Potential Farm Sector Effects of 2009 H1N1 "Swine Flu": Questions and Answers

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Summary

In March 2009, a number of cases of an influenza-like illness and severe respiratory infections in humans were reported in parts of Mexico. These cases were later confirmed to be a strain of influenza A(H1N1), commonly referred to as "swine flu" and later called 2009 H1N1. By the end of April 2009, confirmed human cases of 2009 H1N1 infection were reported throughout Mexico, in parts of the United States, and in several countries worldwide.

Reports of the outbreak—coupled with the use of the initial moniker "swine flu"—initially caused a downturn in domestic and international pork markets. Domestic pork demand and prices dropped sharply because of consumer fears that eating pork might result in infection. Several pork-importing countries also began to consider instituting trade bans and restrictions on live pig and pork imports from certain countries, including the United States. This initial reaction further rippled throughout pork and other agricultural markets, such as feed grain and other livestock markets, as market analysts attempted to speculate about the short- and long-term consequences of a decline in pork demand and prices.

The Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO), and the World Organization for Animal Health (OIE) confirm that there is no evidence that the 2009 H1N1 virus is transmitted by food and that humans cannot get the illness from eating properly handled pork or pork products. Four global organizations—WHO, OIE, the World Trade Organization (WTO) and the United Nations Food and Agriculture Organization (FAO)—also issued a joint statement that "pork products handled in accordance with hygienic practices are not a source of infection." Also, in the United States, the CDC and the U.S. Department of Agriculture (USDA) report that there is no evidence at this time that pigs in the United States are infected with this virus strain.

Administration officials and many in Congress are strongly urging U.S. trading partners to base any food safety measures on scientific evidence and to act in accordance with their international obligations under the World Trade Organization (WTO), OIE guidelines, and WTO member obligations under the Sanitary and Phytosanitary (SPS) Agreement. OIE, among other international organizations, has stated that there currently is no justification for imposing trade measures against the importation of pork and pork products. As some countries are continuing to pursue trade restrictions on North American pork products, some affected exporting countries are considering formal trade actions in the WTO.

U.S. pork producers hope these efforts to avoid further negative effects on U.S. pork and other agricultural markets are successful. The National Pork Producers Council (NPPC) has asked USDA to provide financial assistance for U.S. pork producers to address the general economic downturn in U.S. hog markets, including assistance to address issues regarding the H1N1 virus. Members of Congress from districts with important meat sectors are likely to pay close attention to developments during 2009.

Contents

Tables

Contacts

General Overview[1]

What Is Swine Flu?

Swine flu refers to strains of influenza ("flu") that occur naturally and may cause outbreaks of respiratory illness among wild and domestic pigs. People do not normally get swine flu, but each year the Centers for Disease Control and Prevention (CDC) identifies a few isolated cases of human flu that are caused by flu strains typically associated with swine.

What Is 2009 Influenza A(H1N1)?

The current outbreak of concern is caused by a new strain of flu virus that produces illness in people. It is one of several flu virus strains designated as influenza A(H1N1) for specific proteins on their surface. This new virus was first detected in people in the United States in April 2009. Mexico, Canada, and other countries around the world have reported human cases of illness from the new flu strain. The virus appears to spread from person to person in much the same way as with seasonal flu.

Why Is This New H1N1 Flu Virus Sometimes Called "Swine Flu"?

This virus was originally referred to as "swine flu" because laboratory testing showed that many of its genes were similar to flu viruses that normally occur in pigs in North America. Further study has shown that this new virus is very different from what normally circulates in North American pigs. It has two genes from flu viruses that normally circulate in pigs in Europe and Asia, as well as genes from flu strains that normally circulate in humans and in birds. At this time, there is no evidence that pigs were involved in the transmission of the new flu virus to humans.

For more background information, see CRS Report R40554, *The 2009 Influenza Pandemic: An Overview*, by Sarah A. Lister and C. Stephen Redhead. General information is also available at the CDC and WHO websites.[2]

Food Safety and Human Health Concerns

Can Humans Get 2009 H1N1 Flu from Eating Pork and Pork Products?

The CDC, the WHO, and the World Organization for Animal Health (OIE)[3] confirm that there is no evidence that 2009 H1N1 virus is transmitted by food.[4] These organizations have repeatedly

[1] This section is adapted from information provided by CDC on the website "H1N1 Flu (Swine Flu)," http://www.cdc.gov/h1n1flu/.

[2] CDC: http://www.cdc.gov/swineflu/general_info.htm; WHO: http://www.who.int/csr/disease/swineflu/en/.

[3] OIE is the intergovernmental organization responsible for improving animal health worldwide, and is recognized as a reference organization by the WTO. The organization is still known by its former French abbreviation, OIE (Office International des Épizooties), though it was renamed the World Organization for Animal Health.

emphasized that humans cannot get 2009 H1N1 flu, or any other type of flu, from eating pork or pork products. Some have further emphasized the importance of eating properly handled and cooked pork and pork products, and recommend cooking pork to an internal temperature of 160°F/70°C. This corresponds to the general guidance for the preparation of pork and other meat to kill all viruses and other foodborne pathogens.

