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Assessing the Status of the Global Dairy Trade

EDITOR'S INTRODUCTION

Christopher G. Davis[a] and William Hahn[b]

[a] *Economist, Market and Trade Economics Division, Economic Research Service, US Department of Agriculture, 355 E Street SW, Washington DC, 20024, USA Tel: + 1.202. 694.5167 Email: chrisdavis@ers.usda.gov*

[b] *Economist, Market and Trade Economics Division, Economic Research Service, US Department of Agriculture, 355 E Street SW, Washington DC, 20024, USA Email: whahn@ers.usda.gov*

Growth in Dairy Trade

Over the last decade, interest in global dairy trade has intensified—partially because of the enormous impact that domestic and international policies have had or are projected to have on the global trade and domestic supply. One significant example in the negotiations is the proposal made by the World Trade Organization (WTO) during the Nairobi ministerial in December 2015 in effort to help stabilize world dairy prices by eliminating export subsidies over the next four years (WTO 2016).

Global dairy consumption has been on the rise steadily since 2005, with the exception of 2009 and 2015[1]. Dairy imports grew in value from $15 billion in 2005[2] to $43.2 billion in 2014[3], a 187% increase in US dollars. Similarly, global dairy exports expanded 175% in value from 2005 to 2014. The leading dairy importers from 2005 to 2009 were the United States, Mexico, Japan, Russia, and the European Union-28 (EU–28). From 2010 to 2015, the situation changed as China

[1] The main reason dairy trade fell in 2009 was due to the global financial crisis. In 2015, dairy trade dropped for several reasons. Those reasons include a weaker demand for dairy commodities; Russia's ban on dairy imports from several countries; and the elimination of Europe milk supply quotas (Cessna et al. *Forthcoming*). The export subsidies received by European Union's dairy farmers from their government also contributed to lower international dairy prices and a weaker demand for dairy commodities. The increase in Europe's dairy production grew faster than consumption.

[2] The import and export values calculated for 2005 exclude values from Iran, Belarus, Bolivia, and Kenya which were not reported or unavailable in World Trade Atlas®.

[3] The import and export values calculated for 2014 exclude values from Azerbaijan and Jordan which were not reported or unavailable in World Trade Atlas®.

emerged as the world's largest dairy importer followed by Russia, the US, Mexico, and Japan (World Trade Atlas®). Although the demographic landscapes of dairy consumption are changing globally, the major suppliers of dairy commodities have remained relatively unchanged from 2005 to 2015. New Zealand is the world's largest dairy exporter in terms of volume. The four top global dairy exporters during the observed period based on value are the EU–28, New Zealand, the US, and Australia.

While many dairy commodities are traded internationally, some of the largest global exchanges involve cheese, nonfat dry milk (including skim dry milk), whey, and butter. In 2015, these four commodities accounted for 50% of the total value of global dairy imports (World Trade Atlas®). Of all the dairy commodities imported globally in 2015, cheese accounted for 24% of the total value. The global cheese import had increased 43% from 2010 to 2014 (World Trade Atlas®). The largest importers of cheese (in value) in 2015 were Russia, the US, and Japan.

Nonfat dry milk (NFDM) was the second largest (in value) dairy commodity imported, making up 11% of the world's total dairy imports in 2015. The import value of NFDM grew by 96% from 2010 to 2014 and the top importers in 2015 included Mexico, China, Indonesia, and Malaysia (World Trade Atlas®). Whey and butter were the third and fourth largest dairy commodities imported, respectively. Both whey and butter balanced out at 7% of the total value of dairy imported in 2015. Over the five-year span from 2010 to 2014, the value of global imports of whey and butter increased by 81% and 62%, respectively (World Trade Atlas®). The world's leading importers of whey are China, the US, and Indonesia, while Russia, Iran, and China are the leading importers of butter.

Free Trade Agreements

Of the many factors influencing agricultural commodity trade, bilateral and regional agreements have been among the most important. The number of bilateral and regional trade agreements rose more than 80 percent from 2008 to 2014. Of the over 350 regional trade agreements (RTAs) in force and reported to the World Trade Organization, more than 70% have been concluded since 2000 (OECD 2015). Bilateral and regional trade agreements are important to the competitiveness of food and agricultural industries. Even though free trade agreements (FTAs) focus primarily on tariff elimination, sensitive agriculture sectors, such as dairy, may be excluded from the terms of agreements (NAFTA 1994). A rich body of literature discusses the impacts of bilateral and multilateral trade agreements (Beckman et al. 2015; Burfisher et al. 2014; European Commission 2014; Fontagne et al. 2014; Arita et al. 2014; Davis et al. 2014; Davis et al. 2013). Several studies have shown that regional trade agreements in agriculture have a direct effect on trade and that the elimination of tariffs through trade agreements can substantially increase trade among nations (Vollrath and Hallahan 2011; Burfisher et al. 2014; OECD 2015).

