Effects of Animal Health Regulations on Market Access for Exports of Livestock Products

Kenneth W. Forsythe, Jr.
U.S. Dept. of Agriculture

Maury E. Bredahl
University of Missouri

By January 1, 1993, the European Community (EC) hopes to establish a unified market for the goods and services of member countries. They will accomplish this by reducing or removing trade barriers between EC member nations thus allowing relatively unrestricted trade across their borders.

Other nations have expressed concern that the creation of this unified EC market will allow freer internal trade but will also erect common, more restrictive, border measures against third country[1] trade. Removing trade barriers caused by technical regulations[2]—such as regulations dealing with standards of public, animal, and plant health—is a focal point of the unified market. However, many see the revised regulations as potentially restricting third country trade. Technical regulations are of particular concern because it is difficult to discern between their use to protect domestic producers from international competition and their use to safeguard human, animal or plant health.

To ease their distorting effect on internal trade, the EC has adopted a policy of harmonizing and upgrading technical regulations. Rather than requesting that an EC member lower its standards on health regulations to permit trade with other member nations—a politically infeasible move—the EC is adopting Community-wide regulations that equal or exceed those of any member. Member nations not meeting the Community norm must bring their national regulations into compliance.

The need to examine the EC's harmonization process is two-fold. First, the unified EC market will present a single set of technical regulations that must be met by third country exporters rather than the disparate sets of national regulations that now exist. Current and prospective exporters hoping to tap the unified market need to be aware of the adjustments in production practices that may be required to accommodate the revised regulations. The adjustments will present barriers to some and opportunities to others. Second, the EC's experience in the harmonization process provides valuable insight into the difficulties encountered in forming new regional free trade areas. Such difficulties face the Western Hemisphere Free Trade Zone envisioned in President Bush's Enterprise for the Americas Initiative.

Legislation is now in process to harmonize animal health regulations within the EC. The EC Commission has classified livestock diseases into three groups, according to the seriousness of each disease (U.S.-EC Mission). The first group includes serious livestock diseases that could quickly devastate livestock populations over large geographic areas. The EC has targeted these diseases for total eradication. The most important disease in this group is foot-and-mouth disease (FMD). Many have long recognized the influence of FMD on world beef trade (de las Carreras). Disparate national FMD control programs interfere with internal EC beef and cattle trade. Many consider the proposed Community-wide FMD control program a model for the control of other diseases in the first group, such as swine fever.

The second group includes diseases whose incidence tends to be more localized. Eradication is the goal for these diseases, though the steps taken to accomplish this may be less stringent than those in the first group. Cattle diseases in the second group include bovine leukosis, brucellosis, and tuberculosis. The third group includes less serious diseases that the EC does not consider a serious threat to the animal population.

The Foot-and-Mouth Disease Program

Prevention of the introduction of FMD is a legitimate concern of all nations. The United States, free of FMD since 1929, maintains very stringent technical regulations on imports of live ruminants and swine to help protect against reinfection. These regulations also apply to fresh, chilled, or frozen meat of these animals. FMD is of major concern because it is highly contagious, with the potential for total devastation of a nation's beef and cattle industry. The disease spreads quickly, transported by such diverse media as packing materials, vehicles, other animal species (for example, birds), and even human beings.

The EC intends to bring all member nations up to the same level of FMD control as practiced in the FMD-free countries of the United Kingdom, Denmark, and Ireland. These countries, foregoing the use of FMD vaccine, rely on eradication of infected animals to control FMD. This policy insures that the presence of the active FMD virus is not masked by the antibodies produced by vaccination. The presence of the antibodies means a country cannot be declared FMD-free. Eradication requires the slaughter of infected animals and the disinfection or destruction of infected production facilities and processing materials.

Other EC member states have used vaccination as a method of control for FMD. All member states have effectively controlled FMD except Italy and Germany. These two nations, Italy in particular, continue to experience serious periodic outbreaks of FMD. Even those countries using eradication programs have experienced occasional outbreaks, as the virus spreads from other areas of the EC.

Benefits to the EC due to FMD eradication accrue from decreased FMD program costs and decreased FMD related production losses. The EC Commission estimated that, over a ten year period, the cost of a FMD eradication program would be

about 35 million European Currency Units (ECU's). This is compared to 1 billion ECU's for an eradication program. The Commission (1989) of the EC estimated the cost of controlling a FMD outbreak on a single farm at approximately 150,000 ECU's.

