

**THE VALUE OF
U.S. MEAT AND POULTRY EXPORTS
TO U.S. SOYBEAN PRODUCERS
THROUGH 2015**

**A Study for the
United Soybean Board**



**By: World Perspectives, Inc.
1300 Pennsylvania Avenue, NW
Suite 380
Washington, DC 20004
Tel: 202-785-3345
Email: wpi@agrilink.com**

February 2006

Table of Contents

Introduction.....	1
Impact of U.S. Meat Exports	1
Creating Formula for Calculating Soy Equivalent.....	3
BSE Implications: Current Market - 2004-2006.....	8
Impact on Indirect Soybean Meal Exports.....	12
Market Determinants: Supply and Demand Factors.....	13
Animal Disease Background.....	14
BSE Experience	14
Foot and Mouth Disease	24
Avian Influenza.....	26
Separating Facts from Fiction.....	30
Substitution's Benefits	31
Culture and Risk Assessment.....	31
Baseline Explanations.....	32
Scenario 1: Avian Influenza in U.S. Broiler Flock.....	35
Scenario 2: Further Spread of FMD in Brazilian Swine Herd.....	36
Scenario 3: FMD in Canadian Swine Herd.....	38
Conclusion	40
Recommendations.....	40

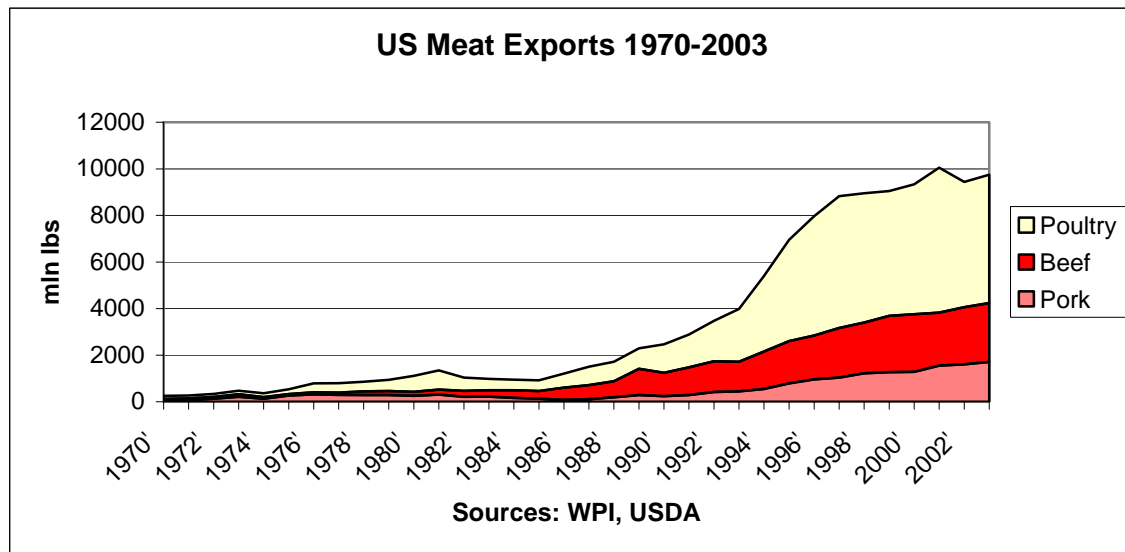
Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

... feed industry growth is tied to export potential for animals and meat products,” *American Feed Industry Association*, position paper on World Trade Organization (WTO) negotiations.

Introduction

Domestic livestock and meat production represents the single largest use of U.S. soybeans and, over the past three decades, export sales of U.S. meat have been the fastest growing utilization of U.S. meat. Export records were achieved for chicken in 2001, beef in 2003, and pork in 2004. Thus, U.S. meat exports have become an important component of increased demand for U.S. soybeans and present a significant opportunity for future growth.

This report quantifies the impact of U.S. meat and poultry exports to U.S. soybean producers, and analyzes the contributions to indirect soybean exports that U.S. meat exports could make under a number of global trade scenarios.



Impact of U.S. Meat Exports

Generally, exports impact the value of livestock and meat – and thus the demand and value of feedstuffs such as soybean meal in two basic ways:

Increased Production: First and most obvious, meat exports support surplus domestic production allowing larger herds and flocks of domestic livestock. In the case of pork, for example, the U.S. became a net surplus exporter in 1995. In the preceding 5 years, the average annual feeder pig supply was 96.7 million head; in the five years after 1995,

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

the average annual feeder pig supply was 100.2 million head. The U.S. swine herd has been larger than 100 million head every year since 1998; it had only exceeded 100 million four times in the 37 years between 1960 and 1997. This increase in feeder pig supply, which is supported by pork exports, ultimately increases the domestic utilization of U.S. soybean meal.

Using the rough estimate that it takes 3.48 bushels of soybeans to fatten a feeder pig (approximate conversion that the U.S. Meat Export Federation uses for its reports on indirect exports), the larger average feeder pig herd in 1996-2000 compared to 1990-1995 consumed the equivalent of more than 12 million bushels of soybeans per year. Again, without exports, the feeder pig herd would not be as large as it is.

Premium Pricing: Second, U.S. meat exports allow for premium pricing of various meat cuts and types, which increases the total revenue generated by a carcass.

Example 1 – Poultry: In poultry, white meat is higher valued domestically, while dark meat – legs and thighs – is more highly valued in a number of export markets from Japan to Russia. Thus, these export markets pay more for such parts than U.S. consumers. More than 60 percent of U.S. broiler exports are leg quarters.

For example, according to the 16 September 2005 *Livestock, Dairy, and Poultry Outlook Report* from the USDA's Economic Research Service (ERS): *Leg quarter prices in August averaged in the 45 to 46 cents per pound range, up almost 40 percent from the previous year. The increase in leg quarter prices can be attributed chiefly to export market strength.*

Example 2 – Beef: Moreover, according to the U.S. Meat Export Federation, which is working on a detailed study of collected export data by cut and by market comparing export prices and domestic prices, the export premium for five cuts – shot plate, tongue, skirt, short ribs and tripe – account for about \$78 per head. For a representative carcass dress weight of 750 lbs, the export premium for those five cuts averages about 10 cents per pound.

In short, value pricing makes livestock production more profitable. In terms of soybean meal demand, more profitable livestock production allows the demand for feedstuffs to be less price elastic – *i.e.* somewhat less sensitive to price increases in feedstuffs. While the exact elasticity of demand for feed stuffs is a complex and dynamic relationship (and beyond the scope of this particular analysis) the theory can be proven empirically by considering the reverse: when livestock prices drop, livestock producers often look to reduce feed costs by various means including feeding to lighter weights and using lower cost inputs. Therefore it can be assumed that the extra value that exports bring to livestock benefits soybean meal demand.

Creating Formula for Calculating Soy Equivalent

To calculate the soybean meal equivalent of meat exports the following steps are necessary.

1) Convert pounds of meat exports to animal live weight equivalent Meat exports are reported in terms of weight, usually noted as carcass weight equivalent (CWE) for red meat and ready to cook (RTC) for poultry. Since it is the live animal that consumes the soybean meal, the meat export weights need to be converted to the live animal weight equivalent to determine the input of soybean meal into the animal production. The following steps are taken:

- Total live weight at slaughter can be obtained by multiplying the number of head slaughtered by the annual average slaughter weight.
- A conversion factor can be obtained by dividing the total annual reported production of meat as reported by USDA’s National Agricultural Statistics Service (NASS), by the total slaughter weight calculated above.
- When the conversion factor is applied to the reported volume of exports as per the USDA’s Foreign Agriculture Service (FAS), or projected meat export volumes as per the USDA’s World Outlook Board (WAOB), the live weight equivalent is then determined.

Type of Meat	Variable: Meat Export to Live Weight Equiv
Beef	.600 to .610
Pork	.704 to .728
Chicken	.72 to .73
Turkey	.794 to .792

Source: WPI, USDA

1B) For beef, apply the proper percentage of total live weight gain that is a result of feeding activity. Cattle gain significant weight on pasture; only a portion of their commercial weight gain is attributed to direct feeding in the feed lot. This step applies to beef only and does not apply to integrated operations like pork farrow-to-finish operations or poultry production.

- Divide the gain on feed by the total finished weight to yield the percentage of gain from feed activity.
- Apply the percentage of weight gain on feed to all further feed calculations.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

Variable: Percent of Live Weight Gain on Feed	
Cattle/Beef	37.5 to 44.3

Source: WPI, USDA

2) Apply the meat gain ratio to the live weight equivalent to determine total feed use. For each species of livestock, there is a meat gain ratio that is the average amount of feed (including other feedstuffs than soybean meal) needed to produce a pound of finished meat.

- Estimates below are based on industry averages discovered in interviews with feeders and producers

Type of Meat	Variable: Meat Gain Ratio
Beef	6.0 to 6.9
Pork	3.6 to 4.0
Chicken	1.99 to 2.25
Turkey	2.6 to 2.9

Source: WPI, USDA

- By calculating the live weight gain, and multiplying by this ratio, the total amount of feed use input into the production of the export volume of meat is produced.

3) Multiply the total feed use by the percentage of soybean meal that is in the feed ration.

- Estimates below are based on industry averages discovered with feed manufacturers and other industry sources.

Type of Meat	Variable: Pct Soybean Meal in Ration
Beef	4.2 to 4.5 pct
Pork	17 to 18 pct
Chicken	26 pct
Turkey	26 pct

Source: WPI, USDA

Variables

Note that most all of the above conversions are based on variables. This suggests there is a level of price elasticity for feedstuffs, and that feeding decisions are based on total economics and value – a point raised previously in the discussion of premium pricing.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

These variable factors are further indication of the value to soybean meal of premium pricing for meat exports.

All the above variables used in the calculations made in this study are used in the appropriate historical years where data exists to indicate such, or the appropriate conversion rates are applied as trend lines for future projections.

For example:

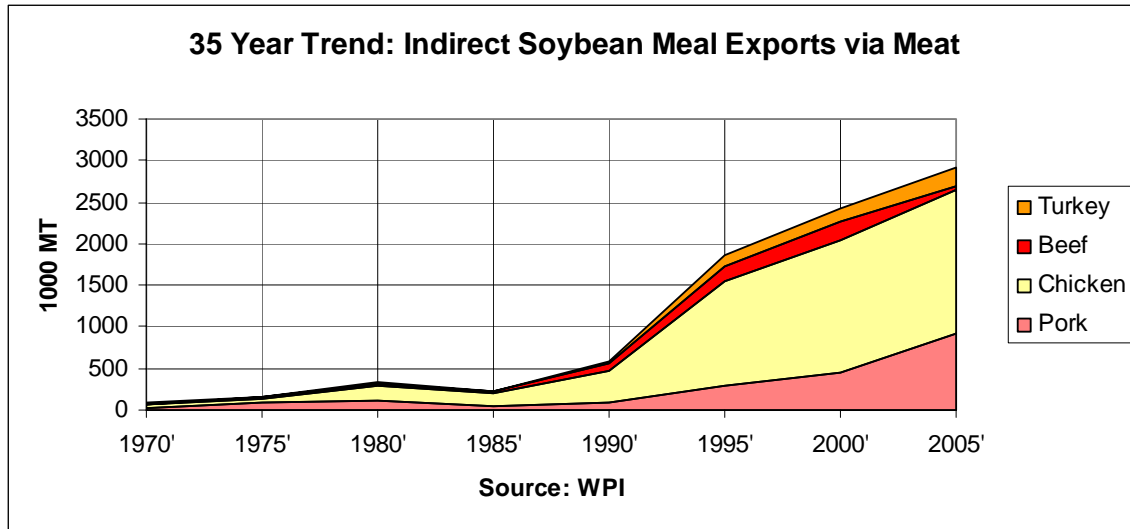
- The percent of weight gain on feed for cattle is relatively large this year versus last. Fed and slaughter weights for cattle and hogs have been steadily increasing.
- The weight gain ratios for red meat production have been slightly decreasing as improvements in genetics and nutrition increase. For poultry, however, the efficiency of weight gain has been much closer to constant.
- The models for beef assume a slight decrease in the percent of soybean meal in total feed use for cattle; this is due to an increased supply of distillers grains from the expanding production of ethanol as a competing, and lower priced substitute protein supplement. This decrease might be understated.

FINAL FORMULA: Soybean Meal Equivalent from Meat Exports

- 1) $(\text{Export Volume}) / (\text{Live Wt Conversion}) = \text{Live Weight Equivalent}$
- 1B) $(\text{Live Weight Equivalent}) * (\text{Pct Gain on Feed (37.5 to 44.3)}) = \text{Gain on Feed}$
- 2) $(\text{Gain on Feed}) * (\text{Meat Gain Ratio}) = \text{Total Feed Use}$
- 3) $\text{Total Feed Use} * \text{Percent of Soybean Meal in Ration} = \text{Total Soybean Meal}$

Applying the above formula, here is a historical look at indirect soybean meal exports via meat over the past 35 years.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



For the comparative purposes of this study, three timelines have been selected:

- **1995 to 2003** – a period of steady growth of meat exports
- **2004 to 2006** – the current market with the implications of BSE
- **2007 to 2014** – future baseline projections and the assumptions of some changes from baseline trends.

Steady Growth in Meat Exports - 1995 through 2003

The period from 1995 to 2003 saw steady growth in meat exports, and thus increased indirect exports of soybean meal. The table below shows annual totals over this period.

