



BRANDON
UNIVERSITY

CASE STUDY

Hemp Oil Canada

Strategies for Growth of Bulk Food Processing in Manitoba

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RURAL
DEVELOPMENT
INSTITUTE

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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 eight conducted to describe successful bulk food processing companies in Manitoba and give insight into opportunities for growth and innovation in these industries.

Hemp Oil Canada Inc. (HOCI) is a privately owned hemp food processor based in Ste Agathe, Manitoba. Established in 1998, they are the ground floor of the Manitoba and Canadian hemp industry, (one of) the world's largest hemp oil producers. They produce organic and conventional hulled and toasted hemp seeds; hemp oil and hemp powders, mostly for the bulk food ingredient market.

Through the years HOCI have innovated in many ways to develop processing technology, new products and with their customers, have gradually built the market for hemp food products in North America and the world. Annual growth rates of about 25% for the company and industry are expected to continue as the health benefits of hemp oil and seeds are investigated, and the products gain main-stream acceptance. An inconsistent and changing regulatory environment is one of the greatest challenges to growth in the hemp food industry; both in Canada and internationally. Consistent fair regulation will enable the industry to grow; this is especially important in attracting new producers to grow the crop and utilizing the potential of the whole plant: seeds, stalk and leaves.



Courtesy of Hemp Oil Canada – www.hempoilcan.com

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 follows from a preliminary study into the opportunities for growth that come from innovation in the bulk food processing industry in Manitoba. For the purpose of these studies a bulk ingredient processor is defined as a company that sells to manufacturers, bulk wholesalers, distributors, businesses and food service. Private label sales are also included as a type of bulk sale in this research; in addition some processors also sell their own branded products. The unit of sale will be in most cases significantly larger than the retail size.

For the second year of the study, the notion of health benefits associated with ingredients was an additional factor examined with the majority of companies selected.

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”: eight Manitoba bulk food ingredient processing companies and their associated supply chains are examined to provide insight into growth and innovation within the bulk food processing industry.

The studies gather data on: history, activities (describe chain processes), setting (product & industry), and 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” guidelines¹ for collecting and interpreting innovation data were used to formulate the interview tool for the semi-structured interviews

¹ Oslo Manual Source: OECD & Eurostat Agri-Food. 2005: Guidelines for collecting and interpreting innovation data.

conducted in this study.

An innovation is defined as 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, 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
Shaun Crew - CEO Hemp Oil Canada	Processor
Larry Marshall Marshall Farms Inc. - Organic Producer	Producer
Kris Anderson - Logistics Manager Interlake Agri	Seed Cleaner
Michal Tózsér - CEO Hemp Seed Oil Europe	Distributor / Customer
Materials Manager North American Food Manufacturer	Customer
Kim Shukla Canadian Hemp Trade Association	Commodity Organization
Alphonsus Utioh – Manager Food Development Centre	Innovation partner
Peter Jones - Director Richardson Centre (RCFFN)	Research Centre
Dave Shambrock Manitoba Food Processors Association	Processor Industry Association

HEMP FOOD INDUSTRY²

Hemp has been an important fibre and food crop for over 10,000 years. Hemp fibre has been used to make clothing, ropes, and paper; the grain has been stewed, roasted, and milled for food; and the oil derived from the grain has been used for food, cosmetics, lighting, paints, varnishes, and medicinal preparations.

After a 60-year ban, commercial cultivation of Industrial Hemp became legal in Canada in 1998. This was largely due to an initiative of a small number of Canadian companies, as well as Canadian universities and provincial governments that researched industrial hemp production and processing. The Industrial Hemp Regulation³ program that came into effect in 1998 applies to all persons in Canada engaged in the cultivation, distribution, importation, exportation, and processing of industrial hemp.

Current world leaders in hemp production are Canada, Germany, England, France and China. The leading hemp acreage provinces in Canada are Alberta, Manitoba and Saskatchewan. According to the Manitoba Government 14,732 acres in 2013 were planted in Manitoba out of the 66,671 licensed acres in Canada.

In 2012, the total retail value of hemp products exceeded \$500 million. This includes food and body products, clothing, auto parts, building materials and other products.

