



Latest Developments on Hemp Food Market

12th International Conference of the European Industrial Hemp Association (EIHA)
20 - 21 May 2015



Hemp food products



Non transformed

- Whole and hulled Seeds
- Oil
- Hemp protein and farine

Dry Foods

- Pasta
- Bread
- Cereal bars
- Granola



Drinks

- Hemp milk
- Beer



Others

- Oil capsules
- Protein powder
- Salad dressings
- Chocolate



Frozen

- Ice cream

Chilled

- Délice de chanvre



Sojade

Triballat in a nutshell



Cheese factory
founded in 1874

HQ in Noyal sur Vilaine,
Brittany (Western France)



Actively involved
in the respect of
the environment
and sustainable
development



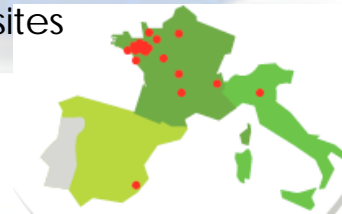
Specialist in plant-
based food
production since
1988

Pioneer in the
Organic sector
(1975)



+900 employees

17 production
sites



242 millions €
Turnover



Our brands

Vegetal

In 1988, launch of the first and innovative range of fresh Soy desserts

French soy GMO free



Nutrition

Formulation and manufacturing of innovative nutrition products and dietary supplements



Organic

Full range of organic dairy products from cow, sheep and goat's milk



Organic expert since 1975

Other organic food brands that combine health and pleasure



La Bergerie



La Chèvrerie

The cheeses

Quality French cheeses from cow's milk and goat's milk



Petit Breton
— Depuis 1921 —

Merzer
Tendrement Léger



LE BEURRE BORDIER
Esprit de Beurre

Fromagers
de tradition



Healthy eating, from field to plate



Our values

- Respect for men
- Respect for the environment
- Solidarity and serenity
- Curiosity and experimentation
- Participative management

Our strategy

- To be a pioneer
- To be a leader
- To be a specialist



Find new protein sources

- **Population growth + higher daily intake >>> increase of global food consumption**
Population expected in 2050 : 9.5 billion
- **Rethink protein consumption**
Protein crops used to feed animals , indirectly fed to people as dairy or meat
More efficient to use them for human consumption (additional 4 billion people could be fed) (1)
- **Vegetal products are more resource efficient than animal based products**
- **Plant based food production and land required**
70% of world available farmland involved in livestock production (2)
Less land used for livestock and feedstock >>> more to produce vegetal based food
- **Lower water inputs for plant-based foods**
Plant based diet requires 2.9 time less water than an animal based diet (3)
- **Carbon footprint**
GHG (greenhouse gas) : livestock sector responsible of 18% of the global emissions (2)
- **Issues for future generations will be the necessity to consume less animal proteins and more vegetal ones**

Sources :
(1) Emily S Cassidy and al (2013). Redefining agricultural yields
(2) FAO, Livestock's Long Shadow (2006)
(3) Marlow, H.J. and al., Diet and the environment (2009)

Why hemp ?



Brittany's history

- Hemp is one of the oldest and versatile crops
- Cultivated in Brittany since the 17th century for the manufacturing of boat sails

Agricultural benefits:

- Valuable preceding crop in rotation (hemp wheat)
- Low fertilizing need (2 times less than for wheat)
- Good resistance to drought (no need for irrigation)
- Favourable influence on soil structure due to its deep rooting system
- Soil weed suppression following from its high shading capacity
- High diseases and parasites resistance (not need of pesticides)





Why Hemp ?



