



Manitoba Agri-Health Research Network

Research Notes

*Current Joint Projects and
Member Areas of Interest*

Updated August 2013





Manitoba Agri-Health Research Network

About MAHRN

Located in Winnipeg, Manitoba Canada in heart of the Canadian Prairies, the Manitoba Agri-Health Research Network Inc (MAHRN) promotes Manitoba's capacity and capabilities for the testing and assessment of plant and animal-based bioactive compounds, from isolation and characterization through clinical proof of safety and efficacy to product development and commercialization. MAHRN supports the commercialization of these bioactives as functional foods, food ingredients and natural health products through project coordination, communications, outreach and test market services in conjunction with three world-class facilities:

Canadian Centre for Agri-Food Research in Health and Medicine (CCARM)

Strategically located within the St. Boniface Hospital Research Centre, home to some of Canada's top researchers in cardiovascular disease and neurodegenerative disorders, CCARM is dedicated to understanding the health benefits of nutraceuticals, functional foods and natural health products. CCARM oversees world-class research teams, made up of both agricultural and medical scientists, who explore the safety and efficacy of value-added foods and natural health products.

Food Development Centre (FDC)

Located 70 miles west of Winnipeg, FDC is a fee-for-service research and development organization for the agri-food industry with expertise in product development, food engineering, regulatory affairs, nutritional labelling, and HACCP consulting. FDC has a federally licensed (Canadian Food Inspection Agency) pilot plant for processed food production that allows companies to produce and market their products nationally and internationally.

Richardson Centre for Functional Foods and Nutraceuticals (RCFFN)

Located in SmartPark Research and Technology Park at the University of Manitoba, the RCFFN processes, prepares, analyzes and tests new and emerging functional foods and nutraceuticals, as well as transfer this technology into product development, marketing and commercialization. The RCFFN's multi-disciplinary teams are focused on developing health-enhancing products from traditional prairie crops.

Mandate

MAHRN is the primary contact point for research and industry partners seeking to access Manitoba's functional food and nutraceutical (FFN) industry. From coordinating introductions, to facilitating research, development and commercialization partnerships and activities, MAHRN assists individuals, institutions and organizations from around the world in connecting with Manitoba's research and product development capacity.

Manitoba Agri-Health Research Network Inc (MAHRN)

Projects and Partners

MAHRN champions a range of diversified, yet interlinked projects that address key Manitoba goals including promotion of health and wellness and supporting rural economic development. By building partnerships with growers, SME's and institutions, MAHRN advances the commercialization of Manitoba's impressive pipeline of research and development products in agri-food and life sciences.

Current activities and partnerships include:

Consorcio de Cereales Funcionales SA:

In partnership with Grupo Granotec of Chile, MAHRN is improving the health and wellness of the Chilean population by improving grain based products.

TM Therapeutics

Joint venture between MAHRN and StepOne Ltd, a subsidiary of TruHealth MD, focused on commercializing disease specific food based therapeutic interventions.

NuEats™ Food Innovation (www.nueats.ca)

Facilitating the commercialization of innovative food products that use MB grown and processed products with health benefits.

“Functional Food Inc’s”:

In partnership with 5 grower groups (buckwheat, pinto bean and soy, carrot, sunflower and Saskatoon berry), commercializing finished ingredients and products that utilize Manitoba grown and processed commodities with health benefits for consumers

Canadian Climate Advantage® (www.cca-portfolio.com)

The Canadian Climate Advantage branded line of products features Manitoba grown and processed foods and food ingredients with health benefits beyond basic nutrition. MAHRN has identified that up to C\$30 billion in annual health care cost savings from adding these products to the diet.

APROPOS- Food and Health Products from Natural Sources (www.apropos.eu)

MAHRN is the only Canadian partner in a €2.9 million project investigating novel technologies for the extraction of food and cosmetic ingredients from rapeseed and fish processing. The project involves partners from Europe, Africa and India as well as MAHRN.

Changing Climate, Changing Diet- Maximizing the Opportunities for Food and Nutritional Security

A multi-year, multi-project collaboration between MAHRN and LifeSciences Queensland, focused on exploiting agriculture and human health opportunities afforded by a changing climate. Of particular importance is to understand how the stresses of climate change on humans can be mitigated by maximizing bioavailability of nutrients in the well adapted crops we grow and process.

Canadian Centre for Agri-Food Research in Health and Medicine

(CCARM)

