

The European Union-United States Wheat Gluten Policy Dispute

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On June 1, 1998, President Clinton approved a three-year quota on wheat gluten imports from Australia, the European Union, and all other nonexcluded countries. The quota-remedy will be reviewed for possible extension for up to five additional years. The potential for extensions is an important reason to develop a better economic understanding of this industry and the effectiveness of the implemented quotas. The purpose of this paper is to provide background on the gluten trade dispute, to decipher the qualitative impacts of EU policies on world gluten markets, and to evaluate the potential effectiveness of the U.S. quota remedy. The U.S. industry has operated at a low level of capacity utilization, implying high elasticity of supply; demand is inelastic; and Canada, a major producer and exporter of gluten, was excluded from the quota. These factors are likely to significantly limit the quota's effectiveness but may give the industry time to develop value-added products that use their primary outputs.

Introduction

From 1983 through 1995, U.S. imports of wheat gluten from the European Union (EU) increased at a 47 percent annual rate (Figure 1). The market effects from these increased imports helped to contribute to declines in U.S. capacity utilization (below 50 percent in 1997), decreased profitability of U.S. firms, and lower imports from other nations. In early 1997, the Wheat Gluten Industry Council (WGIC)¹ pursued actions against the EU under Section 301 of the 1974 Trade Act.² Their principal claim was that EU Common Agriculture Policies (CAP) were enabling European starch processors to profitably export a starch co-product, wheat gluten, to the United States at prices below

Balzer and Stiegert are graduate assistant and assistant professor at Kansas State University, respectively. Funding for this project was graciously provided through The Wheat Utilization Committee of U.S. Wheat Associates, which consists of representatives from several state and national wheat commissions and marketing boards. Appreciation is expressed to KSU Wheat Research Center for council and advice during this project. The authors are listed alphabetically; senior authorship is not assigned. Contribution No. 99-117-J from the Kansas Agricultural Experiment Station.

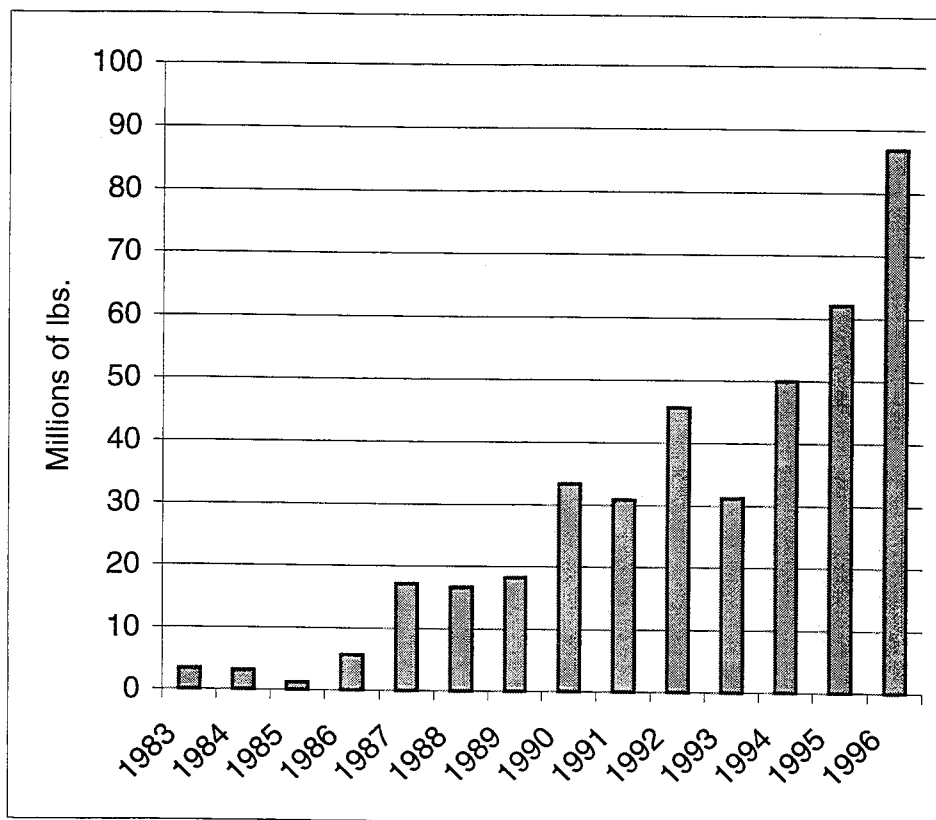
¹ The WGIC is a group comprised primarily of two starch gluten processors—Midwest Grain Products, Inc., Atchison, KS, and Manildra Milling Corporation, Shawnee Mission, KS. Manildra Milling Corporation is a subsidiary to the Manildra Group of Australia, which also owns gluten-processing capacity in its home country. Archer Daniel Midlands and Heartland Wheat Growers also own gluten-processing facilities in the United States.

