Cluster 2 – Progress Report for the Cluster 2 Science Advisory Body

1. CLUSTER PROJECT DETAILS

Project number: CL03-Pulse-Activity-T4.H29.V1
Name of Project: Blood Glucose Attenuation and Satiety Levels in Humans Following Consumption of Whole Lentils and Yellow Peas and Their Food Products
Project research period: April 1, 2013 to March 31, 2018
Period covered by this report: April 1, 2014 to Dec 15
Principal investigator and research collaborators: Dan Ramdath - Principal investigator
Collaborators: Heather Blewett; Rong Cao; Qiang Liu; Susan Tosh (AAFC); Alison Duncan (U of Guelph); Michel Aliani (U of Manitoba)

NON-CONFIDENTIAL ABSTRACT/SUMMARY

STUDY RATIONALE: Diet and lifestyle related diseases such as type 2 diabetes (T2DM) and coronary heart disease are affecting increasing numbers of people, and pose a significant public health problem in Canada. There is consistent observational evidence to suggest that pulse-based foods may be useful in the prevention and management of diabetes and cardiovascular disease. However, in Canada and in many other countries, the consumption of pulses is very low, so a large proportion of the population do not accrue the health benefits of pulses. In order to raise awareness of the health benefits of pulses and to encourage increased consumption, the pulse industry needs to be able to advertise these messages to the general population. Advertising a health claim for a food item is regulated and requires approval by Health Canada based on credible evidence.

OBJECTIVES: The research activities being pursued in this project have a primary aim of generating credible evidence to support regulatory approval of a pulse health claim for the reduction of blood glucose.

STUDY DESIGN: In order to complement other projects in the Pulse Cluster the workplan of this project is being limited to studies on commonly consumed lentil and yellow pea varieties. To meet the regulatory requirements of Health Canada we are testing lentil and yellow market class varieties that are sold in supermarkets and therefore commonly consumed by Canadians. Healthy Canadians are being asked to volunteer for testing these pulses and food items made from them; this meets another requirement of Health Canada.

To achieve the overall aim of this project the following specific, but interrelated objectives are being pursued: (i) detailed characterization of the nutritional composition and chemical characteristics, and microstructure of commonly consumed lentil and yellow pea varieties; (ii) test three lentil and three yellow pea varieties commonly available in supermarkets for their ability to reduce blood glucose levels when eaten in combination with a known amount of rice or potato; (iii) formulate foods (e.g. muffin, soup, chili) with (test foods) and without (comparison) lentils/yellow peas and assess these for consumer acceptability; (iv) test the foods developed in iii for their ability to reduce blood glucose and promote satiety when compared to the same foods without lentils or yellow peas.

FINDINGS: Analysis of the nutritional components of emerging Canadian lentils (n=23 varieties) and yellow peas (n=20 varieties) as well as those currently sold in supermarkets confirm that these pulses are high in protein, carbohydrates, and dietary fibre. We have also shown that lentils contain significant amounts of antioxidants, polyphenols, and vitamins. Our laboratory studies confirm that when these pulses are boiled and digested, the rate of release of glucose is much lower than other starchy foods such as white bread and potato. However, this property is lost when the pulses are boiled or freeze dried then milled into flour. As such, only whole or pureed pulses will be used in formulation of the products outlined in Objective iii above. Human clinical trials are in progress in Guelph and Winnipeg. Study participants are being recruited in order to test the effect replacing one half serving of rice with lentils or yellow peas on their blood glucose.