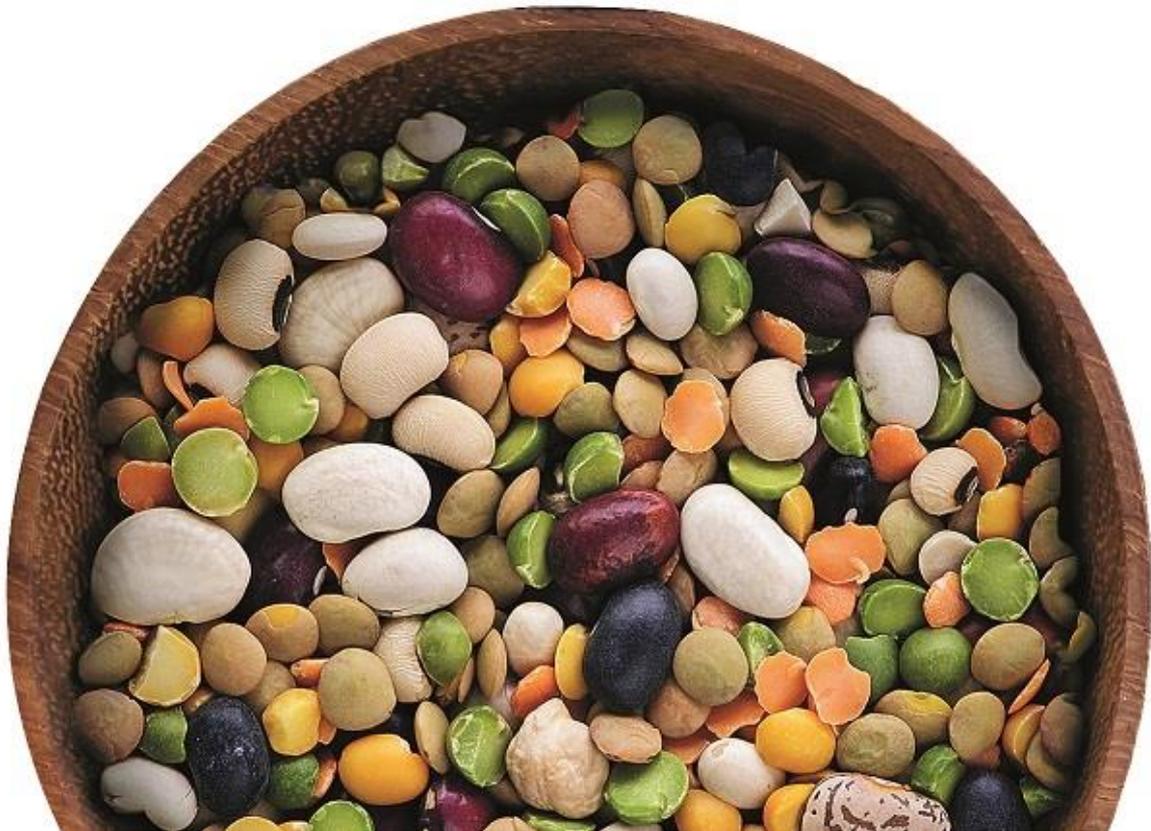




Business Cases

Deliverable D.4.2 (D24)

Lead Author and Institution: Karen Hamann, IFAU





Deliverable Description & Contributors

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 - **Work package leader:** Karen Hamann (IFAU)
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-
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-
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1. Background to the TRUE project

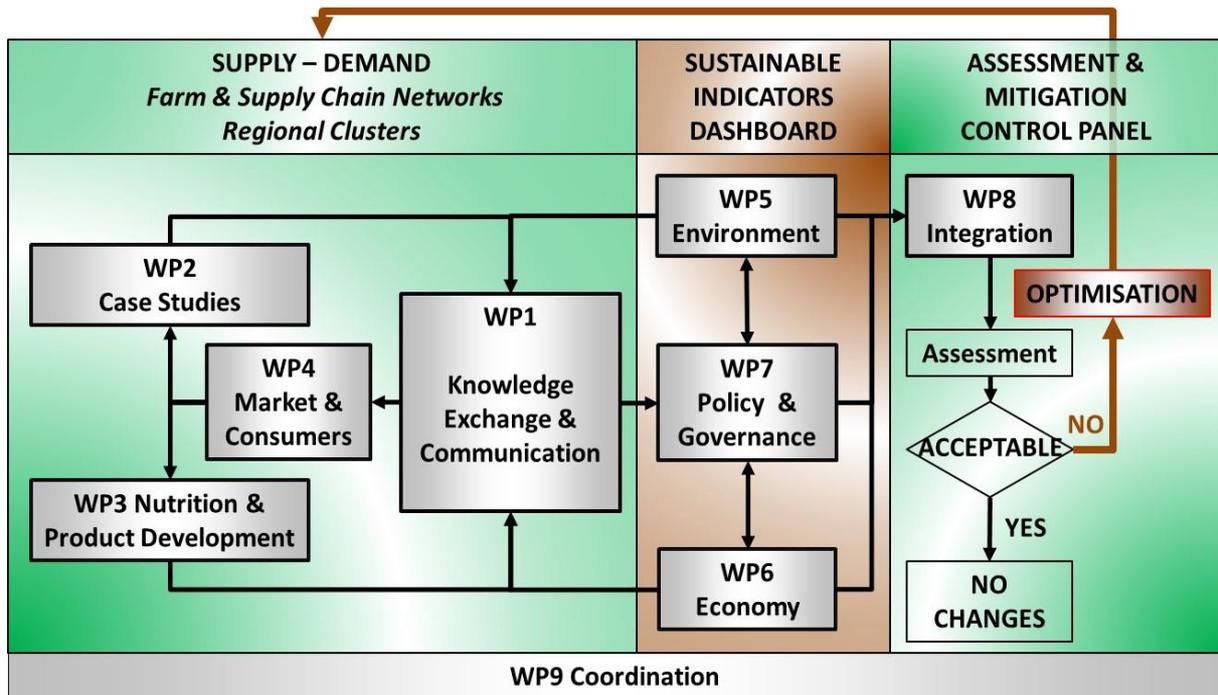
1.1 TRUE Project Executive Summary (*abbreviated*)

TRUE's perspective is that the scientific knowledge, capacities and societal desire for legume supported systems exist, but that practical co-innovation to realise transition paths have yet to be achieved. TRUE presents 9 Work Packages (WPs), supported by an *Intercontinental Scientific Advisory Board*. Collectively, these elements present a strategic and gender balanced work-plan through which the role of legumes in determining 'three pillars of sustainability' – 'environment', 'economics' and 'society' – may be best resolved.

TRUE realises a genuine multi-actor approach, the basis for which are three *Regional Clusters* managed by WP1 ('*Knowledge Exchange and Communication*', University of Hohenheim, Germany), that span the main pedo-climatic regions of Europe, designated here as: *Continental*, *Mediterranean* and *Atlantic*, and facilitate the alignment of stakeholders' knowledge across a suite of 24 Case Studies. The Case Studies are managed by partners within WPs 2-4 comprising '*Case Studies*' (incorporating the project database and *Data Management Plan*), '*Nutrition and Product Development*', and '*Markets and Consumers*'. These are led by the Agricultural University of Athens (Greece), Universidade Catolica Portuguesa (Portugal) and the Institute for Food Studies & Agro Industrial Development (Denmark), respectively. This combination of reflective dialogue (WP1), and novel legume-based approaches (WP2-4) will supply hitherto unparalleled datasets for the '*sustainability WPs*', WPs 5-7 for '*Environment*', '*Economics*' and '*Policy and Governance*'. These are led by greenhouse gas specialists at Trinity College Dublin (Ireland; in close partnership with Life Cycle Analysis specialists at Bangor University, UK), Scotland's Rural College (in close partnership with University of Hohenheim), and the Environmental and Social Science Research Group (Hungary), in association with Coventry University, UK, respectively. These *Pillar WPs* use progressive statistical, mathematical and policy modelling approaches to characterise current legume supported systems and identify those management strategies which may achieve sustainable states. A *key feature* is that TRUE will identify key *Sustainable Development Indicators* (SDIs) for legume-supported systems, and thresholds (or goals) to which each SDI should aim. Data from the *foundation WPs* (1-4), to and between the *Pillar WPs* (5-7), will be resolved by WP8, '*Transition Design*', using machine-learning approaches (e.g. *Knowledge Discovery in Databases*), allied with *DEX* (*Decision Expert*) methodology to enable the mapping of existing knowledge and experiences. Co-ordination is managed by a team of highly experienced senior staff and project managers based in The Agroecology Group, a Sub-group of Ecological Sciences within The James Hutton Institute.

Work Package Structure - Diagram

Flow of information and knowledge in TRUE, from definition of the 24 case studies (left), quantification of sustainability (centre) and synthesis and decision support (right).



Project Partners – Table

No	Participant organisation name (and acronym)	Country	Organisation Type
1 (C*)	The James Hutton Institute (JHI)	UK	RTO
2	Coventry University (CU)	UK	University
3	Stockbridge Technology Centre (STC)	UK	SME
4	Scotland’s Rural College (SRUC)	UK	HEI
5	Kenya Forestry Research Institute (KEFRI)	Kenya	RTO
6	Universidade Catolica Portuguesa (UCP)	Portugal	University
7	Universitaet Hohenheim (UHOH)	Germany	University
8	Agricultural University of Athens (AUA)	Greece	University
9	IFAU APS (IFAU)	Denmark	SME
10	Regionalna Razvojna Agencija Medimurje (REDEA)	Croatia	Development Agency
11	Bangor University (BU)	UK	University
12	Trinity College Dublin (TCD)	Ireland	University
13	Processors and Growers Research Organisation (PGRO)	UK	SME
14	Institut Jozef Stefan (JSI)	Slovenia	HEI
15	IGV Institut Fur Getreideverarbeitung Gmbh (IGV)	Germany	Commercial SME
16	ESSRG Kft (ESSRG)	Hungary	SME
17	Agri Kulti Kft (AK)	Hungary	SME
18	Alfred-Wegener-Institut (AWI)	Germany	RTO
19	Slow Food Deutschland e.V. (SF)	Germany	Social Enterprise
20	Arbikie Distilling Ltd (ADL)	UK	SME
21	Agriculture and Food Development Authority (TEAG)	Ireland	RTO
22	Sociedade Agrícola do Freixo do Meio, Lda (FDM)	Portugal	SME
23	Eurest -Sociedade Europeia De Restaurantes Lda (EUR)	Portugal	Commercial Enterprise
24	Solintagro SL (SOL)	Spain	SME

