

Working Papers

on Economic Geography

Online

Issue 2010-07
Volume 2

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Globalizing Dairy Industry -
A New Zealand Perspective

web: www.ispa.uni-vechta.de/



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Keywords: dairy industry, agri-food-systems, globalizing economic spaces, New Zealand

Abstract

The production, consumption and distribution of food have changed dramatically in recent years. This is especially true for so called ‘high value foods’, such as milk and milk-based products, which are characterised by highly complex agri-food production systems (Dicken, 2007; Murray, 2006). However, our knowledge about the globalization of agriculture is limited and the range of industries studied in the literature is disturbingly narrow. This paper, therefore, analyses contemporary global transformations of the agri-food system by using dairying as a case study. It draws on the new economic spaces strand of geography literatures (e.g., Stringer and Le Heron, 2008) to argue that close attention must be given to globalizing firm networks to better understand the new dimensions of globalization. Finally, the paper discusses how the future might look like for a globalizing dairy industry and speculates about alternative pathways in the context of global change.

Editor: Christine Tamásy

Managing Editor: Annika Neubauer

ISSN: 1869-6449

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Introduction

Since decades, the global agri-food system has changed rapidly in response to global change, e.g. rising incomes in many developing countries, shifting dietary patterns and societal expectations. The food industry is increasingly expected to provide safe food for growing populations as well as, more recently, global public goods related to climate change and normative sustainability goals. In addition, production-related factors such as the globalization of the dairy value chain have transformed the structure of the industry. Today dairying is a highly complex and geographically differentiated industry. A growing divide is emerging (FAO, 2009) with large-scale producers that serve dynamic growing markets whereas smallholders often continue to support local livelihoods and risk marginalization. At point of consumption, there is the widely documented problem of hunger and famine. The Food and Agriculture Organization of the United Nations estimates, for example, that 1.02 billion people are undernourished worldwide in 2009. The problem has increased as a result of higher food prices, lower incomes and higher unemployment due to the recent global economic crises (OECD-FAO, 2009). With respect to food security, the melamine scandal in China raised ethical questions related to globalizing food production networks and the quality of agricultural practices. In September 2008, one of the biggest dairy companies in China, the Sanlu Group, partly owned by New Zealand-based dairy giant Fonterra, recalled milk powder and infant formula after contamination with melamine (Stringer et al., 2009; Tamásy et al., 2008). As a result of the poisoning, several children died and thousands of others fell ill with kidney and urinary problems. Other countries had also reported finding melamine in milk containing products manufactured in China. The World Health Organization (WHO) referred to the melamine incident in China as a major global food safety event. There is also an increasing interest in the environmental impacts from agriculture on biodiversity, ecosystems and global warming (FAO, 2009a). Livestock production, for example, both contributes to climate change and suffers from its consequences. The structural change towards intensive production in large and specialized units with high productivity and the geographic concentration of the industry have altered the environmental impacts of agriculture. Reduced agricultural yields and increased competition from other sectors, on the other hand, are predicted to result in increased prices for feed and might escalate input costs of production. Other relevant negative effects of climate change are, for example, new disease epidemics and increased costs of animal housing, e.g. cooling (FAO, 2009).

Food has become a topic of great interests for geographers and agri-food researchers from other disciplines. Niles and Roff (2008) review recent progress in this field and emphasize the permeability and multiplicity of production systems “in which issues of food safety, quality and convenience intersect in temporally and geographically specific ways with industrial conventions of mass production, global distribution pathways, free trade, regulatory harmonization, environmental and social justice sensibilities and the particular necessity of

biological processes” (3). Contemporary geography scholars often think about where and how food is produced, how it is distributed and where and how it is consumed. The different routes from “farm to plate” are often referred to as food systems, food chains or networks (Ilbery, 2008). Friedland (1984) proposed a production-oriented commodity systems analysis as a framework for exploring the stages through which a commodity is transformed and how it acquires value. Dixon (1999) has developed a cultural economy model for studying food systems which integrates the consumption perspective into this line of thinking. Several variations of the commodity chain and network approaches have been discussed by Kulke (2007) from an economic geography perspective. However, Jackson et al. (2006) investigate why diverse and inconsistent definitions of the term ‘commodity chains’ might result in chaotic conceptions with diverse uses and conflicting perspectives.

