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COMMITTEE ON COMMODITY PROBLEMS

INTERGOVERNMENTAL GROUP ON MEAT AND DAIRY PRODUCTS

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Rome, 13-16 November 2006

IMPACTS OF ANIMAL DISEASE OUTBREAKS ON LIVESTOCK MARKETS

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I. INTRODUCTION

1. Previous Sessions of the Group have taken stock of the growing influence of animal disease outbreaks on domestic and international livestock markets. At its 17th Session, the Group discussed the economic costs of animal diseases, focussing on the various types of costs of animal disease outbreaks and how they can be assessed. At the 19th Session, a number of case studies were summarized that attempted to measure the market and trade impacts of specific disease outbreaks in various countries and drew some lessons on how to minimize such costs. At these Sessions, the Group requested that the Secretariat continue to monitor and assess emerging developments.

2. While it is recognised that animal disease may have a significant local impact, the growing interdependence of livestock markets is creating awareness of the broader costs on livestock industries around the globe. Certainly, escalating outbreaks of animal diseases have increased market instabilities, most recently with a recurrence of foot-and-mouth disease (FMD) in South America, the identification of bovine spongiform encephalopathy (BSE) in various major exporting countries and, most specifically, the ever widening and troublesome spread of Avian Influenza (AI) around the world. These outbreaks have tested the resilience of global livestock markets which have recently exhibited the slowest growth in trade over the past decade. The notification of trade bans for meat has never been higher and, increasingly, consumers' concerns about meat safety are leading them to shift consumption to other animal proteins. As Governments express rising concern about the socio-economic impact of animal disease prevention and control, the zoonotic nature of H5N1 is raising the cost of prevention and disease control, prompted by the possibility of a disease pandemic affecting the human population.

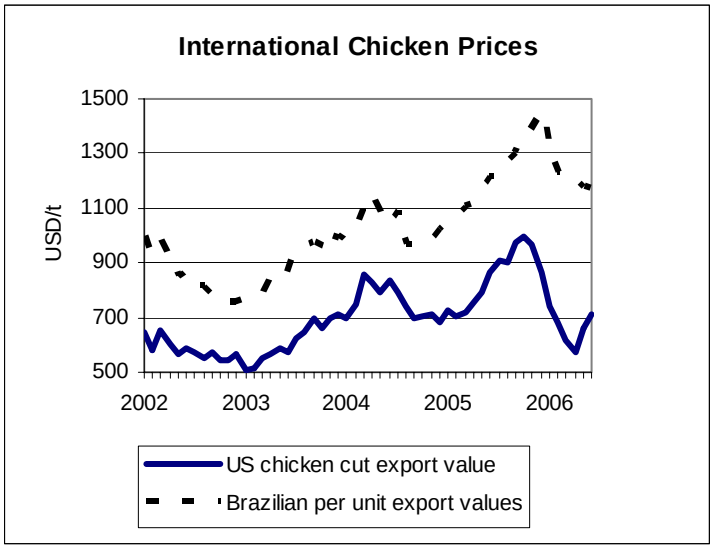
3. In the context of the considerable policy challenges posed by animal disease to livestock producers, meat processing industries, and policy makers around the globe, the Secretariat has been investing in modelling tools that will help assess the global market and trade impacts of these diseases. As part of its Cosimo Project[1], a collaborative modelling effort with the Organisation for Economic Cooperation and Development (OECD), the Secretariat has developed a detailed world agricultural commodity model that includes enhanced coverage of the world meat market, including the Pacific and Atlantic beef and pigmeat (including FMD and FMD-free) markets, and the global poultry meat sector. The model includes important domestic and trade policies that condition global market responses and supports cross-commodity analysis through linkages to the major markets for grains, oilseeds and oilseed products and milk and dairy product markets.

4. This document provides a market review of the status of the major animal diseases currently affecting markets. It then assesses some preliminary scenario results of three broad animal disease scenarios involving AI, FMD and BSE outbreaks, which are part of a larger programme of work being undertaken to examine global market impacts arising from animal diseases. The examination of alternative model simulations helps identify and assess critical aspects of the impacts of animal diseases on markets. In particular, it provides general benchmark estimates on the market and trade costs of these diseases under different scenarios, while providing a framework to assess some of the factors and policies that can influence the market impact of different types of animal diseases.

[1] The Aglink-Cosimo model was presented to 65th Session of CCP and the latest version is briefly described in document CCP: ME 06/CRS 4. The model generated the commodity projections published in the OECD-FAO Agriculture Outlook: 2006 to 2015. These projections served as the basis of the analysis found in this document.

