



Potential Trade Implications of Restrictions on Antimicrobial Use in Animal Production

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July 11, 2011

Congressional Research Service

7-5700

www.crs.gov

R41047

Summary

Exports of U.S. livestock and poultry products are important both to farmers and to the U.S. economy. In 2009, U.S. livestock and poultry exports were valued at more than \$10 billion, accounting for about 12% of total global meat trade (estimated at nearly \$87 billion in 2009).

Growing concerns about antimicrobial resistance have caused some U.S. trading partners and competitors to implement restrictions and prohibitions on the use of certain antimicrobials for subtherapeutic or nontherapeutic purposes in animal production. Although antibiotic use in animals has not been a significant factor affecting U.S. trade in meat products to date, evidence suggests that country restrictions on the use of these drugs could become an issue in the future and could affect U.S. export markets for livestock and poultry products.

At issue is whether increased restrictions and prohibitions on the use of certain drugs in animal feed in some countries, including the European Union (EU), New Zealand, and South Korea, could affect or may already be affecting international trade in livestock and poultry products from countries, such as the United States, that do not actively restrict the use of these drugs for growth promotion in animal production.

In the United States, legislation has been introduced that seeks to restrict the use of certain antimicrobial drugs for subtherapeutic or nontherapeutic purposes in food-producing animals. In the 112th Congress, the leading bills are the Preservation of Antibiotics for Medical Treatment Act of 2011 (PAMTA, H.R. 965, S. 1211). Most U.S. livestock and poultry producers are opposed to such restrictions because of concerns about animal welfare and food safety, as well as concerns about possible increases in production costs, among other reasons.

Presently, it is not possible to precisely predict or to provide a quantitative assessment of the potential trade implications of future restrictions on antimicrobial use in food animal production. Given the number of market variables that would need to be evaluated, along with other trade issues facing U.S. meat exporters in global markets, it is difficult to precisely predict trade implications of possible future restrictions on antimicrobials in animal feed in selected countries. However, it is possible to examine the range of possible outcomes from two scenarios involving potential trade implications for U.S. livestock and poultry exports from tightened restrictions or prohibitions on the use of antimicrobial drugs in animal feed for growth promotion:

- **Scenario 1:** Tightened restrictions or prohibitions in key U.S. export markets, *without* corresponding changes in the United States on the use of antimicrobials in animal feed for growth promotion.
- **Scenario 2:** Tightened restrictions or prohibitions in key U.S. export markets, *with* corresponding prohibitions in the United States on the use of antimicrobials in animal feed for growth promotion.

This report discusses the possible outcomes under these scenarios in terms of changes in U.S. livestock and poultry exports and changes in U.S. market share in global meat markets.

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Background

Exports of U.S. livestock and poultry products are important both to farmers and to the U.S. economy. In 2009, U.S. livestock and poultry exports were valued at more than \$10 billion, accounting for about 12% of total global meat trade (estimated at nearly \$87 billion in 2009).

In recent years, however, some countries have considered or implemented changes to their agricultural and trade policies that could potentially affect U.S. livestock and poultry exports. One such change pertains to the use of antimicrobial drugs in animal production systems. Some U.S. trading partners and competitors, such as the European Union (EU), New Zealand, and South Korea, have implemented restrictions on the importation of livestock and poultry products grown with antimicrobial drugs.

In the United States, legislation has been introduced that seeks to restrict the use of certain antimicrobial drugs for subtherapeutic or nontherapeutic purposes in food-producing animals. In the 112th Congress, the leading bills are the Preservation of Antibiotics for Medical Treatment Act of 2011 (PAMTA, H.R. 965; S. 1211). Most U.S. livestock and poultry producers are opposed to such restrictions because of concerns about animal welfare and food safety, as well as concerns about possible increases in production costs, among other reasons.

This report is organized into three parts. First, it provides an overview of U.S. export markets for livestock and poultry products, and highlights key U.S. foreign trading partners. Second, it discusses policies in selected foreign markets that may restrict or limit the use of antimicrobial drugs in food animal production, including imports of animal products grown with these drugs. Third, it discusses some implications of these policies for U.S. livestock and poultry exports to selected foreign markets.

Overview of Antimicrobial Use

Antimicrobials are used in food animal production as therapeutics (i.e., treatments), prophylactics (i.e., preventatives), and growth promoters.¹ The U.S. Department of Agriculture (USDA) reports that antimicrobial use in the U.S. livestock and poultry sectors is a common practice. Available data suggest that antimicrobials are used in most phases of swine and poultry production and that usage has been increasing. Approximately 25%-30% of small cattle feedlot operations and about 60%-70% of larger feedlots use or are exposed to antimicrobials, most frequently through in-feed additives at feedlot operations.²

In December 2010, the U.S. Food and Drug Administration (FDA) reported sales and distribution of all approved uses of all dosage forms (e.g., injectable, oral, medicated feed) of the identified classes of actively marketed drugs in food-producing animals for 2009.³ These data have been

¹ The term “antimicrobial” refers broadly to drugs that act against a variety of microorganisms including bacteria, viruses, fungi, and parasites. The term “antibiotic,” or “antibacterial,” refers to drugs used to treat infections caused by bacteria and other microorganisms and is used to describe both natural and synthetic products. Although “antibiotic” is more narrow, the two terms are often used interchangeably.

² Based on studies by USDA’s National Animal Health Monitoring System (NAHMS) between 1990 and 1997. USDA, Animal and Plant Health Inspection Service (APHIS), “Antimicrobial Resistance Issues in Animal Agriculture,” December 1999 (edited May 2007).

³ FDA, *2009 Summary Report on Antimicrobials Sold or Distributed for Use in Food-Producing Animals*, December (continued...)

widely cited as indicating that animal agriculture accounts for a large share of total use.⁴ Some industry groups, however, claim that FDA's estimate is overstated because, among other things, it includes ionophores, even though they claim that these drugs are not used in human medicine.⁵

When antimicrobials are used for therapeutic and prophylactic purposes, they help treat and prevent disease in exposed animals. When used at low levels in animal diets and feed for subtherapeutic (essentially nonmedical) purposes, antimicrobials help improve animal growth rates and feed efficiency, and also help reduce mortality and morbidity and may improve reproductive performance.⁶ Some studies show that higher growth rates from subtherapeutic antimicrobials have positively influenced producer incomes and resulted in higher per-animal net returns.⁷ Some studies suggest that large-scale confined animal operations are particularly dependent on the use of antimicrobial drugs in production.⁸

Growing scientific evidence shows, however, that certain bacteria are becoming increasingly resistant to these drugs, and that antimicrobial resistance may be transferred from animals to humans through the consumption or handling of meat that contains resistant bacteria.⁹ Public health experts also attribute such resistance to a number of other causes, such as overuse of antimicrobial drugs by medical professionals and their patients. Internationally, the issue of antimicrobial use in animal production and concerns about antimicrobial resistance continue to be actively reviewed by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) of the United Nations, as well as the World Organization for Animal Health (OIE).¹⁰ The United States is participating with other member countries in a Codex Alimentarius Commission Ad Hoc Intergovernmental Task Force on Antimicrobial Resistance aimed at helping to develop guidelines to assess human health risks associated with the presence of antimicrobial-resistant agents transmitted through food and feed.¹¹ WHO first published global principles for the containment of antimicrobial resistance in food-producing animals in 2000.¹²

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2010, <http://www.fda.gov/downloads/ForIndustry/UserFees/AnimalDrugUserFeeActADUFA/UCM231851.pdf>. Reported in kilograms of active ingredient. Also on FDA's website is "Questions and Answers Regarding FDA's 2009 Summary Report on Antimicrobials Sold or Distributed for Use in Food-Producing Animals."

