



BRANDON
UNIVERSITY

CASE STUDY

Shape Foods

Strategies for Growth of Bulk Food Processing in Manitoba

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FEBRUARY 2015

>> Acknowledgements

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Rural Development Institute, Brandon University

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Executive Summary

>> This applied research project answers the question: *Where are the opportunities for growth in bulk food processing?*

This case study is one of three conducted to describe successful bulk food processing companies in Manitoba and give insight into opportunities for growth and innovation in these industries.

Shape Foods is a flax seed processor that manufactures organic and non-organic, non-GMO cold-pressed flax oil and meal. Their flax oil does not require refrigeration and has a shelf life of up to 2 years. They sell bulk ingredients throughout North America and overseas, as well as a private label which is exported overseas.

There is great growth potential for Shape Foods and the flax foods industry in general due to the numerous health benefits of the various components of the oil and meal. Shape Foods will need to work with all other members of the supply chain to build a stable network that meets everybody's needs. All members of the chain will need to invest and innovate to build this business to its potential. This represents both a challenge and an opportunity for all involved.



Courtesy of Shape Foods, Inc. –
www.shapefoods.com

A preliminary cross case analysis report of the three case studies can be found at:
www.brandonu.ca/rdi/files/2011/02/Innovation-in-Agri-food-Processing.pdf

Introduction

PURPOSE OF STUDY

Growth in food processing to produce bulk ingredients represents a major opportunity for Manitoba to increase economic activity in the province.

This research is a preliminary study into the growth opportunities from innovation in the bulk food processing industry in Manitoba.

For the purpose of this study a bulk ingredient processor is defined as a company that sells to manufacturers, bulk wholesalers, distributors or businesses; the unit of sale will be significantly larger than the retail size.

RESEARCH METHODS

The main research method was interviews with company and association leaders through the supply chain, together with researchers and other innovation partners.

This research uses “Instrumental Case Studies”: three particular cases are examined to provide insight into growth and innovation in the bulk food processing industry.

The studies gather data on: history, activities (describe chain processes), setting (product & industry), other contexts and informants (chain). Beyond this description, the focus of the study is growth and innovation in each company and supply chain.

The “Oslo Manual” guidelines for collecting and interpreting innovation data was used to formulate the interview tool for the semi-structured interviews conducted in this study.

An innovation is defined the implementation of a significant change in product, process, marketing or organization that is new (or significantly improved) to the company.

The interviews covered several areas of focus:

- Overview: a description of the company, industry and supply chain are structured and how they work together

- An investigation of innovation in the companies, supply chain and industry:
 - Past innovations that lead to this industry
 - Innovation opportunities for the future
 - Factors that affect ability to innovate
 - Linkages to outside innovation resources

INTERVIEW PARTICIPANTS

Participant	Role
Stuart Kidd, Bill Vincent, Dane Lindenberg <i>Shape Foods, Inc.</i>	Processor
Cal Vandaele <i>Vandaele Seeds Ltd.</i>	Supplier/Cleaner/ Transport - truck
Manager, <i>Seed cleaner and supplier</i>	Supplier/ Cleaner
Executive Assistant, <i>Distributor</i>	Distributor
Eric Fridfinnson <i>Manitoba Flax Growers Association</i>	Producer Association
Brian Johnson <i>Flax Council of Canada</i>	Industry Association
Dave Shambrock <i>Manitoba Food Processors Association</i>	Processor Association
Kelly Fitzpatrick <i>Flax Council of Canada</i>	Industry Association
Grant Pierce <i>CARRM – St. Boniface Hospital</i>	Researcher
Rex Newkirk <i>Canadian International Grains Institute</i>	Researcher
Bonnie Bain <i>Farm Credit Canada</i>	Financial
Susan Abel <i>Food & Consumer Products of Canada</i>	Manufacturing Industry Association

Oslo Manual Source: OECD & Eurostat Agri-Food. 2005: Guidelines for collecting and interpreting innovation data.