² Section 301 permits the U.S. Trade Representative to investigate and sanction countries whose trade practices are deemed "unfair" to U.S. interests.

the cost of production. The U.S. Trade Representative-Designate Charlene Barshefsky initiated the Section 301 investigation on "certain subsidies of the European Union that are adversely affecting U.S. modified starch exports to Europe." However, for a number of legal and political reasons, the investigation ended, and the United States chose not to seek damages under Section 301.

The WGIC then pursued sanctions against the European Union under Section 201 law. Under Section 201, domestic industries seriously injured or threatened with serious injury by increased imports may petition the U.S. International Trade Commission (USITC) for import relief. The test of injury to an industry is less complicated politically and perhaps easier to prove than a Section 301, which involves a comprehensive interpretation of U.S. interests with its trade partners. The USITC completed its inquiry in January of 1998 and found (by a 3-0 vote) that the industry claims were indeed valid. They provided to the President a quota-remedy policy opinion (USITC, 1998b).

Responding to the USITC opinion report, President Clinton, on June 1, 1998, approved a three-year quota on wheat gluten imports from Australia, the European Union, and all other nonexcluded countries. The excluded countries were Canada; Mexico; Israel; beneficiary countries under the Caribbean Basin Recovery Act, or the Andean Trade Preference Act; and developing countries that have not exported gluten. Canada is the only excluded country with significant exports of gluten to world markets. The quota went into effect immediately, and it limits gluten imports from all nonexcluded countries in the first 12 months to 126.8 million pounds. The quota limits imports to

Figure 1. U.S. Imports of Gluten From the European Union.

Source: U.S. Department of Commerce (edible/non-edible).

62.425 million pounds from Australia, 54.041 million pounds from the European Union, and 10.346 million pounds from the "other" country categories (USTR, 1998). The quota will increase 6 percent annually for the duration of the three-year relief period. The quota-remedy will be reviewed for possible extension for up to five additional years. The potential for extensions is an important reason to develop a better economic understanding of this industry and the effectiveness of the implemented quotas. The purpose of this paper is to provide background on the gluten trade dispute, to decipher the qualitative impacts of EU policies on world gluten markets, to evaluate the potential effectiveness of the U.S. quota remedy, and to outline possible future research.

Economics of Wheat Gluten

Commercial wheat gluten is obtained by separation of wheat flour into starch and gluten through the wet-milling process. Wheat gluten is produced in fixed proportion to wheat starch. For every pound of wheat gluten produced, the wet-

milling process also produces about 3 pounds of wheat starch. After drying, the gluten is marketed as a free-flowing powder. Powdered wheat gluten rapidly absorbs water to approximately twice its original weight, which restores its intrinsic functionality (MGPI, 1997b). Gluten is a term that describes two groups of wheat protein in the gluten complex—gliadins and glutenins (Stiegert and Blanc, 1997). Combined, these proteins give bread dough its properties of strength and elasticity. The starch output can be used as food additives, further processed into value-added products, or used as feedstock for ethanol production.

Gluten typically is added to specialty bread products because formulas using whole wheat or other ingredients need a stronger protein complex to maintain strength and elasticity in the mixing and baking process (MGPI, 1997a). The strengthening characteristics provided by wheat gluten also improve machinability in the high-speed bread production processes. Wheat inherently contains most of the proteins needed for baking many bread-type products. However, in crop years when intrinsic wheat protein is low, vital wheat

gluten will be added to high-volume pan bread and hard roll flours to raise the protein content to a desired level. Thus, wheat gluten is a substitute for the inherent protein in wheat kernels. Ortalo-Magne and Goodwin (1992) showed that demand for wheat gluten is positively related to the price of high protein wheat.

Because of the important role that protein content has in determining hard wheat quality, hard wheat is marketed globally based on contracted protein minimums. *Milling and Baking News* reports a protein premium schedule for intrinsic protein levels between 11 percent and 14 percent at 0.2 percent increments. Parcell and Stiegert (1998) summarized the findings from nine different studies that estimated the marginal value of wheat quality characteristics in world markets. Protein consistently emerged as the most important quality characteristic in shaping the quality-based pricing profile of wheat.

