FoodNexus Nordic Assets
Contents

1. A leading Food innovation region................................................................. 3
2. Nordic Strengths in Food and Agriculture .................................................... 9
3. Nordic Research, Innovation, and Education Level .........................................13
4. Nordic Sectorial Strengths
5. Denmark and Sweden leaders of general Innovation linkages.........................20
6. Nordic Industry Pre-Core Partners................................................................. 22
7. Nordic Knowledge Institutions Pre-Core Partners.........................................24
1. A leading food innovation region

The region of Denmark and Southern Sweden ranks as the world’s 3rd largest food cluster due to a very highly concentrated food and food-related industry, leading food science universities and innovation organisations along the entire food value chain. The cluster is one of the fastest developing food clusters in Europe, and is officially appointed as highly priorities areas by both Swedish and Danish governments. The actors in this cluster conduct numerous R&D collaborations on a large scale, and accounts for successful market impacts on the European and global markets. Within all food categories and associated industry (packaging, process equipment, ingredients, food safety monitoring, etc.), the region contains dominant companies with headquarters (and/or R&D centres).

Sweden and Denmark possess both similar and different instruments favouring food innovation and entrepreneurship the most important ones described briefly in this report.

Successful innovations are increasingly about breakthroughs in collaboration, forming linkages. The most effective innovation ecosystems contain many different linkages among companies, industries, academia, public sector, research institutes, clusters and society. Creating such infrastructures, that fosters innovation linkages, is one of the key factors in global challenges.

This has been acknowledged by Danish and Swedish authorities and several innovation facilitators which have led to the establishment of platforms such as open innovation facilities at the major universities, large companies starting working actively with suppliers, researchers and entrepreneurs and SMEs on open innovation issues etc.

Largest R&D-active regional food companies

The region have several global food manufacturing companies as well as a large array of globally leading suppliers of especially ingredients and enzymes, but also packaging material and production technology. Furthermore, the region is recognised for its global competence in food safety assessment.
## Important food companies in the Nordic Region

<table>
<thead>
<tr>
<th>Company (HQ/R&amp;D HQ)</th>
<th>Products/sector</th>
<th>Turnover B€</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetra Laval (SE/SE)</td>
<td>Packaging, Food Processing Equipment</td>
<td>13,455</td>
<td>Private (stock)</td>
</tr>
<tr>
<td>Carlsberg (DK/DK)</td>
<td>Beverages</td>
<td>8,960</td>
<td>Private (stock)</td>
</tr>
<tr>
<td>Arla Foods³ (DK/DK)</td>
<td>Dairy products and milk-based ingredients</td>
<td>8,415</td>
<td>Cooperative</td>
</tr>
<tr>
<td>Danish Crown (DK/DK)</td>
<td>Meat products</td>
<td>7,528</td>
<td>Cooperative</td>
</tr>
<tr>
<td>DLF (DK/DK)</td>
<td>Seed, feedstuffs, farm machinery, plants, vegetables, fertilizers</td>
<td>6,467</td>
<td>Cooperative</td>
</tr>
<tr>
<td>Lantmännén (SE/SE)³</td>
<td>Grains, feedstuffs, bakery, farm technology</td>
<td>5,053</td>
<td>Cooperative</td>
</tr>
<tr>
<td>Orkla Foods (NO/SE)</td>
<td>Food</td>
<td>3,97</td>
<td>Private (stock)</td>
</tr>
<tr>
<td>Danish Agro (DK/DK)</td>
<td>Seeds, eggs, agricultural supplies, fertilisers</td>
<td>2,347</td>
<td>Cooperative</td>
</tr>
<tr>
<td>AarhusKarlshamn (SE/SE)³</td>
<td>Specialty vegetable oils and fats</td>
<td>2,255</td>
<td>Private (stock)</td>
</tr>
<tr>
<td>Billerud Korsnäs (SE/SE)</td>
<td>Forestry, Food Packaging Material</td>
<td>2,150</td>
<td>Private (stock)</td>
</tr>
<tr>
<td>DuPont Nutrition Biosciences (US/DK)</td>
<td>Food ingredients and enzymes, food protection</td>
<td>1,584</td>
<td>Private (stock)</td>
</tr>
<tr>
<td>Novozymes (DK)</td>
<td>Biotech, Food ingredients</td>
<td>1,57</td>
<td>Limited company</td>
</tr>
<tr>
<td>Christian Hansen</td>
<td>Food ingredients</td>
<td>0,75</td>
<td>Private (stock)</td>
</tr>
</tbody>
</table>

³ Also some R&D-activities in Sweden.

² Also some R&D-activities in Denmark.

The biggest food companies ranks relatively high on European level, and all have remarkable exports to (and outside) EU. Several of the largest food manufacturing companies are co-operatives and thus owned by primary producers, and possess a certain value-chain perspective in their daily operations, innovation mindset etc. Both Sweden and Denmark are net exporters of food products and technologies to EU and global markets. The number of SME:s in the food sector is currently increasing rapidly. Many of them are producing high quality and innovative products, with large potential on the international market.

## Leading public and private research institutions

The Nordic region has a long tradition for excellence in research and education within food science, with the key university actors listed below. Since the early 2000s, all universities have developed entrepreneurship programmes and facilities aiming at fostering new companies. Two of the world’s top 15 agricultural universities are placed in the region (SLU and KU).

## Universities with excellence in agriculture and food science, research, education and entrepreneurship

### Denmark
- University of Copenhagen (KU)³
- Aarhus University (AU)³
- Technical University of Denmark (DTU)³
- Aalborg University (AAU)
- University of Southern Denmark (SDU)

### Sweden
- Lund University (LU)³
- Swedish University of Agricultural Sciences (SLU)
- Chalmers University (CLM)
- Malmö University (MAH)
- Kristianstad University (HKR)
- Halmstad Högskola (HH)

³ Approx. 40,000 students each.

² The three universities account for 95% of the Danish university food research.

Several research and innovation activities exist across the universities, and also across Oresund, especially within primary food production, engineering and health sciences. Food Science Sweden is a joint platform for collaboration in food science between Chalmers, LU, SLU and SP/RISE.

Apart from these universities, Denmark and Sweden have more than 50 university colleges performing medium-length education of food and health professionals as well as some levels of research and innovation.

In Denmark, all STEM universities have innovation offices focusing on a combination of technology transfer, innovation, research-based business development, patenting and licensing. In Sweden, this function is accompanied by national innovation offices located at the STEM universities.
Private and Public Research and Technology Organisations (pRTOs)

The region contains multiple RTOs within food science and technology operating within industrial research, certification and testing, innovation processes, technological counselling and knowledge dissemination. A key role is the practical application of developed results between academic research and industrial product and process development. RTOs focus on innovation, but limited on entrepreneurship. Most RTOs also conduct courses aimed at industry professionals.