II. ANIMAL DISEASE OUTBREAKS: AN UPDATE

5. Recent market developments in meat markets are set against a backdrop of animal disease-induced market instability in recent years characterized by consumption shocks, variability of export supplies, and price volatility. The onset of avian influenza in Asia (AI outbreaks in late 2003 and early 2004) coincided with the discovery of BSE in North America, a region which supplies nearly one-quarter of global meat exports. Exacerbating market instability were the FMD outbreaks in Brazil and Argentina in late 2005. Limitations on exportable supplies initially supported meat prices, with poultry prices rising over 30 percent over the 2004 and 2005 period. This trend reversed itself in late 2005 in response to the adverse consumption impacts of the spread of AI to major poultry markets in Europe, Africa and the Middle East**.** Of the approximately 55 countries reporting AI outbreaks since early 2004, 28 are classified as developing (8 in Africa, 4 in the Near East, and 14 in Asia).



A. AVIAN INFLUENZA

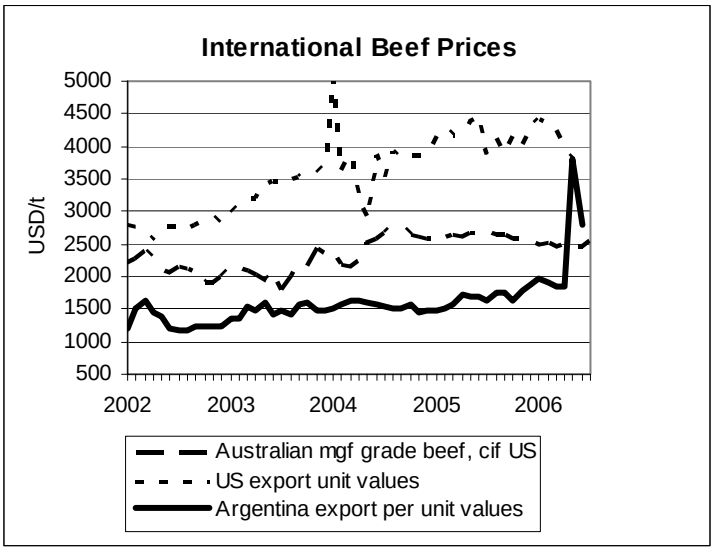
6. New AI detections in the major consumption areas of nearly 40 poultry importing nations in Western Europe, the Near East, and Africa in late 2005/early 2006 led to major consumption shocks and translated into shifting trade flows, dramatic price declines, and supply responses in both infected and non-infected countries. While more than 220 million birds are estimated to have been culled since the onset of the disease, this accounts for less than 1 percent of the 52 billion birds slaughtered annually. Most of the market and trade impact of AI are closely linked to consumption and the imposition of trade restrictions. However, the culling and high mortality of birds certainly has had an impact on the livelihoods of poultry-dependent households in many of the least developed countries. In addition, the unproductive "downtime" forced on affected poultry farms has had a negative effect on industry profitability and market stability while there have been broader ripple effects through global markets as consumption and trade shocks have affected prices for meats and industry inputs around the globe.

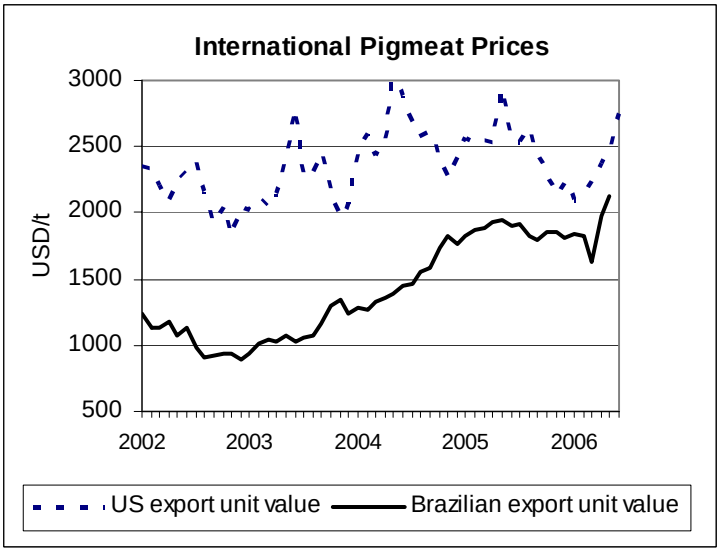
7. In the European region, AI outbreaks were confirmed in 25 countries, with trade bans put in place for those 9 countries where AI was identified in domestic poultry operations. Approximately 69 countries put bans on poultry products from the various affected Member countries within the EU-25. Eleven of those did not adopt a regional approach and imposed bans on all EU products. In addition to bans related to H5N1, trade restrictions were also put in place on product from the Netherlands which in August identified a low pathogenic bird flu strain on

one farm. With short term consumption shocks in the EU-25 ranging between 70 percent in Italy, 40 percent in France, and 0-10 percent in other member countries, EU aggregate chicken prices declined, by 15 percent in late 2005.

