Why Trade Agreements Matter: The Case for U.S. Dairy

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I. Executive Summary

- The U.S. dairy sector is a competitive, innovative, and export-driven industry. Strong growth in overseas demand has helped fuel U.S. dairy exports, while domestic structural and policy adjustments have enhanced U.S. competitiveness. Over the past 15 years, U.S. dairy exports have grown by more than fivefold, reaching a record $7.1 billion in 2014. While 2015 exports decreased due to strong global dairy supplies, weaker import demand, and an appreciation of the U.S. dollar, the longer-term USDA 10-year forecast projects record export levels.

- Continued growth of the U.S dairy sector is largely contingent on trade. The share of U.S. milk production that is exported has tripled from 2000 to around 14-15 percent. The U.S. market is fairly mature and per capita consumption is not expected to expand significantly, which makes overseas markets increasingly important to producers' returns.

- U.S. dairy exports are also important to the broader U.S. economy. USDA's Economic Research Service (ERS) estimates that at the primary (milk) production level, each dollar of U.S. dairy exports generates nearly $3 in additional economic output; for each $1 billion in dairy exports, around 20,000 jobs are supported.

- Free trade agreements (FTAs) have contributed to the growth in U.S. dairy exports and helped to address tariff and nontariff barriers that disadvantage U.S. products in overseas markets. The U.S. dairy industry estimates that the average U.S. dairy farmer's income increased $7,560 over 2004-14 and the average milk price was $0.34 per hundredweight (cwt) higher as a result of trade with FTA partners. U.S. dairy exports to FTA partners grew from $690 million (in the year prior to each of the U.S. FTA's entry into force) to $2.8 billion in 2015, driven by lower trade barriers and increased U.S. competitiveness.

- The Trans Pacific Partnership (TPP) agreement covers 12 countries and expands dairy market access in several key Asian countries, such as Japan, Vietnam, and Malaysia, and provides new access into Canada. The TPP also breaks new ground with rules on nontariff barriers, including sanitary and phytosanitary (SPS) measures, geographical indications (GIs), biotechnology, and organics. TPP addresses the competitive advantages other suppliers have gained in this region.

- In this report, OCE presents estimates of the medium-to-long-run dairy trade effects of TPP dairy market access provisions. The analysis projects an additional $150 to $300 million in annual U.S. dairy exports as a result of TPP. While U.S. dairy imports show some growth ($30-100 million a year), particularly for butter, the U.S. maintains a net export position.

- Other TPP analysis shows similar results. The American Farm Bureau Federation (AFBF) estimates that annual U.S. net farm income could grow by $4.4 billion and annual U.S. net agricultural exports by $5.3 billion, if TPP is implemented. The U.S. dairy sector also benefits, with cash receipts and net dairy exports projected to grow $275.3 million and $131.2 million, respectively.

- The U.S. International Trade Commission's (USITC) economic review of TPP projects U.S. agricultural exports would be $7.2 billion higher in 2032, with U.S. dairy exports forecast at $1.8 billion higher. The USITC model looks at the full economy and cross-commodity effects of full (long-term) implementation. It also covers trade in all dairy products, including higher value processed items (ice cream, infant formula, etc.) not covered in the AFBF and OCE analyses.

II. Evolution of the U.S. Dairy Sector

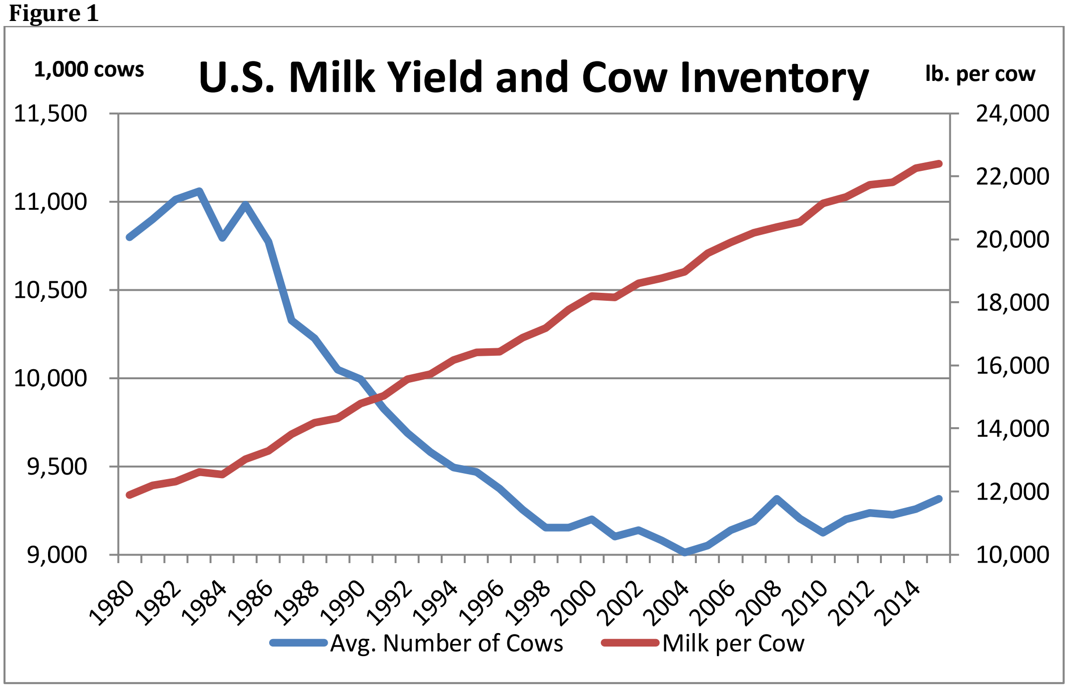
The U.S. dairy market has gone through a substantial transformation from a relatively closed, import-sensitive sector to one that is increasingly competitive and export-focused. This transformation has several causes: increased productivity, product innovation by a well-developed processing sector, a less-distortive policy environment, and, in particular, rapid demand growth in overseas markets. An increasing share of U.S. dairy production is exported to overseas consumers, particularly in Asia where dairy consumption is growing at a relatively faster pace. Reducing trade barriers through multilateral negotiations and free trade agreements (FTAs) have also helped develop new markets for U.S. dairy products and contributed to the growth in dairy exports.

Growth in U.S. dairy production is projected to continue through 2025 due to strong global demand. U.S. consumption will not keep up with this pace. Opening new markets will be a key factor for the U.S. dairy sector's ability to continue to expand and prosper. This is particularly important given that the main competitors to U.S. dairy have gained preferential access in some of these rapidly growing markets.

U.S. Dairy Farms – More Productive and Competitive

U.S. milk production has grown 62% between 1980 and 2015 (figure 1). The rate of growth has been higher in recent years than it was during the past. The compound average growth rate (CAGR) for 2004-2015 was 1.8 percent compared to 1.5 percent for 1992-2003 and 1.3 percent for 1980-1991. Dairy cow inventories declined through the 1980s and most of the 1990s and have remained fairly stable since about 1998. Growth in production has been driven by increased milk yields. The net effect has been a significant increase in U.S. milk production.

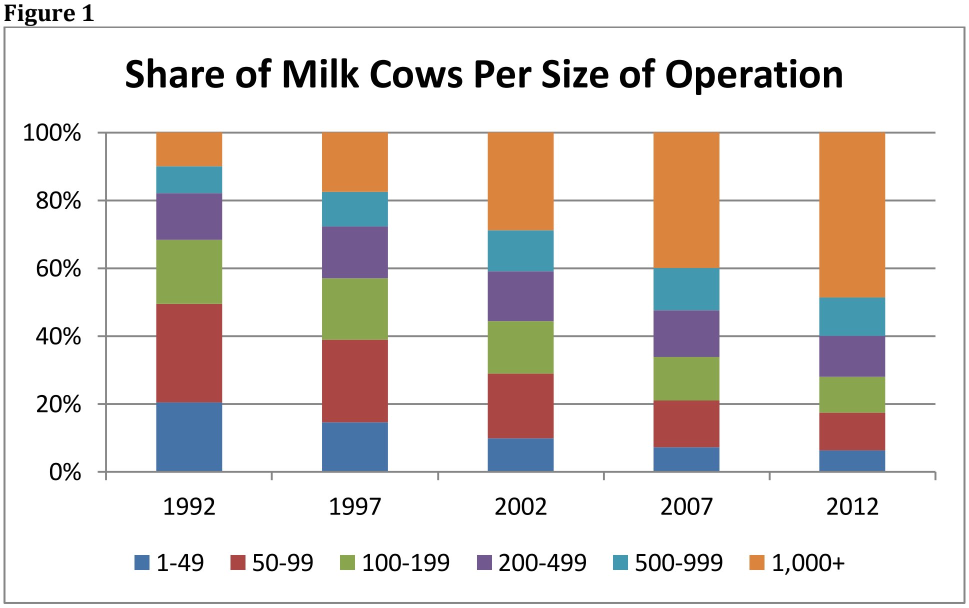
Figure 1



Source: USDA/ERS.

The increase in milk yields and U.S. cost competitiveness can be traced to important structural and policy changes that have taken place over the past two decades. One major shift has been the reduction of milk cow operations in total and the increase in larger, specialized operations. Based on data from the USDA Census of Agriculture, in 1992, nearly half of dairy cows were on farms with fewer than 100 cows while only 10 percent were on farms with over 1,000 cows (figure 2). In contrast, the situation in 2012 was nearly reversed – nearly half of dairy cows are on farms with over 1,000 cows, while less than 20 percent were on farms with less than 100 cows.

Figure 1



Source: USDA Census of Agriculture.

One reason for the shift towards larger dairy farms is that they face relatively lower costs. ERS estimates that for 2015, farms with fewer than 50 cows had average operating costs of $22.59 per hundredweight (cwt), compared to $15.96 per cwt for farms with 1,000 or more head. Adding in allocated overhead costs results in average total costs of $48.30 per cwt for the smaller farms compared to $20.65 per cwt for the largest farms. A recent ERS study[1] found that larger farms were able to lower costs through higher labor productivity and leveraging input price risks through forward contracting and other risk management tools. Moreover, ERS estimates that industry-average costs in 2012 were nearly 20 percent lower than they would have been without the structural changes that have occurred over the past decade and a half. The transition to larger-scale, lower-cost operations is a key reason for U.S. competitiveness in the U.S. and global dairy markets.