### RTOs within food science and innovation

<table>
<thead>
<tr>
<th>Denmark</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORCE Technology(^{b}): Materials, hygienic design, processing, food safety</td>
<td>RISE consists of four research and technology organizations including&lt;br&gt;SP Technical Research Institute of Sweden: food and agricultural science (sensory and flavour, structure and material design, sustainable food production, microbiology and process hygiene, process technology, and agricultural engineering), life science, energy, transportation, ICT, risk and security, and built environment.&lt;br&gt;&lt;br&gt; <em>Inventia</em>: pulp, paper, graphic media, packaging and bio refining&lt;br&gt;<em>Swedish ICT</em>: Information and Communication Technology&lt;br&gt;<em>Swerea</em>: materials development, production, product development</td>
</tr>
<tr>
<td>Danish Technological Institute (incl. DMRI)(^{a}): Food structure, sensory science, packaging, processing, ingredients, slaughters (DMRI), biorefining, logistics, food conservation&lt;br&gt;AgroTech: Primary production, LCA, food waste, bioenergy, gastronomy</td>
<td>VTI: Transportation, logistics</td>
</tr>
<tr>
<td>DHI Group(^{b}): Food safety, risk assessment, water</td>
<td></td>
</tr>
<tr>
<td>DELTA Light and Acoustics(^{c}): Process monitoring, PAT</td>
<td></td>
</tr>
<tr>
<td>Alexandra Institute: ICT in food, user-driven innovation</td>
<td></td>
</tr>
</tbody>
</table>

\(^{a}\) 8 official Danish RTOs exist (GTS-institutes) being organized by the GTS-network.  
\(^{b}\) Also represented in Sweden and other markets.  
\(^{c}\) Also represented in Denmark and other markets.

Generally, the largest relative income at the RTOs arises from commercial activities. However, all institutions also gain income from projects contracted with national public bodies (e.g. innovation consortia, performance contracts) with a balanced focus on applicable knowledge build-up and knowledge dissemination to especially SMEs.

### Business Incubators & accompanying innovation centres

In relation to entrepreneurship based on innovations, public, public-private and private incubators play an important role in the region. They are most often located near technology parks, university campi and/or RTOs – hereafter denominated as “innovation centres”.

### STEM-relevant business Incubators and innovation centres (university co-location)

<table>
<thead>
<tr>
<th>Denmark</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbion Science Park (IC - Copenhagen)</td>
<td>Ideon Innovation(^{b}) (LU)</td>
</tr>
<tr>
<td>Østjysk Innovation A/S (INC - AU)</td>
<td>Ideon Science Park (LU)</td>
</tr>
<tr>
<td>INCUBA Science Park (IC - AU)</td>
<td>Lund Life Science(^{b}) (LU)</td>
</tr>
<tr>
<td>Aarhus Universitets Forskerpark (IC - AU)</td>
<td>LU Innovation System (LU)</td>
</tr>
<tr>
<td>Innovation Lab (IC - AU)</td>
<td>Venture Lab(^{b}) (LU)</td>
</tr>
<tr>
<td>Innovation MidtVest A/S (INC - AU)</td>
<td>Chalmers Innovation(^{b}) (CLM)</td>
</tr>
<tr>
<td>Kathrinebjerg (IC - AU)</td>
<td>Encubator(^{b}) (CLM)</td>
</tr>
</tbody>
</table>
Apart from the incubators listed above, several others exist in the region, but without a specific focus on life science/STEM that can be related to food. A slight increase in food-related STEM entrepreneurs has been observed over the last decade – mainly arising from a changing cost structure, increased competition via globalisation etc.

**Triple helix clusters and Innovation Platforms**

Several platforms for secure business development based on research, innovation and education are present in the region. However, their focus, geographic coverage and funding differs from each other and between Sweden and Denmark. Most clusters are located close to universities, incubators and innovation centers. Relevant entities are listed below.

### Food/STEM-related triple helix clusters and Innovation Platforms

<table>
<thead>
<tr>
<th>Denmark</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster organisations:</strong></td>
<td></td>
</tr>
<tr>
<td>VIFU</td>
<td>Livsmedelsakademin/Skane Food Innovation Network (SFIN)</td>
</tr>
<tr>
<td>FOOD Denmark</td>
<td>Packbridge</td>
</tr>
<tr>
<td>AU FOOD Platform</td>
<td>Resilient Regions association</td>
</tr>
<tr>
<td>SESAM</td>
<td>Media Evolution Centre</td>
</tr>
<tr>
<td>Danish Food Cluster</td>
<td>Mobile Heights</td>
</tr>
<tr>
<td>Copenhagen Cleantech Cluster</td>
<td>Sustainable Business Hub</td>
</tr>
<tr>
<td><strong>Pan-national networks:</strong></td>
<td></td>
</tr>
<tr>
<td>Enterprise Europe Network (HQ)(^a)</td>
<td>Ideon Agrofood</td>
</tr>
<tr>
<td>European Food Cluster Alliance'</td>
<td>Partnership Alnarp</td>
</tr>
<tr>
<td>ManuFOODture</td>
<td></td>
</tr>
<tr>
<td><strong>National innovation networks/platforms:</strong></td>
<td></td>
</tr>
<tr>
<td>Madkulturen</td>
<td>Tillväxt Trädgård</td>
</tr>
<tr>
<td>InSPIRe FOOD</td>
<td>Centrum för innovativa drycker</td>
</tr>
<tr>
<td>BioX (SPIR)</td>
<td>Krinova Science Park Open Innovation Arena</td>
</tr>
<tr>
<td>FoodNetwork</td>
<td></td>
</tr>
<tr>
<td>InBIOM</td>
<td></td>
</tr>
<tr>
<td>Robocluster</td>
<td></td>
</tr>
<tr>
<td>Biopeople</td>
<td></td>
</tr>
<tr>
<td><strong>Regional platforms:</strong></td>
<td></td>
</tr>
<tr>
<td>Future Food Innovation</td>
<td></td>
</tr>
<tr>
<td>Regional Madkultur</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Also counts partners in Sweden and other EU countries (technology scouting and SME matching).

In Denmark, Innovation networks hold the responsibility of – in close collaboration with especially RTOs, universities and cluster organisations – conducting innovation seminars, perform matchmaking for especially SMEs, and conduct fast-track innovation demo projects with these.
Public innovation and entrepreneurship funding

In the Nordic countries, the national funding systems for innovation and entrepreneurship play an important role – especially at high-risk cross-sectorial innovations and early-stage start-ups. In both countries, the national systems are focussed towards global challenges in their funding scopes, but differ somewhat in targeted funding types in relation to food/STEM.