The EC Commission submitted proposal 89/C 327/17 to the EC Council on October 30, 1989, to amend the existing directive 85/511/EEC codifying EC measures for FMD control. The proposal (approved August 18, 1990) required that by January 1, 1991, all EC member states must "bring into force the laws, regulations and administrative provisions necessary" to end the use of their current vaccination programs. Furthermore, all states must "prohibit the manipulation, manufacture, storage, sale or use of foot-and-mouth disease virus, anti-serum or vaccines in their territories" (Official Journal No. C 327, December 30, 1989, p.85).

To carry out this proposal, beginning January 1, 1992, other EC member states may not export cattle to the U.K., Denmark, or Ireland. In turn, those nations will abandon their quantitative and other restrictions to beef trade. Also, third countries will not be permitted to export cattle to any EC member, unless or until certified FMD-free. Council Directive 84/643/EEC states that "member states which have been free of foot-and-mouth disease for at least two years, which do not practice vaccination and which do not allow on to their territory animals which have been vaccinated less than one year previously may make introduction on to their territory of live cattle...where the animals come from a Member State satisfying the same criteria..." (Official Journal No. L339, December 27, 1984, p.27). As a result, beginning January 1, 1993, any EC member that has not experienced an outbreak of FMD after dismantling its vaccination program will be considered free of the disease. The member can then resume cattle trade with FMD-free member states.

While the proposed FMD legislation is a necessary first step toward eradicating FMD, it is unlikely to be enough because it deals only with live cattle trade. At least as important to consider are the implications of FMD eradication on trade in fresh, chilled, and frozen beef products. The FMD-free countries have as carefully regulated trade in beef products as trade in live animals. U.S. regulations prohibit imports of live cattle and fresh, chilled, or frozen beef from countries that have not eradicated FMD. The U.S. also places restrictions on imports from countries that may be FMD-free but that import live cattle and fresh, chilled, or frozen beef from countries that have not eradicated the disease.[3] The major exception to U.S. regulations is cooked or cured deboned beef. The U.S. government considers cooking or curing of meat necessary to kill the FMD virus. This meat must then be shipped in sterilized, sealed containers to prevent recontamination. Meat treated in this manner is an important part of beef exports from FMD-infected countries in South America.

It is reasonable to believe that the EC will not be able to achieve its stated goal of eradicating FMD without adopting additional import regulations for beef products from countries infected with FMD. With their vaccination program dismantled, EC cattle will be susceptible to FMD infection. Thus, continued imports of

uncooked or uncured meat from countries where the FMD virus may be present increases the risk of importing the FMD virus and infecting healthy livestock. It is possible that additional EC FMD regulations will be similar to those of the United States.

There are impediments to the EC adopting such regulations. The EC has concessionary bilateral agreements with certain FMD-infected third countries that guarantee minimum levels of access to the EC beef market. These commitments by the EC present an obstacle to ending fresh, chilled, or frozen beef imports from possible sources of FMD-infection. The EC thus faces a choice; maintain the concessionary agreements or reduce the risk of reinfection with FMD. How the EC will respond to this choice is uncertain but the effects of the latter bear consideration.

De las Carreras argued that the U.S. FMD-trade restrictions, combined with the emergence of Japan (a FMD-free country) as a major importer of beef, contributed to the rise of two separate world markets for beef and cattle in the 1960s and early 1970s. The so-called clean market includes those countries free of FMD; the dirty market consists of those that are not. Clean exporting countries have complete access to both the clean and dirty beef markets. Dirty exporting countries may not export fresh, chilled, or frozen beef (or live cattle without a lengthy and expensive quarantine) to the clean market. This restriction places them in a more vulnerable trade position than the clean exporting countries.