Over the past decades, the nature of food production has moved away from the traditional smallholder farming model for domestic markets to complex food circuits with global networks and chains (Whatmore, 2002). Transnational corporations have been the driving forces of this evolution. Global flows have increased, become more intensive, move at increased pace and have more profound impacts ‘on the ground’ (Murray, 2006). However, our knowledge about the globalization of agriculture is still limited and the range of industries studied in the literature is disturbingly narrow. This paper, therefore, analyses contemporary global transformations of the agri-food system by using dairying as a case study. It draws on the new economic spaces strand of geography literatures to argue that close attention must be given to globalising firm networks to better understand the new dimensions of globalisation. Finally, the paper discusses how the future might look like for the dairy industry and speculates about alternative pathways in the context of global change.

Globalizing Economic Spaces

Geographers have a longstanding interest in globalizing economic spaces. Le Heron and Harrington (2005) distinguish between new economic spaces and new economic geographies. The objective is to illustrate and understand the ways in which institutional, technological and policy innovations have created and attempt to affect the location of economic activity and the nature of economic development. The phrase ‘new economic spaces’ is used for the resultant pattern, and ‘new economic geographies’ for the several ways in which observers (geographers) attempt to understand them. The new (and globalizing) economic spaces in agriculture, however, are not homogenous or follow a predetermined path to a particular end-state of globalization. If anything the structures and processes unleashed have made the global agri-food system a more uneven and contested terrain than ever (Ilbery, 2008; Murray, 2006).

Industrialized agricultural food systems have evolved, on the one hand, with truly global patterns of production, distribution and consumption. In this system, a relatively small number of giant, transnational corporations determine what, how much, by what method and for whom food is produced and distributed to final consumers (Whatmore, 2002). Dicken (2007), among others, identifies very large transnational corporations as the primary ‘movers and shapers’ of globalization in contemporary agri-food industries. The largest food corporate worldwide is Nestlé with a turnover of 18.5 Bill. EUR (2008, Table 1). The company with headquarters in Switzerland describes itself “as the world’s leading Nutrition, Health and Wellness company” (www.nestle.com). Nestlé has currently operations in over 80 countries, employs around 280,000 staff and produces in 470 factories worldwide. Pritchard (2000) explores, by using Nestlé in East Asia as case study, why transnational corporations do not possess unitary geographies. Instead, they establish multiple geographies of production, trade and finance, which are negotiated and mediated within varying spatial scales (local to global). On the other hand, subsistence agriculture remains of critical importance for many people who only produce enough food for themselves to secure their livelihoods. Millions of smallholders are bypassed by globalization entirely, disconnected from global agri-food networks. Robinson (2004) describes farming in the developing world as “the ‘other side’ of globalization” (146). However, Neilson and Pritchard (2009) convincingly argue that there is no generic answer to the question whether or not globalization is improving to rural livelihood or not. Instead, it is an outcome of ‘site-specific altercations and intersections’ between different economic actors embedded in varying ways within spaces, networks and social structures (2).

As counter-trend to globalization, however, post-productivist agricultural practices have evolved with a focus on small-scale niches and localized networks. Post-productivism is often described as agricultural production that is characterized by a move away from intensification, concentration, and specialization towards extensification, dispersion and diversification (Ilbery and Bowler, 1998; Robinson, 2004). Geographers now provide a range of provocative studies on alternative systems of food. ‘Local’, ‘sustainable’, ‘organic’ or ‘slow’ food represent some of the many facets of what has recently become most popular in the agri-food research arena (Maye et al., 2007). New market niches have developed based on short supply-chains and direct relationships between small-scale producers and consumers. Farmers markets, for example, can be seen as one representation of alternative food systems: “a complex and ambiguous space where (contingent) notions of local, quality, authenticity and legitimacy find expression in communications and transactions around food” (Smithers et al., 2008, 337). However, DuPuis and Goodman (2005) question ‘unreflexive localism’ in which a small, non-representative group of people decide what is ‘best’ and then attempts to change the world “by telling everyone to accept their utopian ideal” (362). Defensive localism might also exclude remote areas and those with poor agricultural land (Winter, 2003).