⁴ Helena Bottemiller, "FDA Releases First Estimate on Antibiotics in Ag," *Food Safety News*, December 13, 2011.

⁵ See, for example, Liz Wagstrom, "NPPC Responds to Slaughter's Accusations about Antibiotics," *National Hog Farmer*, June 16, 2011.

⁶ Antibiotics added to the feed of food animals to enhance their growth rate and production performance may be referred to as "antimicrobial growth promoters" (AGPs).

⁷ S. Secchi and B. A. Babcock, "Pearls Before Swine? Potential Trade-offs Between the Human and Animal Use of Antibiotics," *American Journal of Agricultural Economics*, 84 (1279-1284), December 2002.

⁸ See, for example, USDA, "Antimicrobial Drug Use and Veterinary Costs in U.S. Livestock Production," AIB-766, May 2001.

⁹ Government Accountability Office (GAO), *Antibiotic Resistance: Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals*, GAO-04-490, April 2004; GAO, *Food Safety: The Agricultural Use of Antibiotics and Its Implications for Human Health*, GAO/RCED-99-74, April 1999; National Research Council, *The Use of Drugs in Food Animals: Benefits and Risks*, 1999; USDA, Economic Research Service, *International Trade and Food Safety: Economic Theory and Case Studies*, AER-828, 2003; and CRS Report R40739, *Antibiotic Use in Agriculture: Background and Legislation*.

¹⁰ For more background information and available reports, see WHO's website, "Antimicrobial Resistance," http://www.who.int/foodborne_disease/resistance/en/. OIE is the intergovernmental organization responsible for improving animal health worldwide, and is still known by its former French abbreviation (which stood for Office International des Épizooties).

¹¹ For information, see http://www.fsis.usda.gov/Codex_Alimentarius/Codex_Antimicro_Resist_Task_Force/index.asp. (continued...)

In the United States, legislation has been introduced in the last three Congresses seeking the phased elimination of nontherapeutic use in animals of “critical antimicrobial animal drugs” such as penicillin, tetracycline, macrolide, lincosamide, streptogramin, aminoglycoside, and sulfonamide, or other drugs that are used in humans to treat or prevent disease or infection. In the 112th Congress, the leading bills are the Preservation of Antibiotics for Medical Treatment Act of 2011 (PAMTA), introduced by Representative Slaughter (H.R. 965) and Senator Feinstein (S. 1211). Some federal agency officials have indicated support for restricting the nontherapeutic use of antimicrobials.¹³ Other possible policy options that might limit the use of these drugs for growth promotion include assessing user fees, imposing targeted bans, or limiting new antimicrobials for human use only, among other options.¹⁴

See CRS Report R40739, *Antibiotic Use in Agriculture: Background and Legislation*, for background information on other recent actions on this issue in the United States.

Aspects of Antimicrobial Use

An understanding of the available information on country restrictions is often complicated by a divergence of policy objectives. Three aspects of antimicrobial use are regulated by U.S. authorities, and may also be regulated by most U.S. trading partners. More specifically, policies on antimicrobials may include restrictions on:

1. The use of certain antimicrobial drugs in producing livestock and poultry for meat consumption. As reported by FDA, scientific studies demonstrate a relationship between the use of antimicrobials in food-producing animals, antibiotic resistance in humans, and adverse health consequences. Studies also demonstrate that antimicrobial resistance among feedborne bacteria may cause prolonged duration of illness, and increased rates of bacteremia, hospitalization, and death. In the United States, FDA regulates these drugs and approves conditions of their use.
2. Residues of antimicrobial drugs remaining in meat tissues, which may exceed allowable standards, tolerance levels, or maximum residue levels. In some cases, even trace amounts of these drugs in meat and poultry products may pose a public health hazard for consumers who are allergic, or for some drugs that have been shown to cause other severe illnesses in some consumers. This problem is different from the problem of antimicrobial resistance in foodborne pathogens that may be transmitted through the meat and poultry products. In the United States, FDA sets tolerances or allowance limits in meat, and USDA’s Food Safety and Inspection Service (FSIS) samples the products to assure compliance.

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The task force was established in 2006. Codex Alimentarius (“Codex”) is the international standards body for food safety.

¹² WHO, WHO Global Principles for the Containment of Antimicrobial Resistance in Animals Intended for Food, June 2000, http://whqlibdoc.who.int/hq/2000/WHO_CDS_CSR_APH_2000.4.pdf.

¹³ Joshua M. Sharfstein, FDA Principal Deputy Commissioner of Food and Drugs, July 13, 2009, testimony before the House Committee on Rules; and Linda Tollefson, FDA Assistant Commissioner for Science, June 28, 2008, testimony before the Senate Committee on Health, Education, Labor, and Pensions.

¹⁴ P. E. McNamara and G. Y. Miller, “Pigs, People, and Pathogens: A Social Welfare Framework for the Analysis of Animal Antibiotic Use Policy,” *American Journal of Agricultural Economics*, 84 (1293-1299), December 2002.

3. The use of certain antimicrobial washes and pathogen reduction treatments (PRTs) for treating meat during packing and processing of food products. These processes typically involve products that are used to treat animal carcasses by meat packers and processors, not drugs that are used in live animals. In the United States, products used in these processes are regulated by FSIS.

This report focuses on available information on country restrictions regarding the first topic, namely, the use of certain antibiotics in feed for growth promotion (subtherapeutic or nontherapeutic) purposes in food-producing animals.

Overview of U.S. Export Markets

World trade in livestock and poultry products totaled nearly \$87 billion in 2009, with the United States accounting for 12% (\$10.4 billion) of all global trade (**Table 1**).¹⁵ Within product categories, in 2009, the United States supplied 31% (\$3.8 billion) of all world trade in fresh, chilled and frozen poultry products; about 18% (\$2.6 billion) of all fresh, chilled and frozen beef products; and 17% (\$3.2 billion) of fresh, chilled and frozen pork products. The United States also supplied about 4% (\$0.6 billion) of all world trade in processed livestock and poultry products. These statistics are based on country compilations of total reported imports, as reported in the Global Trade Atlas, and do not always comport with other country statistics, such as reported U.S. export data compiled by the U.S. Census Bureau. Following is an overview of U.S. export markets for beef, pork, and poultry products, highlighting key U.S. foreign trading partners and recent market shares for these importing countries.

Table 1. Reported Global and U.S. Trade, Livestock and Poultry Products, 2009
(\$ billions)

HS Category	World Total	U.S. Total	U.S. Share
Live Bovine Animals (HS 102)	6.0	0.1	1.0%
Live Swine (HS 103)	3.3	0.0	0.3%
Live Poultry (HS 105)	1.6	0.2	11.1%
Fresh/Chilled, Beef (HS 0201)	18.4	1.7	9.2%
Frozen Beef (HS 202)	10.3	0.9	8.5%
Fresh/Chilled/Frozen, Pork (HS 203)	18.2	3.2	17.4%
Fresh/Chilled/Frozen, Poultry (HS 207)	12.4	3.8	31.0%
Processed Livestock and Poultry (HS 1602)	16.6	0.6	3.8%
Total	86.7	10.4	12.0%

Source: Compiled by CRS using Global Trade Atlas, <http://www.gtis.com/gta/>, "Reporting Total Import Statistics" (world total) and "Reporting Countries Export Statistics" (United States).