Possible effects of FMD eradication in the EC may include:

(1) Reductions in EC beef and cattle imports from FMD-infected third countries will redirect third country beef trade and reduce beef prices in the dirty market.[4]

(2) If the EC successfully eradicates FMD and clean importing countries recognize them as FMD-free, new markets may become open for subsidized EC beef and cattle exports in FMD-free countries.[5]

Volume of Trade Affected

The first step in analyzing the potential effects on world beef trade of the EC's eradication of FMD is to determine the affected volume of trade. Using data from the Food and Agriculture Organization of the United Nations *Animal Health Yearbook*, we classified the top 20 beef importers and exporters in 1987 into one of three groups (Table 1). These groups are: 1) FMD-free countries, 2) countries controlling FMD using vaccination, and 3) countries experiencing outbreaks of FMD in the last two years for which data are available (1987 and 1988).

Several EC countries rank among the top importers of beef. Some have been major destinations for beef exports from FMD-outbreaking countries in South America, and from other Western and Eastern European countries that have controlled FMD with vaccination programs. If the EC adopts FMD import regulations similar to those of the United States—to further its goal of FMD eradication—it will eliminate the fresh, chilled, and frozen portion of this trade. If not eliminated, it

Table 1.
FMD Status of the Top Twenty European Community (EC) and Third Country (3rd) Beef Exporters and Importers in 1987[a]

	Free	Vaccinating	Outbreaking
Exporters:			
EC	Ireland (303.2)[b] U.K. (160.7) Denmark (118.5)	France (393.5) Netherlands (309.1) Belgium-Luxembourg (101.7)	F.R.G. (434.2) Italy (86.6)
3rd	Australia (507.3) New Zealand (304.4) U.S. (224.3) Canada (72.5) Poland (40.9)	Hungary (116.1) Austria (62.9) Romania (58.5) Yugoslavia (29.0)	Brazil (72.0) Argentina (64.0) Uruguay (55.6)
Importers:			
EC	United Kingdom (208.4)	France (291.7) Greece (157.6) Netherlands (62.4) Spain (33.9)	Italy (449.0) F.R.G. (233.3)
3rd	United States (676.4) Japan (220.0) Canada (92.3) Taiwan (32.8) Hong Kong (29.2)	U.S.S.R. (270.0) Iraq (44.8) Yugoslavia (40.9)	Egypt (143.0) Brazil (142.7) Iran (79.9) Saudi Arabia (57.7) Israel (39.8)

a. Several EC countries are both importers and exporters of beef. The EC produces largely grass-fed beef. Much of this is exported as frozen been, with the help of subsidies, to relieve internal surpluses. The EC imports mostly fresh and chilled beef some of which is the high quality "Hilton beef" imported under concessionary agreements.
b. Numbers in parentheses are the quantity of beef explored (imported) in 1,000 metric tons.
Source: United Nations Commodity Statistics datatape.

will be diverted to other major third country beef importers in the dirty market such as the Soviet Union, Egypt, and other Arabic countries (Table 2). Live cattle imports from Austria, Switzerland, and Eastern Europe will be interrupted under the 1992 FMD control program.

Effects on FMD-Infected Third Countries

To provide some insight into the losses to exporters and the benefits to importers in the third country dirty beef market that could result from possible revision of the EC's FMD import regulations, we calculated estimates of the changes in producer and consumer surplus. These changes assume, for comparison, an equal $10 per metric ton decrease in domestic beef prices in the affected countries. We assumed a fixed margin between producer and consumer prices. We also assumed the returns from the margin to accrue to market intermediaries in the importing country. We

Table 2.
European Community (EC) Imports of Beef and Cattle from EC Countries and Third Countries (3rd) by FMD Classification

Exporting region	EC Importing Region					
	Free		Vaccinating		Outbreaking	
	(Beef and Veal, million ECU)					
EC Free	369.6		454.8		360.2	
EC Vaccinating	133.7*	(74.5%)	669.4		1,127.4	
EC Outbreaking	62.8*	(92.6%)	637.2		405.1	
3rd Free	94.1		118.4		31.3	
3rd Vaccinating	54.7*	(52.3%)	25.8*	(76.6%)	253.3*	(91.2%)
3rd Outbreaking	181.2*	(29.6%)	68.4*	(63.1%)	333.0*	(76.1%)
	(Live Cattle, million ECU)					
EC Free	120.1		78.0		3.9	
EC Vaccinating	1.9*		248.0		946.2	
EC Outbreaking	0.5*		112.4		79.9	
3rd Free	0.7		8.3		48.5	
3rd Vaccinating	0.0*		44.9*		142.1*	
3rd Outbreaking	0.0*		0.0*		0.0*	

* These trade flows could be affected by EC FMD eradications. (Number in parentheses are the percentage of fresh, chilled, and frozen beef in the trade flow.)
Source: NIMEXE Analytical Tables of External Trade, 1987.

calculated linear approximations of supply and demand schedules for each country from a single price-quantity combination and the price elasticities of supply and demand for beef in that country. We got the price-quantity combinations and the elasticities for the base year 1986, from Sullivan, Wainio and Roningen.