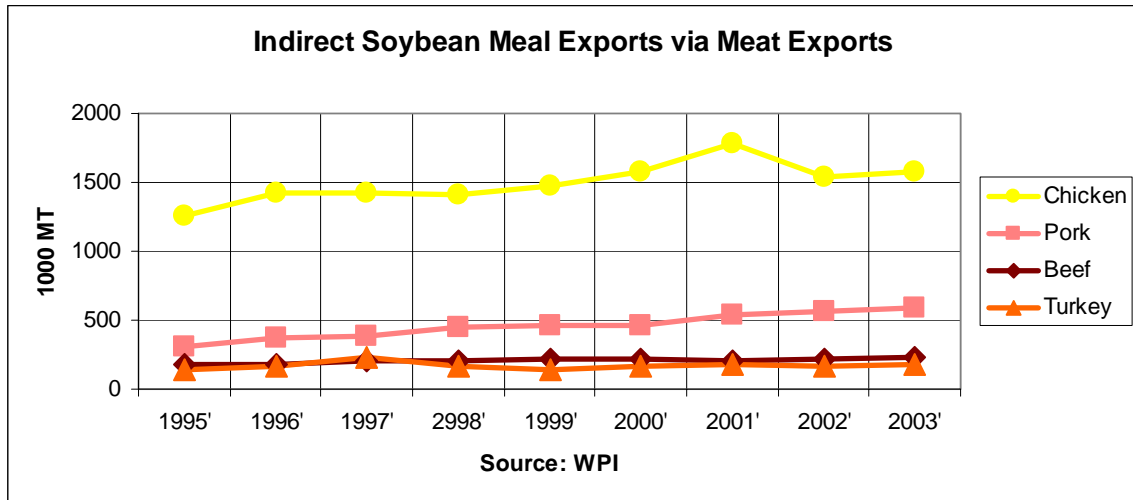
	Beef	Pork	Chicken	Turkey	Total
1995	174.8	302.3	1257.5	135.8	1870.4
1996	176.6	367.8	1426.2	169.9	2140.5
1997	201.8	387.7	1418.9	233.3	2241.7
1998	201.5	451.8	1403.9	170.3	2227.5
1999	221.3	466.1	1474.6	143.2	2305.2
2000	223.6	458.5	1580.0	168.1	2430.2
2001	203.0	543.0	1782.7	182.7	2711.4
2002	217.9	557.7	1540.5	163.4	2479.5
2003	225.3	586.2	1575.5	179.4	2566.4

As can be seen above, all types of meat showed positive overall growth, though chicken exports dropped in 2002 to a more normal trend level from the all time record exports in 2001.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

In 2003, Russia instituted a poultry quota which curtailed exports as Russia is the largest single importer of U.S. broiler meat, but those restrictions were lifted later in the year, allowing exports there to recover somewhat. In the meantime in 2003, the U.S. significantly expanded chicken exports to Canada and Mexico.

Beef exports hit a record in 2003 based on strong global demand, a declining dollar, and trade restrictions being placed on Canadian beef in May after the discovery of bovine spongiform encephalopathy (BSE).



Based on the growth in meat exports, indirect soybean meal exports via meat, compared with direct exports of soybean meal over this period, showed more sustained and steadier growth.



Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

BSE Implications: Current Market - 2004-2006

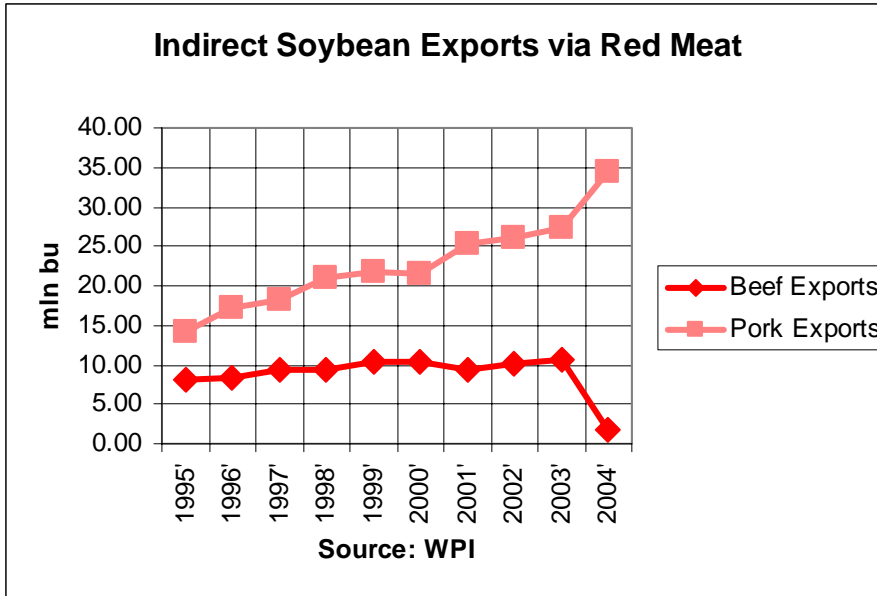
On December 23, 2003, the USDA announced a “presumptive positive” case of BSE in Washington State; it was subsequently confirmed as a positive case of BSE. In response, all export markets were closed to U.S. exports. As of December 2005, Japan, the top U.S. export market opened to U.S. beef with a number of restrictions, but remained open for only weeks, and re-closed in January; in March 2004, Mexico the second largest market for U.S. beef re-opened. Other major markets, including Korea and Taiwan were not open by the end of 2005. This export market closing had a significant impact on U.S. meat exports, as shown below.

Export Comparison 1998-03 Avg vs 2004-06 (1000 MT)					
	Beef	Pork	Chicken	Turkey	Total
1998-03 Avg	880	757	2248	202	4087
Actual 04	209	989	2170	201	3569
Estimated 05	285	1229	2464	262	4240
Projected 06	290	1263	2358	272	4363
3 yr Cumulative Loss/Gain	-1856	1210	584	129	67
Impact on Indirect Soybean Exports	-318	802	409	104	997

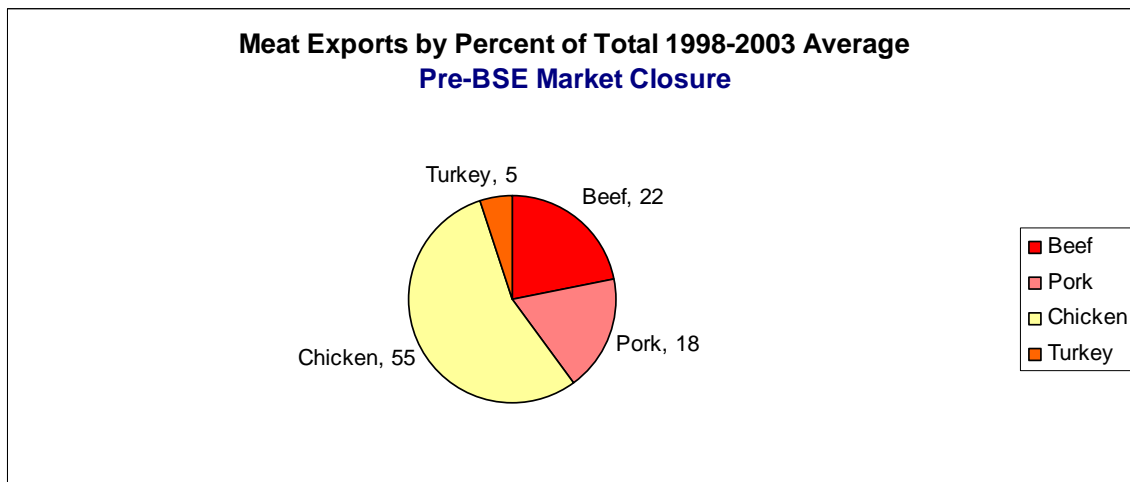
Market Shock

This sudden closing of the beef export market can be categorized as a “demand shock” – *i.e.* an event that affects the demand for goods or services – in this case beef. In terms of beef, the BSE related market closing can further be categorized as a *negative* demand shock. But, as shown in the table above, and the chart below, the BSE related market closings for beef can be considered a *positive* demand shock for other meat exports, especially pork. The chart below shows graphically the impact on soybean meal.

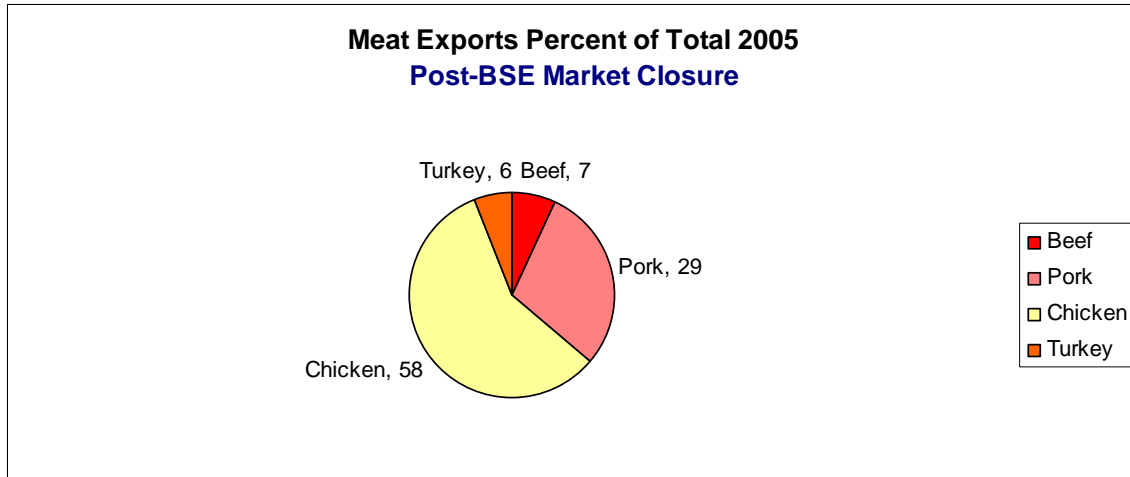
Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



Again, by referring to the table above, over a three year period, total meat exports are expected to change by 67,000 MT compared to the previous five year average. As a percent of the cumulative three year total, that amount is one-half of one percent; as a percent of the five year average, the change is 1.6 percent. In other words, the total supply of meat exports remained relatively stable, increasing on trend. The components of total meat exports, however, changed dramatically. See the two charts below.



Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



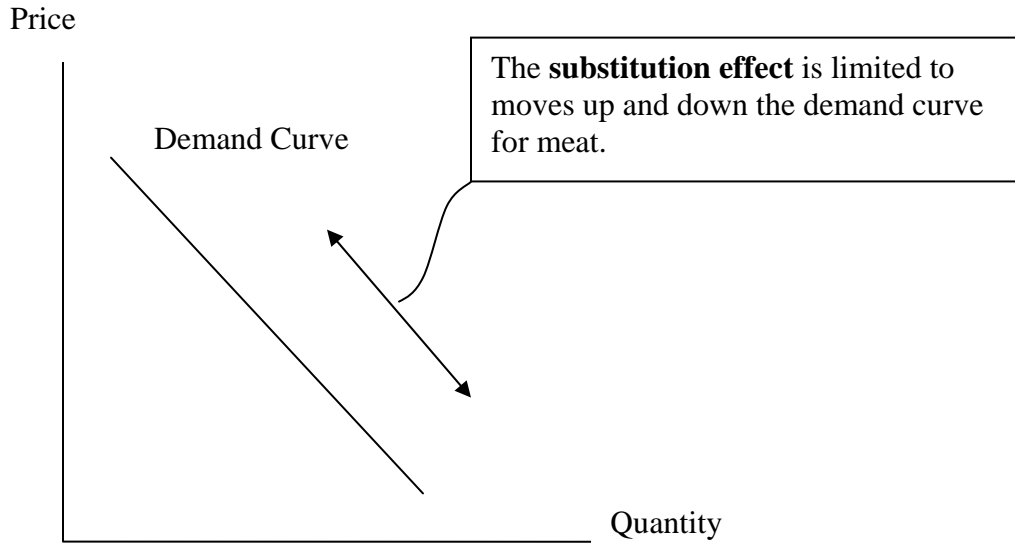
In short, the demand shock of BSE caused a substitution effect. Export consumers substituted pork, primarily, and to a lesser extent chicken and turkey for beef. The primary markets for this substitution were Japan and Mexico.

There are two important distinctions to note about this substitution effect. One is a practical market issue: the substitution effect won't be the same in all markets because of cultural constraints. Japanese and Mexican consumers freely substitute pork for beef, but the same would not happen in a Muslim country. For example, the Middle East was the eighth largest market for U.S. beef exports prior to the BSE incident. However, pork exports there have not grown as a result of the ban on U.S. beef. Other major cultural influences on meat consumption to be considered as well include India's Hindu population which does not consume beef, as well as China's and Eastern Europe's preference for pork.

The second distinction is one of economic theory: the substitution effect has to do with prices of certain commodities and the substitutability of other commodities. There is a similar, but distinctly different, phenomenon known as the income effect. Rather than changes in the price or availability of a product, changes in income can cause different export/import patterns. For example, China is a major importer of chicken now; as incomes in China grow, it can be expected that pork imports there will grow with incomes even if the relative availability and price of the chicken and pork supply don't change.

From an economic theory standpoint, the difference between the substitution and income effects can be shown by diagramming a demand curve for meat.