THE FLAX INDUSTRY

Flax has been a food crop since ancient times, and is well established in Europe, especially Germany. Flax is also used in animal feed and in industrial applications (linseed); the plant fibres are used to make linen. As flax produces higher seed and oil yields in northern latitudes, Canada is one of the best places in the world to grow flax, producing 489,000 tonnes in 2012/13, 45% of worldwide production (80% SK, 11% MB). Flax remains a minority crop in the prairies when compared with wheat, canola soybeans or corn.

SHAPE FOODS

The Company

Shape Foods, Inc. crushes prairie grown flax seed into cold-pressed oil and flax meal. These are sold as bulk ingredients and retail packed for private label sales. The processing plant was built in Brandon Manitoba in 2006/7, and operational in January 2008. The original company ceased operations in 2008. Under new leadership, Shape Foods, Inc. was incorporated in 2009 and began crushing at the new plant in January 2010.

Shape Foods was established in Brandon because it had the desired social, economic and transportation links and a good supply of prairie flax seed was available.

Shape Foods' focus is on producing high quality, pure flaxseed based omega-3 oil and flax meal products that can be used to introduce these healthy ingredients to the consumers of North America and the world.

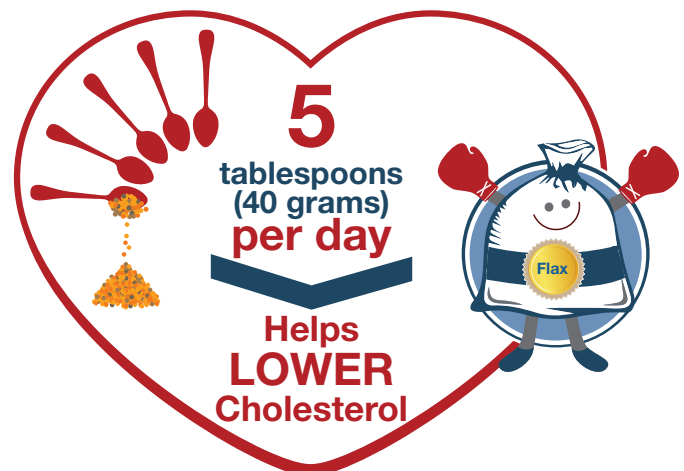
Flax, Omega-3 and Health Benefits

Recent research on flax indicates that it may reduce the risk of heart disease, cancer, stroke and diabetes.

- In 2014 a health claim for flax was approved by Health Canada as helping reduce cholesterol
- Each tablespoon of ground flaxseed contains about 1.8 grams of plant omega-3s

- Flax oil contains 50-60% alpha-linolenic acid (ALA) an omega-3 polyunsaturated fatty acid. It is believed that the beneficial effects of flax to cardiovascular health and hypertension are due to its high ALA content.
- Flax oil provides better bioavailability of ALA than whole or milled flax seed; this gives a competitive advantage for the use of flax oil as an ingredient to provide dietary ALA.
- Omega-3 oils have anti-inflammatory effects. Flax oil can help consumers balance their ratio of omega-6 to omega-3 consumption. The recommended ratio for good cardiovascular health is 4:1, but the typical North American diet is about 20:1.
- Flaxseed contains 75 to 800 times more lignans than other plant foods, which have both plant estrogen and antioxidant qualities
- Flaxseed contains both soluble and insoluble fibre, which are important for healthy digestion and conditions such as heart disease and diabetes.

FLAX, THE CHOLESTEROL FIGHTER



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada



The Processing Plant

Shape Foods' processing plant is a 70,000 sq. ft. HACCP certified state-of-the-art production facility. Flax arrives by truck (20 or 40 tonnes). The plant has the capability to add additional capacity under the current footprint.

Processing

Shape Foods' proprietary manufacturing process cold presses flax seed, and removes impurities from the oil without the use of additives, chemicals, or preservatives. Due to this unique extraction method Shape's oil retains flavor and nutrients and has a two year shelf-life; much longer than the industry standard of 6 months.

