

Explore an Issue: Hemp (Hemp Fibre) in Canada

Background

Carbohydrates are a class of chemicals that includes sugars, starch and cellulose. The simplest carbohydrates have the chemical formula $C_nH_{2n}O_n$. Where n is three or greater these are known as monosaccharides. Examples of monosaccharides include glucose and fructose. Disaccharides are made up of two monosaccharides. Examples of disaccharides include sucrose (table sugar) that is made up of two linked glucose molecules, and lactose (found in milk) made up of glucose and galactose. Mono and disaccharides that are small and water soluble are known as sugars.

Starch is a very large carbohydrate made up of many glucose molecules linked together. Starch is produced in all green plants, and used as a reserved supply of food. Foods high in starch include bread, rice and potatoes. Starch is broken down in by our bodies to generate energy.

To see diagrams illustrating these chemicals:

- <http://www.usetute.com.au/sugars.html>
- http://chemwiki.ucdavis.edu/Biological_Chemistry/Carbohydrates/Carbohydrates_Fundamentals

Hemp is a natural fibre made up of cellulose (77.5%), hemi-cellulose (10.0%), lignin (6.8%), pectin (2.9%), fat and wax (0.9%) and water soluble materials (1.8%). Cellulose is a type of very large carbohydrate similar in size to starch. Cellulose cannot be broken down by our bodies to generate energy but it is still helpful for good digestion. Hemi-cellulose and pectin are other forms of complex carbohydrates.

Hemp fibre can be harvested from two locations. The phloem of the hemp plant is known as bast fibre. Linen, jute and ramie are also sourced from bast fibre. The core fibres of hemp come from the xylem of the plant. These fibres give hemp its distinctive qualities.

Use the following websites to help you with your research:

- Agriculture and Agri-Food Canada –search industrial hemp:
<http://www.agr.gc.ca/>
- Agricultural Marketing Resource Center:
http://www.agmrc.org/commodities_products/fiber/industrial-hemp/
- Alberta Farmer: <https://www.albertafarmexpress.ca/crops/theres-a-reason-why-alberta-is-canadas-hemp-leader/>
- History of Hemp, Massachusetts Institute of Technology (MIT):
<http://www.mit.edu/~thistle/v13/2/history.html>

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- Hemp: A New Crop with New Uses for North America - Purdue University:
<https://www.hort.purdue.edu/newcrop/ncnu02/v5-284.html>

1. What are some of the historic products made from hemp?

fibre	
grain	
oil	

2. Industrial hemp is sourced the plant species *Cannabis sativa*; so is marijuana. What regulations are in place to distinguish between industrial hemp and marijuana?

3. *Cannabis sativa* was legal in Canada at one time. When was it banned? Why?

4. Briefly explain how and when the ban on industrial hemp was lifted.

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5. Use the <http://www.agr.gc.ca/> website for (a)-(h). According to Agriculture and Agri-Food Canada, hemp seed contains EFAs (essential fatty acids) and GLA (gamma linolenic acid).

(a) What conditions can occur or worsen if a person has low EFAs in their body?

(b) What percent of hemp seed oil is EFAs- _____

(c) What are the diseases/conditions that hemp seed oil can help to treat?

(d) EFAs are used in body care. What is their function in these products?

(e) What are the potential positive effects of GLA?

(f) Hemp fibre is considered very durable. There are two types of fibres in the stalk of hemp. Give the location of these fibres in the plant, their characteristics and uses.

Bast fibres-



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Core fibre-

(g) One hectare of hemp can produce...

___ kg of grain, _____ L of oil, and ___ tonnes of straw that produces ___ tonnes of fibre.

(h) Summarize the “Conclusions” section

6. Proceed to Industrial Hemp Statistics on the <http://www.agr.gc.ca/>. Use Table Canada: Industrial Hemp Total Imports and Exports
- (a) Compare the amount of hemp fibre exported and its cash value from 1998 to 2007

(b) Compare the amount of hemp fibre imported and its cash value from 1998 to 2007

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