### Food/STEM-related national public innovation and entrepreneurship funding bodies

<table>
<thead>
<tr>
<th>Denmark</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UFM</strong> is Denmark’s national agency for research, innovation and higher education. UFM funds a wide array of RTDs and universities in relation to challenge-driven research and innovation, industrial PhDs and post-docs, SPIR, GTS performance contracts, innovation consortia, -networks, and -partnerships. Also in charge of InnovationsFonden for risky high-tech innovation projects. UFM also co-funds the national innovation milieus (incubators).</td>
<td><strong>Vinnova</strong> is Sweden’s public innovation agency. Vinnova funds challenge-driven innovation, supports SME initiating R&amp;D strategies, assists researchers in commercializing their discoveries in several different programs.</td>
</tr>
<tr>
<td><strong>Ministry of Growth</strong>; Administers the national entry points to EU structural funds and rural development funds in collaboration with the 5 Danish geographical regions. Hosts growth initiatives within user-driven innovation, entrepreneurship educations and Danish municipal start-up consultancies (væksthuse). Administers ‘Vækstfonden’ and ‘Eksportkreditfonden’ with specific focus on SMEs and start-ups.</td>
<td><strong>The ministry of Enterprise and Innovation</strong> is responsible for matters relating to food and regional growth, it is also responsible for the business sector, housing and transport, ICT, regional growth and rural policy.</td>
</tr>
<tr>
<td><strong>Ministry of Environment and Food of Denmark</strong>; Administers national rural development programmes (agri innovation), ‘Green Growth’ as well as ‘Green Development and Demonstration Programme’ with strong focus on co-funding potential start-ups within food-related bioeconomics.</td>
<td><strong>Tillväxtverket</strong>; The Swedish Agency for Economic and Regional Growth is in charge of the internet portal Verksamt.se, which supplies support for start-ups in many areas. They are also a financial provider for businesses via regional funds and product development programs.</td>
</tr>
<tr>
<td><strong>Ministry of Energy</strong>; Administers the ‘Energy technological Development and Demonstration Programme’ as well as smaller programmes focusing on sustainable bioenergy, waste-to-value etc.</td>
<td><strong>The Swedish Board of Agriculture</strong> is the Government’s expert authority in matters of agriculture policy, and is responsible for the agricultural and horticultural sectors. <strong>Energimyndigheten</strong> is Sweden’s public energy agency providing for pilot and demonstration plants where new technology and research are developed concerning, conversion, distribution and use of energy.</td>
</tr>
<tr>
<td><strong>Regional Growth Councils</strong>, all focusing on growth initiaties within especially food, health and energy. Especially Capital Region have had experiences with the completed ‘Healthy Growth’ programme. Central Denmark Region is currently boosting its ‘Healthy food as sound business’ programme including the ‘Future Food Innovation’ milieu.</td>
<td><strong>Regional Councils</strong>, the Regional Council such as, Skåne Regional Council situated at the southernmost county of Sweden participates in both regional and interregional and cross-border cooperation outside Sweden.</td>
</tr>
<tr>
<td><strong>Local ‘growth houses’</strong>, administered by Danish municipalities having research institutions. Focus on counselling on start-up processes and networking to private and public funding, counselling etc. In Central Denmark, ‘FødevareMIDT’ is maintained by the regional growth houses and VIFU to foster food entrepreneurship.</td>
<td><strong>Länsstyrelsen</strong>, The public county administrative boards in Sweden, work to implement the EU and the Swedish agricultural and rural policy, to make agriculture competitive and sustainable. Main support includes the rural development program (Landsbygdsprogrammet) which has high impact on the regional level.</td>
</tr>
</tbody>
</table>

In addition, the major universities possess own funds for investments in academically based spin-offs.
**Food/STEM-relevant public early stage funding bodies**

<table>
<thead>
<tr>
<th>Denmark</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vækstfonden</strong> is Denmark’s national public venture fund for investment in early stage companies. The portfolio lies mainly within ICT, biotech and cleantech. The fund has a close collaboration with investment banks and innovation milieus (other public cofounders) about cofounding start-ups.</td>
<td><strong>Almi</strong> a publicly-owned company acts as bank, supplying SMEs with loans under the condition that the firm also can attract other creditors or equity investors. Almi’s role is also to invest venture capital where the risk is high and the availability of capital is scarce. They offer advisory service for SMEs and provide an incubation program, BIG Sweden. The incubator program links 45 of Sweden’s incubators and quality assures the business processes performed at these incubators.</td>
</tr>
<tr>
<td><strong>Export Credit Foundation</strong> is Denmark’s public fund for securing loans for export boosts for small and medium-sized companies, especially in relation to start-ups with global market potentials that need scale-up funding.</td>
<td><strong>Industrifonden</strong>, The foundation invests in small and medium-sized Swedish companies with international growth potential. All investments are made on commercial terms together with entrepreneurs and other investors. The Foundation supply venture capital throughout the whole business cycle with direct and fund-in-fund investments in ventures both at early and expansion stages.</td>
</tr>
<tr>
<td><strong>Fornyelsesfonden</strong> is a relatively new public foundation that provides risk capital for proof-of-concept funding and market development of promising technologies within esp. cleantech and bioeconomy (incl. food resources). The foundation focus on business development of new companies based on spin-offs from joint ventures between existing partners (academia, industry and cluster organisations).</td>
<td><strong>Teknopol</strong>, offers senior business advisors with expert knowledge, network and experience from the industry relevant to innovations. They work in close partnership with international investors and industries as well as other private and public players and incubators. Work area is mainly Skåne but offer some of their programs nationwide. Teknopol also try out new methods for growth, in pioneering projects. Their main expertise lies within IT, Telecom, Life Science, Digital Media and Software, Cleantech, Biotech, Life Science and Food.</td>
</tr>
</tbody>
</table>

**Private venture capital and private equity**

A range of private investors exist in Denmark and Sweden with different foci (primarily cleantech, biotech, ICT), but also some emerging investors looking at the food market.

As a means for attracting private investments to food, Foodbest has been co-hosting European Food Venture Forum in Aarhus in 2012-15 in collaboration with Europe Unlimited, Enterprise Europe Network and Future Food Innovation.
2. Nordic Strengths in Food and Agriculture

Nordic food and agriculture sector is one of the largest in the world, exporting to more than 180 countries. The Food export is accounting for a quarter of Denmark’s goods exports. Sweden’s food export has been less important in a national context, but is now rapidly increasing and reached over 70 Billion SEK in 2014. The capabilities within research, innovation, and production span the entire food value chain. Studies published in 2013 and 2014 cite Denmark as Europe’s no. 1 and Sweden as no. 9 country for food innovation.

The Nordic agrifood sector is a centuries-old success story about getting the best out of the resources provided by nature – and by science. Knowledge sharing and expertise development are part of the everyday culture in Sweden and Denmark.

In the IBM Global Location Report 2015, Denmark and Sweden ranks among the world’s most attractive countries for knowledge-intensive investments – measured by the added value and knowledge intensity of jobs created by foreign investment projects.

Furthermore, the national go governments are strongly committed to the food industry. The Danish government launched in 2013, an ambitious plan to accelerate its growth. Along with the many knowledge-based companies already in the country that creates a good climate for investors. The Swedish national government will launch a national food strategy in 2016, aiming to support the development of a sustainable, profitable and innovative food sector.

Ease of doing business

Denmark and Sweden are ranked as some of the easiest countries to do business in worldwide. This is a useful indicator of the overall environment within which the Danish agrifood sector operates. In Forbes ranking of “Best countries for business” Denmark is no 1 and Sweden no 5 in 2014.
Forbes statement about Denmark:
“Thoroughly modern market economy features a high-tech agricultural sector, state-of-the-art industry with world-leading firms in pharmaceuticals, maritime shipping and renewable energy, and a high dependence on foreign trade.”