*Coordinating institution



Objectives (abbreviated)

Objective 1: Facilitate knowledge exchange (UHOH, WP1)

- *Develop a blue-print for co-production of knowledge*

Objective 2: Identify factors that contribute to successful transitions (AUA, WP2)

- *Relevant and meaningful Sustainable Development Indicators (SDIs)*

Objective 3: Develop novel food and non-food uses (UCP, WP3)

- *Develop appropriate food and feed products for regions/cropping systems*

Objective 4: Investigate international markets and trade (IFAU, WP4)

- *Publish guidelines of legume consumption for employment and economic growth*
- *EU infrastructure-map for processing and trading*

Objective 5: Inventory data on environmental intensity of production (TCD, WP5)

- *Life Cycle Analyses (LCA) -novel legumes rotations and diet change*

Objective 6: Economic performance - different cropping systems (SRUC & UHOH, WP6)

- *Accounting yield and price risks of legume-based cropping systems*

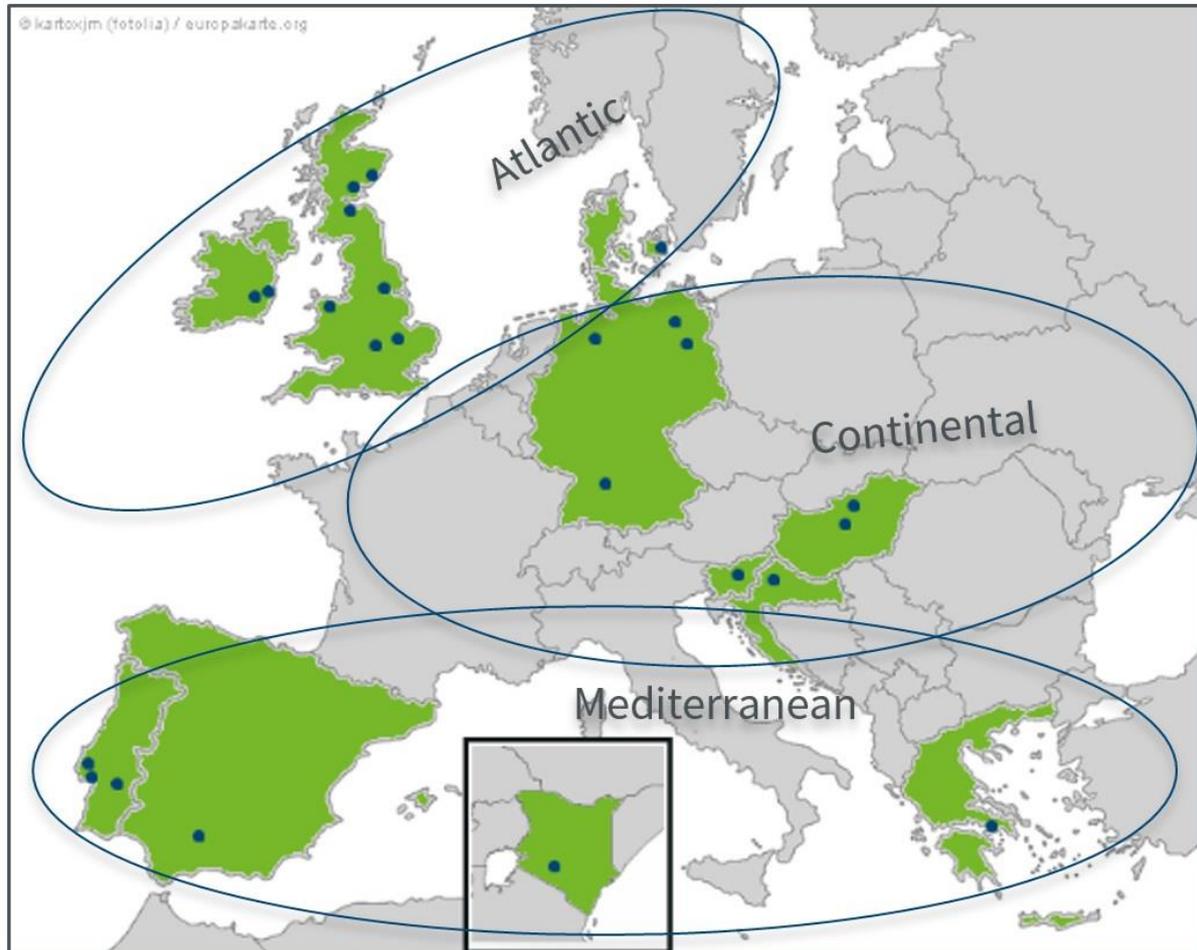
Objective 7: Enable policies, legislation and regulatory systems (ESSRG, WP7)

- *EU-policy linkages (on nutrition) to inform product development/uptake*

Objective 8: Develop decision support tools: growers to policy makers (JSI, WP8)

- *User friendly decision support tools to harmonise sustainability pillars*

Regional Cluster & Case Study Diagram



Knowledge Exchange and Communication (WP1) events include three TRUE European Legume Innovation Networks (ELINs) and these engage multi-stakeholders in a series of focused workshops. The ELINs span three major pedoclimatic regions of Europe, illustrated above within the ellipsoids for Continental, Mediterranean and Atlantic zones.



1.2 Purpose of the Deliverable

The purpose of this deliverable is to showcase the breadth of business cases that already exist for legume-based food products. These business cases highlight the “what, how and who” of ventures developed by start-up companies or companies already processing legumes.

The demand for legume-based foods is significant and showing strong growth rates across Europe as the market is fuelled with concerns about diets and environmental impacts. This report shows how companies responded to these changes by marketing legumes and processed pulse-based products and, how they use environmental impact as an integral part of their corporate communication targeted at investors, society and, the consumers in particular.

The report provides examples of 10 business cases of companies processing legumes for the food market to provide insights in the diversity of businesses building on legumes. The European market is showing strong dynamics with respect to the number of entrepreneurial companies being established to exploit the business opportunities created by the growing consumer’s awareness of the benefits of plant-based foods. The 10 companies selected illustrate how businesses can successfully process and market legume-based foods, and the business cases presented serve as examples of effective practice and do not claim to represent an exhaustive picture of all existing business strategies. To illustrate the chosen business cases, pictures (sourced from the from companies’ websites) have been added to each company’s fact- sheet.

It is the hope this report will inspire present and future entrepreneurs to develop new business activities that can contribute to increase the number of legume-based products in the food market, and for the benefit of the environment, biodiversity and the human population.

2. Pulses and legume-based products in food demand

2.1 The food system and needs for dietary changes

In recent years, the challenges facing the global agri-food system has attracted considerable attention. By 2050, the global population is expected to reach over 9 billion people, with an increasing share expected to demand more meat and dairy products in their daily food intake. This development combined with climate changes is putting more stress on land- and water-use. Global food production threatens climate stability and ecosystem resilience and constitutes the single largest driver of environmental degradation and transgression of planetary boundaries. This calls for an urgent and radical transformation of the global food system, to one where legumes play a significant role (Willet *et al.*, 2019).

In 2019, the EAT Lancet Commission published a report introducing a new diet to ensure the future sustainability of the global food system (Willet *et al.*, 2019). The essence of the proposed diet is to sustain food security and proper nutrition for the global population, with agriculture and food production remaining within the boundaries that the Earth's ecosystem can tolerate. Hence, the authors recommended a diet consisting of approx. 35 % calories from tubers and grains, protein sources mainly from plants, and 500 grams *per day* of fruits and vegetables. The recommended diet also includes 14 grams of red meat *per day*. A shift to this dietary pattern will require a reduction in the global consumption of foods such as red meat and sugar by 50 %, and a major increase, approximately doubling, in the consumption of nuts, fruits, vegetables and legumes and pulses.

In 2016, the consumption of pulses *per person per year* in Europe was on average 3 kg, but with large variations between countries (Figure 1). Hence, offering flexitarian options of plant-based alternatives instead of meat and dairy products is regarded as an important route to increase legume consumption.

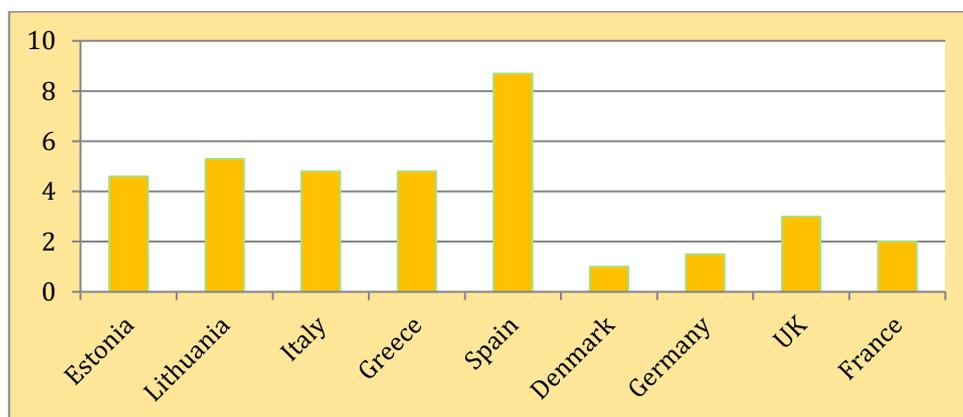


Figure 1. Consumption of pulses *per person* in kg y⁻¹ in 2016 (Magrini, 2018)



It is estimated that there were approximately 375 million vegetarians worldwide in 2017 and that number continues to increase as a result of new changing consumer preferences such as: reducing meat consumption due personal health concerns; worries about animal welfare; and, and animal welfare and disease prevention practices employed in the meat industry. These phenomena have given rise to the “flexitarians” consumer segment. Whilst flexitarian consumers do eat meat, they also seek plant-based food items to reduce their meat intake or/and improve their intake of fibre and non-refined (or resistant) starches. This has led to a market demand for plant-based solutions to be used as replacements for meat and processed meat products and products are targeted at flexitarians as well as vegetarian and vegan consumers.