Another factor that differentiates U.S. dairy producers from other suppliers is their access to abundant domestic feed supplies. For example, New Zealand employs a pasture-based model that is lower cost but has natural resource limitations (e.g., water, land). These limitations constrain New Zealand's ability to significantly expand production under a pasture-based system. However, if New Zealand moved to a feed-based system in order to expand production, the marginal cost of production could exceed U.S. cost of production.[2]

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[1] MacDonald, James, M., Jerry Cessna, and Roberto Mosheim. "Changing Structure, Financial Risks, and Government Policy for the U.S. Dairy Industry." March 2016.

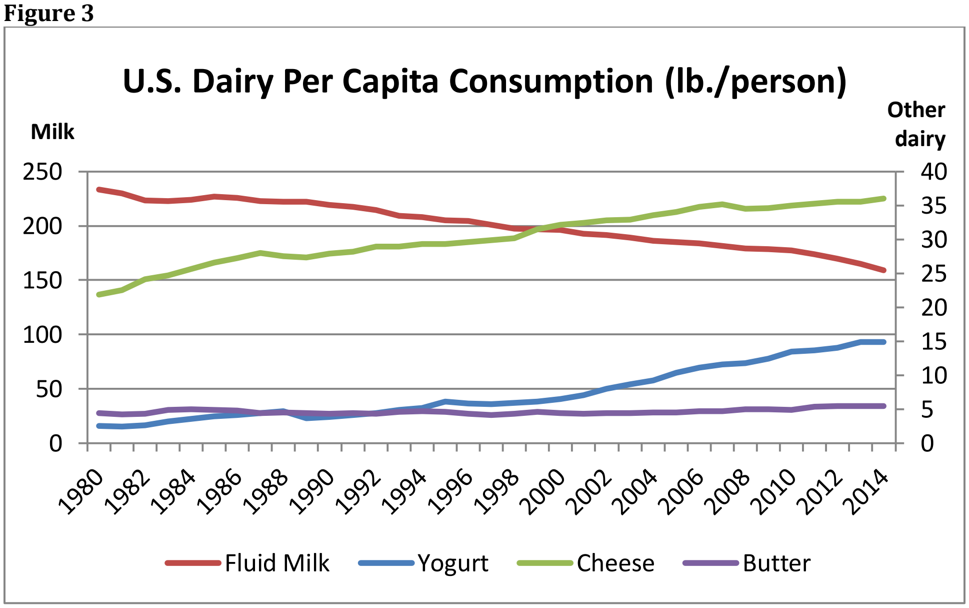
[2] "Dairy Globalization Refresh: 2011 Update." Innovation Center for U.S. Dairy commissioned study, August 2011.

Australia's system moved from pasture-based to a mixed supplemental feeding system during a ten-year period when milk production decreased due to drought. According to the Australian Government, fodder costs per liter of raw milk more than tripled (in nominal terms) from 3.1 cents in 1989-90 to 11.6 cents in 2012-13.[3] Rising labor costs, due to strong competition for skilled workers and restrictive immigration policies, also contributed to higher costs of production. In 2012-13, these feed and labor costs combined accounted for nearly 40 percent of total raw milk production costs.

Growth in U.S. Dairy Consumption Slows and Diversifies

While U.S. dairy supply has increased, growth in domestic consumption of dairy products has slowed. U.S. per capita dairy consumption has matured, and provides less potential for substantial demand growth. Per capita consumption of all dairy products (on a milk-fat basis) grew just 4 percent over the period 2000-14. Fluid milk consumption has been steadily declining since 1980 and USDA estimates that per capita fluid milk consumption was 159 pounds per person in 2014, a 3.7-percent decrease from 2013 (figure 3). While per capita consumption of other dairy products has been growing, total per capita dairy consumption is not expected to show significant growth.

Figure 3



Source: USDA/ERS.

According to USDA research[4], one reason for the decline in fluid milk consumption is that it is consumed less frequently compared to previous periods. Another reason is the availability of other beverages – soft drinks, juice, bottled water – as well as alternative "milk" beverages made from nuts, soybeans, or coconut that have grown in popularity in recent years. The growth in dairy consumption is largely been driven by increased per capita cheese consumption, in particular of natural and Italian-style cheeses. The wide variety and availability of convenience foods that contain cheese, such as frozen pizza, macaroni and cheese, cheese sticks, and pre-packaged cheese slices are one reason for this increase. The growing popularity of certain "cheese-rich" cuisines,

[3] "Relative Costs of Doing Business in Australia: Dairy Product Manufacturing." Productivity Commission Research Report, September 2014.
[4] Bentley, Jeanine. "Trends in U.S. Per Capita Consumption of Dairy Products, 1970-2012." Amber Waves, June 2014.

such as Italian and Mexican foods, is another reason for the growth in U.S. cheese consumption. Butter consumption has also increased, as consumers have increasingly moved from margarine to butter. This shift is in part due to growing concerns with trans fats in margarine, while health concerns with butter have relatively diminished.

The U.S. dairy industry has been well positioned to respond to the growing demand for new types of dairy products through innovation, technological advances, investment, and global business partnerships. Production and consumption of dairy protein products is also on the rise. Food manufacturers continue to find new uses for dairy protein ingredients, such as whey proteins, milk protein concentrates and casein products, in a wide range of processed foods (e.g., bakery, confectionary, nutritional products, infant foods, etc.) as well as animal feeds and pet food.[5] International companies, including Fonterra and Glanbia, have invested in U.S. processing; meanwhile U.S. companies, including Dairy Farmers of America and Leprino, have invested in firms overseas. The U.S. dairy sector is attractive for these types of investment and partnerships because the United States is a large market with dynamic consumer demand and maintains liberal foreign investment policies compared to other high-income markets.[6]

2014 U.S. Dairy Policy Reform Eliminates Price Support and Export Subsidies

Another key factor that contributes to U.S. competitiveness is the evolution of the farm programs away from price support and export subsidies to policies that help producers manage risk and respond to market signals. The 2014 Farm Bill included a major reform of U.S. dairy support policy that further moves the sector to a more market-driven system. Long-standing dairy price supports and export subsidies that often kept U.S. dairy prices above world prices were eliminated, along with a more recent income support measure called the Milk Income Loss Contract (MILC) program.

A new voluntary program, the Margin Protection Program for Dairy Producers (MPP-Dairy), was established to help producers manage risk when dairy prices fall and/or feed prices rise. Producers elect the level of coverage (or margin between milk and feed prices) and if payments are made, they are based on historical production levels. Coverage for the minimum margin level ($4 per cwt) costs $100 per producer and producers can purchase supplemental coverage up to $8 per cwt. Premiums increase if more than 4 million pounds of milk production (equivalent to a herd of about 185 cows) is enrolled in the program. Payment levels are not tied to milk production in the current year, thereby reducing the incentive to increase production to maximize payments. The program is optional and producers can sign up during an open season each year, similar to other insurance products. Once dairy farmers have signed up, they remain in the program at the minimum coverage level ($4 per cwt), with an annual option to "buy up" to a higher level of coverage, for the duration of the program through 2018.

Should the margin between feed and milk prices fall below the coverage level selected by a producer for two consecutive months, the producer is eligible to receive payments. In addition, when margins fall below $4 per cwt, the Dairy Production Donation Program (DPDP) is triggered to purchase dairy products for donation to U.S. food banks and other feeding programs. Purchases are made at market-prices and are time-limited. In recent years, margins have rarely fallen below $4 per cwt. From 2000 through 2015, margins fell below $4 per cwt. in only 10 months (in February-July 2009 and May-August 2012).

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[5] Lagrange, Veronique, Dacia Whitsett, and Cameron Burris. "Global Market for Dairy Proteins," Journal of Food Science, Volume 80, S1, 2015.
[6] Blaney, Donald, et. al. "U.S. Dairy at a Global Crossroads," ERS Report No. ERR-28, November 2006.

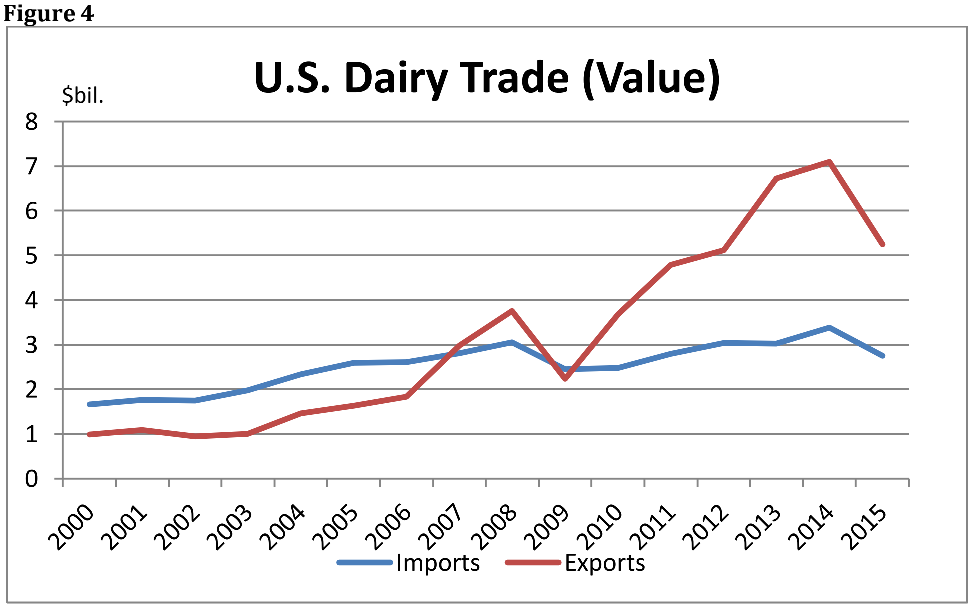
MPP-Dairy is less likely to distort the U.S. dairy market compared to previous policy instruments. It does not provide price support and there is little incentive to produce more milk to increase payments. The coverage is based on historical production and the program is voluntary. The shift to market-based policy tools helps dairy farmers manage risk while avoiding the types of market distortions that price supports and export subsidies create.

