

Mariët van de Noort Msc.

Freelance Foodscientist specialism pulses, vegetable proteins



Background and cv:

Studied food science in Wageningen '88-'94

Director Sales and Development Pelmolen bv

Traditional pulses industry cleaning, dehulling, milling, importing proteins

Since 2002 Freelance FoodScientist Specialism Pulses, vegetable proteins

Selling ingredients, consumer product, freelance advice, participating in research groups

Like Protein2Food/Pulse, member of Planeet, TPC, covenant Vegetable proteins

Some projects:

2002 -2012 Freelance sales, quality and development Alimex bv

2003 Kerry development precooked pulses

2010 Freelance raw material and development advice vegetarian butcher

2004-2012 Freelance sales Frank Food Products lupin ingredients

2007-2011 Freelance sales and promotion pea protein and fibres from

Emsland GmbH

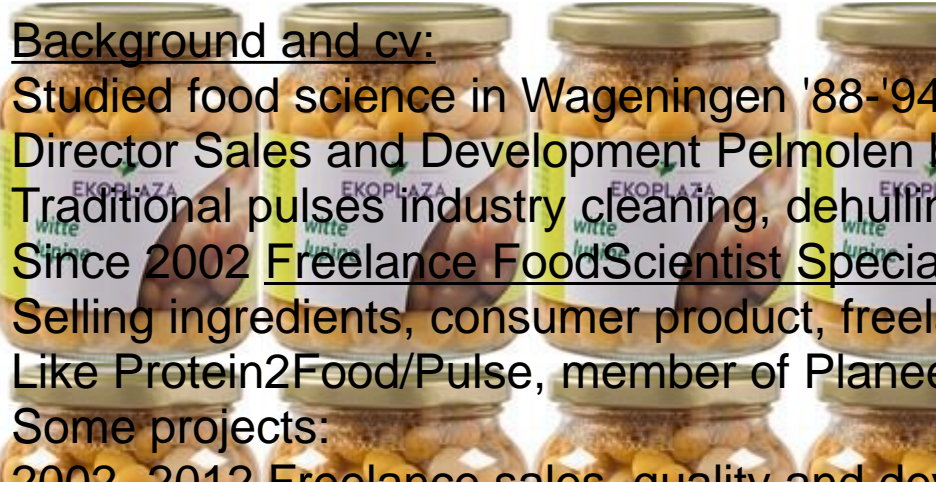
2012 Vivera Freelance development lupin meat replacer and process

2013/2014 AGT foods start up promotion protein and starch concentrates

from Minot, USA

2015 Lassie/Herba/Ebro training of the directors on pulses

2017 IPC Development Healthy Ice with vegetable protein



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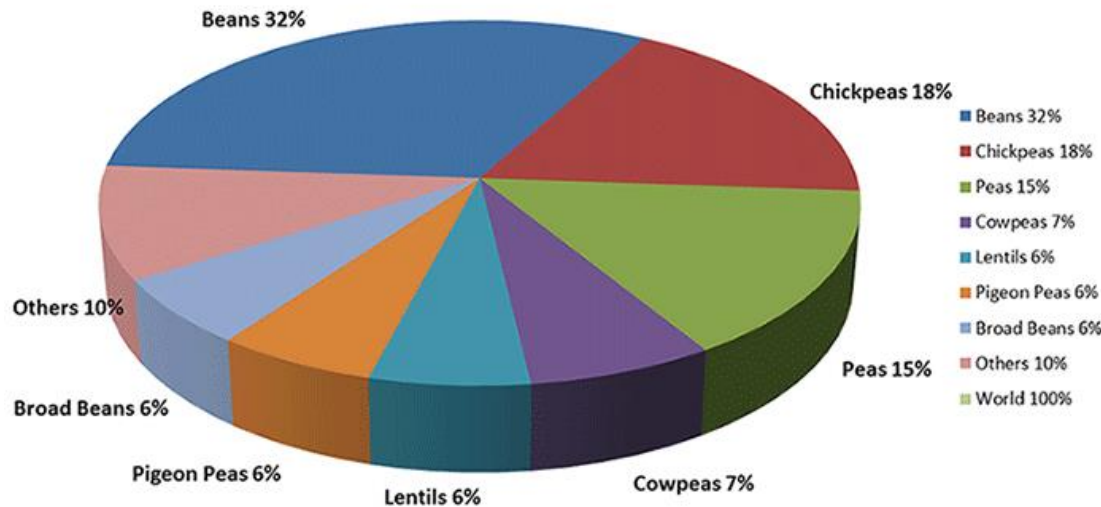


