Proposed Initiatives from the USDA Antimicrobial Resistance Action Plan

In December 2014, the U.S. Department of Agriculture (USDA) released an Antimicrobial Resistance Action Plan to guide future activities related to antimicrobial resistance (AMR). The Action Plan outlines USDA's current activities and proposes a comprehensive, integrated approach for future activities that includes surveillance; research and development; and education, extension, and outreach. This info sheet briefly describes initiatives proposed in the USDA's Antimicrobial Resistance Action Plan that the USDA's Animal and Plant Health Inspection Service's (APHIS) National Animal Health Monitoring System (NAHMS) might be involved in and provides a tentative timetable for implementing the proposed initiatives.

Background

Antimicrobial resistance is one of the most serious threats to the health of animals and humans worldwide. As such, everyone has a shared responsibility to limit the impact of AMR. Antimicrobial resistance is a multifaceted issue that requires a One Health[1] approach, which recognizes that the health of animals and humans is irrevocably linked and closely connected to the environment.

The USDA is not the lead regulatory agency with respect to antibiotic use and AMR. It does, however, play an important role in addressing the challenges presented by AMR by developing partnerships with stakeholders and via the missions of several of its key agencies.[2] In addition, the USDA possesses in-depth knowledge of the management practices and technologies associated with animal health, welfare, productivity, and food safety. As such, the USDA is uniquely positioned to contribute to the body of scientific knowledge about AMR and the role of antimicrobial use and other factors that play a part in the health of livestock.

For nearly two decades, the USDA has actively conducted surveillance, basic and applied research, and education and outreach programs related to AMR. Through these efforts, effective mitigation strategies for AMR were developed, and animal producers were advised on how to implement these strategies. The USDA's AMR activities have made important contributions to better understanding the role of animal management in AMR and to reducing its development and spread of AMR. Considerable work remains, however, and there is a growing sense of urgency throughout the world to address the AMR issue.

Proposed initiatives

The Action Plan proposes several initiatives that would enable USDA to address recognized knowledge gaps in AMR and develop effective, practical mitigation strategies to help prolong the effectiveness of antibiotics for animals and humans. The USDA proposes to obtain and disseminate science-based, actionable, information about antibiotic use and resistance and relate this information to livestock management practices. To achieve the greatest impact, the proposed initiatives would build upon existing activities and be integrated across USDA agencies. Since all of these proposed activities are voluntary, collaborations with stakeholders and producers will be established to leverage expertise and resources in the most efficient and effective ways.

The USDA wants to ensure that stakeholders have an opportunity to review the components of its AMR Action Plan and provide feedback before moving forward with the proposed AMR initiatives in the plan. Accordingly, the remainder of this info sheet offers a brief synopsis of initiatives proposed in the Action Plan and a timetable for implementing the initiatives in which USDA, APHIS might be involved.

[1] The One Health Initiative is a movement to forge co-equal, all inclusive collaborations between physicians, osteopaths, veterinarians, dentists, nurses, and other scientific-health and environmentally related disciplines, including the American Medical Association, American Veterinary Medical Association, American Academy of Pediatrics, American Nurses Association, American Association of Public Health Physicians, the American Society of Tropical Medicine and Hygiene, the Centers for Disease Control and Prevention (CDC), the United States Department of Agriculture (USDA), and the U.S. National Environmental Health Association (NEHA). Additionally, more than 800 prominent scientists, physicians, and veterinarians worldwide have endorsed the initiative.

[2] Agricultural Research Service (ARS), APHIS, Economic Research Service (ERS), Food Safety and Inspection Service (FSIS), the National Agricultural Statistics Service (NASS), the National Institute of Food and Agriculture (NIFA), as well as other agencies.