The U.S. Department of Agriculture (USDA) has repeatedly said that the 2009 H1N1 flu is not a foodborne disease and that eating properly handled and cooked pork or pork products is safe.[5] These same arguments were made by medical and veterinary authorities at congressional hearings.[6] The American Veterinary Medical Association (AVMA) further claims that "neither exposure to pigs nor consumption of pork are risk factors for infection."[7]

Four intergovernmental organizations—WHO, OIE, the World Trade Organization (WTO), and the United Nations Food and Agriculture Organization (FAO)—issued a joint statement that "pork products handled in accordance with hygienic practices are not a source of infection."[8] The European Centre for Disease Prevention and Control (ECDC) also states that "influenza virus is not transmitted by eating properly handled and cooked pork and pork products," and the European Food Safety Authority (EFSA) claims it is "not aware of any scientific evidence of risk to pork consumers from influenza viruses regardless of the type of pork consumed."[9]

Given the safety of eating pork and pork products, along with the fact that the disease is primarily transmitted from human to human, several U.S. and international organizations argued that the disease should not be called "swine flu." The CDC, WHO, and OIE, among others, now recommend instead referring to the disease by its scientific name, influenza A(H1N1) or 2009 H1N1.

Can Humans Get 2009 H1N1 Through Contact with Pigs or with Uncooked Pork?

The WHO and CDC continue to emphasize that humans typically contact this type of flu through human-to-human contact, or through contact with infected pigs or environments contaminated with the virus. However, there is no current evidence of humans acquiring infection directly from live pigs. OIE further notes that pork and pork products, "handled in accordance with good

(...continued)

[4] CDC: http://www.cdc.gov/swineflu/general_info.htm; WHO: http://www.who.int/csr/disease/swineflu/en/; and OIE: http://www.oie.int/eng/press/en_press2009.htm?e1d3.

[5] USDA, "Questions and Answers," Release No. 0131.09; and USDA, "Update By Secretary of Agriculture Vilsack Regarding USDA Outreach Efforts Regarding H1N1 Flu," April 27, 2009, Release No. 0132.09.

[6] See testimony, for example, from a Senate Labor, Health and Human Services, Education, and Related Agencies Appropriations Subcommittee hearing, April 28, 2009.

[7] AVMA, "AVMA advises consumers that pork and pork products are safe for consumption," April 29, 2009, http://www.avma.org/press/releases/090429_pork_products_safe.asp.

[8] WTO, "Joint FAO, WHO, OIE, WTO Statement on A/H1N1 Virus," May 2, 2009, http://www.wto.org/english/news_e/news09_e/jt_stat_02may09_e.htm.

[9] ECDC, "Frequently asked questions on influenza virus A(H1N1)," May 3, 2009, http://www.ecdc.europa.eu/en/files/pdf/Health_topics/090503_FAQs_Influenza%20AH1N1.pdf; and EFSA, "New influenza A (H1N1)," May 3, 2009, http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1211902500487.htm.

hygienic practices recommended by the WHO, the Codex Alimentarius Commission,[10] and the OIE, will not be a source of infection"; and it recommends that "authorities and consumers should ensure that meat from sick pigs or pigs found dead are not processed or used for human consumption under any circumstances."[11]

EFSA has further stated that it is "not aware of any scientific evidence of risk to pork consumers from influenza viruses regardless of the type of pork consumed," including raw meat, although it is quick to cite longstanding food safety advice that proper cooking kills bacteria or viruses which may be found in foods, and may prevent possible risk of foodborne illness.[12] USDA is also reminding consumers to practice good food hygiene and "safe food handling and preparation techniques for all meat and poultry."[13]

Do Any Pigs Have the Virus That Has Infected Humans?

In the United States, USDA and other veterinary experts confirm that, as of this date, there has been no evidence that U.S. swine are infected with the 2009 H1N1 virus; the 2009 H1N1 virus has also not been reported in feral pigs in the United States.[14] USDA and a network of federal veterinarians, state animal health officials, and private practitioners are regularly monitoring U.S. swine for signs of significant disease.[15]

The H1N1 flu virus was found in a swine herd in Alberta, Canada. This incident was reported to the OIE and was confirmed to have resulted from human-to-pig transmission.[16] The Canadian Food Inspection Agency (CFIA) said it has taken all necessary precautions and has placed the herd under quarantine. CFIA maintains that Canadian pork continues to be safe to eat.[17]

The *U.S. Animal Health & Productivity Surveillance Inventory* ("Inventory")[18] maintained by USDA's Animal and Plant Health Inspection Service (APHIS) does surveillance for avian flu,[19] but currently does not do surveillance for swine flu because of information limitations:[20]

[10] Codex is the international food safety organization that develops food standards, guidelines and codes of practice under the Joint FAO/WHO Food Standards Programme.

[11] OIE, "Joint FAO/WHO/OIE Statement on influenza A(H1N1) and the safety of pork," reissued May 7, 2009, http://www.oie.int/eng/press/en_090507_bis.htm.

[12] EFSA, "New influenza A (H1N1)," May 3, 2009, http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1211902500487.htm.

[13] USDA, "Questions and Answers," Release No. 0131.09.

[14] AVMA, "Frequently Asked Questions About 2009 H1N1 Flu Virus," May 4, 2009, http://www.avma.org/public_health/influenza/new_virus/new_flu_virus_faq.asp.

[15] USDA, "Questions and Answers," Release No. 0131.09.

[16] OIE, "Immediate Notification Report," May 2, 2009, http://www.oie.int/wahis/reports/en_imm_0000008065_20090505_191855.pdf.

[17] CFIA, "An Alberta Swine Herd Investigated for H1N1 Flu Virus," May 2, 2009, http://www.inspection.gc.ca/english/corpaffr/newcom/2009/20090502e.shtml.