The grounding of the agri-food system in biophysical structures and processes means the food production differs fundamentally from other industries. The greatest physical constraints upon agriculture are the climate, e.g. the average temperature or the amount of precipitation, and soil types (Robinson, 2004). The nature of land limits the amount of capital investments and biological constraints restrict plant and animal growth (Whatmore, 2002). Food production, therefore, remains a highly localized process, while the production and consumption of food have become increasingly globalized (Dicken, 2007). However, globalization has also enabled some agri-businesses to overcome localized resource limits, e.g. feed for livestock production in non-grazing systems. The growth of agri-businesses has, generally speaking, taken place through processes of horizontal and vertical integration. Much of the increased concentration is a result of mergers and acquisitions. Nestlé, for example, has made several significant mergers and acquisitions over the last decades. The latest one was the purchase of Kraft Frozen Pizza in 2010. Other significant acquisitions were Novartis Medical Nutrition (healthcare nutrition), Gerber (US baby food) and the Swiss water company, Sources Minérales Hennessey S.A. Another milestone (in 2007) was the strategic partnership with the Brussels-based luxury chocolate maker Pierre Marcolini (www.nestle.com). Mergers and acquisitions have also been important factors in the growth of other major transnational agri-businesses, e.g. New Zealand-based dairy giant Fonterra, and in the food retailing industry. According to Humphrey (2006) global agri-food systems have become increasingly complex because of concentration at all points in the value chain.

‘Big Food’ and ‘Big Retail’ have to be seen as two sides of the same coin (Blythman, 2004). Parallel to the globalization of agri-food businesses, an embryonic group of transnational retail corporations rapidly expanded the scope and scale of their store networks globally whilst, at the same time, putting into place extensive sourcing networks (Coe and Wrigley, 2007). This transformation has been called by researchers ‘supermarket revolution’ that took most recently place in the emerging markets of East Asia, Central and Eastern Europe, and Latin America (Wrigley and Lowe, 2007). Dawson’s (2007) analysis of the world’s 100 largest retailers illustrates that firms in the lower half of the top have continued to ‘collect countries’ since the mid 1990s and have substantially increased the proportion of their sales made through foreign operations. The majority of the 100 largest retail firms are based in North America and Europe. The leading transnational retail firm is US-based Wal-Mart. Wal-Mart claims for 2010 to serve „more than 200 million times per week at more than 8,416 retail units under 53 different banners” (www.walmartstores.com). Wal-Mart was founded in 1962 and grew to 276 stores by the end of the decade. In 1988, Wal-Mart opened the first supercenter - now the company’s dominant format - featuring a complete grocery in addition to general merchandise. In 1991, Wal-Mart started to explore the international market with the opening of a retail unit in Mexico City. Despite its aggressive strategy to internationalize, Wal-Mart

operates in only 15 countries worldwide today. The huge size and rapid growth of Wal-Mart are well documented in the international literature. Just recently Wal-Mart Canada announced to open 35 to 40 new supercentres (one-stop shopping at low prices) later this year which are expected to generate approximately 6,500 store and construction jobs (The Financial, 24/02/2010). However, much less is known about the company's production networks. Many of the non-perishable products, for example, toys, clothes and electronics, are likely to be sourced from China today. According to Coe et al. (2007) Wal-Mart is China's eighth largest trading partner (as of 2005), ahead of entire nations such as Australia, Canada and Russia.