Notes: Data are by Harmonized System (HS) code. Excludes sheep and other farm animal products. Processed products include all processed livestock and poultry products, including offal and miscellaneous meat products.

¹⁵ Based on trade data reported by the Global Trade Atlas, <http://www.gtis.com/gta/>. Considerable differences frequently occur in the reported trade statistics across various databases, reflecting reporting differences between country export and import data, attributable in part to differences in product categories and to administrative issues.

U.S. Beef Export Markets

U.S. beef exports have been highly variable since 2000, primarily because of a significant decline in 2003-2004 due to concerns about U.S. cases of mad cow disease, among other trade issues.¹⁶ By 2008, U.S. beef exports had recovered somewhat and totaled nearly \$3 billion worldwide, according to official U.S. export data (**Table 2**). By volume, exports account for about 7% of total annual U.S. beef production.¹⁷ Fresh, chilled, and frozen beef accounts for the bulk of U.S. annual exports, comprising more than 90% of the total value of beef exports.¹⁸ Mexico and Canada are the leading importers of U.S. beef, receiving about two-thirds of annual U.S. exports (**Table 2**). Several Southeast Asian countries also are among the leading international markets for U.S. beef, including Japan, Korea, Taiwan, and Hong Kong, accounting for about 30% of all exports in 2008. Exports to the European Union (EU) nations total about 3% annually.

Table 2. U.S. Beef Export Value by Importing Country
(1998-2008 and average market share; \$ million)

Country	1998	2000	2002	2004	2006	2008	Avg. Share (2006-2008)
Mexico	467.5	592.6	659.7	372.3	780.4	881.4	36.8%
Canada	347.1	478.7	336.1	97.6	435.8	706.8	26.9%
Japan	1,285.6	1,461.5	833.8	1.0	62.9	350.5	9.8%
Korea	140.7	506.8	609.5	0.7	0.9	285.0	6.2%
Taiwan	28.0	53.0	49.6	0.0	101.2	127.6	5.2%
Vietnam	0.1	0.0	0.2	0.0	5.0	125.8	2.4%
Russia	9.9	86.5	14.4	0.4	0.0	65.3	1.0%
EU-27	29.2	25.6	9.7	11.9	16.7	105.7	2.5%
Hong Kong	34.2	51.8	57.4	0.2	13.8	40.0	1.4%
Saudi Arabia	6.8	2.4	5.5	5.1	16.3	27.7	1.0%
All Other	96.6	97.8	116.3	66.0	106.8	201.2	6.9%
Total	2,445.7	3,356.7	2,692.2	555.2	1,539.8	2,917.0	100.0%

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

Notes: EU-27 refers to the European Union (EU) nations. By U.S. Harmonized Tariff Schedule (HTS), includes live cattle (HTS 0102), fresh, chilled and frozen beef (HTS 0201 and 0202), and processed products (HTS 1602.50). Excludes offal and other products. Imports for consumption (U.S. dollars). Nominal U.S. dollars.

¹⁶ See CRS Report RS22345, *BSE ("Mad Cow Disease"): A Brief Overview*, and CRS Report RL34528, *U.S.-South Korea Beef Dispute: Issues and Status*.

¹⁷ USDA's Production, Supply and Distribution Online, <http://www.fas.usda.gov/psdonline/psdHome.aspx>. Data for beef and veal based on carcass weight equivalent (2008-2009).

¹⁸ Based on trade data reported by the USITC, <http://dataweb.usitc.gov>. Fresh, chilled, and frozen beef (HTS 0201 and 0202) as a share of total, including live cattle (HTS 0102) and processed products (HTS 1602.50).

U.S. Pork Export Markets

U.S. pork exports have seen sharp, steady growth in the past decade, increasing from less than \$1 billion in 1998 to nearly \$4 billion in 2008, according to official U.S. export data (**Table 3**). By volume, exports account for about 20% of total annual U.S. pork production.¹⁹ Fresh, chilled, and frozen pork products account for the bulk of U.S. annual exports, comprising more than 90% of the total value of pork exports.²⁰ Japan is the leading importer of U.S. pork products, accounting for nearly 40% of all exports annually (**Table 3**). Several other Southeast Asian countries also are among the leading international markets for U.S. pork, including Hong Kong, Korea, China, the Philippines, and Taiwan, accounting for another 20% of all exports in 2008. Mexico and Canada account for about one-fourth of annual exports. Exports to the EU-27 nations total about 3% annually.

Table 3. U.S. Pork Export Value by Importing Country
(1998-2008 and average market share; \$ million)

Country	1998	2000	2002	2004	2006	2008	Avg. Share (2006-2008)
Japan	554.1	664.3	726.5	875.4	918.2	1,447.4	38.7%
Canada	86.9	99.6	136.5	230.9	365.1	506.7	15.0%
Mexico	90.0	141.2	150.6	330.6	334.7	435.6	11.9%
Russia	70.7	81.5	19.0	33.1	136.4	328.0	7.2%
Hong Kong	24.3	20.4	12.4	14.5	26.0	260.3	4.0%
Korea	15.7	27.0	28.3	47.4	211.4	239.1	7.5%
China	6.5	5.2	9.4	21.5	31.7	238.4	4.3%
EU-27	36.5	8.9	18.3	30.2	51.2	130.7	2.7%
Australia	5.2	3.6	5.7	6.9	51.4	90.3	2.4%
Philippines	7.9	4.5	1.7	6.2	7.9	45.6	0.8%
Taiwan	13.9	33.5	21.4	46.7	28.6	37.8	1.0%
All Other	33.6	32.7	36.9	41.3	93.0	206.10	4.8%
Total	945.4	1,122.2	1,166.5	1,684.6	2,255.8	3,965.9	100.0%

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

Notes: EU-27 refers to the European Union (EU) nations. By U.S. Harmonized Tariff Schedule (HTS), includes live pigs (HTS 0103), fresh, chilled and frozen pork (HTS 0203), and processed products (HTS 1602.40). Excludes offal and other products. Imports for consumption (U.S. dollars). Nominal U.S. dollars.

¹⁹ USDA's Production, Supply and Distribution Online, <http://www.fas.usda.gov/psdonline/psdHome.aspx>. Data for pork based on carcass weight equivalent (2008-2009).

²⁰ Based on trade data reported by the USITC, <http://dataweb.usitc.gov>. Fresh, chilled and frozen pork (HTS 0203) as a share of total, including live swine (HTS 0103) and processed products (HTS 1602.40).

U.S. Poultry Export Markets

According to official U.S. export data, U.S. poultry exports more than doubled in the past decade, increasing from \$2.3 billion in 1998 to \$4.6 billion in 2008 (**Table 4**). By volume, exports account for about 20% of total annual U.S. broiler meat production, and about 10% of U.S. turkey meat production.²¹ Fresh, chilled, and frozen poultry meats account for the bulk of U.S. annual exports, comprising more than 90% of the total value of poultry exports.²² Russia is the leading importer of U.S. poultry products, accounting for about 20% of annual exports, with Ukraine importing another 3% (**Table 4**). Several Southeast Asian countries also are among the leading international markets for U.S. poultry, including China, Hong Kong, and Taiwan, accounting for about 20% of all exports. Mexico and Canada account for another one-fourth of exports. Exports to the EU-27 nations total less than 4% annually.