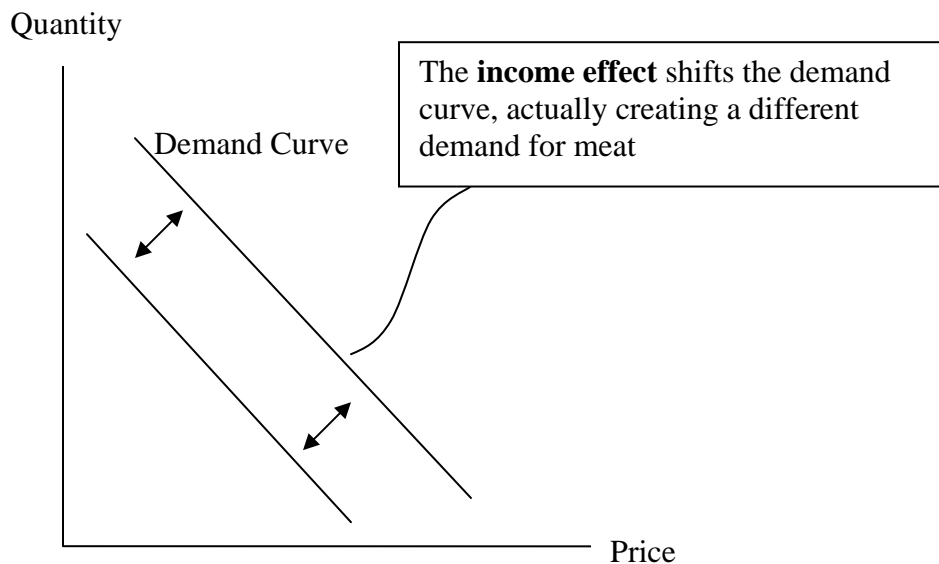
SUBSTITUTION EFFECT



The demand curve for meat shows that at certain prices, certain quantities of meat will be consumed. For purposes of illustration using the Bureau of Labor Statistics price composites for meat in December 2005 in the U.S., one unit of (non hamburger) beef is roughly equivalent to 3 units of chicken, 4 units of turkey, and 1.5 units of pork.

Thus under the substitution effect, if the price of beef doubled, then consumers would eat less beef, and substitute some combination of pork, chicken and turkey according to the above ratios, and ultimately consume the same amount of meat at their same price point on the demand curve, *i.e.* their budget and expenditures for meat would stay the same, but the mix would change.

INCOME EFFECT



Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

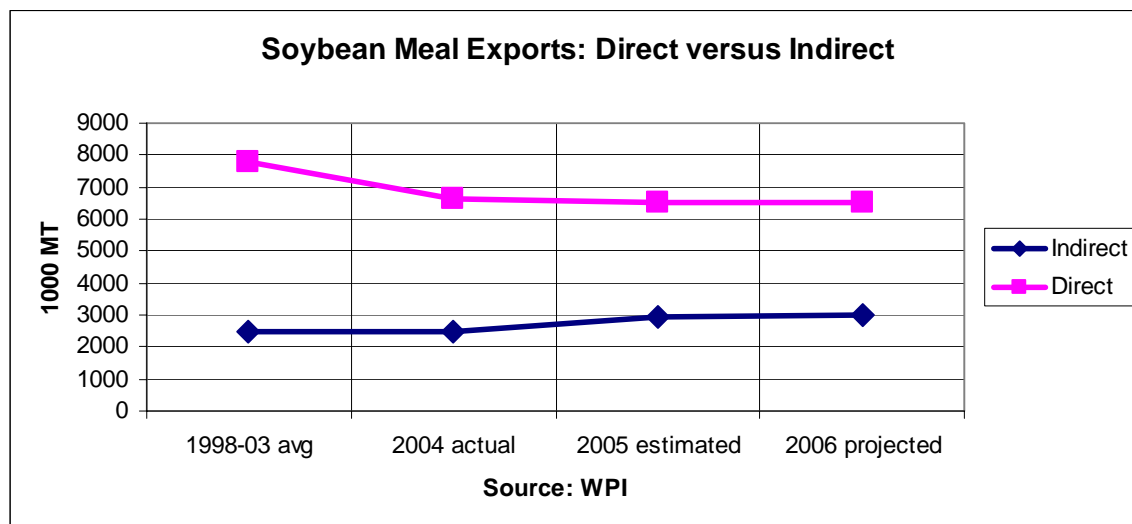
Under the income effect, a new demand curve for meat is created. If income goes up, consumers demand curve will reflect move toward their meat preference, whether that is a different quantity of meat, a different type of meat, or a different quality of cut of the same meat (steak versus hamburger; chicken breast versus legs; pork loin versus hams).

In summary, either a change in price/availability (substitution effect) or in the buying power of consumers (income effect) can change the composition of U.S. meat exports. While this may seem an academic exercise at this point of the report, it is an important factor to consider when making projections. For example, the substitution effect can explain why China imports more or less broiler meat when the price changes; the income effect explains why China imports less chicken and more pork as their economy grows.

The substitution effect, *i.e.* the dynamic of moving up and down the existing demand curve can also help illustrate (and predict) that while BSE and the policy imposed limits on beef trade may have a significant impact on increasing broiler meat exports, AI and limits on poultry trade may not have the same magnitude of impact on increasing beef exports.

Impact on Indirect Soybean Meal Exports

In either case, significant changes in meat exports do impact the indirect exports of soybean meal. In the case of the BSE-induced substitution effect, the amount of indirect soybean meal exports rose dramatically. All in all, the three-year net impact of the BSE market closure to U.S. beef will boost indirect soybean meal exports by 997,000 MT or, on an annualized basis 332,000 MT. That is a 13.5 percent increase over the pre-BSE, five year (1998-2003) annual average of 2.46 MMT of indirect soybean meal exports.



As shown by the trend line above, indirect soybean meal exports have grown as a percent of total soybean meal exports. During the 1998-2003 period, indirect exports averaged 27 percent of total soybean meal exports; in 2006 indirect exports are projected to

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

comprise 31.5 percent of total soybean meal exports – that is due to both an increased volume of indirect soybean meal exports, and a projected stagnant market for direct soybean meal exports.

Market Determinants: Supply and Demand Factors

As stated above, the change in relative prices of meat commodities as well as changes in buying power can and do drive meat exports. And just like those factors can be categorized as supply or demand factors (*i.e.* the price/availability driven substitution effect is a supply factor; the buying power, income effect is a demand factor), so too can the several other factors that determine the market for U.S. meat exports. A summary of some of the major factors follow.

Demand Factors	Supply Factors
<p><u>GDP:</u> Because animal protein demand is correlated to income, GDP growth means more meat demand, especially in developing countries. In developed countries, it might mean demand for different cuts of meat. Conversely, slow GDP growth, or recession, could cause a slump in meat demand, or a change in demand for certain types of cuts, or kind of meats.</p>	<p><u>Animal Production:</u> When meat demand grows in a certain country or region, the domestic or regional supply will be a factor in how much demand will be directed toward U.S. meat and how much demand is directed toward other suppliers.</p>
<p><u>Consumer Preference:</u> Preferences among types and cuts of meat are often culturally related. For example, Muslims won't eat pork, Hindu's won't eat beef – they both may eat chicken, however, while other cultures may move from chicken to beef or pork as their incomes rise (income effect). Other preference factors may include marbling, higher grade, etc.</p>	<p><u>Labor:</u> One issue that adversely impacts U.S. meat production relative to its competitors in the Southern Hemisphere is the cost of labor. On the upside, however, as the production process is becoming more technologically advanced, the skills required are greater, and this could be an advantage to the U.S. in future years.</p>
<p><u>Diet Trends:</u> Especially in developed countries, diet trends can have an impact. Atkins and low-carb diets in the U.S. are examples.</p>	<p><u>Cost of Capital:</u> Meat production and processing is a capital intensive business and the U.S. has some of the most available and lowest cost capital in the world.</p>
<p><u>Government Policy and Regulations:</u> Government policies ranging from bans on imports (like those imposed on U.S. beef over the course of the past two years in light of the North American BSE situation) or tariffs can have an impact.</p>	<p><u>Infrastructure:</u> Like labor, industry infrastructure is a significant factor in cost of production but is largely uncontrollable by the producers and processors. Generally, infrastructure is a competitive advantage for U.S. producers. It should be noted that lack of infrastructure in importing countries (cold chain in China, etc) is a limiting factor on the demand side.</p>

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

<p><u>Food Safety Perceptions:</u> In many markets, consumers have a strong sense of food safety; in other markets, consumers pay less attention. Generally, U.S. meat exports are considered of high quality and as meeting high safety standards; however, Japan and the EU have exploited their domestic consumers' concerns about food safety to erect trade barriers to meat and other commodities.</p>	<p><u>Animal Disease:</u> Animal disease can have a major impact on meat trade. Disease outbreaks can limit supply, and can trigger regulatory actions that prevent shipment of meat and livestock.</p>
---	--

Animal disease and the resulting trade restrictions have significantly affected U.S. meat exports since 2003, and looking into the future, animal disease and related trade regulations are the most likely constraint/opportunity for U.S. meat exports. Moreover, animal disease events provide a good “case study” scenario because there are definite time frames involved, e.g. there is the discovery of the disease and the closing of markets, and then things are resolved with the re-opening of markets.

Animal Disease Background

The World Organization for Animal Health (OIE-Office International des Epizooties) tracks more than 50 different diseases impacting the production of animals around the world. While there are numerous diseases of concern to U.S. producers such as Classical Swine Fever and Newcastle Disease, this report analyzes the major diseases with a potentially larger adverse impact on U.S. livestock of interests.

Using the past as prologue, the three major livestock diseases reviewed include:

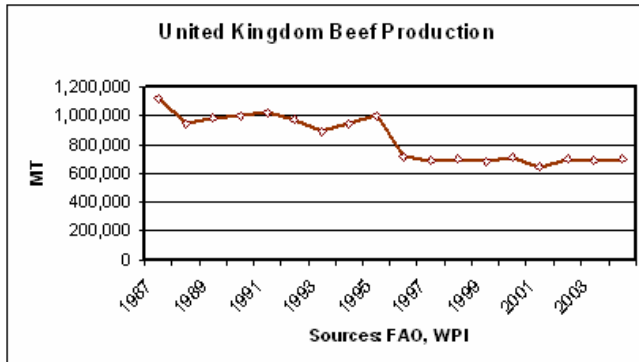
- Bovine Spongiform Encephalopathy (BSE);
- Foot and Mouth Disease (FMD);and
- Avian Influenza (AI).

BSE Experience

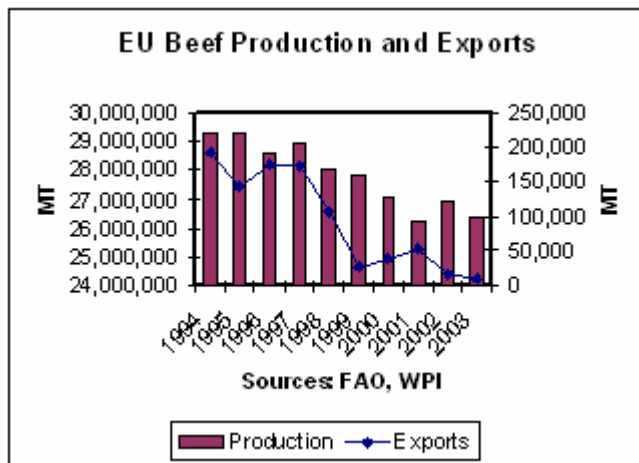
The science of BSE remains imperfect but it is generally believed to be associated with intensive production and feeding practices. Consequently, most of the prophylactic approaches adopted thus far have involved controls on the feed component side of production. This has had some ancillary benefit to soybeans as feed rations have substituted plant protein meals for some of the animal-based proteins (specified risk material) previously used. Note that most cattle are grass-fed around the world and therefore not considered susceptible to the disease. Moreover, the incidents of BSE in various developed countries notwithstanding, the global production and demand for beef continues to expand.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

Europe: Discovered in Britain in 1986, BSE has infected around 200,000 animals in Europe. The adverse impact of the disease has predominantly been felt in the UK where beef production has dropped nearly 40 percent (see graph below).

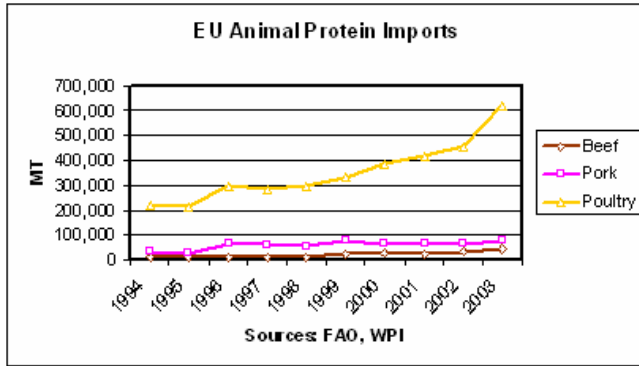


Evidence of a broader BSE problem in Europe was subsequently revealed causing the rest of the EU-15 countries to suffer a little more than a 15 percent decline in beef production over the past 15 years of the disease. At the height of the disease concern in 1995, EU beef exports had fallen by about a third, though there was a temporary rebound in sales (see graph below).