The two trade agreements presently under negotiation that are expected to have a significant impact on the dairy trade are the Trans-Pacific Partnership (TPP) and the *Transatlantic Trade and Investment Partnership* (T-TIP). On October 5, 2015, the President of the United States and leaders of other countries concluded negotiations on TPP, which is yet to be ratified by the US Congress (USTR NEWS 2015). The TPP is a trade and investment agreement negotiated by twelve Pacific Rim countries, including the United States and eleven other countries: Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam (Burfisher et al. 2014). T-TIP is designed to eliminate trade barriers and reduce the

restrictions on investment that traditionally have been in place during trade transactions between the United States and the EU–28. Both the TTP and the TTIP are important trade agreements and are sure to increase the competitiveness of dairy trade given that the proposed country members are some of the world's largest exporters and importers of dairy commodities.

Impediments to Trade

Many factors continue to hinder trade flows. Trade impediments may include *sanitary and phytosanitary (SPS) measures*[4], import policies such as tariffs, embargos, quotas, import licensing, customs practices, labeling, and various types of certification. In 2015, Russia imposed a ban on dairy imports from the EU–28, Australia, Canada and Norway. During the same period, the EU–28 eliminated their milk supply quotas, which caused milk production to rise and reduce prices. Russia's ban on dairy imports and the EU elimination of milk production quotas were partially responsible for the global dairy imports drop of 27% from 2014 to 2015.

In Turkey, US dairy exports were suspended due to the continuation of negotiations on a new bilateral veterinary certificate for dairy commodities. US dairy exports to Turkey were suspended on April 1, 2016. Turkey's imports from the US recently dropped from 4,931 metric tons (MT) in 2014 to 99 MT in 2015 (FAS TR6016). Another example is Pakistan who has proposed a rise in import tariff on milk powder. If approved, the increase may benefit Pakistani farmers but will impede imports from the world's four largest dairy suppliers, New Zealand, Australia, the EU–28, and the U.S (FAS PK1610).

Trends in Domestic Dairy Production

Global milk production has been strong over the last several years leading to expanded growth in trade in most years with a sudden drop off in 2015. For example, from 2005 to 2013, the world milk production increased more than 16% (FAO 2005–2013). An average of 594.4 million metric tons of cow milk was produced throughout the world over the observed nine year period. The six major milk suppliers, the EU–28, the US, India, China, Russia, and Brazil, accounted for more than 80% of the world's cow milk production during the last four years (FAS–USDA). The EU–28 was by-far the largest milk producer, providing an average of 30% of the world's cow milk during the previous four years (FAS–USDA). Although the EU–28 is the world's largest milk producer, the greatest growth in milk production among the top six milk suppliers occurred in India and China.

According to USDA–FAS, India's cow milk production grew 15.3% from 2012 to 2015, while China production expanded by 15.1% (FAS–USDA). Factors contributing to India's growing production include the world's largest dairy herd[5] (water buffalo, indigenous, and cross-bred cattle), improved veterinary services, feed and farmer education, artificial insemination, the growth and success of cooperatives particularly Gujarat Cooperative Milk Marketing Federation,

[4] SPS measures include standards necessary to protect human, animal, plant life, or health from risks arising from the entry or spread of plant or animal-borne pests or diseases, or from additives, contaminants, toxins, or disease-causing organisms in foods, beverages, or feedstuffs (Womach 2005).

[5] Food and Agriculture Organization (FAO). FAOSTAT database: http://faostat3.fao.org/home/E

Food and Agriculture Organization (FAO). Domestic Animal Diversity Information System. http://dad.fao.org/

and increases in consumer demand and GDP (FAO; Jones et al. *Forthcoming*). China's production growth was motivated by relatively low production costs stemming from the recruitment of small-scale farmers who utilized abundant feed resources and slack labor (Fuller et al. 2006; Gale and Hu 2009).

The increase in Brazil milk production almost mirrors that of India and China. From 2012 to 2015, Brazil milk production grew by 14.3% (FAS-USDA). One reason for Brazil's success is the governmental support milk producers receive by participating in state government dairy development programs designed to increase productivity through pasture improvement and animal genetics (FAS BR0917). Brazil's increase in milk production is also partially motivated through exemption from state government value-added taxes on the sale of milk by producers and cooperatives.

Over the last four years, the other major milk-producing areas experienced moderate growth ranging from 7.6% for the EU–28, to 4.9%, and 4% for China, and the United States, respectively. According to USDA, the milk production forecast for 2016 has lowered as the pace of cow herd expansion has slowed. However, the production forecast for 2017 is raised as higher forecast milk prices and lower feed costs in late 2016 and early 2017 are expected to lead to higher 2017 cow numbers (WASDE 555).

