

The development of Danish agriculture and agribusiness: Lessons to be learned in a global perspective

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ABSTRACT: The agri and food industry is a major industrial sector in Denmark. Around 20 % of total industrial turnover still comes from the food industry and that places the sector in a remarkable position seen from a global perspective. Compared to other countries on a similar level of economic development Denmark has an extremely important agriculture and agribusiness sector. Danish agri and food cooperatives seem to have been successful in obtaining international competitiveness. The transformation and the structural development of the cooperative sector has more or less been completed. In Denmark, cooperatives play a major role in the agri and food industry - especially in sectors close to the farmers in the food chain. Cooperatives have succeeded in building up greater market power to strengthen the marketing of farmers' products. The development of the industrial structure among Danish agri-cooperatives has been very rapid during the latest decades. Through mergers and acquisitions the number of firms has fallen dramatically, and the result has been increasing concentration ratios in almost all groups of the food industry. Structural development, concentration and globalisation in recent decades have resulted in the agri and food companies now being among the largest in Europe. To a large extent, agriculture all over the world faces similar problems and challenges. For this reason, it is essential that know-how, experiences and lessons can be transferred and adopted by agriculture in other countries around the world. In many ways, the experience and the success behind Danish agriculture and agribusiness can be transferred to other countries. However, profound studies of specific needs and conditions are necessary. The transfer of knowledge from Danish agri and food businesses can take place through joint-ventures or foreign investments, in which mutual and equal benefit is obvious. However, the transfer of knowledge can also be facilitated by development assistance from industrialised countries.

INTRODUCTION

For decades, Danish agriculture and agribusiness have been characterised by a high market share for cooperatives and strong international competitiveness. The structure of companies in the sector has, to a high degree, been export and globally oriented. Also, in a global perspective, the world market shares, the competitive strengths and the size of cooperative food companies etc. in Denmark is remarkable.

Cooperatives have succeeded in building up more market power to strengthen the marketing of farmers' products. By pooling products in larger and larger cooperatives, the market position has improved, and managing the globalization process has been facilitated. Barriers to globalisation have been avoided as the big cooperatives had resources and products to invest in international marketing.

Cooperatives are recognised as being structurally robust in many areas. Vertical integration, traceability, supply management etc., give cooperatives a competitive advantage. Many cooperatives have proved to be extremely competitive having a high quality management and business administration.

Financially, cooperatives have a unique construction: Cooperatives are owned by the members - by the farmers - but the financial contribution is rather limited. Because farmers agree to deliver their production to the cooperative, the need for capital in the cooperative is reduced. In a way, the farmers' commitment to deliver their production to the cooperative is the major contribution and support from the farmers, and indeed a stable supply from the farmers, is a very important asset for any company. In this way cooperatives need less capital, and the farmers can be owners of their own cooperative company without adding huge capital input.

The lessons learned by Danish agriculture and cooperatives might benefit farmers and cooperatives in foreign countries - in several ways.

First of all, the cooperative movement is based on the principle of supporting one another and other cooperatives. The transfer of knowledge and support to build up new cooperatives in e.g. developing countries is completely in line with the values and ideas of the cooperative movement.