SUPPLY CHAINS in the EU Protein Sector

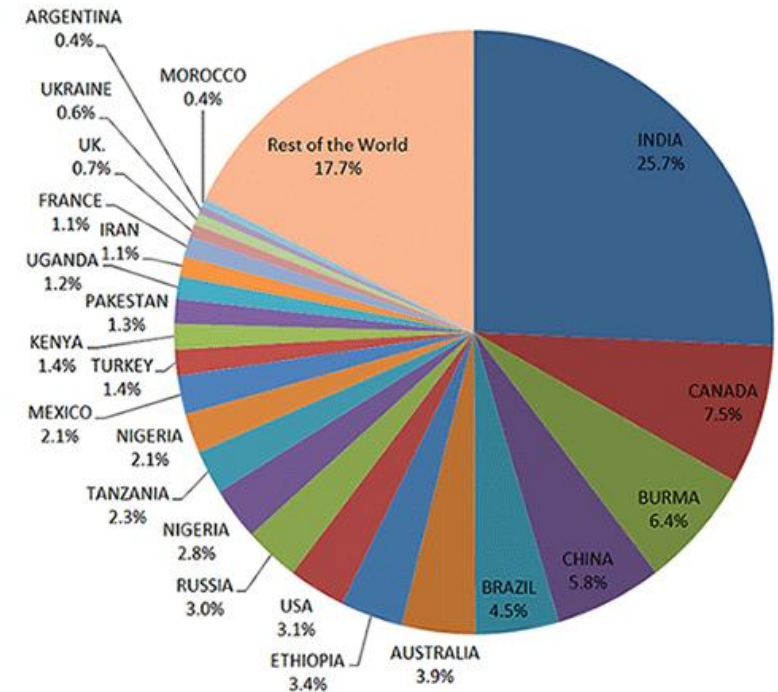
- Food Chain, high value, specialised markets
- Most of protein in diet Humans Europe from animals
- Human diet on plant protein (like pulses and soy) more healthy and sustainable

Supply chain; 1. cultivation
Pulses grown globally

GLOBAL CROP PRODUCTION (2014) MT 77,644,255



TOTAL GLOBAL PRODUCTION 2014



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2. Processing, cleaning and packing

Pulses processors; collection, cleaning, packing

Mullers Muhle: 120000 MT rice

20000 MT pulses, main raw materials: Chickpea, Fababean, Lentils

Sourcing Fababean Europe, Chickpea en lentils outside Europe

Export: 20%

Part of GoodMills Deutschland GmbH, also airclassifying

Challenges and bottlenecks: Law around pesticides Fababean FR/Du

Sourcing fababeans, chickpeas and lentils

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3. Processing, cooking and packing
Pulses processor into jars, cans and bags
Turnover: 80 million Euro
Growth around 15% each year since 2014
Challenges and bottlenecks; Sourcing

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4. Processing, protein separation dry or wet Extraction vegetable protein from Pulses

- Concentrates (dry airclassifying proces)
AGT Foods, Minot USA/Vestkorn Norway (40000 MT)/ Am Nutrition Norway
- Isolates (wet proces)
Cosucra Belgium, Processing 50000 MT yellow peas
Emsland GmbH, Processing 80000 MT yellow peas
Roquette France and Canada, Processing 120000 MT yellow peas
- 80% protein going into petfood
- 80-90% protein going into food

Application : Bakery, Drinks, Health food and Meat/Meat Substitutes

For Meat Substitutes: Next step Texturising by extrusion, gelling, Form and glue

5. Processing, into textures with Extrusion, Fermentation, Gelling Meat Substitutes market

- 2020 USD > 5 billion
- Meat substitutes are: Tofu, Quorn, Tempeh, TVP, Seitan
- Global meat substitutes market has grown exponentially
- Europe largest market for meat substitutes
- Followed by North America
- Asia-Pacific will be fastest growing market for meat substitutes between 2015-2020

Motivation for Meat substitutes market:

- Health Hazards caused by consumption of meat and meat products

Advice to eat more fibres and more vegetable protein

- Concern about environmental problems like global warming, land use
- Animal welfare