Health Benefits of Hemp

Hemp foods are new, however nutritional analysis of hemp seed indicates potential for health benefits. Hemp oil is high in “healthy” polyunsaturated fatty acids with a 3:1 ratio of Omega 6 to Omega 3. The oil is also used in body-care applications as it is high in vitamin E. Hemp seeds (and powders) have high protein and fibre content, with a good range of amino acids. Hemp protein is easily digested due to a lack of trypsin-inhibitors and the high fibre content gives an increase in satiety. Current research is looking at

potential benefits effects of hemp consumption, including: effects on eye health, cholesterol levels, blood pressure, insulin levels and appetite.

HEMP OIL CANADA

The Company

Hemp Oil Canada was incorporated in March 1998; the same month that Health Canada re-legalized the cultivation of industrial hemp in Canada. In 1999, following 14 months of intensive market, product, and processing research and development, HOCl opened the first exclusive hemp seed processing facility in Canada. The company moved to its current facility in 2006, recovered quickly following a fire in September 2013, and a new larger facility will be ready to operate in the summer of 2015. HOCl currently employs about 30 people. The company and the industry have grown at about 25% per year since 1999.

Today HOCl is one of the world’s largest bulk wholesale producer, private label packager, and custom processor of hemp food products and ingredients. They have exclusive Canadian rights to Finola®, a popular hemp variety with excellent nutritional, taste and agronomic characteristics. Hemp Oil Canada exports globally to more than 15 international destinations.

Processing

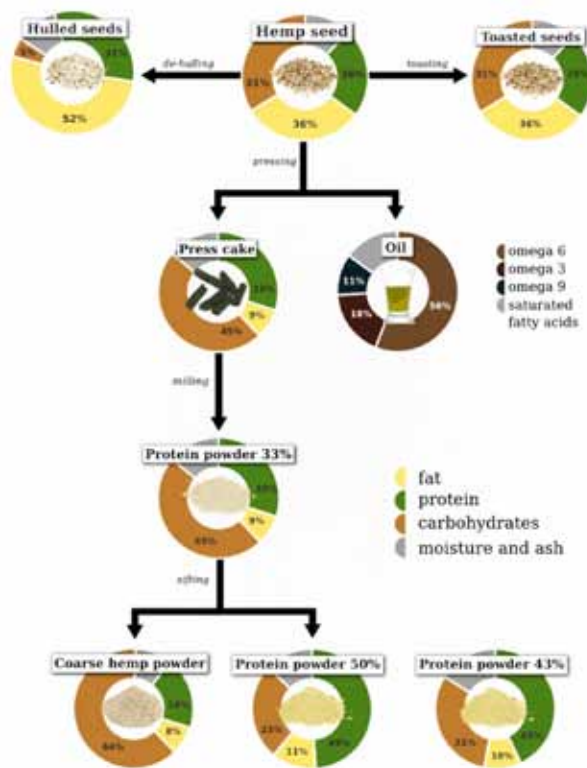
Hemp seed oil is extracted mechanically without use of chemicals, preservatives or additives and cold pressed at temperatures below 48°C yielding solid “press cake” and oil. Hemp protein, hemp flour and powder are produced by mechanical milling and sifting of the resulting solid press-cake. The oil is filtered using HOCl’s cold filtering technology, removing any natural suspended solids. No heat or chemicals are applied during the process.

Hemp seeds are hulled through a no-heat, mechanical process without sacrificing any nutritional benefits. Hemp seeds can also be roasted using custom-built hemp seed roasters for providing different flavors. Roasted hemp seed (25%) combined with coffee beans (75%) produce hemp coffee.

2 Sources: Agriculture and Agri-Food Canada, Health Canada, Canadian Hemp Trade Alliance, Manitoba government http://www.gov.mb.ca/agriculture/crops/production/print_hemp.html

3 <http://laws-lois.justice.gc.ca/eng/regulations/SOR-98-156/index.html>

Hemp Seed Processing & Typical Product Composition



Courtesy of <http://www.hempseedoil.eu/>

Products

Hemp Oil Canada offers a variety of products from hemp seed oil, which is offered as bulk, private label or in capsules (Veggie Green Caps), to hemp seeds (both toasted and hulled) and hemp protein, flour and powder. Specialty (e.g. hemp coffee) and organic products are also offered.