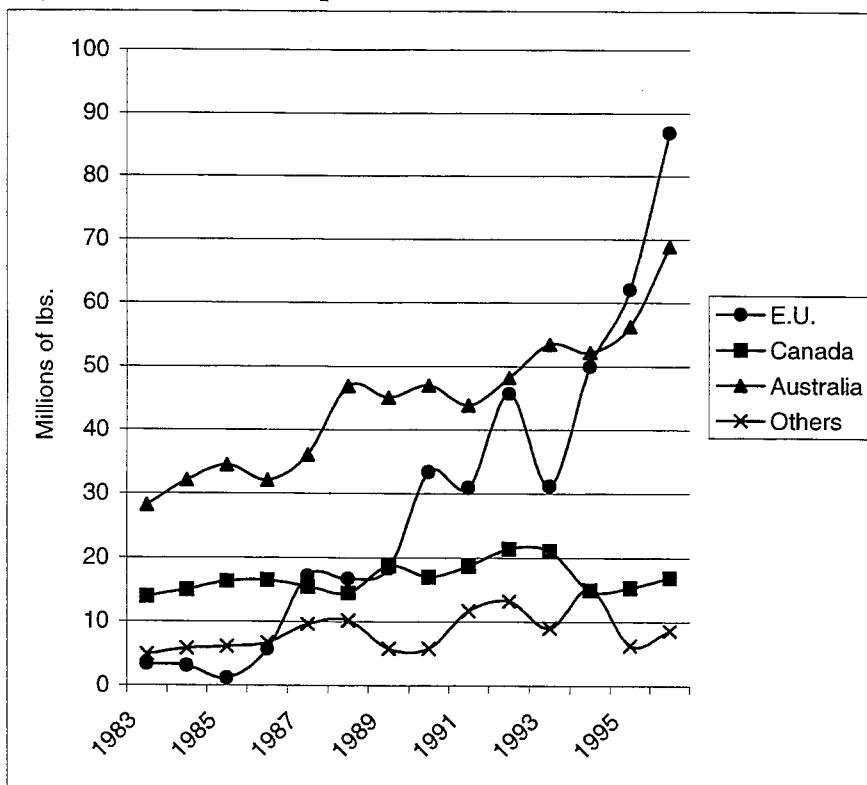
U.S. Gluten Imports and Economic Impacts

The relative scarcity of high protein wheat and the demand for protein for many high-volume

baked products give wheat gluten its market value. Thus, the economic impact associated with the EU-U.S. trade dispute involves more than the simple injury claims of the starch-gluten industry. Distorted gluten markets may be responsible for lowering protein premiums, which would negatively impact the returns to wheat breeding programs, producers, and owners of storage facilities in many regions of the world.

The trend in U.S. gluten imports from 1983 through 1996 is presented in Figure 2 by major suppliers. Although the imports sourced from the European Union and Australia both have increased over time, imports from the European Union have been increasing at a much faster rate. Canada and other countries have generally kept gluten imports constant over time. In the quota-restricted market, it is completely feasible for Canada to increase exports to the United States. In fact, the more successful the quota is in driving a wedge between the world price and the U.S. price, the more Canada will take advantage of its exclusionary status. Later, we discuss the policy structure in Canada and Canada's ability to expand production and to capitalize on the U.S. gluten quota.

Figure 2. U.S. Gluten Imports.