U.S. Dairy Trade: From Net Importer to Major Dairy Exporter

The transformation of the U.S. dairy sector from an import-sensitive, high-priced market to a competitive exporter of dairy products and ingredients was driven in part by the aforementioned structural and policy changes. U.S. dairy farms are larger and have lowered costs through economies of scale. Technological advances, innovation, foreign direct investment, and joint ventures have also contributed to this evolution.

The shift in the U.S. dairy trade position is striking. In 2000, U.S. exports of dairy products were valued at $980 million and U.S. imports were $1.7 billion (figure 4).[7] By 2014, U.S. exports reached a record $7.1 billion and imports were $3.4 billion. The U.S. is now the third largest dairy exporter in the world, behind New Zealand and the EU.[8] However, continued growth largely depends on expanding access to global markets and lowering trade barriers, as underscored by the reduction in 2015 exports, which fell by 26 percent to $5.2 billion. Ample world supplies, bolstered by the removal of milk production quotas in the EU, faced reduced import demand in China and other major importers in 2015. Russia's ban on EU dairy products diverted these products into other markets. The strongest U.S. dollar in 13 years also had a negative impact on U.S. competitiveness. The U.S. dollar gained 11-15 percent against the currencies of Australia, New Zealand, and the EU.[9]

Figure 4

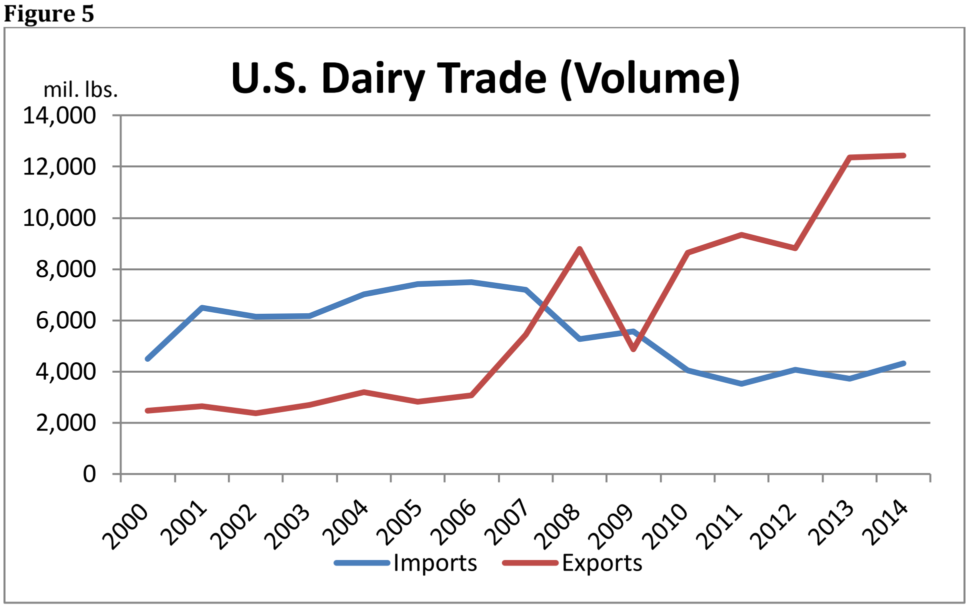


Source: USDA.

[7] All trade data is in nominal terms.
[8] The U.S. is the second largest dairy exporter if the EU is not considered as a single exporter.
[9] U.S. Dairy Export Council. "The Global Dairy Situation in 7 Charts," http://blog.usdec.org/usdairyexporter/the-dairy-downturn-explained-in-7-revealing-charts/ Accessed on July 11, 2016.

While U.S. dairy imports have increased in value terms, from $1.6 billion in 2000 to $2.8 billion 2015, the volume of dairy imports (on a milk-fat milk-equivalent basis) was about the same: 4.5 billion pounds in 2000 compared to 4.3 billion pounds in 2014 (figure 5).[10] While imports rose (in volume terms) during the early 2000 period, they have generally declined since 2007. So, an increase in the value of imports has not meant an increase in the volume of dairy imports on a milk-fat milk-equivalent basis.

Figure 5



Source: USDA.

U.S. imports of some dairy products are constrained by high tariffs outside of tariff-rate quotas (TRQs). However, in recent years these TRQs have not filled for certain products, in particular, skim milk powder. For those TRQs established under the WTO, the simple average quota fill for 2009-15 was around 60 percent for cheese and less than 5 percent for skim milk powder. Butter TRQ fill was higher, at 80 percent for this period. Moreover, additional access provided through recent FTAs has not resulted in a substantial increase in U.S. dairy imports, as will be discussed in the section on trade agreements. The increase in U.S. milk production has helped feed the U.S. domestic demand for cheese, butter, and other milk fats. The resulting quantity of milk solids has exceeded U.S. demand and helped fuel the increase in U.S. exports of those products. Growing global demand and U.S. policy reform also contributed to the growth in U.S. dairy exports.

It is also helpful to look at how U.S. TRQs for dairy products were established during the Uruguay Round in 1995. Table 1 presents the U.S. initial TRQ bindings in 1995. While these quotas grew slightly during the implementation period, they have been bound since 2000. As a result, the share of this market access opening compared to U.S. domestic use has been declining. For example, the TRQs for cheese, if fully used in 1995, had the potential to amount to 4 percent of domestic use. However, due to the growth in cheese consumption, the share of the WTO cheese TRQ relative to domestic use had been reduced to 2.7 percent by 2015. Given baseline projections for further growth in the domestic cheese market, this access, as a share of domestic use, will continue to

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[10] USDA/ERS database. Milk: Supply and utilization of all dairy products on a milk-fat-milk-equivalent basis, 1970-2014.

decline. In fact, U.S. cheese TRQs would need to be increased by 75,000 metric tons to have the same proportional access to domestic use as in 1995. For whole milk powder (WMP) and skimmed milk powder (SMP), there is little difference since domestic use has either increased modestly or in the case of WMP, declined.[11]

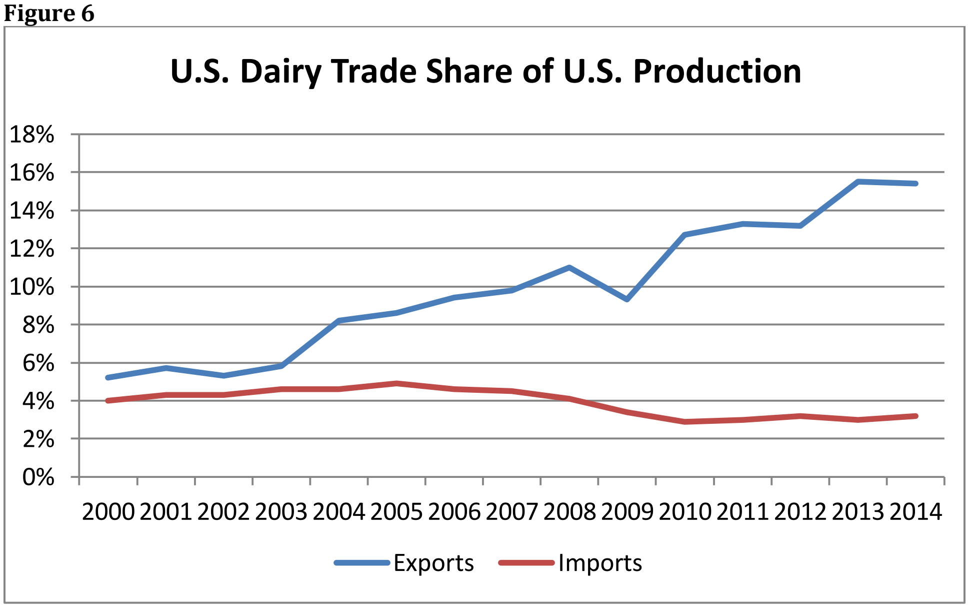
Table 1: U.S. WTO TRQ Commitments as a Share of Domestic Use

	WTO Initial TRQ (1,000 MT)	Domestic Use in 1995 (1,000 MT)	% of Domestic Use	Domestic Use in 2000 (1,000 MT)	% of Domestic Use	Domestic Use in 2015 (1,000 MT)	% of Domestic Use
Cheese	135.6	3,274	4.1%	3,817	3.6%	5,105	2.7%
Butter	6.9	538	1.3%	581	1.2%	843	0.8%
SMP	5.3	415	1.3%	345	1.5%	461	1.2%
WMP	3.3	50	6.6%	39	8.5%	44	7.5%

Source for domestic use: USDA Production, Supply, and Demand (PSD) estimates.

Dairy exports are clearly important for the economic wellbeing of the U.S. dairy sector. According to the U.S. Dairy Export Council (USDEC), the share of U.S. dairy exports as a percent of U.S. milk production[12] has tripled from 5.2 percent in 2000 to 15.4 percent in 2014 (figure 6). USDEC estimates that this share was closer to14 percent in 2015, reflecting lower exports. On the other hand, U.S. dairy imports as a share of milk production have declined – 4 percent in 2000 compared to 3.2 percent in 2014. Exports as a share of U.S. production of major dairy products – butter, cheese, skim milk powder have also grown; while U.S. imports as a share of total consumption have remained flat or declined (figures 7-9).