Great infrastructure in the region
Operating from the Nordic Countries gives easy access to the entire EU market place and brings you within next day delivery reach of over 100 million of the wealthiest consumers in the world. Denmark and Southern Sweden has a dense and highly developed transportation infrastructure.

Copenhagen Airport – which repeatedly has been elected the most efficient airport in Europe – is the main hub in the Nordic and Baltic region with 57 operating airlines serving altogether 132 destinations and handling approximately 380,000 tons of airfreight each year with the shortest goods transit times of all European airports (source: Invest in Denmark).

The Øresund Bridge makes a fast link from the Copenhagen area to the Nordic countries. And by 2021 a tunnel will be built from South-eastern Denmark to Germany – all allowing even better connections for business.

Many large international companies are based in the Nordic Countries, along with research-intensive universities, specialist knowledge organisations and budding growth businesses.

Research infrastructure
Access to state-of-the-art research infrastructures is an international competitive parameter and is a crucial determinant for the capacity of Nordic research institutions to produce pioneering research results and to educate, retain and attract the best students and the greatest research talents on a global and increasingly competitive knowledge market. Thus, Denmark and Sweden has a strong focus on continuously developing and improving the research infrastructures.

The development of ESS and MAX IV will develop the research infrastructure further. The European Spallation Source is a pan-European project. It will be built by at least 17 European countries, with Sweden and Denmark as host nations. ESS is one of the largest science and technology infrastructure projects being built today and is a significant step forward in the science of everyday life. It is a multidisciplinary research Centre based on the world’s most powerful neutron source. This new facility will be around 30 times brighter than today’s leading facilities, enabling new opportunities for researchers in the fields of life sciences, energy, environmental technology, cultural heritage, fundamental physics, climate, communication and transport. The facility design and construction of ESS includes a linear proton accelerator, a heavy-metal target station, a large array of state-of-the-art neutron instruments, a suite of laboratories, and a supercomputing data management and software development centre. The ESS’s strength is within living complex material where food is in focus.

ESS and the synchrotron MAX IV Laboratory will be located in Science Village Scandinavia, which will form an exciting and creative world-class research and innovation village, as well as an international area for sustainable urban development.

Furthermore, the digital network giant Cisco has entered into an innovation partnership with Copenhagen, which will test and develop tomorrow’s digital infrastructure, the Internet of Everything, Cisco chose Copenhagen because of its green ambitions and unique test facilities.

The region has several well developed science parks, among which Ideon science park in Lund is noted to be one of the first, and biggest, University science parks in Europe with 350 companies and 2,700 employees. Ideon is one of Europe’s most successful meeting places for visionaries, entrepreneurs and venture capital. Several world leading edge companies in the mobile, IT, Life Sciences and Cleantech have began their journey at Ideon.
Positive image of the sector
Thanks to an ongoing successful campaign highlighting the positive impact of the Danish agrifood on the entire society, the general perception of the sector has changed significantly. As a result the agrifood of Denmark now enjoys wide support from public as well as political side.

The Swedish food sector, especially agriculture, is repeatedly ranked among the highest in terms of trust and quality among consumers in Sweden, and has a very good reputation in other parts of the world.

Food production, sustainability and food safety
Nordic food production is characterized by an extremely high level of food quality, safety, sustainability and traceability. Hygiene and safety are top priorities in the Nordic agrifood sector and the sector is continuously working to further improve on this field. A focus on controlling risks at the source, and long-standing history of controlling food-borne hazards e.g. salmonella control, prudent use of antibiotics, monitoring of antibiotic usage and antibiotic resistance are key features of the Nordic agrifood sector. Antimicrobial growth promoters have been banned in Sweden since 1986 and in Denmark since 2000, veterinary medicines are used responsibly, and the extended research within the field ensures a high level of innovation and continuous improvement of Nordic agriculture and food.

Nordic food production is known for its high level of safety. The Nordic model has focus on solving the food safety problems in primary production and preharvest and food security locally. The education level in all parts of the value chain is high from an international perspective. There is strict regulation and control of the use of pesticides in agriculture which is low (Source: The use of plant protection products in the European Union - Data 1992-2003. Eurostat, Luxemburg 2007). The prevalence of diseases such as Salmonella, listeria and MRSA in breeding is one of the lowest in the world http://www.sva.se/globalassets/redesign2011/pdf/om_sva/publikationer/surveillance2013_w.pdf

Swedish and Danish agriculture and food production have high ambitions and developed programs in order to reduce negative environmental impacts of agriculture and food production and to maintain and enhance biodiversity. http://www.un.org/esa/agenda21/natlinfo/countr/sweden/agriculture.pdf The waste and recycling systems are well developed. Moreover, strong consumers’ organizations as well as communication and collaboration between scientists, producers and consumers are well developed in the Nordic countries.

Big data
The Nordic countries have been collecting agricultural data of a high quality for a long time. Data which can be used to improve Nordic food production by making it safer, more efficient, and more sustainable. There is a great opportunity in the primary production where the use of big data i.e. can diminish the use of antibiotics, reduce the use of fertilizers, and help optimizing the feed composition.

The potential advantages of big data use in the agrifood sector are obvious and the Nordic countries are now aiming to derive substantial benefits from the targeted use of the collected data. Thanks to the great Nordic tradition of data collection within the field Nordic might have a significant competitive advantage compared to other regions.

NordGen – the Nordic Genetic Resource Center – is a Nordic organization dedicated to the safeguarding and sustainable use of plants, farm animals and forests. The Nordic countries have been co-operating for more than 30 years on conservation of genetic resources. NordGen’s primary task is to contribute to securing the broad diversity of genetic resources linked to food and agriculture. This is done through conservation and sustainable use, solid documentation and information work and international agreements.

Sweden has multiple national infrastructures for data collection, catering to the needs of different research fields: Of relevance to Food Nexus, research and data is collected on e.g. health at the Swedish National Data Service (SND; snd.gu.se); environment and climate at the Swedish University of Agricultural Sciences (SLU; slu.se) and Environment Climate Data Sweden (ECDS ; ecds.se) and; agriculture at Agrifoods Economic Centre (agrifood.se)
There is also a remarkably strong competence and tradition in Sweden in predictive multivariate modelling, stemming back to the ground-breaking work on the PLS-family of algorithms at Umeå University. This competence, in combination with national infrastructures for bioinformatics (Bioinformatics Infrastructure for Life Sciences; bils.se) and high performance computing (Swedish National Infrastructure for Computing; snic.se), are key success factors for harnessing the immense power of multivariate, big data and addressing the pressing, global challenges in the food and agriculture sector.

**Technology**


Denmark is at the forefront of technical development. For instance, Danish cattle farmers have a long tradition of farmer-driven innovation and development. Thus, modern technology is adopted in all stages of milk and beef production systems in Denmark today.