Table 4. U.S. Poultry Export Value by Importing Country
(1998-2008 and average market share, \$ million)

Poultry	1998	2000	2002	2004	2006	2008	Avg. Share (2006-2008)
Russia	521.2	352.6	372.9	535.4	461.8	823.5	18.9%
China	42.8	49.0	57.0	17.1	324.9	745.1	15.4%
Mexico	236.1	254.7	176.0	323.0	447.3	554.4	13.7%
Canada	263.2	269.1	290.9	354.7	344.0	462.3	11.5%
Ukraine	4.8	0.5	1.3	86.7	49.7	193.1	3.0%
Hong Kong	361.0	377.8	254.4	137.3	77.7	139.8	2.7%
EU-27	239.8	163.8	96.2	141.6	125.3	139.1	3.7%
Cuba	0.0	0.0	21.5	58.6	44.7	136.0	2.4%
Angola	6.2	13.0	23.7	28.9	53.4	109.2	2.1%
Taiwan	9.4	22.4	25.9	47.0	68.7	83.0	2.0%
All Other	570.4	548.8	496.7	549.1	588.7	1,220.3	25.2%
Total	2,254.9	2,051.7	1,816.5	2,279.4	2,586.2	4,605.8	100.0%

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

Notes: EU-27 refers to the European Union (EU) nations. By U.S. Harmonized Tariff Schedule (HTS), includes live birds (HTS 0105), fresh, chilled and frozen poultry (HTS 0207), and processed poultry products (HTS 1602.30). Excludes offal and other products. Imports for consumption (U.S. dollars). Nominal U.S. dollars.

²¹ USDA's Production, Supply and Distribution Online, <http://www.fas.usda.gov/psdonline/psdHome.aspx>.

²² Based on trade data reported by the USITC, <http://dataweb.usitc.gov>. Fresh, chilled and frozen poultry (HTS 0207) as a share of total, including live birds (HTS 0105) and processed products (HTS 1602.30).

Policies in Selected Countries

Growing concerns about antimicrobial resistance have caused some U.S. trading partners and competitors, including the EU, New Zealand, and South Korea, to implement restrictions and prohibitions on the use of certain antimicrobials for subtherapeutic or nontherapeutic purposes in animal production.

As noted in the first section of this report, various aspects of antimicrobial use may complicate an understanding of the available information on country restrictions and policy objectives. These include (1) the use of certain antimicrobial drugs in producing livestock and poultry for meat consumption; (2) residues of antimicrobial drugs remaining in meat tissues, which may exceed allowable standards, tolerance levels, or maximum residue levels; and (3) the use of certain antimicrobial washes and pathogen reduction treatments (PRTs) for treating meat during packing and processing of food products. This report focuses on country restrictions on the use of certain antibiotics in feed for growth promotion purposes (subtherapeutic or nontherapeutic) in food-producing animals.

The United States has had a long-standing trade dispute with the EU regarding PRTs since the EU first banned the use of antimicrobial rinses or PRTs on poultry, effectively shutting out U.S. poultry exports. In the United States, such treatments are approved by the federal government and are routinely used in U.S. chicken and turkey plants. In a separate example, in 2008 and 2009, Russia has refused imports of meat products from several European countries and from several U.S. plants—including plants owned by Tyson Foods Inc. and a unit of Smithfield Foods—because trace amounts of tetracycline and oxytetracycline were found in some of the pork tested.²³ These examples are different types of scenarios involving policies regarding antimicrobials and antibiotics in food animal production, and involve different sets of policy issues.

In June 2011, a forum of multinational consumer organizations—the so-called Trans Atlantic Consumer Dialogue (TACD)—approved a resolution calling on countries to ban the non-therapeutic use of antibiotics in food animals, among other recommendations.²⁴

Country Comparisons

The United States and many of its key trading partners and competitors differ in their use and regulation of antimicrobials in food animal production. As highlighted in a 2004 report by the U.S. Government Accountability Office (GAO),²⁵ the areas of difference include (1) the specific drugs that can be used for growth promotion and (2) the availability of these drugs to producers (by prescription or over the counter).²⁶ Such differences complicate a straightforward comparison

²³ See, for example, “Russia Bans Five U.S. Pork Plants on Antibiotic Findings,” *Meatingplace online*, December 10, 2009, and “Russia Bars Pork Imports from 70 EU Companies,” *Pig Progress.net*, June 26, 2008.

²⁴ Trans Atlantic Consumer Dialogue (TACD), “Resolution on Antimicrobials in Animal and Food Production DOC No. FOOD 32-11, June 2011, http://www.foodsafetynews.com/tacd_amr_resolution_-_final%5B1%5D.pdf. Also see Gretchen Goetz, “World Coalition Demands Less Antibiotics on Farms,” *Food Safety News*, June 30, 2011.

²⁵ GAO, *Antibiotic Resistance: Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals*, GAO-04-490, April 2004, <http://www.gao.gov/new.items/d04490.pdf>.

²⁶ *Ibid.*, “Appendix IV: Information on Selected Countries’ Activities to Address Animal-Related Antibiotic (continued...)”

of policies regarding the use of these drugs in food animals between the United States and its key trading partners and competitors. **Table 5** provides a summary of the policies regarding antimicrobial use in animal feed for selected countries. Since GAO conducted its summary in 2004, other available updated information for some countries became available as follows:

- **European Union.** The EU prohibits the use of antibiotics for growth promotion in animal production. The EU's effort is part of its overall strategy to address the emergence of bacteria and other microbes resistant to antimicrobials, due to their perceived overexploitation or misuse, by phasing out these drugs for non-medicinal purposes.²⁷ This action was part of a broader EU regulation²⁸ on the use of additives in animal nutrition that established rules for the authorization, marketing, and labeling of feed additives. The regulation covers several feed additive categories, including technological, sensory, nutritional, and zootechnical additives, as well as the use of certain anti-parasitic drugs. In June 2001, the EU prohibited all but four antibiotics used for growth promotion; prohibition of the remaining four products went into effect as of January 1, 2006.²⁹ In 2011, the EU passed a resolution that, among other things, calls on EU member states to “ensure a better control over the implementation of the ban (2006) on antimicrobials being used as growth promoters,” and to “work towards an international ban on antimicrobials as growth promoters in animal feed, and to bring this matter up in its bilateral negotiations with third countries such as the United States.”³⁰
- **New Zealand.** New Zealand claims that its “regulatory control of antimicrobials remains one of the most stringent in the world” and that its prohibitions are effectively similar to the EU's in the extent to which antibiotic use is regulated.³¹ All antibiotics must be registered and approved for use by the New Zealand Food Safety Authority (NZFSA) and cannot be used unless there is a veterinary prescription (except for those antibiotics not relevant to the resistance problem). Registrations specify the veterinarians' responsibilities to ensure that they prescribe these drugs in a prudent manner, and only approved traders are allowed

(...continued)

Resistance” Major U.S. trading partners include Canada, China, Hong Kong, Japan, Mexico, Russia, and South Korea; selected competitors include the EU, Australia, Brazil, and New Zealand.

²⁷ EU Commission press release, “Ban on Antibiotics as Growth Promoters in Animal Feed Enters into Effect,” IP/05/1687, December 22, 2005, <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/05/1687>.

²⁸ Regulation (EC) No 1831/2003 of the European Parliament and of the Council of 22 September 2003 on additives for use in animal nutrition, http://eur-lex.europa.eu/LexUriServ/site/en/oj/2003/l_268/l_26820031018en00290043.pdf. Detailed rules are in Regulation (EC) No 429/2008, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:133:0001:0065:EN:PDF>.