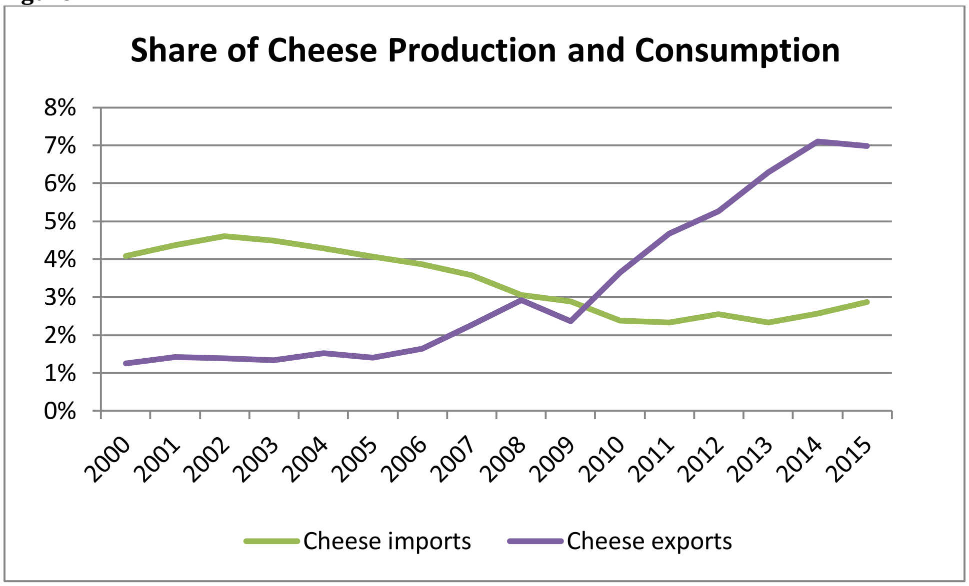
Figure 6



Source: USDEC. Calculated on a total milk solids basis (TSB).

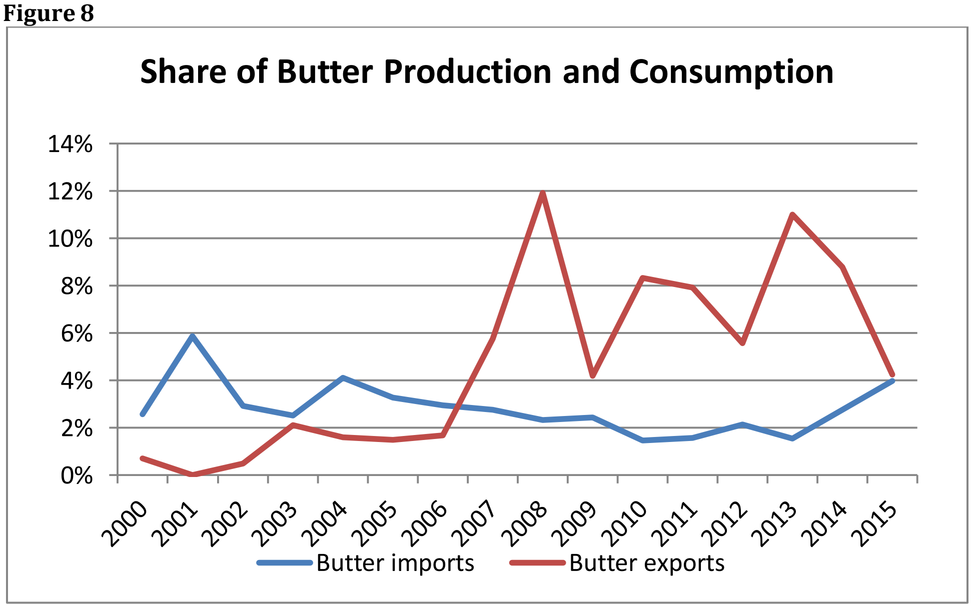
[11]One reason for lower U.S. WMP consumption is the transfer of U.S. confectionary manufacturing to other countries, such as Mexico, for access to lower-priced inputs.
[12] Total milk solids basis.

Figure 7



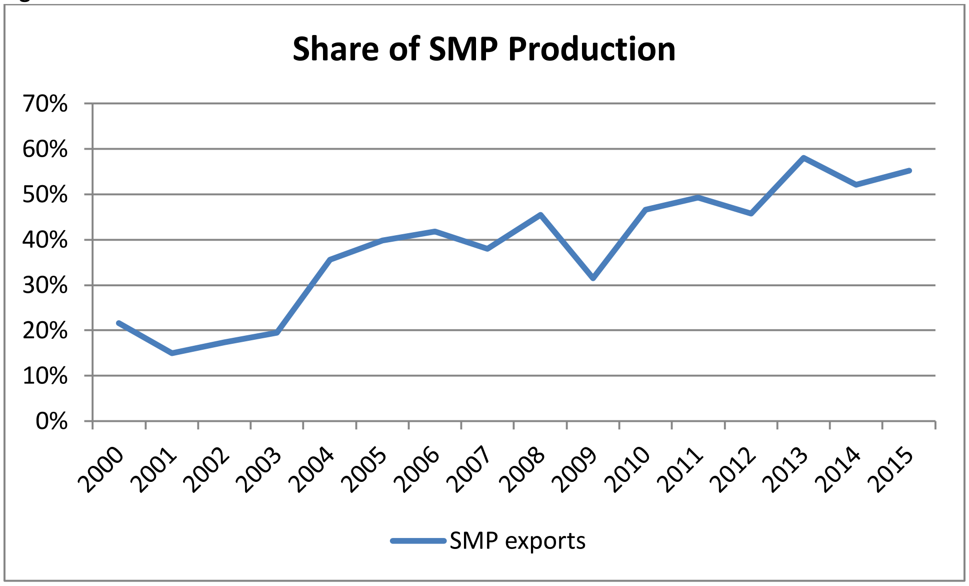
Source: USDA.

Figure 8



Source: USDA.

Figure 9



Source: USDA. U.S. imports of SMP as a share of U.S. consumption are negligible.

U.S. dairy exports are also important to the broader U.S. economy. It is estimated that at the primary (milk) production level, each dollar of U.S. dairy exports generates nearly $3 in additional economic output. Around 20,000 jobs are generated per $1 billion in dairy exports.[13] At the manufacturing level, U.S. dairy exports generate nearly $4 in additional economic activity per $1 of exports and support around 3,200 jobs per $1 billion of exports.[14]

Long-term U.S. Dairy Projections Underscore Importance of Opening Global Markets

USDA projects[15] continued increases in U.S. milk production and milk per cow yields. Milk production is forecast to increase from 206 billion pounds in 2014 to 256.2 billion pounds in 2025, or an increase of nearly 25 percent. The long-term upward trend in yields continues and projected favorable returns to dairy producers – the result of strong domestic and export demand combined with an expected recovery in milk prices and moderate growth in feed costs – encourage a slight expansion of cow inventories after 2020.

USDA projects a steady increase in U.S. dairy exports over the forecast period, reaching record levels on both a milkfat (13.6 billion pounds) and a skim-solids basis (53.4 billion pounds) in 2025. On a skim-solids basis, this reflects an increase of nearly 40 percent from the 2014 levels. USDA notes that production increases in other major dairy exporting countries are projected to lag compared to the growth in global import demand.

The trade projections are based on the market access parameters in place as of November 2015 and do not reflect gains that could occur if trade barriers are further reduced. Export growth is the key driver behind the forecast for increased U.S. milk production. Therefore, opening up new markets is critical to the continued growth of the U.S. dairy sector.

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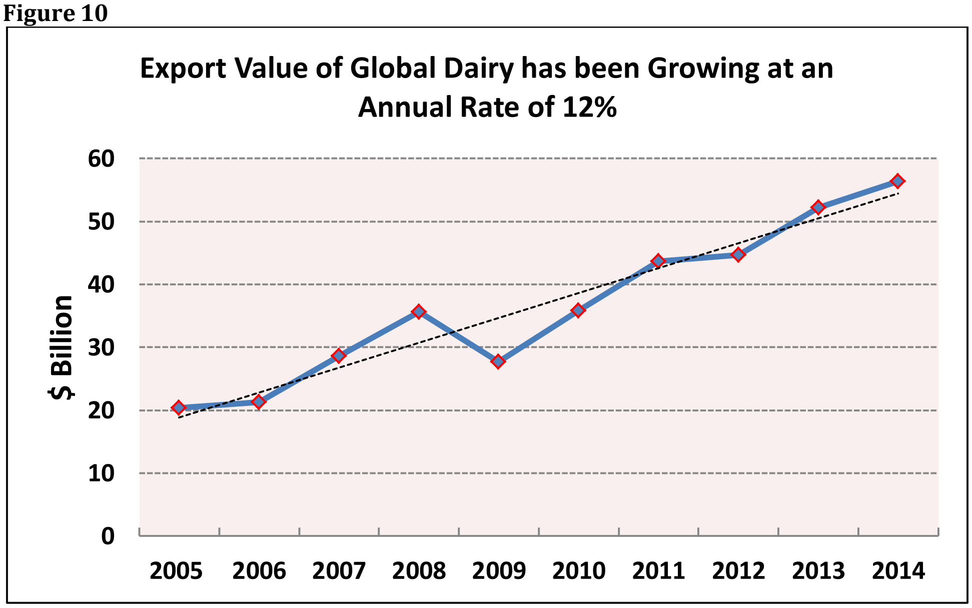
[13] These data come from the Agricultural Trade Multipliers app on the ERS website. See http://www.ers.usda.gov/data-products/agricultural-trade-multipliers.aspx. Accessed on July 11, 2016.
[14] Ibid.
[15] This section is derived from the USDA Long-term Projections to 2025 report (OCE2016-1), February 2016.

World Dairy Market

The U.S. is Competitive with Other Major Dairy Exporters

During the past decade, global dairy exports have been growing at a rapid pace averaging around 12 percent (CAGR) annually to reach a market value of approximately $56.4 billion in 2014 (figure 10).

Figure 10



Source: Global Trade Information Services (GTIS).

International dairy trade has traditionally been dominated by four exporters, the EU-28, New Zealand, the United States, and Australia (table 2). Typically, these four countries account for around 75 percent of the value of all dairy products traded, with Argentina the next largest exporter. However, as the U.S. has become a larger net dairy exporter, there has been striking shift in world market shares. The U.S. share grew from 4 percent in 2000 to 14 percent in 2014 while Australia's share and to a lesser extent, the EU's share, have declined (figure 11).