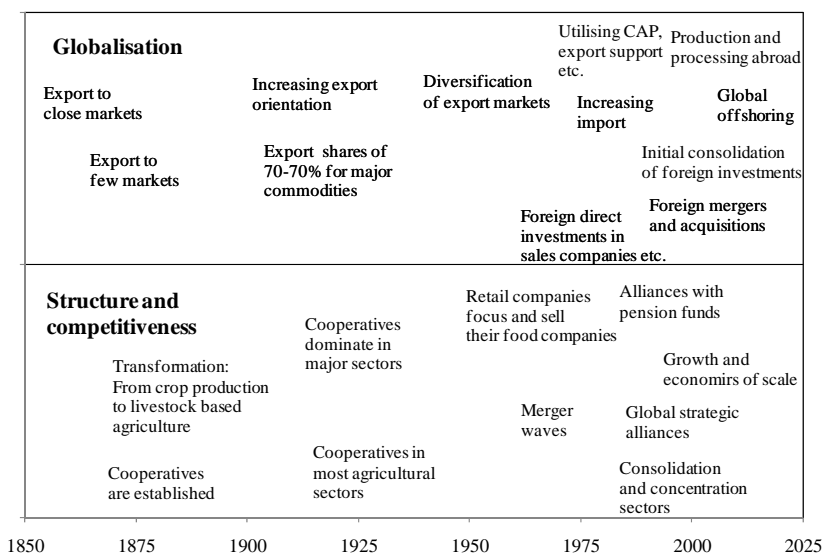
Secondly, Danish cooperatives take part in the globalisation process through export and increasingly also through foreign direct investment, global strategic alliances, foreign joint-ventures etc. Partnerships with companies or group of farmers in foreign countries are common, and the concept of such cooperation is that all partners are supposed to benefit.

Thirdly, Danish cooperatives and Danish agribusiness have developed and strengthened their structure, competitiveness and market power in many decades, and farmers from other countries - whose agribusiness sector is less developed - can copy or learn from the Danish experiences. The process of developing agribusiness often has to go through similar stages, so companies at an early stage are more or less able to learn from the experiences of companies at a later stage.

Fourthly, the combination of a highly competitive agribusiness and a dominance of cooperatives is a unique case, from which lessons from successes and failures can be learned. Researchers, consultants and farmers from many countries study the Danish cooperatives in agribusiness in order to learn and copy from the Danish experiences.

THE PROCESS OF DEVELOPMENT OF STRUCTURE AND COMPETITIVENESS

The process of globalisation, structuring and creating competitiveness has developed over many decades. Cooperatives were established in the 1880s, and the transformation from domestic orientation to export orientation started in the same period. The major stages in the globalisation and structure/competitiveness of Danish cooperatives are shown in figure 1.



Source: Own presentation

Figure 1. Stages in the globalisation and development of the structure/competitiveness of Danish cooperatives

The globalisation and industrialisation of Danish agriculture and agribusiness started gradually as early as the end of the 19th Century. Increasing international competition and price pressure on the international grain markets were drivers of a significant transformation, in which the production and export of animal products such as butter, eggs and meat increased. In later stages of the globalisation process, the diversification of export markets and the export of goods to more distinct markets have characterised the development, indicating a more advanced stage of the globalisation process.

Recently, foreign direct investment, global strategic alliances and production abroad have also been major elements in the globalisation process.

Since the beginning of the transformation process at the end of the 19th Century, the Danish agricultural sector has focused on cooperatives as a main driver for development and globalisation. The overall aim was to ensure farmers' market power in the marketing chain through the establishment of cooperatives in most agricultural sectors, both up-stream and down-stream. The market share of cooperatives increased, and during the last decades a remarkable wave of mergers among agribusiness companies, and especially cooperatives, has occurred. Structural development through consolidation and concentration has dramatically increased the competitiveness of companies.

THE GLOBAL STATUS OF AGRICULTURAL COOPERATIVES

Cooperatives play a significant role for many farmers around the world. The importance of cooperatives varies from country to country, although there is no clear pattern regarding the importance and development from a global perspective. Generally, cooperatives in agriculture are most prevalent in northern Europe. Prevalence varies from sector to sector with cooperatives having a large market share within the milk and meat sectors.

Viewed over a long time scale, there is evidence to suggest that cooperatives in the EU have gained a greater market share (e.g. Bekkum, and van Dijk, 1997; Hansen, 2005).

In the EU, agricultural cooperatives have a 50 % share of the supply of agricultural inputs and more than a 60 % share in the collection, processing and marketing of agricultural products (COPA-COGECA, 2010).