[18] USDA, APHIS, Animal Health Monitoring & Surveillance, http://www.aphis.usda.gov/vs/nahss/inventory.htm.

[19] Ibid. Surveillance and monitoring activities related to avian influenza.

[20] USDA, APHIS, U.S. Animal Health and Productivity Surveillance Inventory, http://nsu.aphis.usda.gov/inventory/background.faces.

> Currently, the Inventory includes all animal health surveillance programs conducted by Veterinary Services, as well as all animal health monitoring studies completed by the National Animal Health Monitoring System (NAHMS). Information on certain additional animal health surveillance programs or studies conducted by USDA and other Federal agencies is also currently included.

Industry reports indicate that APHIS is working on draft guidelines and surveillance plans for the H1N1 virus. Other industry reports based on information prior to the outbreak also indicate that the CDC National Center for Immunization and Respiratory Diseases (NCIRD) Influenza Division (ID) and USDA APHIS Veterinary Services (VS, specifically the National Veterinary Services Laboratories or NVSL) entered into an interagency agreement regarding swine influenza virus (SIV) surveillance in July 2008.[21] These same reports suggest that a parallel agreement was reached between CDC and USDA Agricultural Research Service (ARS) for related research efforts on isolates derived from the APHIS program.

The CDC continues to study the origins of H1N1 and in May 2009 released information indicating that the virus likely originated in pigs, but that more genetic study and surveillance is needed.[22]

There were initial reports that the 2009 H1N1 flu had possibly originated at a business unit of Smithfield Foods Inc. located in Veracruz, Mexico.[23] Smithfield has repeatedly reported that there is no evidence of the presence of 2009 H1N1 influenza in any of the company's swine herds or in its employees at any of its worldwide operations, including those in the United States.[24]

U.S. Pork Market Effects

How Have U.S. Consumers Reacted to Reports of the Outbreak?

In late April, amid early reports of the spread of 2009 H1N1 flu, retail outlets reported that consumers were leery of buying pork because of fears that the disease may be linked to pork consumption. Tyson Foods Inc. also reported a drop in domestic pork sales.[25] As domestic sales fell, retail and wholesale hog prices fell sharply, along with hog and pork-belly futures prices on the Chicago Mercantile Exchange.[26] This drop in prices coincided with seasonal fluctuations in the hog market that would normally have caused prices to be higher. Economists at Purdue

[21] John A. Korslund and Ellen Kasari, "National Swine Influenza Surveillance," as reported by Thepigsite.com, http://www.thepigsite.com/articles/1/pig-health/2770/national-swine-influenza-surveillance (originally reported in North Carolina State Extension's *Swine News*, May 2009).

[22] L. Schnirring, "Genetic study: Novel H1N1 likely originated in pigs," May 22, 2009, Center for Infectious Disease Research & Policy (CIDRAP) Academic Health Center, University of Minnesota, http://www.cidrap.umn.edu/cidrap/content/influenza/swineflu/news/may2209genetics.html.

[23] See, for example, S. Fainaru, "Mexicans blame industrial hog farms," *Washington Post*, May 10, 2009; and R. Roberson, "Smithfield says it's not the source of H1N1," *Southeast Farm Press*, May 8, 2009.

[24] See, for example, Smithfield Foods Inc., "Smithfield foods reaffirms no incidence of A(H1N1) in any of its herds or employees," May 3, 2009, http://investors.smithfieldfoods.com/releasedetail.cfm?ReleaseID=381309.

[25] "Tyson Foods saw dip in pork sales as flu spread," *Reuters*, May 4, 2009.

[26] See, for example, B. Baskin, "Oil Slips Below $50 a Barrel on Swine-Flu Worries," *Wall Street Journal*, April 29, 2009; W. McFerron, "Hog Futures Fall as Swine Flu Reduces Pork Trade; Cattle Rise," *Bloomberg.com*, April 28, 2009; and W. Cheng, "China, Indonesia Ban Pork From Mexico, U.S. on Flu," *Bloomberg.com*, April 27, 2009.

University estimate that Indiana hog producers were losing about $5 a head on April 24, compared to estimated losses of about $20 immediately following reports of the initial outbreak in March.[27] Stock analysts also reportedly downgraded the stock of Tyson Foods Inc. and Smithfield Foods Inc. and lowered annual earnings estimates for these companies.[28]

In late April, consumers were still confused by how humans can get the 2009 H1N1 flu. For example, a phone survey conducted by the Harvard School of Public Health on April 29 asked 1,067 consumers about the ways humans can get the 2009 H1N1 flu. Among listed choices, respondents were asked about whether each was a possible way of contracting the disease. Most (83% of respondents) said: "From being in close contact with someone who has swine flu—that is, within about three feet." However, others responded that humans can get the 2009 H1N1 flu "From being near someone who has swine flu, but not in close contact—that is, being at thirty feet away" (29% of respondents) and "From coming in contact with pigs" (34%). Others indicated that they thought humans can get the 2009 H1N1 virus "From eating pork" (13%).[29]

Once the safety of consuming pork products was widely recognized, consumers in the United States returned to buying them—particularly as pork prices began to drop.

How Have U.S. Trading Partners Reacted to Reports of the Outbreak?