Products

Shape Foods' products include flax oil and flax meal marketed as ingredients, sold in several sizes.

Private label oils are available in 250ml or 500ml glass bottles; packaging is critical for flax oil as it is sensitive to light and needs to be protected in black bottles. Pure conventional and organic oils, as well as culinary and dessert oil flavours are available. Private label flax meal from brown or golden, organic or conventional seed is sold in 454g Mylar packs.

All Shape products are Kosher, Halal, gluten-free and vegan.

Markets / Customers

Most of Shape Foods' ingredient sales are within North America. Their major market for private label is overseas, with significant focus on SE Asia. Flax meal is sold for both human and animal/pet food.

Position in Industry

Shape Foods, Inc. has been operating for four years and has established a consistent customer base as an ingredient and private label supplier. Competitors are other flax and specialty edible oil producers, fish oils and crushers producing whole crushed flax seed.

Competitive Advantages

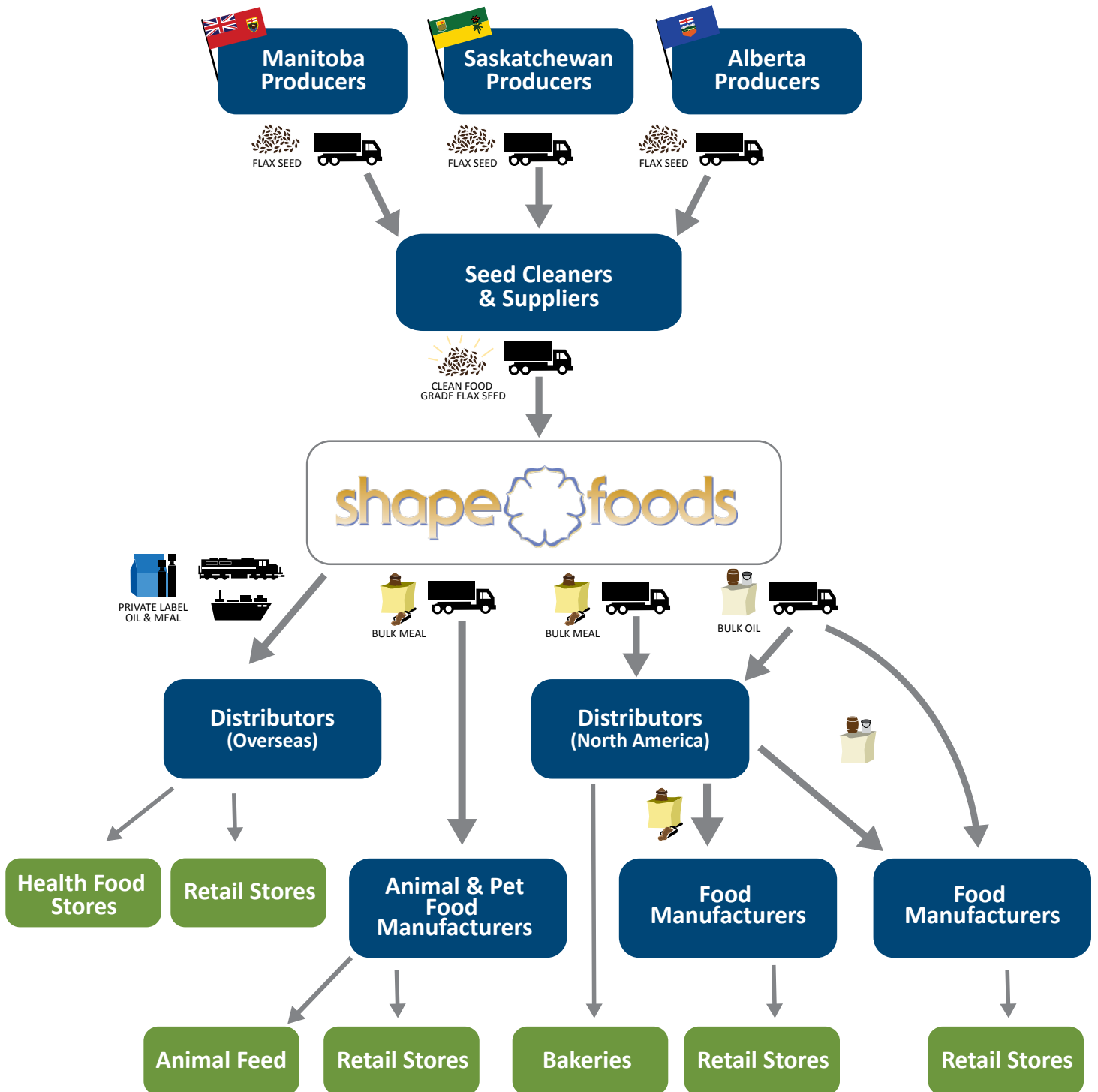
- Shelf stable oil, for up to 2 years
- Oil does not require refrigeration
- The only flax oil that can withstand pasteurization
- Excellent taste
- Culinary & dessert flavoured oils
- Average 11.5% residual fat content in meal, 6.5% omega-3