The Nordic consumers are well known for their openness for innovative products and concepts and are therefore often used as test markets for technological innovations.
3. Nordic Research, Innovation, and Education Level within the Agrifood Sector

Core Competences of Nordic Universities on Agrifood Level:
The Nordic countries have excellent education and research within the food and agriculture sector. As mentioned, Two of the world’s top 15 agricultural universities are placed in the region (SLU and KU) in addition to excellent full-scale universities and RTOs

Denmark

Danish food and agriculture research is of high quality and internationally acknowledged. The number of quotations underlines the quality and the confidence in the Danish work being done in this area.

In Denmark, five universities work with food related research, and all of them are mentioned in international rankings. Denmark’s 3 elitist universities are: University of Copenhagen, University and Aarhus and The Technical University of Denmark. Their core competencies within agrifood are shortly described below.

Furthermore, Denmark has 9 RTO institutes offering companies support and knowledge to foster even more innovative and research intensive business environment.


Sweden

In Sweden food and agricultural science is well known worldwide for its excellence in especially packaging, food safety, sustainability and innovation aspects. Large full-scale universities as Lund University – ranking 70 by QS University Ranking – but also agri focused Swedish University of Agricultural Sciences (SLU) and Chalmers University of Technology with its emphasis on innovation, are in the front when it comes to food and agricultural research and international acknowledgement. SLU is for instance very high ranked on different ranking lists – among the 250 best universities in the world 2015 (THE), the 10th best university in Agriculture and Forestry, no. 6 in Plant & Animal Sci worldwide (QS) and 3rd best university of study in Sweden (URANK).

In close collaboration with Lund University the science park Ideon is a large research and innovation park, especially with the ESS and MAX IV being of great international interest.

Other universities in South Sweden with high quality food research, innovation and packaging are Malmö University and Kristianstad University.

RISE Research Institutes of Sweden is a network of Research and Technology Organizations (RTOs). RISE creates value, growth and competitiveness for business and society built upon research excellence, business skills and
innovation capacity. RISE has several knowledge areas being highly important for innovative solutions to the food chain challenges, also outside food science.

Research funding from the EU program on food, agriculture, fishery and biotech (per 1000 inhabitants):
Source: E-CORDA-database, EuroCenter and Eurostat.

Level of investment in research and innovation
Denmark and Sweden has a high level of business investment in relation to turnover in food and drink businesses.

“Denmark is investing more in business research (both by the government and by industry) this is leading to more patents and new products being introduced. In general firms appear more collaborative, agriculture is more productive and the overall environment is more conducive to innovation.”

Education within the Nordic Agrifood Sector
New talents graduate each year from Nordic universities and other educational institutions – a growing number of them with an education related to food and agriculture. The strong collaboration between universities, industry and society is also reflected in the content of Nordic education. Almost half of the Nordic population completes a higher education program. Opportunities to study in both Denmark and Sweden also attract thousands of students from abroad. Here, they find universities with a strong international reputation and a country that offers a good quality of life.
Focus on life-long education and training

The Nordic Countries pays attention to ongoing competence upgrades and education.

As a result the workforce is flexible, skilled and ready to changes. Furthermore, the Nordic focus on continuous education and training throughout the entire work life keeps the employees motivated and places the Nordic workforce among the most educated in the world.

Source: Eurostat 2015
4. Nordic Sectorial Strengths

One of the characteristics of the Food sector in the Nordic countries is the prevalence of large and successful co-operatives.

**TURNOVER IN DANISH CO-OPERATIVES, MILLION DANISH KRONER**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Company</th>
<th>2010</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy sector</td>
<td>Arla Foods</td>
<td>49,030</td>
<td>73,600</td>
</tr>
<tr>
<td></td>
<td>Thise</td>
<td>501</td>
<td>648</td>
</tr>
<tr>
<td>Meat sector</td>
<td>Danish Crown</td>
<td>45,211</td>
<td>58,029</td>
</tr>
<tr>
<td></td>
<td>Tican</td>
<td>4,001</td>
<td>5,158</td>
</tr>
<tr>
<td></td>
<td>DAT Schaub</td>
<td>2,530</td>
<td>2,994</td>
</tr>
<tr>
<td></td>
<td>Daka</td>
<td>966</td>
<td>1,007</td>
</tr>
<tr>
<td>Farm supply sector</td>
<td>DLG</td>
<td>39,364</td>
<td>59,103</td>
</tr>
<tr>
<td></td>
<td>Danish Agro</td>
<td>13,347</td>
<td>25,128</td>
</tr>
<tr>
<td>Other sectors</td>
<td>Kopenhaguen Fur Center</td>
<td>7,117</td>
<td>13,279</td>
</tr>
<tr>
<td></td>
<td>DLF Trifolium</td>
<td>2,001</td>
<td>3,325</td>
</tr>
<tr>
<td></td>
<td>Danreg</td>
<td>963</td>
<td>1,157</td>
</tr>
<tr>
<td></td>
<td>KMC / AKV Langboll</td>
<td>788</td>
<td>1,255</td>
</tr>
</tbody>
</table>

Source: Facts and Figures about Danish Agriculture and Food, DAFC, 2014 (1 EUR. = 7,5 DKR.)

Source: Company balance sheets

### 18 largest cooperatives in Sweden (2013)

<table>
<thead>
<tr>
<th>Company</th>
<th>No of Employees</th>
<th>Members</th>
<th>Turnover (tkr)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lantmännren</td>
<td>9 133</td>
<td>32 082</td>
<td>33 802 000</td>
</tr>
<tr>
<td>Arla</td>
<td>3 433</td>
<td>3 385</td>
<td>17 380 000</td>
</tr>
<tr>
<td>Skånsmejerier</td>
<td>600</td>
<td>520</td>
<td>2 406 748</td>
</tr>
<tr>
<td>Norrmajeri</td>
<td>480</td>
<td>559</td>
<td>1 893 608</td>
</tr>
<tr>
<td><strong>Others (alphabetical order)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folksam</td>
<td>3 641</td>
<td>4 000 000</td>
<td>40 438 000</td>
</tr>
<tr>
<td>Fonus</td>
<td>670</td>
<td>2 424</td>
<td>854 078</td>
</tr>
<tr>
<td>HSB</td>
<td>3 000</td>
<td>558 932</td>
<td>7 109 564</td>
</tr>
<tr>
<td>FE</td>
<td>8 444</td>
<td>3 371 000</td>
<td>38 118 000</td>
</tr>
<tr>
<td>Landshypotek</td>
<td>122</td>
<td>45 000</td>
<td>656 464</td>
</tr>
<tr>
<td>Länsförsäkringar</td>
<td>6 000</td>
<td>506 316</td>
<td>41 518 000</td>
</tr>
<tr>
<td>Mellanskog</td>
<td>210</td>
<td>31 938</td>
<td>2 933 963</td>
</tr>
<tr>
<td>Norra skogsgärna</td>
<td>377</td>
<td>16 000</td>
<td>1 806 250</td>
</tr>
<tr>
<td>Norrkog</td>
<td>287</td>
<td>12 623</td>
<td>1 648 000</td>
</tr>
<tr>
<td>OK</td>
<td>3 230</td>
<td>1 252 283</td>
<td>13 173 258</td>
</tr>
<tr>
<td>Praktikertjänst</td>
<td>8 783</td>
<td>2 000</td>
<td>9 665 252</td>
</tr>
<tr>
<td>Riksbyggen</td>
<td>2 300</td>
<td>378 000</td>
<td>5 746 000</td>
</tr>
<tr>
<td>Sparbankerna</td>
<td>3 244</td>
<td>66</td>
<td>5 242 000</td>
</tr>
<tr>
<td>Södra Skogsgärna</td>
<td>4 061</td>
<td>50 000</td>
<td>16 580 000</td>
</tr>
</tbody>
</table>
**Dairy Industry**

Cooperatively owned by Danish and Swedish milk producers, Arla Foods is Europe’s largest dairy group. The Arla group processes more than 90 percent of the Danish and two thirds of the Swedish milk pool. It also runs dairy operations in a number of other countries, with Arla UK plc as its biggest business.