2.2 Consumers’ perceptions of legume-based products

For legume-based products to gain a foothold in the food market a important pre-requisite is consumer acceptance. This means that the product should meet the consumer’s liking or expectations with regards to aspects such as appearance, taste, palatability, traditional eating habits. Other important criteria include consumers’ willingness to pay for the product, and the accessibility of the product, that is the consumer in a position socioeconomically or geographically for example, to acquire and/or access to the product. As this report’s focus is on presenting business cases for a selection of legume-based products, considerations about consumer aspects are concentrated to those aspects that result in an actual product-purchase. By far, taste and ‘likability’ or ‘appeal’ (visual and/or social-image the product presents) are the critical parameters, for the sustained purchasing of food (and drink) products. In essence, if the product does not meet the consumer’s liking, in particular taste and texture (or mouthfeel), then re-purchase of the product is less likely. The consequence is that the product will not gain a foothold in the market and will be removed by the retailers (and wholesalers). Therefore, with the overall aim to have more legume-based products in the consumer market, the products available need to encourage s to sustained consumer-repurchasing.

Consumer research carried out in EU countries shows that consumers are very interested in trying new products, including legume-based products. From a focus-group hosted in Denmark, it was demonstrated that taste was the most important criteria for liking the product. Consumers participating in the focus-group were asked to taste products such as lentil soup, bread made with faba beans, snack bars with pea proteins, cakes made with faba beans, and nuggets made with pea protein (Hamann and Nautrup, 2018). A focus-group in Germany also tested consumers’ liking of new products and here the range of samples includes lentil salads, brownies and bread made with faba bean flour and bean salads. The outcome of the German consumer research was a clear indication of strong consumer interest in new legume-based products and a willingness to try new foods (Lehrack U. 2018). For companies in the legume-based food industry the results of the consumer focus-groups are indicative of a market where innovations are important, and where the ability to launch products that meet the consumer’s requirement are essential elements in a business case.

Consumer research conducted in Finland revealed that purchasers think only of soya and beans as the first items when asked about their knowledge of vegetarian food ingredients – highlighting the high profile of legume grains among purchasers in that market place. Through a series of focus groups, the main barriers and drivers for increasing consumption of plant-based protein were investigated, (Table 1).

Table 1. Main drivers and barriers for increasing consumption of plant-proteins in Finland.

Main drivers	Main barriers
<ul style="list-style-type: none"> • Taste has to be good • Ecological concerns – plant-based food is better for the environment • Offer tastings to make consumers more familiar with vegetarian foods • Plant-based products in a special department in food stores • Plant-based products displayed besides the meat counterparts in food stores • Basic usage instruction on the packaging • Ready meals lower consumers’ threshold against trying new foods • Convenience items (nuggets <i>etc</i>) appeal to many consumers, also the vegan segment 	<ul style="list-style-type: none"> • Non-vegetarian consumers regard vegetarian food as difficult to cook and time-consuming due to the need for soaking pulses (soya and beans) • General unfamiliarity with vegetarian food • Reluctancy to try vegetarian food • Vegetarian food was regarded as a side dish, so having vegetarian food needed a change of mindset • Challenges of finding the vegetarian products in food stores • Packaging sizes being too large to encourage a first-try

The findings from the Finnish consumer research clearly match the strategies of the several of the business cases presented in this report. Key learnings from Finland are - to provide consumers with products that appeal to the way consumers shop, cook and think about food. Especially the findings about the high potential of convenience items and widening product ranges are aims which found in several of the business cases illustrated in this report. It is also clear from the Finnish consumer research that products which address ecological concerns of consumers are high underpin business plans and addressing such concerns can form a pivotal part of a company’s communication and marketing strategies with consumers and other stakeholders. This will be elaborated further in Chapter 5.

In South Europe there is a more profound tradition of including legumes in the diet than in North Europe. Consumer research carried out in Portugal showed that individuals who are either female, elderly and more educated people were more likely to replace animal products with pulses. The research showed that 20 % of the consumers already included pulses in their diet at the expense of animal products, and 21 % claimed to be likely to do so (Duarte et al., 2018). The main reasons stated by the Portuguese consumers for not increasing the inclusion of pulses in their diets were given as:

- lack of time to cook and prepare meals with pulses;
- traditional recipes are too heavy, so new and modern recipes are needed;
- pulses were regarded as “poor people’s food”, thus suffering from a less appealing image to consumers; and,
- lack of awareness of how consumption of pulses could contribute to a positive impact on the environment.



The results from the consumer research carried out in Denmark, Germany, Finland and Portugal point to the same paths: companies that offer legume-based products which meet consumers' demand do have a market and can build a business case for processing and marketing legume-based food products. This will be demonstrated in the analysis of the business cases.

Pulses play a role in the traditional diet, and this has been demonstrated by consumer research carried out in Hungary. Here, consumer research was undertaken to explore the eating patterns for pulses and vegetables. On average, the Hungarian consumer has an intake of 2.3 kg legumes and pulses per capita per year in comparison to 60.8 kg. of meat. Consumption of pulses and vegetables (green beans and peas) is most frequent by villagers in contrast to more developed areas, indicating that unprocessed pulses account for a larger share of rural diets compared to urban diets (Szuromi et al., 2019). The traditional method of serving legumes is as a side dish with meat, or with a vegetarian alternative. Hungarian cuisine offers legumes in soups, vegetarian dishes, salads and legumes are typically served with lemon or vinegar and spices like fennel. The regional aspect of the consumer market was also part of the consumer research in Germany. A bread made with 40 % faba beans from the Rheinland-area and 60 % local spelt flour was offered to the participants in the focus group. The consumers' response clearly indicated a strong interest and appreciation of the local-provenance of the ingredients (Lehrack, 2018).

The example from Hungary illustrates that a country cannot be regarded as a single market, but it needs to be recognised as a diversity of segments each with their own characteristics. To supplement this finding, the results from Germany illustrate that local-provenance of legumes is relevant to consumers. As will be demonstrated by the business cases, there are markets for a diverse range of legume-based (processed) products generally, and that such consumer interests and demands extends to a desire for such products whose raw materials have been cultivated and processed locally.

Research from a number of European countries have demonstrated that there is a consumer demand for legume-based foods, and that a wide assortment of products of diverse formats (canned, dried, processed, fresh and more) are needed. This calls for a greater diversity of products to be offered and innovation to enlarge the assortment, maintain consumers' interest and attract new-comers to vegetarian foods. In essence, there is room for more products and more business ideas in the European consumer market for legume-based foods.

2.3 Presenting the business cases

Developing and selling legume-based products is a business opportunity that food companies are keen to be a part of. The range of companies producing, distributing and processing legumes in the food market is large and highly heterogeneous. The companies included in this report represent some of the most common business cases in the growing legume-based food market. However, there are many other business cases related to the production and distribution of legume-based food as for example within global-trading and shipping or targeting the food service market. For more information about the food service market, refer to Hamann *et al.*, (2018).

To showcase the diversity of business plans which are used to market legumes a range of companies was selected, and which ranged from: start-up and operating businesses; SMEs and large companies; and, producers of conventional and organic products; a diverse range of legume-based products being processed. This provides a pan-European perspective (Table 2). The underpinning business cases selected are described in more details in the following pages.

Table 2. Business cases included in this report.

Company	Country of origin	Start-up/ Operating	SME/large	Conv/Organic	Product categories
Naturli	Denmark	Operating	Large	Organic	Meat replacements
Lauteracher	Germany	Operating	SME	Organic	Lentils and pasta
Papicante	Germany	Start-up	SME	Conv.	Snack bars
Bonduelle	France	Operating	Large	Conv./org.	Canned legumes
Epi & Co	France	Start-up	SME	Conv.	Meat replacements
Roquette	France	Operating	Large	Conv.	Pea protein
The Vegetarian Butcher	The Netherlands	Operating	SME	Conv.	Meat replacements
Brave Foods	United Kingdom	Start-up	SME	Conv.	Snacks
Dikotylon	Greece	Operating	SME	Conv.	Dried legumes
Garden Gourmet	Switzerland	Operating	Large	Conv.	Meat replacements

Naturli Foods (Denmark)

Naturli was founded more than 20 years ago with the purpose of producing soy milk. In early 2018, the company introduced plant-based “minced meat” which were sold in Danish supermarkets and from autumn 2018 in Tesco stores in the UK. Naturli has now started exporting its products to Australia and have expanded their product range to include, “poultry cubes” and, “fishy burgers”. The company is a subsidiary of the Norwegian-owned Orkla Foods group.