SUPPLY CHAIN

Shape Foods purchases flax seed from producers across the Prairies in Alberta, Saskatchewan and Manitoba. The purchasing is done through seed suppliers who also clean and transport the seed by truck. Shape Foods sells its ingredients direct to food manufacturers and uses distributors/brokers to market their products.

After processing, the flax oil is shipped by truck in bulk (20 litre pails, 200 l drums, or 1000 l totes) to food manufacturers throughout North America. Bulk meal is also shipped by truck either in 750kg totes or 50lb bags to animal and pet food manufacturers and human food manufacturers. Private label oil and meal is shipped to port by train; then shipped by sea to overseas distributors.

SHAPE FOODS SUPPLY CHAIN



Innovations

Shape Foods' business is based on a unique proprietary process innovation that gives their oil excellent taste, nutritional properties and shelf-life. Their current business plan incorporates a two pronged marketing plan: selling oil and meal as bulk ingredients and reaching the retail market through private label sales, where their innovative flavoured oils give them a distinctive product. Study participants agreed that the health benefits of flax are and will be the main driver for growth and innovations in the flax food industry. The past

confirmed Canadian health claim for ground flax together with promising medical research on the benefits of omega-3 (ALA) and other active compounds in flax will lead to significant growth through marketing, process and product innovations, by Shape Foods or other members of the flax industry. Study participants indicated that the industry is ready to meet the projected increased demand for flax foods; this will include improving growers yield through agronomic and plant breeding innovation.

SF1 Innovation: Unique Process Type: Process / product New to: World Part of supply chain: Processor When: 2004-6 Time Line: Incremental Developed: In-house with equipment company	Shape Foods' has developed their own unique proprietary cold pressed oil extraction process. It is this proprietary process that gives Shape's products their exceptional quality and shelf life.
SF2 Innovation: Ingredients - diversification Type: Marketing / organizational New to: Company Part of supply chain: Processor When: 2010 and continuing Time Line: Step-wise Developed: In-house, with distributors	Shape Foods is developing sales and markets for every part of the raw material flax seed processed. In 2010 the company launched a two pronged marketing strategy: selling their oil and meal as bulk ingredients to food manufacturers, together with reaching the retail market through private label sales. Shape is also diversifying their marketing efforts by actively seeking overseas markets such as SE Asia
SF3 Innovation: Flavoured oil Type: Product/marketing New to: Industry Part of supply chain: Processor When: 2008 and continuing Time Line: Incremental Developed: In-house, with distributors	Shape Foods differentiates its products in the retail market by offering a number of different innovative culinary flavours including Italian and Szchuan, together with dessert flavours. This increases customer choice and available flavours, increasing the appeal of their private label products.