Environmental benefits:

- Contribute to biodiversity
- Biomass plant for a major carbon storage
- Suitable to phytoremediation (heavy metals)

Nutritional Benefits

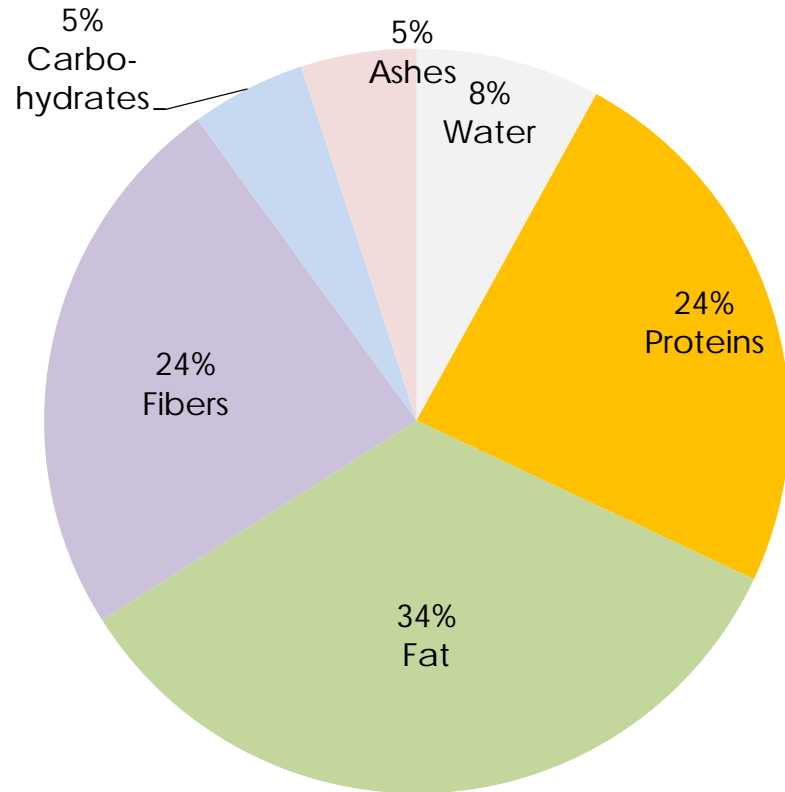
- Contains essential fatty acids not produced by human body
- Good Omega 3 /Omega 6 ratio : 1/3.5
(Recommended ratio : 1/5 - Current ratio in our diet : 1/20)
- Good level of protein