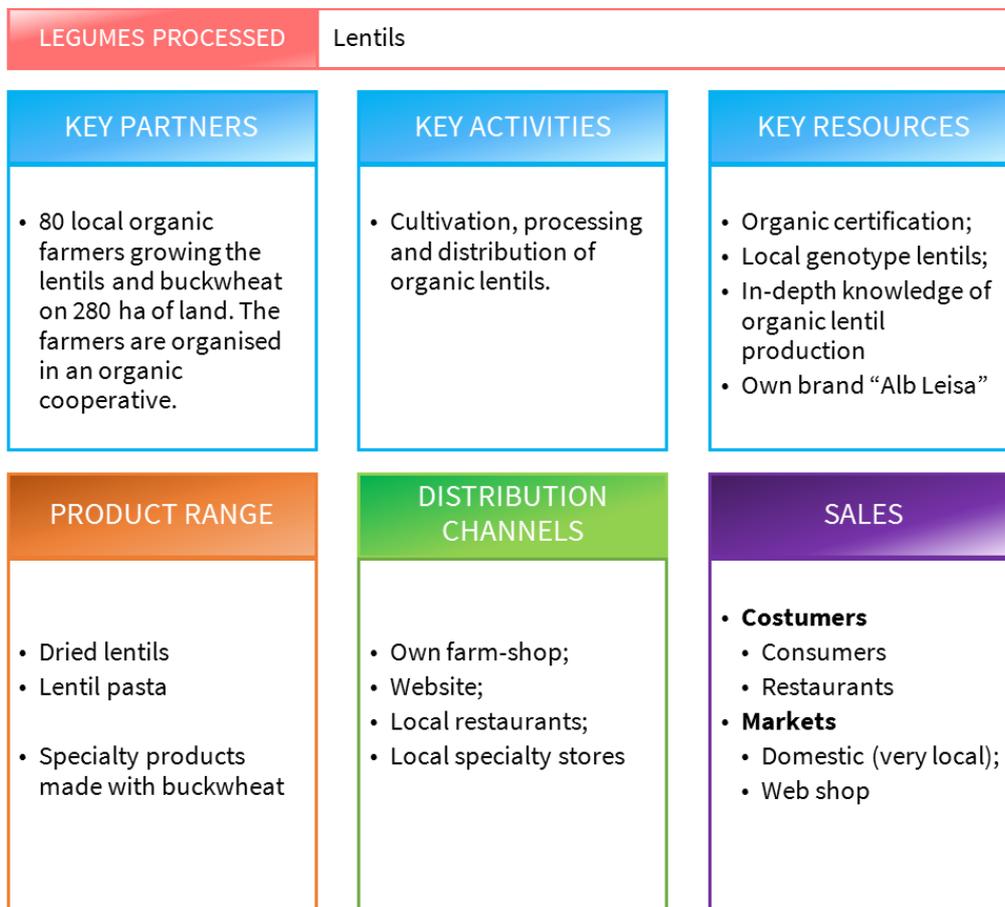


LEGUMES PROCESSED		Soybeans, peas, chickpeas	
KEY PARTNERS	KEY ACTIVITIES	KEY RESOURCES	
<ul style="list-style-type: none"> Imported raw materials but looking for opportunities to work with Danish providers of legumes 	<ul style="list-style-type: none"> Processing of plant protein (soybeans, chickpeas, peas, and wheat protein) into “minced meat” and “burgers” 	<ul style="list-style-type: none"> Organic certification; Industrial scale production facility; Long experience in manufacturing and selling plant-based alternatives to dairy products Own brand “Naturli” 	
PRODUCT RANGE	DISTRIBUTION CHANNELS	SALES	
<ul style="list-style-type: none"> Plant-based minced meat and burgers, meat replacers New: plant-based “poultry cubes”, “fishy burger” 	<ul style="list-style-type: none"> Supermarkets Wholesalers in the food service market Own vegan supermarket in Copenhagen (opened 2018) 	<ul style="list-style-type: none"> Costumers <ul style="list-style-type: none"> Consumers (with interest in green food, environmental concerns and the vegan segment) Markets <ul style="list-style-type: none"> Domestic-nationwide; Exports to UK and Australia 	

<https://www.naturli-foods.dk>

Lauteracher Alb Feld-Früchte “Alb Leisa” (Germany)

Lauteracher Alb-Feld-Früchte started as a business in 2001 from an existing organic farm. In 2006, the farmer managed to obtain some of the special genotypes of lentil seeds that had been originally grown in this region of Germany (Schwäbische Alben). In 2011, the first “Alb Leisa” lentils were available for sale, and in 2014 the business was expanded to include buckwheat, linseed and products thereof. The business emphasises the local origin of their lentils (produced within a range of 50 km).



<https://lauteracher.de/unternehmen/alb-leisa-entwicklung.html>

Papicante (Germany)

Papicante is a start-up located in the South of Germany, which sells pea-based savory snack bars in retail outlets and through contracts with airline caterers. The company started operating in 2016/2017.



LEGUMES PROCESSED		Green peas
KEY PARTNERS	KEY ACTIVITIES	KEY RESOURCES
<ul style="list-style-type: none"> • Not known 	<ul style="list-style-type: none"> • Production of snack bars made from green pea protein crisp 	<ul style="list-style-type: none"> • Direct contact to airline catering; • Own brand “Papicante”
PRODUCT RANGE	DISTRIBUTION CHANNELS	SALES
<ul style="list-style-type: none"> • Healthy snack bars made with pea protein crisps and in more flavours 	<ul style="list-style-type: none"> • Convenience stores • Supermarkets • Airline catering 	<ul style="list-style-type: none"> • Costumers <ul style="list-style-type: none"> • Consumers looking for healthy snacks; • Vegan consumers; • Travelers • Markets <ul style="list-style-type: none"> • Domestic

www.papicante.com

Bonduelle (France)

Bonduelle is a family-owned company founded in 1853 in France and has since developed into a leading international company of processed and fresh vegetables. The Bonduelle brand is recognised for its high quality and is acknowledged across many markets by consumers and professionals alike. The company’s business is based on conventional products with organic products accounting for only a few percent of their production. Other brands from the French company are Cassegrain (France), Artic Garden (Canada), Ready-to-Pac (USA), and Globus (canned vegetables in East Europe and Russia).

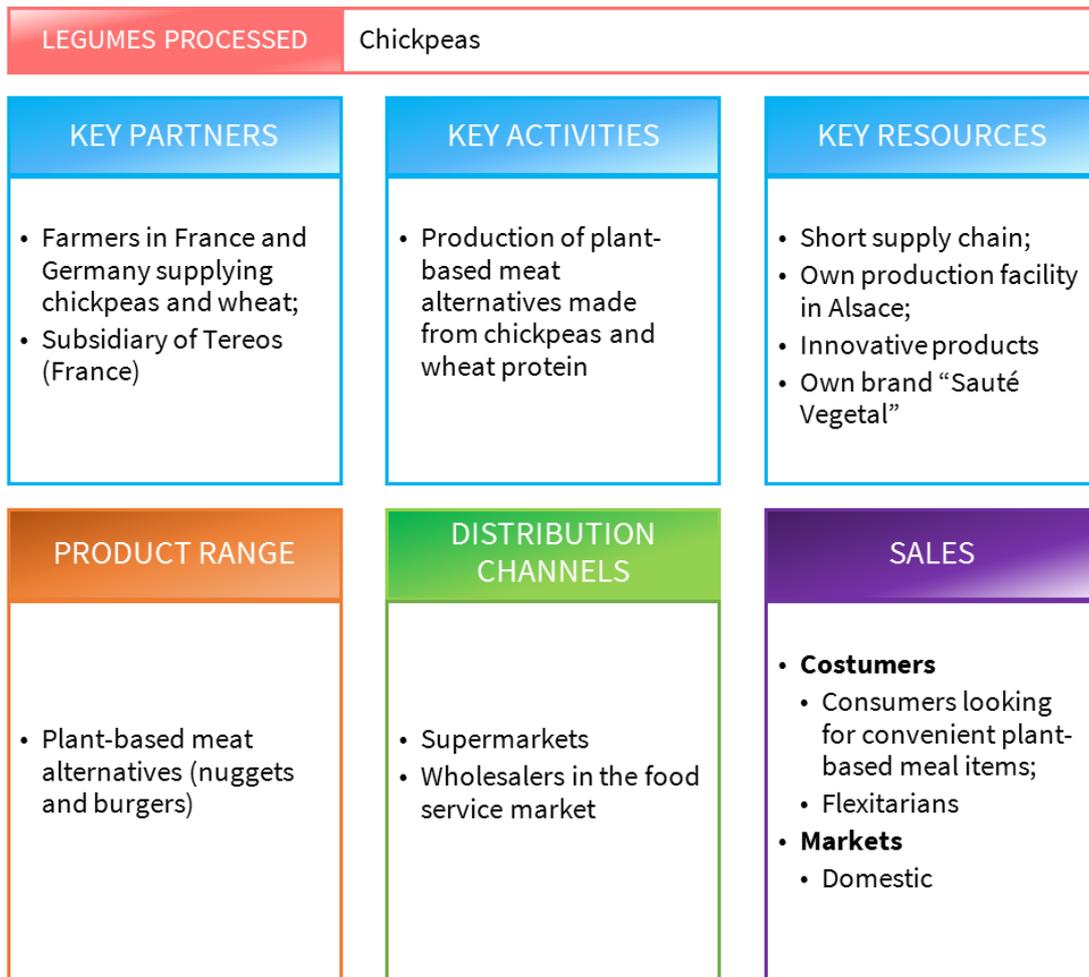


LEGUMES PROCESSED			Peas, beans, lentils, chickpeas		
KEY PARTNERS		KEY ACTIVITIES		KEY RESOURCES	
<ul style="list-style-type: none"> Farmers supplying the vegetable crops on contracts 		<ul style="list-style-type: none"> Processing of vegetables into canned and frozen products 		<ul style="list-style-type: none"> International scale of operations; Long history; Organic certification; Long-term relationships with distributors; Own brand “Bonduelle” 	
PRODUCT RANGE		DISTRIBUTION CHANNELS		SALES	
<ul style="list-style-type: none"> Wide assortment of frozen peas and beans; Wide assortment of canned peas, beans, lentils and chickpeas; Conventional and organic products 		<ul style="list-style-type: none"> Supermarkets Wholesalers in the food service market 		<ul style="list-style-type: none"> Costumers <ul style="list-style-type: none"> Consumers – in general; Consumers of organic food Markets <ul style="list-style-type: none"> European and Russian markets; American and Canadian markets 	

www.bonduelle.fr

Epi & Co (France)

Founded in 2015, Epi & Co is a 100 % subsidiary of Tereos, a French agribusiness company processing wheat and potato starch, and alfalfa. It has built a business case on the processing of chickpeas and wheat proteins sourced in France and Germany



www.epiandco.com

Roquette (France)

Roquette is a global family-owned company with headquarters in France. It has activities within bio-based value chains, pharmaceuticals, cosmetics, food and feed. Their pea protein ingredient business is global. The ingredients are traded under the brand Nutralys and produced at sites in France and Canada, the latter expected to be in operation in 2019. The pea protein range is sold to customers in the food and feed industries. The company also produces wheat proteins. Roquette’s supply chain is rooted in France (French peas for processing in France) and Canada, which demonstrates intercontinental supply chains.



LEGUMES PROCESSED		Yellow peas	
KEY PARTNERS	KEY ACTIVITIES	KEY RESOURCES	
<ul style="list-style-type: none"> • Farmers in France and Canada supplying the yellow pea crop on contracts 	<ul style="list-style-type: none"> • Processing of peas into pea protein for use in food and feed 	<ul style="list-style-type: none"> • Industrial scale of operations; • Long history • Technology platform rooted in bio-based industries; • Long-term relationship with distributors; • Own brand “Nutralys” 	
PRODUCT RANGE	DISTRIBUTION CHANNELS	SALES	
<ul style="list-style-type: none"> • Refined protein products made from yellow peas; • Conventional and organic products 	<ul style="list-style-type: none"> • Distributors and wholesalers in the business-to-business market 	<ul style="list-style-type: none"> • Costumers <ul style="list-style-type: none"> • Companies producing food and feed • Markets <ul style="list-style-type: none"> • Global 	

www.roquette.com

The Vegetarian Butcher (The Netherlands)

The Vegetarian Butcher is a Dutch company that produces a wide range of meat alternatives for the retail market by using plant proteins of Dutch origin. The Company started in 2010 and developed in collaboration with Unilever in 2016. In 2018, it was acquired by Unilever. The Vegetarian Butcher now has a strong position in the market and strong outreach to consumers *via* social media. Their own production plant will be built in the Netherlands in 2019, which was enabled by financing *via* crowdfunding.