In the U.S., the number of cooperative dairies fell by almost 70 % in the period 1973-2002, but during the same period their share of total milk sales increased from 76 to 86 % (USDA, 2005). Generally, the market share of cooperative dairies has been increasing in both the U.S. and the EU-15 in recent decades.

In general, the market share of cooperatives is rather high when it comes to businesses close to the farmers in the value chain. Cooperatives also play a relatively important role within segments, in which the farm value share of total expenditures is high (Rogers, 2000). Farmers' incentive to establish and maintain cooperatives is stronger when it comes to companies that directly trade with farmers, and where it is most critical for the farmers to have access to a reliable supplier and buyer. For this reason, cooperatives play a minor role within sectors such as breweries, bakeries, food service etc.

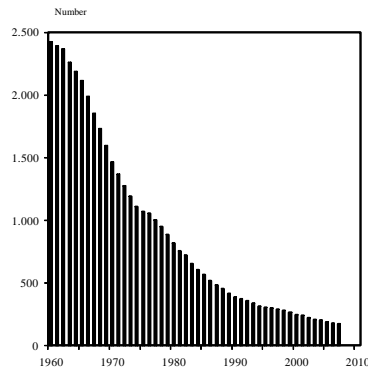
THE DEVELOPMENT OF COOPERATIVE INDUSTRIES

The development of the industrial structure among Danish agri-cooperatives has been very rapid during recent decades. The number of firms has decreased dramatically and today only a few firms survive. The result has been increasing concentration ratios in almost all groups of the food industry. Recently, foreign direct investment and production abroad have increased significantly (see figure 2-5).

In general, the number of cooperatives and other companies in the agri and food industry increased until the mid-1900s, and has since declined. Since 1960, the number of companies has fallen by more than 90 %, mostly due to mergers and acquisitions. In the same period, the average size of a company has increased from index 100 to index 4.500 - here measured by production in volume terms.

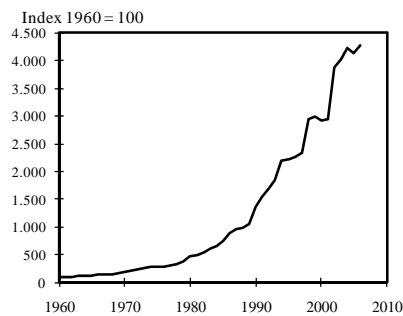
Concentration has increased tremendously since the mid-1980s. Merger waves have resulted in the establishment of larger cooperatives, which have increased their market share significantly. Also, a shift in focus from export to globalisation through investment and production in foreign countries, has appeared.

Increasing market power and increasing international competitiveness have been the major drivers behind this structural development in the Danish agri and food industry.



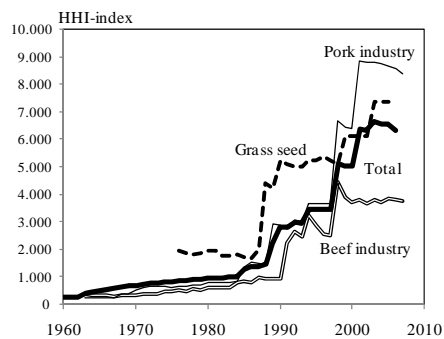
Note: Data from 10 sectors within Danish agri and food industry
 Source: Own calculations based on annual reports and company information

Figure 2. Number of companies in Danish agri and food industry



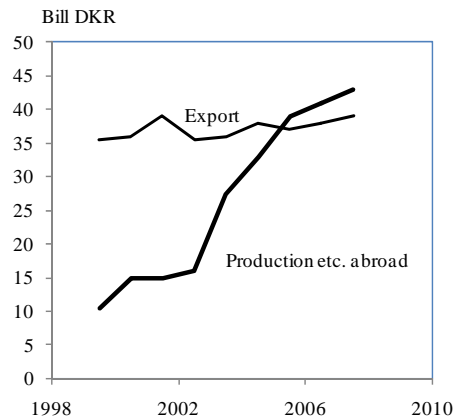
Note: Size = Production (volume) per company
 Source: Own calculations based on annual reports and company information

