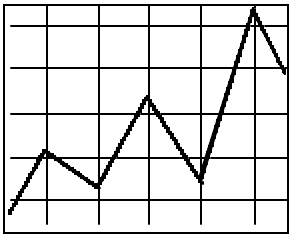
MARKETING AND POLICY BRIEFING PAPER



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U.S. Imports of Concentrated Milk Proteins: What We Know and Don't Know?

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Imported milk protein has, once again, become a hot button in the U.S. dairy industry. The current controversy concerns Milk Protein Concentrate (MPC). Imports of MPC, a relatively new form of concentrated dairy-based protein, increased rapidly in the late 1990s, leading to charges that dairy farmers were being economically penalized. Bills were introduced in both the U.S. House and Senate in 2001 to restrict imports through the application of over-quota tariffs. A Senate bill to require special labeling of products manufactured from imported MPC has already been introduced in the 108th Congress.

The issue of border controls for imports of concentrated milk proteins dates back more than 20 years and probably much longer. In 1979, the Agriculture Committee of the U.S. Senate conducted hearings on the issue of whether increased imports of casein had reduced domestic use of nonfat dry milk and elevated the cost of the dairy price support program (Graf). This led to an investigation of casein imports by the U.S. International Trade Commission in 1980. The 1985 Food Security Act mandated USDA to conduct a study to determine whether imports of casein reduced the effectiveness of the dairy price support program. None of these actions resulted in import restrictions — concentrated milk proteins are and have been imported into the United States without quotas and with only inconsequential duties.

This paper provides a broad perspective on the milk protein import issue. It proceeds as a series of questions related to the nature and uses of the products imported, trends in import volume and sources, and effects of imports. The intent is to sort out what we know from what we don't know about imported milk proteins.

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What are Milk Protein Concentrates and Casein?

Imported milk proteins come in many forms, and distinctions among named products are often blurred. One major categorization of types is based on classifications used in the *Harmonized Tariff Schedule of the United States* (HTS), which distinguishes between Milk Protein Concentrate (HTS 0404901000) and three dairy-based casein categories. Milk Protein Concentrate (MPC) is included within HTS Chapter 4, a commodity group consisting mostly of dairy products. Casein is included within HTS Chapter 35: *Albuminoidal Substances; Modified Starches; Glues; Enzymes*, a diverse group of food and non-food fillers, binders, gels and glues, most of which are manufactured from raw products other than milk.

Milk Protein Concentrate

Technically, MPC is made by ultrafiltration of skim milk.[2] Ultrafiltration removes water and some lactose and minerals. Repeated passes through an ultrafiltration membrane alters the solids composition, increasing the protein percentage and reducing the percentage of lactose and other solids in the final product. MPC is further evaporated and spray-dried after ultrafiltration to preserve the product.

MPC can be manufactured to any specific protein level. Common specifications are MPC 42, MPC 56, MPC 70 and MPC 80, where the number refers to percent true protein in the product. As the percent protein increases from 42 to 80 percent, the moisture and mineral percentages remain constant while the lactose percentage decreases from 46 to 4 percent (Smith).

Mainly because of reduced lactose relative to nonfat dry milk, MPC (as well as liquid ultrafiltered skim milk) possesses attractive attributes in cheesemaking. To achieve optimal casein-to-fat ratios, cheesemakers typically standardize cheese milk, either by removing butterfat or by adding protein. Added protein may be in the form of condensed skim milk, nonfat dry milk, ultrafiltered milk or (for cheeses that do not have a Food and Drug Administration standard of identity) MPC. Condensed skim milk and nonfat dry milk contain lactose in the same ratio to other milk solids as skim milk. The lactose remains with the whey portion of cheese milk, which has marginal commercial value compared to the value of cheese. The higher protein-to-lactose ratio of MPC means less low-valued lactose is produced per pound of protein retained in cheese. Moreover, because of the higher protein content of MPC relative to condensed skim milk or nonfat dry milk, more cheese per vat can be produced. Hence, use of MPC enhances both the economics and the technical efficiency of cheesemaking.

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[2] MPC is defined here as ***dry*** forms of ultrafiltered skim milk and is distinguished from liquid ultrafiltered skim milk. There are allegations that some imported product labeled MPC may, in fact, be a mixture of MPC and nonfat dry milk intended to evade the tariff-rate quota on nonfat dry milk. The incidence of this alleged practice is unknown.

The U.S. Food and Drug Administration (FDA) establishes standards of identity for a long list of cheeses and cheese products (see GAO). MPC may not be legally used in producing cheese with an FDA standard of identity, but no such restrictions apply to other "cheeses."[3] Recently, Kraft Foods, Inc. changed the product description on its popular American singles from *Pasteurized Process Cheese Food*, which has a FDA standard of identity, to *Pasteurized Prepared Cheese Product*, which does not. MPC is a listed ingredient in Kraft American singles.

Besides its use in making cheeses that do not have an FDA standard of identity, MPC is an ingredient in a wide array of food products (GAO). MPC with protein content less than 70 percent is commonly used in frozen deserts and bakery and confectionery products. Lower-protein MPC is also the form most commonly used in standardizing cheese milk. MPC 70 is often used in pasteurized process cheese products. The most common use of MPC with protein 70 percent or greater is in sports and nutrition drinks and bars (energy bars), aged care products (nutrition supplements), and hospital rehabilitation products. These higher-protein forms of MPC are not typically used in cheesemaking because of their higher cost.

Nonfat dry milk can be used instead of MPC in most applications, but its suitability varies across products. Nonfat dry milk does not substitute well in products where a more concentrated milk protein is required. In particular, MPC can be easily formulated to meet specific product requirements in the rapidly-growing sports/nutritional beverage and food market. Use of nonfat dry milk in these applications would require modification to elevate protein content and lower lactose content, likely through reconstitution and ultrafiltration of nonfat dry milk.

Casein

Three sub-categories of dairy caseins are identified within the HTS classification: Casein-Milk Protein Concentrate (HTS 3501101000), Casein (HTS 3501105000), and Caseinates and other Casein Derivatives (HTS 3501906000).[4]

Casein-Milk Protein Concentrate is apparently a 90-percent protein version of MPC, although it may contain a mix of MPC and casein, depending on source and user specifications. The very low levels of lactose (1 percent or less) in this product make it attractive in food products with a lactose and sugar-free claim (GAO). This characteristic also means that nonfat dry milk does not represent a practical substitute unless it is further processed to remove lactose.

Casein is made by treating skim milk with acid or rennet to cause precipitation (acid) or coagulation (rennet) of the casein portion. The resulting curds are washed to remove

[3] FDA has issued exceptions for liquid ultrafiltered milk procured domestically. And some cheese plants legitimately use ultrafiltration to reduce skim milk as part of their make procedure.

[4] Casein glue is also included in Chapter 35. While dairy based, casein glue imports are small in volume and used entirely in industrial applications. Consequently, they are ignored in subsequent analyses because they pose no material competition with U.S. milk.

remaining lactose, trace milk fat, whey proteins and ash, leaving a more-or-less pure form of the casein component of milk. The resulting casein is then dried to maintain keeping quality.