The globalization of retail businesses has not been problem-free. Christopherson (2007) analyses Wal-Mart's exit from the German market in 2006 after 10 years of attempting to achieve competitive advantage. She explains why "Wal-Mart's reliance on the resources of network dominance and autonomous action that made for its success in the USA contributed to unsuccessful strategies in the German retailing market" (451). Aoyama (2007) investigates the contradictory forces between standardization and localization by using Carrefour and Wal-Mart Japan as case studies and provides empirical evidence on how these forces affect store-front and distribution operations of global corporations. From a community perspective, it is a widely held belief that the expansion of chain stores such as Wal-Mart might have negative impacts on the small locally owned retail sector (David-and-Goliath controversies, Halebsky, 2008). According to Paruchuri et al. (2009), however, Wal-Mart's impact varies significantly with retailers' market overlap with and spatial proximity to Wal-Mart. In addition, there is a lot of criticism of the organization of the global supply chain by transnational retail firms, e.g. the treatment of suppliers and workers. Gereffi and Christian (2009) examine Wal-Mart's impacts in terms of a selection of overlapping themes: the business model and organizational structure, the dual impact of labor relations in terms of stores and working conditions in the global supply chain, the genesis of community mobilizations against Wal-Mart, and how the company's growth is linked to the emergence of buyer-driven commodity chains in the world economy. They conclude that "Wal-Mart underscores the value of a public sociology agenda that embraces three research criteria: the incorporation of new media and audiences, the need to go global with our research, and the ability to work for change from within" (573).

The Dairy Industry in Globalizing Economic Spaces – A New Zealand Perspective

At the global scale, cow milk production is heavily concentrated and dominated by two countries (Figure 1): the US and India, followed by China in third place. One prominent trend in the *Agricultural Outlook*, published by OECD-FAO (2009), is the increasing importance of China's milk production with double-digit growth figures in the last decade.

However, most recently fundamental quality problems have damaged the Chinese dairy sector. The 2008 milk melamine scandal was a food safety incident in dairy products, adulterated with melamine. Almost 300,000 children became ill and six died due to contaminated milk powder produced by the Sanlu Group, a Chinese state-operated dairy company. In January 2009, the responsible chairperson was sentenced to life in prison and two middlemen were given death sentences, in a significant abuse of general human rights (The New York Times 22/01/2009). Overall, milk production grew more than consumption in 2008.

Against the backdrop of this global production pattern, international trade of dairy products across borders is still a small percentage of the total and is dominated by the traditional developed export regions (Figure 2): Australasia (Australia, New Zealand) and Europe. New Zealand is the largest single exporting country, followed by Germany, the Netherlands, France and Australia some way behind in fifth place. The composition of international trade in dairy products varies markedly by export region. New Zealand is the world's leading exporter of milk powder (a product that is important in both food manufacturing and reconstitution as liquid milk) and butter, while Europe is by far the biggest exporter of cheese.

Imports of dairy products are much more fragmented than exports of dairy products (Figure 3). Europe is the biggest player, while the Australasian region is not a substantial importer of dairy products. It is important to note that the world's most valuable dairy markets in Europe, North America and Japan are highly protected, all being subject to a high degree of product access quotas and high tariffs (Stringer et al., 2008). In 2009, the European Union reactivated export refunds on dairy products as regulatory reaction to the global economic crisis; and the US put its dairy export incentive scheme back in place. The European Union and the US also use import quotas in combination with high out-of-quota tariff rates to protect national dairy producers from competition. Milk production quotas in the European Union, however, are being gradually lifted and should be removed completely by 2015.

Insert Figures 1-3 about here

New Zealand has a competitive advantage in pasture-based milk production and does not subsidize its dairy industry. The dairy industry value chain (Figure 4) displays the simplified route for dairy products originating from New Zealand. In 2008/09, New Zealand had 4.253 million cows (11,618 herds) with the average dairy farm size being 131 hectares (LIC, 2009). Over the last 30 years, the number of dairy herds has fallen while the average herd size has increased. 16.0 billion liters of milk had been processed in New Zealand in 2008/09; this figure results in a production output of 3,710 liters of milk per cow. However, milk production per cow varies significantly from farm to farm, caused by varying temperature, rainfall, soil quality, stocking rate, genetic merit of the herd, and general farm management practices (LIC, 2009).

New Zealand's dairy value chain is quite unique as 95 % of the raw milk is processed by one single company: Fonterra Cooperative Ltd (Gray et al., 2007). Due to the limited size of the national market, Fonterra is also the world's largest single exporter of dairy products. In addition to Fonterra, only niche companies process milk in New Zealand.