Figure 3. Average size of companies in Danish agri and food industry 1960 = 100



Source: Own calculations based on annual reports and company information

Figure 4. Concentration (HHI-index) in selected sectors within Danish agri and food industry



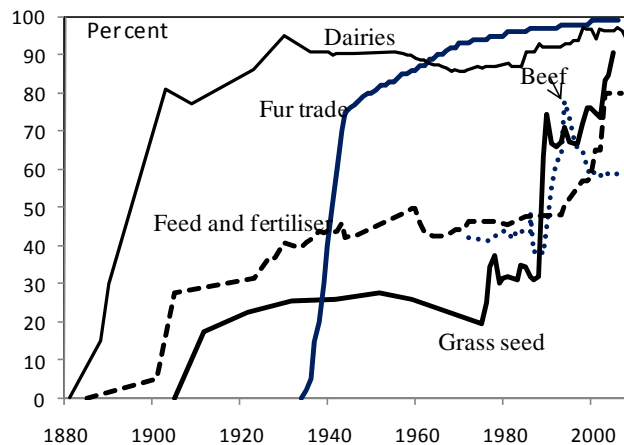
Note: Selected agri-cooperatives.

Source: Own calculations based on annual reports and company information

Figure 5. Export and production etc. abroad from Danish agri and food industry

COOPERATIVES' MARKET SHARE

In general, during the 19th Century, Danish agri and food cooperatives increased their market share. Within the dairy and pork industries, market share increased from zero to 80-90 % within a few decades following the establishment of cooperatives in the 1880s. For other sectors, cooperatives were established at a later stage, but in most cases their market share rose year on year (see figure 6).



Source: Own calculations based on information from companies and organisations.

Figure 6. Market share of cooperatives in the Danish agri and food industry.

The increasing market share of cooperatives in the Danish agri and food industry is due to organic growth and acquisitions of capital owned companies.

AGRICULTURAL COOPERATIVES TODAY

In Denmark, cooperatives are completely dominant when it comes to pork, dairy products, grass seed, fur, grain and feedstuff. In other areas - such as sugar and poultry - cooperatives have completely disappeared and their business has been taken over by capital owned companies. The present market share of Danish cooperatives is shown in table 1.

The pattern of market shares - going from zero to almost 100 - can be explained by several different factors. In sectors such as dairy and pork, farmers must rely on daily deliveries from the farm to processing companies, and therefore cooperatives give farmers some kind of assurance and trust. This explains the large market share of cooperatives within the milk and pork processing industries. Transaction costs, and the farmers' share of total marketing costs, also explain a part of the market share. In other sectors, the success or failure of cooperatives can be explained by managerial competence.

According to Hansen (2009), Danish cooperatives are expected to at least maintain their market share in the coming years. In general, the fundamental concept of the cooperative will remain unchanged. Cooperatives regard globalisation as a positive challenge with some seeing cooperative ownership as an advantage during globalisation.

Finally, it should be stressed that cooperatives operate mainly in the supply and processing industries. When it comes to farms and primary agricultural production, cooperatives do not play any role at all.

Table 1. Market share (%) for cooperatives in Denmark, 2008

| Business | Market share |
|-----------------------|--------------|
| Pig slaughtering | 86 |
| Pig production | 68 |
| Beef slaughtering | 57 |
| Meat processing | 52 |
| Dairies | |
| - milk intake | 94 |
| - milk, consumption | 96 |
| - butter | 99 |
| - cheese | 89 |
| Fur | 95 |
| Sugar | 0 |
| Poultry | 0 |
| Agri. machinery | 0 |
| Feed, fertiliser etc. | 80 |
| Eggs | 58 |
| Grass seed | 73 |
| Potato starch etc. | 77 |

Source: Own calculations based on information from companies and organisations.

