DEFINING FUNCTIONAL PROTEIN, MUCILAGE AND FIBRE VALUE OF YELLOW MUSTARD FOR THE FOOD INDUSTRY

Principal Investigators: DR. JANITHA WANASUNDARA, Agriculture and Agri-Food Canada Saskatoon Research and Development Centre and DR. STEVE W. CUI, AAFC Guelph Research and Development Centre

Canadian mustard industry needs to respond to the growing competition from other crops and the changing consumer preference beyond traditional uses. Canada produced 233,900 tonnes of mustard seed in 2016 with yellow mustard comprising about 55% of the total mustard production, most of which is exported. Yellow mustard (YM) seed is naturally rich in components valuable to the food industry: protein, mucilage gums, fibre, oil and glucosinolates. Developing innovative uses and products focused on these components of the seed will allow opportunities to expand use of yellow mustard beyond a commodity. Yellow mustard protein has an opportunity to align with the increased consumer and food industry demand for alternative proteins for the specialty protein category, particularly those derived from plants, for both nutritional and functional purposes. Yellow mustard seed coat is a valuable source to obtain soluble fibre and gums that have functional advantage in foods and also offers health benefits to the consumer. Current knowledge on mustard polysaccharides is limited to some level of structural characteristics and rheological performance. Detailed understanding on the emulsifying/stabilising capacity and bioactivity of mustard dietary fibres and gums and scaled-up production of mustard fibre and gum products are needed to extend uses of yellow mustard. Similarly, the knowledge on yellow mustard proteins lags behind in having detailed information on nutritional quality, functional attributes and sensory properties, which are the requirements new protein ingredients must have to enter and perform in the plant protein market. A considerable information gap exists on yellow mustard proteins, fibre and gums that can be fulfilled only by the developments in science and technology. The limited availability of total Canadian YM production will dictate our ability to exploit unique YM functionality for high-value niche markets. The objectives of the proposed project are to generate scientific understanding of yellow mustard (*Sinapis alba*) seed proteins, dietary fibres and gums and explore their characteristics and functionalities required in food applications.

The activities of this project will investigate ways of obtaining seed components with economic value, and particularly in utilizing major components of the seeds, proteins, fibres and gums (soluble polysaccharides) in product systems that deliver these components and their molecules to meet the growing market demand of plant proteins and fibres. This project will provide science support for innovative value creation of yellow mustard beyond traditional markets and also gives Canadian manufacturers competitive advantages in the global marketplace.