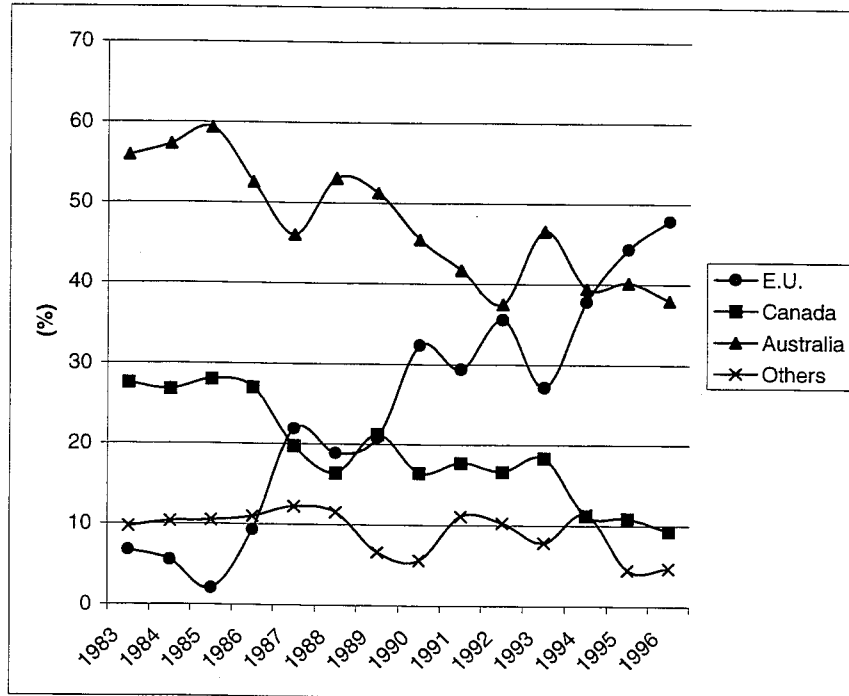
Source: U.S. Department of Commerce (edible/non-edible).

The market share of U.S. gluten imports is presented in Figure 3 by major supplier. Only the European Union increased its U.S. market share during the 1980s and 1990s. Even though Australia was a dominant exporter of wheat gluten into the United States, they lost about one-third of their market share. These trends are particularly observable from Figures 4 and 5, which break down the import market in 1985 and in 1996, respectively. In 1985, the European Union maintained a 2 percent market share, but this increased to nearly 50 percent of the import market in 1996. Australia's market share dropped from 59 percent to 38 percent, and Canada's dropped from 28 percent to 9 percent.

The section 201 investigation by the USITC focused on the claim of injury to the domestic in-

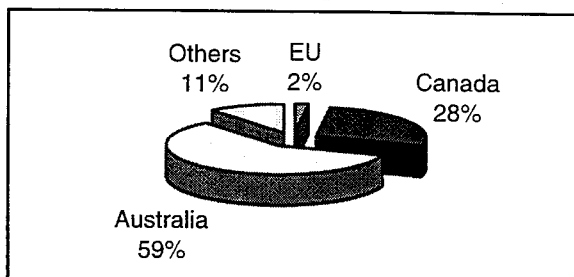
dustry caused by gluten imports. Several key factors generally supported this claim (USITC, 1998a). Increased imports of gluten to the United States displaced potential U.S. production. In 1993, the industry operated at 78 percent of capacity. By 1996, annual capacity utilization had decreased to 42 percent of capacity, and it increased only slightly to 44 percent in 1997. Inventories more than tripled from 1993 through 1995, from 4.5 million pounds to 13.8 million pounds. After 1995, inventories remained excessively high by historical standards—11.5 million pounds in 1996 and 9.1 million pounds in 1997. The ratio of EU imports to U.S. production rose from 34 percent in 1993 to almost 75 percent in 1997.

Figure 3. Percentage of U.S. Gluten Imports.



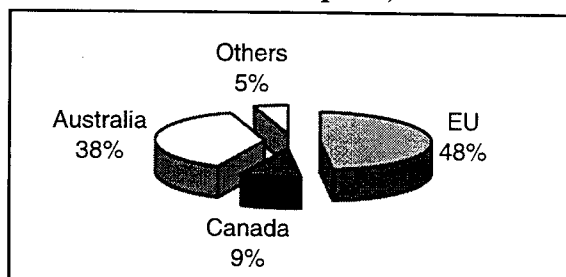
Source: U.S. Department of Commerce.

Figure 4. U.S. Gluten Imports, 1985.



Source: U.S. Department of Commerce.

Figure 5. U.S. Gluten Imports, 1996.



Source: U.S. Department of Commerce.

On the flip side, excess capacity also occurred because U.S. firms added new capacity in the mid-1990s.³ U.S. plant capacity grew from 162.856 million pounds in 1993 to 273.895 million pounds in 1997 (USITC, 1998a). This underutilized source of gluten processing poses a serious threat to the success of a quota designed to raise gluten prices above the world price. One motive for the recent additions in capacity came from the U.S. ethanol sector policies. The U.S. Congress had mandated pollution reductions on large American cities by requiring minimum oxygenated fuel (that is, ethanol) requirements by the mid-1990s. The added demand for ethanol encouraged new construction of ethanol capacity.⁴ However, after the 1994 election and the subsequent shift in control of congress to the Republicans, the mandate was removed. This unanticipated shock in the ethanol market lowered returns to wheat starch production, which exasperated the excess capacity problem in the starch-gluten industry.