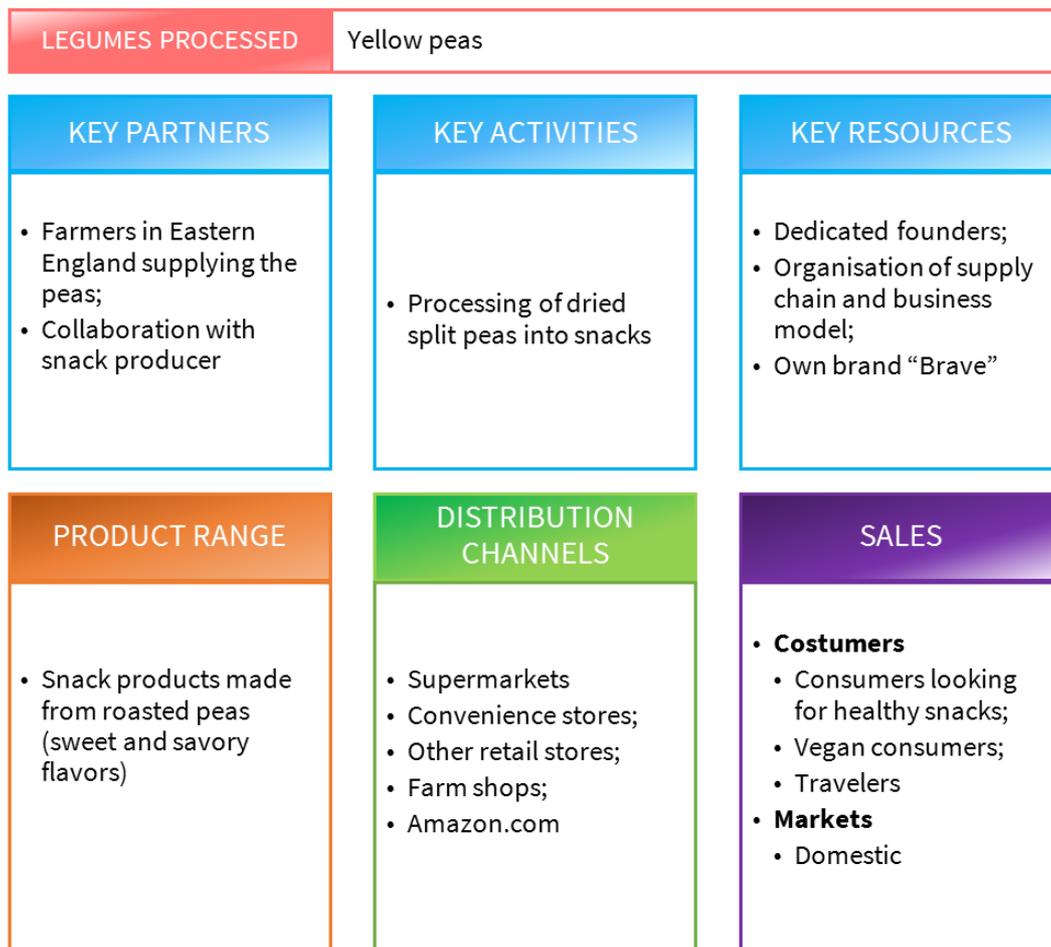


LEGUMES PROCESSED		
Soybeans, peas, lupines		
KEY PARTNERS	KEY ACTIVITIES	KEY RESOURCES
<ul style="list-style-type: none"> • Unilever acquired the company in 2018; • Processing facilities that produce for this brand 	<ul style="list-style-type: none"> • Production of a wide assortment of plant-based meat alternatives including sausages, nuggets, burgers and more 	<ul style="list-style-type: none"> • Strong platform for innovation; • Long history; • Own restaurant; • Own brand “The Vegetarian Butcher”
PRODUCT RANGE	DISTRIBUTION CHANNELS	SALES
<ul style="list-style-type: none"> • Plant-based meat alternatives; • Conventional and organic products 	<ul style="list-style-type: none"> • Supermarkets 	<ul style="list-style-type: none"> • Costumers <ul style="list-style-type: none"> • Consumers looking for convenient plant-based meal items • Markets <ul style="list-style-type: none"> • Domestic; • Exports to 17 countries in Europe

www.thevegetarianbutcher.com

Brave Foods (United Kingdom)

Brave Foods is a start-up founded in 2017 and located in the UK. It sells pea-based snacks for convenience stores and other retail outlets in the UK and Ireland. Their products are suitable for vegan consumers, and their short supply chain building on British-sourced peas is a real asset which is communicated in their marketing. Production is contracted and their headquarters are in London.

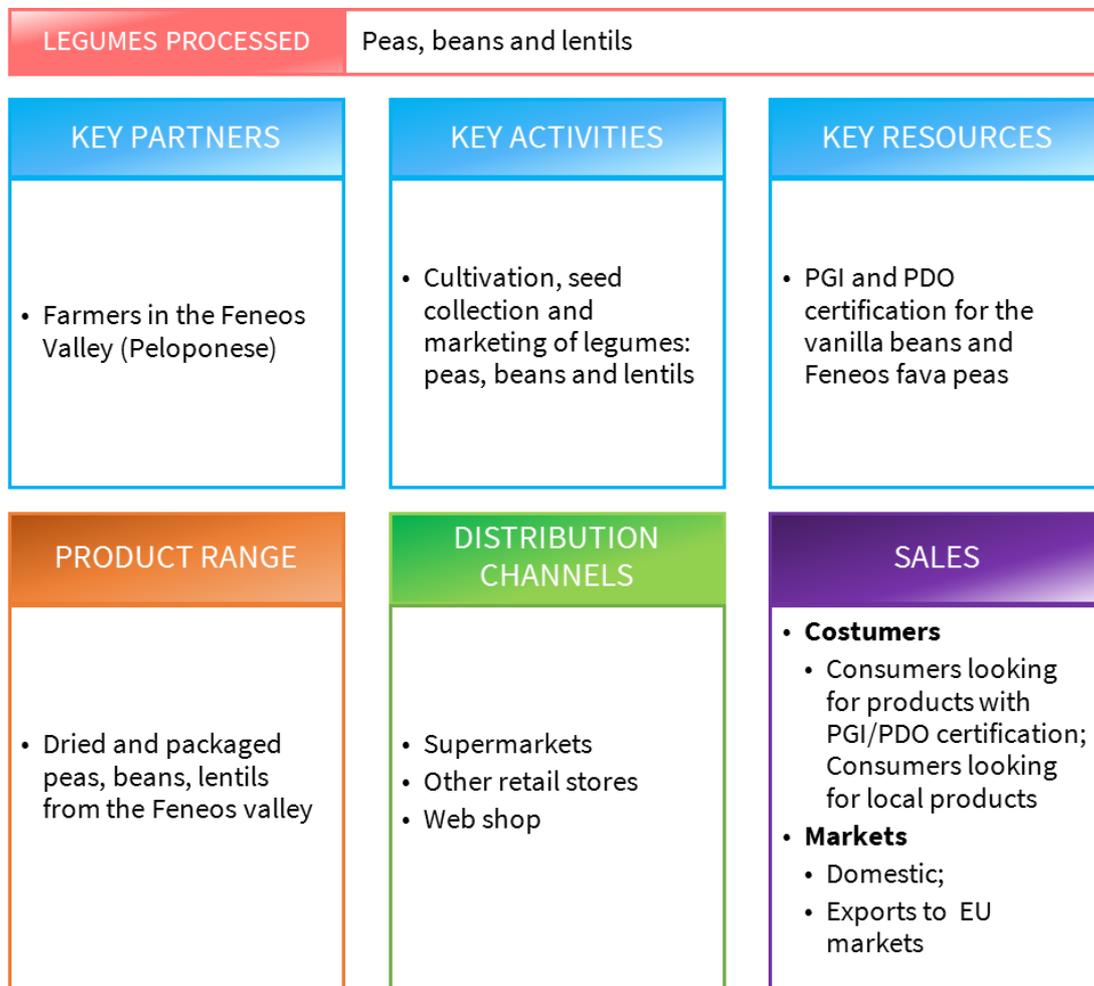


www.bravefoods.co.uk

Dikotylon (Greece)

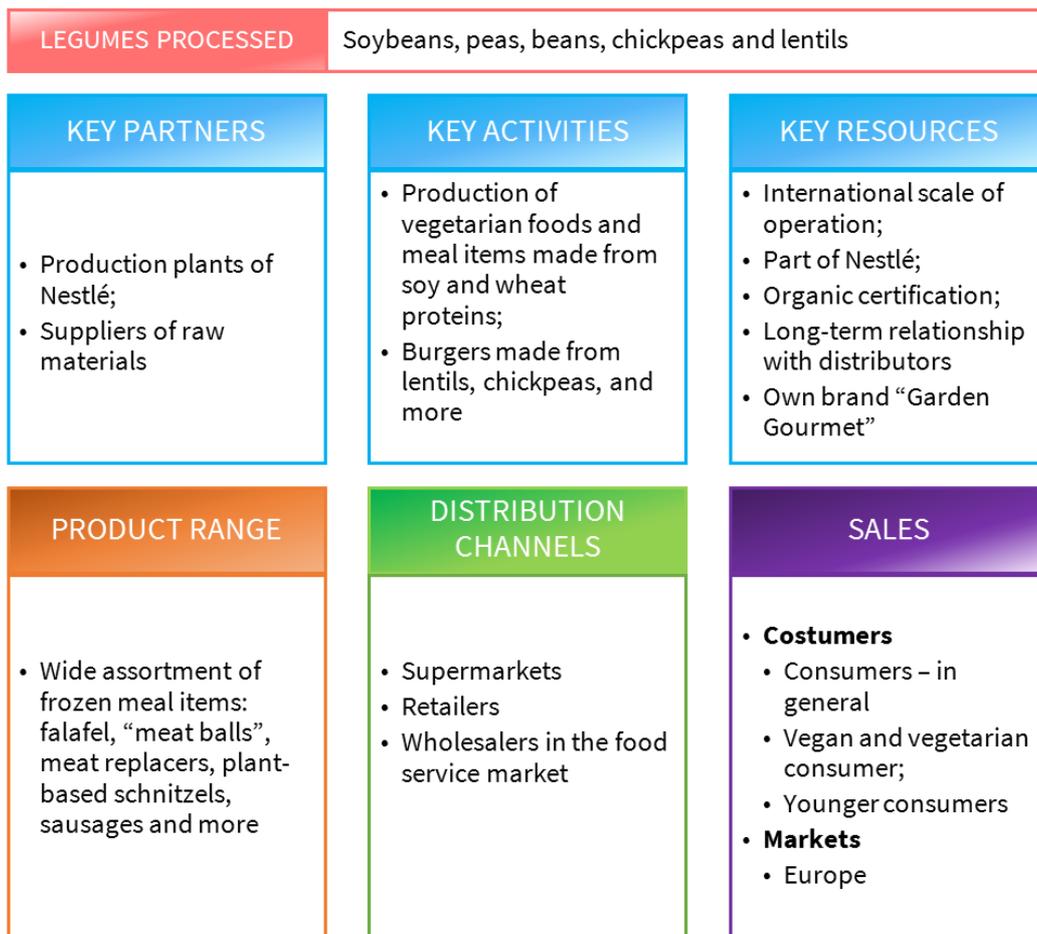
Dikotylon provides a range of dried legumes from the Feneos valley in Greece. The company's activities include screening, collecting, standardisation and marketing legumes from this region. Their production is carried out under the integrated pest management system. The vanilla beans and Feneos faba peas are certified as Protected Geographical Indication (PGI) and Protected Designation of Origin (PDO) by the EU.