The production process renders casein insoluble in water. Hence, unlike MPC, *casein cannot be used to standardize cheese milk*. However, in combination with butteroil or vegetable oils, casein can be used to make imitation cheese, cheese substitutes, and blended natural/imitation process cheese products. Nonfat dry milk represents a partly acceptable but more costly substitute for casein in these ersatz cheeses.[5]

While there is no definitive data to allow segregation of uses, the principal uses of casein are believed to be industrial. Acid casein is the major casein in world commerce. It is used extensively as a glaze in the manufacture of high-quality papers and in paints and cosmetics (Smith). Rennet casein is extrudable, which makes it useful in producing plastic-like materials such as buttons and knitting needles.[6]

Caseinates are a derivative of casein, made by dissolving casein in an alkaline solution of sodium or calcium. After drying, the resulting product is over 90 percent casein with the remaining portion consisting of about equal amounts of water and ash. Lactose is virtually absent. Compared to casein, caseinates have the desirable attribute for food uses of being soluble in water. This makes caseinates more functional in certain food applications than casein. The ingredient list of most non-dairy coffee "creamers" includes sodium caseinate. Caseinates are also used as emulsifiers in cured meats and in other food applications.

Caseinates are imported, but are also produced in the U.S. from imported casein. The U.S. exports substantial quantities of caseinates, probably re-exports rather than domestically produced product. In 2002, US exports of caseinates were valued at $10 million and caseinate imports were valued at $20 million.

Why aren't concentrated milk proteins made in the U.S.?

Neither MPC nor casein is currently manufactured in commercial quantities in the United States at this time, although a Dairy Farmers of America plant in Portales, New Mexico, is scheduled to begin production of MPC shortly. The reason most often cited for the absence of U.S. production is the U.S. Dairy Price Support Program, which sets a floor price for nonfat dry milk at a level that makes it more profitable to make nonfat dry milk and sell it to the government than to make MPC or casein.

The price support program and the U.S. federal milk marketing order program use an assumed manufacturing cost for nonfat dry milk of 14 cents per pound. Little is known about the average cost of manufacturing concentrated milk proteins, and the range is likely very wide depending on the particular product and manufacturing process. But given the more

[5] There are technical problems associated with the use of nonfat dry milk in imitation cheeses related to crystallization and browning of lactose.

[6] Fonterra's web site includes a recipe for making buttons from home-produced rennet casein (http://www.nzdairy.co.nz/public/eduresources/casein/main.html). It works.

complex process of converting milk to MPC, casein, and caseinates, manufacturing costs are certainly higher than 14 cents per pound of product.

The current government purchase price for nonfat dry milk is $0.80 per pound. Nonfat dry milk contains 36 percent protein, so assigning all of the value of nonfat dry milk to protein at the federal intervention price of $0.80 per pound of nonfat dry milk yields a protein price of $2.22 per pound.[7] Calculating the unit value of protein in imported milk protein products, especially MPC, is difficult because the products are diverse and import data do not indicate the percentage protein. Using average 1992-2001 unit import values and assumed protein content of specific products, the estimated value of protein contained in imported concentrated dry milk proteins is as follows:

Product	Average Protein (Percent)	Average Price ($ per Pound)	Protein Value ($ per Pound)
MPC	62.4	1.39	2.23
Casein-MPC	90.0	1.64	1.82
Casein	92.0	1.92	2.09
Caseinates	94.0	2.06	2.19

Source: Average protein derived from Smith. The 62.4 percent protein percentage shown for MPC is the average of MPC 42 and MPC 80 and may be quite different from the actual average protein content of MPC. Import quantity and value from FAS. Note that the protein in MPC and Casein-MPC consists of whey proteins as well as casein; the protein in Casein and Caseinates does not. Consequently, proteins across products are not directly comparable.

The table demonstrates that in comparison to nonfat dry milk at the government purchase price, U.S. processors would obtain the same or lower return per pound of protein by selling MPC or casein products. And they would incur substantially higher manufacturing costs. Clearly, any benefits of MPC or casein in terms of enhanced functionality relative to nonfat dry milk are not being reflected in relative prices. Relative profitability favors manufacturing and selling nonfat dry milk.

[7] The purchase price per pound for nonfat dry milk was reduced from $1.01 to $0.90 in May 2001 and to $.80 in November 2002. The equivalent protein values for the higher purchase prices are $2.81 and $2.50 per pound, respectively. In other words, recent butter-powder tilts have made domestic nonfat dry milk somewhat more competitive with imported dry concentrated proteins. Assigning all of the value of nonfat dry milk to protein is not appropriate in applications where lactose is important. But lactose has a very low market value relative to protein.

How are concentrated milk proteins treated under U.S. Customs rules?

Under the 1994 World Trade Organization (WTO) Agreement, the U.S. converted import quotas for many imported dairy products to a two-tiered tariff system. A low, unrestrictive tariff is applied to imports falling within specified "quota" volumes and a much higher "tariff-rate quota" (TRQ) is applied to imports exceeding the quotas.

Since the U.S. had never imposed import quotas on casein, there were no TRQs applied under the WTO Agreement. Imports of Casein (HTS 3501105000) enter the U.S. duty-free. MPC, Casein-MPC, and Caseinates/Other Casein Derivatives are subject to a U.S. tariff of 0.17 cents ($0.0017) per pound.[8] So in effect, there are no restrictions on the volume of imports.

FDA and USDA are responsible for ensuring the safety of imported milk proteins and collaborate with the U.S. Customs Service in monitoring and sampling imports. Because concentrated milk proteins are manufactured under high heat conditions that destroy pathogens, FDA believes these products pose little health risk. Shipments from many countries with food safety regulations comparable to those in the U.S. are automatically released by U.S. Customs (GAO).

How much milk protein does the U.S. import?

Looking at the entire class of concentrated milk proteins, imports increased steadily at the rate of about 4,200 metric tons per year between 1989 and 1997. The average rate of growth was much higher — 18,000 metric tons per year — in 1998, 1999, and 2000.

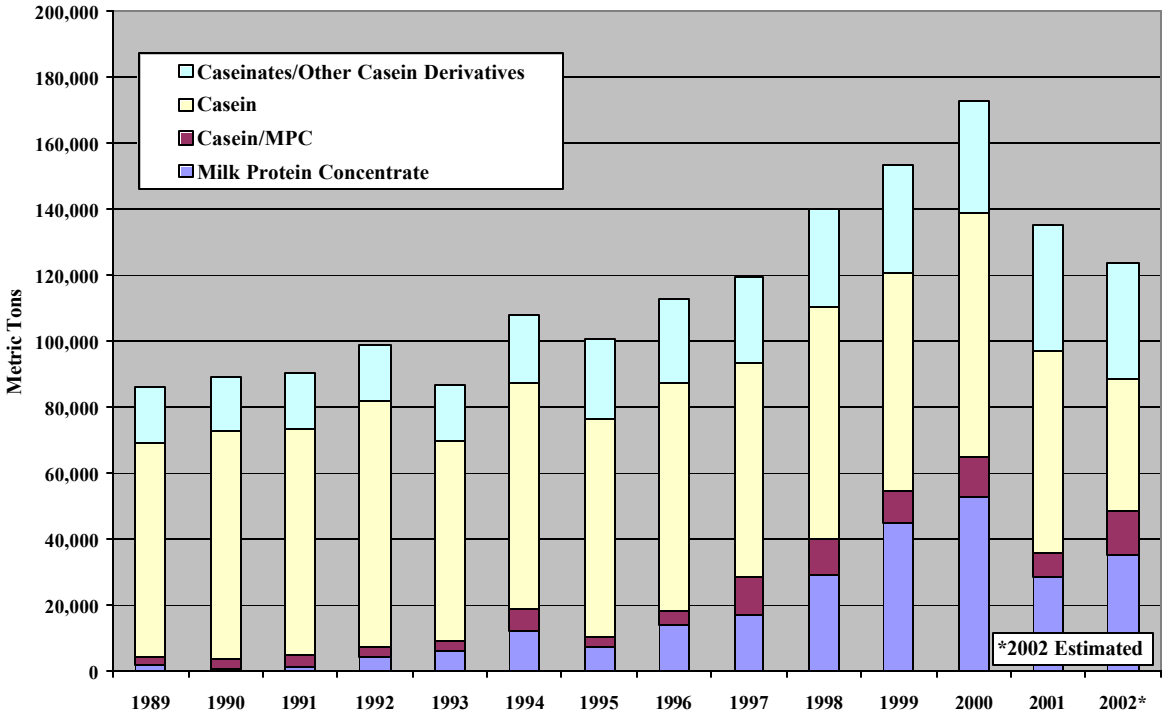
Imports fell sharply in 2001 because slightly less milk was produced in the European Union (EU) and substantially more milk than usual was diverted to cheese. Expanded EU cheese production was in response to an increase in cheese demand. Consumers heavily substituted cheese for red meats due to food safety concerns stemming from BSE and foot and mouth disease outbreaks in some EU countries. More cheese production meant a relative shortage of milk for making milk powders and casein.