The investigation also took into account financial information of individual gluten-processing firms in the United States. This financial data was suppressed in the public version of the report. However, verbiage in the public report indicates a strong response in favor of the industry. Regarding operations on wheat gluten; "There was a sharp increase in profitability between 1993 and 1994, then a sharp decline in profitability in 1995, and further declines which resulted in losses in 1996 and 1997" (USITC, 1998a). In response to questions about whether profitability of starch operations should be included in the analysis, WGIC's position was one of indifference: "you've got a very severely declining performance trend, regardless of how you look at it." (USITC, 1998a) Thus, the WGIC apparently presented evidence that clearly related the excess imports of EU gluten to decreased capacity utilization, increased inventories, lost market share, and accounting losses. The timing of accounting losses correlated also with increases in U.S. production

³ New wheat starch-gluten facilities began operations in two locations. Midwest Grain opened a plant in Pekin, Illinois, and a cooperative plant was opened in Russell, Kansas.

⁴ The Pekin, Illinois, wheat gluten plant operated by Midwest Grain is fitted to process wheat starch into ethanol.

capacity. U.S. capacity increased 28 percent in 1994 and 22 percent in 1995.

EU Policies

Starch-gluten processing involves a simple technology commonly applied in many regions of the world. As a result, major technological, logistical, or managerial forms of comparative advantages do not exist across nations in this industry. In this section, we discuss the EU policy structure for the cornstarch and wheat starch markets.

As we will see, substantive evidence ties excess supplies of wheat gluten to policies that protect EU cornstarch and wheat starch markets. However, the policy structure is far from easy to understand. Most of the complexities involve wheat starch and cornstarch policies, substitutability of wheat starch and cornstarch in the marketplace, and the subsequent effect on EU output of a wheat starch-gluten joint product.

Wheat Starch

Although we do not have a time series of EU starch tariff levels, periodic and anecdotal information suggests that the industry has been provided considerable support and protection from outside competition. In 1995, for example, the European Union maintained an average tariff of \$435/ton on imported wheat starch (MGPI, 1997b). The average prices of native wheat starch were \$242 per metric ton in the United States and \$529 per metric ton in the European Union. With the large starch tariff in place, imported wheat starch was kept out of the European Community.

It appears that starch-gluten processors in the European Union earn profit in a protected starch market. Because gluten is a co-product in the production process, incentives to produce excess starch imply that excess gluten will be produced as well. This overproduction drives the world market price for gluten lower. Because starch-gluten producers in other regions of the world do not enjoy as much tariff protection as EU producers do, their total per unit revenue from starch and gluten could easily end up below their cost of production.

The USITC (1998a) reported that the U.S. import tariff rate on wheat starch was \$0.004 per pound in 1997 (USITC, 1998a). The EU wheat starch import tariff, converted to U.S. dollars, was \$0.106 per pound, or about 26 times higher

than the U.S. tariff. To put this in a different perspective, the world price of starch is typically at about the same level as the EU tariff on wheat starch (that is, 0.11 per pound). This tariff differential between the two countries helps to explain why the price for wheat starch in the European Union has been, at times, 2 ½ times greater than the world price.

Cornstarch

The European Union maintains import tariffs on cornstarch that also raise their internal price well above the world price. Without cornstarch tariffs, many EU food processors would substitute cornstarch for high-priced wheat starch in their formulas whenever possible.

In a free market, cornstarch maintains several cost and processing advantages over the production of wheat starch. The most obvious is that corn is cheaper than wheat on world markets. Corn also is processed into a single fraction of starch. Wheat yields two starch fractions, which require added costs to separate. In the European Union, two major trends have been noteworthy; first, corn-processing plants have been retrofitted to process wheat (MGPI, 1997b), and second, new wheat-processing plants have been constructed (USITC, 1998a). Under the current EU policy structure, therefore, wheat processing appears to be sufficiently protected such that it is favored relative to either extracting or importing cornstarch.

Nonfood Starch Subsidy

Starch refunds also increase gluten and starch production by providing government payments to European industrial (that is, nonfood) users of wheat starch. The nonfood subsidy is meant to compensate producers of industrial products for the difference between the EU price of starch and the world market price. This nonfood starch subsidy causes an outward shift in the demand curve for starch and increases EU starch prices. This greater demand for starch increases production for starch, which, in turn, increases gluten production.

