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**The German Dairy Sector: Internationalization -
Competitiveness - Supply Chains**



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I Introduction

“Some are heading in the wrong direction.”

With these words Peter Stahl, CEO of Hochland SE, one of the largest dairies in Germany and CEO of the Dairy Industry Association, described the orientation of German dairies towards the export of inadequately differentiated and interchangeable dairy products to countries with the necessary natural resources for milk production. These are, for example, countries in Western Africa, such as Nigeria and the Senegal (EMB, 2019; Cornall, 2019). The statement also refers to the fact that these exports are at least partly realized on the basis of feed imports and are associated with negative externalities in Germany, such as high nutrient surpluses. In case of milk production these are, for example, the regions around the North Sea coast in Lower Saxony (Chamber of Agriculture, 2019; top agrar, 2019).

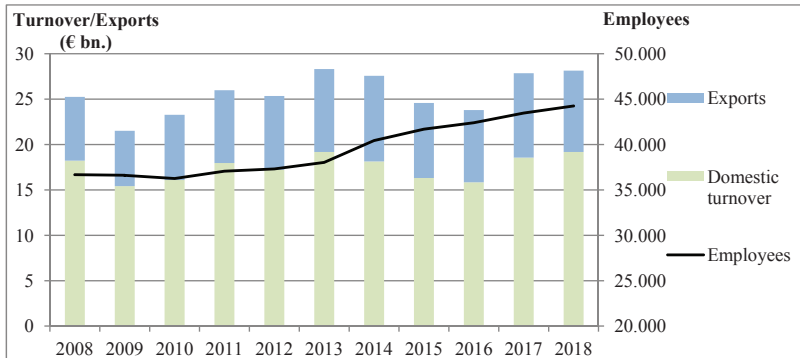
Looking at the figures, the German dairy industry has developed quite positively in recent years. In 2018 turnover was € 28.1 billion, whilst exports amounted to € 9 billion. While sales are strongly influenced by product prices, the dairy industry has shown a positive trend over recent years in terms of both the number of companies and the number of employees (see Figure 1). In 2018, 244 companies assigned to it employed 44,252 people, whereas investments amounted to € 711 million in 2017 (Destatis, 2019a, 2019c). Investments remain at a high level despite a decline when compared to 2016. Due to the frequently rural situation of these companies, the dairy industry is of great economic importance as part of German agribusiness, especially for rural and, in part, structurally weak regions (Janze *et al.*, 2018, 2019).

Despite this development, the German dairy industry is under considerable competitive pressure. This is illustrated by the industry's average EBIT margin of around only 2%, which is well below the average for the food industry. One of the main reasons for this low profitability is the high price pressure exerted by the powerful food retail market. In 2015, the market share of the four largest food retailers in Germany was 85% (Schlippenbach and Pavel, 2011; Bundeskartellamt, 2015; Brokelmann and Gäde, 2017). High competitive pressure can also be seen in mergers and acquisitions, such as the merger of Humana and Nordmilch to form the new German market leader Deutsches Milchkontor (DMK) in 2011, or the takeover of the almost insolvent OMIRA



Molkerei by the French Lactalis Group in 2017 (Handelsblatt, 2011; dlz Agrarmagazin, 2017).

Figure 1. Development of turnover, export and employees in the German dairy industry from 2008 to 2018



Source: Authors' depiction based on Destatis, 2019a; Destatis, 2019b, Destatis, 2019c.

The global dairy industry has experienced a strong wave of internationalization generated by growing demand (primarily from developing countries), policy drivers (such as the General Agreement on Tariffs and Trade (GATT) in the middle of the 1990's and the liberalization of the Common Agricultural policy (CAP)) and price drivers (for example in 2001 and 2007) (Guillouzo and Ruffio, 2005; Heyder *et al.*, 2011; Vitaliano, 2016). A similar trend applies to the German dairy industry; many dairies generate more than 40%, a few even more than 50%, of their total sales outside of Germany (Meyer and Theuvsen, 2017). As a whole, the German dairy industry had a total share of foreign sales of 31.8% in 2018. As a result, the export ratio rose from 27.8% in 2008 by four percentage points. However, it peaked in 2014 at 34.2%. Since then, the export ratio has declined (Destatis, 2019a; Destatis, 2019b). Even if the export ratio initially appears low compared to other sectors, such as the agricultural machinery industry (74.5% in 2017), the importance of export business for the German dairy industry becomes clearer when considering volumes (Janze *et al.*, 2019). According to the Dairy Industry Association, 49% of the raw milk processed in Germany was exported in the form of milk and milk products (MIV, 2019a). Internationalization has thus become the most important driver in the development of the dairy industry (Theuvsen *et al.*, 2010).