²⁹ Includes monensin sodium, salinomycin sodium, avilamycin, flavophospholipol. See EU Commission press releases, “Ban on Antibiotics as Growth Promoters in Animal Feed Enters into Effect,” IP/05/1687, December 22, 2005, and “Question and Answers on Antibiotics in Feed,” MEMO/02/66, March 25, 2002, <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/02/66>. <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/05/1687>. For more information, see USDA's Foreign Agricultural Service website, “Feed and Feed Additives,” <http://www.fas.usda.gov/posthome/useu/feed.html>.

³⁰ European Parliament, European Parliament resolution of 12 May 2011 on antibiotic resistance, P7_TA-PROV(2011)0238, B7-0295/2011, May 12, 2011.

³¹ New Zealand Food Safety Authority (NZFSA), “FAQ—Antibiotic Resistance and Food,” http://www.nzfsa.govt.nz/acvm/topics/antibiotic-resistance/abrfaqs.htm#P98_14032.

to sell these drugs to ensure that access to them is effectively limited by the prescription condition. These products may not be promoted or advertised to the public. Further action on New Zealand's restrictions and registration process is proceeding, and more updated information is available at the NZFSA website.³²

- **South Korea.** In 2008, reports indicated that Korea's Ministry for Food, Agriculture, Forestry, and Fisheries (MIFAFF) was tightening restrictions on the use of antibiotics in animal feed. USDA reported that Korea would phase down the number of allowable drugs as a way to reduce their overall use in compound feed that are premixed during production.³³ In July 2010, MIFAFF published its notice banning the "addition of antibiotics in animal feed ... to strengthen the safety management of domestic livestock products," prohibiting the use of "eight antibiotics (enramycin, tyrosine, virginiamycin, bacitracin methylene disalicylate, bambermycin, tiamulin, apramycin and avilamycin) and one antimicrobial agent (sulfathiazole) in animal feed as feed additives," effective in the "latter half of 2011."³⁴ Korea notified World Trade Organization (WTO) members of its intention in August 2010 since, as stated in its notification, this could affect Korea's trade in "animal feed."³⁵ These policies followed other legislation enacted in 2007 regarding Korea's requirements for labeling meat products as "antibiotic free" or "organic."³⁶
- **Other Southeast Asian Countries.** Other media reports indicate that similar bans might have been enacted or are being considered in several other Southeast Asian countries, including Singapore, Japan, Thailand, Taiwan, and Malaysia.³⁷ Whether or not such restrictions have actually been implemented is difficult to confirm. Direct comparisons with prohibitions in the EU and New Zealand are not straightforward.
- **South American Countries.** Some U.S. meat export competitors, such as Argentina, Brazil, and Uruguay, likely do not use many antimicrobials in food-producing animals, given that these countries raise livestock that are mostly rangeland- or grass-fed.
- **Other Countries.** Several countries such as the United States,³⁸ Canada,³⁹ and Australia⁴⁰ continue to review and monitor antimicrobial use in food animals.

³² NZFSA, "Antibiotic Resistance and In-Feed Use of Antibiotics in New Zealand," <http://www.nzfsa.govt.nz/acvm/topics/antibiotic-resistance/>.

³³ USDA, Foreign Agriculture Service, "Republic of Korea, Livestock and Products Annual 2008," GAIN Report KS8054, October 20, 2008, <http://www.fas.usda.gov/gainfiles/200810/146296154.pdf>. USDA reported that the number of allowable antibiotics would be phased down from 25 types in 2008 to 18 types in 2009 and then to 9 types in 2011.

³⁴ MIFAFF, "Scope of and Standards for Hazardous Feed," Notice #2010-298, July 23, 2010. Also see WTO, Committee on Sanitary and Phytosanitary Measures notification, G/SPS/N/KOR/366, August 6, 2010.

³⁵ *Ibid.* Korea's WTO notification did not reference other possible effects under "Products covered."

³⁶ USDA, Foreign Agriculture Service, "Korea, Republic of Livestock and Products Semi-Annual 2008," GAIN Report KS8011, February 29, 2008, <http://www.fas.usda.gov/gainfiles/200803/146293843.pdf>. Refers to Korea's 2007 law, the Environmentally Friendly Promotion Act (EFPA).

³⁷ "Malaysia's Sunzen leads fight against antibiotic-tainted meat," *The Malaysian Insider*, June 9, 2009. CRS contacted researchers at Chulalongkorn University in Thailand for more information, but did not receive a reply.

³⁸ See, for example, Joshua M. Sharfstein, FDA Principal Deputy Commissioner of Food and Drugs, July 13, 2009, testimony before the House Committee on Rules, and Linda Tollefson, FDA Assistant Commissioner for Science, June 28, 2008, testimony before the Senate Committee on Health, Education, Labor, and Pensions.

As discussed in its report, GAO had difficulty obtaining information comparing policies across countries, given the limited availability and varying responses from these countries, reporting errors and other administrative issues, and an inability to independently verify this information, among other concerns.⁴¹ Because of these difficulties, GAO's report did not claim to provide a definitive and comprehensive summary across all selected countries on policies regarding antibiotics in animal feed. Limited additional information is available on how policies regarding antimicrobial use in animal feed may have changed since the GAO completed its report. Discussions with key staff that work on these issues at the U.S. Meat Export Federation (USMEF)⁴² and the USDA's Foreign Agricultural Service (FAS)⁴³ confirmed that neither USMEF nor USDA regularly compiles consolidated and readily available information on country policies regarding antimicrobial use in feed. Additional country surveys were not conducted, given time constraints and the types of procedural difficulties in obtaining and verifying information on such policies for selected countries.

Potential Trade Implications for U.S. Exports

In its 2004 report, GAO addressed the question of whether restrictions on antimicrobial use in food animals had affected U.S. trade and whether such policies might become an issue in the future. GAO stated that, according to officials of USDA's FAS, the Office of the U.S. Trade Representative, the USMEF, and the U.S. Poultry and Egg Export Council, "antibiotic resistance associated with use in animals has not been a significant factor affecting U.S. trade in meat products."⁴⁴ GAO concluded, however, that there was evidence that country restrictions on the use of these drugs could become an issue in the future and could affect U.S. export markets for livestock and poultry products.

At issue is whether increased restrictions and prohibition on the use of certain drugs in animal feed in some countries, including the EU, New Zealand, and South Korea, could affect or may already be affecting international trade in livestock and poultry products from countries, such as the United States, that do not actively restrict the use of these drugs for growth promotion in animal production.

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³⁹ See, for example, Health Canada, "Antimicrobial Resistance (AMR) Frequently Asked Questions," http://www.hc-sc.gc.ca/dhp-mps/vet/faq/faq_amr-ram-eng.php#a13.

⁴⁰ Australian Government, "Pilot Survey for Antimicrobial Resistant (AMR) Bacteria in Australian Food," <http://www.health.gov.au/internet/main/publishing.nsf/Content/foodsecretariat-amr-qa>. Also see <http://www.foodstandards.gov.au/foodmatters/antibioticsandfood.cfm>.

⁴¹ GAO, *Antibiotic Resistance: Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals*, GAO-04-490, April 2004, <http://www.gao.gov/new.items/d04490.pdf>. See discussion on pages 10 and 59.

⁴² CRS communication with USMEF staff, November 9, 2009.