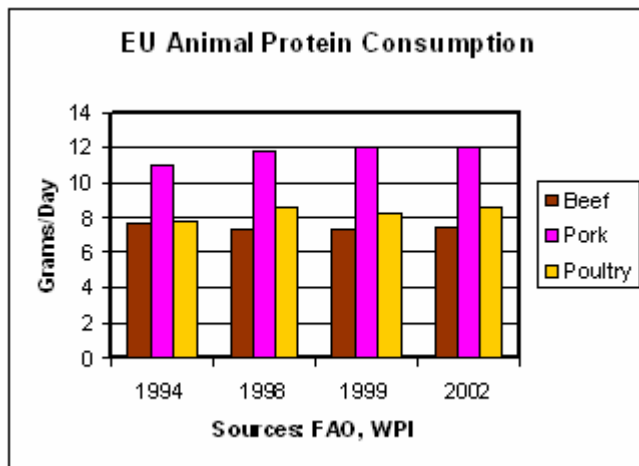


Overall, Europe's beef exports have failed to ever fully recover from its earlier peak and the EU is now believed to be headed toward becoming the world's largest importer of animal protein products (see graph below). This shift is being aided by reduced support under the Common Agricultural Policy.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

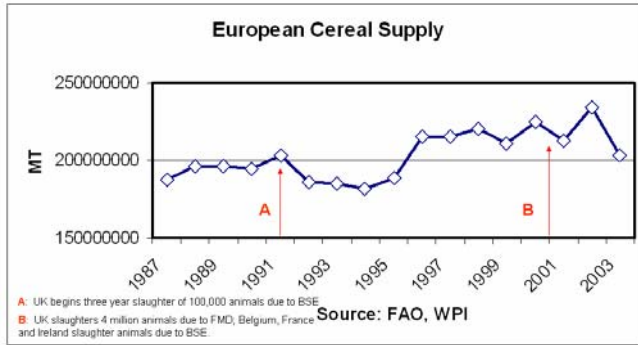


In just a two month period during the peak year of BSE's adverse impact, the price of beef in Europe fell from around €140/100 kilograms (\$3.63/pound) to €15/100 kilograms (\$2.98/pound). The drop in value of beef was most precipitous where prices of beef were highest and the revelation of the problem more pronounced (*i.e.* France). While beef consumption has fallen as a result of BSE, Europe has increased its consumption of pork and poultry in the intervening years – evidence of the substitution effect discussed in the previous section. In fact, overall per capita animal protein consumption has continued to increase, following the economic correlation detailed earlier (see graph below).



A review of European grain production and imports indicates a drop in supply following the two major periods of EU cattle de-population (see graph below), though it should be recognized that these animals are also grass-fed in Europe.

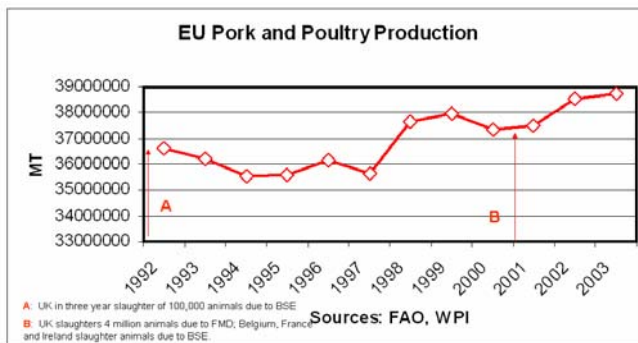
Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



Looking specifically at EU oilseed production and imports could infer a flattening in demand (see graph below) in the timeframe immediately following the two great de-population periods (1991-1993 and 2001-2002).



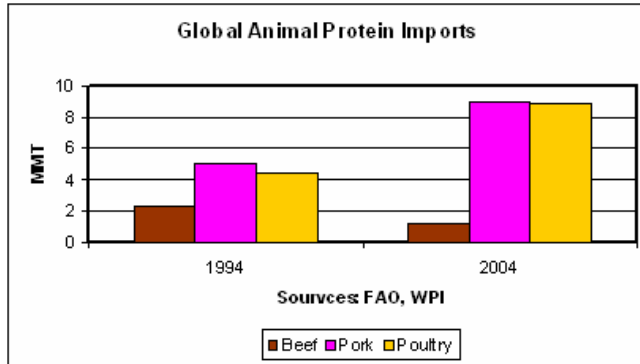
Notably pork and chicken production flattened following the first (BSE-related) cattle de-population in Europe, likely missing the interest of consumers in substitute protein sources. However, production of these grain and oilseed consuming animals increased following the second great (FMD and BSE-related) cattle de-population period (see graph below).



This mixed picture following the EU BSE/FMD experience should not obscure the fact that the world as a whole has altered its preference for the type of animal protein imports. Over the past decade, the world has imported half as much beef but has doubled its imports of pork and poultry (see graph below). This can be considered to be the result of both the substitution effect from limited supplies of beef (BSE in North America, Europe,

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

and FMD in South America), but also income effect of greater preference for pork. The United Nation's Food and Agriculture Organization (FAO) predicts that pork consumption globally will grow 29 percent by 2015, and 57 percent by 2030. The same hold true with poultry, with the income effect coming from lesser developed countries gaining income and moving from vegetable protein to animal protein.

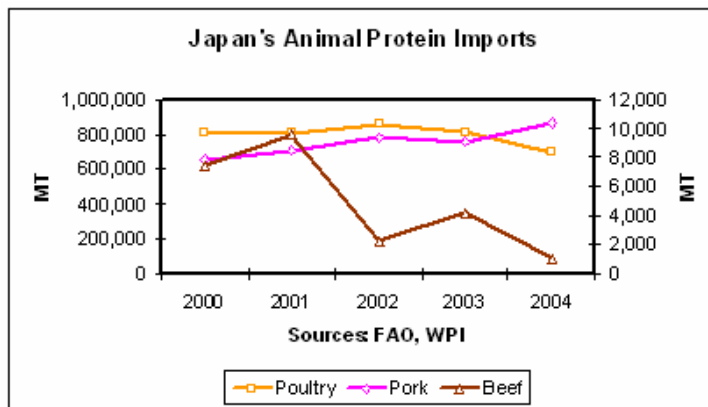


Caveats of Extrapolation

In fact, it must be broadly cautioned that extrapolating changes in European beef production and consumption specifically due to BSE and FMD into potential future impacts on U.S. production or export demand is limited by several factors including:

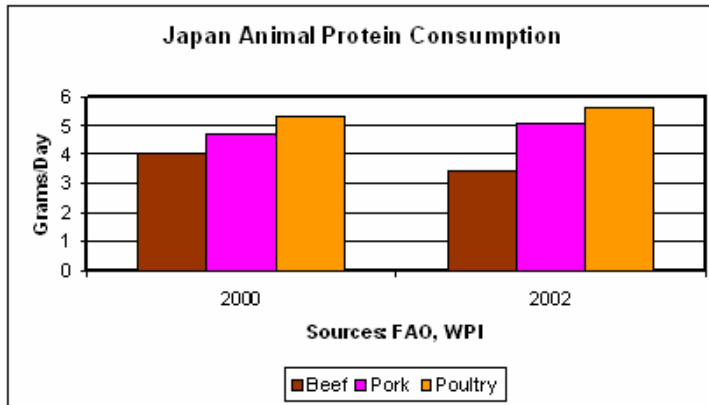
- *Relative Sensitivity:* European consumers may be more sensitive than consumers in other markets (i.e. less confidence in their food safety system) where disease outbreaks might occur.
- *Policy Failures:* The EU imposed certain restrictions on beef production that may subsequently be viewed as ineffective and therefore not repeated (mass culls were later refined).
- *Subsidy Impacts:* Europe also concurrently provided certain incentives to producers either as compensation for lost production, or as incentive for continued production.
- *Competitiveness:* Declines in European production may be associated with a natural decline in competitiveness relative to foreign suppliers such as Brazil and Argentina.

Japan: BSE made its presence known in Japan beginning in 2001, almost three years before it was found in the U.S. Japanese beef imports fell as a result of restrictive actions taken by the government, and there may have been some modest substitution by imported pork, though poultry imports have actually fallen (see graph below).

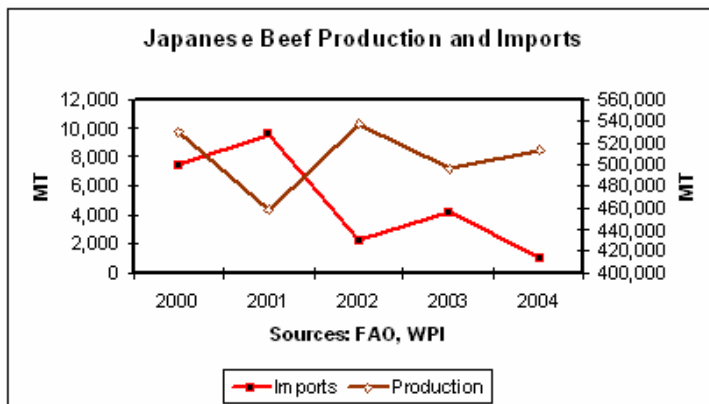


Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

More recent FAO data on Japanese per capita consumption is not available but it appears that beef consumption dropped by 15 percent following the revelation of BSE while pork and poultry consumption continued to climb (see graph below).

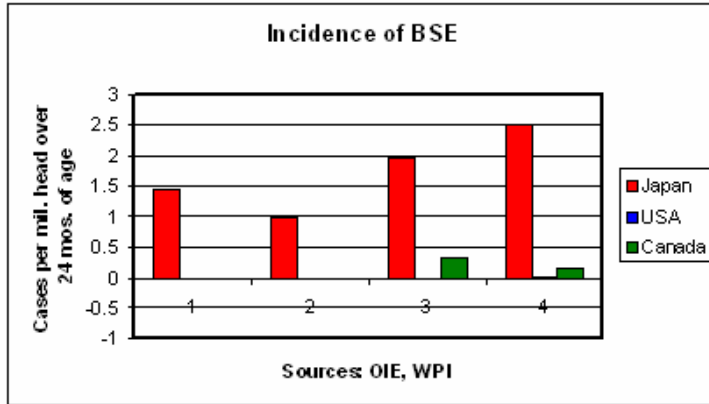


Ironically, despite the discovery of BSE in Japan's domestic herd, most of the adjustment for reduced domestic consumption of beef was borne by imports, predominantly from the U.S. and Canada (see graph below).

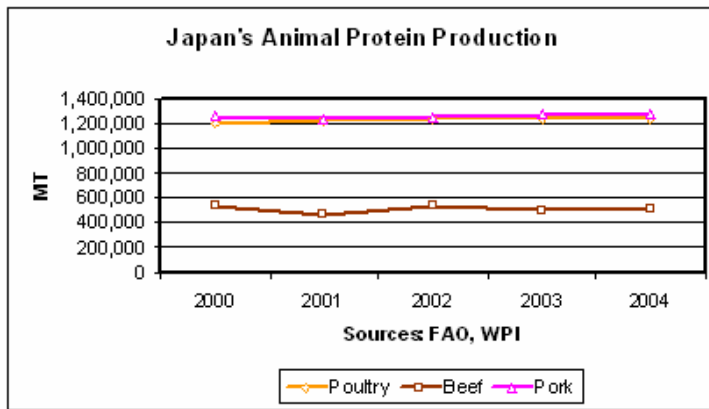


This is despite the fact that Japan itself has incurred substantially more indigenous cases of BSE (see graph below). Japan argues that its more robust inspection system better protects consumers than that offered by U.S. and Canadian suppliers.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



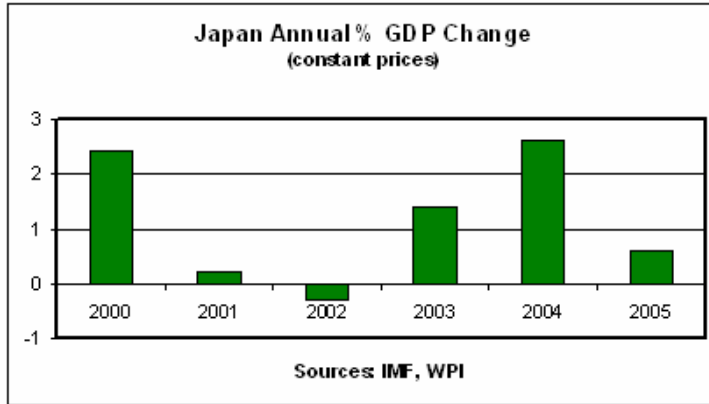
As a result, Japanese beef, pork and poultry production has held relatively steady through the past few years of BSE news (see graph below).



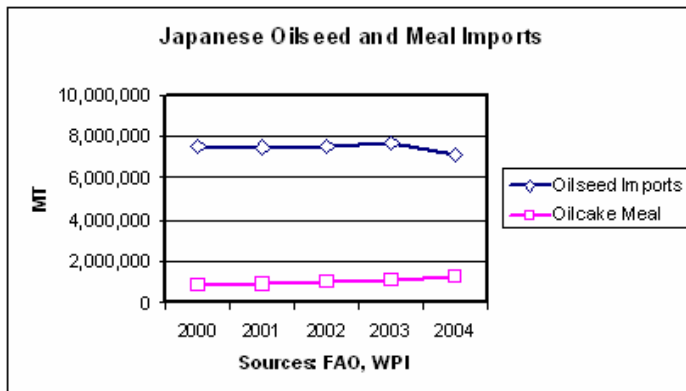
The Japanese situation presents an entirely different analytical limitation than the EU experience. Again, animal protein consumption is more strongly correlated to wealth than disease concerns and the Japanese economy has undergone a very mixed situation in recent years. Already the average animal protein intake in Japan is half that of the U.S. or Europe and it is difficult to parse whether meat consumption fell in 2002 due to BSE (substitution effect, food safety concerns) or because of a national economic recession (income effect). See the graph below.