B. FOOT-AND-MOUTH DISEASE IN SOUTH AMERICA

8. **Brazil:** In October 2005, FMD outbreaks in the **cattle** sector were reported in two Brazilian States, Mato Grosso do Sul and Parana. These two States previously accounted for 50% of Brazilian's beef exports. Bans were imposed by over 50 countries, but the overall export impact was mitigated by the regional nature of the bans imposed by the European Union and the Russian Federation, recipients of nearly half of Brazil's beef exports, which targeted only the two affected States. The Government expects to send soon documentation to the OIE requesting the reinstatement of sanitary status as an area free of FMD with vaccination. The end of September sees the conclusion of the six-month period required after the last animals were culled on the properties affected. The regionalization of export bans allowed the beef sector to maintain export volumes at almost the previous years' level, because slaughterhouses substituted beef from the affected States with that produced in states completely free of FMD such as Goias, Mato Grosso and Minas Gerais. This process of substitution was facilitated by Brazil's diversified export markets with product moving to over 150 countries.





9. The **pork** sector in Brazil has been more disadvantaged by the FMD outbreak than the beef sector, which actually experienced the outbreak. This is despite the fact that the share of exports to production, at 21 percent, is similar to that of beef. The pork sector has a heavy dependence on the Russian Federation market, the destination of 65% of Brazil's total pork exports. This, combined with a decision by the Government of the Russian Federation to extend the ban to Santa Catarina (the only State in Brazil which has the status of being completely free of FMD without vaccination) and Rio Grande do Sul, has led to serious damage to the industry with prices declining on the Brazilian domestic market by 30%, well below the costs of production. Approximately 60 countries have imposed import restrictions on pork from Brazil. While exports were reported down more than 25 percent in the first half of the year, a resumption of trade to the Russian Federation from Rio Grande do Sol in mid-year implies some export recovery. There have been attempts this year to diversify markets to FMD areas, in particular Singapore, Hong Kong and other smaller markets in Africa and Asia.

10. **Argentina:** In early February 2006, FMD was detected in the province of Corrientes. Since the outbreak, Argentina has lost its FMD-free with vaccination status, a suspension which could last 6-8 months as the country responded to the outbreak through the stamping out of around 5,000 head (mainly cattle).The trade impact has been minimal because, with the exception of Chile, most major markets only banned imports from Corriente, a province which accounts for only 2 percent of Argentine beef exports.

C. BOVINE SPONGIFORM ENCEPHALOPATHY IN NORTH AMERICA

11. In 2003 BSE infected cows were discovered in North America, a region which supplies nearly one-quarter of global beef exports (valued at US$4 billion). Since then, net export availabilities of beef from the region have been significantly reduced by about 1 million tonnes. It was only some 30 months after BSE was found in Canada (May 2003) and the United States (December 2003) that major high value Asian beef markets have started to re-open the access to Canadian and US beef cuts. The economic impact of the prolonged ban on North American beef products extended beyond the immediate effects on the two affected markets (see below) as reduced exportable supplies prompted a nearly 20 percent increase in Pacific market beef prices (supported also by rising chicken prices in the context of AI).

12. The BSE-related market losses in Canada and the United States have differed depending on the two countries' export dependency and net trade position. For example, the Canadian cattle industry exported 12 percent of its live animals and nearly 50 percent of total beef production prior to the identification of a BSE-infected animal in May 2003. After more than two years, at a total estimated cost of over US$4 billion, exports of meat are gradually recovering. Exports of live animals are languishing as exports of cows are still banned; however, exports of young cattle are rebounding. In 2003 alone, the value of Canadian beef and cattle exports declined by over $1billion (US$400 million for beef, $700 million for live cattle). In the case of the United States, the country is a net beef and live cattle importer and, although one of the world's largest beef exporters, its exports account for only 10 percent of production . The value of US beef exports, following the detection of two BSE-cows dropped by $2.6 billion in 2004, while the absence of US beef in global markets contributed to raising international prices. However, domestic prices remained relatively high as imports adjusted. This contrasts with the domestic impact in Canada where a more dramatic dependence on international export market, as indicated above, immediately translated into cattle prices dropping by approximately 50 percent and reduction of cattle and calf receipts for 2003 by 33 percent from previous year's level (Statistics Canada, 2004).

OIE Rules on Disease Freedom

Foot-And-Mouth Disease:

To be recognized as an FMD free country without vaccination, a country should show that there has been no outbreak of FMD and that no vaccination against FMD has been carried out during the last 12 months. When FMD outbreak occurs in a FMD free zone where vaccination is not practiced, the following waiting period is required:

- 3 months after last case of stamping out
- 3 months after slaughter of all vaccinated animals where a stamping out policy is imposed
- 6 months after the last case or the last vaccination where stamping out policy was not applied.

When FMD outbreak occurs in an FMD free zone where vaccination is practised, one of following is required:

- 6 months after last case where stamping out is applied
- 18 month after the last case where a stamping out policy is not applied.

Avian Influenza:

For an AI free country, zone or compartment, no infection for the past 12 months. If an infection occurs in a previously free zone, disease free status can be regained 3 months after a stamping-out policy is applied. Low pathogenic poultry can be kept for slaughter or stamping out, disease free status can be regained 3 months after disinfection of all affected establishments.