Citing public health and safety concerns, several countries have initiated or implemented steps to ban or restrict U.S. pork or pork products. Reports differ among governmental, industry, and other media sources regarding which importing countries are instituting restrictions and which imported product lines will be targeted. Following the initial reports of the outbreak, the U.S. Meat Export Federation (USMEF) and other media reports confirmed that several countries, among them China (but not Hong Kong) and Russia, had instituted official full or partial trade restrictions on U.S. pork products (see box).[30] By the following week, some countries had announced that they would lift their import ban; however, other countries announced that they too would ban all pork imports.[31] Many of these countries have also imposed these same restrictions on Mexican and Canadian pork and pork products. South Korea had instituted a partial ban (which was subsequently lifted), suspending imports only of live swine, but not pork products. Various conflicting media reports listed some countries as restricting pork imports, although many of these countries did not impose such trade restrictions.[32]

[27] C. Everson, "Hog farmers brace for financial pain of swine flu," *Associated Press*, May 6, 2009.

[28] J. Wilson and T. C. Dreibus, "Corn, Soybeans, Wheat Drop as Swine Flu May Cut Animal-Feed Use," *Bloomberg.com*, April 27, 2009.

[29] Harvard School of Public Health, "Swine Flu (H1N1 Virus) Survey," Harvard Opinion Research Program, April 29, 2009, http://www.hsph.harvard.edu/news/press-releases/files/Swine_Flu.TOPLINE.pdf. Survey was funded under a cooperative agreement with the CDC, and based on a total of 1,067 interviews. See responses to survey question 9.

[30] As reported by various news media and information cited and/or reported from USTR, USDA, and the U.S. Meat Export Federation (USMEF).

[31] T. Johnston, "Some countries are over H1N1 scare, some aren't," *Meatingplace Online*, May 11, 2009.

[32] See, e.g,, Reuters wire, "Countries slap bans on pork after flu outbreak," April 30, 2009; and T. Johnston, "More trading partners prohibit U.S. pork on swine flu fears," *Meatingplace Online*, April 27, 2009.

Importing Countries with Official Full or Partial Bans on U.S. Pork Imports (as of early September, 2009)

Armenia: All pork imports have been banned, effective May 8, 2009.

Azerbaijan: USTR indicates official import restrictions on U.S. pork and pork products are in effect.

Bahrain: USTR indicates official import restrictions on U.S. pork and pork products are in effect.

China: Trade suspension is limited to uncooked pork and pork products, and applies to most U.S. states with confirmed H1N1 cases. Fresh/frozen and heat-treated pork and pork products are ineligible if derived from swine raised or slaughtered in most U.S. states. Pork and pork products also may not transit these restricted states even if the truck, container, or railcar is sealed. *Hong Kong is not included in any portion of China's suspension*.

Ecuador: Restricted U.S. imports, effective April 28, but not currently on USTR list of countries restricting trade.

Honduras: Restricted U.S. imports, effective April 24, but not currently on USTR list of countries restricting trade.

Indonesia: Effective April 27, suspended imports of all pork and swine from outside its borders.

Jordan: USTR indicates official import restrictions on U.S. pork and pork products are in effect.

Kazakhstan: Effective April 28, suspended pork imports from Texas, California, and Kansas, but is expected to extend this ban to other affected states as well.

Kyrgystan: USTR indicates official import restrictions on U.S. pork and pork products are in effect.

Macedonia: USTR indicates official import restrictions on U.S. pork and pork products are in effect.

Russia: Starting on April 21, suspended fresh/frozen poultry meat, pork, and beef from animals raised or slaughtered in most U.S. states, as well as from certain slaughtering facilities (such as a suspension of imports from Smithfield Packing Company's Virginia slaughter plant, effective as of July 2009). Trade suspension is limited to uncooked pork and pork products. Heat-treated (not less than 80° Celsius for not less than 30 minutes) meat and poultry products are allowed. Products from some states may continue to transit through any of the restricted states.

Saint Lucia: Effective April 27, suspended import of fresh and frozen pork, live pigs, and swine semen.

Serbia: U.S. pork and pork products are already listed as ineligible for export to Serbia due to a lack of certification requirements.

Thailand: Effective April 27, suspension covers all U.S. states, and includes all uncooked pork products including meat (fresh, chilled, and frozen), offal, live animals, semen, embryos, and hides and skins. Processed pork products such as canned foods or food in sealed containers are still eligible.

Ukraine: Effective date April 21, suspended imports of pork, live pigs, and pork products from all states. Other products of animal origin can be imported under existing regulations if these are accompanied by valid health certificates.

Uzbekistan: USTR indicates official import restrictions on U.S. pork and pork products are in effect.

United Arab Emirates: Restricted U.S. imports, effective April 27, but not currently on USTR list of countries.

Countries that have lifted trade suspensions:

- **South Korea** had instituted a partial ban in April, suspending imports only of live swine from North America, but had not suspended imports of pork or pork products (although it has instituted increased screening and inspection of pork from the United States). Media report indicate that this partial ban was lifted in August 2009.
- **Others:** Some countries, such as Croatia and Malaysia, have lifted their earlier import bans.

Sources: USTR, "H1N1 and Trade," June 2, 2009, USMEF, "USMEF Export Issues—Influenza Update," May 4, 2009; various articles by *Meatingplace Online*; and USMEF press releases and communication.

Restrictions vary by country. For example, Russia has announced it will restrict all livestock and meat products, including beef, pork, and poultry, from selected states, and restrict all pork from several other selected states; China is restricting pork and live pigs from most, but not all, U.S. states. Some countries are banning all pork products, whereas other countries are restricting certain products only. The United States is among the largest supplier of pork products to both China and Russia.[33]

How Important Are Export Markets to the U.S. Pork Sector?