Note that Japan has been embroiled in a controversy whereby more pork has been sold as domestic product than has actually been produced in the country. A similar situation has involved EU beef consumption in recent years.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

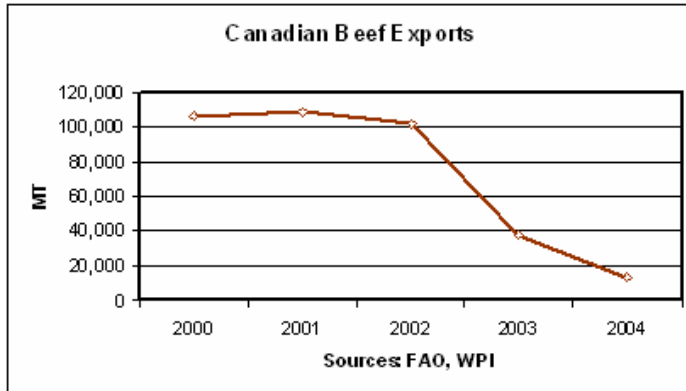


Indeed, the data indicates that Japanese oilseed imports actually increased following the 2001 domestic discovery of BSE when their beef herd numbers were falling. Imports of oilseeds fell following the ban on Canadian and U.S. beef, but imports of oilcake meal may have offset some of the decline (see graph below).

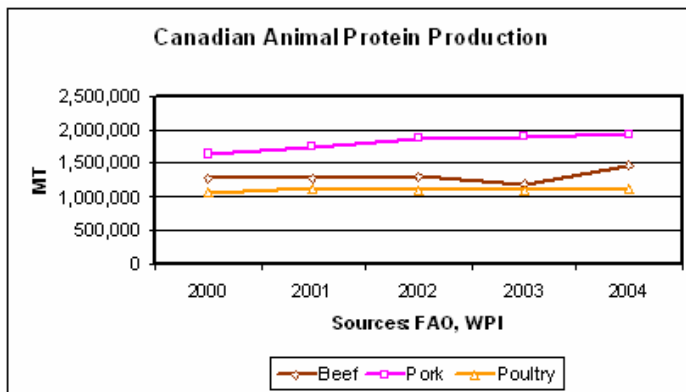


Canada: Canada incurred its first reported case of BSE in May 2003. The global ban against trade in Canadian beef (see graph below) was strongly felt since half the country's production moves into export. Stocks increased by around 10 percent (increasing feed requirements) and producer livestock revenues fell by around one-third but again, an exact measurement of the impact is difficult due to the ameliorative effects of Canadian government actions. The Canadian government committed well over C\$1 billion in assistance to the industry (which is estimated to have collectively lost over C\$6 billion) for both direct income support and for employing specific herd management practices.

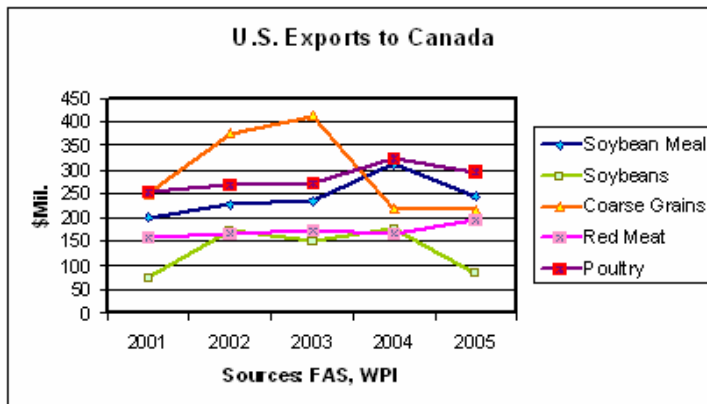
Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



However, the beef export problem did not have a dramatic effect on the country's overall animal protein production as pork production continued its expansion with several new processing facilities brought on-line, while poultry was limited by that country's supply management program (see graph below).



In fact, just looking at the value of U.S. agricultural exports to Canada in recent years it would appear that U.S. sales of soybeans and soybean meal held relatively steady, coarse grains sales fell following the first BSE case, but sales of U.S. meat and poultry rose despite the higher stocks of cattle in the Canadian market (see graph below).

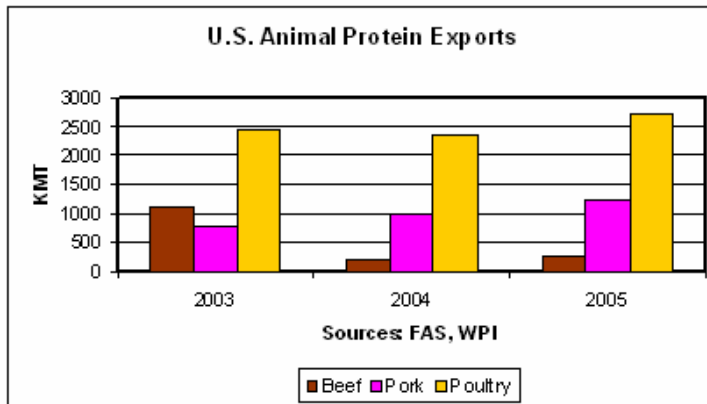


Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

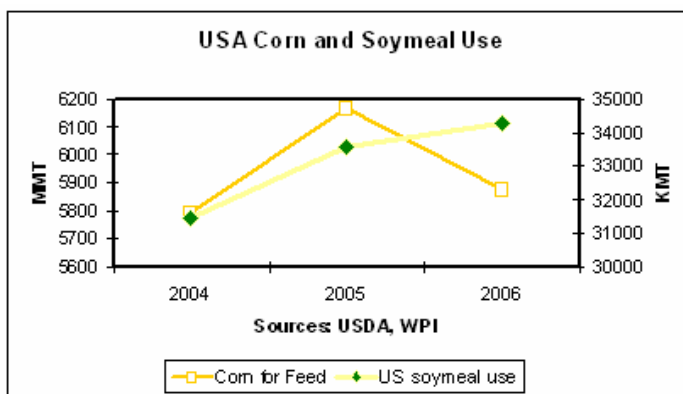
United States: The first diagnosed case of BSE in the U.S. occurred in December 2003 (a second occurrence in November 2004 was confirmed in June 2005) and it is estimated to have cost the industry over \$4 billion in exports since that time. USDA expects U.S. beef exporters to ship 295 million pounds of beef to Japan during 2006, roughly one-third of the one billion pounds it shipped prior to the BSE-related closure of that market. Still, there are four factors that have cushioned the adverse impact of BSE on the U.S. cattle industry:

1. Only about 10 percent of U.S. beef production is typically exported.
2. U.S. cattle supplies have been tight relative to growing domestic demand.
3. Imports of cattle from Canada have been stymied because of BSE.
4. Imports of beef from Brazil and Argentina were limited because of FMD, and imports of beef from Australia were limited because of drought.

In fact, after a brief decline in early 2004, U.S. cattle prices went on to set a record that year. U.S. demand for soybeans, soybean meal and feed grains have remained strong, and exports of poultry and pork have remained strong (see graph below).



Between 2004 and 2005, corn for feed use rose by over six percent and domestic soybean meal utilization increased by nearly seven percent (see graph below). Domestic soy meal utilization is expected to increase again this year and even though the U.S. is regaining access to markets previously blocked due to BSE, corn for feed is forecast lower.



Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

U.S. exports of red meat to other major markets like Mexico, Korea and Canada declined in 2004, though only in Korea in any large or enduring way. U.S. beef exports were constrained by the BSE situation but as shown in the previous section, it benefited the pork industry, which experienced a sharp increase in the value of its product. According to the National Pork Producers' Council (NPPC), total U.S. pork exports increased by 13 percent from 2004 to 2005, totaling 1,157,689 metric tons in 2005. Moreover, valued at \$2.6 billion, that export growth was 18 percent more in value in 2005 compared to 2004.

Changes in US Pork Exports		
	2004	2005
Volume	1,007, 189 MT	1.157,689 MT
Value	\$2.132 bln	\$2.600 bln

Source: WPI, NPPC

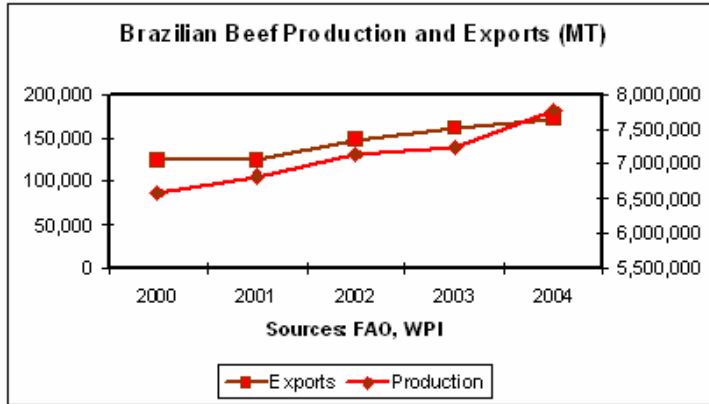
Foot and Mouth Disease

It is often stated that the occurrence of Foot and Mouth Disease (FMD) in the United States would be devastating to the cattle and swine industries, and consequently to U.S. soybean growers. The country has been free of the disease since 1929 and, without doubt, it would adversely affect the marketing for U.S. beef. However, it is important to keep this disease and its implications in perspective.

First, FMD has at times been nearly endemic around the world. At least 50 countries currently have the disease or have reported an outbreak in the past couple of years. Granted, most are not beef exporters but nearly half of the major beef exporting countries have had recent FMD incidents, including Brazil, Argentina and India. China has not reported one way or another whether it has FMD to the OIE, and Uruguay is now free of the disease but could easily regain infection since it is surrounded by FMD prone countries.

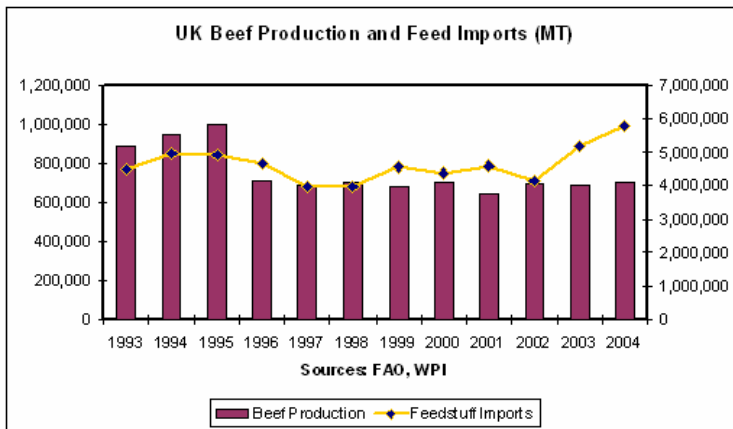
FMD's Lack of Impact: Brazil has been able to continue growing its beef exports despite the discovery of FMD in Mato Grosso do Sul province in October 2005. Russian officials recently announced a one-year ban on all beef and pork products from Mato Grosso do Sul and Parana, and a six-month ban on six other nearby states. But Mato Grosso do Sul is not a pork production area and the Brazilians have said they will simply shift beef production to non-affected areas. The following graph shows Brazil's ability to succeed in the global beef market despite its FMD designation.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



In short, Brazilian beef exports will climb from 11 percent of production in 2001 to 21 percent of expanded production in 2006 – despite the occurrence of FMD. The existence of FMD in Brazil is actually a positive from a feed supplier’s standpoint because the disease makes the animals less efficient at weight gain.

As was seen in the graph on United Kingdom beef production above, the actual decline in the British cattle industry began after the 1986 recognition of BSE. The FMD outbreak in 2001 caused a drop of 257,000 head of cattle due to the mass culling but most of that herd loss has since been rebuilt. In fact, the following graph shows that the UK’s feed imports have actually increased since the 2001 FMD-related culling of the herd which may be associated with a concurrent expansion in poultry production.



Prospective U.S. Impact: An optimist would point to the disease containment capacity of U.S. regulators and the WTO’s concept of “regionalization” whereby only beef from the specific region of the U.S. afflicted by FMD should be subject to import restrictions. However, one should still anticipate that the U.S. would be hit harder by an outbreak of FMD than has been a country like Brazil. This is because Brazil is positioned as a low cost supplier whereas the U.S. is selling high value, grain-fed beef and pork to the market. In essence, luxury product purchasers are far less tolerant of quality problems (i.e. income effect) The U.S. BSE cases were extraordinarily narrow in their scope yet the U.S. has lost global market share in beef for each of the past two marketing years.

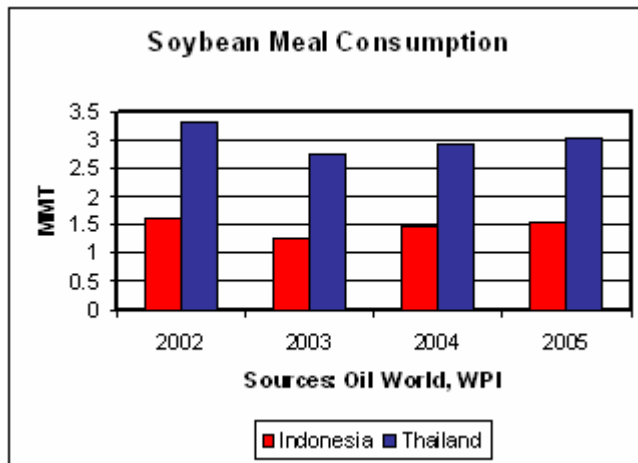
Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

From a relative risk perspective, an occurrence of FMD in the U.S. is more hazardous to some importing nations than a couple of cases of BSE.

Avian Influenza

There have been 24 highly pathogenic avian influenza epidemics (epizootics) over the past 50 years. The World Organization for Animal Health notes that poultry meat and eggs are not vehicles for transmitting the disease but that has not avoided problems in both trade and consumer demand for poultry meat. Some scientists are predicting that a pandemic of avian flu will occur in 2006 or sometime thereafter. It should be noted that no one knows for certain whether a highly impacting animal disease will occur in 2006, 2016, or ever for that matter, but a true “pandemic” would be highly destructive of the world’s poultry industry.