SF4 Innovation: Product development Type: Product/ process/ marketing New to: Industry Part of supply chain: Processor When: 2010 and continuing Time Line: Incremental Developed: In-house with customers	Shape Foods makes demonstration oil blends and flavours for customers; as well as various meal grinds. They also work with ingredient customers, giving technical processing advice so these food manufacturers can use flax oil and meal effectively within their products and not cause onset rancidity through improper handling and mixing. This cooperative product and process development is an essential component of establishing a long-term relationship between ingredient supplier and customer.
SF5 Innovation: Expanding products & markets Type: Marketing / products New to: Company Part of supply chain: Processor + all When: Now and next 5 years Time Line: Incremental Developed: With distributors and others	Flax has very useful functional properties for food processing due to its water absorbing (hydrocolloidal) properties. Flax can be used to replace expensive guar gums in processed foods, adding to functionality for processing and adding nutritional benefit. This represents an opportunity as the oil industry is using large quantities of guar gum in fracking operations. Other markets that have potential for further growth include: the baking industry, flax dressings for salads, protein in third world countries, supplements and cosmetics.
SF6 Innovation: Flax breeding / Increased yield Type: Process / product New to: Industry Part of supply chain: Growers When: Continuous + next 5 years, Time Line: Incremental Developed: Flax Council of Canada with breeders and growers	<p>There is significant potential to increase yield for Canadian flax growers through research and use of best-agronomic practices. This is essential to ensure a consistent supply of food-grade 99.9% clean product for food processing. A multi-year program with an agronomic package that could increase yield by 25% is currently being prepared by the Flax Council of Canada. This is intended to increase flax acres and production to meet expected increases in demand. It will also enable flax to compete in the battle for seeded acres with the dominant crops: wheat, canola and, increasingly in Manitoba, soy. There is evidence that flax has a genetic potential to give up to 2.4 times the current yield.</p> <p>Plant breeding research is also being conducted to give improved varieties in terms of agronomics, oil yield and food use.</p> <p>An example of a novel flax cultivar breeding project that could enhance Canadian flax for food use worldwide would be to breed a reduced cyclolinopeptide E flax seed cultivar. This would reduce the natural flavour bittering constituent in flax seeds and greatly enhance the character of the flax food taste profile.</p> <p>Developing and promoting Canada's flax growing expertise would allow for more growth as customers would come to Canada first, this could lead to doubling of the industry.</p>

SF7 Innovation: Health claims	
Type: Marketing / product	
New to: The industry	
Part of supply chain: All	
When: 2014 - future	
Time Line: Incremental	
Developed: Health researchers + entire supply chain	<p>Flax has many components that have demonstrated beneficial effects on human health. The health benefits of omega-3 (ALA) are well established; ground flax reduces cholesterol (health claim); soluble fibre, lignans and protein all have positive effects.</p> <p>The study participants recommended continued efforts to educate the food industry, consumers and the medical community on the health benefits, quality and safety of flax. Continued scientific and medical research to explore and validate the health benefits is also essential.</p> <p>Human consumption of flax will increase significantly from the current value of about 20% of the crop, if the value chain works together to develop innovative marketing methods to promote the health benefits of flax and flax products.</p>



Courtesy of Shape Foods, Inc. – www.shapefoods.com

Innovation Methods

Factors that Affect Ability to Innovate

Shape Foods innovates mainly on their own, with help from NSERC/NRC, the equipment manufacturer, and university and other researchers. The company generates ideas through Bill Vincent, the research and development manager at Shape Foods. Ideas are screened by looking at cost effectiveness, if they meet all the terms and conditions (for flavors), and if there is a maximum impact of omega 3 in a minimum dose. Incentives for Shape Foods to innovate include spreading the word about the health impacts of omega 3 and “offering a contribution to humanity that is ethical and profitable”.