Foreign sales are a critical source of income for the U.S. meat and poultry industries, with the United States now exporting more than one-fourth of its annual pork production.[34] Fresh, chilled, and frozen pork products account for the bulk of U.S. annual pork exports (**Table 1**). China and Russia are among the top 10 largest international markets for U.S. pork, and represented 15% percent of total U.S. pork exports in 2008 (**Table 2**).

What Share of U.S. Pork Exports Is Represented by Countries Restricting Trade?

Countries that have instituted full or partial bans, as of mid-May, on U.S. pork exports as a result of the 2009 H1N1 flu outbreak represent 13%-16% of U.S. annual pork trade, based on trade data for the past three years from 2006 through 2008 (**Table 1**). The bulk of this lost potential is the result of restricted trade from Russia and China. The other countries that are restricting U.S. pork imports comprise a small overall share of annual U.S. pork trade. Japan, the largest U.S. market for U.S. pork, with more than one-third of the market in 2008, has repeatedly indicated that it will not restrict U.S. pork exports; also, Hong Kong, despite mainland China's trade restrictions, has indicated that it will not restrict trade.[35]

Table 1. U.S. Pork Product Exports, by Type
(annual and three-year average, 2006-2008, and percentage share; $ millions)

HTS Category	2006	2007	2008	Avg. 2006-2008	% Share 2008	% Share 2006-2008
Live pigs	25	19	28	24	1%	1%
Fresh, chilled, frozen pork	2,222	2,488	3,789	2,833	84%	86%
Processed pork products	131	152	204	162	5%	5%
Offal and other products	186	211	481	293	11%	9%
Total	**2,564**	**2,870**	**4,503**	**3,312**	**100%**	**100%**

Source: Compiled by CRS using data from the U.S. International Trade Commission, http://dataweb.usitc.gov.

Notes: By U.S. Harmonized Tariff Schedule (HTS), includes live pigs (HTS 0103), fresh, chilled, and frozen pork (HTS 0203), processed pork products (HTS 1602.40), and offal and other pork products (HTS 0206.40, 0502). Imports for consumption (U.S. dollars). Nominal U.S. dollars.

[33] *Global Trade Atlas* data, 2006-2008.

[34] *CattleFax Update*, August 29, 2008.

[35] USMEF, "USMEF Export Issues—Influenza Update," May 4, 2009.

Table 2. U.S. Pork Product Exports, by Country
(annual and three-year average, 2006-2008, and percentage share; $ millions)

Country	2006	2007	2008	Average 2006-2008	% Share 2008	% Share 2006-2008
Japan	1,034	1,144	1,529	1,236	34%	37%
Mexico	429	363	574	455	13%	14%
Canada	388	452	516	452	11%	14%
Russia	145	182	402	243	9%	7%
Hong Kong	42	82	350	158	8%	5%
Korea	227	224	275	242	6%	7%
China[a]	47	138	271	152	6%	5%
Australia	52	71	95	73	2%	2%
Philippines	10	17	49	25	1%	1%
All Other	190	196	440	275	10%	8%
Total	**2,564**	**2,870**	**4,503**	**3,312**	**100%**	**100%**
Potential Loss[b]	**208**	**342**	**738**	**429**	**16%**	**13%**

Source: Compiled by CRS using data from the U.S. International Trade Commission, http://dataweb.usitc.gov.

Notes: By U.S. Harmonized Tariff Schedule (HTS), includes live pigs (HTS 0103), fresh, chilled and frozen pork (HTS 0203), processed pork products (HTS 1602.40), and offal and other pork products (HTS 0206.40, 0502). Imports for consumption (U.S. dollars). Nominal U.S. dollars.

a. China does not include Hong Kong.

b. "Potential Loss" based on reported U.S. exports from countries with import bans (see box).

What Are the International Obligations of Our Trading Partners?

Under WTO rules, health and safety measures applied to imports must be supported by scientific evidence. Administration officials and many in Congress are strongly urging all U.S. trading partners to base any food safety measures on scientific evidence and to act in accordance with their international obligations under the WTO, OIE guidelines, and WTO member obligations under the Sanitary and Phytosanitary (SPS) Agreement.[36]

Regarding 2009 H1N1, OEI—the global animal health standards organization—asserts that "the imposition of ban measures related to the import of pigs and pig products do [*sic*] not comply with international standards published by the OIE and all other competent standard setting international bodies for animal health and food safety."[37] Accordingly, it is argued, there currently is no justification for imposing trade measures against the import of pork and pork products based on 2009 H1N1.

[36] SPS measures refer to any of the laws, rules, standards, and procedures that governments employ to protect humans, other animals, and plants from diseases, pests, toxins, and other contaminants. See also CRS Report RL33472, *Sanitary and Phytosanitary (SPS) Concerns in Agricultural Trade*, by Geoffrey S. Becker.

[37] OIE, "OIE reaction to trade restrictions imposed following transmission of virus 'A/H1N1' from human to pigs," May 7, 2009, http://www.oie.int/eng/press/en_090507.htm.

What International Actions Are Being Taken?