Insert Figure 4 about here

New Zealand-based Fonterra Cooperative Ltd is ranked the 6th largest dairy company globally (Table 1), privately owned by its supplying 11,000 dairy farmers. The large, vertically integrated company was formed in 2001 from a mega merger of the New Zealand Dairy Board (the export marketing arm of the New Zealand dairy industry) and two large dairy co-operatives: the New Zealand Dairy Group and Kiwi Co-operatives. At present, Fonterra has four business segments defined by product type and geographic area, reflecting how the dairy giant is managed (Fonterra, 2009):

- *Fonterra Trade & Operations – from the farmgate through to Fonterra global trade customers. This includes Milk Supply, Shareholder Relations, Milk Collection, NZ Operations, Offshore Milk Sourcing and Processing (except those activities already under other Strategic Business Units), Supply Chain, Sustainability, Government Relations and Global Trade.*
- *Fonterra Global Ingredients and Foodservice – operations in North Asia, North America and Europe, Corporate and equity accounted joint ventures.*
- *ANZ – operations in New Zealand and Australia, including businesses marketing brands such as Anchor, Tip Top and Mainland.*
- *Asia & AME – operations in Asia, Africa and the Middle East.*

Insert Table 1 about here

Gray et al. (2007) show transformations in Fonterra's global trade linkages over space and time. The mapping of Fonterra's trade flows at the firm-level, rather than aggregate country-to-country flows, provides a unique window on globalizing dairy dynamics and explores how the altering character of the New Zealand dairy industry can be seen as outcome of a distinctively national production focus, but with investment trajectories heavily focused on selling products on the international stage. Stringer et al. (2008) examine the rationale and global patterning of Fonterra's strategic alliances in the light of the corporation's growing global prominence and desire to be a major shaper of the globalizing dairy supply chain. The study explored Fonterra's responses to institutional barriers over the past decade, arguing that strategy was closely tied into intensifying supply chain, market channel and innovation pressures. Stringer et al. (2009) further investigate partnership issues by focusing on the Latin American and Chinese dairy market

contexts. The competitive and collaborative interplay of dairy enterprises engaging in both these market contexts reveals something of the variety and origins of geographical and organizational configurations in a globalizing dairy world. They also refer to the recent melamine tragedy in China - in which Fonterra was involved through a joint venture with Chinese Sanlu group - and emphasizes the continuing influence of the home country on Fonterra's competitive strategies and global dairy partnerships (see also Gray et al. 2007, Stringer, 2008). Tamásy et al. (2008) investigate the conditions, practices and outcomes of knowledge management in Fonterra. They argue that in order to enhance the understandings of globalizing networks, it is imperative that the transfer of expertise through expatriation (international assignments) is recognized as an integral part of the strategy development and maintenance of intra-firm networks and the building on inter-firm networks. Fonterra's expatriation population has to be seen as an organizational strategy to transfer knowledge in the evolving and globalizing networks of the dairy giant.

The favorable climate conditions and the mercy of the weather in New Zealand have been the catalyst for the development of a highly complex dairy production system that stretches from the local to the global scale. Within New Zealand the majority of dairy herds are located in the North Island, with the greatest concentration in the South Auckland region (LIC, 2009). The growing scale and intensity of dairy production have caused significant negative effects on the environment. Jay (2007) discusses productivist constructions of environmental management by the New Zealand dairy industry in the context of global change. But rural environmental change is not just the result of activities within rural space. Instead, it is also influenced by global processes, such as climate change. These have the potential to significantly alter the agri-food production system. The question of how societies should respond to environmental rural change generates different answers depending on the perception of nature (utilitarian versus naturalist perspectives; Woods, 2005).

Quo Vadis New Zealand?

