

# Extension of Shelf Life on Refrigerated Soy Spread and Utilization of Soy in Non-Dairy Yogurt

Locally produced GM soybeans can be utilized for food and beverage applications without beanie off-flavours.



Seasoned soy spread

**SOY PRODUCTS SUCH** as soy milk, tofu, yogurts and spreads are increasing in popularity due to the increase in lactose intolerant diets and interest in Asian foods, which commonly use soybeans. Soybeans are also an economical source of plant protein and Health Canada recently recognized that consuming 25g of soy protein per day can help lower the risk of coronary heart disease. Soybeans grown in Manitoba are typically produced for the oil crush market and these genetically modified (GM) varieties are not bred for speciality food markets. These varieties tend to have a gritty mouth feel, beanie off-flavours and other undesirable traits for food developers. Advances in processing such as fermentation, dehulling and thermal treatments have been used to limit some of the off-flavours. If flavour and quality issues can be overcome, there may be opportunities for value-added markets for both farmers and processors.

This project utilized a laboratory scale pilot plant to improve a soy yogurt beverage and soy spread prototypes, develop nutrition fact tables, conduct sensory evaluations and assess the products' shelf life to prepare products for commercialization. Manitoba-grown food grade soybeans were soaked overnight, washed and rinsed. The beans were then ground with hot water to obtain a slurry product using a blender. Soy milk was

extracted and used as the base material for the production of soy spread and soy yogurt.

To develop the soy spread, the milk was coagulated with a salt or lemon juice to precipitate the proteins and form curds and whey. The curd, also known as tofu, was separated from the whey by draining, filtering and pressing. To create the soy spread, the tofu was mixed thoroughly with other ingredients and seasonings. Because seasonings' composition and source of origin can compromise the microbial load and subsequently increase the rate of quality deterioration, the soy spread was developed using pre-treated seasonings. The final soy spread had negligible beanie off-flavour and an acceptable pH level. In sensory



Soy yogurt beverage

evaluations, the overall appearance, colour, mouth feel and spreadability met consumers' expectations. Based on the results of nutrient analyses, the soy spread was high in calcium, a source of fibre, low in fat, saturated fat and sodium, and free of trans fat and cholesterol.

To develop the soy yogurt, high fat soy milk was extracted from whole soybeans. Additional ingredients were added for hydration (to achieve a drinkable texture), pH adjustment (to achieve the tangy yogurt characteristic) and additional berry flavouring and

masking agents (to mask the beany off-flavours). A product development challenge identified was the separation of the yogurt beverage into two phases after storage meaning that the beverage requires shaking before drinking or the use of gums and stabilizers to improve the homogenization. A 93-day shelf life study indicated acceptable microbiological safety and sensory analysis. Sensory panelists scored the beanie off-flavours as very low and liked the colour, creamy texture and fruity flavours of the yogurt. According to the Canadian Guide to Food Labelling and Advertising, the soy yogurt beverage product can be labelled as low in saturated fat and sodium, free of trans fat and cholesterol and a source of energy and iron.

This research demonstrated how Manitoba-grown GM soybeans for the oil market can also be used in food products by utilizing processing techniques, preservatives and seasonings to alter taste and functionality. These products were developed as part of the Canadian Climate Advantage Project, which promotes novel Manitoba-grown and processed foods and food ingredients with health benefits beyond basic nutrition. Industry partner, NuEats Food Innovation (managed by MAHRN), can be contacted regarding product commercialization. This research could be expanded to frozen soy desserts, kefir, energy bars or baked good applications. ▀

**PRINCIPAL INVESTIGATORS** Dr. Pauly Appah and Meeling Nivet, Food Development Centre

**MPSG INVESTMENT** \$21,400

**CO-FUNDER** \$5,000 – Manitoba Agri-Health Research Network (MAHRN), NuEats Food Innovation

**DURATION** 1 year