As some countries continue to pursue trade restrictions on North American pork products, some affected exporting countries are considering formal trade actions within the WTO. The U.S. Trade Representative (USTR) is urging all U.S. trading partners to base any food safety measures on scientific evidence in accordance with their international obligations, and to remove trade restrictions. In a statement, USTR said that "restrictions on U.S. pork or pork products or any meat products from the United States resulting from the recent outbreak do not appear to be based on scientific evidence and may result in serious trade disruptions without cause"; USDA also has emphasized that "the science is clear that consuming or handling pork, consistent with safe handling practices, is of no risk to consumers."[38] Many in Congress also are urging U.S. trading partners to base these decisions on science, and therefore not to ban imports of U.S. pork.[39]

At a June 2009 meeting of the WTO's Committee on Sanitary and Phytosanitary Measures, which deals with trade-related aspects of food safety and animal and plant health, several exporting countries—Australia, Canada, the Dominican Republic, Mexico, Japan, and the United States—criticized WTO member countries that had imposed "unjustified" import bans on pork and pork products. Some countries with import restrictions—Ukraine, Indonesia, China, Jordan—claim these measures are temporary and either had been lifted or would be lifted once the "scientific evidence had been examined." China said it had to "act urgently" because of its "large vulnerable population, the burden on its public health system, the importance of pigs and pork, and the fact that the H1N1 virus shares some genetic make-up with influenza that affects pigs."[40]

On May 5, Mexico issued a statement asking its trading partners to "withdraw any restrictive measure imposed on Mexican products that is not consistent with the scientific information available and with their international obligation."[41] This was followed by other formal statements against import restrictions on pork products due to influenza H1N1 maintained by Armenia, Bahrain, China, Croatia, Gabon, Indonesia, Jordan, Thailand, and Ukraine.[42] Other reports indicate that Canada would consider bringing a WTO challenge to China's ban on imports of Canadian pork.[43] The European Union Standing Committee on the Food Chain and Animal Health also asserts that, based on the available evidence, trade restrictions are not justified.[44]

Many regard the trade bans and restrictions as politically motivated or intended to protect pork producers in their own countries. Russia, for example, is not competitive on the global market in

[38] USTR, "USTR and USDA Caution Trading Partners to Base Food Safety Measures on Science During Human Swine Influenza Outbreak," April 28, 2009; USTR, "H1N1 and Trade," June 2, 2009, http://www.ustr.gov/trade-topics/agriculture/h1n1-and-trade.

[39] See, for example, press releases from Senator Harkin, "Harkin Statement on the Safety of U.S. Pork," April 28, 2009, and "Harkin Calls on U.S. Trade Representative, Secretary of Agriculture, Secretary of State to Push for Lift of Bans on U.S. Pork," June 11, 2009; and public comments from Senator Grassley, "Transcription of Senator Grassley's Agriculture News Conference Call," July 21, 2009.

[40] See http://www.wto.org/english/news_e/news09_e/sps_25jun09_e.htm; and International Centre for Trade and Sustainable Development (ICTSD), "Pork Exporters Condemn 'Swine Flu' Import Bans," July 1, 2009.

[41] WTO, Committee on Sanitary and Phytosanitary Measures, "Information On Outbreaks of A/H1N1 Human Influenza Virus On Mexican Territory," Communication from Mexico, G/SPS/GEN/921, May 5, 2009.

[42] Ibid; see also WTO notifications G/SPS/N/CHN/116, G/SPS/N/JOR/20, G/SPS/N/UKR/2.

[43] "Mexico, Canada Condemn Bans on Pork Exports," *Bridges Weekly*, May 6, 2009.

[44] EC, "Statement of the Standing Committee on the Food Chain and Animal Health," May 5, 2009, http://ec.europa.eu/health/ph_threats/com/Influenza/docs/scfcah_statements.pdf.

red meats and poultry, and its domestic production has not kept pace with consumption as incomes rise, even though government policies have attempted to encourage domestic production. In recent years, imports have accounted for a growing share of Russian pork consumption, and reached more than 50% of supplies in 2008.[45] Russia periodically has imposed SPS measures that have impeded U.S. meat and poultry imports in recent years. In March 2002, Russia announced a ban on U.S. poultry imports over the possible presence of avian influenza in the United States. U.S. officials countered that the ban was not scientifically defensible and was discriminatory.[46] China is among the world's largest pork markets and producers, and imports account for a negligible share of overall supplies. However, imports have grown in recent years and are important to exporting nations such as the United States, given the sheer size of China's market.

The National Pork Producers Council (NPPC) has said it expects current restrictions on U.S. pork exports because of concerns about the H1N1 virus to be temporary, particularly as international authorities continue to emphasize that the virus is transmitted through human contact and not through pork consumption.[47] However, many producers are concerned that these initial trade restrictions will be difficult to remove, once fully instituted. For example, EU's livestock beef production has not returned to the level it maintained prior to the outbreak of bovine spongiform encephalopathy (BSE), commonly known as "mad cow disease." BSE also affected U.S. beef producers in 2003 when the first U.S. case was announced.[48] Russia was among the many countries to ban U.S. beef, although it not had been a major purchaser of such products.

Other U.S. Farm Sector Effects

How Have Other U.S. Agricultural Markets Been Affected by the Outbreak?