Bovine Spongiform Encephalopathy:

Determining the BSE risk status of the cattle population of a country, zone or compartment is done by conducting a risk assessment, which is reviewed annually, that identifies all potential factors for BSE occurrence and their historical perspective. These factors include a number of factors such as feeding regimes, live animal movement and importation of beef products. In the case of a positive BSE finding, full documentation must be provided to demonstrate related cattle have been completely destroyed. A claim of negligible or controlled risk must be substantiated.

Zoning, Regionalisation and Compartmentalisation:

Regionalisation (or zoning) and compartmentalisation are procedures implemented by a country to preserve the distinct health status of a specific geographic area or subpopulation (in the case of compartmentalisation) for the purpose of international trade. The exporting country defines this zone/compartment in respect to the specific disease and the measures recommended by the OIE with the importing country recognising this status.

III. ANIMAL DISEASE SCENARIOS: SOME MODEL RESULTS[2]

13. There is no established conceptual framework for analysing the global cost of animal diseases; however, estimates of producer market losses that arise from various disease outbreaks scenarios can be estimated by model simulation. The results could prove useful for Member governments and international organizations when evaluating policy interventions which seek to mitigate aggregate costs.

14. This section provides some preliminary estimates of producer market losses that arise from disease outbreaks, in particular those that result from production, consumption, trade and price impacts. The document reviews estimates of outbreaks of AI in Europe, FMD in Brazil, and BSE in North America. Hypothetical AI outbreaks are also examined for Brazil and the United States as comparisons to the European situation. The discussion focuses on: 1) the role of that market characteristics play in determining individual country market losses; 2) the impact that regionalization policies have on disease costs; 3) the nature of consumer responses in influencing market losses; 4) the differential market impacts of various animal diseases.

15. The heterogeneous nature of meat products and markets complicates modelling of the sector and this needs to be taken into consideration in understanding the results. For example, world beef and pigmeat markets are considered to be divided into at least three market segments. These markets, the Pacific Market (PM), the Atlantic Market (AM), and the FMD endemic market (FMDM) have been established over time, largely on the basis of the FMD status of the various countries, but also by trading patterns and trade agreements[3]. In general, the Pacific Market for beef includes North and Central America, Oceania, Japan, South Korea, Thailand and a portion of the Chinese and Indonesian markets; it is similar for pigmeat but includes the Philippines and high quality cuts from the EU. The Atlantic Market for beef includes South America, Malaysia, Viet Nam, various countries in North Africa and the Middle East, Eastern Europe and the remaining portion of the Chinese and Indonesian markets; for pigmeat, lower quality cuts from EU are also included. The FMDM is the residual market. The PM is the premium market with the highest prices, followed by the AM, with the FMDM having the lowest prices. Exporters sell into specific markets largely based on their own disease status, supported by bilateral protocols. The poultry market, one of the fastest growing sectors, is characterised by diverse consumer preferences, with higher income markets preferring white over dark meat. While an estimated 54 percent of world chicken production consists of white meat, dark meat trade predominates, as it accounts for about 65 percent of the volume of world poultry meat trade. Comparing the two largest exporters, the United States is the major supplier of dark poultry cuts while Brazil provides whole birds as well as dark and white meat cuts. The heavy concentration of poultry export suppliers, with Brazil, the United States and the EU supplying nearly 80 percent of global trade, implies that any outbreak or consumption shock in those countries could generate large global market shocks. Import markets are less concentrated, but, in the context of an animal disease outbreak, most countries place trade bans immediately to protect their own markets. Consumers, increasingly linked to the global media, are now more aware of food safety issues, thus heightening the impact of a food crises. These responses have direct implications for market prices and trade patterns. Within these market contexts, trade policies also condition trade flows and, hence, international market impacts. These policies range from specific disease bans or meat

[2] The model results chosen for exposition are part of a larger work programme to examine the impacts of animal disease globally. The focus of these scenarios is on major exporters since these have the largest impact on international markets. For example, while work is being undertaken on outbreaks in other countries, such as AI in Africa and Southeat Asia.

[3] In 2004-05, the Pacific Markets accounted for some 46 percent of world beef exports and 68 percent of world pork exports. Atlantic markets accounted for 51 percent of world beef exports and 29 percent of world pork exports. The remaining FMD markets account for the remainder and are small.

safety standards, to high tariffs and tariff rate quotas that limit trade. In some cases, export subsidies also apply. Models such as the one employed for this study take into consideration these various policy measures in their assessments.

A. AVIAN INFLUENZA SCENARIOS

16. Various scenarios on the market and trade impact of AI were analysed:

- Global AI consumption shift/shock of 10 percent away from poultry to other meats[4].
- AI outbreak in the EU: Two scenarios with loss in exports for 6 months[5], first, with no consumption shock, second, with a 10 percent consumption shock in the EU.
- AI outbreak in Brazil: loss in exports for 6 months, no consumption shock.
- AI outbreak in the United States: loss in exports for 6 months, no consumption shock.