The countries examined are those whose beef exports may be diverted from the EC market and those who may be recipients of the diverted trade.[6] The major exporters for which data are readily available are Brazil, Argentina, Other Western Europe, and Eastern Europe. The major importers examined are the Soviet Union, Egypt, and other North African and Middle Eastern countries.[7] The regional groupings follow those of the database.

We summarized the results in table 3. Consumer surplus increases and producer surplus decreases in all countries reflecting a transfer of value from owners of productive fixed assets to consumers. This is due to the presumed negative price change. Producers in exporting countries lose some of the increased returns to fixed assets they gain from trading beef with other countries as opposed to remaining in an autarky situation. Consumers in importing countries experience additional gains from beef trade due to the price decrease. Returns to domestic intermediaries in the marketing process increase in all countries because the domestic quantity demanded of beef increases and the margin remains fixed (Figure 1).

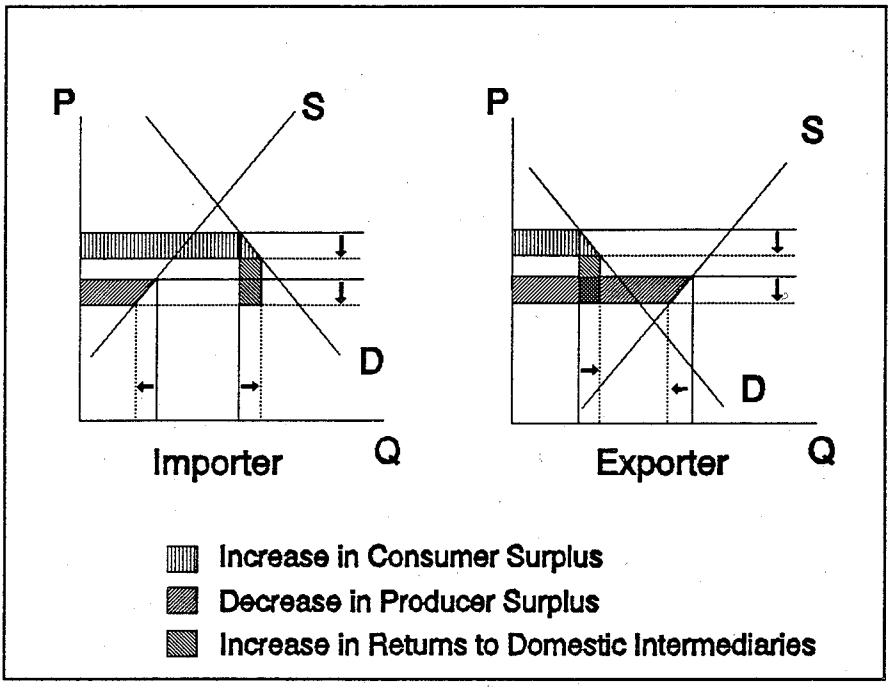
Table 3.
Changes in Producer and Consumer Surplus Resulting from a Hypothetical $10 Per Metric Ton Decrease in Domestic Beef Prices

Country	Change in Consumer surplus	Producer surplus	Gaines from trade[a]	Returns to intermediaries[b]	Net welfare
	($1000)				
Exporters					
Brazil	20,833	–19,959	874	6,551	7,425
Argentina	26,037	–28,421	–2,384	6,898	4,515
Other Western Europe	5,814	–6,721	–907	2,422	1,515
Eastern Europe	22,706	–25,092	–2,386	2,043	–343
Importers					
U.S.S.R.	80,299	–76,959	3,340	6,111	9,452
N.A.M.E.[c]	5,162	–3,558	1,604	650	2,254
Egypt	5,462	–3,957	1,505	1,302	2,807

a. Gaines from trade are defined as the additional consumer or producer surplus over the total consumer and producer surplus that exist under autarky.
b. The intermediaries include those entities in the marketing and distribution chain between the farm or ranch level producer and the retail or wholesale level consumer.
c. North African and Middle Eastern countries other than Egypt.