Southeast Asia Impact: Indonesia and Thailand have been particularly hard hit by the outbreak of HPAI and its often fatal transmission to humans. Many smaller producers in these countries have gone out of business after being ordered to liquidate stocks without adequate compensation. Up to a quarter of Thailand’s poultry flocks were destroyed and while some stock restoration is expected this year in both Thailand and Indonesia, neither is expected to rebuild to the same level of production that existed prior to the AI problems. As can be seen in the following graph, soybean meal usage declined in 2003 with the initial depopulations for AI, and while use has grown since that time it has not reached pre-disease levels.



However, USDA reports that consumption at quick-serve restaurants in urban areas of Indonesia never declined and that consumer confidence in poultry was only temporarily shaken. They predict that Indonesia’s poultry consumption will actually be up by two percent in 2005. It is also important to keep in mind that AI was not the sole constraint on poultry production in Southeast Asia since producers also faced higher energy costs and weaker currencies that raised imported feed costs. Their decline in feed consumption was offset by expansion in the Brazilian poultry sector.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

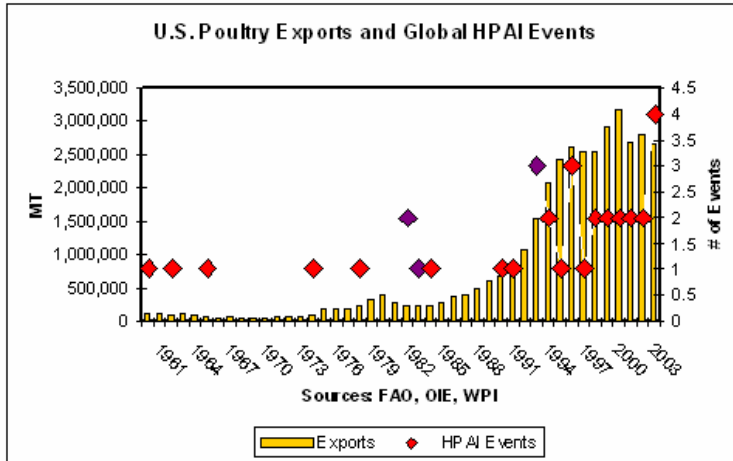
Poultry Meat Import Bans: Banning imports of live birds from AI infected countries may be justifiable but some governments temporarily imposed or threatened to impose what are likely to be WTO-illegal bans on all poultry meat imports in response to the H5N1 virus. This was the policy sought this past year by Iraq, Ukraine, Vietnam, Sri Lanka and Lebanon, with the latter two still imposing such a ban. Some of these markets are relatively small but Iraq has been importing 25,000 tons of poultry meat per month and Ukraine had imported almost 300,000 tons of poultry meat in 2004. A total that equates to over 300,000 tons of soybean meal were at risk to complete bans on poultry meat imports.

Poultry Consumption Declines: Whether by government fiat or simply adverse consumer reaction, USAPEEC estimates that poultry consumption in the Middle East has dropped by 40 percent compared to pre-AI levels. They report that the price of chicken leg quarters fell by over 25 percent and that the Brazilians dropped their prices by 10 percent in response to the fall in demand. Romania captured a lot of news for being the first European country to experience an outbreak of the H5N1 virus and USAPEEC reports that chicken prices fell as a result by 25-40 percent while sales volumes fell even further by 30-45 percent. Romania imports just over 150,000 tons of poultry each year with nearly 60 percent of it coming from the U.S. As of February 2006, the USDA has downgraded its forecast for poultry meat exports from the US because of the AI situation in Turkey and Romania and the consumer reactions there. Nonetheless, the USDA is still forecasting overall growth for exports.

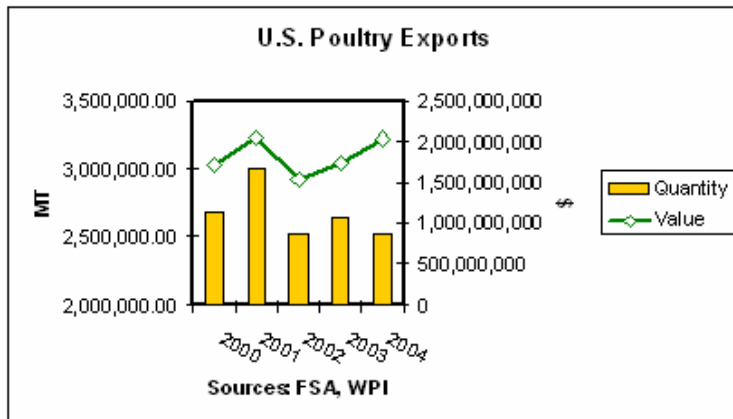
USAPEEC reports a more mixed situation in China where sales declined by 40-50 percent but were headed back to normal at the end of 2005. Russia had a similar reaction with initial consumption declines of up to 30 percent related to the AI outbreaks but greater stability returned to both volume and price as the initial fears faded.

Impact on U.S. Poultry Exports: U.S. poultry meat exports have generally been on an ascendancy for several years, regardless of any HPAI incidents. The following graph shows U.S. poultry exports and HPAI events around the world, with the years that included a U.S. HPAI event in purple. Although the volume of U.S. poultry exports appears to slow in recent years at the same time the number of HPAI events around the world have become more common, in fact global poultry trade has continued to expand through the period but U.S. exports have more recently faced tremendous poultry export growth by Brazil.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

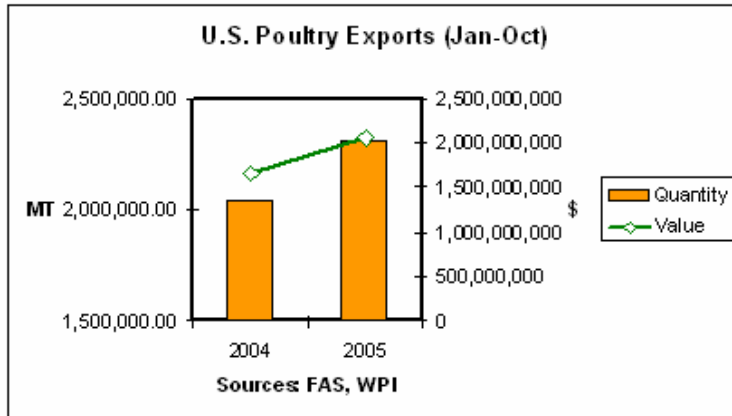


While U.S. poultry exports have never recovered to their peak volume in 2001, the total value of U.S. exports in 2004 exceeded that of 2001 (see graph below). As noted in the previous section of this report, the increase in price of leg quarters, which constitute more than 60 percent of exports appreciated over the 2001 average price.



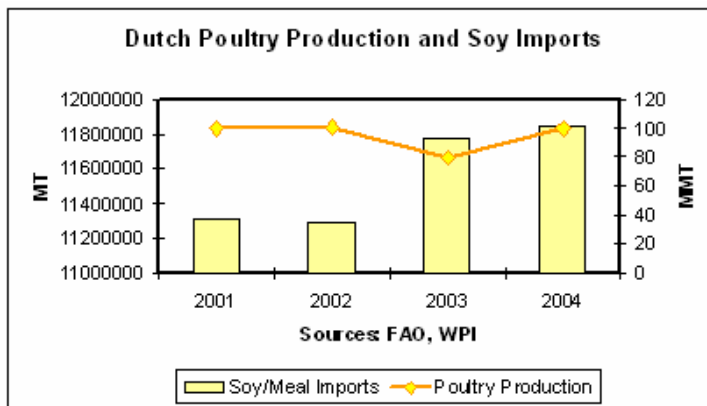
More recently, both U.S. poultry export volume and value were higher during the January-October timeframe of 2005 (see graph below), which notably coincides with elevated news of global HPAI problems

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



The conclusion is that HPAI events certainly pose concerns but have not demonstrably meant huge problems to U.S. poultry exports, at least heretofore.

Poultry Sector Resiliency: Even when western poultry production has suffered setbacks, it is important to keep in mind that it is an industry that is quickly rebuilt since the turnaround time is roughly 60 days per flock. The Netherlands had an outbreak of the H7N7 avian influenza in 2003 in which Dutch authorities ordered the de-population of 30 million chickens, or roughly 30 percent of the nation's entire stock. The result was a one year dip in Dutch poultry production but there was no adverse impact on the Netherlands' imports of soybeans and soybean meal (see graph below).



Mitigation Efforts: First, while up to 200 million birds were depopulated in Asia due to AI, the closed-system of production in the west is deemed less susceptible to a mass outbreak of the disease than the backyard production system that exists in many developing countries. Nonetheless, the U.S. and Europe have implemented an intensive inspection/surveillance system to quickly address any problems that arise related to AI. The U.S. government itself has proposed several initiatives including:

- \$251 million to detect and contain outbreaks before they spread around the world.
- \$2.8 billion to accelerate the development of cell-culture technology.
- \$800 million for new treatments and vaccines.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

- \$1.029 billion to stockpile antiviral medications.
- \$644 million for pandemic response preparedness at all levels of government.

U.S. and EU officials are responding to a UN request for over \$1 billion in aid commitments to help other countries reduce their risk of a human AI pandemic.

Poultry organizations from the EU, U.S., Brazil, China, Mexico, Argentina, Russia and Thailand have created the International Poultry Council (IPC) with the goal of coordinating efforts to address the bird flu issue. Its focus is communicating the importance of uniform and science-based sanitary and marketing standards, plus to strengthen ties to international animal disease and food safety organizations.

Background on Animal Disease Shock Model

In constructing the sensitivity of the market response to any of the three key disease risks entails recognition of three factors:

1. Actual trade impacts versus “reported” reactions.
2. Substitution effect
3. Public’s capacity for relative risk assessment

Separating Facts from Fiction

There are two forms of market risk that occur with animal disease outbreaks: consumer over-reaction and supplier over-reaction. If one reads just the anecdotal reports about both consumers and market players, one would draw a significantly different conclusion than if one views actual statistical results.

Rumor	Reality
Chinese State media reports that sales of chicken and duck are plummeting and chick prices have dropped up to 90 percent. People are not raising young chicks. If you raise chicks, you’ll surely lose. Who would you sell them to?” said an official with a large Chinese feed company.	Sales of chicken in China grew in October, just not as fast in previous periods. No drop off in consumption was reported at fast food restaurants.
In Vietnam, 40 people have died from bird flu and chicken cannot be found in the marketplace.	38 million fowl were destroyed but the country produces 291 million birds/year according to the FAO.
Indonesians in general have not shied away from eating chicken, the staple meat in the country.	The price of broilers has more than doubled since February, from 36 cents to 71 cents a kilogram, evidencing continued strong demand.
“Although consumers have been largely undeterred from beef consumption in the	The public has actually been frightened of “spongy brain” depicted death from BSE

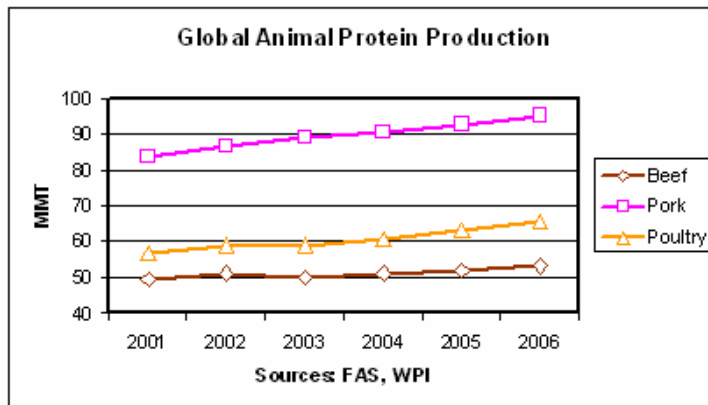
Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

wake of Mad Cow (disease), we believe the prevalence and familiarity with flu in modern society may foster a more tentative public reaction and possibly lead to a reduction in consumption,” Jonathan Feeney, a food and beverage industry analyst at Wachovia Securities, recently warned in a research note to clients.

while both poultry and people suffer annual bouts of influenza. Cooking kills influenza but not BSE prions.

Substitution's Benefits

The global meat market has shown a quick ability to adjust to disease outbreaks in specific geographies. Additionally, with the exception of religious constraints in certain regions (pork in Islamic markets; beef in Hindu markets), the various animal proteins are generally readily substitutable. For example, U.S. beef producers claim to have lost \$4 billion due to the BSE-related drop in exports but U.S. pork producers benefited from a 13 percent increase in their product exports in 2005 alone. Moreover, the changes appear more to affect marginal prices than actual production. There was little change in U.S. beef production despite the closure of export markets but U.S. pork producers received higher prices for their exports as a result of the reduced competition from beef. In sum, the collective global production in beef, pork and poultry has continued to grow despite animal disease problems (see graph below).



Moreover, the collective trade in these products is expected to continue its expansion in 2006 regardless of any continued outbreaks of various animal diseases and the associated trade restrictions.

Culture and Risk Assessment

The consuming public is generally considered to do a poor job of relative risk assessment. For example, pathogen-based diseases such as *listeria*, *e-coli* and *salmonella* are estimated to kill thousands of people every year while BSE has killed just 144 people over the past 18 years, yet the latter disease receives a disproportionate amount of the publicity and mitigation effort. Europeans express horror over American

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

use of scientifically proven safe beef growth hormones and yet accept a certain number of deaths each year from consuming unpasteurized cheeses. The Japanese are hypersensitive about GMOs and yet consume Fugu (puffer fish) that are known to kill about 50 people each year. If a culture has a history of specific product consumption, then it is likely to return to purchasing that product once confidence returns or doubt fades. For example, EU beef consumption has rebounded from the earlier BSE-induced declines, though production has not.

