

Dairy Policy Changes and the U.S. Dairy Sector

The continued commitment of the United States to WTO agricultural trade objectives, including reduced domestic support for agriculture and freer trade, leads to the question: What do changes in dairy trade and domestic dairy policies and programs worldwide mean for the U.S. dairy sector? We employed two empirical agricultural trade models to derive estimates of the effects of liberalization on the domestic dairy sector. The first model, the Partial Equilibrium Agriculture Trade Simulator (PEATSim), is a partial equilibrium commodity trade model with detailed crop and livestock sectors that captures interactions among dairy and nondairy sectors. The second model, the University of Wisconsin World Dairy Model (UWWDM), is a spatial model of only dairy sectors.¹

All economic models are stylized representations based on theoretical assumptions and observed relationships that can not embody all of the economic complexities that might exist. The trade models used in this study fit that mold—they do not capture all of the realities of modern food markets. We noted some of these realities earlier: the strategies of international dairy companies and their decisions to invest in foreign markets providing economic returns to shareholders and farmers and the supplies and demands for many different types of nontraditional milk products. Attempts to include these types of relationships in modeling efforts are in their infancy. Nevertheless, the existing models can be used to estimate the effects of trade liberalization on dairy industries with given technologies and market structures (including policies and programs).

PEATSim and UWWDM focus on trade in butter, cheese, and dry milk powders. The UWWDM includes additional detailed product and policy representation for countries in the UWWDM framework. As part of the greater product detail, UWWDM includes milk component (fat, proteins, and skim solids) accounting as a step toward gaining more information about changing trade relationships related to ingredients. The two models are not connected—they represent two different ways of looking at dairy trade relationships and the potential effects of liberalized domestic dairy policies and dairy trade policies. The use of the two different models provides greater validation of the assessments of likely effects on key dairy industry and trade variables under alternative policy scenarios.

Dairy Policy and Modeling Issues

Domestic dairy support instruments include intervention prices and other forms of price support, direct producer payments, and production and marketing quotas. Market access or border restrictions include tariffs and TRQs. Export subsidies for dairy products are important for some countries as are domestic consumer subsidies as a means of disposing of surplus dairy products or increasing dairy product demand.

Tariffs on dairy products are well above the overall average agricultural tariff level and are among the highest of all commodities. Gibson et al. (2001) calculated an average agricultural tariff level of 62 percent, with

¹Further details on both models are included in appendix B.

dairy tariffs averaging about 85 percent. The only product with a higher tariff was unmanufactured tobacco at 90 percent. Gibson et al. also found average over-quota tariffs for dairy products to be high at 128 percent, even though they were applied to only a few products. Countries with some of the highest over-quota tariffs on dairy products have relatively low in-quota tariffs. Japan had an in-quota dairy tariff of 10 percent but a 227-percent over-quota tariff; the corresponding U.S. rates were 12 and 43 percent. Import measures work in concert with domestic price support programs in many countries, while some countries rely solely on tariffs to protect their dairy sectors. Removal of import protection would likely have the most significant effect of all policy reform measures because it would affect the largest number of countries and would expose the domestic dairy markets of previously protected countries to competition from lower priced imports.

The United States, the EU, and Canada all support the price of milk and some dairy products. In these countries, multilateral liberalization would likely lead to reductions in domestic milk prices, either directly through disciplines on domestic support or in response to increased imports in a more liberal trading regime. However, increased world prices resulting from liberalization would offset some of the reductions in support. The EU and Canada limit milk output with milk production quotas, an action that reinforces other price support measures by limiting surplus production.

When all domestic and border measures are included, dairy programs account for a large share of dairy producers' revenue. In those countries for which this measure is calculated, the share of revenue provided by government programs ranges from 1 percent in New Zealand to 68 percent in Japan. How would dairy output in these countries respond to policy reforms that simultaneously reduced price support and import protection and lifted restrictions on production? Of the specific countries analyzed, the United States, the EU, and Canada currently have longstanding domestic programs for dairy products.

The model scenarios defined here eliminate the longstanding export subsidy programs of the United States, the EU, and Canada (table 4). These programs offer a means of supporting domestic milk prices by removing surplus milk, in the form of dairy products, from the domestic markets. Eliminating only export subsidies could put pressure on domestic market prices or lead to accumulation of large government stocks. On the other hand, extensive use of export subsidies depresses world market prices. Their elimination would be expected to raise world dairy market prices and thus mitigate negative price impacts on countries that had relied extensively on them. It is also assumed that both the EU and Canada would eliminate production quotas as the need to manage surplus production disappears with elimination of the other support programs.

The observed interactions among domestic and border policies highlight a commonly held view—border measures are essentially extensions of domestic dairy policies. To alter or eliminate one set without changing or eliminating the other could result in potentially adverse effects on government budgets.