Exports of dairy products, in particular cheese, preserved milk products and butter, account for more than 20 percent of all Danish agricultural exports. The largest market for Danish dairy products is the other EU countries. The Danish dairy industry consists of the international dairy group Arla Foods and 30 smaller and medium size dairy companies, together processing 4.7 billion kg milk from a total of 61 production plants in Denmark. The 30 Danish dairies are evenly distributed between cooperatively and privately owned companies. The small dairies typically specialize in various product areas within cheese, butter and liquid milk production. A large part of their production is exported by specialized exporters. The value of all Danish dairy exports totals EUR 1.8 billion annually. The domestic market is, to a large extent, a market for domestic dairy production, although imported cheese and yoghurt now account for approx. 25 percent and 20 percent, respectively, of total domestic consumption. The market share of foreign milk remains moderate.

Like the processing sector, the Danish milk producers have seen tremendous structural change, with production now taking place on a small number of large farms. In 2010, approx. 4,100 dairy farmers each had an average of 127 cows and a milk quota of 1,142 tonnes. This places the Danish dairy farmers among the largest and most modern in Europe. More than half the cows live in new loose-housing systems.

**Packaging Industry**

The Swedish Packaging industry is well known all over the world. It has an annual turnover of just over SEK 70 billion and employs about 20,000 people. The last period of time has been a steady climb up from the recession years. The average growth rate of 3.5% is good compared to a GDP growth of 2.4% during the same time. Sweden is in the lead when it comes to packaging, both when it comes to research and development and when it comes to production and export. The production is more than three times the consumption (usage of consumer packaging = 1.3% of the total European consumption, Production = 4.5%).

Sweden has a very well developed forest industry that is mirrored in the fact that the packaging industry is dominated by fibre based packaging solutions. Producers of carton board and converters thereof represent about two thirds of the industry’s revenue. This is twice the size compared to the global fibre share. Innovation and research are of highest interest in packaging industry as the branch is developing in an even more environmentally adapted way. Food safety is one of the priority areas and of very high global interest. *Sources: IMF, PIRA, Packbridge*

** Appliances and Machinery**

The production of appliances to domestic households and machineries for industry are strong industrial sectors. Swedish based Electrolux is a global leader in home appliances. Electrolux Group sells more than 50 million products to customers in more than 150 countries every year. In 2014, Electrolux had sales of SEK 112 billion and about 60,000 employees.

Within appliances for the food industry, Alfa Laval is a leading global supplier of products and solutions for the food chain. Machinery for heating, cooling, separating and transporting food, as well as treating water, reducing carbon emissions and minimizing water and energy consumption are important parts of the Alfa Laval, which has over 18,000 employees, of which many are located in Sweden and Denmark. The head quarter is located in Sweden, forming the base for a global company with a turnaround of approx. 40 billion Euro (2014).

DeLaval, part of TetraLaval group, offers automatic and conventional milking systems, cooling and feeding systems, effluent & housing systems and farm management support systems. DeLaval has an annual turnover of over 1 billion Euro and 4500 employees (2014)
**Pig Meat Industry**

Denmark is among the world’s largest pig meat exporters. For more than 100 years, the production of pigs and pig meat has been a major source of income for Denmark. Approx. 90 percent of the production is exported and is thereby essential to the Danish economy and the balance of trade. The Danish pig industry is among the world leaders in areas such as breeding, quality, food safety, animal welfare and traceability. This is the reason why Denmark is among the world’s largest pig meat exporters.

Danish pig meat producers observe high standards of animal welfare, and pig farmers constantly strive to improve the welfare of live pigs. Danish pig production is characterised by high food safety standards and good animal health. Environmentally sustainable production methods are key to Danish pig production. Around 5,000 pig farms in Denmark produce approx. 28 million pigs annually. Most pigs are slaughtered at the co-operative abattoirs Danish Crown and Tican. In addition, a substantial number of live piglets are exported, mainly to Germany.

Exports of pig meat account for almost half of all agricultural exports and for more than 5 percent of Denmark’s total exports. More than 70 percent of Danish pig meat production is exported to other EU countries, and the remaining part is exported to countries outside the EU. Danish pig meat is exported to more than 140 countries, and the largest markets in terms of volume are Germany, UK, Poland, China, Japan, Italy, Russia and Sweden. Read more about the Danish pig meat industry at [www.agricultureandfood.co.uk](http://www.agricultureandfood.co.uk) and [www.pigresearchcentre.dk](http://www.pigresearchcentre.dk).

**Beverages**

The Nordic beverage industry is well known worldwide. Brands such as Carlsberg and Absolut Vodka belong to the most recognized brands in the world and continue to be export successes from the Nordic Countries.

**Health Foods and Supplements**

Nordic Food industry is home to some of the leading innovations within the health food sector. Products with Probiotics are developed, at among others, Probi and BioGaia, focusing on gut and mouth health. Healthy cereals for tackling e.g. diabetes is an emerging market with enormous potential. The innovations are a result of the close collaboration between companies, universities and research institutes.

**Ingredients**

Several of the major Nordic ingredients companies, such as Chr. Hansen and Novozymes, are global market leaders in segments like enzymes, emulsifiers, cultures, natural colorings, specific animal proteins, special fat stuffs for chocolate and so on. As an example there are Danish cultures in 3 out of 4 cartons of yoghurt and in half of the world’s cheese slices.