www.dikotylon.gr



Garden Gourmet (Switzerland)

Garden Gourmet was founded in Israel 30 years ago under the company name Tivall, which was later acquired by Nestlé. It produces and sells vegetarian (vegan) meat replacers to the consumer market and to food services in Europe. In Sweden, the company uses the brand name Hälsans Kök (Cuisine of health). Garden Gourmet is also currently accelerating new product launches such as non-dairy coffee creamers and plant-based smoothies



www.gardengourmet.com



3. The market aspect of the business cases

3.1 Business cases targeted at mass market retailing

In 2017, launches of ‘meat substitute’ products accounted for almost 14 % of all new “meat” launches in Western Europe compared to 6 % in 2015 (Innova Market Insights 2017). In the coming years, the market for pre-cooked pulses and meat alternatives is expected to grow by +6 % annually. In terms of meat substitutes, it is interesting to note the breadth of the products now available on the market, provide consumers with a lot more choice and convenience. Indeed, vegetarian friendly products are highly prevalent in today’s market, with many traditional meat companies venturing in the vegetarian/vegan space. Vion Foods was among the early-adopters to engage in the vegetarian market as the company started to produce vegetarian products more than 10 years ago, and these products are sold in Germany and the Netherlands through wholesalers (<https://www.foodingredientsfirst.com/news/vion-considers-vegetarian-expansion-as-profitability-hit-by-hot-european-summer.html>). Nestlé (refer to Business Case *Garden Gourmet*) has invested in meat alternatives through the acquisition of the Israeli company Garden Gourmet (formerly Tivall) some 30 years ago. Lately, in 2018, Unilever acquired a leading Dutch entrepreneur in meat alternatives, The Vegetarian Butcher (refer to the Business Case *The Vegetarian Butcher*, detailed above). As demonstrated, there is a growing interest from meat processors to enter into the plant-based food sector.

Learning from the present debate which is taking place in the European dairy industry, the naming of a product can disrupt the market. For example, can plant-based milk alternatives rightfully use the term “milk” in the product name? The dairy industry argues, that only animal-derived products can be called ‘milk’, building on the EU legislation outlined in Regulation 1308/2013 defining the standards for marketing agricultural products including dairy products and meat. This market situation seems to point to the outcome that plant-based drinks may need to change their names to “plant-based dairy alternatives”, or otherwise to eliminate the term “milk” from product name. It may be anticipated that a similar debate may occur in the plant-based meat-alternatives market. The EU Marketing standards are also outlined for meat (pork, beef and poultry) and therefore, pork, beef and poultry meat are protected terms. Given this, terms like “burger” or “nugget” are not protected, which may be the reason for why producers of plant-based meal items use such terms. In addition, consumers are looking for so-labelled convenience food items, and this market demand is central for growing the business of the plant-based food products.

While the majority of the meat substitutes are still produced from soy or wheat proteins, more products made with legume-based proteins are being introduced into the market. **Garden Gourmet**, **The Vegetarian Butcher**, **Epi & Co** and **Naturli** are examples of companies engaging in the growing market of meat replacements with products made from chickpeas, lentils and peas. These four companies provide a wide range of meat replacers targeted at retail stores and marketed under their own brand names. Their meat replacement product range includes:



- burgers and “meat” balls;
- schnitzels;
- sausages;
- “minced meat”;
- “meat” pieces and cubes; and,
- cold “meat” cuts for sandwiches.

Convincing consumers to try a new plant-based (meat replacement) products can be challenging. To overcome this challenge, the Danish company **Naturli** had its meat alternatives placed in the cooler next to the minced beef. This approach made consumers associate the new product with the similar looking conventional “minced meat” product. In addition, such positioning highlighted these new plant-based products directly to consumers seeking meat. This strategy proved a success, and sales in Danish supermarkets took off.¹

With more consumers turning to plant-based proteins, a revival of established market segments such as frozen and canned legumes ensued. Within this market segment, **Bonduelle** is a leading brand globally and took full advantage of this resurgence. All its products are marketed under the “Bonduelle” brand in the European market and their product range includes a large assortment of canned legumes such as:

- kidney beans;
- black beans;
- white beans;
- French beans;
- green lentils;
- chickpeas;
- peas and carrots;
- peas; and,
- a range of canned organic pulses.

The breadth of the canned legume assortment offered by **Bonduelle** is regarded as an indicator of a market where consumers are seeking choices of plant-protein product. The wide assortment of canned and frozen legumes also indicates that traditional products are holding a significant position in the food market.

¹ <https://www.tv2ostjylland.dk/artikel/vegansk-hakkekoed-rives-vaek-det-burde-ligge-i-groentafdelingen>



3.2 Business cases with other market strategies

There are several options for marketing legumes in high value segments such as organic food products especially with local provenance or speciality attributes. For example, EU producers have the opportunity to apply for the PDO or PGI certification schemes for products with provenance. The EU's DOOR database includes all issued and pending applications for the PGI and PDO schemes (*ca.* 450 registrations in March 2019)². A search for horticultural products and Greece showed that this specific country has 48 registrations of PGI or PDO products (some pending), including eight certified legume products. The Greek company **Dikotylon**'s business case is centred round legumes with provenance, which is a key element in the marketing of their vanilla beans from Feneos and faba feneos peas from the Peloponnese region. Both types of legumes are certified under the EU scheme PGI (Mitropoulos Y, 2018). **Dikotylon** distributes their dried legumes to local stores and through a web shop. Their products are also available in selected export markets (Germany, the UK and the Netherlands among others). Another business case which builds on local affiliation is the case of the lentils from **Lauteracher**. These lentils are marketed under the brand name "Alb Leisa", which refers to the provenance of the lentil seeds that was originally grown in this region in the South of Germany and re-introduced to the local area only some 20 years ago by the founder of **Lauteracher**. This business case is rooted in the founder's organic farm, where the processing of the lentils takes place and sales are organised from their farm shop whose operations extend to distribution to retailers in the local area.

Alternative market strategies of mass market retailers are often a preferred choice for start-ups, particularly in the snack food and confectionery segments. For example, the companies **Papicante** and **Brave Foods** offer snack products made with legumes through large chained convenience stores, and in the transport market, *e.g.* at train stations and airline catering.

3.3 Functional ingredients as business case

The growing consumer demand for plant-based products and/or meat replacements drives demand for functional plant-based protein ingredients, reaching beyond the demand for soy protein isolates. Currently, the global market for functional protein ingredients is dominated by dairy-based proteins (caseinates, whey protein concentrates), gelatine and egg white protein. It is estimated that animal-based proteins account for 60 % of the global use of functional protein ingredients (Euromonitor, 2017). Whilst plant-based protein ingredients account for 40 %, soy proteins make up half of this segment and wheat protein (gluten) 18 %. Other plant-based proteins such as protein from peas, hemp, lentils and chickpeas are estimated to account for 3 % of the global use of functional proteins. Compared to other plant-based proteins such as potato or wheat protein, pea protein is a small market even on a global scale but is expected to grow by 7 % annually in the coming years (Ben Said, 2018).

Marketing plant-protein ingredients such as pea protein or soy protein isolates is a business-to-business (B2B) operation in contrast to marketing plant-based foods targeted at consumers. For a company like **Roquette**, the deep knowledge of the functional properties of pea protein in different

² [EU DOOR Database](#)

applications (*e.g.* baked good, sauces, ready meals *etc.*) is essential to meet its customers' demand. This is due to the fact that food processing companies rely on the supply of food ingredients to develop and produce successful products. As a result, the market strategy for a company in the ingredients industry is regarded as a direct partnership with the customer.

4. The production aspect of the business cases

4.1 Sourcing of legumes

The 10 business cases selected process a wide range of conventional and organic legumes (Table 3).

Table 3. Legumes processed by the companies.

Company	Types of legumes
Naturli Foods	Soybeans, peas – organic
The Vegetarian Butcher	Lupines, soybeans, beans and peas
Garden Gourmet	Soy beans, lentils, chickpeas and, use of pea protein and pea starch as functional ingredients
Epi & Co	Chickpeas and wheat proteins
Brave Foods	Green peas
Roquette	Yellow peas
Bonduelle	Green peas, haricot verts, a wide assortment of beans, chickpeas and lentils – some organic
Papicante	Yellow peas
Lauteracher	Lentils – organic
Dikotylon	Beans, peas and lentils

Referring to the descriptions of the 10 business cases, it can be seen that the companies have developed very diverse supply chains. Hence, there is no clear or characteristic pattern(s) for commercially successful supply chains for legumes and pulses targeted to the food market. Key parameters to be communicated to consumers seem to be supply chain length, *i.e.* a short supply chain emphasising the local or national origin of raw materials has marketing strength. This is the case for small as well as large companies. In the case of companies selling plant-proteins in the B2B market, the core issue is to build a strategic and sustainable supply chains.