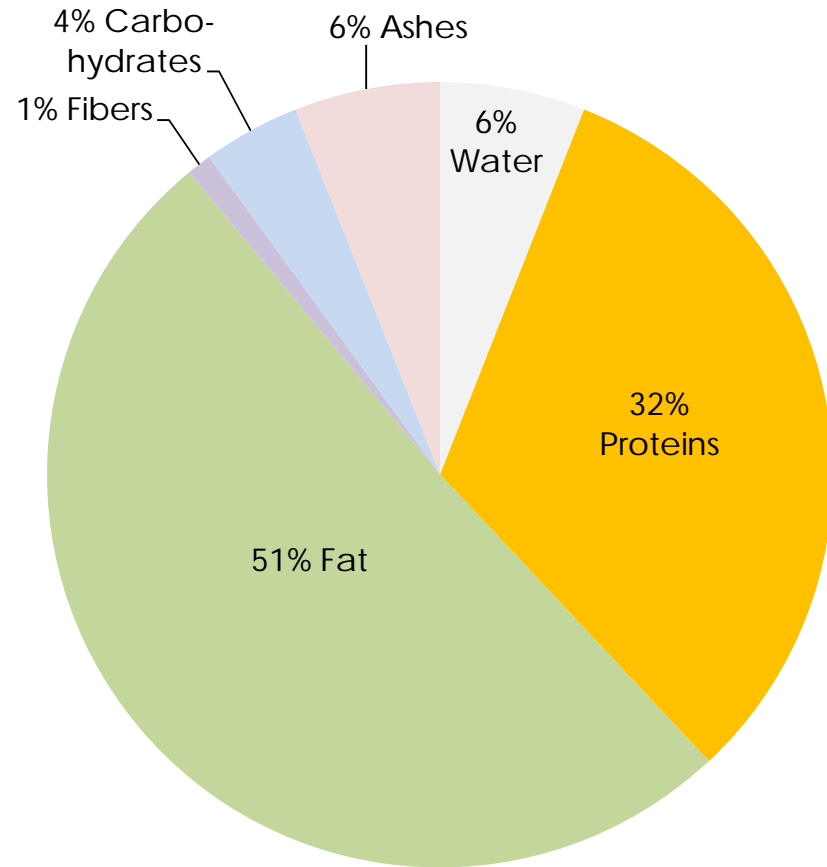


Hemp seed nutritional values

Whole hemp seeds



Hulled Hemp seeds

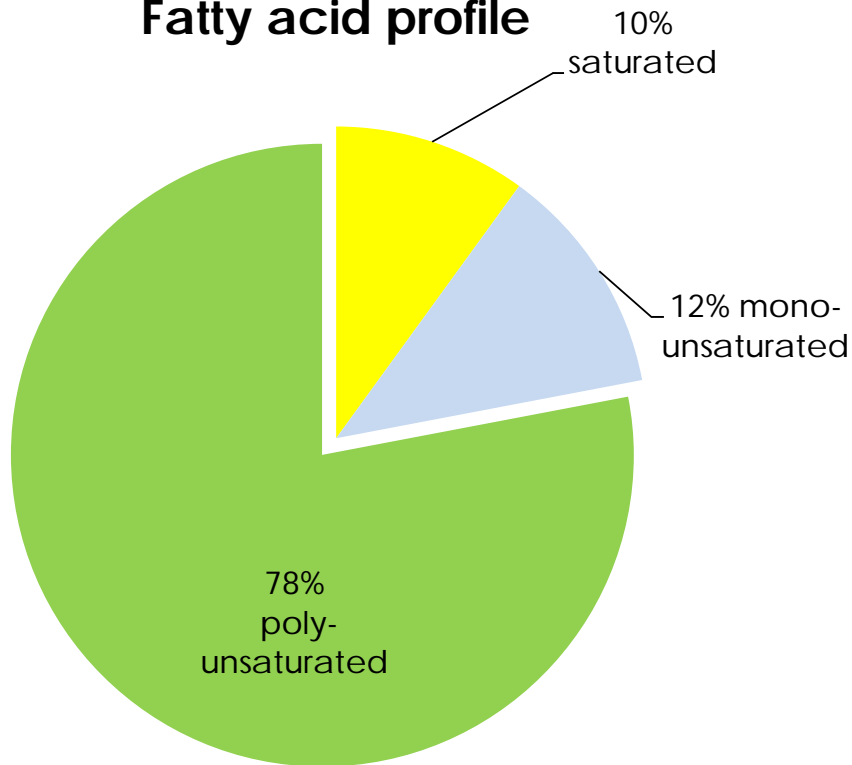




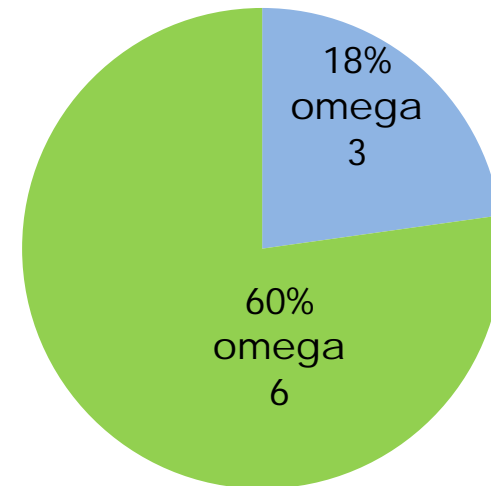
Hulled hemp seed

Focus on lipid profile

Fatty acid profile

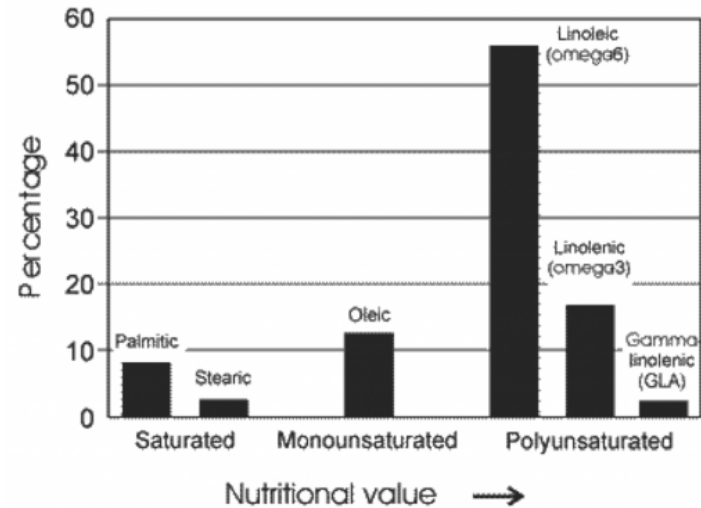


Essential fatty acids repartition



Omega 6 in hemp: LA (Linoleic Acid)+ GLA (Gamma Linolenic Acid)
Omega 3 in hemp: ALA (Alpha Linolenic Acid)+ SA (Stearidonic Acid)

Hemp fatty acids



Content of main fatty acids in hempseed oil
Source : Small and Marcus 2000

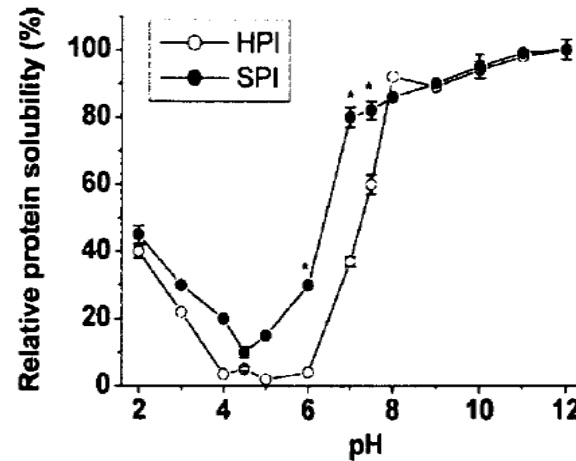
- Higher nutritional values for unsaturated fatty acids



Hemp proteins

- High quality protein
- High digestibility (88%–91%)
- Composition of hemp protein
 - Edestin (65%)
 - Globulin (35%)
- 8 essential amino acids
- No antinutritional factors (as antitrypsin factors for soy)