⁴³ CRS communication with USDA Foreign Agricultural Service (FAS) staff, November 11 and December 7, 2009. FAS staff also checked available information on food safety portals at FAO and OIE.

⁴⁴ GAO, *Antibiotic Resistance: Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals*, GAO-04-490, April 2004, <http://www.gao.gov/new.items/d04490.pdf>.

Table 5. Selected Country Policies on Antimicrobial Use in Animal Production

Country	Overview of Policies
Australia	Allows use in feed of some drug classes that are important in human medicine, but is reviewing its policies for approved uses. Establishing a comprehensive surveillance system. Limited information is available on its data collection system.
Brazil	Limited information suggests that Brazil does not currently restrict the use of these drugs in feed. Information is not available to determine if Brazil has surveillance and data collection systems in place.
Canada	Allows use in feed of some drug classes that are important in human medicine, but is reviewing its policies for approved uses. Establishing a comprehensive surveillance and data collection system.
China	Limited information on current activities, as well as information on existing surveillance and data collection systems.
European Union	Prohibits use of antibiotics in feed for growth promotion. Most EU Members have established surveillance and data collection systems. In 2011, the EU passed a resolution calling on its Member States to “ensure a better control over the implementation of the ban (2006) on antimicrobials being used as growth promoters,” and to “work towards an international ban on antimicrobials as growth promoters in animal feed,” and to bring this matter up in its bilateral negotiations with other countries such as the United States.
Hong Kong	Limited information on current activities, as well as information on existing surveillance and data collection systems.
Japan	Some unconfirmed media reports indicate that Japan has increased or is considering increasing restrictions on antimicrobial use in food animal production, while other reports indicate it is continuing its review. Has established surveillance and data collection systems.
Mexico	Limited information suggests that Mexico does not currently restrict the use of these drugs in feed. Limited information also suggests that Mexico is developing a surveillance and data collection system.
New Zealand	Prohibits use of antibiotics in feed for growth promotion. Has established surveillance and data collection systems.
South Korea	Effective in 2011, prohibits “eight antibiotics (enramycin, tyrosine, virginiamycin, bacitracin methylene disalicylate, bambarmycin, tiamulin, apramycin and avilamycin) and one antimicrobial agent (sulfathiazole) in animal feed as feed additives,” effective in 2011. Limited information is available on its surveillance and data collection systems.
Thailand	Some unconfirmed reports indicate that Thailand has increased or is considering increasing restrictions on antimicrobial use in food animal production. Information is not available on its surveillance and data collection systems.
United States	Allows use in feed of some drug classes that are important in human medicine, but is reviewing its policies for approved uses. Has established surveillance and data collection systems.

Source: Compiled by CRS using available updated country information and information from GAO’s 2004 report, *Antibiotic Resistance: Federal Agencies Need to Better Focus Efforts to Address Risk to Humans from Antibiotic Use in Animals* (Appendix IV: Information on Selected Countries’ Activities to Address Animal-Related Antibiotic Resistance), GAO-04-490, April 2004, <http://www.gao.gov/new.items/d04490.pdf>.

Notes: Appendix IV of the GAO study provides information for selected countries, including (1) an overview of activities, (2) antibiotic-resistance surveillance systems, and (3) antibiotic use data collection systems.

At this time, it is not possible to provide a quantitative assessment of the potential trade implications of future restrictions on antimicrobial use in food animal production, for reasons outlined in the following sections. Instead, following is a discussion of two possible scenarios for the potential trade implications on U.S. livestock and poultry exports of tightened restrictions or prohibitions on the use of antimicrobial drugs in animal feed for growth promotion:

- **Scenario 1:** Tightened restrictions or prohibitions in key U.S. export markets, *without* corresponding changes in the United States on the use of antimicrobials in animal feed for growth promotion.
- **Scenario 2:** Tightened restrictions or prohibitions in key U.S. export markets, *with* corresponding prohibitions in the United States on the use of antimicrobials in animal feed for growth promotion, which might increase meat exports from the United States.

Scenario 1: Global Restrictions *without* U.S. Restrictions

This scenario discusses possible tightened restrictions or prohibitions in key U.S. export markets on use of antimicrobials in animal feed for growth promotion *without* corresponding changes in the United States. Such a scenario could result in lower U.S. meat exports and reduced U.S. market share in global markets, if U.S. producers continue to regularly use these drugs in animal feed.

Possibility of a Reduction in U.S. Exports

At present, few key U.S. export markets have imposed such restrictions. The EU and New Zealand have the tightest restrictions on antimicrobial drug use in food animal production, which also affects countries wishing to export into these markets. However, these countries are meat export market competitors with the United States and receive only a small part of U.S. annual meat exports. Total meat exports to the EU range from about 3%-4% of all U.S. beef, pork, and poultry exports annually, suggesting that industry-led quality assurance efforts regarding antimicrobials still allow for U.S. meat exports to some EU markets. Although South Korea (a major importer of U.S. beef) and other markets either have initiated or are considering actions to restrict antimicrobial drug use in feed, an assessment of future trade trends is complicated for any number of reasons, as will be discussed.

In U.S. beef markets, the top five export markets in 2008 were Mexico, Canada, Japan, Korea, and Taiwan, accounting for about 80% of all exports (**Table 2**). Among these countries, Korea (with about 10% of annual exports) is phasing in restrictions over the next few years to 2011 regarding antimicrobial use in feed for growth promotion. In U.S. pork and poultry export markets, none of the top five export markets in 2008 are confirmed as having restrictions in place or as actively considering prohibitions on antimicrobial use in feed for growth promotion. The top five U.S. pork export markets were Japan, Canada, Mexico, Russia, and Hong Kong, accounting for about 75% of all exports (**Table 3**); the top five U.S. poultry export markets were Russia, China, Mexico, Canada, and the Ukraine, accounting for about 60% of all exports (**Table 4**).

Canada is reportedly reviewing its policies regarding use, and there are unconfirmed media reports that some other countries, such as Japan and Taiwan, might also be considering similar restrictions. At this time, however, such restrictions have not yet been initiated in these countries.

Given myriad technical and administrative issues regarding U.S. meat trade, it is difficult to generalize about what future restrictions on these drugs in feed might mean for U.S. meat exports. For example, comments submitted by the U.S. Meat Export Federation (USMEF) to the U.S.

Trade Representative regarding various international sanitary and phytosanitary (SPS)⁴⁵ and technical trade barriers highlight the wide-ranging types of issues facing U.S. meat exporters in global markets. Among these are growing consumer concerns in markets such as Japan, South Korea, and Taiwan about certain U.S. production practices, including the use of antimicrobial drugs in U.S. livestock and poultry animals but also including other practices such as the use of growth promoting hormones,⁴⁶ feeding genetically modified organisms to livestock, cloning, animal welfare, and the impact of livestock production on the environment.⁴⁷ Other priority trade issues involve problems of market access due to various other types of restrictions, including concerns about bovine spongiform encephalopathy (BSE, or mad cow disease),⁴⁸ biotechnology,⁴⁹ antimicrobial washes,⁵⁰ other feed additives, drug residues in meat tissue, labeling requirements, animal traceability, the H1N1 influenza virus,⁵¹ and various other food safety issues. Each of these issues is highlighted and outlined as part of USMEF's public comments.⁵²

With respect to South Korea, there is still uncertainty about whether future U.S. meat exports will be affected by its recently enacted restrictions. Korea's restrictions do not prohibit use of all antibiotics (presumably, Korea would still allow for the use of other animal drugs). Also, it is not clear whether meat imports to Korea from other countries that allow for the use of the prohibited animal drugs in production will be affected; other U.S.-Korea trade issues may take precedence over the issue of antimicrobial drug use in feed.⁵³ As previously noted, Korea's notification to the WTO claimed that its policy change could affect Korea's trade in "animal feed," and did not mention trade in meat products.⁵⁴ Media reports differ in terms of the extent of Korea's recent policy changes.⁵⁵ Based on 2008 trade data, Korea accounted for about 6% of U.S. beef exports and 8% of U.S. pork exports (**Table 2** and **Table 3**).