Internationalization is unlikely to lose any importance in the future. Although current trends such as; increasing quality orientation, sustainability, transparency and the increasing demand for organic food, offer companies the opportunity to position themselves in newly emerging niche markets with appropriate products, the whole process is taking place against the background of a saturated domestic market (Bratschi and Feldmann, 2005; Brümmer *et al.*, 2018; Mehlhose *et al.*, 2019). Thus, due to a self-sufficiency rate from 100% in butter to 163% in dried milk products, exports will remain a necessary outlet for the German dairy sector (BMEL 2019). Internationalization is also likely to remain a key driver in the future against the background of forecast increases in global demand and production, which will essentially take place in other parts of the world, in particular Asia and Africa (OECD and FAO, 2019). For the German dairy industry, this development can already be seen today from the list of most important export targets. The member states of the European Union continue to be the most important trading partners, accounting for 83.3% of total export sales in 2017. However, the importance of exports to third countries is increasing step by step. The share of non-EU exports rose from 12.8% in 2001 to 16.7% in 2017, although the share varies greatly depending on the product group under consideration (Trademap, 2019; MIV, 2019b).

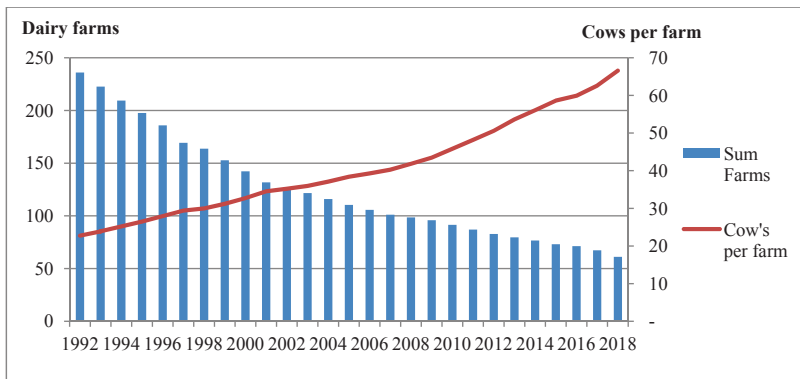
Most dairy companies serve markets outside Germany with classic exports. This applies in particular to German dairy cooperatives, which process an estimated 60 to 70% of German milk production. Studies show that cooperative dairies, which specialize heavily in the export of undifferentiated dairy products, for instance milk powder or butter, have a particularly low added value (Jürgens, *et al.*, 2015; Hörl and Hess, 2017). Management theory proposes that an export strategy can only be successfully implemented if there are competitive advantages in the home country over competitors in other countries (Grant and Nippa, 2006). Undifferentiated products compete on the market through low prices (Porter, 1980).

With regard to competitive advantages in the dairy industry, it is important to note that due to the limited transportability and storability of raw milk, processing milk is to a large extent linked to domestic milk production (Friedrich, 2010). In the past, EU milk production was strongly regulated by agricultural policy measures, for instance by a quota regime. In the course of increasing liberalization of the Common Agricultural Policy (CAP), milk production and the dairy industry had to orient themselves more



strongly towards international competition (Lassen, 2011; Tangermann and Cramon-Taubadel, 2013). With regard to the liberalization of the milk market, the biggest step was probably the abolition of the milk quota in 2015 (Hörl and Hess, 2017). However, the measures implemented in the run-up to the abolition, such as the expansion of milk quota volumes or the improved tradability of milk quotas via quota exchanges, had already led to a significant increase in milk production and to a regional shift in milk production in Germany and several other EU member states (Brümmer and Loy, 2004; Kirner, 2009; Betzholz, 2010; Eurostat, 2019). At the same time, the structural change in milk production continues to progress, while demands are constantly increasing, for example in the form of stricter environmental legislation as well as stricter requirements for husbandry conditions, on the part of consumers. (Lutter, 2009; Lindena *et al.*, 2018). As a consequence, the number of dairy farms in Germany has been decreasing and average herd size has been increasing over the past few decades (see Figure 2).

Figure 2. Development of number of farms and cows per farm from 1992 to 2018 in Germany



Source: Authors' depiction based on ZMB, 2012; Destatis, 2011–2019d.

The research objectives of this work are manifold. Due to the liberalization outlined above and the resulting new competitive environment, new framework conditions have emerged both for the German dairy industry itself and for its upstream milk production. Against this background, this dissertation examines which factors can influence the development of milk production after the end of the milk quota and how they affect it. With regard to the dairy industry itself, this dissertation examines how competitiveness has developed on the international market for milk and dairy products and how different internationalization strategies affect corporate success. Based on these results, strategic



lines of development for the German dairy industry are illustrated, as well as implementation methods based on a concrete example. These research objectives are addressed in a number of papers (Chapters II to VI).