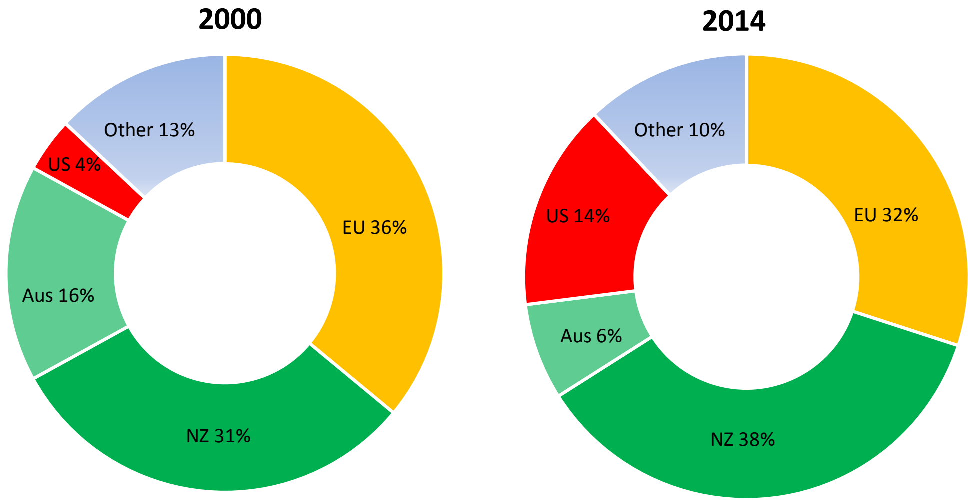
Table 2: 2015 Dairy Exports

	Whole Milk Powder	Skim Milk Powder	Cheese	Butter
	1,000 metric tons			
New Zealand	1,360	410	325	530
EU-28	390	705	700	190
U.S.	16	563	315	22
Australia	70	200	170	45
Argentina	128	30	45	10

Source: USDA, Production, Supply, and Distribution (PSD)

Figure 11

Dairy Exporter Global Market Shares, Milk Equivalent Basis



Source: Australian Dairy Corporation.

New Zealand, Australia, and Argentina rely on pastoral systems, which are highly cost competitive. However, they can be susceptible to weather extremes, particularly drought, which affects their ability to be consistent suppliers in a growing global market. For example, Australian milk production peaked in 2002 at 11.6 million tons and has yet to recover due to the financial toll from long periods of drought. Australia's milk production during the past 3 years (2013-15) averaged 9.6 million tons.

A further disadvantage of these extensive pastoral systems is that expansion requires more land which carries an increasing premium as the supply of available land is reduced.[16] According to USDEC, milk production gains in New Zealand have largely been driven by farm conversions and increased inventories.[17] Future growth would require more intensive methods – such as significantly higher supplemental feed use – which will raise production costs. In contrast, the U.S. relies largely on a higher cost intensive feed-lot system that is much less susceptible to weather extremes and benefits from an abundant domestic supply of feed inputs. And as discussed previously, the marginal cost for the U.S. to expand production is expected to be lower than that for a pasture-based system such as New Zealand. This factor, along with resource constraints, limits New Zealand's ability to greatly expand output to meet growing global dairy demand.[18]

The EU is generally considered the highest cost dairy producer among major exporters. However, it remains a formidable competitor and recent policy reforms will allow the EU's lowest cost producers to increase their output relative to higher cost producers, which could lower the overall average EU milk cost of production. EU farms are significantly smaller compared to U.S. dairy farms

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[16] According to one article, agricultural land values in New Zealand rose from $5,000 to $35,000 per hectare during 1990 to 2009, a seven-fold increase. This was driven by the expansion of New Zealand milk production in response to high prices. See "What is our role as a major dairy exporter," Hoard's Dairyman website. http://www.hoards.com/DE-DP/US-role-major-dairy-exporter
[17] "Market Update: New Zealand," USDEC Export Profile, Vol. 24, No. 1, May 2013.
[18] "Dairy Globalization Refresh: 2011 Update," Report Commissioned by Dairy management Inc. and the U.S. Dairy Export Council, August 2011, p. 13.

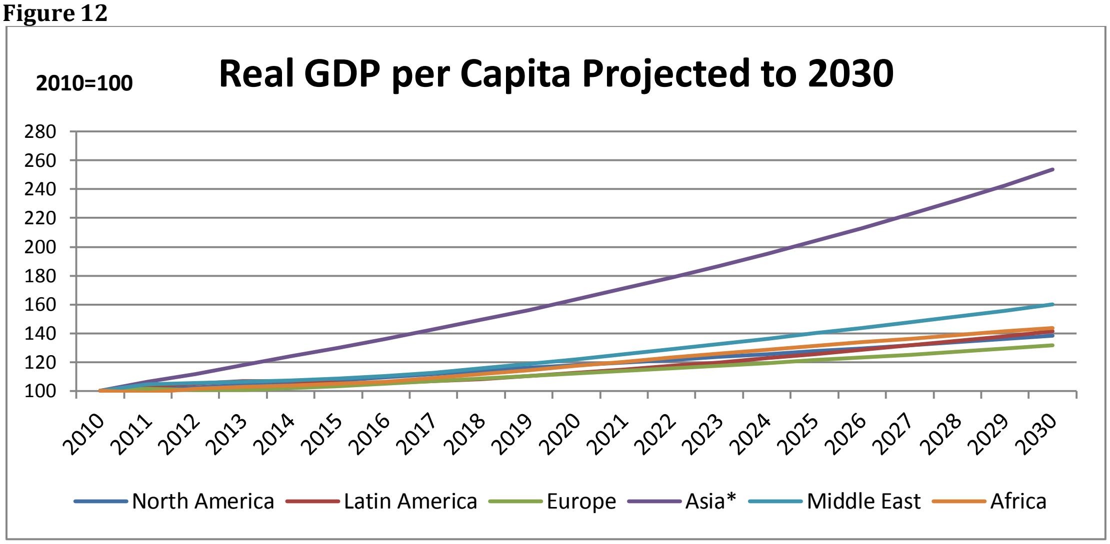
and the milk production in northern Europe relies on pasture as well as winter confinement systems. The EU's leading export commodity is cheese. Like the U.S., the EU also has the advantage of having a substantial domestic market for highly valued dairy products which allows it to sell lower valued bulk commodities, such as WMP and SMP at competitive prices.

A consistent series of cost of production data for global dairy producers is difficult to assemble. The International Farm Comparison Network (IFCN) has published some data that provides insights into how U.S. producers compare to those in other exporting countries. According to the IFCN[19], in 2012, the U.S. cost of production was around $18 per cwt. This compares to New Zealand ($16 per cwt) and a world average of $21 per cwt. Japan and Canada have much higher costs of production, estimated at over $45 per cwt and $27 per cwt, respectively. China has also seen rising costs, particularly for feed and labor, and IFCN estimates that the cost of production at a representative Chinese farm is 50 percent higher than that of the United States.

New Opportunities in the Global Dairy Market

Dairy products are generally not treated as staple products in many developing countries; consequently, import demand is less dependent on population growth and more reliant on per capita income growth. There are exceptions, such as Mexico and Algeria where parastatals purchase substantial dairy volumes of milk powder for use in low income social programs. As a result, the import demand for dairy products has been most pronounced in regions such as Asia where there has been a substantial rise in domestic per capita income. For the future, income growth in Asia is expected to far surpass the world rate and that of other regions (figure 12).

Figure 12



Source: USDA/ERS macroeconomic database. *Asia excluding Japan and Oceania.

China is a prime example of dairy import demand being driven by per capita income. In the span of 10 years, China has experienced an extraordinary population shift from rural to urban centers. This led to the creation of a middle income social class which started to consume an increasing amount and variety of value-added, processed foods. In 2005, real per capita GDP (in 2010 dollars) in China was $2,720, and had doubled by 2014 to $6,050 per capita.[20] From 2015-30, China's per capita

[19]IFCN, "Overview on milk prices and production costs world wide." (2013). The IFCN reports data in $ per 100 per kg. For the U.S. audience, we have converted this to $ per cwt.
[20] ERS/USDA. Historical GDP per Capita database.

income is expected to grow by 5-6 percent annually.[21] As a result, it has become the single largest market[22] for dairy imports as domestic supplies have not kept pace with demand. Moreover, quality and food safety problems contributed to this surge in imports, which was led by whole milk powder from New Zealand. China is currently a WMP market, given that Chinese production is also based on WMP. However, this could change as Chinese processors start to diversify their production. Such a shift might lead China to import protein and fat separately (ie., SMP and butter/anhydrous milk fat (AMF)).

China is not the only Asian market experiencing rapid per capita income growth and increased demand for dairy products. Dairy consumption in Southeast Asia – Indonesia, Malaysia, the Philippines, Thailand, and Vietnam – has been increasing and is projected to continue to grow through the next decade (table 3). While domestic production in this region is also expected to increase, the OECD/FAO projections continue to show growth in Asia and Pacific region imports to meet this increased demand (table 4).

Table 3: Projected Annual Change (in Percent) in Per Capita Consumption of Dairy Products, 2015-25

	Butter	WMP	SMP	Cheese
China	2.42	3.47	6.72	4.17
Indonesia	1.66	2.06	1.66	1.67
Malaysia	1.13	0.20	0.03	1.12
Vietnam	2.29	3.88	3.43	2.26
Philippines	2.14	2.89	1.70	2.24
Thailand	1.11	0.78	0.65	2.31

Source: OECD-FAO Agricultural Outlook 2016.

Table 4: Projected Annual Change (in Percent) in Imports of Dairy Products, 2015-25

	Butter	WMP	SMP	Cheese
China	5.05	3.73	7.04	7.28
Indonesia	2.76	4.08	3.14	2.65
Malaysia	1.46	0.81	0.61	2.46
Vietnam	3.29	4.17	4.44	3.27
Philippines	3.71	1.58	3.32	3.93
Thailand	1.09	0.80	0.74	3.54

Source: OECD-FAO Agricultural Outlook 2016.