DANISH AGRICULTURE AND AGRIBUSINESS AT A GLANCE

The agri and food industry is a major industrial sector in Denmark. Though the relative share is decreasing over time, around 20 % of the total industrial turnover still comes from the food industry, which places the sector in a remarkable position seen from a global perspective. Compared to other countries on a similar level of economic development, Denmark has an extremely important agriculture and agribusiness sector.

The Danish food industry is dominated by two major branches – the dairy and meat industries - which account for more than 50 % of the turnover for the sector. The export orientation has been high for many years, almost dating back to the beginning of the 20th Century. In general, about 60-70 % of agricultural production is exported, which indicates strong international competitiveness.

Structural development, concentration and globalisation in recent decades have resulted in the agri and food companies now being among the largest in Europe. Today, Danish companies are in the top 3 in several important sectors in the agri and food business in Europe (see table 2).

The figures are remarkable considering that Denmark accounts for less than 0.5 % of the total economically active population within agriculture in Europe, and less than 0.7 % of the total agricultural land in Europe.

In the dairy, pork and fur sectors, Danish companies are in the top 2 in Europe, with all three companies being cooperatives.

Cooperatives have been a major driver in the development of Danish agriculture. Cooperatives were definitely an indispensable catalyst in the transition from a self-sufficient and protected agriculture, to an industrialised, globally-oriented, highly competitive and vertically integrated agri-business sector.

The international competitiveness of Danish agri and food business is reflected in the fact that their world market shares are remarkably high. Despite the fact that resources in Danish agriculture are rather limited, the sector plays an important role on the global market, as export, in several cases, has a high share of total international trade and is even more or less dominant in some important cases (see table 3).

Table 2. Danish food companies by rank in Europe (2008)

| Sector | Rank | Company |
|--------------------|------|----------------|
| Pork* | 2 | Danish Crown |
| Beef* | 7 | Danish Crown |
| Dairy* | 2 | Arla |
| Feed industry* | 3-4 | DLG |
| Grass seed* | 1 | DLF-TRIFOLIUM |
| Fur trade* | 1 | Kopenhagen Fur |
| Brewery | 3 | Carlsberg |
| Pot plants (trade) | 7 | Gasa Group |
| Potato seed* | 8 | Danespo |

* Means that cooperatives dominate the sector (see table 1).

Source: Own calculations based on information from companies and from national and international organisations

Table 3. World market share (export) of selected Danish agri and food products (2008)

| Products | World market share, % |
|-------------------|-----------------------|
| Grass seed | 32 |
| Mink skin | 30 |
| Pork | 29 |
| Processed pork | 14 |
| Cheese, processed | 12 |
| Bacon and ham | 11 |
| Hides and skin | 9 |
| Cheese | 8 |
| Butter | 6 |

Source: Own calculations based on FAO (2010)

The export of machinery from the Danish agri and food sector now accounts for a greater share of the total export from the sector. This export of capital goods also leads to a potential transfer of knowledge.

During recent decades, Danish cooperative agri and food companies have increased their foreign direct investment significantly. Production, processing, innovation etc. in foreign subsidiaries or joint-ventures now play an increasing role, and this step further step in the globalisation process will also lead to the transfer of knowledge to foreign countries. Foreign direct investments from Danish agri and food cooperatives have taken place in all regions of the world.

CATTLE BASED AGRICULTURE AND AGRIBUSINESS

Cooperatives play a major role in the dairy and beef sectors. Farmers producing milk and beef are often heavily dependent on daily access to markets, and cooperatives give farmers an easy, cheap and reliable marketing channel. Transaction costs are reduced, and an optimal price for milk and meat is given to the farmers, as no owners other than the farmers need to be paid. Live cattle markets, which

hardly exist anymore in Denmark, were also organised by farmers themselves. Furthermore, cattle farmers also depend on access to feed stuffs and other inputs such as veterinary medicine, and these suppliers now mostly come from farmer owned cooperatives.