The production, distribution and consumption of dairying have been transformed significantly over the last decades. After record prices and booming trade, dairy exporting agri-businesses now face an uncertain market situation. In 2007, milk prices reached a historical high, but fell to their lowest level for decades in the middle of 2009 (IDF, 2009). Income growth, population growth, dietary patterns, and exchange rate developments are key drivers affecting international dairy markets. Fonterra, for example, is a New Zealand-based global dairy giant, whereas world dairy trade is typically denominated in US dollars. Significant exchange rate adjustments immediately influence the cost structure and revenue of this globally organized company. In addition, dairy markets remain 'thin'. An economic downturn in one country could, therefore,

have considerable consequences for global demand and world prices. High dairy prices have stimulated attention towards domestic milk supplies (OECD-FAO, 2009).

The melamine contamination in China has been a factor undermining demand as Asian consumers question the integrity of dairy products. Chinese imports of dairy products from New Zealand significantly increased following the melamine scandal in China. However, importers now have to apply for permits from the Chinese commerce ministry to monitor the rising level of dairy imports (The National Business Review, 16/07/2009). Regardless the melamine incident, Fonterra still has an ongoing investment interest in China: “Fonterra has a 30-year history in China and this remains a very important market to us” (www.fonterra.com). As the other side of the same coin, Chinese-based Natural Dairy Holdings just recently announced to buy Crafar family farms, a New Zealand dairy empire worth NZ \$ 1.5 billion, including farmland, cattle, and milk powder production plants (The New Zealand Herald, 25/03/2010). This would be the largest overseas purchase of a New Zealand farming business. An application has been filed with the Overseas Investment Office (OIO). An official consent from the OIO is required in New Zealand if overseas investors wish to purchase sensitive land, business assets worth more than NZ \$ 100 million and fishing quota. Sensitive land is, for example, all non-urban land in New Zealand or land held for conservation purposes (Overseas Investment Act 2005 No 82, as at 01/10/2008). There is an intensive ongoing public discussion whether or not the Chinese investor should be allowed to buy significant rural assets in New Zealand: “The fear with these particular buyers is that opportunism and easy credit-fueled cash could cause more trouble than it’s worth. Now it’s ... time for New Zealanders to face the deep and long term truth: we exchanged future sovereignty for short term capital gains through a credit-fueled frenzy...” (The New Zealand Herald, 25/03/2010).

The concern for climate change is definitely an emerging issue in higher income countries. Likely climate change impacts in New Zealand include higher temperatures, rising sea levels, more frequent extreme weather events (e.g., droughts and floods), and a change in rainfall patterns. Modeling projections of the expected impacts of climate change, both at the national and regional levels, have been published by the Ministry of the Environment (ME, 2008). In 2010, the government revised the Emissions Trading Scheme (ETS) “to ensure New Zealand takes a responsible approach to the global problem of greenhouse gas pollution and climate change” (www.climatechange.govt.nz). The amendment Act includes revised the entry date of 2015 for agriculture. However, New Zealand agriculture will begin to face pass-through costs of greenhouse gas emissions as soon as the transport and energy sectors enter the ETS in 2010. The ETS will increase costs for agriculture, but some of this cost effect might be offset by the Government giving an allocation of emission units to the agriculture sector (dairying including). The New Zealand’s government overall emissions reduction target is 10-20 per cent below 1990 levels by 2020.

Finally, despite growing environmental pressure on agriculture and negative effects of the global economic crisis, the prospects for dairy markets remain positive (OECD-FAO, 2009). Demand growth has weakened, but per capita demand is expected to continue, particularly for the higher value-added processed dairy products. New Zealand is the biggest single exporter of dairy products and expected to remain a country recording the strongest milk production growth in percentage terms among the OECD members (IDF, 2009). Main dairy products exported from New Zealand are traditionally whole milk powder and skim milk powder. Even though the milk production is very fragmented globally, New Zealand-based Fonterra is the largest milk processor and handles 2.7 % of the world milk. Because food is a basic human need, the global agri-food sector is expected to be more resilient to economic crises than other sectors of the world economy (OECD-FAO, 2009).