Hemp Oil Canada is GFSI accredited under the FSSC 22000 food safety and quality program standard. In addition, HOCI holds certifications for Organic (Pro-Cert Organic Systems, USDA, JAS, EU Organic) and special dietary (Kosher, Halal, gluten-free) products and the facility is allergen-free and HACCP-designated.

Markets / Customers

Hemp Oil Canada supplies its products only to manufacturers, bulk wholesalers, distributors and businesses; they do not sell to the final consumer. Their products are sold both nationally and internationally.

Position in Industry

Hemp Oil Canada is the largest wholesale hemp producer in Canada and among the largest in the world. Hemp Oil Canada together with Manitoba Harvest (the largest retail hemp product company in Canada) established the hemp industry in Manitoba and in Canada and they are still leading the way for tons processed, innovation and growth.

Competitive Advantages

- Largest producer and processor of bulk hemp food products / ingredients
- Quality and customer-care driven
- Expertise and knowledge of the industry - products, processes and market were created from scratch
- Well connected and established company - have dealt with almost everyone in the hemp industry over the years

Supply Chain

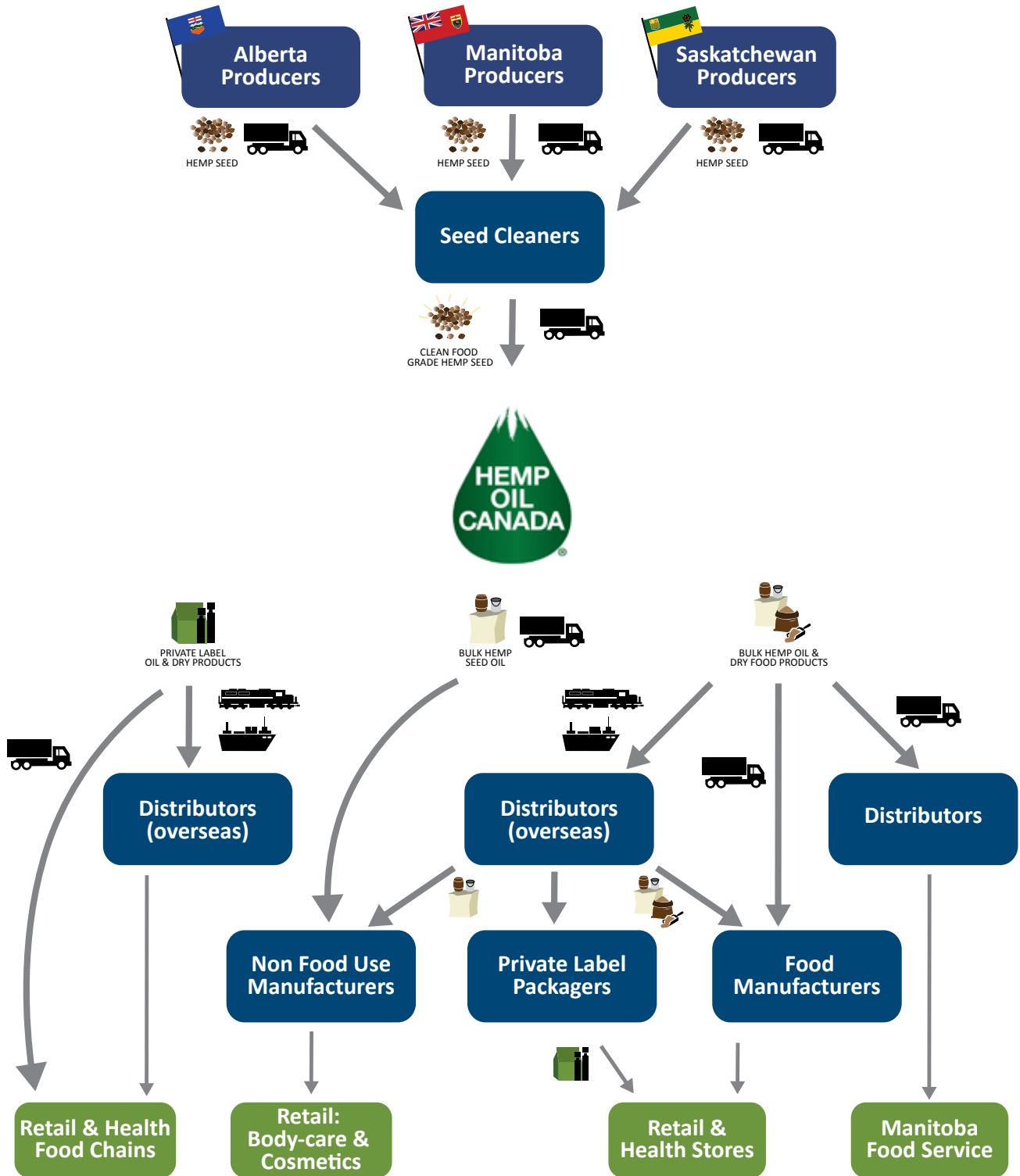
Hemp Oil Canada purchases seed from contracted hemp producers in three provinces, Alberta, Saskatchewan and Manitoba. The seed is shipped by truck to seed cleaners across the prairies, where it is cleaned to HOCI's specifications. The clean seed is then trucked to Hemp Oil Canada's plant in St. Agathe, Manitoba for processing.