Brazil is a net importer of beef in the base year due to government contracts for large amounts of beef in 1986 from the EC, the United States, and Uruguay. These contracts were a response to Brazilian producers holding beef supplies off the market in retaliation for a government price freeze. Although Brazil is a major beef exporter the change in its gains from trade resulting from the price decrease are positive. The total returns to Argentina's fixed factors of production fall more than any other net exporting country considered because Argentina produces the most beef. The Soviet Union is both the largest producer and consumer of beef in the dirty market. It experiences the largest changes in producer and consumer surplus and the largest increase in its gains from trade. Increases in the returns to intermediaries more than offset decreases in gains from trade for all exporters except Eastern Europe. Eastern Europe's more inelastic demand (–0.2 compared to –0.7 for Other Western Europe and Brazil and -0.6 for Argentina) prevents the quantity of beef demanded from increasing as much as that of the other exporters. Eastern Europe is therefore the only region experiencing a net loss in welfare though the owners of productive fixed assets suffer in all of the FMD-infected third countries.

Figure 1:
Changes in consumer and producer surplus and returns to domestic intermediaries.



EC Access to FMD-Free Third Countries

The EC's access to the clean market is limited by factors other than its FMD status. The United States and Japan (both FMD-free countries) are the major importers in the clean market. The U.S. Meat Import Act indirectly limits the quantity of beef that the United States imports.[8] Australia and New Zealand are the major suppliers of beef to the United States. The EC, Australia, and New Zealand are largely producers of grass-fed beef as opposed to the higher quality grain-fed beef produced in the United States. If the entirety of the EC was certified by the United States as FMD-free, the EC would have to compete for market share directly with the relatively inexpensive beef exports of Australia and New Zealand.

Japan is the other major FMD-free import market. The EC has a disadvantage in distance compared to Japan's current principal suppliers, the United States and Australia. EC beef exports to Japan would most likely be frozen because of the distance. Japan's Livestock Industry Promotion Corporation (LIPC) is now holding large inventories of frozen beef (116,869 metric tons as of April 1, 1991)—more

than double the more manageable 50,000 metric tons.[9] LIPC is trying to release the stocks into the domestic Japanese market while simultaneously trying to avoid depressing domestic beef prices and harming domestic producers. They have been largely unsuccessful in releasing the stocks and the large supplies have been putting downward pressure on prices. Once the stocks are brought down to a manageable level, we expect imports to increase as Japanese per capita beef consumption increases.

Since the EC produces largely grass-fed beef, their exports could not compete directly with U.S. grain-fed beef exports in the Japanese import market.[10] Though Australian beef exports to Japan are grass-fed, they ship mostly chilled and not frozen beef. It is unlikely that the EC could compete with the inexpensive Australian chilled beef exports because of the large shipping distance.

Summary and Conclusions

Most EC countries have been largely excluded from the fresh, chilled, and frozen beef import markets of FMD-free countries (including those in the EC). Italy and Germany have been excluded because of the presence of FMD. All EC countries other than the United Kingdom, Denmark, and Ireland have been excluded because they use vaccination programs to control FMD. New EC legislation has prohibited vaccination for FMD which is a prerequisite to gaining FMD-free status. FMD-free status would allow freer internal EC beef trade and would be consistent with the goals of the unified market. Eradication is also a more cost effective method of control than vaccination for FMD.

Success of the EC's plan to eradicate FMD is uncertain. Additional control measures are likely to be needed. These measures will partially isolate the EC domestic beef industry from competition with—and are likely to reduce beef prices in—FMD-infected third countries. These effects give credence to the concerns that the new unified EC market will erect common and more restrictive barriers to third country trade.

While it is possible for the EC to gain increased access to FMD-free third country beef import markets (for example, Japan and the United States), factors other than FMD-status limit this potential. These factors include the distance to Japan, differences in beef quality, competition from inexpensive beef from Australia and New Zealand, and quantitative restrictions. Also, the hardy nature of the FMD-virus and the extent to which it is integrated into the environment of the FMD-infected EC countries (for example, FMD-infected wildlife populations in Germany) suggests that FMD-free status in the EC is a long term goal. The immediate effects of FMD eradication will be in FMD-infected third countries for which the EC has been a major beef import market.