As well, flax is a small player when compared to other grains such as wheat or canola. If the benefits of flax could be marketed to its greatest extent, the industry could double. Study participants suggested that the industry needs to work together through the entire chain (growers, processors, manufacturers, retailers and everyone in between). A sign that this is possible is the Flax Council of Canada’s (FCC) success in leading the elimination of Tryffid from the Canadian flax supply and the lead they have taken in agronomic improvement.

The time and money that it takes to market a novel product (1 year for smaller customer up to 5 years for large established customer) is another factor that affects Shape’s time-line to market for innovations. It takes time to build customer relationships and trust, making a new product is a risk for a food manufacturer. Before making a commitment, food manufacturers must be confident in the product and the ability of the ingredient supplier to consistently provide sufficient high quality supply of the ingredient.

Innovation Linkages

External information sources for Shape Foods are NSERC, NRC and IRAP who also provide funding. In addition the Richardson Centre for Functional Foods and the Proteomics lab at the University of Manitoba, as well as the Food Development Centre in Portage le Prairie have assisted in product evaluation and development trials.

Their interaction with these linkages is described as cooperative, coordinated and collaborative. However, it was suggested by research participants that “people are in their own worlds” with regard to the cohesiveness of the flax industry in Manitoba, and more communication is needed. However, the chain relationships are still described as cooperative.

There are competing interests as producers want a high price for seed, while processors and manufacturers want the best product at the lowest price. These issues can be addressed by increasing efficiency of growers and yield, (as with the FCC agronomy package) and growing the whole industry. It was suggested that, areas of concern need to be put to the side so that the whole industry can concentrate on educating growers and customers about flax and its benefits in order to allow growth for the whole industry.

Shape Foods’ main area of concern when working with innovation linkages is intellectual property and proprietary information; these concerns are addressed through non-disclosure agreements.

It was agreed across the board that the consistency and stability within Shape Foods’ supply chain is healthy. Relationships are mature and established with reliable customers who are happy with the product. As well, there are new customers that have major potential.

Limits to Growth

There is sufficient supply of flax seed and initiatives underway to improve yields. Growth of seeded acres for flax is not unlimited as flax should be grown high pH soils with low cadmium concentrations to keep Cd levels low in the seed. Flax also contains small amounts of cyanogenic glycosides, the amounts are not sufficient to cause harm, but the issue must be addressed in some Asian markets. As well, in order for flax oil processing to grow, there has to be acceptance of new flax ingredients by manufacturers, and acceptance of new flax products by consumers, on an individual and country-wide scale.

With regard to the supply chain, limits to growth include poor secondary roads connecting producers to seed suppliers, consistent supply of food grade flax, yield and knowledge and the tendency for producers to chase last year's markets. Disposing of flax straw is a disincentive for some producers, but that is reduced as there is now a market for the straw in Manitoba. As well, it was suggested that flax breeding programs are not being supported well. This could hurt the industry as breeders would not have as much opportunity to enhance flax as a functional crop.



The industry as a whole has its own set of limitations to growth including a time sensitive need to reinvent themselves with customers, and the possibility that they may not be able to capitalize fast enough the opportunities open to the flax industry before someone else does.

Conclusions

Shape Foods has a unique process which gives excellent quality flax oil and meal that has great potential in the marketplace. Challenges begin at the producer level where it has been suggested that growers tend to chase last year's markets. An agronomic package would help growers to increase their yield by 25% which would help provide consistent supply to Shape Foods.

As for Shape Foods, it was consistently commented through our research that they need to continue to build partnerships and customer relationships. Although they have cracked the market in North America and SE Asia, it is important to keep pushing markets in order to grow in the bulk flax oil and meal industry.

There is increasing evidence that points towards flax gaining in popularity as a healthy food. The industry could grow immensely by marketing the health benefits of flax. The promotion of the health benefits of flax oil and meal depends on the cohesiveness of the industry. The flax industry needs to more effectively use the regulatory environment to their advantage (health claims).

The opportunities for growth in bulk flax oil and meal processing are abundant; it is up to the whole value chain to work together in order to meet the needs of potential customers in order to grow.



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