17. Results are examined relative to the baseline projection for 2006, and are shown in Tables 1-4.

Global consumption shock due to AI

18. The impact on global markets and trade of shifting consumer preferences in all countries against poultry meat is demonstrated in Scenario 1 which simulates the effect of a global 10 percent shift away from poultry toward the other meats (see Table 1) in 2006. In the first year, trade in poultry products falls by 13 percent and traded prices by almost 7 percent. World production and consumption of poultry meat decline by nearly 6 percent. Given the lag in supply response of other meats, prices increase considerably, with beef and pigmeat prices up from 10 to 20 percent in the Atlantic and Pacific markets. Feed prices fall as poultry production contracts and other meat production remains largely unchanged in the first year. However, the model, when carried into future years, illustrates the global markets ability to respond to market shocks with feed demand recovering in subsequent years as production of other meats rises. Clearly, sharp meat consumption shifts, as currently witnessed in global poultry markets, have large ripple effects throughout the broader agricultural economy.

[4] The "shift" is interpreted to mean a shift in the demand schedule such that for the same prices and incomes, consumers consume 10 percent less poultry meat.

[5] Annual average equivalent of a complete ban on exports for 6 months.

Table 1: Scenario 1 - Worldwide 10% Preference Shift Away From Poultry Consumption

	World	Developed	Least Developed	Other developing
Poultry:				
Production	-5.8	-4.7	-5.5	-6.7
Consumption	-5.8	-5.5	-6.2	-6.0
Imports		-16.2	-8.0	-12.3
Exports	-13.3	-7.7	na	-18.9
International Prices:				
Poultry	-6.7			
Atlantic Pigmeat	14.9			
Pacific Pigmeat	18.8			
Atlantic Beef	15.8			
Pacific Beef	10.7			
Maize	-3.2			
Oilmeal	-3.3			

Notes: In this scenario the consumption preference shift away from poultry is re-allocated to other meats on a proportion basis using world consumption shares of 2004-05. An na value for LDCs results from the fact that exports from these countries are miminal.

AI outbreak in the EU.

19. In Scenario 2a, a simulated reduction in EU poultry exports, channelled into the domestic market in the short term, reduces EU chicken prices by almost 4 percent. In response to a 7 percent decline in production, a shortage of white poultry meat results in increased imports. As competitors move to fill the global supply shortages, international poultry prices increase by almost 2 percent, while substitution effects increase the prices of beef and pigmeat. Scenario 2b is identical to 2a, except that a 10 percent EU consumption shock (ie. a shift left in the demand schedule), which is allocated proportionally to other meats, has been assumed. In this scenario, chicken prices decline by over 6 percent, poultry output by almost 12 percent and consumption by almost 7 percent. The consumption shift affects the domestic pigmeat sector and, given the biological lag that limits the supply response for the first year, prices rise by almost 12 percent. Pigmeat prices in the Pacific market, which is the highest value destination for EU pigmeat, rise only 1 percent, as EU supplies to that market are reduced. In the beef sector, increased beef consumption attracts imports from the Atlantic market, causing beef prices in that market to rise 3.5 percent. The price and trade impacts of a significant shift in European meat consumption patterns stimulates higher Brazil and US poultry exports. Finally, while under the first scenario producer market revenues (as measured by the sum of the price and output changes) fall by about 11 percent (or about €1.2 billion), they fall almost 18 percent (or about € 2.1 billion) under a consumption preference shift away from poultry meat.

Table 2: Market and Trade Impacts of AI outbreaks in the European Union

Scenario 2a: AI outbreaks in the EU: No consumption preference shift							
	World	**EU**	**Brazil**	**United States**	**Developed**	**Least Developed**	**Other developing**
				% change			
Poultry:							
Production	-0.2	-7.0	2.1	0.4	-2.0	1.0	1.3
Consumption	-0.2	0.8	-1.3	0.0	0.3	-0.8	-0.6
Imports		37.1	0.0	0.0	9.3	-3.9	-8.6
Exports	-0.6	-50	10.2	2.5	-12.2	na	10.9
Price:							
Poultry	1.6	-3.8	2.1	0.3			
Pigmeat	0.0	-1.2	0.4	0.0			
Beef	0.0	-0.6	0.0	0.1			

Notes: Applied to 2006 base projection. Assumes trade bans last 6 months. Results for annual data. For the EU, the world reference prices used are the Pacific pigmeat prices and Atlantic beef prices.