Vegetarianism's Benefit: Vegetarianism is voluntarily practiced by a relatively small portion of the non-Hindu population, about 3-4 percent in the rich countries. It may enjoy a very small growth pattern in the developed countries but marketers say that the practice, or what more specifically may be called “meat avoidance,” tends to increase during adverse publicity periods surrounding animal disease outbreaks. Extensive research and development work on non-meat alternatives may give this segment greater appeal over time, and most certainly if meat exports become increasingly disrupted due to disease concerns. But much of the developing world is trying to escape an animal protein deficient diet that has long been imposed due to a lack of sufficient wealth. The allure of meat consumption is likely to remain strong well alive through the base period covered by this study.

Baseline Explanations

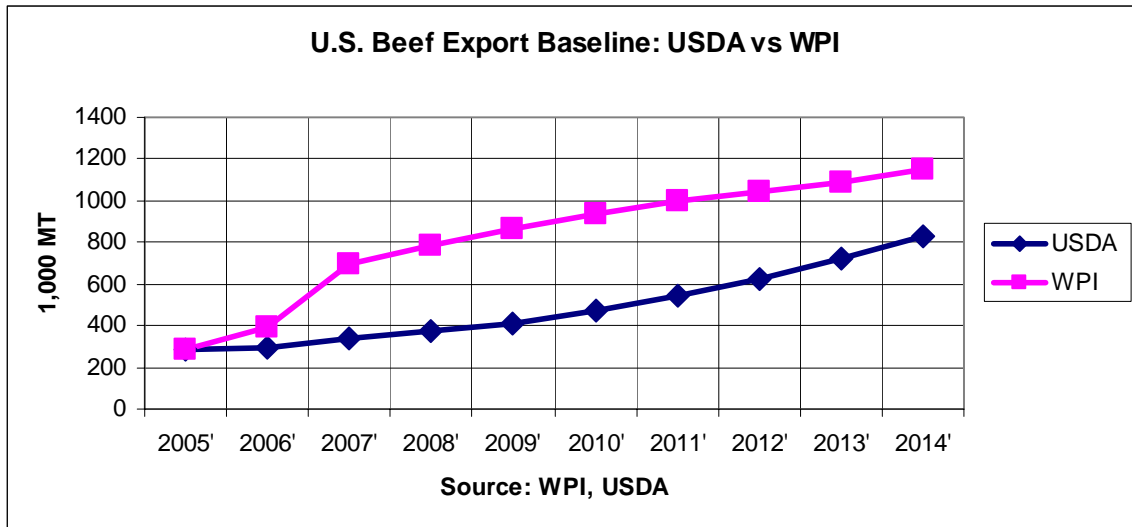
USDA baseline assumptions can be found in USDA Annual Agricultural Baseline Projections to 2014 published by the World Agriculture Outlook Board. WPI's revised assumptions are based on data provided by USMEF, interviews with packers, and statistics and data from the United Nation's Food and Agricultural Organization. .

Following is an explanation of each:

USDA Beef – gradual recovery from BSE embargo; primary export markets projected to be Japan and Korea

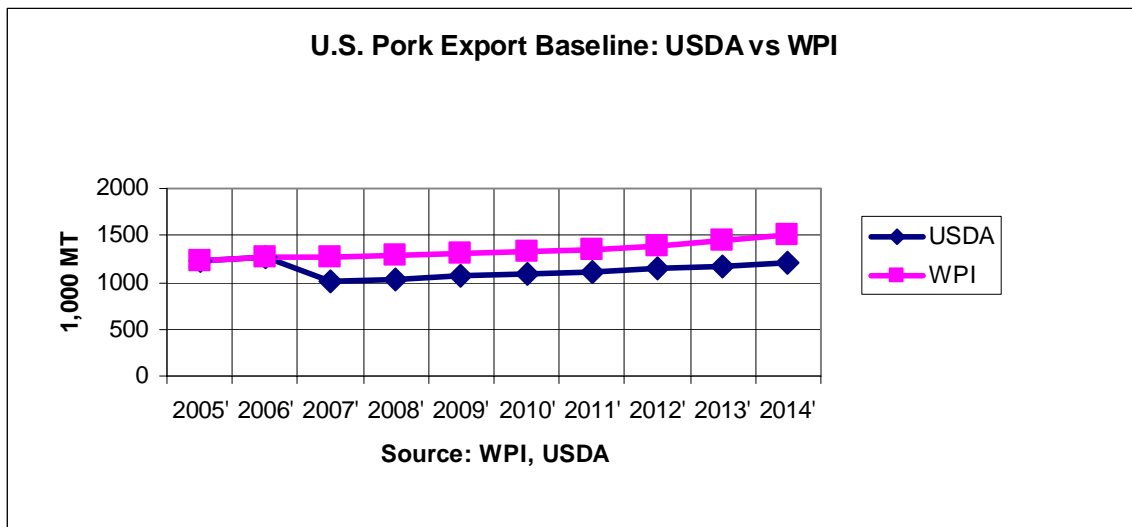
WPI Beef – gets back up near 2003 levels in 5 years, assumes a stronger export growth than USDA. Resumption of shipments to Japan, plus openings in EU, and continued growth in Mexico. Some drop in domestic demand makes beef competitive; resumption of rules on offal and variety meats lead to more exports.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



USDA Pork - pork benefited from substitution effect with lower beef exports. U.S. pork exports will be determined by costs of production and environmental regulations relative to competitors. Such costs tend to be lower in countries with growing pork industries, such as Brazil and Mexico. Brazil targets Russia, Argentina, and Asian markets other than Japan and South Korea. USDA cites Canada as major competitor.

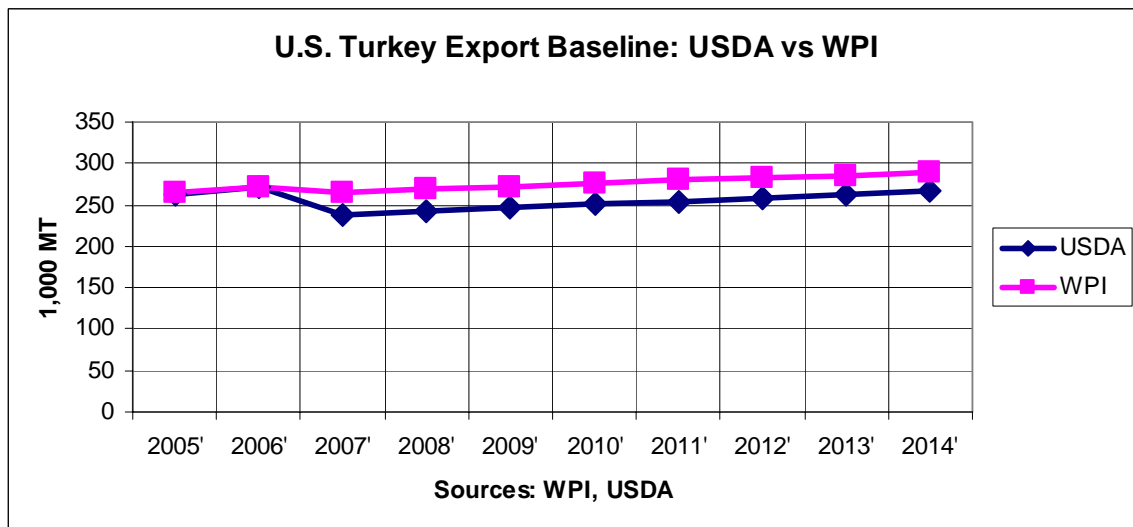
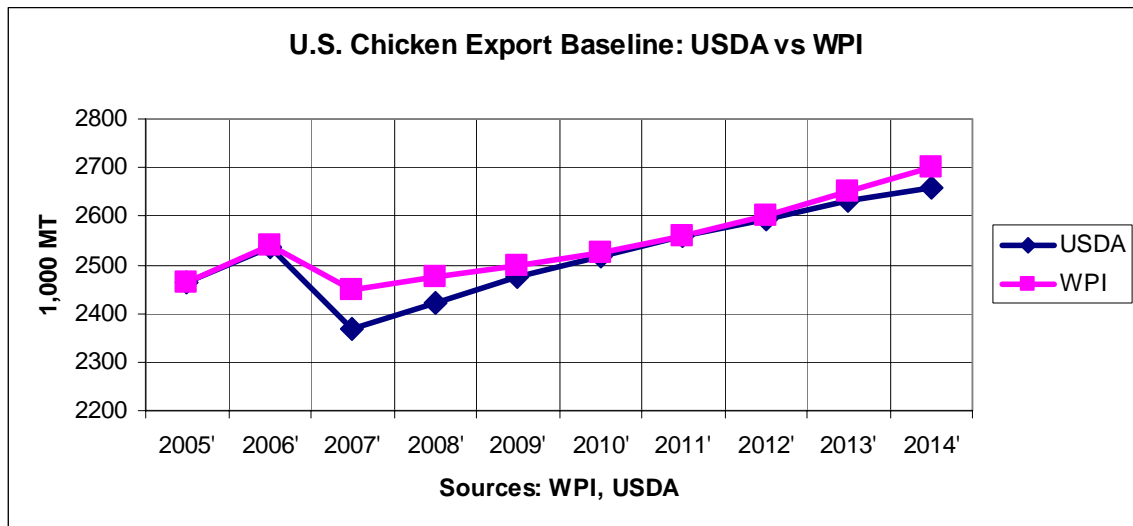
WPI Pork – continues to grow from new levels. USDA’s baseline projects a drop in 2007; pork has not had a year over year drop in export volume since 1990. While USDA focuses on Japan and Korea demand for pork, WPI notes that EU, Eastern Europe, Mexico, Caribbean, and Russia are all ahead of past forecasts in terms of imports of U.S. pork. FAO predicts 29 pct growth in global consumption by 2015 (over 3 year average 97/98/99). U.S. keeps relatively steady percentage of total global supply; more exports of pork from Canadian feeder pig imports into the U.S.



Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

USDA Poultry – U.S. broiler export growth is expected to slow from the rate of the 1990s. U.S. producers will face strong competition from other major broiler exporting countries, particularly Brazil.

WPI Poultry – assume USDA baseline for chicken; assume turkey keeps some of its gains and makes growth in Halal countries like it has made growth in kosher Israel.



WPI's baseline meat export projections represent an additional 2.231 MMT of indirect soybean meal exports over the 9 year period. Cumulatively, that represents 77,440 bu of soybeans, which averages to 8,604 bu per year. Traditionally, pork has been the steadiest export meat, with year over year growth nearly every year. Chicken and turkey have been less steady. Given the global situation for animal disease, and the trade implications that come with those diseases, and that the growth in meat demand will be in developing countries with fluctuating economies and less than stable currencies, it is unlikely that

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

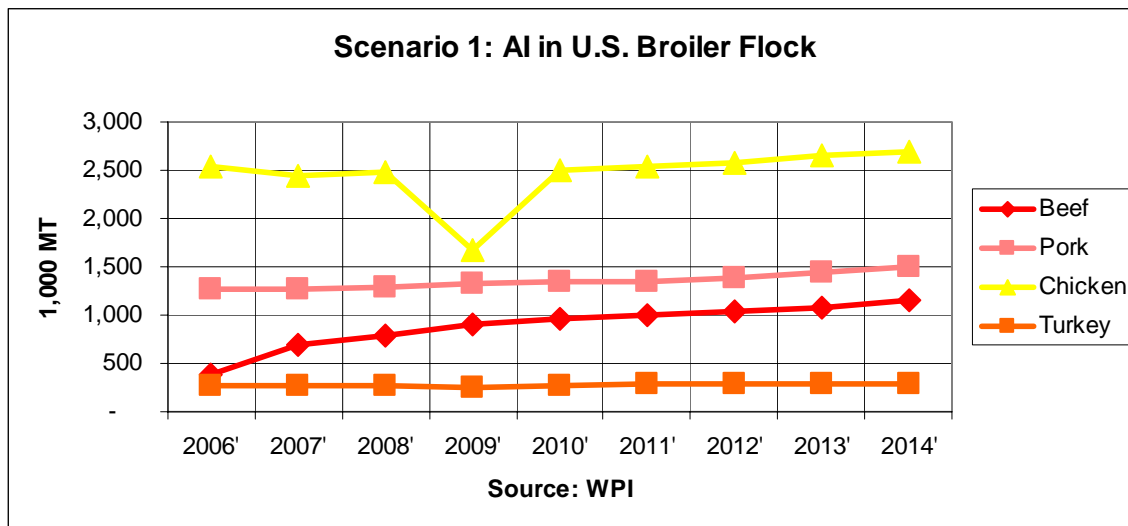
meat export growth will strictly follow the trend line, but more likely that there will be some fluctuations and variability year-over-year, though the longer term trend will hold.

Projected Indirect Soybean Meal Exports (1,000 MT)			
<i>Year</i>	<i>from USDA Meat Export Baseline</i>	<i>from WPI Baseline Marginal Increase</i>	<i>Total SBM Indirect Exports</i>
2006	2987	17	3004
2007	2654	322	2976
2008	2709	302	3011
2009	2764	279	3043
2010	2815	264	3079
2011	2869	251	3120
2012	2916	254	3170
2013	2965	258	3223
2014	3015	284	3299

Sources: WPI, USDA

Scenario 1: Avian Influenza in U.S. Broiler Flock

This scenario assumes a negative shock to chicken exports, such as an avian influenza pandemic problem that results in a 25 percent global flock reduction and closed export markets which pushes U.S. broiler exports down 15 percent.