Rapid economic growth is giving consumers in Southeast Asia the ability to purchase a wider range of agricultural products, particularly higher-value products. During the next decade, Southeast Asia is forecast to experience much stronger economic growth than the global average, which will further support the emergence of a strong middle class. In tandem with a high rate of urbanization, retail food sales are expected to increase by 60 percent in the next decade, compared to just 37 percent globally.[23] Increasing investment in the food processing and food service sectors, spurred

[21] ERS/USDA. Projected Real GDP Per Capita for Baseline Countries/Regions (in 2010 dollars).
[22] China's position as the top global importer underscores the importance of opening up more markets and increasing the number of trading partners to reduce the potential shock from a trade disruption in China (or Russia), as was the case in 2015.
[23] USDA/Foreign Agricultural Service. "Southeast Asia: A Fast Growing Market for U.S. Agricultural Products," November 2014.

by lower trade barriers and growing consumer incomes, is another driver of U.S. dairy exports to the region.[24]

U.S. dairy exporters have already recognized the tremendous market growth potential in Southeast Asia, which has become the third largest U.S. dairy export market valued at $1.3 billion in 2014, or nearly 20 percent of total U.S. dairy exports. Four of the top ten U.S. markets for dairy products are in this region: Philippines, Vietnam, Indonesia and Malaysia. U.S. dairy exports to Vietnam have nearly doubled between 2010 and 2014 ($157.4 million to $263.7 million), making it the eighth largest country market for U.S. dairy. U.S. dairy exports to Malaysia saw similar growth during this period ($94.3 million to $181.4 million). In both markets, nonfat dried milk, whey, and lactose are the top U.S. exports. However, the U.S. has exported a broad range of products – including ice cream, cheese, butter, and buttermilk. While U.S. exports to this region fell in 2015, as they did worldwide, the market is still an important one given the strong import demand forecast.

However, the U.S. faces stiff competition in this region from other major dairy exporters. New Zealand, Australia, and the EU are also reorienting exports to Southeast Asian dairy markets and have concluded or are negotiating FTAs that could disadvantage U.S. dairy. This is one reason why free trade agreements, such as the Trans-Pacific Partnership (TPP) are important for U.S. dairy. Without these agreements, U.S. dairy exports will be disadvantaged in those emerging markets.

For example, the EU has completed FTA negotiations with over 30 countries and is increasingly focused on Asia: Japan, ASEAN, Malaysia, China, and Vietnam are among the Asian countries with which the EU has entered into negotiations. Not only is the EU seeking preferential access but also use those negotiations to lock in restrictive rules on the use of geographical indications (GIs) like they did with Canada and other U.S. FTA trading partners, such as South Korea. Those agreements are detrimental to U.S. cheese producers because they restrict the use of common food names, such as "parmesan" and "feta." Australia and New Zealand have concluded FTAs with China and Korea, in addition to the agreement with the ASEAN block (which includes Vietnam and Malaysia). Australia and Japan have already concluded a bilateral agreement that includes new openings for Australian dairy exports.[25]

Free Trade Agreements and Trade Liberalization Matter for U.S. Dairy

Recent free trade agreements have been a major boon to U.S. dairy exports. USDEC/NMPF analysis suggests that trade generated by these FTAs helped bring an additional $8.3 billion to the U.S. dairy industry from 2004-12.[26] According to their analysis, FTAs contributed to higher U.S. milk prices -- on average $0.34 per cwt -- and led to an additional $7,560 for the American dairy farmer over the ten-year period. Looking at two of the most recent U.S. FTAs with South Korea and with Colombia, USDEC noted that U.S. dairy exports (in value terms) to South Korea nearly doubled (86 percent),

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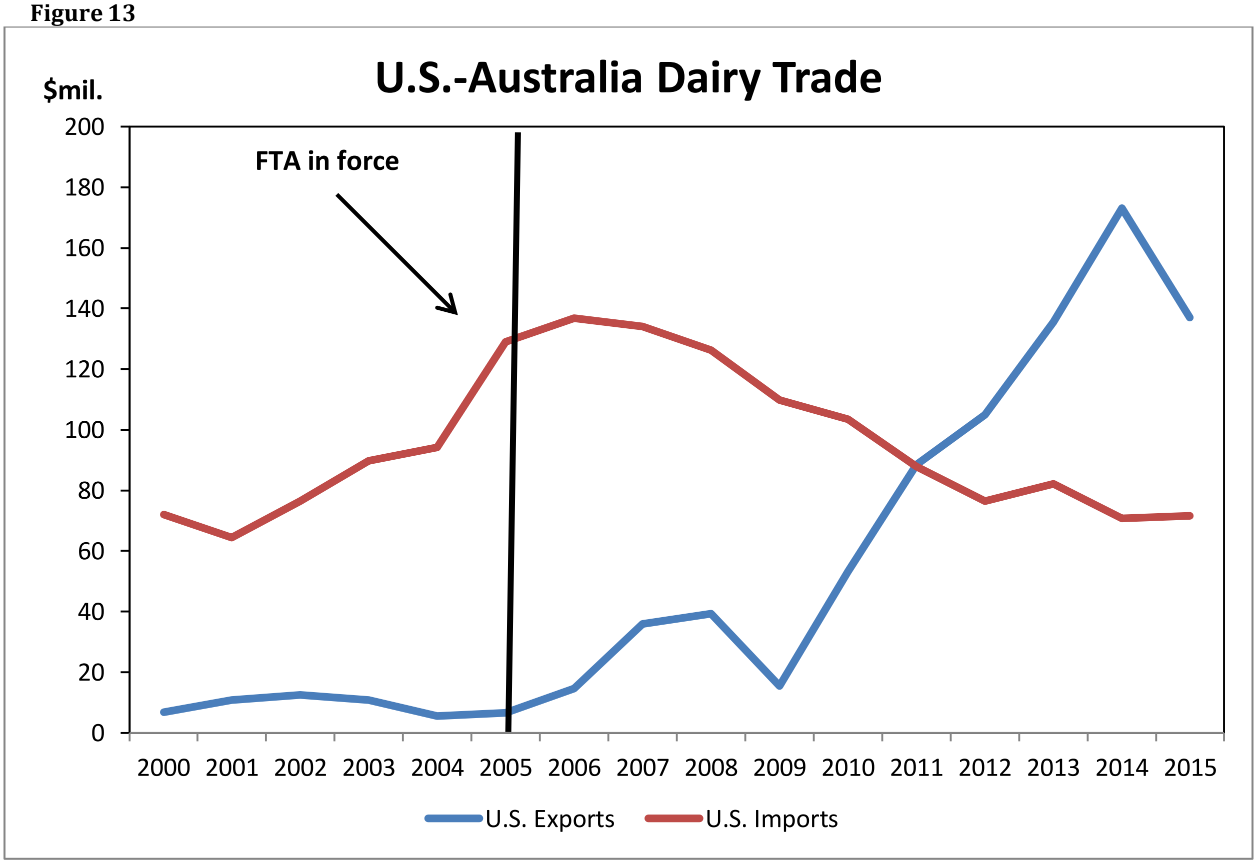
[24] USDEC. "Six Growth Drivers for U.S. Dairy in Southeast Asia," April 17, 2015. U.S. Dairy Exporter Blog.
[25] The Japan-Australia Economic Partnership Agreement (JAPEA) also provides Australia with preferential access to the Japanese beef market. ERS found that Australian beef exports to Japan increase by more than $100 million per year as a result of the JAPEA, while U.S. beef exports to Japan fell by about the same amount. If the U.S. gains equivalent access as Australia, U.S. exports increase by about $130 million a year. This underscores the importance of using FTAs such as TPP to remedy this type of competitive disadvantage for U.S. agricultural exports. See Muhammad, Andrew, Kari Heerman, Alex Melton, and John Dyck, "Tariff Reforms and the Competitive of U.S. Beef in Japan." January 2016.
[26] USDEC. "Study: Free Trade Agreements Helped Bring $8.3 Billion to U.S. Dairy Over 10 Years," The U.S. Dairy Exporter Blog, January 26, 2016.

while sales to Colombia grew six-fold between 2011 and 2014. This growth rate was far above that of total global U.S. dairy exports, which grew by about 50 percent during this period.

Under the U.S.-Central American Dominican Republic FTA (CAFTA-DR), the U.S. dairy market was opened at the same speed as for the CAFTA-DR countries, with immediate access largely afforded under TRQs. U.S. exports to those countries were $68 million in 2005, increasing to $202 million in 2014. U.S. imports from the CAFTA-DR countries were $12.4 million in 2005 and $24.9 million in 2014.

The results of Australia FTA for dairy are noteworthy, particularly given initial domestic concerns with providing additional dairy market access to Australia. In 2004, the year before implementation of the agreement, U.S. dairy imports from Australia were $94 million, and U.S. dairy exports to Australia were $5.6 million (figure 13). In 2014, Australia's exports to the United States fell to $69 million, despite the new market opening afforded Australia, while U.S. dairy exports to Australia had grown to $173 million. Australia now ranks as the 4th largest market for U.S. cheese exports. While U.S. dairy exports to Australia fell in 2015, there was still a positive trade balance, as U.S. imports of Australian dairy products remained flat.

Figure 13



Source: USDA.

The U.S. FTA with Mexico has been one of the biggest success stories for U.S. dairy. While the North American Free Trade Agreement (NAFTA) is a trilateral agreement between the U.S., Canada, and Mexico, the market access commitments are bilateral: U.S.-Canada, U.S.-Mexico, and Canada-Mexico. Unlike the Canada agreements, the U.S-Mexico agreement provided for full liberalization of dairy trade between the two countries. Mexico has become the top market for U.S. dairy exports, which have grown nearly six fold from 1993 (the year prior to implementation) to $1.6 billion in 2014. The agreement also addressed Mexico's import permit requirements, thus eliminating a major trade barrier.[27] Trade liberalization enabled U.S. dairy producers to respond to rising Mexican demand for milk powder and other dairy products. USDEC notes that while SMP accounted for 47 percent of total U.S. dairy exports to Mexico, the majority of the product portfolio is fairly diverse.[28]

U.S. FTAs have also provided for preferential TRQ access into the U.S. market.[29] In aggregate[30], these agreements provided additional TRQ access for approximately 2,800 metric tons of butter, 7,500 metric tons of dried milk/powder, and 35,000 metric tons of cheese in 2015. Quota fill for these FTA TRQs in 2015 was around 60% for butter, 9% for powder/dried milk, and 19% for cheese.

