shay's project is designed to examine the ability of raspberries and specific raspberry compounds to influence a series of metabolic conditions of interest to the raspberry industry including diabetes, chronic inflammation, obesity, and cardiovascular health. Using a proven mouse model, the study will examine the role of whole fruit, juice, seed extract and two key components: ellagic acid and raspberry ketone. Raspberries fed to mice would be in real world quantities equivalent to 1-2 servings of fruit per day. Although raspberry ketones have largely been de-bunked as "voodoo science", there is no real science as to its efficacy. This project could provide an unequivocal answer one way or the other. Year one is proposed to confirm metabolic benefits from raspberry consumption, while year 2 would determine the biomechanisms of those benefits. The second year of the project is predicated on success in year one. While expensive for an animal trial, it is an extremely well designed project that will examine a number of combinations of compounds and health impacts, concluding with a communications strategy targeting two key audiences for the NPRC, Experimental Biology and the Academy of Nutrition and Dietetics (AND).* | | | | |
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| **Diabetes** | | | | |
| | **Noratto, Washington State University** | Protective Effects of Raspberries Against Diabetes Through Modulation of Gut Microbiota | Three years | FY 2015: $25,077<br>FY 2016: $26,420<br>FY 2017: $27,297<br>Total: $78,794 |
| ***Comments:*** *Noratto's project calls for approximately $25,000/year of matching funds, doubling resources available to this project. Similar to Dr. Zhu's proposal, it looks at the modulation of gut Microbiota. In this project, the objective is to assess the health benefits of raspberry consumption as it pertains to diabetes, diabetes-induced metabolic disorders, inflammation, and cardiovascular risk factors. Nutrition science is recognizing the inter-relationship of series of health maladies associated with Metabolic Syndrome, and the moderation of this Syndrome through dietary change to improve gut microbiotic health can have a significant impact on overall health by lowering multiple risk factors. Rader Farms and* | | | | |

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| *Enfield Farms are cooperators on this project.* | | | | |
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| | **Basu, Oklahoma State University** | Postprandial Metabolism and Type 2 Diabetes | One and one-half years | FY 2015:$48,120 |
| ***Comments:*** *Raspberries are believed to have a "competitive advantage" among all berries as a whole food moderator of diabetes. This clinical study with human patients will address the role of raspberries in the dietary management of Type 2 diabetes and the effects of raspberries to modulate metabolic stresses contributing to vascular dysfunction and cardiovascular disease in diabetic patients.* | | | | |
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| | **Losso, Louisiana State University** | Molecular Mechanisms Underlying the Protective Effects of Red Raspberries Against Insulin Resistance | Three years | FY 2015: $98,967<br>FY 2016: $36,930<br>FY 2017: $20,795<br>Total: $156,692 |
| ***Comments:*** *The clinical study in the project will establish the effects of whole red raspberry consumption on insulin sensitivity and inflammation and provide data on how Type 2 diabetes patients respond to red raspberry intervention. The in vitro portion of the project will determine molecular mechanisms protect cells.* | | | | |
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| | **Burton-Freeman, Illinois Institute of Technology** | Red Raspberries and Insulin Action | Two years | FY 2015: $78,255<br>FY 2016: $78,255<br>Total: $156,510 |
| ***Comments:*** *Burton-Freeman's clinical study to examine the relationship between red raspberries and oxidative inflammatory stress, and the relationship of these responses to insulin action is based on data suggesting the role of red raspberry consumption in reducing risk factors for diabetes. It hypothesizes that red raspberries will restore impaired oxidative stress and inflammatory-mediated insulin signaling in healthy and insulin resistant individuals.* | | | | |
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| **Cardiovascular Health** | | | | |
| | **Kirakoysan, University of Michigan Medical School** | Cardioprotective Benefits of Red Raspberries | Two years | FY 2015: $57,435<br>FY 2016: $57,827<br>Total: $115,262 |
| ***Comments:*** *Kirakoysan's study draws its hypothesis from Crozier's work on biomechanisms. Taking a holistic view of* | | | | |

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| *health, it addresses the moderation of metabolic syndrome to lessen the public health burden of heart disease by reducing cardiovascular risk factors of including elevated cholesterol and insulin resistance.* |

## POST HARVEST RESEARCH PROJECTS

| Researcher | Project Title | Duration | Funding Requested |
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| **Sablani, Washington State University** | Ultraviolet Light (UV-C) Treatment for Improving Safety of Red Raspberries | second year | FY 2015: $17,760 |
| **Summary.** *Responding to requirements in the Food Safety and Modernization Act, this project will investigate the efficiency of ultraviolet light to inactivate foodborne pathogens and its effect on berry quality. Many of the commonly used anti-microbial treatments used on other fruits are not transferrable to raspberries due to their fragile nature. While UV-C treatment has proven effective on smooth surfaces, little research has been done on products with complex surfaces like raspberries. Enfield Farms is a cooperator on this project.* | | | |
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