Sale of ingredients to food manufacturers (e.g. nutrition bar, cereal and cookie manufacturers) comprises the majority of HOCI's business followed by direct sales of private label products to retail chains. A significant portion of the oil is used in the cosmetics industry.

Food service sales (e.g. restaurants, hospitals and schools) are a smaller but increasing part of HOCI's business.

Hemp Oil Canada exports its products throughout North America and internationally to about 30 destinations. In some cases (European Union, Australia, Korea, Japan and Mexico) distributors are used; HOCI ships directly to other destinations.

Hemp Oil Canada Supply Chain



Innovation

Hemp Oil Canada is a founding company for the North American hemp food industry which is “new” to the continent following a 60 year “legislated break”. Hemp Oil Canada and the rest of the industry have innovated rapidly, creating the processes, products and markets for hemp food products. Investments are being made into research, as many of hemp’s functionalities have

not yet been fully explored. There is significant potential for the industry to continue to innovate and grow with growing acceptance of hemp as a food crop and ingredient, and possibilities for uses for the entire hemp plant for fibre, livestock feed and nutraceutical or pharmacological products.

HOCI 1 Innovation: New Oil Processes

Type: Process / Product → Marketing

New to: Hemp oil industry

Part of supply chain: Processor

When: 1998 & 2003

Time Line: one-step x 2

Developed: In-house with equipment suppliers

Hemp Oil Canada adapted established cold press technology to extract the oil from hemp seeds. This decision was in part a marketing decision as this process naturally gives a higher quality, premium oil. Omega 3 and 6 fatty acids are not damaged by the process.

A new cold filtration process was developed using a method modified from water filtration technology. This process is more efficient than conventional food oil filtering, giving less waste and a clear, consistent product with excellent taste and shelf life.

HOCI 2 Innovation: New Seed Ingredients

Type: Process / Product

New to: World hemp industry

Part of supply chain: Processor

When: 1999 & 2000

Time Line: one-step x 2

Developed: In-house with equipment suppliers and customers

Perfecting the process to de-hull hemp seeds to give a “nut” or hemp heart was the innovation that established the company and the Manitoban industry. Equipment from the seed-cleaning and sunflower industry was adapted, to give a process that had the advantage of being scaleable.

HOCI was the first company to roast hemp seeds. Initially suggested by a customer who wanted to incorporate hemp into coffee, the toasting process (using a modified coffee roaster) gives a nuttier taste than raw hemp seeds. This product is now an ingredient in many products, including coffee.