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The Netherlands

- Early entry meat producing companies MEAT SUBSTITUTES
 - High quality, high added value vegetable protein products
 - Mainstream hamburgers, sausages, Higher standard high moisture extrusion; Chicken chunks and Steak. The latter high investment and expertise/fingerspitzen gefühl
- Very much varying parameters

Main producers:

- Meatless
- Vivera
- Vegetarian Butcher
- Ojah
- Schouten

Interviews

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Meatless Founded 2005

- Production volume 160 ton/maand
- 90% export, 50% vegetarian, 50% hybride
- Alginate gelling process
- Raw material: Rice, Wheat, Lupin, Field beans

Sourcing raw material: Rice Europe and Asia

Wheat, lupin and field beans Europe

- Growing > 15% last year now even more
- Challenges and bottlenecks:

Sustainability whole chain from seed to fork

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- Turnover 66 million Euro
 - Producing 1,5 million packages / week
 - Newest product the steak already 100000 / week clients: UK Tesco, Sainsbury, NL
 - dry and wet extrusion
 - Raw materials: Soya, Rice, Wheat and lupin
 - Sourcing raw material: Soya for tofu France and Italy, for meat substitutes isolates, Concentrates North America. Rice Asia, Lupin Germany and Australia
 - 65% export UK, France, Italy, Belgium, Germany, Sweden
 - Growth 2018: 40-50%
 - Challenges and bottlenecks
- Getting good operators, employees, getting external expertise.

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Vegetarian Butcher

- Turnover: 20 million Euro
- Export: 10%
- Raw material: Soya, Rice, Peas, White beans
- Sourcing raw material: Rice asia, middle east
- Peas europe

White beans North America

Soya Europe and North America

- Wet and dry extrusion
- Volume production 1000 MT
- Grow this year 50%
- Challenges and bottlenecks

Getting sustainable ingredients. See European ingredients

For example organic soya protein concentrate

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– Schouten Europe bv

Raw materials: Protein from soya, wheat, peas, egg protein

Pulses, Nuts, Seeds

Sourcing of the raw materials: Canada, East and South Europe, The Netherlands, Far east

Dry extrusion, forming

Growth: last couple of years 50%

Challenges and bottlenecks: Local ingredients, employees, export documentation slow

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Ojah

Turnover: 5 million Euro

Raw materials: Soya, Pea

Wet extrusion, high moisture extrusion

2017 Colruyt

2018 Kerry Ireland

Challenges and bottlenecks:

- Knowledge on processing other than Soya on high moisture extruder
- Knowledge consumers about vegetable protein, good quality

Health effects (less obesity, cardiovascular diseases, cancer).

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New vegetable protein products: based on:

- seaweed (duplaco)
- Nuts, Mushrooms
- Watercress, rapeseed (protein after pressing)

Challenges and bottlenecks: Regulation novel foods, trial volumes, consumer awareness

Plant protein for the future: Investments from companies

- US plant-based companies like impossible Foods, Beyond Meat And Hampton creek have attracted > US\$500 million past 5 years
Like from TYSON USA
- French Roquette invested 340 million Euro in pea protein processing in France And canada
- Cosucra invested 40 million Euro in pea processing in Belgium in 2018
- Quorn UK is planning to invest 165 million in UK plant facilities
- Kerry Ireland bought Ojah 10 million

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Stimulation of plant proteins by uniting Companies:

- Green protein Alliance, cluster of companies and Experts to stimulate a more healthy food system.
Goal for 2025 from 37:63 to 50:50 vegetable:animal
 - * General promotions of vegetable protein sector
 - * Create independent information for consumers
 - * Platform connecting with government, cooperating
- The protein cluster, platform for middle size companies active in vegetable proteins International



Challenges:

- More human consumption of vegetable protein, BIGGEST effect health&env
- European cultivation of raw materials/pulses
- Use of pesticides
- Specialised employees, personnel
- Expertise on processing like high moisture extrusion
- Novel Food regulation
- Knowledge/education consumers on good quality vegetable protein, effect
On health and environment
- Consumer trials new vegetable protein products (pulses, nuts, mushrooms,
- Processing industry limited (dehulling, flours, concentrates)

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Thanks for your attention

[Www.mfh-pulses.com](http://www.mfh-pulses.com)