Table 4

Dairy policies eliminated in liberalization scenarios, by country and product

	Milk	Butter	Cheese	Nonfat dry milk	Whole dry milk	Other dairy products
United States	PS,PP	T,TQ,X,PS	T,TQ,X,PS	T,TQ,X,PS	T,TQ,X	
European Union	PS,Q	T,TQ,X,PS,C	T,TQ,X	T,TQ,X,PS	T,TQ,X	T,TQ,X
Japan	PP	T,TQ	T	T,TQ		
Canada	PS,Q	T,TQ,X	T,TQ,X	T,TQ,X	T,TQ,X	T,TQ,X
Mexico		T	T,TQ	T,TQ	T,TQ	
Brazil		T	T	T	T	
Argentina		T	T	T	T	
China				T	T	
Australia		T	T,TQ	T	T	
New Zealand		T	T	T	T	
South Korea			T	T,TQ		
Rest of world		T	T	T	T	T

T = Tariffs

TQ = Tariff rate quotas

X = Export subsidies

PS = Price support

PP = Producer payments

Q = Production/marketing quota

C = Consumer subsidies

Source: Prepared by USDA, Economic Research Service.

PEATSim and the UWWDM generate results for multiple countries and, in the case of PEATSim, multiple commodities. We focus on the effects on the U.S. dairy industry of liberalizing only dairy sector policies and programs in all countries. The effects on milk production and milk prices are key indicators of interest as is the trade position of the U.S. in a scenario reflecting full liberalization. Appendix tables contain selected results for the other countries or regions as defined in the two models.

Impacts From the PEATSim Model

Based on the assumption that dairy policies and programs worldwide are eliminated, the PEATSim model results indicate the U.S. milk price falls just over 11 percent while milk production declines about 6 percent (app. tables 2-5). Production of butter, nonfat dry milk, whole dry milk, and other dairy products decline, but cheese output expands slightly. World prices of the traded products included in the model—butter, cheese, nonfat dry milk, and whole dry milk—all increase. The largest percentage increase is for butter, followed in descending order by cheese, whole dry milk, and nonfat dry milk. The United States maintains its trade position in most markets but slightly increases exports of nonfat dry milk. For more information on the PEATSim results, see Langley, Somwaru, and Normile (2006).

Impacts From UWWMD

The UWWDM framework provides results over a medium term (5 years) presented relative to a base scenario for each year. Impacts on price and

production are greater in the early years but decline in later years due to adjustments in milk production and product markets. Globally, multilateral full liberalization of dairy trade policies results in lower domestic milk prices in distorted sectors, which benefits consumers at the expense of producers, increases milk production, and increases trade in dairy products (app. tables 6-8).

At the end of the simulation period, 2007, U.S. milk prices are about 4 percent lower than the projected baseline price, and production is down just under 2 percent. As noted in appendix B, these estimates are based on an assumption regarding the U.S. classified pricing system that may overestimate its effects. If so, they could be considered maximum estimates. In any case, the results are modest. U.S. exports fall while imports rise—implying a slightly larger net import position—but the changes in trade volume are small relative to the size of the U.S. dairy sector. The loss in exports is a result of reduced milk production and elimination of U.S. export subsidies, even with their low volume limits.

A key feature of the UWWDM framework is its total welfare measure component. This measure includes producer, consumer, and government costs and benefits associated with dairy policy and trade liberalization. The welfare analysis shows that the U.S. economy gains from multilateral dairy liberalization, about \$800 million, as a result of lower consumer and government costs offsetting lost producer benefits. The gains would be less if estimated effects on prices and production are smaller. For more information on the results of the UWWDM framework, see Peng and Cox (2006).

Why the Results Differ

The two models that generate the empirical estimates represent alternative modeling structures. The PEATSim model adapted for our analysis is a partial equilibrium, comparative static model while the UWWDM is a dynamic spatial model. Additionally, the models depend on a large number of “fixed” parameters, such as the supply and demand price elasticities for each country or region identified in the model. Differences in the underlying structures and parameters partly determine the different quantitative estimates.

The selection of the base period also affects the quantitative findings. If the base year selected is a year in which U.S. dairy prices are high, a period when underlying domestic policies and programs would not be expected to be having much effect, elimination of those policies and programs would not be expected to have large impacts. The opposite is true for low dairy price base years. The PEATSim model is based on 2001, a period of relatively higher milk prices than 2002, the base for UWWDM.

Percentage changes are simple summary statistics, but the base year issue is of some importance. A large percentage change applied to a high price may generate the same magnitude as a small percentage change applied to a low price. It is the consistency of the directions and interpretations of the effects that are key elements for evaluating the usefulness of the two models. Estimated sizes of effects are always subject to arguments—this is a facet of all empirical economic modeling.