This project hopes to show that food products containing pulse ingredients can qualify for satiety and blood glucose control health claims. Pulse ingredients possess the potential to provide health benefits and could be used in foods to control body weight and blood glucose. An interest also exists in supporting the use of foods containing pulse ingredients to improve exercise endurance. Increasing aerobic exercise endurance by consuming food products containing pulse ingredients could potentially reduce tiredness and increase the ability to exercise longer. This project consists of two parts. Part 1 is looking at how participants’ glucose, appetite, food intake, and insulin respond to different pulse ingredient food products. Part 2 is looking at how participants’ aerobic endurance during an exercise session and the blood glucose, insulin, appetite, and food intake responses after the exercise session are influenced by different pulse ingredient food products. The project consists of six human trials, three in Part 1, and three in Part 2. In all trials, participants attend six sessions, one session per week. Blood is drawn so that blood glucose and insulin can be measured. Participants complete questionnaires to measure appetite and food intake is measured during an all you can eat pizza meal. In Part 2, exercise endurance is measured during an exercise session on a treadmill. Preliminary data from the first two trials in Part 1 has been analyzed; the first trial focused on extruded snacks made with pulse flours compared to a corn snack control. The second focused on extruded cereals made with pulse ingredients (pea starch, protein, fibre) compared with an oat cereal control. In the first trial, pinto bean and chickpea snacks led to lower blood glucose concentrations following consumption (before the pizza meal), compared with control, whole yellow pea, and green lentil snacks. No differences were observed between treatments in blood glucose after the pizza meal, food intake or appetite. In the second trial, the blood glucose response was different depending on the type of pulse fraction. Following consumption (before the pizza meal), the blood glucose response was lower following the treatments containing pea protein alone or in combination (pea protein plus pea starch and/or pea fibre), compared to the pea starch and control cereals. However, following the pizza meal, there was a higher blood glucose response to the combination protein with starch and fibre compared to the control cereal. No differences were seen between cereal treatments in food intake or appetite. In conclusion, the results so far suggest that the effects of pulse flours and fractions are dependent on type. Pinto bean flour and pea protein are the most effective pulse ingredients in extruded products at controlling post-prandial glycemia. This data is supportive of post-prandial glycemic food claims for extruded products containing pulse ingredients.