- No allergen known for hemp protein
- No gluten in hemp

Hemp protein solubility



Solubility of hemp protein (HPI) and soy protein (SPI) in function of pH
 Source : Tang and al. (2006)

- low solubility at pH values from pH 4 to 7
- soy protein more soluble at lower pH levels



Hemp protein nutritional values

Amino Acid (g for 100g of protein)	Hemp protein	Reference protein (FAO 2011)	Soy protein (USDA)	Egg white (FAO 1985)	Cow Milk (FAO 1985)	Wheat (SFK)	White Rice (USDA)
Isoleucine	4,1	3	4,9	5,4	4,7	4,7	4,3
Leucine	6,9	6,1	8,1	8,6	9,5	8,1	8,3
Lysine	3,8	4,8	6,7	7	7,8	3,3	3,6
Methionine + Cysteine	4,2	2,3	3	5,7	3,3	4,5	4,5
Phenylalanine + Tyrosine	8,4	3,8	9	9,3	10,2	9,2	8,7
Thréonine	3,6	2,3	4,3	4,7	4,4	3,8	3,6
Tryptophan	1,4	0,6	1,5	1,7	1,4	1,3	1,2
Valine	5,0	3,9	5	6,6	6,4	5,4	6,1
Chemical Index	79% (lysine)	100%	100%	100%	100%	69% (lysine)	75% (lysine)

