



Hemp in Canada and the U.S.

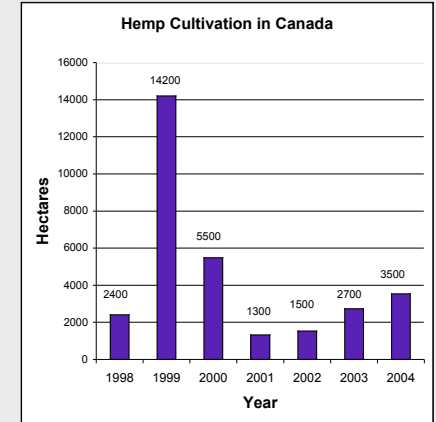
Production, Markets
Research on Hemp Foods

*Gero Leson
Leson & Associates
Scientific Advisor CHTA
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Hemp in Canada – Overview

- Commercial hemp farming legal in Canada since 1998 – remains illegal in the U.S.
- After speculation related bust in 2000/01, hemp area grows steadily by 40% p.a.



Source: Health Canada, 2004



Hemp in Canada – cont'd

- More than 90% grown in Prairie provinces.
- Virtually all production for seed – no utilization of fiber.
- More than 60% of acreage is certified organic and targets food market.

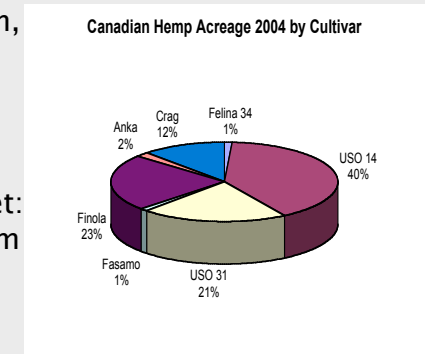


2004 Hemp farming area by Province
Source: Health Canada, 2004



Hemp in Canada – cont'd

- Varieties are early to medium, predominantly Eastern European origin.
- Several new Canadian varieties available or under development. Breeding target: high seed yield / FA spectrum
- Canada's extensive oilseed experience and farming/processing infrastructure has been a great asset to industry.



Source: Health Canada, 2004



Who's the CHTA?

- Founded in 2003, the Canadian Hemp Trade Alliance (CHTA/ACCC) represents relevant members from all sectors of the North American hemp industry.
- 52 members, 90% Canadian, representing:
 - 80 farmers
 - 13 processors
 - 15 distributors
 - 8 retailers
 - 12 researchers / consultants / labs
 - 2 Associations
- 7 Board members represent all industry sectors.



Who's the CHTA? – cont'd

- CHTA's mission:
 - Development and execution of marketing, export promotion and research programs,
 - Policy development in support of the Canadian hemp industry,
 - Serving as a representative to all levels of governments in Canada and abroad.
- Activities: Representation at trade shows, interaction with government, support of research projects.
- Major flaw: not enough fiber representation.



The North American Market – Legal Challenges

- U.S. market for natural foods by far largest consumer of Canadian hemp seeds and products.
- In 2001, U.S. Drug Enforcement Administration (DEA) tried to outlaw hemp foods containing any THC.
- Industry successfully challenged both rules, obtained stays of execution (i.e. hemp foods stayed legal), final victory in Sept.04 when DEA decided not to appeal to U.S. Supreme Court.



U.S. Market – Legal Challenges...

How did industry succeed?

- Vision, leadership and financial support by Dr. Bronner's Magic Soaps and other firms.
- Strong legal position and good lawyers,
- Effective public relations,
- Scientific studies showing that THC in hemp foods at current levels
 - Do not cause positive drug test,
 - Do not pose a health risk

Studies co-funded by industry and Canadian government programs (ARDI).



... And Free Advertising

- Extensive press coverage of court case => improved visibility and name recognition for hemp foods.
- Retailers willing to keep hemp foods on the shelves.



Market Size

- Recent retail survey (SPINNS) shows U.S. sales of hemp foods grew by >60% between 02/03 and 03/04.
 - Estimated total retail volume for foods: US\$10-12 million.
 - U.S. Retail market hemp cosmetics: about \$35 million in 2004,
 - Canadian seed processors also report growth of 30-40% p.a. since 2002.
- ⇒ Canadian hemp seed products apparently in expansion phase in North America.