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Study type	Proposed initiative	Primary purpose	Description	Strengths	Weaknesses
Longitudinal studies	On-farm longitudinal studies	Assess relationships between antibiotic use (and other factors) and the development of resistance in zoonotic pathogens and commensals on farms.	Studies of this type would entail collecting antibiotic-use data and biological samples from feedlots, broiler/turkey operations, and swine operations that volunteer to participate over time (expanding to other commodities eventually). Operations could submit data/samples multiple times per year. *Salmonella, Campylobacter, Enterococcus*, and *E. coli* isolated from samples collected on-farm could be tested for AMR.	These studies can assess relationships between antibiotic use, AMR patterns, and management practices on farms over time. Data would be protected from Freedom of Information Act (FOIA) requests.	Due to cost limitations, the number of operations would likely be insufficient to provide national or regional population estimates.
	Collation of AMR data from veterinary diagnostic laboratories	Monitor AMR profiles in animal pathogens.	Veterinary diagnostic laboratories perform AMR testing on samples from clinically ill animals, but these data are rarely collated and reported across multiple labs. A centralized database would allow for collating AMR data across labs. These data could help monitor the continued usefulness of antibiotics against animal pathogens.	These data could help inform producers' and veterinarians' when making treatment decisions.	These data would represent sick animals, sometimes ones that have already been treated with antibiotics.
National cross-sectional studies	Annual Antibiotic Use Survey	Provide annual national estimates of antibiotic use in feed or water for feedlot cattle, broilers, swine, and, potentially, turkeys.	Questions could be added to existing and proposed NASS surveys. Participation would be voluntary, and data would be protected from FOIA. This could allow for monitoring trends in antibiotic use for feedlot cattle, broilers, swine, and, potentially, turkeys. This could also provide one metric to assess changes in antibiotic-use practices before and after finalization of the Food and Drug Administration (FDA) Guidance for Industry (GFI) #213 and the Veterinary Feed Directive (VFD).	National annual estimates of antibiotic use in feed or water in livestock and poultry are currently unavailable in the U.S. National estimates are needed to assess effects of FDA policy changes.	Estimates would likely be limited in terms of providing percent of animals treated and percent of operations using products, not total kg used or animal daily doses.
	Enhancements to ERS surveys	Assess effects of FDA GFI #213 and VFD Rule on costs, productivity, and production practices.	Questions could be added to ERS Agricultural Resource Management Surveys (ARMS) to investigate the impact of losing medically important antibiotics for growth promotion on outputs and production costs at the farm level.	Could allow economic impacts at the farm level of FDA-GFI #213 to be assessed.	This information would likely be limited to swine and broilers.
	Analysis of Retrospective Data from Past NAHMS Studies	Provide more in-depth analyses of NAHMS data already collected.	Additional analyses could be done on existing NAHMS data. For example, antibiotic-use practices could be broken out by percentage of operations using antibiotics that will be affected by FDA-GFI #213.	More fully utilize existing data to meet current information needs.	NAHMS lacks personnel to perform this analysis.
	Enhancements to NAHMS studies	Provide national estimates of antibiotic-use practices on various types of U.S. livestock and poultry operations.	Questions could be added to NAHMS surveys to provide additional information on antibiotic-use practices In addition, a sufficient number of operations could be sampled and tested for the presence of zoonotic pathogens (e.g., *Salmonella, Campylobacter*) and commensals (e.g., *Enterococcus, E. coli*) to provide national, population-based estimates on prevalence and antimicrobial resistance in these organisms.	NAHMS studies provide national, population-based estimates from survey data.	NAHMS studies are conducted every 5-7 years for each commodity. NAHMS studies do not collect information on quantities of antibiotics used.
Targeted studies	As-needed epidemiological investigations	Enable the investigation of clusters of AMR pathogens identified through NAHMS studies or FSIS sampling.	USDA could collaborate with producers, slaughter plants, and public health officials to conduct voluntary on-farm and/or in-plant biological sampling and complete surveys regarding antimicrobial-use and management practices to determine the source of pathogens and identify mitigation strategies.	There is currently no mechanism within the USDA for conducting as-needed investigations into clusters of AMR pathogens.	Would be a nonregulatory activity performed at the request of producers and slaughter plants.
	Focused NAHMS studies	Provide an opportunity to conduct limited-scope NAHMS studies outside of its planned study rotation.	NAHMS studies are typically conducted every 5-7 years for each major U.S. livestock species. These proposed limited-scope studies could focus on specific, critical issues related to AMR or antibiotic use for the commodity of interest, before the next scheduled NAHMS study.	These limited-scope NAHMS studies would provide timely national estimates without placing an undue burden on respondents.	Resources and costs would be similar to NAHMS studies but would not provide the same breadth of information.
Proprietary data	This was not a proposed initiative in the USDA AMR Action Plan	Serve as an alternative source of data on national estimates of antibiotic use in livestock and poultry operations.	For large companies raising feedlot cattle, poultry, or swine, acquiring proprietary data (e.g., export from databases) may be an easier method of obtaining data on antibiotic use than using a questionnaire. This could complement NASS surveys for smaller operations to obtain national estimates of antibiotic use in feed for feedlot cattle, broilers, swine, and, potentially, turkeys.	Data would remain confidential and protected from FOIA requests due to NAHMS statistical unit status within USDA.	Not all companies may want to share proprietary data, even with the assurance of protection from FOIA requests.