Estimated imports in 2002 (based on January-November numbers) fell even further and were below the 1989-97 trend. Most of the 2002 fall-off was due to sharply lower imports of casein.

Among the various forms of concentrated milk protein, MPC showed the largest rate of growth in recent years, increasing from less than 10,000 metric tons in 1995 to more than 50,000 metric tons in 2000. Imports of MPC in 2002 are expected to total about 35,000 metric tons after falling to under 30,000 metric tons in 2001.

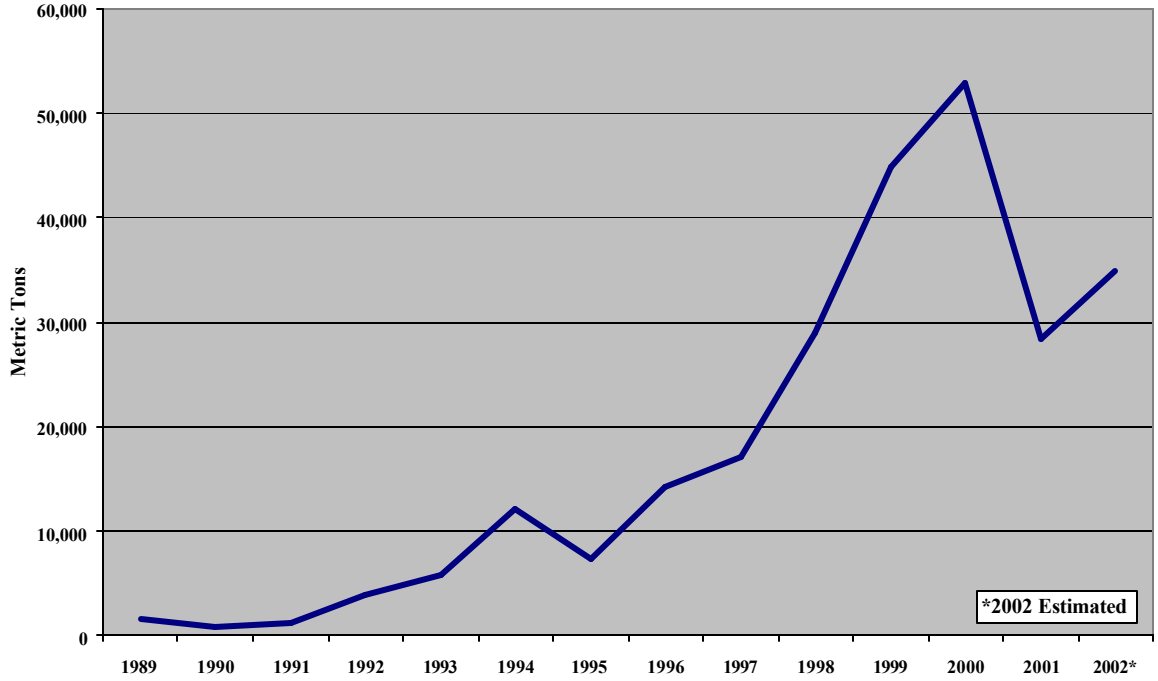
[8] Canadian imports are duty-free under the North American Free Trade Agreement (NAFTA).

U.S. Imports of Concentrated Milk Proteins



U.S. Milk Protein Concentrate (MPC) Imports

(HTS 0404901000)



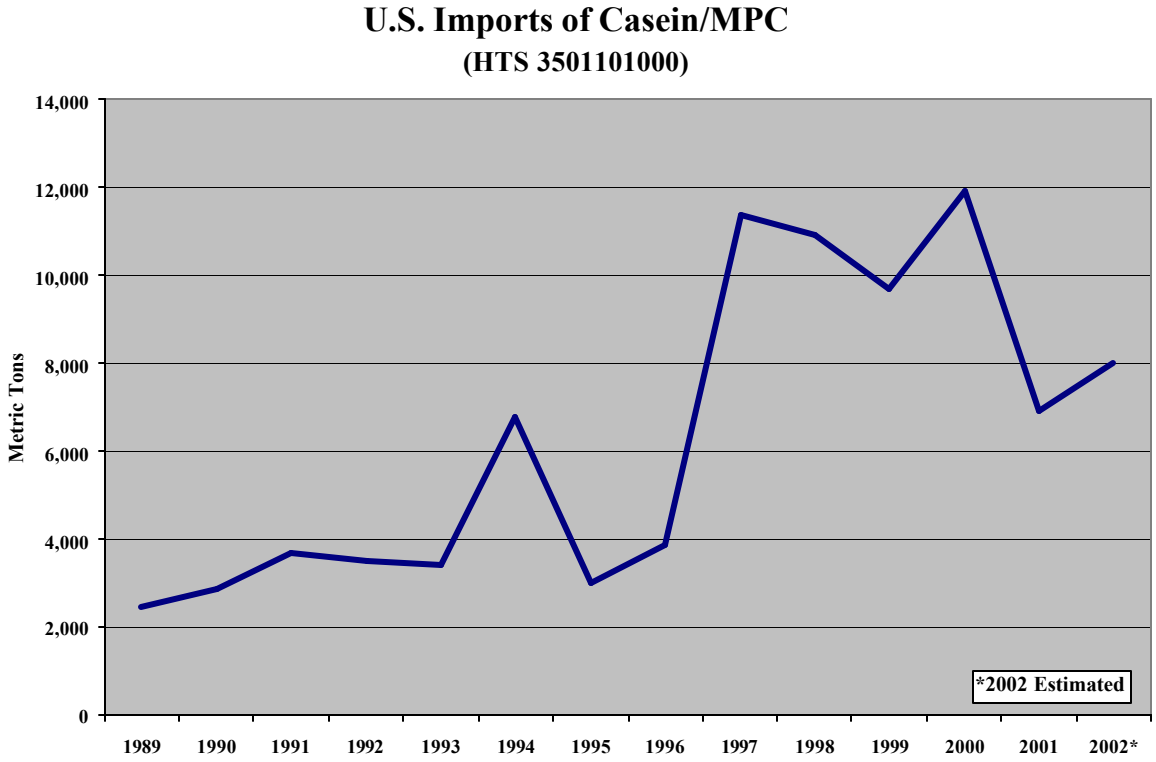
The rapid increase in MPC imports from 1995 to 2000 is related partly if not mostly to the WTO agreement of 1994. When other milk powders were subjected to large tariff-rate quotas by the agreement, international suppliers turned to products serving similar needs that were not included in the tariff-rate quota list.

The fall-off in MPC imports in 2001 was mainly from a relatively short supply of nonfat dry milk in world markets and, as a result, less milk moving to MPC. The price of MPC imports to the U.S. (average across all protein levels) increased nearly 20 percent between 2000 and 2001, making U.S. nonfat dry milk more attractive in uses where it represented a good substitute for MPC.