One possible scenario is that certain higher-income Asian countries, such as Japan and Taiwan, may choose to follow South Korea and impose similar restrictions on antibiotic use in food animal production. These countries tend to have consumers that place a high value on premium quality, often higher-priced meats, including niche markets such as antibiotic-free meat products. Consumers in these markets also tend to have heightened sensitivities to food safety concerns and other related issues. In such a case, absent changes in the U.S. meat market that would restrict the use of antimicrobial drugs in food animal production, it is possible that the United States could

⁴⁵ See also CRS Report RL33472, *Sanitary and Phytosanitary (SPS) Concerns in Agricultural Trade*.

⁴⁶ See also CRS Report R40449, *The U.S.-EU Beef Hormone Dispute*.

⁴⁷ Comments submitted to the U.S. Trade Representative from Philip Seng, U.S. Meat Export Federation, "Request for Public Comments to Compile the National Trade Estimate Report on Foreign Trade Barriers and Reports on Sanitary and Phytosanitary and Standards-Related Foreign Trade Barriers," Docket USTR-2009-0031.

⁴⁸ See also CRS Report RL32199, *Bovine Spongiform Encephalopathy (BSE, or "Mad Cow Disease"): Current and Proposed Safeguards*; and CRS Report RL34528, *U.S.-South Korea Beef Dispute: Issues and Status*.

⁴⁹ See also CRS Report RS21556, *Agricultural Biotechnology: The U.S.-EU Dispute*.

⁵⁰ See also CRS Report R40199, *U.S.-EU Poultry Dispute*.

⁵¹ See also CRS Report R40575, *Potential Farm Sector Effects of 2009 H1N1 "Swine Flu": Questions and Answers*.

⁵² Comments submitted to the U.S. Trade Representative from Philip Seng, U.S. Meat Export Federation, "Request for Public Comments to Compile the National Trade Estimate Report on Foreign Trade Barriers and Reports on Sanitary and Phytosanitary and Standards-Related Foreign Trade Barriers," Docket USTR-2009-0031.

⁵³ For more information, see CRS Report RL34528, *U.S.-South Korea Beef Dispute: Issues and Status*.

⁵⁴ WTO, Committee on Sanitary and Phytosanitary Measures notification, G/SPS/N/KOR/366, August 6, 2010. Korea's WTO notification did not reference other possible effects under "Products covered."

⁵⁵ See, for example, Richard Smith, "South Korea to ban use of antibiotics in feed," *Meatingplace.com*, June 6, 2011; and Dan Flynn, "South Korea bans antibiotics in animal feed," *Food Safety News*, June 7, 2011.

lose its export markets to these countries. Based on 2008 trade data, these three markets—Korea, Japan, and Taiwan—account for a sizable combined share of total annual U.S. beef and pork exports, comprising 26% (\$0.8 billion) of annual U.S. beef exports and 43% (\$1.7 billion) of U.S. pork exports in 2008 (**Table 2** and **Table 3**).

In other markets, the United States has already encountered trade restrictions with regard to other types of antimicrobial-related trade issues in its poultry trade. In Russia, imports of meat products from the United States and from several European countries have been periodically denied because trace amounts of tetracycline and oxytetracycline were found in some of the pork tested. In 2010 Russia, the leading export market for U.S. poultry products (with 18% of exports in 2008), implemented a ban on poultry treated with chlorine rinses.⁵⁶ Similarly, in the EU, U.S. poultry exports are currently being restricted because the EU is prohibiting the use of antimicrobial rinses or pathogen reduction treatments (PRTs) on poultry, effectively shutting out U.S. poultry exports.⁵⁷

Possibility of a Reduction in U.S. Global Market Shares

At present, two of the United States' key meat competitors—the EU and New Zealand—have imposed restrictions on their own domestic industries regarding the use of antimicrobials in feed for growth promotion, which also affects countries wishing to export into these markets. Although other U.S. major export competitors, such as Brazil, Argentina, Uruguay, and Australia, currently do not have similar restrictions in place, these countries generally grow animals that are rangeland- or grass-fed. These animals may be less exposed to antimicrobials, compared to other countries where the majority of animals raised may be regularly exposed through in-feed additives at feedlot operations.

Under such a scenario, this might suggest that some U.S. export competitors, such as the EU and other major net-exporting countries, may be better poised to capture a larger share of world meat export markets. As noted, current production practices and regulatory regimes in some of these markets make these net-exporting countries already better able to supply antibiotic-free meats to markets demanding such products, irrespective of any future policies or prohibitions that might be enacted. However, some U.S. competitor markets may likely face certain capacity and production constraints, and have limited opportunity to increase production to meet growing global demand. Most export competitors have only a small share of the global meat export market, such as Australia (about 5% of world exports in 2008), Argentina (less than 2%), and New Zealand and Uruguay (each with about 1% of exports).⁵⁸ Brazil accounted for about 10% of global livestock and poultry exports in 2008. The EU accounted for well over one-half of all global exports in 2008; however, it faces a sizable domestic market, similar to the United States. The United States accounted for 12% of global livestock and poultry exports (**Table 1**). Relative export per-unit price differences among these countries is also a factor. In general, U.S. meat exports tend to be price-competitive compared to some competitors.⁵⁹

⁵⁶ See CRS Report RS22948, *U.S.-Russia Meat and Poultry Trade Issues*.

⁵⁷ For more information, see CRS Report R40199, *U.S.-EU Poultry Dispute*.

⁵⁸ Global Trade Atlas data, "Reporting Total Import Statistics."

⁵⁹ As shown by comparing aggregate per-unit import values for U.S. product, based on import data reported by Global Trade Atlas data. Per-unit prices compare reported total value with total volume traded for aggregated products listed in **Table 1**.

Scenario 2: Global Restrictions *with* U.S. Restrictions

This scenario discusses possible tightened restrictions or prohibitions in key U.S. export markets on use of antimicrobials in animal feed for growth promotion, with corresponding changes in the United States. It is unclear whether such a scenario would result in opportunities for U.S. meat exports in global markets, or whether U.S. restrictions would adversely affect overall meat production in the United States.