Innovation is absolutely central for ingredients companies, therefore these companies use up to 7% or more of their turnover on Research and Development (R&D). The Nordic ingredients industry works in a targeted way to research in and generate new knowledge which is actively transformed into new products, improved applications of existing products, and development of new processes and technology platforms. This work is done in collaboration with universities. In addition to the figure below, ingredients companies as Culinar, Solina and ASM/Barry Callebaut have both production and R&D activities located in Sweden.
## Examples of Danish ingredients companies' production sites and R&D/application centers

<table>
<thead>
<tr>
<th>Company</th>
<th>Production facilities</th>
<th>R&amp;D or applications center</th>
</tr>
</thead>
<tbody>
<tr>
<td>DuPont</td>
<td>Denmark and several other places in the world – global presence</td>
<td>France, USA, China and more – global presence</td>
</tr>
<tr>
<td>CP Kelco</td>
<td>Denmark (the Huber Group also has production facilities in Finland, Germany, China, the Philippines, USA and more)</td>
<td>Denmark and other countries</td>
</tr>
<tr>
<td>Palsgaard</td>
<td>Denmark, Malaysia (under construction), Holland, Mexico</td>
<td>Mexico, Singapore, Denmark</td>
</tr>
<tr>
<td>Chr. Hansen</td>
<td>Denmark (3), Argentina, Australia, Brazil, China, the Czech Republic, France, Germany, Italy, Mexico, Peru, Turkey, USA</td>
<td>R &amp; D in Denmark, Germany, France, USA. Applications centers in 20 countries incl. Asia and Russia</td>
</tr>
<tr>
<td>BHJ</td>
<td>Denmark (2), Sweden, UK, Germany</td>
<td>Denmark</td>
</tr>
<tr>
<td>Novozymes</td>
<td>Denmark (3), USA, China and more</td>
<td>Denmark and other countries</td>
</tr>
<tr>
<td>Arla Food Ingredients</td>
<td>Denmark, Argentina, Germany</td>
<td>Denmark, Argentina</td>
</tr>
<tr>
<td>AAK</td>
<td>Denmark (AAK as a group has global production)</td>
<td>Denmark</td>
</tr>
<tr>
<td>Orana</td>
<td>Denmark, Vietnam, Egypt, India, Malaysia</td>
<td>-</td>
</tr>
<tr>
<td>Agrana</td>
<td>Denmark, Poland</td>
<td>-</td>
</tr>
<tr>
<td>Lactosan-Sanovo Group</td>
<td>Denmark, China, Germany, Uruguay</td>
<td>?</td>
</tr>
<tr>
<td>Einar Willumsen</td>
<td>Denmark, Sweden</td>
<td>Denmark (R &amp; D and applications) Sweden (applications)</td>
</tr>
</tbody>
</table>
5. Denmark and Sweden leaders of general Innovation linkages

The theme of the Global Innovation Index (GII), 2012 “Stronger innovation linkages for global growth” put particular emphasis on the importance of linkages and of supporting the optimal infrastructure for innovation ecosystems. New this year is the Innovation Efficiency Index, a ratio that shows how much innovation output a given country is getting for its output. Denmark and Sweden shows outstanding performance in the GII ranking 2012, figure 1.

In the Global Innovation Index

- Sweden comes in 1st and Denmark on 3rd among all EU countries and globally 2nd and 7th out of 144 ranked countries, as innovation leader with high score in innovation linkages.
- Globally, Denmark ranks 1st in Institutions, Sweden ranks 1st in infrastructure and 2nd place in ecological sustainability.
- Among EU countries Denmark ranks 3rd and Sweden ranks 1st with scientific research institutions of quality, a high level of gross expenditure on R&D and a high rate of patenting and scientific publications.
- Sweden ranks 6th in Innovation Efficiency among high-income countries.


Innovation Leaders of Europe

The performance of Sweden and Denmark is well above average of the EU27 member states in the Union Scoreboard (UIS) 2013. Sweden ranked 1st and Denmark 3rd titles us “Innovator leaders” of Europe, figure 1. UIS uses 24 indicators to capture the performance of national research and innovation systems. The scoreboard is meant to help monitor the implementation of the Europe 2020 Innovation Union flagship.

In the specific country profiles it is clear that both Denmark and Sweden rates high in six out of eight dimensions; Human resources, Open excellent & attractive research system, Finance and support, Linkages & entrepreneurship and intellectual assets.
Leading Regional Innovation Capacity

The IUS reflects performance at the level of Member States, but innovation plays an increasing role as engines of economic development. The Regional Innovation Scoreboard (RIS) 2012 replicates the methodology used in UIS, using 12 of the 24 indicators for 190 regions across Europe. For specific indicators innovation regional performance over time, see appendix 3.

In Denmark and Sweden we find five specific regions with general innovation leader capacity. In a Foodbest context, all major food universities are located in these regions.
6. Nordic Industry Pre-Core Partners

**Arla Foods**

Arla Foods is an international cooperative. It is the largest producer of dairy products in Scandinavia, and the seventh largest dairy company in the world measured by turnover.

- **Revenue:** 9.9 billion € (71% of this comes from core markets)
- **Employees:** 19,600
- **Markets:** Worldwide. (Core: DK, S, D, UK, FI, NL). Special focus strategies on China, Middle East, Russia & Africa
- **Ownership (2015):** Agricultural cooperation with more than 13,500 owners in Denmark, Sweden, Germany, Luxemburg, Belgium, Netherlands and Great Britain (2015-info).
- **Headquarters:** Viby, Denmark
- **Website:** www.arla.com

**BillerudKorsnäs**

BillerudKorsnäs is a provider of renewable packaging material and together with partners they create packaging solutions that increase profits, addresses millions of consumers and focus on a sustainable future for generations to come.

BillerudKorsnäs Skog’s (forest) supplies the company with fibre and biofuel. Products: Packaging Paper, Consumer Board and Containerboard. Company facilities: 8 production units and sales offices in around ten countries.

- **Turnover:** 2.265 billion €
- **Employees:** 4,300
- **Markets:** Packaging for food and beverage, industrial, consumer & luxury and medical & hygiene
- **Ownership:** Publikt AB
- **Headquarters:** Solna, Stockholm, Sweden
- **Website:** www.billerudkorsnas.com

**Chr. Hansen**

Chr. Hansen is a global company within bioscience. Chr. Hansen develops natural ingredient solutions for the food, pharmaceutical, nutritional and agricultural industries. Their Major basic research facilities are in Denmark. They have development centres in Denmark, the USA, France and Germany and application centres in over 20 countries as well as extraction and production plants on five continents.

- **Turnover:** 750 million €
- **Employees:** 2,500
- **Markets:** Global
- **Headquarters:** Hørsholm, Denmark
- **Ownership:**
- **Website:** www.chr-hansen.com

**Danish Crown**

Danish Crown AmbA is a Danish food processing company, dealing primarily in meat processing of pork and beef. Through its subsidiaries, known as the Danish Crown Group, it is also involved in a long list of other food products. It is Europe’s largest pork-processing company and Denmark's largest beef-processing company, as well as its single largest agricultural exporter. The group owns production in Denmark as well as in the UK, Germany and Poland.

- **Revenue:** 7.8 billion €
- **Employees:** 22,500
- **Markets:** Global presence. Largest markets are the UK, Japan and Germany
- **Headquarters:** Randers, Denmark
- **Ownership:** Cooperative with 13,500 members
- **Website:** www.danishcrown.com
**Lantmännen**

Lantmännen is an agricultural cooperative owned by farmers in Sweden. It is active in all the parts of the value chain, from farmland to table including food, bioenergy and agriculture. One of Lantmännen’s four sectors provides seed and machinery for production while another sector carries out production and distribution of consumer goods (including fresh bakery and meat, frozen food, ready-to-eat and pet-food). Lantmännen also conducts research and development work in association with universities, colleges and companies.