HOCI 3 Innovation: Product Development

Type: Product → Process

New to: Company / Industry

Part of supply chain: Processor / Distributor / Manufacturer

When: Continuous to future

Time Line: Multiple step-wise

Developed: In-house with and by distributors, manufacturers & Alberta Innovated Technology Futures (AITF)

Hemp Oil Canada, their European distributor and their manufacturer customers are constantly developing new products and expanding the hemp market.

HOCI sends a lot of samples to potential customers so they can experiment with using seeds, oil or flours as ingredients, ingredients are also customizable to manufacturers’ specifications.

New products have included superfood bars; with multiple high energy, functional ingredients including hemp ingredients and cereals with added hemp. Germinated hemp seed is a novel ingredient that is easier to digest; has a 30% increase in tocopherol content (Vitamin E compounds) and strong antioxidant properties.

<p>HOI 4 Innovation: Health Benefits</p> <p>Type: Marketing → Organizational & Product</p> <p>New to: Industry</p> <p>Part of supply chain: All</p> <p>When: Continuous to future</p> <p>Time Line: Multiple step-wise</p> <p>Developed: All with health researchers</p>	<p>Realizing the importance of the health benefits and possible health claims; hemp processors, the rest of the industry and government are funding research on the effects of hemp in the diet on blood pressure, cholesterol levels and eye health.</p> <p>Hemp oil has significant Omega 6 and 3, in a ratio of about 3:1. Hemp also has significant fibre and vitamin E content.</p> <p>Hemp flour can be used in recipes and baking to increase protein content, the amino acid profile is virtually complete. Hemp Oil Canada has successfully separated the crushing solids into high fibre and high protein powders, giving popular new ingredients and products, including flavoured protein powders for body builders (developed in Europe).</p>
<p>HOI 5 Innovation: Agronomy</p> <p>Type: Process → Organizational</p> <p>New to: Hemp industry</p> <p>Part of supply chain: Producers</p> <p>When: Continuous to future</p> <p>Time-Line: Incremental + one step</p> <p>Developed: CHTA, processors, agronomists, government, AITF & PCDF (Parkland Crop Diversification Foundation)</p>	<p>Hemp is well suited to the prairies, growing well in the North; it is relatively easy to grow organically as it grows faster than the weeds. However, as industrial hemp was not grown in North America for 60 years most producers are not familiar with the crop, or the multiple regulations surrounding it. Producers are constantly experimenting to improve quality and yield. HOI employs an agronomist to serve producers and has exclusive rights to a top food grade hemp variety, Finola®.</p> <p>To encourage more producers to grow both conventional and organic hemp and meet growing demand, the Canadian Hemp Trade Alliance has spearheaded the creation of a guide for producers. This guide covers regulations and licenses; agronomy, growing and harvesting to give high quality seeds for food use.</p>
<p>HOI 6 Innovation: Expansion</p> <p>Type: Organizational → Process</p> <p>New to: Company</p> <p>Part of supply chain: All</p> <p>When: since 1998; before 2025</p> <p>Time Line: Continuous, step-wise</p> <p>Developed: In-house, with equipment suppliers, engineers & architects</p>	<p>Hemp Oil Canada will complete a new plant in the summer of 2015; this facility will have significantly greater efficiency, automation and processing capacity.</p> <p>The evolution of the Canadian hemp food industry has led to a global increase in the distribution and use of hemp oil and seeds. The growth of Hemp Oil Canada has led to the establishment of new companies both locally and around the world. In the prairies, seed cleaners have invested in specialist equipment and developed management systems to achieve efficient processing to the highest food safety and quality standards. This includes colour sorters and treatment with Neo-Pure, an innovative new organic, biodegradable sanitizer to remove fungi and bacteria on raw seeds.</p>

