# #008

## Increasing the Usage Value of Canola Meal

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Canola meal is the bi-product of oil extraction and is exported from Canadian processing facilities globally for use as animal feed. The primary use is for dairy rations and research has consistently reported that dairy cattle that have canola protein as part of the ration produce 1 litre more milk / cow / day. Amino acid digestibility and in some cases fiber content in the meal / press cake is a limiting factor for inclusion in diets for poultry, swine and certain fish species. Current canola processing also impacts protein bioavailability and therefor utility in monogastric rations. Emerging trends for plant based proteins have potential to increase demand for canola protein, for human consumption, companion animal and aquaculture. In order to capitalize on these emerging trends and unleash the potential of canola meal, changes in breeding, enhancing production, processing and food product manufacture are starting to occur in Canada and globally. One forecast has the companion animal food market growing at 5% compound annual growth rate (CAGR) with a market value of greater than $10 B in the next few years. Plant protein isolates and concentrates for human food is a $7.7 B industry and is currently seeking soy alternatives. The US, Brazil and Argentina soy protein content is in steady decline and preliminary studies indicate that this is also the case with Canadian canola.

Creating high quality protein begins with the canola seed. Many plant proteins face serious challenges including limitations on certain essential amino acids and the presence of antinutritional compounds. New breeding technologies and more efficient utilization of existing genetic variability in Brassica allows for increase in seed protein content, amino acid balance and bioavailability, protein subunit optimization, and fiber reduction, without lowering seed oil content and quality. Utilizing modern plant breeding technologies to optimize canola seed protein for value-added end-use is critical for canola to build on the long history of discovery and improvement that has made the crop a global success. A 2-3% increase in seed protein content with improved bioavailability has significant potential to alter market dynamics.

In order to take advantage of the improved genetics and produce higher amounts and value of protein under dryland farming conditions, will require more efficient nutrient utilization, especially nitrogen fertilizer. This is also important for sustainability, which is linked to producing higher yield and protein while improving the ecological footprint with respect to soil, air, water quality and biodiversity. This goal is not incongruent with modern farming practices and requires the breakthroughs in algorithmics, big data, machine learning, artificial intelligence that is currently being realized in farming practices in Canada.

A final component for increasing value of canola protein is changing processing technologies. Oil-derived plant proteins frequently have off-flavours and oxidize on the shelf. Novel technologies for defatting, protein extraction and formulation of protein fractions have been identified but commercial scale-up has proven elusive. The development of environmentally friendly processes to extract, purify and use canola protein fractions will provide canola with a competitive position in a rapidly expanding market.

This presentation will address challenges and opportunities that exist for canola to establish first mover market advantage in the global trend of increasing production and consumption of healthy plant proteins in emerging markets of human, companion animal and aquaculture and also continue to supply high quality, sustainably produced plant protein for use in monogastric and ruminant feed rations. The presentation will address creation of high quality protein germplasm, optimizing sustainable protein production on the landscape using emerging technologies related to precision farming, novel protein processing technology which preserves or enhances protein functionality and bioavailability and product development which addresses changing consumer tastes, sensory requirements, and food trends.