The Market Place



...and the products

- Cold pressed oil
- Hulled seeds (nuts)
- Protein powder
- Cereals (Müsli)
- Snacks bars
- Bread, cookies, pretzels
- Chips
- Icecream
- Salad dressings
- Soap, cream, shampoo





Nutrition and Health Trends

- Composition of hemp seeds and oil make them a good fit with trends in the growing U.S. market for natural foods:
 - Excellent omega-3/6 balance, presence of SDA and GLA,
 - Reasonably balanced protein,
 - High concentrations of some minerals (Mg, Mn, Fe, Zn and vitamins (B1, B2, B6),
 - Culinary versatility and nutty flavor.



Obstacles to Further Market Growth for Hemp

- ...but, nutritional benefits of hemp not well recognized by trade journalists and main stream consumers.
- In the U.S. extensive press coverage of nutrition, particularly fat and omega-3 are “hot”, but hemp is virtually never mentioned.
- Reason: lack of coverage by scientific publications => limited credibility.
- To maintain growth, nutritional benefits of hemp need to be validated and communicated.



Agenda for Joint Industry Research

To address these needs, CHTA has developed a short-term R&D agenda in collaboration with Canadian and U.S. firms:

1. Comprehensive assessment of hemp protein and its nutritional value,
2. Expert panel for overall assessment of potential nutritional benefits,
3. Understanding and controlling hemp food stability.



1. Hemp Protein: Establishing and Communicating its Nutritional Value

- **Objectives:** Provide industry, media and consumer with reliable and meaningful info on hemp protein's amino acid spectrum, digestibility and presence of select other nutritionally relevant constituents.
- **Scope:**
 - Analysis of ~35 samples (seed, nuts, flour) for AA composition, macronutrients and select phytoestrogens and antinutrients.
 - Determine digestibility and protein value through rat feeding trials.



1. Hemp Protein (cont'd)

- Assess overall protein value and compare to other protein sources, provide nutritional recommendations, assess other constituents (Minerals, vitamins, phytosterols), publish results in journal.
- Work to be performed at U Manitoba, Winnipeg.
- **Budget:** € 30,000, 50% co-funding from ARDI.
- **Start Date:** December 2004



2. Expert Panel on the Nutritional Benefits of Hemp Foods

- **Objective:** Panel of recognized experts in key areas to comprehensively assess potential health benefits of hemp foods and effectively disseminate results.



2. Expert Panel on Hemp Foods (cont'd)

- **Scope:**
 - Gather panel of experts, present compositional data, request initial assessments, develop consensus position on potential benefits, publicize in peer reviewed journal, make results available to industry and media, track "hits".
 - Prioritize areas for clinical studies, identify potential sources of public funding.
- **Status:**
 - Invitations accepted by 8 experts
 - Planning under way
- **Budget:** € 22,000. 50% co-funding approved by CAFI.
- **Start Date:** March 05



3. Stability of Hemp Foods

- **Objectives:**
 - Study the processes that control deterioration of hemp foods (rancidity, formation of by-products) during production, storage, processing and use,
 - identify most effective methods of control.
- **Scope:**
 - Subject seeds and oil to representative conditions during primary processing (crushing for oil, hulling), storage (duration, temp., light, atmosphere) and final processing (toasting, sautéing, baking).
 - Measure key quality indicators (peroxide value, anisidine value, trans FAs, conjugated dienes) at various steps.
 - Develop recommendations for manufacturers,
 - Publish recommendations for retailers and consumers.



3. Stability of Hemp Foods, (cont'd)

- Analytical work by Dr. Przybylski, U Lethbridge, Alberta, industry to provide samples and overview.
- **Status:** Planning completed, work to commence Dec.04.
- **Budget:** € 22,000.
50% co-funding from ARDI approved.



THC: An Ongoing Issue

- In the absence of health-based THC limits in U.S. and Canada, industry has adopted voluntary standards
 - Oil: 5 ppm
 - Nut and flour: 1.5 ppm
- Internal audits and recent survey by Health Canada have demonstrated virtually full compliance.
- However: Industry must prepare for lower limits in the future, particularly in the U.S.



Future Projects

- Assess opportunities for health claims in Canada and U.S., suggest language to industry.
- Evaluate causes and control options for microbial contamination of flour and nut products.



Cooperation Canada / Europe

- Canadian and European hemp industries have unique opportunity to benefit from nutritional trends.
- Sales efforts must be supported by effective communication of nutritional science.
- European companies are invited to participate in the CHTA's projects. This will allow expansion of work scope and provide companies with valuable information for marketing and educational purposes.
- Development of mutual trading relationships will also help secure supplies of planting seeds and products for both sides and support more predictable growth.