Scenario 2b: AI outbreaks in the EU: 10% preference shift away from poultry							
	World	**EU**	**Brazil**	**United States**	**Developed**	**Least Developed**	**Other developing**
				% change			
Poultry							
Production	-1.0	-11.9	1.5	0.6	-3.4	0.9	1.0
Consumption	-1.0	-6.6	-0.3	0.2	-1.7	-0.9	-0.4
Imports		-0.4	0.0	0.0	3.0	-4.5	-8.5
Exports	-3.2	-50	5.8	3.0	-12.3	na	5.8
Price:							
Poultry	1.2	-6.2	1.5	0.5			
Pigmeat	1.5	11.8	-0.1	1.5			
Beef	3.6	4.7	3.6	0.6			

Notes: Applied to 2006 base projection. Assumes trade bans last 6 months. Results for annual data. For the EU, the world reference prices used are the Pacific pigmeat prices and Atlantic beef prices.

AI hypothetical outbreaks in Brazil and the United States

20. Scenarios 3 and 4 evaluate hypothetical AI breakouts in Brazil and the United States (see Tables 3 and 4). Not surprisingly, given their large share of world trade, these scenarios hold broader implications for international poultry markets than that of the EU, which only accounts for 10 percent of global trade. These two examples show how market shocks differ for countries depending on their relative linkages to international markets. A 50 percent export shock in Brazil, which exports about 30 percent of its production, leads to a 10 percent reduction in domestic poultry prices. Meanwhile, given the lower export dependence of the industry in the United States, where exports (almost exclusively lower priced dark meat) account for only 15 percent of domestic output, the same proportionate loss of export markets is estimated to reduce production and prices by some 7 percent. The obvious lesson demonstrated by these scenarios is that greater involvement in international markets exposes a country to proportional greater “market access risk”; e.g. the price/sales risk that is associated with higher export dependence. In these two scenarios, market revenue losses, as exports are banned for the duration of six months, are 20 percent in Brazil compared to about 14 percent in the United States . Effects on international markets obviously depend on relative market shares, the importance of trade to the overall industry , and the destination of trade flows.

Table 3: Scenario 3 - Hypothetical AI Outbreak in Brazil: No consumption shock

	World	EU	Brazil	United States	Developed	Least Developed	Other developing
				% change			
Poultry							
Production	-0.1	1.8	-9.8	0.2	0.6	1.4	-0.6
Consumption	-0.1	-0.6	5.7	-0.1	-0.2	-0.9	0.0
Imports		-25.0	0.0	0.0	-2.5	-3.3	-9.7
Exports	-6.3	8	-50	1.5	3.9	na	-16.7
Price:							
Poultry	3.4	2.7	-9.7	0.4			
Atlantic Pigmeat	-3.0	0.8	-3.0	0.0			
Atlantic Beef	-1.7	0.4	-1.7	0.1			

Notes: Applied to 2006 base projection. Assumes trade bans last 6 months. Results for annual data.

Table 4: Scenario 4 - Hypothetical AI Outbreak in United States: No consumption shock

	World	EU	Brazil	United States	Developed	Least Developed	Other developing
				% change			
Poultry							
Production	0.0	3.5	3.2	-6.6	-2.2	2.2	1.7
Consumption	0.1	-0.4	-1.7	1.3	0.4	-2.3	-0.1
Imports		-20.2	0.0	0.0	-3.3	-11.6	-5.6
Exports	-6.2	23	15.0	-50	-25.3	na	12.8
Price:							
Poultry	2.3	1.8	3.0	-6.8			
Pacific Pigmeat	0.7	0.5	0.7	-1.4			
Pacific Beef	0.9	0.3	0.9	-2.1			

Notes: Applied to 2006 base projection. Assumes a trade ban lasting 6 months. Results for annual data.

B. FMD SCENARIOS: THE IMPACT OF REGIONALISATION

21. The market and trade impact of an outbreak of foot-and-mouth disease in Brazil is assessed for the two year period, 2006-2007. Scenarios 5a and 5b illustrate the differential impact that may be anticipated under an OIE recognized regionalization approach, under which importing countries ban beef only from the disease-stricken regions, versus a scenario that does not recognize regionalization, which results in a total ban of imports from the country, rather than the region, affected (Table 5). In the case of Brazil, the world's largest beef exporter, the assumed difference in export levels due to regionalization, as evidenced in 2006, is significant; for beef, under a regionalised market, exports of beef and pork fall by about 9 and 60 percent respectively, compared to a 100 percent reduction for both product exports, under a no regionalization assumption.

22. Under the regionalisation[6] scenario (see results in Table 5), the decline in beef exports in 2006 of about 10 percent is accompanied by a drop in market prices of 16 percent in the first year. Domestic production falls less than one percent in the first year as product moves onto the domestic market; however, the total market revenue loss is estimated at 16 - 17 percent of market receipts in the first year. Lower production in the second year causes domestic prices to rebound to previously projected levels, with market revenue losses of only 2.5 percent. Beef prices in the Atlantic markets, as measured by the Argentinean export price, rise by nearly 7 percent, reflecting the lower export supplies to that market in the first year, but by only 2 percent in the second year. The market impacts gradually erode subsequently as market access is regained as bans are lifted. For the pigmeat sector, a reduction of exports of almost 60 percent pushes down domestic prices

[6] Exports not allowed from the two disease-affected States.

by 26 percent in the first year. Producers respond to the lower prices of the previous year through an output cut of 9.5 percent in the second year, 2007. Given the significant market share of Brazil in the Atlantic pigmeat market, Atlantic pigmeat prices rise by over 60 percent in the first year, before moderating in the second year.