Starch Export Subsidy

The European Union pays export subsidies for wheat starch and cornstarch. The amount of

export subsidy paid to producers varies, depending on the spread in starch prices between Europe and the world. This policy, like the others, maintains the European Union's domestic starch price above the world price. Domestic producers gain from the export subsidy, and domestic consumers lose. Again, this subsidy increases production of both wheat starch and gluten.

Who's Right?

The European Union maintains that, relative to the rest of the world, its policies do not provide an unfair advantage to its processors. They have explained that subsidies for wheat starch are designed only to reimburse its processors for CAP programs that raise the price of wheat above world markets. True, the EU price of wheat has been above the world price for over a decade as a result of CAP policies. Essentially, the claim is that the EU marketing margin (that is, the co-product revenue from processing a specific quantity of wheat less the cost of that wheat) is about the same as that in any other country.

If marketing margins for EU and U.S. processors are about the same, then in a free global market, industry expansion rates and capacity utilization rates should be similar as well. Such has not been the case in recent years. Wheat gluten processing in the European Union has expanded through retrofitting of corn wet milling plants and new plant investments.⁵ Therefore, logic dictates that marketing margins are more profitable for EU wheat processors than they are for EU corn processors. Two possible conclusions subsequently arise. One, EU policies in the corn sector place that industry at a comparative disadvantage with the rest of the world (ROW), and the European Union claims that its wheat processors are no more profitable than those in the ROW are indeed possible. Second, if policies controlling the corn sector do not place corn processors at a comparative disadvantage with the ROW, then its wheat policies

⁵ The *Tate and Lyle 1994 Annual Report* states: "Reforms to the European Common Agricultural Policy are . . . increasing price discrepancies between maize and wheat. [Tate and Lyle] is consequently investing to increase its wheat processing considerably at the expense of maize."

must be strategically benefiting the wheat-processing sector relative to the ROW.

Capacity utilization rates point to the latter hypothesis. In the United States, wheat processing capacity utilization rates dropped below 50 percent in 1996 and 1997. For the 20 wheat starch-gluten firms in the European Union, capacity utilization remained above 91 percent in most years from 1993 through 1997, except in 1995 when utilization dropped to 87.8 percent (USITC, 1998a).⁶ So, without even a detailed analysis of the policy framework, anecdotal evidence suggests that EU wheat processors are benefiting from EU policies relative to the ROW wheat processors. This can be the only way to explain retrofitting activities, new plant investment, and low capacity utilization in the ROW.⁷

Because of the fixed proportional nature of starch-gluten processing, firms that maximize joint-product profits will produce more of both products when only one is subsidized. In fact, fixed proportion technology implies directly that the chosen output level is not dependent on which product is subsidized or whether both products are subsidized. The only critical components of the decision are the joint product revenues per volume of material processed and the associated material and processing costs. Simply put, subsidies in wheat starch will cause firms to increase outputs of both products.

Assuming that EU starch policies have generated added supplies of gluten, one of the most important questions facing U.S. policymakers is simply, "What is the demand elasticity of wheat gluten?" If it is inelastic, then increased supplies tend to reduce price appreciably. If it is rela-

tively elastic, quantity changes do not cause much price movement. The same effects on world price would be observed if the EU policies simply led to displaced imports into their own region. The reason is that importers traditionally supplying the European Union would now have extra supplies on the world market, which also would lower prices.

Only one economic analysis of the world gluten market has been conducted. Ortalo-Magne and Goodwin (1992) used a U.S. structural import demand model to estimate the demand elasticity of gluten. They showed the long-run demand elasticity for wheat gluten to be -0.69, which implies that the market is price-inelastic. However, their study covered a period of time (1974-1988) when gluten prices were fairly stable and EU starch policies were in their beginning stages. Therefore, the policy-induced supply increases since then may have lowered the world gluten price such that firms selling starch in unprotected markets cannot turn a profit and shut down plants.

Support for U.S. Wheat Gluten Industry

During the January 1998 ITC hearings, the U.S. baking industry testified in favor of WGIC claims (Frey, 1998).⁸ Why would the U.S. baking industry be in favor of import restrictions on wheat gluten, which would increase their input costs? Gluten is not a high-cost component for bakers; therefore, paying more may not be of great importance to this industry. What is perhaps the greatest threat is lack of supply control. Ideally, a buyer prefers not to rely strictly on a small group of distant suppliers for a critical input. It is in the buyer's best interest to have many suppliers from different regions of the world. If the U.S. and Australian wheat starch-gluten industries were forced to shut down completely, U.S. bakeries would become much more dependent on Europe, which could exercise near monopoly power in setting prices. In sum, a reliable long-run supply of competitively produced gluten is more important to U.S. bakers than are the short-term benefits associated with subsidy-enhanced gluten prices.