Possibility of Export Opportunities for U.S. Products

Some might speculate that should the United States restrict or prohibit the use of antimicrobials in animal feed for growth promotion, U.S. meat exports might increase, given general expectations that consumer demand for antibiotic-free meats is growing. One possible model for this scenario is the Non-Hormone-Treated Cattle (NHTC) Program, which was established to address EU prohibitions against imports of U.S. beef that are produced with growth hormones. Under this program, USDA's Food Safety and Inspection Service (FSIS) certifies the processes and procedures in place for meats produced without the use of growth hormones, which are commonly used in the United States. Any U.S.-exported beef to the EU is accompanied by both a health certificate and a certificate of authenticity issued by USDA. Initially, few U.S. plants participated in this program or were approved for export to the EU, and the volume of U.S. beef exports were low and often well below the allowable quota limit set by the European Union.⁶⁰ Over time, however, some larger facilities have been approved and U.S. export volumes have been higher, approaching or possibly exceeding the quota limit, and there is renewed interest in increasing U.S. market access under the quota.⁶¹

Nevertheless, despite recent increases in exports of U.S. hormone-free beef, total U.S. beef exports are still much lower than traded levels prior to the enactment of the EU's ban. The U.S. beef industry claims that, absent the EU's hormone ban, U.S. beef exports to the European Union would be much greater.⁶²

Regarding antimicrobial use, the U.S. livestock and poultry industries have initiated a number of producer-driven quality assurance programs that address administration of these drugs and their proper use, handling, and application. These programs include:⁶³

- **American Association of Avian Pathologists (AAAP).** "Statement on Use of Antibiotic Feed Additives by the Poultry Industry" (www.aaap.info) and "Guidelines to Judicious Therapeutic Use of Antimicrobials in Poultry" (http://www.avma.org/issues/policy/jtua_poultry.asp).

⁶⁰ USDA, FAS, EU-25 Livestock and Products, "U.S. Beef Faces Strong Competition on the European Market," *GAIN Report* E35178, Sept. 8, 2005, <http://www.fas.usda.gov/gainfiles/200509/146130828.pdf>.

⁶¹ "U.S., EU Look to Resolve Beef Fight by Increasing Hormone-free TRQ," *Inside U.S. Trade*, October 13, 2006.

⁶² For more information, see CRS Report R40449, *The U.S.-EU Beef Hormone Dispute*.

⁶³ Letter to Melody Barnes, Assistant to the President for Domestic Policy, from a coalition of 20 organizations related to animal agriculture, August 19, 2009. Letter posted at Pig Progress.net, <http://www.pigprogress.net/article-database/us-feed-industry-letter-on-antibiotics-id941.html>. These organizations assert that these programs are similar to voluntary advisory programs in place by the American Medical Association (AMA) and the American Academy of Pediatrics (AAP).

- **National Pork Board (NPB) and National Pork Producers Council (NPPC).** “Take Care—Use Antibiotics Responsibly” (<http://www.pork.org>); Pork Quality Assurance Plus (<http://www.pork.org/Producers/PQA/PQAPlusEdBook.pdf>).
- **National Cattlemen’s Beef Association (NCBA).** Beef Quality Assurance Program (BQA) and Producers’ Guide for Judicious Use of Antibiotics (<http://www.beef.org> and <http://www.beefboard.org>).
- **American Feed Industry Association (AFIA).** Safe Feed/Safe Food Certification Program (<http://www.afia.org>).
- **National Grain & Feed Association (NGFA).** Model Feed Quality Assurance Program (<http://www.ngfa.org>).

The availability of such programs could help to hasten a transition to antimicrobial-free meat production in the United States, in the event that the United States or some of its key export markets were to restrict or prohibit the use of antimicrobial drugs in feed for growth promotion. At this time, the United States does not have an export verification program specific to these drugs.⁶⁴

Possibility of Adverse Production Effects for U.S. Products

It is important to keep in mind the principal reasons why livestock and poultry growers in the United States and elsewhere use low levels of these drugs in animal diets and feed: this practice helps improve animal growth rates and feed efficiency, and also helps reduce mortality and morbidity and improve reproductive performance. Improved growth rates and feed efficiency translate into important cost savings for most growers, which in turn positively influences producer incomes and per-animal net returns. Prohibiting the use of these drugs for growth promotion purposes use would likely carry cost implications for growers, raising overall production costs possibly beyond what growers may be willing to accept and still remain in business. This could potentially lower U.S. meat production and reduce supplies available for export. Alternatively, U.S. prices might increase relative to those of competitors and remove any price advantage U.S. meat exporters might have currently, which could also erode U.S. export market share.

Furthermore, under a scenario whereby the United States produces and exports antibiotic-free meat, overall traded product volumes would likely be very low compared to current volumes without such restrictions, at least initially (as is the case with hormone-free meat exports to the EU under the NHTC Program). Rather than raise U.S. meat exports, this could, alternatively, initially decrease overall U.S. meat exports and erode overall U.S. export market share in world markets. There is general uncertainty about how the United States would respond to a worldwide ban on the use of these drugs in animal feed for growth promotion, since this would depend largely on the ability of U.S. producers to adapt and transition effectively in response to global or domestic market conditions and consumer demand. In fact, the NHTC Program example might provide a poor model for predicting what might happen in global meat markets under a worldwide ban, since this program addresses U.S.-EU bilateral trade only, which still allows for the United States to ship conventional beef products elsewhere in the world.

⁶⁴ CRS communication with USMEF, December 7, 2009.

Considerations for Congress

Although the potential trade flow outcomes of changes to import policies among key U.S. trading partners and export competitors regarding antimicrobial use cannot be precisely quantified or predicted, what seems clear is that existing and future policy changes in some countries could carry important implications for U.S. meat trade. Overall, policy changes restricting U.S. livestock and poultry trade could result in adverse effects on U.S. poultry and livestock producers and exporters, either with or without similar policy changes restricting use of these drugs.

A number of bills were introduced in the 111th Congress aimed at curtailing agricultural uses of medically significant antibiotics, but none was enacted. These included bills introduced in the House and Senate on March 17, 2009, as H.R. 1549 by Representative Slaughter and S. 619 by Senator Reid (for Senator Kennedy). These bills, the Preservation of Antibiotics for Medical Treatment Act of 2009 (PAMTA), were similar in title and purpose to bills introduced but not enacted in the 110th Congress (H.R. 962, S. 549), the 109th Congress (H.R. 2562, S. 742), the 108th Congress (H.R. 2932, S. 1460), and the 107th Congress (H.R. 3804, S. 2508). Top officials of the U.S. Food and Drug Administration (FDA) have weighed in on the debate by expressing support in concept for phasing out nontherapeutic (essentially, nonmedical) uses of antimicrobials in food animal production.⁶⁵ For more information, see CRS Report R40739, *Antibiotic Use in Agriculture: Background and Legislation*.

Industry groups generally oppose these bills because of concerns about animal welfare and food safety, as well as concerns about possible increases in production costs, among other reasons.⁶⁶ Some, including Chairman Peterson of the House Agriculture Committee, also continue to question whether the scientific evidence supports the claim that a reduction in antibiotic use in animal agriculture results in public health benefits.⁶⁷ Lawmakers with important poultry and meat industry constituents are likely to monitor import policy changes regarding antimicrobial use among U.S. trading partners and competitors, as well as legislative proposals suggesting similar policy changes in the United States.

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⁶⁵ See, for example, Joshua M. Sharfstein, FDA Principal Deputy Commissioner of Food and Drugs, July 13, 2009, testimony before the House Committee on Rules; and Linda Tollefson, FDA Assistant Commissioner for Science, June 28, 2008, testimony before the Senate Committee on Health, Education, Labor, and Pensions.

⁶⁶ See, for example, a letter from a coalition of 20 animal agriculture organizations to Melody Barnes, Assistant to the President for Domestic Policy, August 19, 2009. Letter posted at Pig Progress.net, <http://www.pigprogress.net/article-database/us-feed-industry-letter-on-antibiotics-id941.html>.

⁶⁷ Ibid; also “Denmark’s Ban Holds Lessons,” *Feedstuffs*, January 4, 2010.