4.2 Organisation of production

Processing of legume-based foods may be organised in several ways and depends on the company's resources. A common approach among start-up companies is to contract a manufacturer to make their product following a specific recipe. This avoids costly investments to production set-up costs in the early phase of the business and allow them to concentrate on building their brand name and market position. For example, the start-up company **Brave Foods** revealed that their production takes place in Eastern England, whilst their headquarters are located in London.³

Examples of companies that process legumes into dried and packaged products are **Lauteracher** in Germany and **Dikotylon** in Greece. They both have invested in equipment for cleaning and packing the legumes in consumer-ready packages. The farmers growing the legumes supply the crop to these companies, who then process and sell them. In the case of **Lauteracher**, the farmers are organised within a lentil-growers cooperative, and in the case of **Dikotylon**, the farmers are contracted suppliers.

The Vegetarian Butcher in the Netherlands has experienced rapid growth from producing and selling meat replacement products. Up to now production has been undertaken by subcontractors but with sales now reaching high volumes, the company is planning to establish its own factory funded through a crowdfunding campaign in 2015 *via* social media and the company website. The crowdfunding campaign raised 2.5 million EUR in 3 weeks.⁴ The new factory is expected to be operational by 2020.

For companies that have a track record in the food industry, production is undertaken by the company itself as the production lines, food safety and documentation procedures are already in place. For example, the products from **Garden Gourmet** that are available in Danish and Dutch supermarkets are produced at a plant in the Czech Republic. Products are also produced in Israel where the company originates. The Danish company **Naturli** has produced soy milk for many years and as a result has gained experience in processing plant proteins. When starting production of meat replacers, the factory was already equipped with most of the required technology and investments were made to adapt the production system to the new product line.

As the global demand for pea protein is increasing, **Roquette** decided to invest in a new pea protein factory located in Manitoba, Canada. This factory will be the World's largest site for manufacturing pea protein and production is expected to start in 2019. The peas will be supplied by Canadian farmers, and the pea protein distributed to the global market. **Roquette** already produces pea protein in factories in France and Belgium close to where the peas are grown. **Roquette** case demonstrates how a company with a global market approach locates production facilities independently of markets, but close to strategic partners (in this case the suppliers of raw materials).

For **Bonduelle**, processing is located close to the contracted farmers who supply the fresh legumes for processing into canned or frozen products. **Bonduelle** has production facilities in Eastern and Western Europe as well as in Brazil, USA and Canada. Another French company, **Epi & Co** is located

³ [*Brave targets guilt-free snacking new range roasted peas*](#)

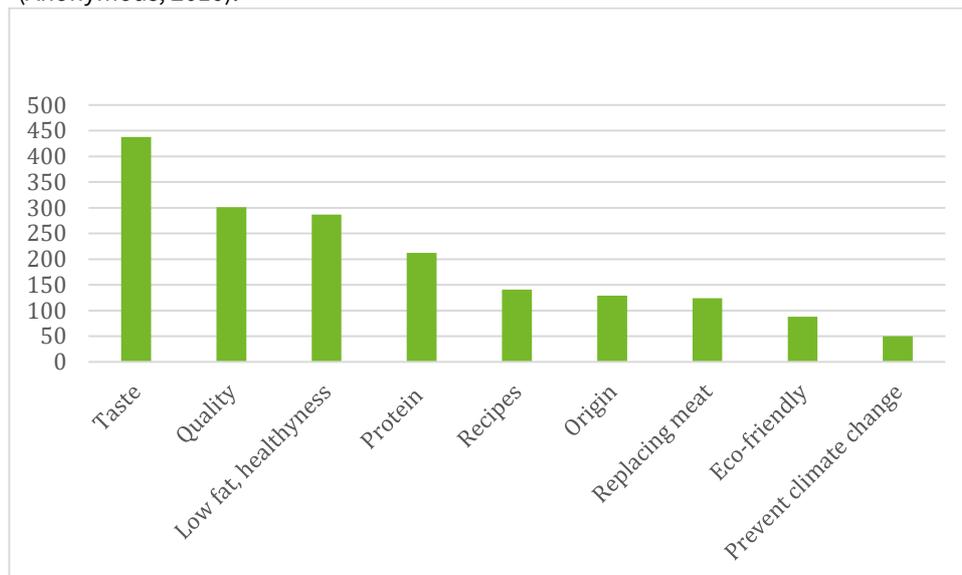
⁴ [*The vegetarian butcher meatless food for meat lovers*](#)

in the Alsace region, where the raw materials are produced. **Epi & Co** processes chickpeas and wheat proteins to make meat substitutes for the French market.

5. Business cases and environmental aspects

The success of marketing of plant-based products to consumers is closely related to the message conveyed to the consumer. In many cases, consumers are attracted by attributes like “healthy” or “easy to prepare” with links well with the business cases presented in this report. Attributes that are related to the production of the product or the raw materials (i.e. the legumes and pulses) can also be used in consumer communication. Research carried out with Finnish consumers show that taste, by far, is the most important attribute followed by quality, (Figure 2).

Figure 2. Finnish consumers’ perceptions of most important attributes for marketing of plant-protein products (no of consumers; sample size 500 respondents, (Anonymous, 2016).



The choice of taste was the preferred one for 438 consumers out of a sample of 500 respondents. Only 88 consumers of 500 responses pointed to “eco-friendliness” as the most important attribute for marketing plant-protein products. If the environmental benefits from growing and eating plant-protein products are to gain stronger appreciation among consumers, massive efforts are needed for consumer education. Yet today, Companies are dealing with this important challenge, as will be demonstrated with examples from the business cases in this report.

Many of the business cases analysed consider the environmental aspects of their production and highlight them in their consumer-targeted communications. For example, the Danish company **Naturli** focusses their marketing on the fact that a plant-based diet is a way to save water by using the slogans (translated from Danish): “*Change to our “minced meat” and save as much water as if*

you were showering continuously for five days”⁵, and “Changing to a plant-based diet contributes to reducing CO₂ emissions by 60 %”⁶. Considering these statements with Figure 3 illustrates how the company target consumers who are interested in plant-based food, the environment and biodiversity (their target group).

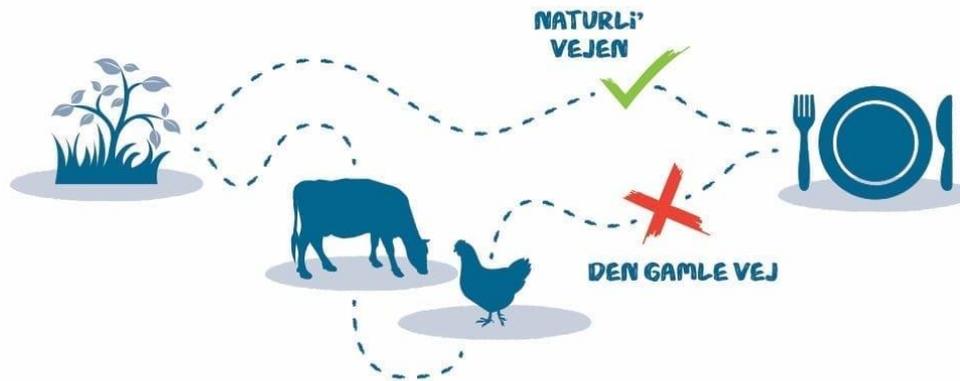


Figure 3. Example of communication used by Naturli to highlight the benefits for the environment by choosing a plant-based diet. Translation: *Naturli' Vejen* refers to the route from plant to plate; *Den Gamle Vej* refers to the route from plant to livestock product and to plate.⁶

Being a large-scale industry actor, the company **Bonduelle** emphasises its role in the transition of the global food system towards more-sustainable states. The company’s attention to mitigate the environmental impact of their food-product production is highlighted on their website under the following justifications:

- vegetables are only seasonal;
- crops are grown in the pedo-climatic zones in which they are native; and,
- new varieties are produced *via* crossings and not from using GMO.

As stated on their website, it is their priority to keep distances between field-production sites and processing plants to a minimum - to preserve the freshness of the products, as well as to reduce ‘food miles’ and validate their products provenance. With special relevance to legumes, it is mentioned that peas are harvested in the Haut-de-France region in the North of France, where this crop benefits from the best growing conditions.⁷

Roquette, a company operating in the B2B market, extensively communicates the environmental impact resulting from a plant-based diet including yellow peas. It also emphasises in a consumer-friendly manner that the inclusion of yellow peas into diets would lead to a more sustainable food

⁵ <https://www.naturli-foods.dk/produkter/plantefars/>

⁶ <https://www.naturli-foods.dk/miljoe-2/>

⁷ [Bonduelle sustainable development in the fields](#)



system, as cultivation of yellow peas has a very limited environmental footprint compared to other agricultural productions.⁸ They explain that:

- cultivation of yellow peas needs 40 times less water than beef production;
- emissions of CO₂ are 20 times lower than for beef production;
- growing yellow peas contributes to sustain biodiversity; and,
- the nitrogen fixation capabilities of legumes contribute to improving soil quality and reducing the need for synthetic nitrogen fertilisers.

The example of **Roquette** illustrates how a company may provide very detailed communications specifically targeted at consumers on the link between diet and environment, and despite the B2B market being the company's core market.

The local origin of the peas used by the entrepreneur **Brave Foods** is an important element in the company's marketing. The company website states that, "*we only use peas produced by farmers in Eastern England. This ensures a short supply chain and high quality*". This example illustrates that a short supply chain and the knowledge of the origin of the raw materials are important when linked to environmental aspects in company communication. In the case of **Epi & Co**, the local French (Alsace-region) and German origin of the chickpeas is an important element in the marketing of their plant-based meat alternatives. **Epi & Co** emphasises in their communication that their meat alternatives are "*easy to handle; easy to process and there is no cooking losses or food waste*" (Tereos, 2018). The statement regarding food losses illustrates that the environmental impact from food production has many dimensions. In the EAT Lancet Commission's report, reduction of food waste by 50 % is seen as an essential part of achieving global access to healthy food (Willet *et al.*, 2019).

The examples described above show that business cases can address aspects of environmental impact in a variety of ways. Common denominators are the reduced impact on water use and CO₂ emissions resulting from cultivation of legumes at the expense of livestock production. Short supply chains may refer to short transportation distances between supplier and processor, or supplier and consumer. In either case, this helps reduce greenhouse gas emission which ultimately help contribute to a better environment. In addition, organic production should also be highlighted as a route by which legume-reliance should be extended into a business case to help highlight the environmental benefits of legumes.