Despite the potential trade distorting aspects of FMD eradication, the severity of the disease and its economic consequences suggest that eradication is necessary to safeguard the EC's livestock population. Other major livestock diseases endemic in the EC (like African swine fever) will be the subject of legislation in the future.

Observing the FMD eradication process will give a good sign of how these programs and others in newly forming regional free trade areas may effect trade in animal products.

Notes

The authors wish to acknowledge Brown Graduate Fellowship for providing funding and Linda Bailey, Shayle Shagam, and two anonymous reviewers for helpful comments. Any errors are the responsibility of the authors.

Any opinions, findings, or conclusions expressed herein are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.

1. Non-EC member.
2. EC regulations are laws that are in force in all member nations without additional national legislation. EC directives are laws binding on the member nations as to the result to be achieved but the implementing legislation is enacted at the national level. For purposes of this discussion, the term regulations refers to both regulations and directives.
3. U.S. regulations treat countries using vaccination as a control measure the same as those where FMD outbreaks are occurring.
4. Including those controlling FMD with vaccination programs.
5. Eradicating FMD in the EC will be difficult because of the hardy nature of the FMD virus and its integration into the environment (for example, wildlife populations).
6. EC countries were not examined because EC producers and consumers are insulated from price fluctuations in the international beef market through a variable import levy. The beef levy is set weekly at the difference between the EC Council's desired price for producers (the guide price) and the duty paid import price. The proportion of the levy paid depends on the state of the EC market. If the market price is lower than the guide price then the payable proportion of the levy increases (and vice-versa).
7. It is important to note that the high levels of beef imports in some of these countries are frequently due to subsidized exports of EC intervention stocks.
8. Voluntary restraint agreements are frequently negotiated with countries exporting beef to the United States to prevent triggering the quantitative restrictions of the Import Act. U.S. beef imports from the EC are also restricted (to about 3,000 metric tons) by a GATT quota.
9. Japan's system of beef import quotas ended on April 1, 1991, replaced by a high tariff that is scheduled to gradually decline through 1994 to a level "consistent with the results of the negotiations in the Uruguay Round [of the GATT]" (Riethmuller et al.)
10. Grain-fed beef may substitute for grass-fed beef (if the price is low enough) but grass-fed beef is not a good substitute for grain-fed beef.

References

Commission of the European Communities. 1989. "Report from the Commission to the Council on a Study Carried Out by the Commission on Policies Currently Applied by Member States in the Control of Foot-and-Mouth Disease." EC 89:1731. Brussels, Belgium, October 18.

de las Carreras, A. 1978. "Foot-and-Mouth Disease and the World Meat Trade." In, *Marketing of Animals and Their Products and Animal Health.* SP #374, Proceedings of the XI Inter-American Meeting, at the Ministerial Level, on Foot-and-Mouth Disease and Zoonoses Control, Washington, D.C., April 11-14.

Food and Agriculture Organization of the United Nations, World Health Organization, International Office of Epizootics. 1987-1988. *Animal Health Yearbook.*

NIMEXE. 1987. *Analytical Tables of External Trade.* Vol. A, Chap. 1-24. "Imports." EuroStat, Statistical Office of the European Community.

Official Journal of the European Communities. 1989. No. C327, December 30.

Official Journal of the European Communities. 1984. No. L339, December 27.

Riethmuller, P. and J. Fenelon. 1988. *Japanese Agricultural Policies: A Time of Change.* Australian Bureau of Agricultural and Resource Economics, Policy Monograph No. 3, Australian Government Publishing Service, Canberra.

Sullivan, J., J. Wainio and V. Roningen. 1989. "A Database for Trade Liberalization Studies," ERS Staff Report No. AGES89-12. USDA-ERS, Agriculture and Trade Analysis Division.

U.S. EC Mission. 1990. Unclassified cable on the "U.S.-EC Bilateral Discussions on 1992: Breakout Session on Animal Health/Veterinary Issues."

U.S. Department of Agriculture Economic Research Service. *Livestock and Poultry Situation and Outlook* Report, various issues 1986-1988.