Starting in 2015, Chile's dairy exports to the U.S. are fully liberalized. Dairy imports from Chile increased in 2015 to around $40 million, compared to $21 million in 2014. Dairy preparations and sweetened milk/cream were the primary products imported, followed by butter and other fats/oils.

Gains from Further Trade Liberalization – the Trans-Pacific Partnership (TPP) Agreement

Overview

All of the quantitative research performed thus far indicates that the TPP Agreement is a net positive for U.S. dairy (table 5). The American Farm Bureau Federation (AFBF) found that by participating in the TPP, net U.S. dairy exports could grow by $131.2 million a year, compared to non-participation in the agreement.[31] The Office of the Chief Economist (OCE) partnered with economists at the University of Missouri – FAPRI-MU and Virginia Tech's Center for Agricultural Trade (VT-CAT) to examine potential trade effects from the agreement. This analysis, which is detailed in the next section, projects annual growth in U.S. dairy exports of $150-275 million due to TPP, compared to each model's baseline projections. While the U.S. will also provide additional market access, U.S. imports are only projected to grow by $38-97 million above the baselines, reflecting U.S. competitiveness for many dairy products. The OCE – VT-CAT analysis also considered different scenarios and assumptions to help validate the results.

In May, the U.S. International Trade Commission (USITC) issued its report on the likely economic effects of the TPP agreement, in accordance with the Bipartisan Trade Priorities and Accountability

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[27] USDA/ERS. "NAFTA at 20: North America's Free-Trade Area and Its Impact on Agriculture," WRS-15-10.
[28] USDEC. "How Free Trade Agreements Ignited U.S. Dairy Exports to 6 Countries," The U.S. Dairy Exporter Blog, January 28, 2016.
[29] Canada received TRQ allocations as part of the U.S.'s WTO commitments, but dairy was excluded from the U.S.-Canadian FTA.
[30] These estimates were derived from the FAS publication "Dairy Monthly Imports (FD MI 01-16) and the Customs and Border Protection (CBP) end-year quota report.
https://www.cbp.gov/sites/default/files/documents/QuotaReport12312015_194357_0.pdf
Some preferential dairy TRQ categories span a number of different products, making disaggregation of the TRQ amount difficult to ascertain. Therefore, these estimates do not include products that are captured in those "other" categories.
[31] American Farm Bureau Federation. "Comments Regarding Effects of Trans-Pacific Partnership on the United States Agricultural Sector." http://www.fb.org/issues/tpp/pdf/TPP%20Full%20Report.pdf

Act of 2015.[32] The USITC study projected that by 2032, when TPP is fully implemented, U.S. dairy exports would increase by $1.8 billion, or 18 percent, compared to the baseline. U.S dairy imports were estimated at $348.6 million, or 10.3 percent above the baseline.

Table 5: Summary of TPP Dairy Analysis Results, Value, $million

	Total U.S. Exports	Total U.S. Imports
OCE FAPRI-MU (2024) – All countries	$150.3	$97.3
OCE VT-CAT (2026) – TPP countries only*	$275.3	$38.0
AFBF (full implementation) – Net exports	$131.2	na
USITC (2032 – full implementation) – Total Trade	$1,845.5	$348.6

*U.S. dairy exports and imports to/from all countries are projected to be $262.5 million and $42.3 million, respectively, compared to the baseline.

What explains the difference between the predicted USITC trade results and the AFBF and OCE analysis? First, the USTIC used a dynamic computable general equilibrium (CGE) model to determine the impact of TPP relative to a baseline projection that does not include TPP. The Farm Bureau and OCE analysis is based on partial equilibrium (PE) models, which do not account for economy-wide and cross-commodity effects the way a CGE model does. Second, the USITC model captured trade in **all** dairy products, including all dairy products in Chapter 4 of the Harmonized System, as well as processed products such as lactose (Chapter 17), infant formula (Chapter 19), ice cream (Chapter 21), casein and caseinates, and milk albumin (Chapter 35). The Farm Bureau and OCE analysis focus on key traded dairy products: butter, cheese, milk powders, and whey (the VT-CAT model also covered fluid milk). Finally, the OCE analysis utilizes baseline models that forecast out to 2024 (FAPRI-MU model) and 2026 (Virginia Tech model), which means that the agreement will not have been fully implemented. The USITC model assumes full implementation in 2032. Some of the most significant increases in access in TPP occur beyond the time horizons of the FAPRI-MU and Virginia Tech models.

Agricultural Provisions in the TPP – Focus on Dairy Products[33]

The agreement provides significant, new opportunities for U.S. food and agricultural exports to TPP through the elimination of nearly all tariffs and the expansion of preferential tariff-rate quotas (TRQs). The TPP also strengthens sanitary and phytosanitary (SPS) rules that will improve transparency and foster greater public input into the development of these measures. Moreover, it is the first U.S. FTA to include consultation and dispute settlement mechanisms to resolve SPS issues in a timely manner. The TPP also strengthens due process and transparency for the use of geographic indications (GIs), a critical issue for U.S. dairy producers.[34] The TPP agreement breaks new ground through provisions that encourage the recognition of equivalency of organic standards and enhance procedural transparency and timely approvals for biotech products.

[32] U.S. International Trade Commission. "Trans-Pacific Partnership Agreement: Likely Impact of the U.S. Economy and on Specific Industry Sectors." May 2016. https://www.usitc.gov/publications/332/pub4607.pdf

[33] For a more detailed discussion of the dairy market access package and other TPP provisions, visit the FAS website: http://www.fas.usda.gov/topics/trans-pacific-partnership-tpp.

[34] As previously noted, the EU has used geographical indications (GIs) to restrict the use of generic terms for cheese (and some livestock products) to a particular geographic area.

Specific dairy market access provisions are summarized below.

Japan

- Japan has generally excluded dairy from its FTAs. One exception is the FTA with Australia, in which Japan provided preferential access for some dairy products.
- TPP will eliminate tariffs for many products - certain cheeses, whey, lactose, lactose syrup, milk albumin, whey protein, whipped cream, frozen yogurt, and various dairy- and cocoa-containing products.
- There will be a substantial reduction (50 to 90 percent) of tariffs on ice cream, yogurt, blue cheese, and WMP, which will range from 3 to 10 percent once the agreement is implemented.
- Japan will create new TRQs and reduced tariffs for butter, milk powder, and evaporated and condensed milk.

Vietnam

- All of Vietnam's dairy tariffs will be eliminated over 5 years. Tariffs on cheese, milk powder, and whey will be eliminated immediately.

Malaysia

- Nearly all of Malaysia's dairy tariffs will be eliminated immediately.
- Three TRQs for fluid milk imports will be created during a 16-year transition period. The in-quota rate is zero. After year 16, the TRQ will be removed and imports will be duty- and quota-free.

Canada

- Canada will eliminate its 208-percent tariff on whey powder over 10 years, with a transitional TRQ and a zero in-quota rate.
- The 55-percent tariff on margarine will be eliminated over five years.
- For all other dairy products, new TRQs will be created. The in-quota rate will be zero, and the quantities will grow for 13-19 years before reaching maximum levels.
- Canada reserved significant portions of the butter, fluid milk, cheese, and yogurt TRQs for processing use.

Other TPP Countries

- Complete duty-free access for all dairy products to Australia, New Zealand, Brunei, Chile, Mexico, Peru, and Singapore. New access into New Zealand and Brunei will be duty-free immediately.

United States

- The U.S. will eliminate tariffs on dairy products from Vietnam, Malaysia, and Brunei within 10 years, and from Japan within 20 years.
- For Canada, the tariff on high-value artisanal cheese will be eliminated over 10 years. New TRQs will be established for other dairy products, similar to those that Canada has provided. The U.S. will reserve 55 percent of the cheese TRQ and 85 percent of the butter TRQ for products in non-retail-sized packages.
- For Australia, tariffs on infant formula and ice cream will be phased out over 15 years; swiss cheese tariffs will be eliminated over 20 years. Milk powder tariffs will be phased out over

30 years with safeguards that remain in place for 35 years. The TRQs established in the U.S.-Australia FTA will be consolidated into new, perpetual TRQs under the TPP agreement.

- Tariffs on infant formula and ice cream from New Zealand will be eliminated over 10 years, while tariffs on a single tariff line for miscellaneous cheese and for skim milk powder will be phased out over 20 years, with a 25-year, quantity based safeguard for the cheese tariff line. Whole milk powder tariffs will be eliminated over 30 years, with a 35-year quantity safeguard. For other dairy products, new TRQs are created with perpetual growth in the TRQ volume.

Quantitative Results

OCE worked with economists from Virginia Tech's Center for Agricultural Trade (VT-CAT) and the Food and Agricultural Policy Research Institute at the University of Missouri (FAPRI-MU) to estimate the quantitative impact on U.S. exports and imports of primary dairy products resulting from implementation of the TPP agreement. Both models assumed implementation in 2018. The FAPRI-MU model projects out to 2024, while the VT-CAT model provides projections for 3 years (2018), 6 years (2021), and 9 years (2026). The TPP results are based on different baseline models and are therefore not directly comparable, but do provide a general range with which to analyze trade impacts from TPP implementation.

Given that these are partial equilibrium models, the results only reflect changes to dairy markets based on the TPP market access provisions for tariffs and TRQs for dairy products. They do not reflect changes to any other sectors (agricultural or economy-wide), either in response to TPP dairy provisions or the TPP agreement as a whole. In other words, all other economic factors are held constant. As discussed below, dairy markets are complex and certain assumptions had to be made to simplify the analysis.

<u>FAPRI-MU</u>

The TPP analysis was performed using two dairy models: the U.S. dairy model, which was used to simulate the impacts of changes in U.S. trade in select dairy products on the U.S. dairy industry; and the FAPRI-MU International Dairy model (FIDM). FIDM includes a system of equations that determine trade and interacts with a detailed model of the rest of the world. Both models are partial equilibrium dynamic models of the dairy sector.

The FAPRI-MU analysis covers milk, cheese, butter, and milk powder (results are given for nonfat dry milk powder, NDMP). Additional analysis on U.S. whey trade was added at OCE's request. FIDM covers the U.S., New Zealand, Australia, India, the EU, China, Mexico, Ukraine, Argentina, Brazil, Japan, Korea, Russia, and the Philippines.