Chapter II (*“Intensive Dairy Farming in Northern Germany: Development and Impact of the New Fertilizer Act”*, published in *Agrarian Perspectives XXVI – Competitiveness of European Agriculture and Food Sectors – Proceedings of the 26th International Scientific Conference (2017)*) examines the regional development of milk production in Germany and the effects of German legislation on farmers’ nutrient management which was amended in March 2017. Data from the 2010 agricultural structure survey at the district level and secondary data on German milk production were used for the analysis.

Chapter III (*“Drivers of Large Herd Sizes in German Dairy Farming: Development and Outlook”*, submitted to *Outlook on Agriculture*) analyzes factors influencing the development of large herds in German dairy farming. The influence of the milk quota, milk price, capital costs, prospects and opportunity costs on the development of large herds in the period from 1992 to 2018 is analyzed. The analysis is done quantitatively in the form of an OLS model with lagged variables, as well as qualitatively. Based on the results and other studies an assessment of the future development is given.

Chapter IV (*“Assessing the International Competitiveness of the German Dairy Industry by Analysing Foreign Trade”*, in preparation for submission to *Agricultural Economics (AGRICECON)*) examines the international competitiveness of the German dairy industry compared to nine major competitors on the international dairy export markets. The analysis covers a period of 17 years from 2001 to 2017 and takes into account aggregated exports as well as six different groups of dairy products classified on the basis of the Harmonized System of the World Customs Organization. The article first defines the concept of international competitiveness. Although there are numerous publications on this subject, there is still no generally applicable definition of this term (Gries and Hentschel, 1994; Feurer and Chaharbaghi, 1994; Trabold, 1995; Baade, 2007). On the basis of the definition “the ability to sell their products on foreign markets for sustained, full cost covering prices, while gaining market share or at least maintaining its market share” based on Utzig (1987), Martin *et al.* (1991) and Weindlmaier (2000), we analyze international competitiveness using Relative Export Advantage (RXA), Relative Import Advantage (RMP) and Relative Trade Advantage (RTA)



(Vollrath, 1991). In addition, the export structure of the countries in question is analyzed over time and the most important trading partners are identified. On this basis, important developments in product group dependency and future developments are derived and the implications of the results for the German dairy industry are discussed.

Chapter V (*“Internationalization Strategies in the German Dairy Industry and their Influence on the Economic Performance of Firms”*, published in *International Journal of Food System Dynamics* 10 (4): 332–346 (2019)), the paper examines the internationalization strategies present in the German dairy industry and their influence on the economic success of companies. The analysis includes 18 companies. 16 of these are headquartered in Germany, 2 are from abroad but with their German subsidiaries have a significant share in milk processing in Germany. The study is based on the consolidated annual accounts of the companies in the period from 2010 to 2017. For the analysis, the internationalization strategies available in the German dairy industry were first analyzed on the basis of an extended version of Perlmutter’s (1969) EPRG model (Wind *et al.*, 1973). The panel data were estimated using Hausmann-Taylor estimation with clustered standard errors in order to cover endogeneity. Thereby we use the EBIT-margin as key figure for economic success, as it is widely used in literature (Li, 2007). Based on the results of the analysis and current studies, we derive recommendations for the internationalization of the German dairy industry.

Chapter VI (*“German Brazilian dairy supply chain integration: Prospects and ways”*, submitted to *Agricultural Economics*) analyzes whether an entry of German dairies into the Brazilian dairy market could provide a perspective for the future and what it could look like. Although Asia as a whole, and China in particular, are repeatedly mentioned with regard to opportunities for entrepreneurial growth, the Latin American milk market, one of the fastest growing markets worldwide, also offers companies interesting growth opportunities and the opportunity to launch new products on the market (Riley, 2017). First, we describe the characteristics of both milk production and the dairy industry in Brazil and Germany. The qualitative analysis is based on expert interviews conducted in both countries in the most important production regions for milk between November 2016 and January 2017. Furthermore, in a subsequent quantitative analysis we use the results from the paper presented in Chapter V in order to present a holistic picture of the potential of the Brazilian market for the German dairy industry. Building on this, we analyze where the opportunities and risks lie with regard to market entry. In



addition, we identify the greatest challenges and give recommendations for action in dealing with them.

The dissertation concludes in Chapter VII with a short summary of important findings, some managerial and political conclusions and an outlook on possible future research directions.



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