- **Turnover:** 3.99 billion €
- **Employees:** 10,500
- **Operations:** 20 countries
- **Ownership:** 29,000 Swedish farmers (ekonomisk förening/lantbrukskooperativ)
- **Headquarters:** Stockholm, Sweden
- **Website:** [www.lantmannen.se](http://www.lantmannen.se)

**Novozymes**

Novozymes is a global biotechnology company. The company’s focus is research, development and production of industrial enzymes, microorganisms, and biopharmaceutical ingredients. As of 2013, the company holds an estimated 48% of the global enzyme market, making it the world’s largest producer of industrial enzymes mainly for food, feed and fiber.

- **Revenue?:** 1.57 billion €
- **Employees:** 6,300
- **Markets:** A number of countries around the world, including China, India, Brazil, Argentina, United Kingdom, US, Canada
- **Ownership:** Limited company (Novo A/S holds 70.1% of the votes)
- **Headquarters:** Bagsvaerd, Denmark
- **Website:** [www.novozymes.com](http://www.novozymes.com)

**Orkla Foods**

Orkla Foods is a leading supplier of branded consumer goods and concept solutions to the grocery and out-of-home sectors in the Nordic and Baltic regions. In addition, the Group holds good positions in certain product categories in India, the Czech Republic and Austria. The company is also a major supplier to the European bakery market. The Group also operates in the aluminium, hydropower and real estate sectors.

- **Turnover:** 3.14 billion €
- **Employees:** 13,000 (30,000 Orkla ASA)
- **Markets:** Europe (primarily), US, Japan.
- **Headquarters:** Oslo, Norway
- **Ownership:** Publikt AB
- **Website:** [www.orkla.com](http://www.orkla.com)

**Tetra Laval**

Tetra Laval Group is an independent industry group and consists of Tetra Pak, DeLaval and Sidel. The group develops and operates in five business segments: milk production, food preparation, food processing, food packaging and food distribution. Tetra Laval International SA provides the financing, risk management and investment support needed by the Tetra Laval Group, with the additional responsibility of managing overall legal and financial structure and tax planning. Tetra Pak develops and manufactures processing, distribution and packaging systems for food and liquids.

- **Turnover:** 13,455 mio €
- **Employees:** 33,760
- **Markets:** Worldwide presence with only very few exceptions. (Two largest markets: Central&South America & Greater China)
- **Headquarters:** Lund, Sweden
- **Ownership:** AB
- **Website:** [www.tetralaval.com](http://www.tetralaval.com)
7. Nordic Knowledge Institutions Pre-Core Partners

Aarhus University
Aarhus University (AU) is a complete university with faculties for medicine, arts, social sciences, law science, and faculties comparable to universities in technology and economics/business. AU owns research facilities often used by external users such as research institutes, companies and other project partners. AU co-owns and collaborates with several food innovation organisations and business parks such as Agro Business Park. AU is highly ranked in all international lists.

Students: 38,000
PhD: 1,827
Internat. guest students: 1,000
Employees: 8,000
Turnover: 861 million €
Website: www.au.dk

Chalmers University of Technology
Chalmers focuses on research and education in technology, natural science, architecture, maritime and other management areas, and has a strong cross-disciplinary research and innovation section for Food & Nutrition. Chalmers is very highly ranked in all international lists.

Students: 11,000
PhD: 1,140
Internat. guest students: 624
Employees: 2,928
Turnover: 384 million €
Website: www.chalmers.se

Lund University
Lund University (LU) is one of northern Europe’s oldest and most prestigious universities, consistently ranking among the world’s top 100 universities. Further, it ranks among the best universities in Northern Europe and very high in all international rankings. LU is a complete full-scale university with faculties for medicine, arts, social sciences, law science, and faculties comparable to universities in technology and economics/business. LU has activities in food studies within research, education innovation and cooperation with industry. The food activity covers the whole food system with e.g. centres for plant studies, agro economy, food and health, food technology, packaging and logistics and a big centre for retail studies organized in Lund University Food Studies (LUFO).

Lund is the home of the big developing European research facilities within materials science ESS European Spallation Source and MAX IV. LU is also co-owner of one of Europe’s now biggest science parks, Ideon.

Students: 42,000
PhD: 3,200
Internat. guest students: 5,600
Employees: 7,680
Turnover: 848 million €
Website: www.lu.se

RISE – Technical Research Institute of Sweden
RISE Research Institutes of Sweden is a network of research and technology organizations (RTOs), wholly or partly owned by the Swedish state. RISE consists of four research and technology organizations: SP Technical Research Institute, Swedish ICT, Swerea and Innventia with a total of 16 RTOs and their subsidiaries. The Swedish government will in 2016, through RISE, become the sole owner of the research institutes Swedish ICT and Innventia, along with SP’s subsidiaries. The RTOs within RISE perform industrial research and innovation. RISE RTOs run a large number of test and demonstration facilities which are available both to companies and universities. RISE RTOs support small and medium sized enterprises (SMEs) in carrying out
research and innovation processes, provide technical services, innovation management, and business development. RISE RTOs offer tailored training courses for companies. RISE knowledge areas include life science, ICT, transportation, pulp paper and packaging; materials science; risk, safety and security; automation and industrial processes; product and production technology; bio economy; energy; built environment. Expertise in food science and agricultural engineering is found at SP Technical Research Institute. RISE participates in EIT Digital, in KIC InnoEnergy, EIT Health and EIT Raw Materials.

Employees (2014) 2 400
Turnover 318 million Euro (3 000 million SEK)
Website: www.ri.se

Swedish University of Agricultural Sciences
Swedish University of Agricultural Sciences (SLU) is focusing on education, research and innovation within agro, forest, food and veterinary sciences, but also, bioenergy, urban and regional planning, sustainable urban and rural development, and global issues such as climate. SLU is for instance very high ranked on different ranking lists – among the 250 best universities in the world 2015 (THE), the 10th best university in Agriculture and Forestry, no. 6 in Plant & Animal Sci worldwide (QS) and 3rd best university of study in Sweden (URANK).

Students: 3,900
PhD: 700
Internat. guest students: 500
Employees: 2,900
Turnover: 375 million €
Website: www.slu.se

Technical University of Denmark
The Technical University of Denmark (DTU) is ranked among Europe’s leading engineering institutions. DTU has focused research centres within e.g. aqua, food, vet, systems biology, chemistry and Chemical Engineering.

Students: 10,300
PhD: 1,490
Int. guest students: 1,000
Employees: 5,800
Revenue: 628 million €
Website: www.dtu.se

University of Copenhagen
University of Copenhagen (UCPH) has major research and education programmes focusing on food science disciplines and human nutrition – the largest number of students within the food area. The department of food science is collaborating with a large number of international universities and has collaboration agreements with several large, international food companies. UCPH is a complete university with faculties for medicine, arts, social sciences, law science. UCPH is consistently very highly ranked in all international lists.

Students: 38,000
PhD: 4,500
Int. guest students: 1,700
Employees: 9,000
Revenue: 1.1 billion €
Website: www.ku.dk