<p>HOCI 7 Innovation: Healthy Hemp Seed Extracts</p> <p>Type: Organizational → Process, Product & Marketing</p> <p>New to: World</p> <p>Part of supply chain: Processor</p> <p>When: Future about 2017</p> <p>Time Line: One step then incremental</p> <p>Developed: In house with researchers & equipment manufacturers</p>	<p>Hemp Oil Canada is planning to expand in the next 2 years, forming a spin-off company that will create new fractions and extractions of hemp to serve the health food and nutraceutical markets.</p> <p>Protein extracts with 85 to 90% protein would open up new markets and fibre made from hemp hulls has potential as a novel fibre ingredient.</p> <p>There are also potential bio-actives in hemp seeds: more research is needed on plant sterols, polyphenols and antioxidants.</p> <p>This direction of expansion is an extension of current trends towards healthy eating and natural supplements with proven health benefits. More research is needed, but it could result in prescriptions for functional foods or supplements for those with genetic disposition to conditions that could be helped by dietary intervention.</p>
<p>HOCI 8 Innovation: Use Whole Plant</p> <p>Type: Organizational → Product</p> <p>New to: Industry / Company</p> <p>Part of supply chain: All</p> <p>When: Future</p> <p>Time Line: Step-wise</p> <p>Developed: Industry, with government, AITF and others</p>	<p>In contrast to Canada, most hemp acres in Europe are grown for fibre rather than seed. Expansion of the hemp fibre industry in Canada would give additional income to prairie hemp farmers (from plant stalks) and support the growth of the whole industry.</p> <p>A pharmaceutical extract from the leaves, CBD or cannabidiol, has neuro-protective and anti-inflammatory effects, with potential for use in treating a variety of conditions including epilepsy.</p> <p>If they received regulatory approval; hemp seed screenings could be used in livestock feed, with several benefits including reduced antibiotic use.</p>
<p>HOCI 9 Innovation: Expand Markets</p> <p>Type: Marketing</p> <p>New to: Company / industry</p> <p>Part of supply chain: Processor</p> <p>When: 2013 to future</p> <p>Time Line: Incremental & step-wise</p> <p>Developed: In house and with distributors & AITF</p>	<p>There are multiple opportunities for hemp products to expand into several new markets.</p> <p>HOCI has recently expanded into the food service sector; this diversifies their customer base and is also likely to increase the use and acceptance of hemp as an ingredient.</p> <p>There is a time-limited opportunity for Canadians to expand into the US market; where it is legal to sell hemp food products (since 2004) and grow hemp for research purposes (since 2014); a domestic US industry will develop as soon as regulations permit.</p>

Innovation Methods

Factors that Affect Ability to Innovate

The members of this supply chain were unanimous in their responses regarding **incentives to innovate**. Growing their business and commitment to grow the hemp industry were the two main reasons cited explicitly or implicitly by the participants. Overall, the supply chain members seem to have innovation highly ranked in their companies' mandates and they are driven by the excitement that they are part of a fast growing industry. For HOCl innovations were also driven by serving customer needs and producing high quality products.

Innovation **ideas are initially generated** in-house, but a more collaborative effort of product development with customers then follows. Companies seek and take into consideration their customers' feedback and are flexible to change and test their products before launching them. There are cases where the innovation ideas come from the customers themselves and collaborative work results in the final product. The grower representative interviewed for this study mentioned that their ideas are exclusively generated in-house, however they partner with graduate students from the local university to implement them.

Obstacles to innovation come down to a lack of specialized hemp equipment, government regulations and lack of research funding. The hemp food industry is only 17 years old in Canada; at the beginning products, processes and markets/demand were all created from the ground up. Every process from farm to processor needed new equipment which was either adapted from another crop or created from scratch. This slowed down process and product innovation compared with other more established crops.

The majority of participants mentioned opportunities for new innovative products that utilize the leaves for pharmaceuticals. Even though there is current market demand, participants cannot

explore the opportunities offered, due to current Health Canada regulations that require producers to immediately "dispose of the branches, leaves and flowering heads by retting or by otherwise rendering them into a condition such that they cannot be used for any purpose not permitted under the Act."

Insufficient government funding for supporting research around the hemp crop was also mentioned as an obstacle; for example seed breeding, where hemp is a poor cousin compared with more established crops.

Innovation Linkages

As with idea generation, Hemp Oil Canada and the majority of the supply chain members innovate in-house with the assistance of their staff but with close collaboration with their equipment suppliers and customers.