Based on previous experience (2002/2003) this will have a spill over effect on turkey, however, the effect will be short lived. It will also have a slight positive impact on beef and pork exports. Essentially the substitution effect is limited because chicken is a lower priced “substitute” meat to beef, so when chicken meat prices increase, there may be substitution but the volume is limited because the substitution is moving up the price scale.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

A closure of the export market for chicken forces poultry prices lower in the domestic market and thus leads to increased domestic utilization. This increased in domestic consumption also has the effect of reducing cattle and hog prices, which can facilitate more exports. This scenario assumes almost full recovery within one year as production cycles are relatively short.

Scenario 1: AI in U.S. Broiler Flock: Changes to 2009/10 Meat Exports in 1,000 MT								
	Beef		Pork		Chicken		Turkey	
2006'	391		1265		2540		272	
2007'	695		1265		2450		265	
2008'	785		1280		2475		270	
2009'	865	895	1300	1330	2500	1677	272	242
2010'	935	960	1320	1350	2525	2500	277	272
2011'	995		1350		2530		280	
2012'	1,045		1390		2580		282	
2013'	1,085		1440		2650		285	
2014'	1,150		1500		2700		290	

Source: WPI

In terms of soybean meal, there is a one year loss of 576,000 MT of indirect soybean meal exports.

Negative Scenario 1: AI Loss of Chicken Exports Net Impact on Indirect SBM Exports					
	Beef	Pork	Chicken	Turkey	Total
2009'	5	21	-578	-24	-576
2010'	4	20	-19	-5	0

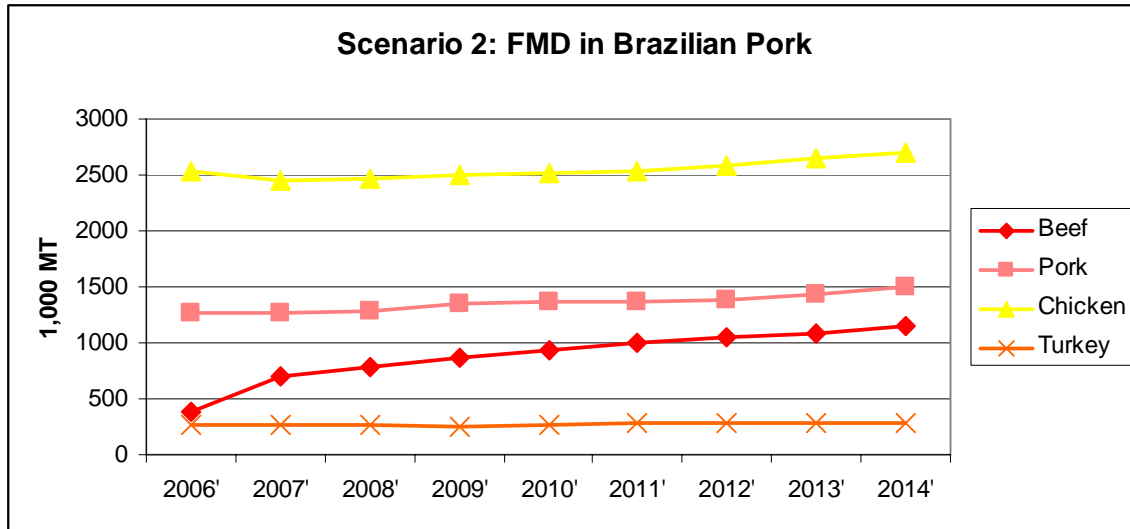
Source: WPI

That is a 19 percent reduction from the WPI baseline projection of 3.043 MMT of indirect soybean meal exports. That reduction is equivalent to 26.9 million bushels.

Scenario 2: Further Spread of FMD in Brazilian Swine Herd

This scenario assumes a positive shock to U.S. pork exports because of limits to Brazilian exports due to extended FMD problems there. Currently embargoes on placed on pork from eight states in Brazil, nonetheless, Brazil's pork export continue to grow and are at record levels. Half of all Russia's pork imports come from Brazil. This scenario assumes a 25 percent reduction in Brazilian pork exports for two years, with the U.S. gaining some of that market share on a proportional basis to other exporters.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers



Source: WPI

Currently, the U.S. holds about 22 percent of the global export market; Brazil holds about 14 percent. Currently, Brazil's two largest customers are Hong Kong, which had been stockpiling pork, and which transshipped a substantial amount of pork to China. Both those scenarios lead to Hong Kong's flattening of imports. About 58 percent of Brazil's exports go to Russia. The U.S. would compete with the EU for this market. Additionally it should be noted that Brazil is a lower cost supplier, and the U.S. is a high quality supplier, and thus serve different markets, but Brazilian exports are rapidly moving toward higher quality pork.

Scenario 2: FMD in Brazilian Pork				
Changes to 2009/11 Meat Exports in 1,000 MT				
	Beef	Pork	Chicken	Turkey
2006'	391	1265	2540	272
2007'	695	1265	2450	265
2008'	785	1280	2475	270
2009'	865	1300	2500	242
2010'	935	1320	2525	272
2011'	995	1350	2530	280
2012'	1,045	1390	2580	282
2013'	1,085	1440	2650	285
2014'	1,150	1500	2700	290

In terms of soybean meal, there is a two year gain of 144,000 MT of indirect soybean meal exports.

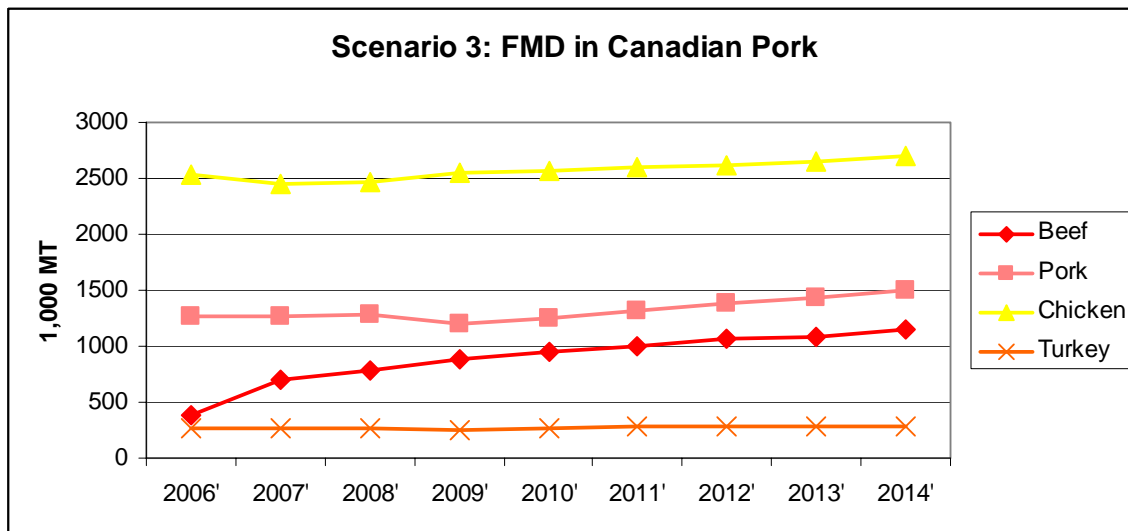
Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

Positive Scenario 1: FMD in Brazil Swine Net Impact on Indirect SBM Exports					
	Beef	Pork	Chicken	Turkey	Total
2009	0	46	0	0	46
2010	0	53	0	0	53
2011	0	45	0	0	45

That is a 4.7 percent increase over the WPI baseline projection of 3.043 MMT of indirect soybean meal exports. That increase is equivalent to 6.7 million bushels.

Scenario 3: FMD in Canadian Swine Herd

This scenario assumes a negative shock to U.S. pork exports because of FMD in Canada. Just like the discovery of BSE in Canada had significant impacts in the U.S., so to could discovery of FMD in the Canadian swine herd, which would significantly limit feeder pig supply to the U.S. It could affect U.S. pork exports by 8 percent for a year. This would be the first time U.S. pork exports dropped from one year to the next since at least 1970.



Source: WPI

Currently, the U.S. imports about 8 million head of feeder pigs from Canada. This actually increases U.S. pork export levels over Canadian pork export levels; losing Canadian feeder pigs in the U.S. market would reduce pork production and exports. However, if the Canadian swine herd were infected with FMD, their exports would also drop. Thus the gap would likely be made up by other producers, such as Brazil. It is likely that Mexico, Australia and Romania could increase their production which has fallen as they have increased imports of pork. Mexican imports have come primarily from the U.S., thus the longer term export picture could be flat for pork. There is likely to be some substitute effect with chicken, turkey, and to a lesser extent beef.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

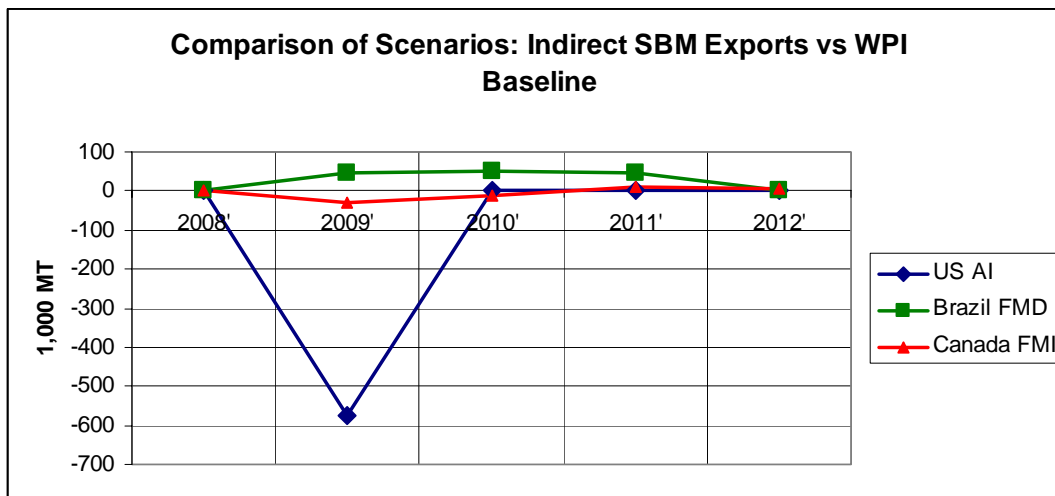
Scenario 3: FMD in Canada Changes to 2009/12 Meat Exports in 1,000 MT								
	Beef		Pork		Chicken		Turkey	
2006'	391		1265		2540		272	
2007'	695		1265		2450		265	
2008'	785		1280		2475		270	
2009'	865	885	1300	1195	2500	2550	242	250
2010'	935	950	1320	1250	2525	2575	272	275
2011'	995	1000	1350	1320	2530	2600	280	285
2012'	1045	1060	1390	1380	2580	2610	282	285
2013'	1,085		1440		2650		285	
2014'	1,150		1500		2700		290	

In terms of soybean meal, there is loss of 29,000 MT indirect soybean meal exports over four years, which is the same net loss as in the first year.

Negative Scenario 3: FMD in Canada Swine Net Impact on Indirect SBM Exports					
	Beef	Pork	Chicken	Turkey	Total
2009	3	- 74	35	7	- 29
2010	3	- 51	35	3	- 10
2011	1	- 21	27	4	11
2012	3	- 7	6	2	4

That is a 1 percent reduction from the WPI baseline projection of 3.043 MMT of indirect soybean meal exports. That increase is equivalent to 1.4 million bushels.

Comparison of Scenarios



Other scenarios can be calculated.

Value of U.S. Meat and Poultry Exports to U.S. Soybean Producers

Conclusion

While broiler exports are the largest cause of indirect soybean meal exports, currently pork exports are the fastest growing. While poultry is more volatile, pork is steadier, but has a longer recovery period from a set back.

General Conversion Benchmark Meat to SBM				
<i>100 lbs of exports of</i>	Beef	Chicken	Pork	Turkey
<i>Equivalent in SBM</i>	61 lbs	70 lbs	68 lbs	80 lbs

In terms of growth potential for soybean meal use, turkey holds the most promise in per unit use of soybean meal. Turkey exports use of soybean meal are currently greater than beef exports' use, and as turkey export volumes are small, this is an area that holds promise for a significant increase in soybean meal usage.

Pork holds the greatest potential to significantly expand indirect soybean meal exports; pork is the fastest growing export from the U.S. and globally.

Broiler exports are a major use of soybean meal; AI threats to U.S. broiler exports are significant.

Recommendations

There are three recommendations that arise from this study that would benefit U.S. soybean growers:

1. Work with turkey producers in expanding their product exports. Turkey exports grew by nearly 25 percent last year and now exceed beef in terms of total export volume. Given the level of soybean utilization by this subsector and the potential for increasing indirect soybean exports, helping turkey growers will concurrently help soybean growers.
2. Encourage improved, science-based SPS approaches in livestock product importing countries. Whether it is the Japanese ban on imports of U.S. beef or the Ukrainian ban on imports of poultry from anywhere, too many countries excessively punish trade in livestock products on the basis of questionable criteria. Ultimately, these questionable practices hurt U.S. soybean producers.
3. Invest in disaster preparedness planning for the soybean sector. According to a study by KPMG, about 40 percent of companies that do not invest in disaster preparedness planning and suffer a major business disruption go out of business within two years. This means that meat producers and their feed suppliers should prepare for the potential of market disruptions due to animal disease outbreaks.