Arla, the Danish-Swedish cooperative dairy, intends to invest in a biogas plant based on manure from Danish farms. The idea is to solve an environmental and economic problem for farmers and at the same time to produce carbon neutral energy for Arla's milk powder factory.

All the above illustrates that cattle-based agriculture and agribusiness is heavily integrated, and that farmers can benefit from cooperation and cooperatives.

KEY SUCCESS FACTORS

Lessons from cooperative development cannot be fully learned by other countries without considering the different situation that exists in these countries. The lessons from the Danish agri and food cooperatives must be targeted at the specific country or region, in which a new cooperative system is to be implemented. From that point of view, some key success factors based on positive and negative experiences from Danish cooperatives can be presented:

1. Farmers must be able to understand the advantages of a cooperative - and to obtain concrete economic benefits in the short or longer run.
2. Farmers must be committed to work for the cooperative, and to follow the rules and principles.
3. A certain level of social competence, mutual trust and credibility among the cooperative members is necessary in order to strengthen cooperation.
4. In a cooperative, the individual farmers or members should regard each other as colleagues and not as competitors.
5. Cooperatives must fulfill a role in society. The role may be to increase the market power of farmers or to reduce transaction costs - aiming at giving the members an economic advantage.
6. Cooperatives must be willing to cooperate with each other - nationally and internationally - in order to strengthen their market position, and in order to obtain mutual benefit.
7. Farmers themselves - and not governmental institutions or companies - must be the main drivers behind the establishment of new cooperatives. Governments, other institutions or companies may facilitate and support establishment, but farmers must be the major players.
8. Cooperatives must be managed as profit companies with the overall goal of maximising the economic benefits for the owners in the long run. Specific political or social goals, which do not add any economic benefit, should be downgraded.
9. Access to capital, investments and funding are potential problems for cooperatives. However, farmers' obligation to deliver their products to the cooperative will reduce the demand for capital. In a joint-venture with a partner, members' supply of agricultural products will be a valuable asset, which to some degree, will eliminate the need for capital from the members.

CONCLUSIONS

To a large extent, agriculture in South East Asia faces the same fundamental challenges and problems as those faced, and more or less solved, by Danish farmers in recent decades: An agricultural sector with many small farmers who have to cooperate in order to increase their market power in the food chain. Furthermore, they have to cooperate to benefit from the potential advantages of economies of scale, which small individual farmers operating alone cannot exploit.

Danish agri and food cooperatives seem to have been successful in obtaining international competitiveness. Also, the transformation and the structural development of the cooperative sector seems to have succeeded.

In several cases, other countries or organisations have tried to copy and to implement the Danish cooperative system with limited success. Several key success factors and lessons must be considered carefully.

Successful cooperatives provide farmers with significant advantages. However, the task of establishing successful cooperatives is not easy, and farmers must be committed and have a strong incentive.

Based on Danish experiences, and based on the specific regional conditions, further development of agri and food cooperatives in South East Asia might succeed. Such a scenario presupposes the following major fundamental conditions and perspectives:

- Local farmers must be committed and must be the main drivers of the cooperative process.
- Governmental authorities or institutions are important stakeholders and they should support or facilitate the process.
- The establishment of cooperatives will definitely be an appropriate tool to ensure the long-term reduction of poverty among rural populations. Also, cooperatives in the agri-environmental business sector focused on sustainable energy production from manure are highly relevant.
- The transfer of knowledge from Danish agri and food businesses can take place through joint-ventures or foreign investments, in which mutual and equal benefit is obvious.
- The transfer of knowledge may also be facilitated by development assistance from industrialised countries. Danish assistance policy towards developing and transition countries is changing, so that agriculture, the food supply chain and partnerships with agricultural businesses seem to be more in focus.

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