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Tables and Figures

Table 1: The Top 10 Dairy Companies Worldwide, 2008

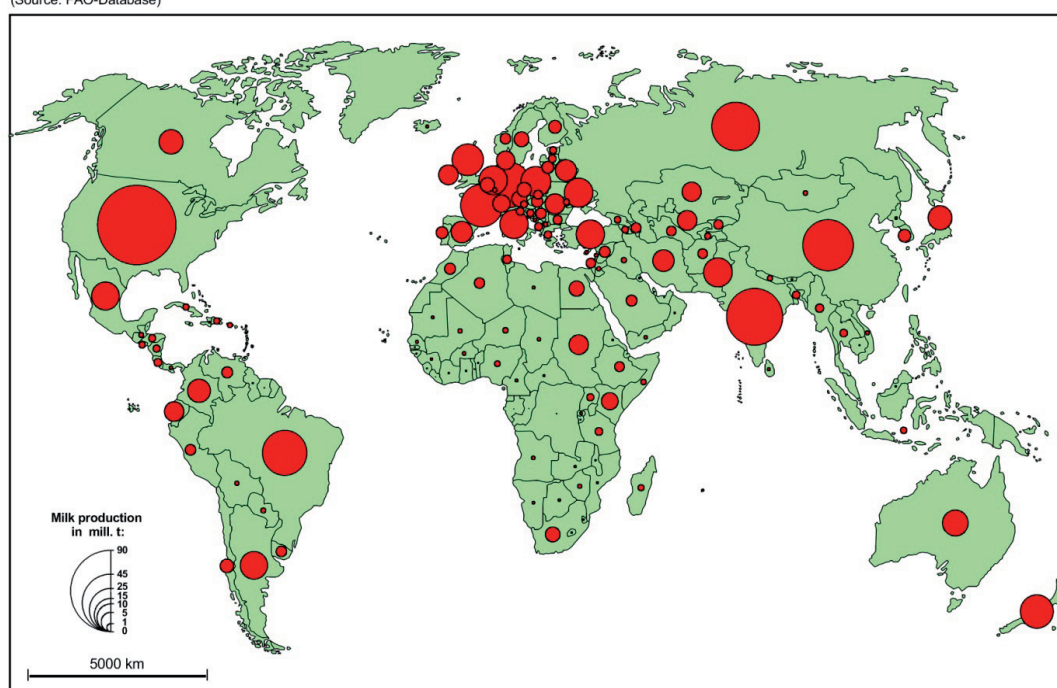
Rank	Company	Headquarters	Turnover € billion 2008	Geographical Presence
1	Nestlé	Switzerland	18.5	Global
2	Danone	France	15.7	Global
3	Lactalis	France	9.3	Europe, North America, Middle East
4	FrieslandCampina	Netherlands	9.3	Europe, Asian, Latin America
5	Fonterra	New Zealand	8.2	Global
6	Dean Foods	USA	8.1	USA
7	Dairy Farmers of America	USA	6.9	USA
8	Arla Foods	Denmark/Sweden	6.9	Europe, Middle East
9	Kraft Foods	USA	5.1	Global
10	Unilever	Netherlands	4.5	Global

Source: International Dairy Federation (2009), company website annual reports

Figure 1: World Milk Production, 2008

World milk production 2008

(Source: FAO-Database)