Among the five other major milk-producing areas, Russia's milk production fell over the past four years, partially due to the unsettled payments of subsidies under state support programs. Global dairy production is expected to continue to increase in the near future as world GDP rises and consumers' preferences for different types of dairy products expand.

Challenges in Domestic Dairy Supply Policies

Domestic policies have been one of the driving forces behind milk production surpluses and the promotion of trade opportunities for some major and minor dairy commodity exporters. Dairy supply policies are used for different reasons in countries across the globe. Some countries use them to help their dairy industries produce sufficient amounts of dairy commodities to satisfy the demands of their citizens. Governments may also establish dairy supply policies to control milk production to help increase domestic dairy prices and farm income. In April 2015, the European Union eliminated its milk quota system after more than thirty years. The discontinuation of this milk supply policy is expected to generate a large milk surplus and expand dairy export potentials for the producers there, which could potentially have detrimental impacts on the US and/or other major dairy exporters.

Canada's dairy sector has operated under a supply management system since the early 1970's. As one of the minor milk producers and dairy exporters, Canada could face challenges as its national subsidized dairy program create issues for UF–85 (ultra-filtered milk with 85% protein) imports from the US (FAS–CA16028). According to Foreign Agricultural Service, "The Canadian Milk Supply Management Committee has authorized the expansion of the dairy ingredients that can be sold at world prices for use in cheese production, and other products, in the national Class 4m Permit Program". This authorization could affect the US UF–85 trade to Canada which is currently treated by processors as an eligible ultra-filtered milk used in manufacturing cheese.

Summary of Dairy Special Issue Articles

Growth in Dairy Trade

Matthew Salois— Global Dairy Trade Situation and Outlook— looks at the recent world trade situation with a special emphasis on conditions that have led to increased imports in Asian markets. Dairy prices, production, consumption, and trade have been volatile in the past few years due to a number of factors including feed-cost volatility and policy shifts. The recent expansion of milk production has resulted in lower prices and profits for dairy producers. Salois predicts that supply increases will be moderate in the near term, producing somewhat higher dairy prices and a slower expansion of dairy production.

Peter Vitaliano –Global Dairy Trade: Where Are We, How Did We Get Here and Where Are We Going?—also examines US dairy export growth, focusing on specific factors that led to it. He notes that increases in US dairy production since 2002 have largely led to increases in exports with a small increase in domestic consumption. He identifies global income growth—especially in lower-income countries—as the key factor in increasing overall world dairy trade. Trade policy changes, the Uruguay Round Agreement and NAFTA, are also important in the expansion of US dairy exports. Vitaliano also outlines reasons for higher world dairy prices that have been observed in recent years. (Supply expansion and lower feed costs have reduced US and world prices in the past three years.) Forecasts of dairy market conditions in the United States and the European Union are provided as well.

The previous two articles show that the most important markets for U.S dairy exports are across the Pacific Ocean. This currently provides West Coast dairy producers an advantage in serving the largest export markets. The planned expansion of the Panama Canal should decrease the export costs for the rest of the United States. Canal expansion would also allow Australia and New Zealand to better serve European and West-African markets. In *The Effects of Panama Canal Expansion on US Dairy Trade Flows: West, East, and Gulf District Regions—Vorotnikova and Devadoss* built a model to predict how the pattern of world dairy trade might change in response to lower-cost shipping through the Panama Canal. They find major impacts on the world dairy trade, particularly lower shipping costs leading to an elimination of US butter exports to Africa; and Oceania is able to squeeze US butter out of African markets.

The United States, Oceania, and the European Union are the world's largest dairy product exporting regions. In *Price Transmission in Global Dairy Markets—John Newton* examines dairy-product prices in these three regions using vector auto-correction and vector error-correction models. US prices for non-fat dry milk and cheddar cheese are affected by the prices in the other two markets. Shocks in the US non-fat dry milk market are not transmitted to the other two regions; US cheddar cheese price shocks affect Oceania cheddar prices.

Free Trade Agreements

Christopher Davis—Potential Impacts of Trans-Pacific Partnership on Japanese Cheese Imports notes that Japan is the world's second largest cheese importer and is negotiating for membership in the Trans-Pacific Partnership (TPP). The United States, Australia, and New Zealand are important suppliers of cheese to Japan and are also involved in the TPP negotiations. The TPP could reduce Japanese cheese tariffs. Davis estimated a model of Japanese cheese demand to determine how Japan's cheese imports would change with no tariffs. The model treats cheese from each source as a differentiated product. He finds that the Australian cheese imports are less sensitive to price changes due to changes in Japan's import rules than those from the United States and New Zealand. The US and New Zealand cheese exports are, therefore, likely to show larger increases due to the TPP than those from Australia.