23. Under an assumption of non-regionalization, the impact of an outbreak of foot-and-mouth disease in Brazil is estimated to be very severe. A simulated total ban of exports in 2006 pushes down domestic prices of both beef and pigmeat by more than 50 percent, as all exports are disposed of in the domestic market. Market revenues for beef fall by almost 60 percent in the first year, and by 22 percent in the second year, compared to the baseline projection. For pigmeat, the results are more severe with market revenue losses estimated at 56 percent and 28 percent in the first and second year, respectively. Prices in both the Atlantic beef and pigmeat meat markets respond drastically to significantly lower supplies and prices increase by about 80 percent in each of these markets . The closing of price differentials between market segments cause major changes in international trading patterns, with participants of the premium Pacific markets also shipping to the Atlantic markets as the prices in the later market rise. This scenario highlights the very important role played by regionalization policies, not only in stabilizing the domestic market of a major trading country, but in limiting price volatility in international markets. Clearly, the benefits arising from the application by partner countries of the regionalization principle are greater the larger the export dependency and international market share of the disease-affected country.

Table 5: FMD Outbreak: Trade Impacts of Regionalisation - the Case of Brazil

	Scenario 5a: Regionalization				**Scenario 5b: No regionalization**			
	World		**Brazil**		**World**		**Brazil**	
	2006	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
Impact on the Beef Sector								
Production	0.0	-0.2	-0.8	-2.7	0.2	-0.4	-4.0	-13.4
Consumption	0.0	-0.2	1.8	-0.7	0.2	-0.4	24.9	12.6
Imports			0.0	0.0			0.0	0.0
Exports	-1.3	-0.9	-9.6	-9.0	-8.7	-6.6	-100	-100
Impact on the Pigmeat Sector								
Production	0.0	0.2	0.0	-9.5	0.0	0.3	0.0	-20.2
Consumption	0.0	0.1	14.3	2.2	0.0	0.2	23.9	-1.6
Imports			0.0	0.0			0.0	0.0
Exports	0.4	-2.8	-59.7	-59.6	-0.1	0.7	-100	-100
Prices								
Pigmeat	62.8	2.6	-26.4	-3.8	83.0	61.1	-50.1	-8.6
Poultry	-0.5	0.1	-0.6	0.1	-1.8	-0.5	-2.3	-0.7
Beef	6.5	2.1	-15.6	0.3	76.1	50.0	-56.0	-27.5
Feed	0.0	0.8	0.0	0.3	-0.1	1.4	0.0	0.5

Scenario 2a: Total Ban on Brazilian Beef: 100 % reduction in exports of beef and pigmeat
Scenario 2b: Regional Bans on Three States: 200 000 tonne reduction in beef exports, 60% reduction in pigmeat exports

C. BSE IN NORTH AMERICA: ADAPTING BACK INTO INTERNATIONAL MARKETS

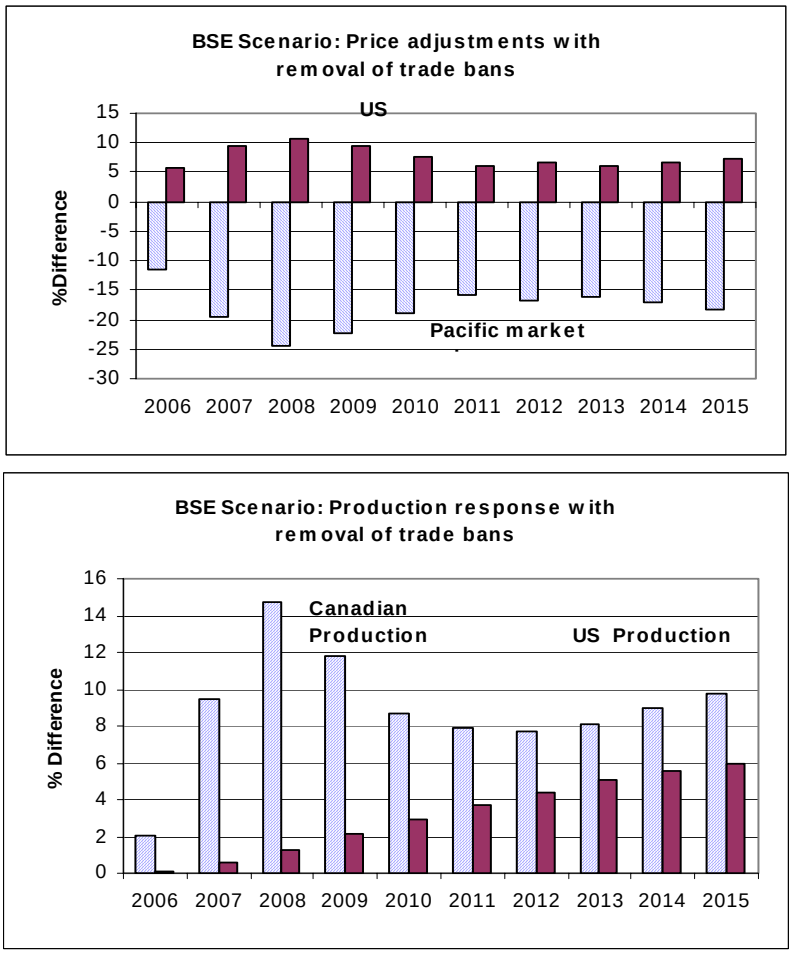
24. The effects of BSE in Canada and United States have been assessed in several studies. The key impact of this disease has been to reduce exportable supplies from these countries to the Pacific Market by about one million tonnes of beef annually. Severe domestic price depression created by excess domestic supply, particularly in Canada, but also in the United States, has led to a contraction of the industry. As trade bans have been lifted, first between these two countries where intra-trade is significant, then by importers in Pacific Markets, the North American beef sectors are gradually returning to a pre-BSE situation. Of clear concern is the long term impact of