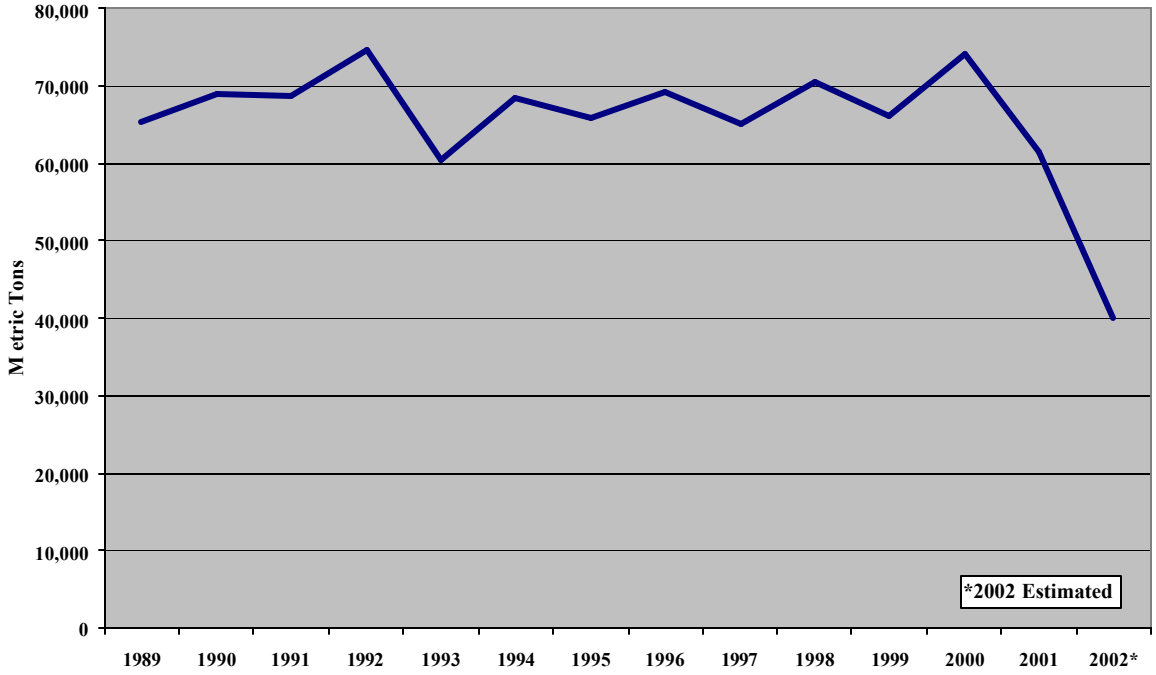
Casein-MPC imports exhibited a different pattern of growth from MPC, nearly tripling between 1996 and 1997, holding steady through 2000, and then falling off in the same manner as MPC. U.S. import value per pound jumped nearly 25 percent in 2001, cutting import demand by more than 25 percent.

U.S. milk protein imports within the large casein class were steady at between 60,000 and 70,000 metric tons from 1989 through 2001. Casein imports fell more than 20,000 metric tons in 2002, probably due to a diversion of milk to other forms of protein.

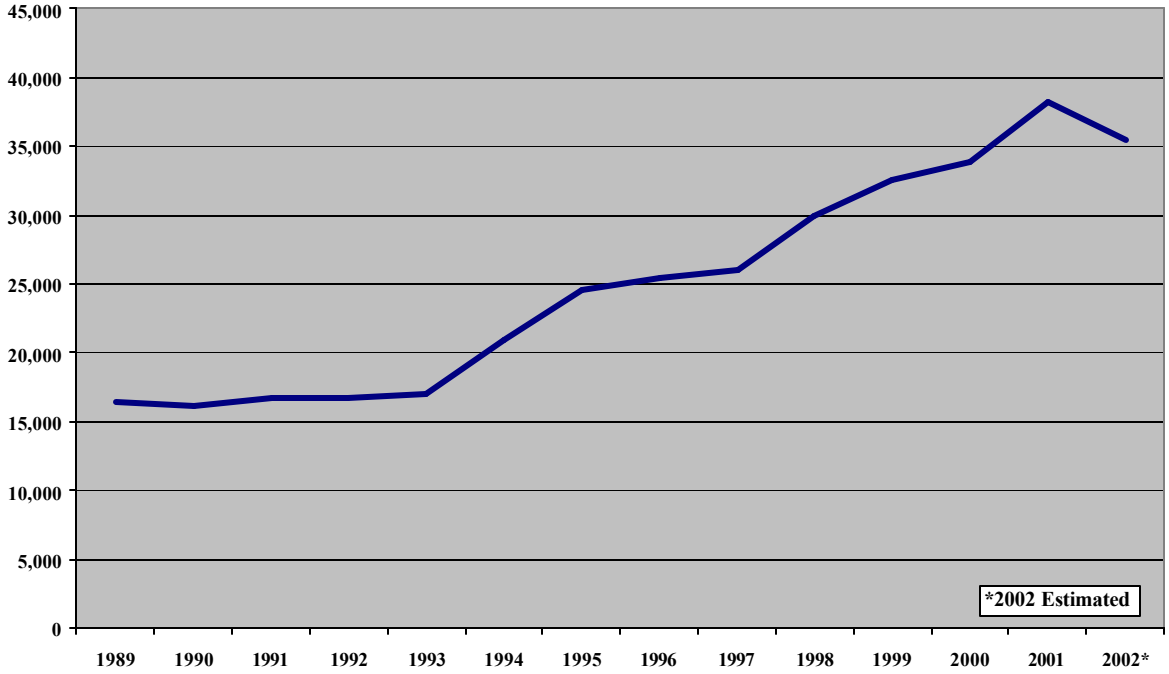
Imports of Caseinates grew gradually from about 15,000 metric tons in the early 1990s to nearly 40,000 metric tons in 2001 before falling off slightly in 2002.



U.S. Imports of Casein
(HTS 35011050000)



U.S. Imports of Caseinates & Other Casein Derivatives
(HTS 3501905000/3501906000)



Where do milk protein imports come from?[9]

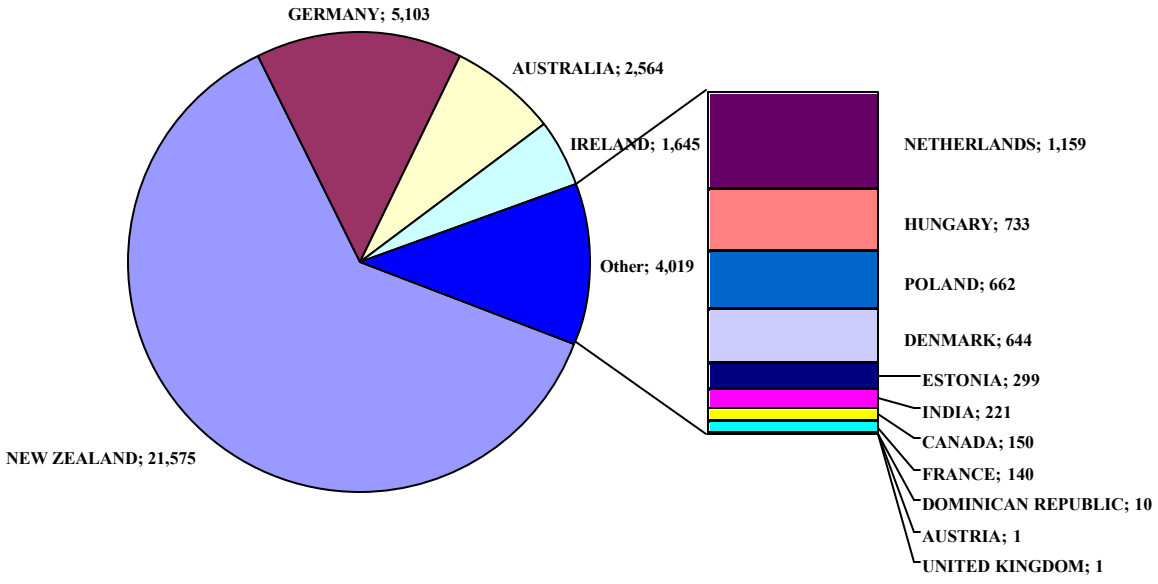
The primary source of U.S. milk protein imports is Oceania and the European Union. Major sources vary somewhat by type of product. In 2002, New Zealand and Australia accounted for about 70 percent of U.S imports of MPC. The EU countries of Germany, Ireland, Holland, Denmark, France and the UK shipped another 25 percent. The remaining 5 percent of MPC imports came from 7 other countries.