External information sources for Hemp Oil Canada and most of the supply chain members are trade shows, national and international hemp conferences / conventions and equipment manufacturers who provide engineering expertise. Two organizations have provided significant support and research data to the hemp industry: AITF - Alberta Innovates Technology Futures and Manitoba's PCDF - Parkland Crop Diversification Foundation. At the producer's level the Prairie Agriculture Machinery Institute (PAMI) and Agriculture and Agri-Food Canada's research centers were also mentioned as useful sources of external knowledge.

Relationships with innovation linkages are both informal and formal depending on the company. Hemp Oil Canada has contracts with hemp producers and there are formal contracts when the chain members work with researchers and institutes. Except with universities and researchers, there is not much concern about intellectual property or proprietary information and companies communicate openly with each other based on mutual trust.

Opinions on linkage relationships within the supply chain varied from cooperative to collaborative. However, when the members described how they work together it appears that relationships tend to be closer to collaborative. Information and experience sharing and feedback exchange occur along the supply chain, e.g. at industry-wide international conferences. Additionally, companies are working together to move the industry forward. A great example for the hemp industry is that two processors: Hemp Oil Canada and Manitoba Harvest are jointly funding research into possible health benefits of the crop.

Relationships are considered consistent and stable as many companies have been working together for years, with occasional ups and downs; due to price and supply. Overall there is commitment to support other members of the supply chain to ensure profitability for everyone.

Limits to Growth

Hemp industry is a relatively young, fast growing industry; Hemp Oil Canada is growing at approximately 25% per year and projected to continue. The crop itself is very innovative and there are many opportunities for future growth and expansion. So what are the limits to growth?

Confusion on the part of regulators and the public between Indian hemp / marihuana and industrial / food grade hemp is still holding the market back. As all begin to understand that food hemp has less than 10ppm of THC (and zero psycho-active effect) further acceptance as a main-stream food ingredient and growth of the market will occur.

Seed supply is one of the top barriers to growth as seen by the study participants, especially organic seed where demand exceeds supply. It is difficult for the processing companies to source organic seed and they have to compete with each other when it comes to contracting new or retaining organic hemp growers. Licensing and harvesting challenges are additional reasons that might discourage farmers from growing hemp. However, the industry as a whole is working to attract new producers through agronomists, mentoring and creation of a hemp production guide by the CHTA.

Updating of regulations to reduce red-tape and allow for full use of all the plant (with additional income for producers) will also encourage growth of the production side of the industry to keep up with demand. In particular, there is an emerging market for hemp leaf extracts that could potentially result in significant growth for the hemp industry.



The majority of participants mentioned that there is a need for a quick Canadian regulatory response to this demand, otherwise other countries (the US within 5 years) will take over the market and it would be very difficult for the Canadian industry to catch up.

Limited research regarding hemp (as a crop and as a food) and limited support from governmental sources as compared to other crops (e.g. canola) has not allowed the hemp industry to explore its full potential. The industry itself is investing in research but additional support from government would be appreciated; and will be especially valuable at this early stage. It was noted that hemp industry is a true example of a value-added industry and that “nothing leaves Canada’s shores until it is further processed” which is in stark contrast to many other prairie crops.

Conclusion

Hemp Oil Canada has the benefit of being one of the founders of hemp industry in Manitoba and in Canada. The expertise and innovations that HOCI has developed over the past 16 years have positioned it among the best well known and established companies in the hemp industry both nationally and internationally.

Hemp itself is a very innovative crop, with opportunities for more of its functionalities to be explored. The Canadian hemp industry has grown at an impressive rate, developing and adapting processes to give new products and develop a market for hemp ingredients and consumer food products. This should continue as consumer acceptance of the product grows; especially if current research leads to health claims for hemp food products.

There is an emerging market for additional innovative products that can be created from different parts of the plant. Utilization of the whole plant will benefit all the members of the supply chain. Additional research and changes to the existing hemp regulations is needed in order for the industry to take advantage of these opportunities.

The hemp industry is characterized by a collaborative relationship throughout the supply chain, with strong communication and information sharing; this should enable the companies and industry to take advantage of the opportunities to continue to grow.



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