Human

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1. Accession	Agency Identification No.	5. Work Unit/Project No.	6. Status
0220078	2. CSREES 3. LA.B	**LAB94005**	**Annual Report**

7. Title

Investigation of the Mechanism for the Beneficial Health Effects of Dietary Resistant Starch

12. Investigator Name(s) (Last Name and Initials)

Keenan, M. J.; Martin, R. J.; Finley, J.

20. Termination Date 09/30/2014

40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

Results of the project were reported at the annual Experimental Biology Conference held in Washington, D.C. April 9-13. Two journal articles and three abstracts were published.

Outcomes/Impacts:

Our research group has demonstrated increased fermentation and reduced abdominal fat with resistant starch included in a low-fat diet in rodents. Recently, a rat study was completed using resistant starch in both a low- and high-fat diet. The study was analyzed as a factorial and the presence of resistant starch versus the absence demonstrated that inclusion of resistant starch in both a low- and high-fat diet increased fermentation and reduced abdominal fat. However, the effects of inclusion of resistant starch in a high-fat diet were attenuated compared to the effects in a low-fat diet. For example, abdominal fat was reduced by 23% in rats fed resistant starch in a low-fat diet, but abdominal fat was only reduced 9% with resistant starch included in a high-fat diet. This attenuated effect on abdominal fat by a high-fat diet appears to be influenced by an attenuated effect on fermentation in the cecum, the first part of the large intestine. Typical markers of fermentation included the weight of the cecal contents, the weight of the empty cecum, the pH of the cecal contents, and measurements of short chain fatty acids. These results indicate that individuals that consume high-fat diets can still have benefits of fermentation of resistant starch. However, dietary advice should still include diets low or moderate in fat as high-fat diets attenuated beneficial effects. Benefits of fermentation of fermentable carbohydrates like resistant starch generally include a healthier GI tract and possible metabolic factors based on interaction of the gut with other organ systems of the body.

Publications:

Shen L, Keenan MJ, Raggio A, Williams, C, Martin RJ. 2011 Dietary resistant starch improves maternal glycemic control in Goto-Kakizaki rat. 55:1499-1508.

Zhou J, Keenan MJ, Losso J, Raggio AM, Shen L, McCutcheon KL, Tulley RT, Blackman MR, Martin RJ. 2011 Dietary whey protein decreases food intake and body fat in rats. Obesity 19:1568-1573.

Charrier JA, Martin RJ, Brown IL, McCutcheon KL, Raggio AM, Zhou J, Shen L, Goldsmith FR, Goita M, Lammi-Keefe C, Keenan MJ. Resistant starch in the diet of rodents promotes and increase in fermentation and a reduction in body fat, which is not lost in a high fat diet. FASEB Journal, March 17, 2011 25:438.6 (Abstract).

Shen L, Keenan MJ, Raggio AM, Williams CC, Martin RJ Feeding resistant starch (RS) to Goto-Kakazaki (GK) diabetic rats improves pancreatic beta cell mass dams and fasting glucose of offspring. FASEB Journal March 17, 2011; 25:584.11 (Abstract).

Keenan MJ, Aryana KJ, Lammi-Keefe C, Finley J, Shen L, Raggio AM, McCutcheon KL, Goita M, Lam N, Martin RJ. A dose response of dietary resistant starch in human subjects using yogurt as the vehicle for delivery. FASEB Journal; March 17, 2011 25:438.7 (Abstract).

Participants:

M.J. Keenan (PI), R.J. Mortier, and J. Finley, 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
Philip A Ehr		3-23-12