⁸ [Nutralys pea protein story](#)



6. Concluding remarks

6.1 Scaling up the business case

The market for plant-based foods, and legume-based foods, will continue to grow in the years to come. It is therefore relevant to consider now how a business case can be scaled-up. For many start-ups and entrepreneurial companies, the business case centers around building a brand and a market position, as exemplified by **Brave Foods** and **The Vegetarian Butcher**. Ultimately, there is a need to re-consider this approach and assess whether investing in production facilities would be relevant. This would very often lead to changes in the business case as volume now becomes more important. Volume in this context refers to securing supply chains (volumes and consistency) and market uptake of the production. Using the example of **Naturli** from Denmark, the company first introduced the plant-based “minced meat” and secured sales through Danish supermarkets early in 2018. It then expanded its range of plant-based products and started to develop exports late in 2018 targeting the supermarket sector in the British market and Australia. As of 2019, exports to the USA are to be developed.⁹ In contrast, some business cases appear to function best within a local setting. For such business cases, the relation to a specific locality, a short supply chain or recognised provenance could prove a path by which a company may thrive commercially.

6.2 Linking diets and environment in business cases

The analysis of these ten business cases shows that it is possible to build a business case where consumer diets and environmental concerns are important elements, by satisfying the consumer expectations for and of plant-based foods. However, it should be highlighted that the true environmental footprints of specific legume- or animal-based is usually derived from average data gathered from statistical databases. There are only a small number of products marketed based on a fully-provenanced supply-chain and associated full life cycle analysis. Such data shortcomings are exploited by marketing professionals and seem to be challenged only rarely. Nevertheless, this report has demonstrated that established and entrepreneurial food companies offer a diversified portfolio of legume-based food products. It is also shown that legume-based food products can enter the consumer market through a range of distribution channels such as mass-market retailers, the convenience segment and through internet shops. Furthermore, the report has provided examples of companies that focus on the local market and including some whose business is built on international supply chains and export markets. Hence, it demonstrates the breadth and diversity of businesses operating in the food industry by processing and trading legume-based products. The business cases described therefore serve as examples of the dynamics that are ongoing in today’s food market.

Marketing is a powerful tool for promoting products in the market. This implies, among other aspects, the importance of effectively communicating a product’s benefits to catch the consumer’s attention. The analysis of the business cases in this report outlines how the companies approach “environment” in their marketing efforts for promoting the legume-based products differently.

⁹ <https://nyheder.okologi.dk/mad-og-marked/plantebaserede-varer-styrker-eksporten>



Although, there seems to be two main avenues for including “environment” in one’s marketing efforts:

- 1) to communicate to the consumer the environmental benefit of choosing this product; and,
- 2) to communicate to a broader target group the benefits for the environment resulting from the production method, processing, or sourcing of this specific product.

Communication to consumers conveys the “easy-to-understand” messages as exemplified by **Naturli** and caters to the environmentally-concerned consumer. It appears that the potential health benefits of legumes are not exploited to the same extent. The report shows how short supply chains can be linked to environmental concerns (the case of **Brave Foods** and **Lauteracher**), and how food waste can play a role in the overall assessment of environmental impact of production and processing (illustrated by **Epi & Co**). To communicate the broader benefits of a specific production or sourcing strategy, as in the cases of **Bonduelle** and **Roquette**, it is important to provide more objective information - yet still catered for a target audience with high environmental awareness.

If the agri-food system as we know it today is to provide nutritious food in sufficient amounts for feeding the global population of 9 billion people by 2050, significant changes are urgently needed. The role of legumes and legume-based products to help achieve this transformation needs to be emphasised more effectively. Since legumes have a positive impact on agriculture and climate changes and are a healthy and nutritious food item globally. Of concern is the dietary patterns prevailing in the Western countries and the requirement to transition communities towards a diet where plant-based products and vegetables play a more profound role at the expense of livestock-based products. If legumes are to exploit this opportunity, it is of utmost importance that food companies identify strategies that can promote legumes and legume-based products into the market.

This report has showcased a range of diverse business strategies to illustrate how one may realize the opportunities, such as; producing and trading certified products, innovative processed products, traditional products and, plant-based ingredients – all made from legumes. In addition, good communication among the B2B is as important as to consumers for the most successful marketing effort.

A path to achieving a more sustainable food system where legumes and legume-based products play a more profound role is, to encourage companies to engage and establish businesses that can thrive and by that, contribute to the dynamics in the European food market. The report at hand has provided findings and inspiration that may promote business development in this field. Further work is needed to bridge the gap between consumer demand patterns and quality attributes on the one side, and the insights about the ecological benefits of cultivating legumes on the other side. Enforcing and adapting communication to raise awareness with the players and stakeholders in the food market is regarded as pivotal actions for laying the grounds for consumers to make their **educated choice of foods**.



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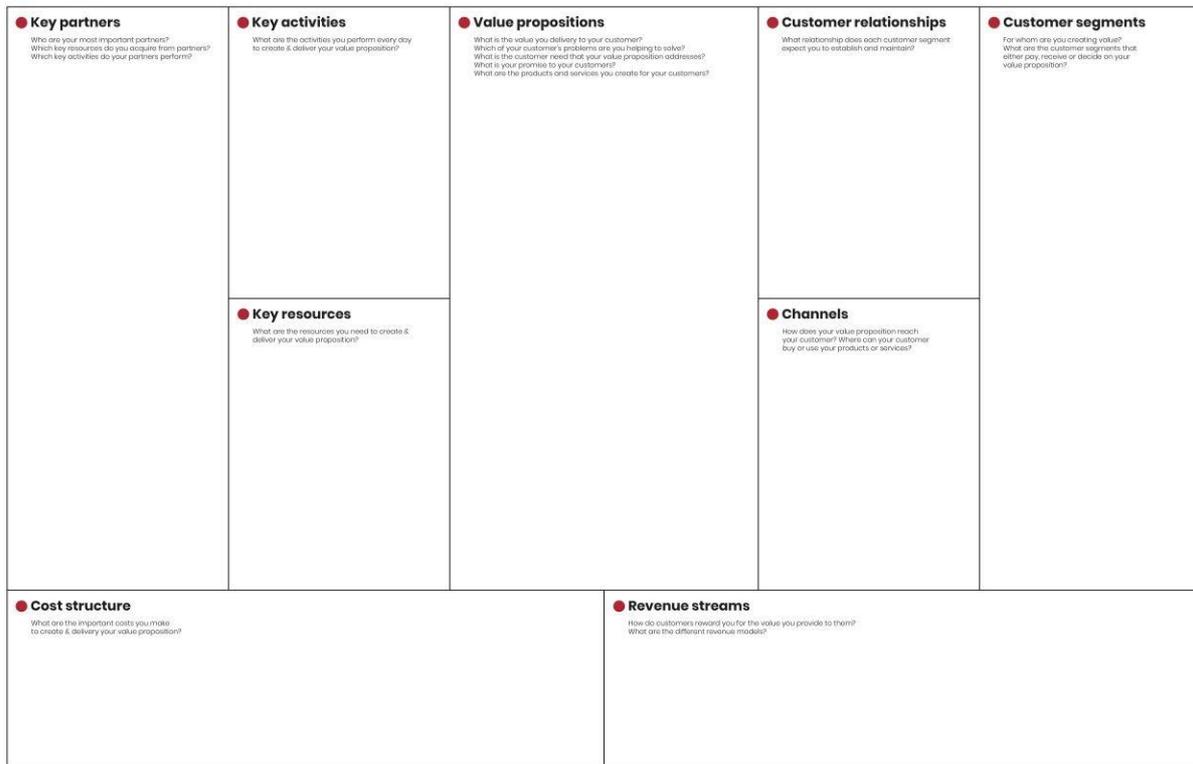
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Annex I - Methodology

As a business case outlines the “what, how and who” of a venture, this report has been based on the principles of the *Business Model Canvas* system, as this well-known approach is used to capture **how a business creates, delivers and captures value** (Figure 4).

BMI • Business model canvas



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Figure 4. The Business Model Canvas system

The Business Model Canvas presents the business case in a current view hence, historical data and future prospects for the business cases are not included in this report. The strengths of using the Business Model Canvas to understand a business case lie in the fact that for every value proposition (*i.e.* what value does the business offer to its customers), there needs to be a customer segment and a market. All categories on the right side are linked to the market, and all items on the left side (*i.e.* partners, activities and resources) are linked to the production and supply side of the business. Due to limited availability of information from the companies, the Business Model Canvas was adapted to only focus on the production and market sides.

In addition, since the purpose of this deliverable is to **show the diversity of business cases** and emphasise the business activities in relation to diet and health, it was decided not to analyse the costs and revenue streams of the selected companies. This report does not aim to provide any assessment of a company's profitability, advice on the most suitable business case for e.g. a specific



market situation or business idea. Therefore, no details about costs or revenues of the business cases are provided in the report.

Data for the business cases have been retrieved from company websites, newsletters, reports, and other sources as mentioned in the References. Company statements and presentations from European workshops on legumes and the Legume Innovation Meetings hosted as part of the TRUE project have provided a large pool of information regarding current businesses dealing with legume-based food in the European market.

Consumer focus groups have been hosted in Denmark, Hungary, Germany and Portugal. Consumers have been recruited from open invitations and the aim has been to gather diverse groups of consumers; each representing a heterogenous socio-demographic/-economic groups. In Denmark and Germany, consumers have been recruited to taste samples of legume-based food and express their views about palatability, liking and product appeal with special reference to the likelihood of purchase. In Portugal, consumers have been recruited for a focus-group to discuss behavioural patterns which underpin dietary change and present eating habits. The consumers have participated in a quantitative survey too. In Hungary, a survey of actors in the gastronomy market has identified key features of traditional Hungarian cuisine that are attractive to consumers. In addition, consumer research has been carried out in Hungary to map consumption patterns. Additional consumer research from Finland (for example), and at European level, has been identified from literature (refer to the Reference list provide below).

From the Legume Innovation Networks (LINs) hosted in Stuttgart, Athens, Peterborough and Budapest as part of the TRUE project, additional insights regarding business-cases, -models, supply chain structures and consumer market trends have been obtained. This knowledge gathered from the LINs include company presentations, facilitated-market and -supply chain transdisciplinary sessions and discussions with stakeholders.