⁶ The 1995 drop in utilization occurred during a single year when there was a 23 percent increase in total capacity. It is common to understate capacity utilization in years when capacity has been added. New capacity is not typically in production at the start of the accounting year, but it will be added to the aggregate capacity for the industry. Also, new capacity often takes time to be brought to full production.

⁷ The European Union also claimed that U.S. corn target price programs drive down the price of corn and make it difficult for U.S. wheat starch-gluten processors to profitably compete in markets where cornstarch is a strong substitute. The U.S. corn target price programs encourage increased corn production and lower the world price for corn and cornstarch. However, without CAP policies designed to raise corn and cornstarch prices above world levels, EU wheat starch-gluten processors would be facing equally stiff competition from cornstarch processors.

⁸ Charles Sullivan, Chairman of Interstate Bakeries, and Paul Abenante, President of American Bakers Association, spoke in support of the wheat gluten petition TA-201-67 on December 16, 1997 (USITC, 1998a).

Assessment of the U.S. Policy Move

U.S. agricultural trade disputes with the European Union have become some of the most common and important issues in international trade negotiations. These disputes are diverse and include topics such as import protection, export subsidies, and a variety of food safety issues. In the midst of these major confrontations, the Clinton Administration put into place an import quota affecting a relatively tiny part of the agricultural processing sector. The quota is designed to reduce gluten imports by about 50 million pounds in the first year. Very clearly, the WGIC's legal position in this case was sound. Its claim of material injury to the starch-gluten industry as a result of EU policies is basically accurate. The Clinton Administration acted in good faith in responding to the concerns of this industry. In fact, the specific nature of the quota generally followed the remedy proposed by the WGIC's legal counsel. In short, the industry was successful in obtaining what it sought.

However, whether the gluten quota will provide much long-term economic relief to the U.S. wheat gluten industry is not apparent. The two primary reasons for this conclusion are the significant excess capacity in the United States and the potentially significant and legal increases in Canadian imports.

Excess Capacity in the United States

The U.S. wheat starch-gluten industry operated at 44 percent capacity in 1997 (USITC, 1998a). A binding quota would drive a wedge between the U.S. price and the world price. However, a binding quota also would create an incentive to use excess capacity. The specific price that emerges in the United States depends on the demand and supply elasticity in the U.S. gluten industry. As discussed earlier, demand is inelastic (Ortalo-Magne and Goodwin, 1992). However, in an excess capacity situation, supply is most assuredly elastic.⁹ Therefore, small increases in price are likely to cause large increases in capacity utilization. A significant supply response to the quota, along with inelastic

gluten demand, will hold the price at a level that is not much higher than the world price.

Increases in Canadian Imports

U.S. wheat gluten imports from Canada likely will increase during the next three years. Canada maintains a prohibitive tariff-rate quota on non-NAFTA wheat product imports.¹⁰ As a result, wheat gluten imports from non-NAFTA regions into Canada are not expected to increase. However, a new wheat gluten processing plant recently opened in Alberta (API Grain Processors—capacity of 13.5 million pounds gluten), and a second plant in Thunder Bay, which was closed in 1996 and 1997, has been renovated and re-opened (Riverside Grain—capacity of 13.6 million pounds) (USITC, 1998a). The combination of these two plants will provide Canada with enough excess gluten to replace a considerable share of quota-restricted imports in the United States.

Prices for wheat gluten will equalize across the NAFTA region. Differences in exchange rates will help to determine trade flows between Canada and the United States. Recent strengthening of the U.S. dollar relative to the Canadian dollar will encourage a greater share of NAFTA production to be in Canada. Indeed, because of sticky wages and fixed costs, a stronger dollar could rationalize a condition in which U.S. processors face accounting losses, while Canadian firms operate at full capacity and earn profits.

USITC Impact Assessment

Presuming that no illegal transshipments of gluten arrive in the United States through excluded nations, such as Mexico, and that Canada does not increase imports into the United States, the USITC estimates that the quota initially will raise domestic wheat gluten prices to between 3.2 percent and 8.3 percent over 1997 levels (USITC, 1998b). U.S. producers' domestic sales volume would increase by 14 percent to 19.8 percent, and sales revenues would increase by

⁹ The USITC (1998c) suggested a supply elasticity between 2 and 5.