New Zealand and Australia were the source countries for 56 percent of Casein-MPC imports. EU countries supplied all but 5 percent of the remaining imports.

Casein imports are much less concentrated. Together, New Zealand and Australia accounted for 36 percent of casein imports and the EU 40 percent. India was the third leading supplier with 12 percent of the market. Ten percent of U.S. casein imports came from Former Soviet Union countries. In total, 23 countries recorded casein imports to the U.S. in 2002.

The EU accounted for 60 percent of the shipments of caseinates to the U.S. in 2002. New Zealand held a 32 percent market share. The remaining imports came mainly from Poland.

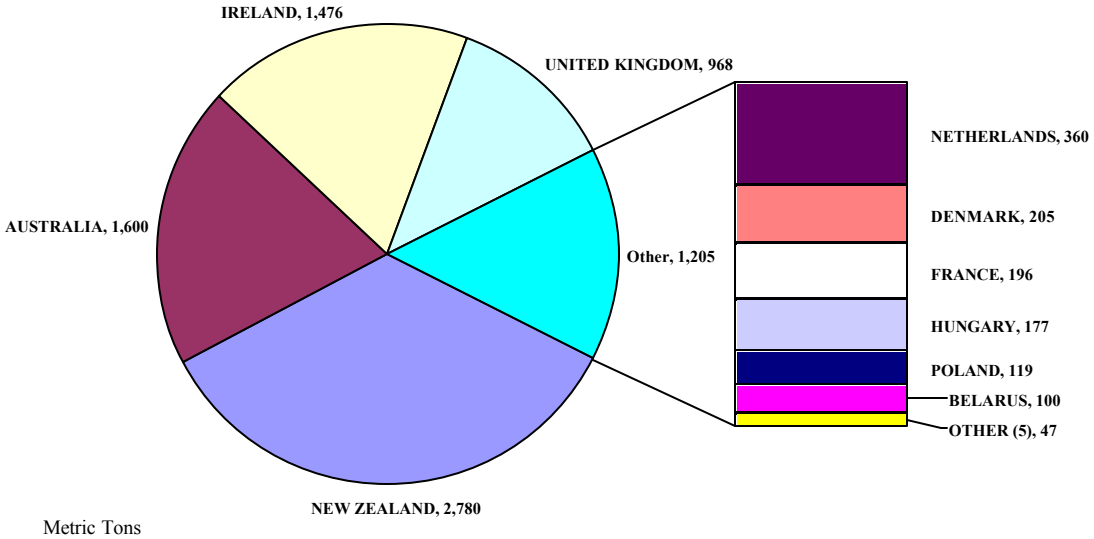
Source of U.S. MPC Imports, 2002
(HTS 0404901000)



Metric Tons
Source: Estimated from FAS

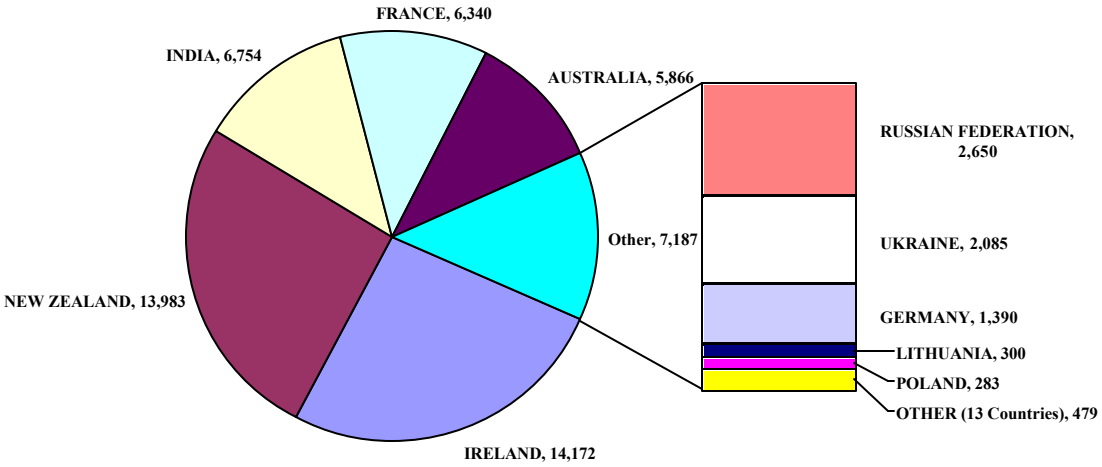
[9] For a review of the international market for dry milk products including MPC and casein, refer to Gould and Villareal

Source of U.S. Casein/MPC Imports, 2002
(HTS 35011101000)



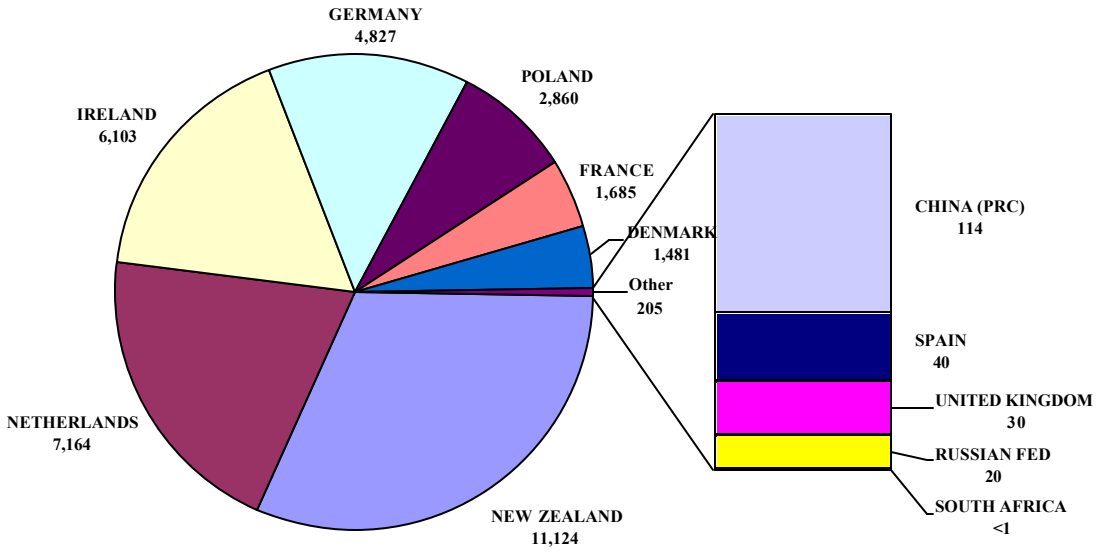
Metric Tons
Source: Estimated from FAS

Source of U.S. Casein Imports, 2002
(HTS 350110500)



Metric Tons
Source: Estimated from FAS data

Source of U.S Imports of Caseinates and Other Casein Derivatives, 2002 (HTS 3501905000)



Metric Tons
Source: Estimated from FAS

How are producer milk prices affected by milk protein imports?