Timetable for Proposed Initiatives from the USDA's Antimicrobial Resistance Action Plan

Study type	Proposed initiative	Phase	CY2015				CY2016				CY2017			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Longitudinal studies	On-farm longitudinal studies	Design		X	X									
		Office of Management and Budget (OMB)*			X	X	X	X						
		Data collection						X	X	X	X	X	X	X
		Analysis							X	X	X	X	X	X
		Reporting								X		X		X
	Collation of AMR data from veterinary diagnostic laboratories	Stakeholder discussions		X	X	X								
		Design			X	X	X							
		Data collection					X	X	X	X	X	X	X	X
		Analysis						X	X	X	X	X	X	X
		Reporting								X		X		X
National cross-sectional studies	Annual Antibiotic Use Survey (Including Proprietary Data)	Design	X	X										
		OMB*		X	X	X	X							
		Data collection					X			X	X			X
		Analysis					X	X			X			
		Reporting						X	X			X	X	
	ERS Surveys	Design		X	X	X								
		OMB*		X	X	X	X							
		Data collection					X	X						
		Analysis						X	X	X				
		Reporting									X	X		
	Analysis of Retrospective Data from Past NAHMS Studies	Analysis		X	X	X	X							
		Reporting			X	X	X	X						
	Enhancements to NAHMS studies: Equine 2015	Data collection		X	X	X								
		Analysis			X	X	X	X						
		Reporting					X	X	X	X				
	Enhancements to NAHMS studies: Beef (stockers) 2017	Info needs assessment			X	X								
		Design			X	X	X	X	X					
		OMB*							X	X	X	X		
		Implementation											X	X
		Analysis												
		Reporting												
Targeted studies	As-needed epidemiological investigations	Stakeholder discussions			X	X	X	X						
		Design, data/sample collection, analysis, reporting (short-term, not national, no OMB package)												
	Focused NAHMS Studies (performed annually)	Design				X	X							
		OMB*					X	X	X	X	X			
		Implementation									X	X		
		Analysis											X	X
		Reporting												
Proprietary data	This was not a proposed initiative in the USDA AMR Action Plan	Stakeholder discussions			X	X	X	X						

*Includes preparation of the OMB package as well as analysis and approval of the package by OMB. Data collection cannot begin until after OMB approval. At least 11 months are needed after submission of the OMB package to obtain OMB approval.

X=Work will occur during this quarter, depending on resources.

References

U.S. Department of Agriculture (USDA), 2014. Antimicrobial Resistance Action Plan. Retrieved from http://www.usda.gov/documents/usda-antimicrobial-resistance-action-plan.pdf

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