prolonged trade bans, the ability of the sectors to recover and to regain their international market shares, as well as the broader incentives related to long term investment in the industry.

25. To evaluate the implications of re-establishing market shares, the baseline projections, which assumed a lifting of trade bans, is contrasted with a simulation which extends trade bans into the indefinite future. The difference between these scenarios provides an impact assessment of BSE in North America on international beef markets and a measure of the length of time that markets take to adjust to the lifting of the trade bans.

26. Figure 4 illustrates the response of both the United States and Canadian industry over the projection period to 2015 after trade bans are removed, compared to a situation where trade bans are retained. This scenario shows the responsiveness of North American beef output to the higher domestic prices associated with the relaxation of the ban. In fact, the adjustment time is very slow, with production continuing to adjust over the ten year period. Output is only 6 percent higher than if trade bans were to have remained in place. The industry recovery allows it to supply to the Pacific Market the one million tonnes that had been precluded by the trade bans. This boosts North American (US) domestic prices by 5 to 10 percent higher over the period, while Pacific market prices decrease 15 to 20 percent, compared to a situation where trade bans continue.

Figure 3: BSE scenario: Effects of removal of trade bans



Notes: The charts show the percentage difference from a base where trade bans continue against North America, and a projection where bans are lifted.

IV. CONCLUSIONS AND RECOMMENDATIONS

27. This document has reviewed the status of the three major animal diseases, namely AI, FMD, and BSE, which have been major causes of instability in meat markets and trade since the last Session. Through the use of a newly developed modelling framework, the document presents the results of three broad animal disease scenarios and draws some lessons on several factors that critically influence market losses from animal diseases and their international market impacts.

28. The Group may wish to discuss the conclusions of the Secretariat that:

- International market responses to animal disease outbreaks depend critically on the type of disease, the nature of consumer responses, the size of the market affected and trade linkages. Obviously, the impact of animal disease outbreaks, in the form of market losses, is highest for countries where the outbreak occurs and is in proportion to the country's export dependence. The prevalence of disease-related market segmentation, such as those existing for beef and pigmeat, create higher international impacts for those market segments.
- Consumer reactions play an important role in determining the size of market losses associated with animal diseases, with non-disease infected exporters significantly and adversely affected. Government policies which seek to sustain consumer confidence could mitigate market losses, thus minimizing markets impacts, both in-country and globally.
- Regionalization is a very effective instrument to limit market losses to countries that are experiencing an animal disease outbreak and to stabilize international markets. This has proved to be the case for Brazil and Argentina, where the potential market impacts of FMD outbreaks could have been extremely severe in the absence of importer recognition of in-country zones.
- A return to market equilibrium following a significant disease outbreak varies by disease and meat product. Poultry markets rebound very quickly, given the rapid supply responses of the industry, in contrast to beef markets which may take a decade to return to equilibrium.

29. In light of the above, the Group may wish to:

- Recommend that measures be undertaken to sustain consumer confidence where there is no apparent threat to the (food) safety of the meat supply system.
- Encourage all countries to abide by international guidelines on the coverage, timing and duration of import bans to protect animal and human health, and in particular to accept regionalization measures that conform to OIE protocols.
- Endorse the Secretariat's work programme which proposes a more in-depth monitoring of animal disease outbreaks, using the developed modelling framework to assess market implications for both developed and developing country markets. In particular, the Group may wish to endorse a comprehensive study of market losses arising from outbreaks of avian influenza.

30. Delegates are invited to provide their views on these observations and make recommendations from the Group to guide both policy makers in Member countries and international organizations seeking to mitigate the impact of animal disease on market players.