This is a very popular question in dairy circles, and there is no shortage of answers. The answers range from "absolutely no impact" to "utter devastation." Those embracing the former answer argue that, at worst, imported milk proteins displace a small amount of nonfat dry milk; an amount much smaller than government purchases. So if there are any spillover costs, they are being borne by taxpayers, not by dairy farmers.

Those who believe milk proteins have a large negative effect on U.S. milk prices argue that nonfat dry milk displacement exceeds government purchases, and that excess cheese supplies augmented by MPC and other milk proteins have depressed the cheese market. Those favoring import restrictions also claim that recent reductions in the government purchase price for nonfat dry milk, which lowered the federal market order prices for certain classes of milk, were attributable to large displacement of domestic nonfat dry milk by imported milk proteins. Some go further in arguing that imported milk proteins are poor-quality products produced under unsanitary conditions, turning off consumers and reducing overall dairy demand in the U.S.

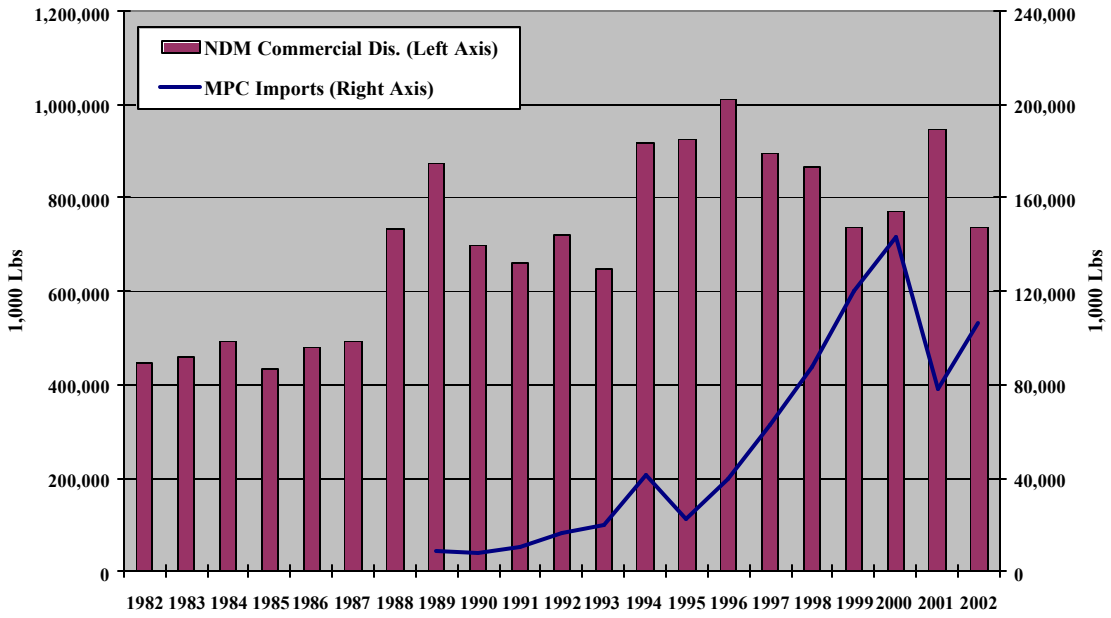
The correct answer lies somewhere between these extremes. Unfortunately, deriving a precise answer is impossible because we don't have hard information on how imported milk proteins are used. We don't know how much imported milk protein is used in industrial products versus food products for which protein in the form of nonfat dry milk might

substitute. We don't know how much more cheese is being made than would be if it weren't for imported MPC. We don't know how well nonfat dry milk substitutes for MPC and casein in various applications, so we don't know how much of a price premium for imported milk proteins might be sustainable if tariffs were applied.

The best we can do under the circumstances is provide some general guides. To begin with, it is reasonable to assume that the principal effect of imported concentrated milk proteins is to displace usage of nonfat dry milk, the major domestic source of milk protein. Further, it is clear that MPC (0404901000) and Casein-MPC (3501101000), among the various forms of imported milk proteins, substitute reasonably well for and therefore displace domestically-produced nonfat dry milk. The chart below is persuasive evidence of that displacement.

Note that nonfat dry milk use increased fairly steadily between 1982 and 1996. The annual rate of increase was about 40 million pounds per year, with the spikes generally indicating years during which the U.S. enjoyed unsubsidized exports. Commercial use steadily declined between 1997 and 1999 while MPC imports increased rapidly. When MPC and casein-MPC imports fell 45 percent in 2001, commercial use of nonfat dry milk rose 23 percent to pick up the slack.

MPC Imports and Commercial Disappearance of Nonfat Dry Milk



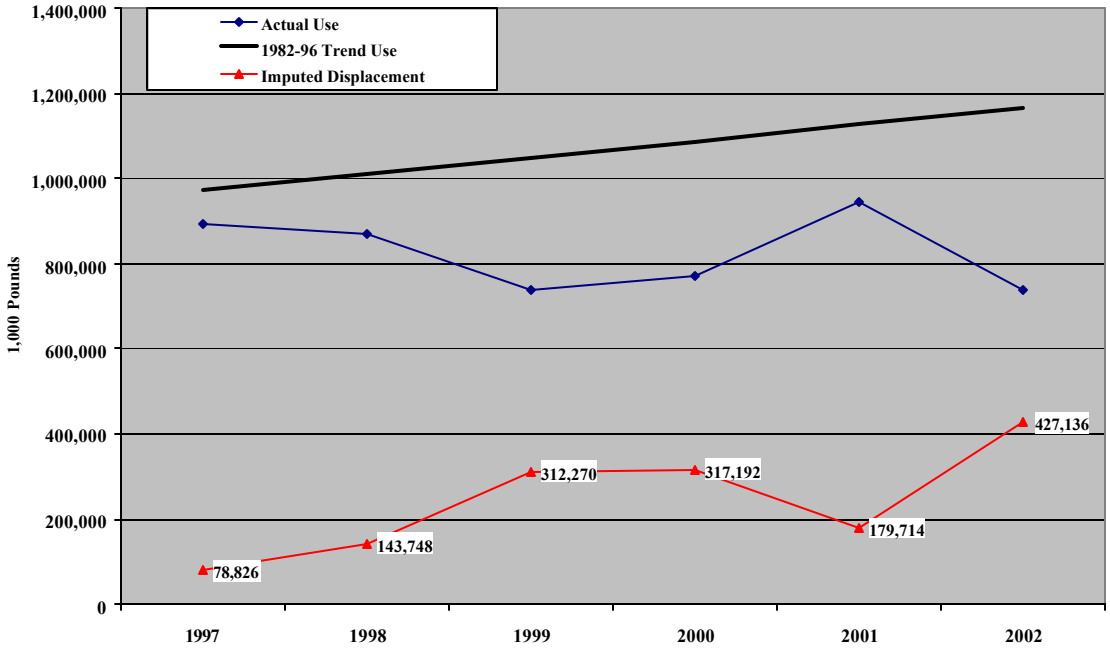
One way to approximate how much nonfat dry milk has been displaced by increasing imports of MCP and other milk proteins is to assume that if these increases had not occurred, the observed trend in nonfat dry milk use between 1982 and 1996 would have continued. A continuation of trend growth in the use of nonfat dry milk would imply that nonfat dry milk

would be the primary ingredient for standardizing an increasing supply of cheese milk[10]. Further, it would imply that nonfat dry milk would be used instead of imported milk proteins to make products within the growing markets for dietary supplements and energy/sports drinks and foods. The validity of both assumptions is questionable — it is possible that because of the greater functionality of imported specialized MPC, it would be used even if stiff tariff-rate quotas were applied. It is also possible that nondairy proteins would be used in some food applications if imported dairy proteins were not available.