Like Davis, *Asci et al.* in *Implications of Trans-Pacific Partnership for the US Dairy Industry* look at the potential impacts of the TPP on dairy trade. The research differs from Davis's in that the Asci looks at dairy trade in the Pacific region in general, not only cheese trade in Japan. Most of his analysis focuses on supply and demand shifts for aggregate dairy imports and exports. *Asci et al.* also forecast changes in bilateral trade in milk powder. Reducing tariffs increase demand and supplies throughout the world. For the most part, the supply and demand shifts are modest—less than 1%. Changes in trade between countries shows larger percentage changes.

Impediments to Trade

Many of the articles in this special issue have noted the recent importance of China as an importer of dairy products [Salois, Vitaliano, and Gale & Jewison] and that changes in Chinese policy are a factor in the recent declines in Chinese dairy imports. *Tao et al.* in *Estimating Restrictiveness of SPS Measures for China's Dairy Imports*—looks at the evolution of China's dairy safety regulations and measures the effect these policies have on China's dairy imports. To a large extent, these dairy-safety regulations were driven by domestic incidents. *Tao et al.* measures these regulations' effects on China's major import suppliers. Their estimates show that these regulations impose higher costs than China's tariffs. They also note that supplying safer dairy products can be an effective competitive strategy for China's suppliers.

Pemberton et al.—The Effects of Trade Liberalization on Dairy Trade and Domestic Milk Production in CARICOM—analyze the effects of trade policy reforms for the Caribbean nations Jamaica, Trinidad & Tobago, and Barbados. Domestic milk producers in these countries have a number of serious problems leading to lower domestic production and higher imports. The most important suppliers of dairy products to these three countries are New Zealand and the European Union. Dairy imports in all three countries are subject to a number of policies that were reformed as a result of the Uruguay Round negotiations. Pemberton et al. estimate general factors that drive imports and domestic dairy demand and measure how much the three country's dairy trade has responded to import liberalization.

Trends in Domestic Dairy Production

The Western United States, especially California, is an important dairy production and exporting region, especially for the Asian/Pacific markets. *Matthews et al*. in *The Role of California and Western US Dairy and Forage Crop Industries in Asian Dairy Markets* study the linkages between dairy and forage production in California and the rest of the west in order to measure the competitiveness of Western US exports and the ability of Western US production to expand to meet increasing Asian/Pacific demand. The authors indicate that limits to Asian forage production will restrict Asia's ability to meet its projected dairy demand with domestic milk. This offers an opportunity to Western US producers to serve Asian markets.

Spanish dairy farms have faced challenges in recent years due to lower milk prices and changes in European Union policy. Some producers have responded to these challenges by diversifying their operations. *Alvarez et al.* in *Diversification in Spanish Dairy Farms: Key Drivers of Performance* conduct in-depth surveys with a group of diversified dairy producers discovering the major factors that lead to better financial performance.

Gale and Jewison in *China as Dairy Importer: Rising Milk Prices and Production Costs* examine cost of production data for China's milk producers in order to explain the increases in Chinese prices observed in 2006–2014. High Chinese milk prices in this period were an important factor driving China's milk imports. The authors found that about half of the milk-price increase can be attributed to feed cost changes. There appear to be improvements in Chinese dairy labor productivity, small gains in milk per cow, but no change in the productivity of cattle feed. They agree with the previously-cited Mathews study that problems with the supply of grains and forage are likely to constrain the future growth of Chinese milk production.

Challenges in Domestic Dairy Supply Policies

Like the works by Salois and Vitaliano in this issue, *Blayney et al.* note the growth of US dairy exports since the signing of the Uruguay Round agreement. In *Dairy Export Markets: Changing the Structure of US Dairy Demand*— their statistical analysis finds that US dairy exports were significantly different after the Uruguay Round commitments were implemented. The authors note that the United States has focused its export efforts on dry products: whey, non-fat, and whole milk. They believe that there may be opportunities to expand US exports in other products—notably butter. Russian bans on US dairy, weaker Chinese demands, and expansions of world production have contributed to lower US exports in 2014 through 2015.

Nehring et al. in *United States and European Union Dairy Farms: Where Is the Competitive Edge?*—compare cost of production estimates for the United States and seven European Union countries. The cost of production data for all eight countries is detailed enough to allow one to compare costs by farm size. In all countries, the larger farms tend to have lower costs. The authors note that recent policy changes in the European Union could allow a more rapid shift to larger farms, making the European Union dairy farmers relatively more competitive with US producers.

Shadbolt and Apparao in *Factors Influencing the Dairy Trade from New Zealand*—note that New Zealand is the most export-dependent dairy producer in the world. They examine the global and local conditions that drive New Zealand's dairy exports and highlight domestic challenges to dairy production expansion in the country.

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