- Good nutritional values for hemp protein



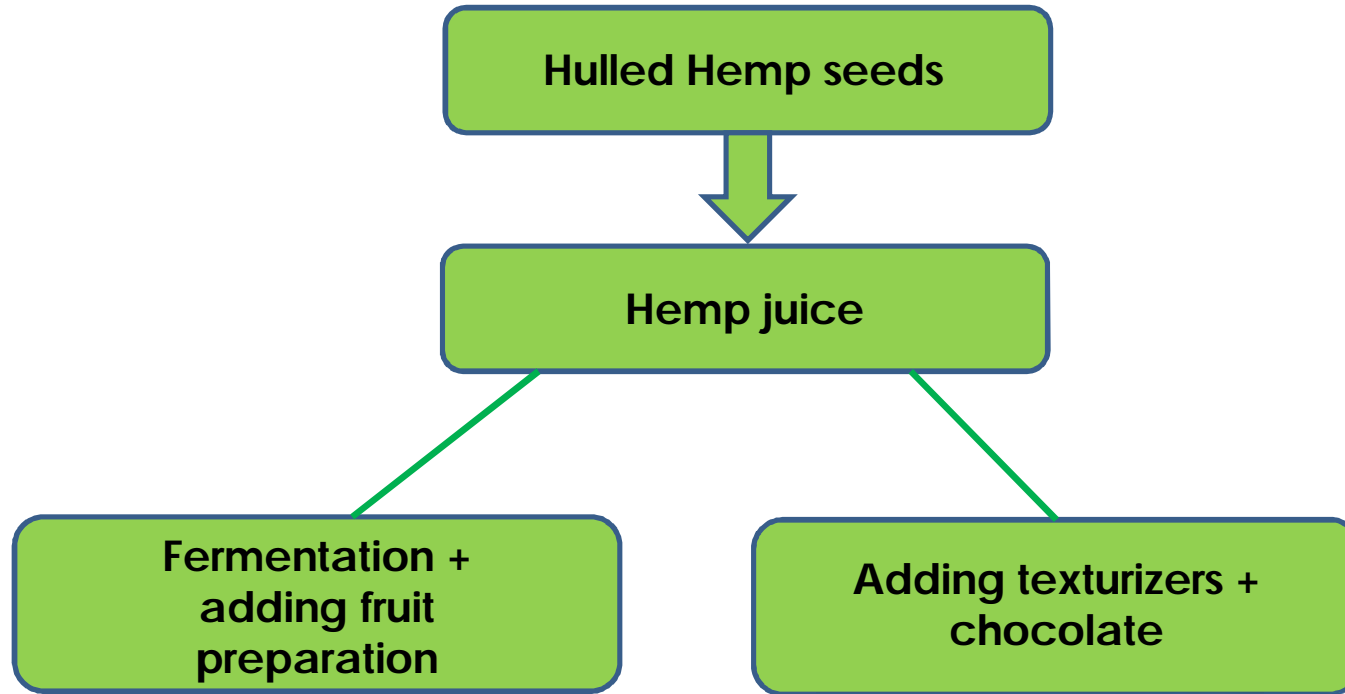
French yogurt market's datas

	Volume (%)	evolution
Cow	51	=
Goat – Sheep	25	+
Vegetal	23	+

- Data from organic groceries store sector in France
- Increasing of market share for vegetal products



Chilled hemp desserts developpement





Benefits : DELICE DE CHANVRE

- Good source of omega 3: 1 pot brings 15% of the daily recommended intake
- Omega 3 / omega 6 ratio close to recommended ratio
- Low in saturated fatty acids helps to maintain a normal level of cholesterol in the blood
- Dairy-free and soy free
- Alternative to yogurt

- A delicious desserts that is good for the health and helps to balance the fat intake!





Product reception

- Délice de chanvre launched in French organic shops in 2014
- Consumers curiosity for a new vegetal product : hemp
- Interest for its nutritional qualities
- Presentation in February 2015 at Biofach (world leading trade fair for organic food) – press award
- Launched on export market in March 2015

Development Issues

- A sudden increase in the demand of hemp for food



Hemp seed prices should allow affordable price for consumer

>>> Hemp supply chain sustainability for food?

- High sensitivity of hemp seeds to oxidation
 - Seed quality affected by oxydation -> seeds not suitable to human consumption
 - Short span of conservation



Challenges and next steps

- Incitate farmers to cultivate hemp in the long run
 - Creation of partnership with hemp producers
 - The whole hemp industry needs to evolve at the same pace
 - Issue for Seeds – Fibres – Straw
- Hemp food consumption is still a niche market
 - Informe the public on benefits and safety
- THC legislation
 - tolerance rates may evolve but they must allow development of hemp products
- New research topics
 - Hemp varietal selection >>> hemp seeds more appropriate for food issues
(bigger size? with more protein? ...)
 - GLA
- Develop new hemp products

Sojade

Thanks for your attention