The chart below shows actual commercial use of nonfat dry milk from 1997 through 2002 along with projected trend usage. The difference between trend use and actual use is defined as the imputed displacement of nonfat dry milk by MPC and other imported milk proteins that substitute for nonfat dry milk. For example, commercial use of U.S. nonfat dry milk in 1999 was 737 million pounds. Trend usage was 1.049 billion pounds. So the imputed displacement of nonfat dry milk by expanded imports of milk proteins was 312 million pounds. With the exception of 2001, imputed nonfat dry milk displacement is shown to increase each year, peaking at about 430 million pounds in 2002.

Note that this procedure says nothing about how much nonfat dry milk was displaced in 1996 and before — it only estimates how much nonfat dry milk use was reduced by *changes* in milk protein imports since 1996.

Imputed Nonfat Dry Milk Displacement by MPC
1997-2002

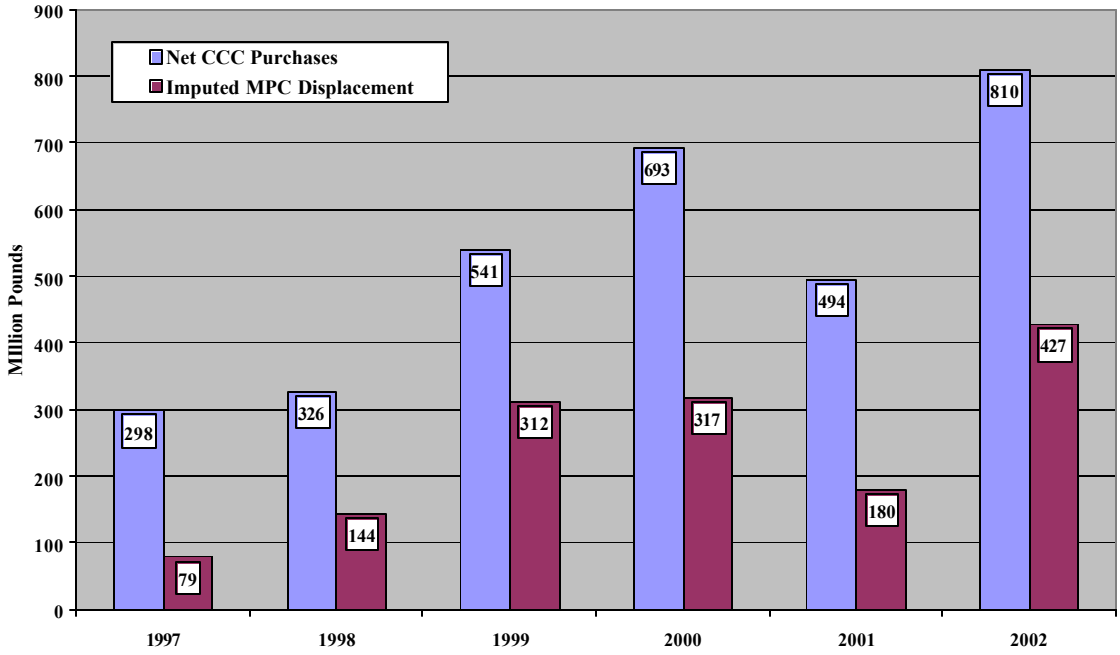


[10] Or alternatively, that condensed skim milk equivalent in volume to nonfat dry milk was used for standardization and correspondingly reduced production of nonfat dry milk.

The following chart compares the amount of U.S.-produced nonfat dry milk estimated to have been displaced by imported milk proteins with government purchases of nonfat dry milk under the dairy price support program. With the exception of 2001, nonfat dry milk purchases have increased each year since 1997, with 2002 purchases estimated at over 810 million pounds. More nonfat dry milk was purchased by the government than was imputed to have displaced by MPC each year. The gap between government removals and imputed displacement has grown from about 200 million pounds to nearly 400 million pounds.

The displacement estimates derived in this fashion very likely err on the high side. Even so, nonfat dry milk production is expanding more rapidly than its use is being eroded by MPC and other milk protein imports. Government nonfat dry milk purchases increased by 500 million pounds between 1997 and 2002. They still would have increased — but only by about 200 million pounds — if imports of concentrated milk proteins had remained at levels experienced in 1996.

Nonfat Dry Milk: Government Purchases compared to Imputed MPC Displacement



This raises an important question related to the price effects of milk protein imports: ***Would USDA have implemented the butter-powder tilts in 2001 and 2002 if government purchases of nonfat dry milk had been smaller by the amount displaced by imported milk proteins?***

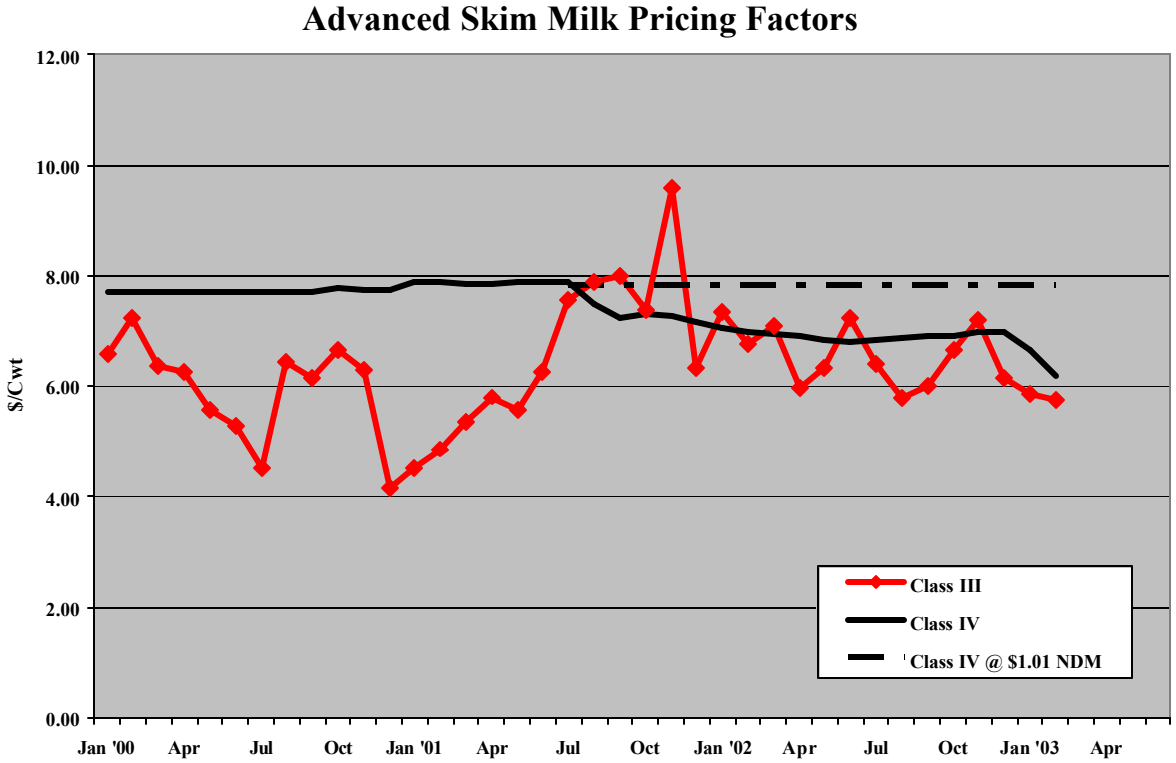
The tilts unquestionably reduced average farm milk prices. Federal orders were amended in January 2000 to adopt a new Class I price "mover." The mover is the higher of an advanced formula price for Class III skim milk (used for cheese and whey) or Class IV skim milk (used

for nonfat dry milk). Class IV skim milk prices have served as the Class I mover most of time since adoption of the "higher of" mover.