U.S. trade in the commodities modeled is determined inside FIDM for the purposes of the TPP scenario. Import and export equations for each commodity are calibrated using assumed parameters, including relative U.S. and Oceania price relationships and TRQs. Given the large number of different dairy commodities produced and traded, these models simplify a very complicated and diverse market. For example, there may be important trade impacts for different types of cheese that are not captured in this analysis. Moreover, the models make assumptions about the relative competitiveness of U.S. products based on historical market shares and the results are sensitive to assumptions about TRQ fill rates. Adjustments to trade levels are also impacted by price movements, which means that trade may not fully expand as much as the quantity adjustments would suggest. Lastly, the model does not track bilateral trade, which could have implications for some of the TPP country-specific TRQ allocations.

Table 6: FAPRI TPP Dairy Model Results

	Milk	Butter	Cheese	NFDM	Whey	Value of all Dairy Trade*
Production	20,080 mt	na	na	na	na	na
Price	$0.01/cwt	-$2.73/cwt	$0.79/cwt	$1.10/cwt	-$0.06/cwt	na
Imports	na	8,600 mt	8,700 mt	10 mt	40 mt	$97.3 mil.
Exports	na	5,690 mt	19,080 mt	1,560 mt	12,710 mt	$150.3 mil.

Change relative to the August 2015 FAPRI-MU baseline (no TPP)
mt=metric ton
na=not available
*Estimate based on model results for butter, cheese, NFDM, and whey and estimates for other dairy products.

As seen in table 6, U.S. milk production and prices are projected to increase moderately due to TPP. While the increase in butter imports slightly exceeds exports, relative to the baseline, the U.S. remains a net exporter of butter. Butter prices show a decrease of less than 2 percent in the TPP scenario relative to the baseline. This reflects that U.S. butter prices are above world prices in the baseline, and the increase in imports lower U.S. prices in the TPP scenario. At the same time, world butter prices are projected to increase by about the same amount, narrowing the gap between U.S. and world prices. U.S. cheese and NFDM prices are projected to rise moderately, due to higher exports of these products. The increase in projected U.S. cheese exports is largely driven by new access into Japan and Canada.

Virginia Tech – Center for Agricultural Trade (VT-CAT)

The VT-CAT model is a detailed, source-differentiated partial equilibrium model of world dairy markets. The model uses a mixed-complementary formulation to handle inequalities resulting from changes in bilateral TRQ quantities and in- and out-of-quota tariffs. The model captures bilateral trade flows resulting from TPP tariff and TRQ commitments. The model also reflects existing trade preferences for dairy products, such as those between the U.S. and Mexico, and between Japan and Australia, for example.

This model covers fluid milk, butter, cheese, milk powder (SMP and WMP), and whey. Country coverage includes the U.S., Australia, New Zealand, Canada, Japan, Vietnam, Malaysia, Mexico, Indonesia, South Korea, the EU, and two "rest of world" (ROW) categories – one that covers Central and South American countries and the other that covers all other countries (including China).

The model baseline is obtained through a forecast simulation, which incorporates data on real per-capita GDP growth, population growth, and income and longer-run supply elasticities for the above countries and categories, beginning in 2015 and ending in 2026. Income growth is strongest in Vietnam, Indonesia, Malaysia, Mexico, and the two ROW categories. These regions also tend to have larger population growth and relatively higher income elasticities for dairy.

The VT-CAT model was used to evaluate 4 different TPP scenarios relative to the forecast scenario:

1) TPP implementation
2) TPP implementation with stronger Canadian import demand for fluid milk

3) The U.S. does not implement TPP (but the other TPP countries do)[35]
4) Strong export response from New Zealand and Australia to new U.S. market access under TPP

The section below discusses each scenario and the trade impacts relative to the base forecast. While the model results provide detailed bilateral trade flows, for brevity we have aggregated the results for U.S. exports and imports to TPP countries. All results given are simulation projections to year 9 (2026) and are U.S. exports to TPP countries or U.S. imports from TPP countries. Total U.S. exports (and imports) are not significantly different from these results.

TPP implementation

This scenario incorporates TPP tariff and TRQ concessions through 2026 without any other modifications to the assumptions. In value terms, exports to the TPP region are projected to increase $226 million relative to the base forecast, while imports are estimated $46 million higher (table 7). The biggest changes are for cheese and milk powder exports. Japan and Canada account for most of the increase in U.S. cheese exports, while U.S. milk powder exports show growth to Japan, Canada, and Vietnam. The model also shows small U.S. milk powder exports to New Zealand.

Table 7: TPP Implementation Scenario Results

	Butter	Cheese	Whey	Powder	Fluid Milk	Total
Exports						
Value ($mil)	10.0	153.9	16.5	40.9	4.5	225.8
Volume (1,000mt)	2.3	31.2	10.2	11.0	4.0	
Imports						
Value ($mil)	4.3	33.3	8.0	0.6	0.0	46.2
Volume (1,000mt)	1.1	6.1	6.3	0.2	0.0	

Change relative to the VT-CAT baseline (no TPP) projections.
mt=metric ton

TPP Implementation – Strong Canadian Import Response for Fluid Milk Imports

Given close proximity and strong demand for U.S. fluid milk in Canada, it is likely that the U.S. will fill this allocation (table 8). This scenario assumes that the U.S. fills the Canadian fluid milk TRQ.

Table 8: TPP Implementation – Strong Canadian Fluid Milk Import Response

	Butter	Cheese	Whey	Powder	Fluid Milk	Total
Exports						
Value ($mil)	10.0	154.1	21.6	41.2	48.4	275.3
Volume (1,000mt)	2.3	31.3	13.4	11.2	54.4	
Imports						
Value ($mil)	4.3	33.0	0.2	0.6	0.0	38.0
Volume (1,000mt)	1.1	6.1	0.2	0.2	0.0	

Change relative to the VT-CAT baseline (no TPP) projections.
mt=metric ton

[35] This is a hypothetical scenario. While the provisions of the TPP agreement would not provide for implantation without the United States, the other TPP countries could, however, negotiate and implement an identical agreement without the United States. The scenario is intended to highlight the benefits of participation in TPP compared to being left outside of the agreement.

U.S. Non-Implementation of TPP

This scenario examines the impact of the United States remaining outside of TPP (ie., the other TPP countries provide preferential access to each other but not the U.S.). U.S. exports fall by nearly $31 million compared to the base forecast, while imports are nearly unchanged (table 9). The effect on U.S. dairy exports to Japan and Vietnam is striking – down $23.7 million and $9 million, respectively – from the base. This reflects the preferential access that New Zealand and Australia gain from TPP if the U.S. does not participate. It is important to note that U.S. dairy exports to non-TPP countries in this scenario do not make up the difference. Moreover, producer welfare drops by $11.5 million relative to the base.

Table 9: U.S. Non-Implementation of TPP

	Butter	Cheese	Whey	Powder	Fluid Milk	Total
Exports						
Value ($mil)	-0.5	-19.1	-0.9	-9.1	-1.4	-30.9
Volume (1,000mt)	-0.1	-4.4	-5.7	-1.6	-1.1	
Imports						
Value ($mil)	0	-1.6	0	-0.1	0	-1.7
Volume (1,000mt)	0	-0.7	0	0.0	0	

Change relative to the VT-CAT baseline (no TPP)
mt=metric ton

Strong Aus/NZ Export Response to New U.S. Dairy Market Access

Lastly, this scenario contemplates the effects of a substantial increase in Australian and New Zealand exports to the United States due to TPP. For the reasons discussed earlier in the report, this outcome is not likely given supply constraints in Australia and New Zealand and price effects of such a reorientation of trade from China and other major dairy importers in Asia. In fact, this scenario requires a 20 percent reduction in the price of dairy products from New Zealand and Australia (expressed as negative in-quota tariff rates) and doubling the aggregate supply elasticities. Even under these conditions, U.S. imports only increase by $121 million, primarily from increased butter and cheese imports (table 10). Producer surplus, albeit lower than in the TPP scenarios, is positive at $66 million.

Table 10: Increased U.S. Imports from Australia and New Zealand

	Butter	Cheese	Whey	Powder	Fluid Milk	Total
Exports						
Value ($mil)	10.0	150.8	21.2	39.6	4.0	225.6
Volume (1,000mt)	2.3	30.8	13.2	3.6	3.6	
Imports						
Value ($mil)	29.8	79.8	0.3	9.4	1.4	120.7
Volume (1,000mt)	7.4	16.1	0.3	2.8	1.1	

Change relative to the VT-CAT baseline (no TPP)
mt=metric ton

The projected additional imports are still below the TRQ quantities afforded in the first year for cheese (18,000mt TRQ for Australia and 10,000mt TRQ for New Zealand) and butter (4,500mt TRQ for Australia and 4,500mt TRQ for New Zealand). Therefore, even with extreme assumptions about Australia and New Zealand's ability to significant increase exports to the U.S., it is unlikely that they will fill the TPP TRQs.

V. Conclusions

These quantitative results underscore the importance of the Trans Pacific Partnership to the U.S. dairy sector. Four different quantitative models show that net U.S. dairy exports increase as a result of the agreement. Milk prices are projected to be higher with TPP in place, and net income and producer welfare are projected to increase as well. If the U.S. does not implement TPP, U.S. dairy producers are clearly worse off and will be disadvantaged if Australia and New Zealand gain preferential access to TPP dairy markets, both current (Japan, Canada, Vietnam) and future partners (other Asian countries). The TPP also sets a high standard for addressing key regulatory issues that U.S. dairy producers are concerned with, including sanitary and phytosanitary measures, organic equivalence, and biotech approvals.

The last scenario in the Virginia Tech model demonstrates that Australia and New Zealand are limited in their ability to significantly shift exports to the U.S. as a result of new market access openings in the TPP. Substantial reductions in Australian and New Zealand prices (relative to the U.S.), as well as more elastic supply response, would be required. And even in this scenario, U.S. projected imports remain below the TRQ limits established in the agreement.