¹⁰ Canada uses tariff-rate quota, which essentially limits all countries except the United States and Mexico to 123,557 metric tons for all wheat products per crop year. The base in-quota tariff is 17.5 percent and is scheduled to be phased down to 5.3 percent as a part of Canada's WTO commitments. Once the quota is met, however, the rate increases to CDN\$467/ton plus the current 17.5 percent tariff.

20.8 percent to 27 percent. Domestic capacity utilization is expected to increase from a level of 44.5 percent in 1997 to between 50.7 percent and 53.3 percent with the implementation of the three-year quota.

Can this industry be profitable when only 52 percent of its capacity is being used in the production process? This is hard to say, given that such low utilization rates are uncommon. Most U.S. industries typically operate between 75 percent and 95 percent of capacity. Also, U.S. starch and ethanol markets have a role in determining profits in this industry. The industry has been developing new value-added products from gluten and starch. If it is successful in developing and marketing these products, profitability to the industry could improve along with utilization rates, even if raw starch and gluten prices remain depressed.

Conclusion

World prices for vital wheat gluten have declined significantly in the past several years. The WGIC claimed that these price declines are due principally to EU policies that have encouraged wheat starch-gluten production and exports. The USITC and the Clinton administration supported these industry claims and placed a three-year quota on wheat gluten imports with specific restrictions on EU levels. The import quota will be reviewed further for possible extensions of up to five additional years.

Considerable anecdotal evidence exists that the EU policies are indeed providing an artificial profit incentive for their domestic starch-gluten industry. During the past 10 years, firms in the European Union have retrofitted corn-processing plants to process wheat; they have expanded with new capacity; and they have operated at or near full capacity most of the time. On the other hand, some U.S. plants have been shut down, and others have operated below design capacity. Given the complex EU CAP structure and these recent events, logic dictates that EU firms that process wheat to gluten and starch must be receiving some preferential policy treatment relative to EU cornstarch processors and relative to wheat processors worldwide.

The three-year quota was approved to help lessen the damage caused by the surge in wheat gluten imports. How well will this policy protect

U.S. wheat gluten firms in the long run? Canada and Mexico are both exempt from the three-year quota. Canada recently has added considerable new capacity, and a weaker Canadian dollar should encourage exports into the United States. Also, the U.S. industry has significant excess capacity.

Future research on the wheat gluten trade dispute should consider several important issues. First, a model could be developed to test whether U.S. imports of gluten have displaced domestic capacity, which was suggested by the anecdotal evidence presented earlier. Second, EU policies to encourage gluten production may be having a significant effect in reducing wheat protein premiums throughout the world. If so, research should be developed to quantify this effect. Returns to breeding programs, elevators and storage businesses, and producer incomes are all partly dependent on wheat protein premiums. Third, simulating the spatial economics of the NAFTA starch-gluten market could provide many stronger insights into the EU-U.S. trade dispute. This simulation would have to consider the economic substitutability of wheat starch and cornstarch, spatial factors of transport costs from the various U.S. and Canadian plants, and exchange rate differentials between trading nations, and also should include the possible impacts on the industry associated with U.S. and Canadian ethanol policies.

In the final analysis, several options could be pursued. First, the U.S. quota could be extended past the current three-year period. While some short-term relief is possible from an extension, increased plant capacity in Canada and excess capacity in the United States will work to limit increases in wheat gluten prices. A second option is to pursue negotiations with the European Union to correct perceived problems with their agribusiness policies. While the potential gains from removing EU starch subsidies could be high, the probability of any such success in this area is probably quite low. Perhaps some joint agreements, which involve other industries, are possible, but it is simply not reasonable to think that the European Union will easily remove long-entrenched policies that favor certain political groups.

One of the reasons that the WGIC wanted a gluten quota was to give the industry time to develop its value-added processing sector. Without locally adequate supplies of starch and gluten from

wheat, such investments and product development would be unlikely. To this end, we think the industry's success will hinge on the effectiveness of this plan. The gluten quota may provide enough of a shield for the industry to limp forward at best. With more value-added options available for these raw outputs, the U.S. wheat starch-gluten industry could generate a more profitable environment. Without success in developing value-added products or somehow getting the European Union to restructure its policies, consolidation within the industry seems inevitable.

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