The Class IV skim milk formula price varies solely with the price of nonfat dry milk, and the commercial price of nonfat dry milk is tied closely to the government purchase price. When the purchase price for nonfat dry milk was reduced by the tilts, the market price moved down almost in lock step. So whenever Class IV was the mover, the Class I price was correspondingly lower because of the lower government purchase price.

The chart below illustrates the effect of the tilts. The dotted line shows what the advanced Class IV skim milk price would have been if market prices for nonfat dry milk had stayed at the $1.01 per pound government purchase price that applied prior to May 31, 2001. Note that in that case, the advanced Class IV price would have been the Class I mover in all but three months following the May 31, 2001, tilt. The Class I price (at 3.5 percent butterfat) from July 2001 through February 2003 would have averaged $0.66 per hundredweight higher, ranging from zero (in those three months when Class III would have been the mover) to $1.57 in February 2003 (when market prices for nonfat dry milk were approaching the new purchase price of $0.80 per pound that became effective November 15, 2002).

The tilt also affected monthly Class II and Class IV skim milk prices, which are tied exclusively to the price of nonfat dry milk. The estimated average monthly impact of the tilts on Class II and Class IV prices (at 3.5 percent butterfat) since the May 2001 tilt is about $0.80 per hundredweight.



Annual average producer milk utilization by class for 2001 was as follows: Class I — 38.2%; Class II — 9.8%; Class III — 44.2%; and Class IV — 7.8%. Applying these percentages to the monthly average price reductions attributable to the tilts indicate an average monthly farm price reduction of abut $0.40 per hundredweight across all markets. For the Upper Midwest order, which has relatively high Class III use, the estimated average monthly price reduction is 17 cents per hundredweight. For the Florida order, with high Class I utilization, the comparable value is 66 cents.

In some markets, larger over-order premiums for Class I and Class II milk probably offset some or all of the reduction in minimum federal order prices. Consequently, the price reductions noted are larger than what actually occurred.

There is a major issue regarding the economic and political wisdom of using the dairy price support program to prop Class I prices (see Jesse and Cropp). Regardless of one's position on that issue, there is no question that butter powder tilts cut farm-level milk prices. But the larger question is whether these tilts would have occurred if milk protein imports had been curtailed.

It's not possible to definitively answer that question. On one hand, the Secretary of Agriculture is bound by law to adjust butter and nonfat dry milk prices as often as twice per year in order to minimize the cost of the dairy price support program. Adhering to this legal commitment means that the Secretary would have been obligated to reduce the nonfat dry milk purchase price (and raise the butter purchase price) even if milk protein imports had remained at 1996 levels — nonfat dry milk purchases would still have been significant and butter purchases nil.

On the other hand, legal commitments of the Secretary often seem to be interpreted in light of political pragmatism. Sufficient political pressure may have been mounted to prevent the tilts if nonfat dry milk purchases and stocks had not increased as much as they did.

So how serious is the MPC/Casein threat to U.S. dairy farmers?

Imported Milk Protein Concentrate has shown robust growth. This growth has been stimulated partly in response to the absence of border protection by the U.S. — a post-WTO agreement "push" factor. The growth in MPC imports has also occurred because MPC is cheaper than domestic sources of milk protein, because it is a very functional ingredient in a rapidly-growing market consisting of high-energy foods and beverages, and because it increases the efficiency of cheesemaking — "pull" factors.

Some of these reasons underlie a legitimate concern by U.S. dairy farmers. For example, it makes little sense to apply restrictive tariffs on nonfat dry milk imports and simultaneously allow unlimited imports of a reasonably close substitute, MPC, essentially duty-free. There is a strong case to be made for comparable customs treatment of nonfat dry milk and MPC imports. At the same time, there are real questions about whether it is realistic or even possible to increase border protection in the middle of new WTO negotiations.

Other reasons reflect more of a protectionist attitude than a legitimate concern. In particular, foreign suppliers of MPC have been quick to heed the call of U.S. food manufacturers for tailored milk proteins. Primarily because of artificial price signals coming from the dairy price support program, potential U.S. suppliers of specialized milk proteins have found it more profitable to manufacture a generic substitute — nonfat dry milk — that does not meet the specifications of these manufacturers. Consequently, U.S. producers have not enjoyed the benefits of this expanding market. The same argument applies to cheese milk standardization. Besides being cheaper to purchase, MPC increases efficiency in the cheese plant. It is illogical to expect cheesemakers to voluntarily use nonfat dry milk instead of a more functional source of protein that is also less expensive.

At least for now, the price effect of MPC imports seems minimal. MPC does displace large volumes of nonfat dry milk. But the production of nonfat dry milk in the U.S. substantially exceeds what would be purchased commercially even if imports of MPC and other milk protein had not increased since 1996. Whether the displaced nonfat dry milk that ultimately ended up in government storage induced butter-powder tilts and associated lower producer milk prices is an open question.

It seems unlikely that imported MPC is stimulating excess natural cheese production. Given normal price relationships between butter and cheese, cheesemakers strive to utilize as much butterfat in their milk supply as possible by adding milk protein.[11] MPC possesses desirable characteristics for standardizing cheese milk, but nonfat dry milk that is currently displaced would be used if MPC were not available. Hence, the same volume of natural cheese would likely be made, albeit at a higher cost. MPC and other milk proteins may be adding to the supply of process cheese, but again, in the absence of MPC, manufacturers would likely turn to nonfat dry milk as an alternative source of protein and supply the same volume of process cheese[12].

Simply put, it is hard to argue that MPC is lowering farm milk prices as long as the U.S. government is purchasing more nonfat dry milk than is being displaced by MPC.

Casein imports do not appear to pose a serious threat to U.S. dairy farmers. It is clear from relative prices and the stability of imports that casein does not displace significant quantities of nonfat dry milk or other dairy ingredients. The primary uses of casein are industrial or in food and feed applications for which nondairy proteins can substitute.

Caseinates are another matter. U.S. imports of caseinates more than doubled between 1993 and 2001, suggesting that they were increasingly being used in food products for which nonfat dry milk might have been employed. On the other hand, the functional characteristics of caseinates are distinctly different from nonfat dry milk, so the increase in imports may be associated with new or expanded uses.

[11] Using 38-percent moisture cheddar as a guide, it is more profitable to standardize cheese milk by adding protein than by removing butterfat as long as the cheese/butter price ratio is greater than 1:2.
[12] Process cheese manufacturers might also look to non-dairy protein sources such as soy proteins...

Finally, there are questions pertaining to whether and how domestic production of specialized milk proteins might be stimulated to meet what is clearly a growing domestic demand. Federal subsidies and a separate federal order classification have been offered as options. These and other options merit further discussion. But a first step in any effort to stimulate production is correcting marketplace signals. As long as making nonfat dry milk generates more net dollars per hundredweight of milk than making MPC, U.S. processors will continue to make nonfat dry milk.

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