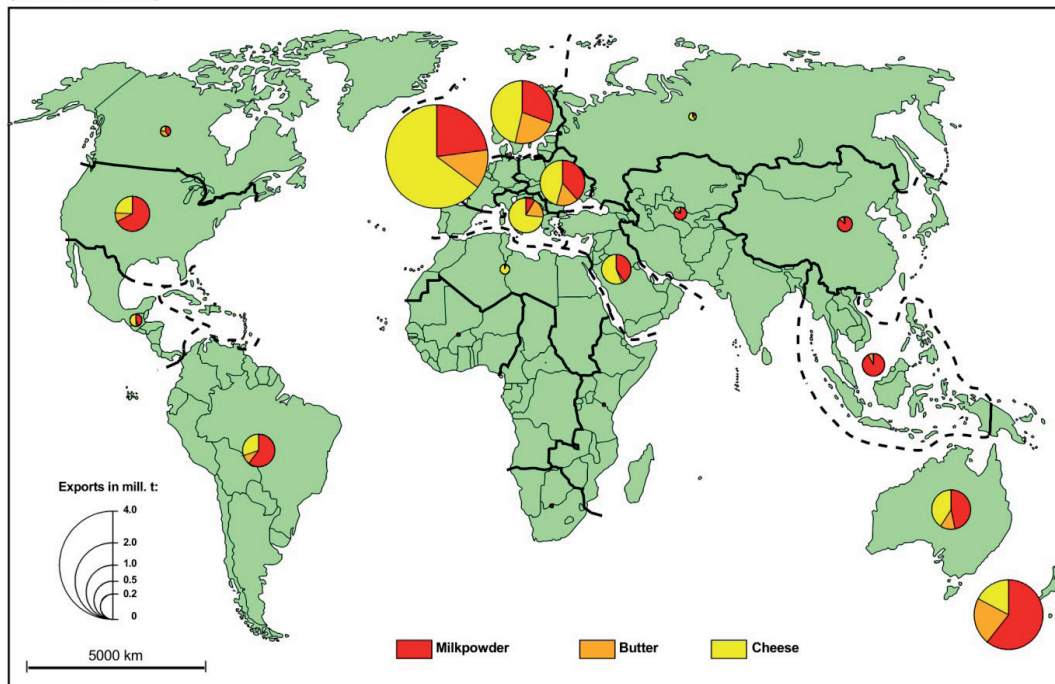


Database: FAO, 2010

Figure 2: World Exports of Dairy Products, 2007

World exports of selected dairy products 2007

(Source: FAO-Database)

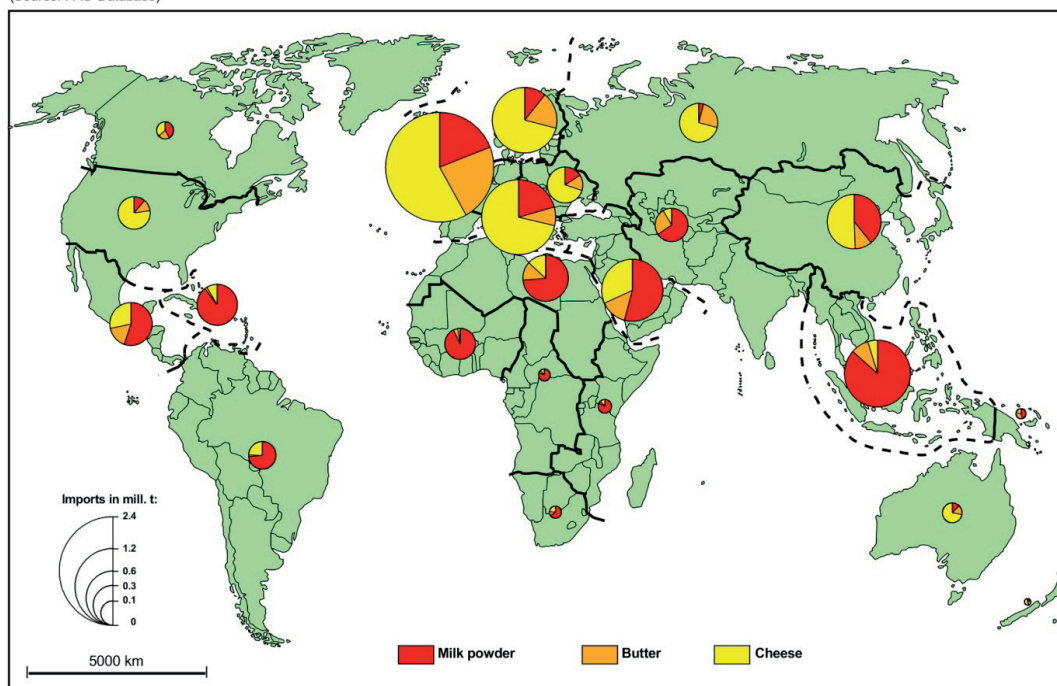


Database: FAO, 2010

Figure 3: World Imports of Dairy Products, 2007

World imports of selected dairy products 2007

(Source: FAO-Database)



Database: FAO, 2010

Figure 4: Dairy Industry Value Chain