Initially, as domestic pork sales fell in response to the spread of the H1N1 flu, futures prices for corn, soybeans, and wheat declined sharply.[49] This was a result of concerns that lower pork demand and production could reduce demand for other commodities, including U.S. feed grains and protein meals (like soybeans), as well as other farm inputs. There were also fears that reduced demand for pork would have adverse ripple effects throughout the hog sector, resulting in production changes as producers respond to lower prices.[50] Analysts predicted that feed prices will likely continue to be volatile, but difficult to anticipate.[51] For example, grains prices have moved higher since their initial drop following early reports of the outbreak.[52] In other livestock markets, wholesale beef and cattle futures prices were initially higher following reports of the

[45] USDA, "Pork Summary Selected Countries," *Production, Supply and Distribution Online*.

[46] See CRS Report RS22948, *U.S.-Russia Meat and Poultry Trade Issues*, by Geoffrey S. Becker.

[47] NPPC, NPPC Expects Export Restrictions to be Temporary," *PigSite.com*, May 1, 2009.

[48] G. Blumenthal, "Influenza Trade Enforcement Needed," *World Perspectives, Inc. Daily Wire* April 29, 2009.

[49] University of Illinois Extension, "Crop markets react to swine flu," *Weekly Outlook*, April 27, 2009; and W. Cheng, "China, Indonesia Ban Pork From Mexico, U.S. on Flu," *Bloomberg.com*, April 27, 2009.

[50] For example, hog producers may choose to curtail planned farrowing and/or decrease their demand for weaned feeder pigs, or choose to liquidate/reduce herd sizes, if lower prices result in low/negative meat-to-feed profit margins.

[51] D. Good, "Crop Markets React To Swine Flu," *Weekly Outlook*, University of Illinois, April 27, 2009.

[52] "Grains rally after initial market reaction to "swine" flu," *Brownfield Network*, May 4, 2009.

outbreak.[53] The U.S. produce sector also expressed concerns about possible restrictions on fresh produce trade with Mexico and the processing of agricultural guest labor workers from Mexico because of the 2009 H1N1 outbreak, but these fears so far have not materialized.[54]

What Are the Estimated Aggregate Market Costs to the U.S. Agriculture Sector?

Initial reports of the aggregate economic effects of H1N1 on the farming sector—especially on U.S. hog producers—were grim. However, as time has passed and the general economic downturn in the U.S. hog industry has deepened, it has become difficult to separate out the economic effects of H1N1 from generally unfavorable market conditions in the U.S. hog sector.

Early estimates by analysts at the University of Missouri have estimated that the U.S. pork industry could see losses of up to $400 million in the next few months, given lower market prices.[55] In its May 2009 outlook report, USDA revised its second-quarter hog prices downward to reflect lower prices in April due to the negative effects of H1N1 flu virus.[56] In June 2009, USTR reported updated estimates by the University of Missouri, indicating that the U.S. pork industry could face losses of about $270 million in income in the second quarter of 2009 alone, based on market conditions in the first few days since the virus was identified.[57] More recent estimates, however, indicate that the economic effect of the H1N1 virus has not been as negative as some analysts had predicted.[58]

Pork producers in the United States began to see a downturn in U.S. pork markets back in late 2007. Following years of favorable returns in 2004-2006, the domestic industry began to expand and eventually pushed up slaughter rates to record levels in 2008. At the same time, pork prices started to decline while feed costs and other production input costs were rising. Starting in 2008, the worldwide economic downturn resulted in a decrease in meat demand.[59] The H1N1 outbreak compounded this already worsening situation, and newly imposed trade restrictions in U.S. export markets, particularly in Russia and China, only further strained demand for U.S. pork products. At the same time, despite industry efforts to downsize and reduce sow numbers, increased herd productivity and efficiency gains—given higher litter rates and also higher slaughter weights owing to favorable weather this summer—have kept overall production volumes stable and put downward pressure on prices.[60] In part because of the current surplus situation, in May 2008 and

[53] W. Cheng, "China, Indonesia Ban Pork From Mexico, U.S. on Flu," *Bloomberg.com*, April 27, 2009.

[54] T. Karst, "Swine flu raises concern about trade, H2-A program, *The Packer*, May 1, 2009; and subsequent postings on *The Packer* website (http://www.thepacker.com/)

[55] J. Perkins, "Hog industry to take huge hit from Influenza A," *Brownfield Network*, May 1, 2009.

[56] USDA, World Agricultural Supply and Demand Estimates, May 12, 2009; and USDA Economic Research Service, "Livestock, Dairy, and Poultry Outlook," LDP-M-181, July 17, 2009.

[57] USTR, "H1N1 and Trade," June 2, 2009, http://www.ustr.gov/trade-topics/agriculture/h1n1-and-trade.

[58] For example, see USMEF, "Pork, Beef Exports Weathering Influenza, Economic Crisis Fairly Well," July 13, 2009.

[59] For market information on the U.S. hog market prior to H1N1, see Ron Plain, "2009 Hog Market Outlook," University of Missouri, February 2009, http://web.missouri.edu/~plainr/PowerPoints/PowerPointindex.html. Other University of Missouri reports are at http://web.missouri.edu/~plainr/. Also see M. J. Crumb, "Feed costs, swine flu put small hog farms in peril," *Associated Press*, June 19, 2009.

[60] "Hog Cutbacks Seem Slow," *Cattle Buyers Weekly*, August 24, 2009; USDA Economic Research Service, "Livestock, Dairy, and Poultry Outlook," LDP-M-181, July 17, 2009; and CRS communication with Ron Plain, University of Missouri, September 3, 2009.