Substantiating a health claim for pulses (beans and peas) and cholesterol-lowering	Effects on pulse varieties on blood vessel function in individuals with peripheral artery disease (PAD)
Lentils as a functional food to improve glycaemic control and reduce biomarkers of cardiovascular disease risk in type 2 diabetes	Establishing mechanisms of action of functional foods
Protection of the heart by conjugated linoleic acid – identifying synergistic targets	Developing innovative wild blueberry food products, processes and information for human health
Protective signaling in cardiac hypertrophy	Characterization and proof of efficacy from fruits: purification, composition and bioactivity of polysaccharides, and polyphenolics from raspberry, cherry and ginseng berry
Effect of dietary interventions on disease progression in models of polycystic kidney disease	Efficacy of cell based model systems of cardiac hypertrophy, inflammation and neural protection
Dietary effects of renal eicosanoid metabolism	Role of hepatic inflammatory response in monocyte recruitment and atherogenesis
Biological effects of alpha-linolenic acid metabolites	The use of flaxseed as a dietary intervention to modify cardiovascular disease
A dose response clinical trial to determine the LDL cholesterol lowering effect of ground flaxseed in adults with borderline to moderate hypocholesterolemia	Advanced bioactive compounds countering the effects of radiological, chemical and biological agents
A randomized controlled trial to determine the LDL-cholesterol lowering effect of whole soy : a dose response study	Establishing a cellular and animal model platform for studying the molecular basis for health benefits of cool climate berries
A randomized, controlled, cross-over study of the effects of snacks on appetite control	Assessment of anti-inflammatory and anti-oxidant properties of Chaga in patients with type 2 diabetes mellitus
The development of high beta-glucan barley banknock and clinical trial testing of its effect on postprandial glucose and appetite control	Effect of plant versus marine sources of dietary omega-3 fatty acids on adipose function and hepatic steatosis
Identification, characterization and proof of bioactivity of polysaccharide and polysaccharide conjugates in apples, cherries and North American ginseng	Effects of canola oil on vascular and metabolic parameters in individuals with metabolic syndrome
New technologies for ginseng agriculture and product development	

Food Development Centre

(FDC)

Saskatoon Berry Functional Food Product Development

- Development of saskatoon syrup
- Development of soy-saskatoon berry smoothie
- Development of saskatoon powder
- Development of a saskatoon beverage shot

Development of Buckwheat as a Functional Ingredient

- Development of roasted buckwheat snacks, (original and flavoured)

Soy Functional Food Product Development

- Scale up development of spreadable product
- Literature review and product application of **sunflower hulls** for **Novel Fibre** approval by Health Canada

Functional Food Ingredient Development

- Development of carrot powder
- Development of saskatoon powder

Development of High protein dry mix

- Utilizing soy, dairy, carrot, saskatoon powders

Oilseed Extraction

- Supercritical Fluid Extraction for:

Seabuckthorn (*Hippophae rhamnoides* L.) Seed Oil and Camelina Oil

- Extraction of **Essential Oils** Using Steam Distillation Technology
- Extraction of **Flax and Hemp Oils** using Cold Press Technology

Development and Applications of Functional Flours from Prairie Grains and Pea fibre Targeting Functional Properties, Nutritional and Health Benefits

- Development of **Flax Bars, Muffins, rolls and biscuits** for Human Clinical Studies
- Evaluation of **pea fibre** in white bread

Textural modification and fibre analysis

Development of Functional Foods from Pulses and Grains

- Development of energy and sports bars
- Development of frozen microwaveable pulse side dish
- Development of cereals

Utilization of Pulse or Pea Flour and Fractions in Batters and Pre-Dust Coatings

- Applications on chicken nuggets, cheese, fish for pulses
- Application on chicken nuggets for peas

Development of Food Products for Baby Boomers

- Development of frozen cookie dough
- Development of a pasta sauce **utilizing red lentils**

Development of Energy Bars

- Evaluation of **phytosterol/beta glucan** in bars
- Development of museli
- Development of bar mixes
- Extraction of **Vegetable Protein Isolates** Using Membrane Filtration Technology

Richardson Centre for Functional Foods and Nutraceuticals

(RCFFN)

Effects of a diet rich in **diacylglycerol (DAG)** oil on body weight, body composition, and blood lipid levels in women

Effect of **Heart & Stroke Portfolio diet** on lipid metabolism and weight loss in men

Effect of **pulses, pulse fractions and canola/flax blends, probiotics** on indices of lipid, carbohydrate, energy metabolism and oxidative status in overweight, hyperlipidemic individuals

Use of **conjugated linoleic acid (CLA)** as a nutraceutical for weight loss in humans

Effects of unique **algal based polysaccharides** on plasma lipid levels and energy metabolism in hamsters

Evaluation of **plant sterol and cholesterol absorption** in overweight, hypercholesterolemic men with and without coronary heart disease

Utilization of modern **dry fractionation** processing for production of commercially ready flours and fractions

Dairy products as functional foods & nutraceuticals

Metabolic health benefits of **dairy protein**

Palatability, acute glycemic index and satiety responses to **tortillas** containing blends of **pulses**, *Opuntia sp.*, and corn flour

Development of “Berry Wild Ricer” – Energy Bar using **boreal forest** products

Supercritical CO₂ and pressurized low polarity water **extraction** (PLPW) of oil and antioxidants from

oats for use in cosmetics and natural health products

Optimization of **supercritical CO₂** extraction of residual oil and phenolic compounds from cold-pressed **canola** press cake and hulls

Supercritical CO₂ and pressurized low polarity water **extraction** of lignans, phytosterols, policosanols and xylo-oligosaccharides from **flax** fiber and shive

Development of monograph pertaining to biopharmaceutical and health **benefits** and contraindications of **Chaga** sp. (*Inonotus obliquus*)

Optimization of **β-glucan extraction** from **oat bran** using air classification

Traceability of functional food and processing quality attributes in pulse crops

Biopharmaceutical manufacturing (capsules and tablets) extract blends for cardiovascular and bone health

Development of and manufacturing scale-up of **novel cosmetic** products utilizing plant essential oils and antioxidant enriched **extracts**

Health effects of **canola oil** and **flax oil** in individuals at risk of metabolic syndrome as a component of the Canola Oil Multicentre Intervention Trial (COMIT)

Health effects of **Dogwood plant and its bioactives** in individuals with joint inflammation or at risk with other conditions