March 2009, USDA announced that it would purchase $50 million and $25 million, respectively, in pork products for federal food and nutrition assistance programs.[61]

Following the H1N1 outbreak, USDA predicted that prices would recover and did not alter its outlook for hog prices during the second half of 2009, based on expectations that market disruptions from trade restrictions and consumer concerns would be short-lived.[62] In mid-June, Smithfield Foods Company reported that, although it remains concerned about restrictions on international markets, the company believes that H1N1 had "only a short-term effect on U.S. fresh pork demand," with "no significant effect on the quarter" based on the company's consolidated income statement.[63] In August, representatives for Smithfield reiterated that quarterly returns would be favorable despite existing hog market conditions that are expected to persist until may 2010.[64] Still, for May 2009, USDA reported that pork exports were 36% below pork exports for May 2008.[65] Exports in June 2009 were down 31% compared to June 2008.[66] In July, USDA predicted pork prices would remain low through 2009.[67]

Overall, analysts predict that 2009 H1N1 will have less of an impact on the pork industry than BSE had on the beef industry in 2003 or avian influenza on the poultry industry in 2005-2006.[68] Analysts with World Perspectives, Inc., note that although pork prices have declined, supplies are also lower than last year, and it remains unclear whether pork sales have actually decreased.[69] In other markets, analysts at the University of Illinois highlight that "grains have had quite a rally in prices, after the market's initial 'knee-jerk' reaction," although pork prices continue to be lower.[70] Among meat packers, analysts predict that the trade restrictions will have less of an effect on larger diversified companies, such as Cargill Inc. and JBS S.A., but could affect single-product firms such as National Beef Packing Company and companies already operating under financial distress, such as Pilgrims Pride.[71]

What Type of Assistance Is the U.S. Pork Industry Seeking?

The ongoing economic crisis in the U.S. hog sector, coupled with potentially negative effects of the H1N1 virus, remains a concern to that sector.

[61] USDA, "Agriculture Secretary Vilsack Announces Support for Domestic Nutrition Programs, Ranchers and Farmers Assistance to Benefit Turkey, Pork, Lamb and Walnut Industries," Release No. 0079.09, March 31, 2009; and USDA news release dated May 1, 2008.

[62] USDA, World Agricultural Supply and Demand Estimates, May 12, 2009; and USDA Economic Research Service, "Livestock, Dairy, and Poultry Outlook," LDP-M-179, May 19, 2009.

[63] Smithfield Foods Company, "Smithfield Foods Reports Fourth Quarter and Full Year Results," June 16, 2009, http://www.smithfieldfoods.com/media/news.aspx.

[64] L. M. Keefe, "Smithfield's Pope has good, bad news for 2010," *Meatingplace Online*, August 27, 2009.

[65] USDA Economic Research Service, "Livestock, Dairy, and Poultry Outlook," LDP-M-181, July 17, 2009.

[66] USMEF, "Slump Continues for Beef, Pork Exports," August 13, 2009. USMEF reports that the export total in June 2008 was the second-highest single-month total in the history of U.S. pork sales.

[67] USDA Economic Research Service, "Livestock, Dairy, and Poultry Outlook," LDP-M-181, July 17, 2009.

[68] Keefe, L.M., "Pork recovery to take 'weeks,': Purdue economist," *Meatingplace Online*, May 1, 2009.

[69] Blumenthal, G., "Pork for Pork, Beef Deal," *World Perspectives, Inc. Daily Wire*, May 6, 2009.

[70] "Grains rally after initial market reaction to "swine" flu," *Brownfield Network*, May 4, 2009.

[71] Johnston, T., "H1N1 hurting protein companies' cash flow and credit profiles," *Meatingplace Online*, June 16, 2009.

In May 2009, NPPC sent a letter to USDA to request assistance for the U.S. pork industry to compensate for losses it says it has incurred since the 2009 H1N1 outbreak. Specifically, NPPC asked USDA to implement a purchase program for $50 million of pork products to help boost cash hog prices; to work with U.S. trading partners to remove all restrictions on exports of U.S. pork and pork products; to develop a comprehensive surveillance program for early detection of swine diseases; and to work to keep open the border between the United States and Canada to allow for movement of hogs.[72]

Again, in August, NPPC asked USDA for up to $250 million in support for USDA pork purchases and for other assistance.[73] Also in August, another group of producer organizations, including the Producers Livestock Marketing Association, the National Farmers Organization, and the Allied Producers Cooperative, asked USDA to consider a $200 million federally funded sow buy-out program to reduce pork supplies.[74]

In September 2009, USDA announced it would purchase another $30 million in pork products. Altogether, USDA claims it has purchased "approximately $151 million in pork products for food and nutrition assistance programs this year."[75]

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[72] NPPC, "NPPC Asks USDA to Help U.S. Pork Producers," May 1, 2009, http://www.nppc.org/News/DocumentPrint.aspx?DocumentID=24693.

[73] NPPC, "NPPC Asks USDA to Save Pork Industry," August 17, 2009, http://www.nppc.org/News/PressRelease.aspx?DocumentID=25252.

[74] "Pork groups urge for sow buy-out program," *PigProgress.net*, August 21, 2009, http://www.pigprogress.net/news/pork-groups-urge-for-sow-buy-out-program-id3316.html. The proposal would take as many as 500,000 sows out of production.

[75] USDA, "Agriculture Secretary Vilsack Announces Support for Domestic Nutrition Programs and Pork Producers," Release No. 0420.09, September 3, 2009, http://www.usda.gov. The purchases reflect both emergency surplus removals and entitlement program purchases for domestic food programs.