REPORT TO NIAA

SCIENCE AND DATA

"HOW MIGHT SCIENTIFIC ADVANCES AND MORE COMPLETE DATA HELP ACHIEVE OUR SHARED GOALS"

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Shared Goals

Better understanding of how antibiotic uses relate to resistance.

Demonstrate agriculture participants are good stewards of antibiotics.

Mitigate risks to human and animal health.

Sustain and benefit the food chain, feed the world.

Participate in global agenda, scoring well on “core indicators”.

Good public policy.
- Policies based on complete and correct information
- Scientific analysis

Knowledge is a deadly friend
When no one sets the rules.
The fate of all mankind I see
Is in the hands of fools.

*Epitah, King Crimson*
Antibiotic Use

Sometimes it is necessary to use antibiotics.

When, Why, Which one and in What dose should I administer antibiotics?

Veterinarians know stewardship is an ethical consideration guided by critical understanding of all aspects of the affected biome. Veterinarians need the data to make decisions.

Use antibiotics when necessary, but not when resistance is augmented and goals are not achieved.

- Use cannot be justified as a convenience or conditioned behavior/cognitive bias.

Data can determine if the desired result is achieved. Analysis of data can support judicious use decisions.
Health of the Food Chain

AMR should convince us that more investment is needed in agriculture.

Animal health and productivity are technical goals.

There are associated marginal cost abatement concerns related to AMR.

Measures of effective intervention should assure allocative efficiency of the economic system is considered.

AMR affects marketability.

AMR and global development goals are linked. (SGD)
Applying Science

We are in the midst of a revolution in medicine made possible by technology.

- Whole genome sequencing is a “microscope” that enables scientific observation, while computer analysis of data provides levels of understanding information never before realized.

The character of the microbiota/pathogen can be revealed to us.
Alternatives to Antibiotics

“Alternatives to antibiotics are broadly defined as any substance that can be substituted for drugs that are increasingly becoming ineffective against pathogenic bacteria, viruses or parasites.”

Provide the benefits of antibiotics without the risk of undesired resistance in pathogens or the biome.

- Probiotics
- CRISPR-Cas9
- Phytochemicals
- Genetic variation
- Gut peptides
- Vaccination
- Hormesis

Do some antibiotics have all the attributes that we desire of alternatives to antibiotics?


[www.ars.usda.gov/alternativestoantibiotics]
Confidentiality protections attempt to mitigate risk of attribution get in the way. Liability concerns prevent us from gathering information that would be useful to guide action.

The threat of attribution drives whole genome sequencing out of the NAHMS biological sample collection planning.

So long as we address confidentiality as the issue, we are losing opportunity.

Can we avoid the risk?
  ◦ If risks are not avoidable, everyone should share responsibility.
National Animal Health Monitoring Systems is a National Reference Repository

To access reports from previous NAHMS national studies or information on upcoming studies, visit the NAHMS Website at http://nahms.aphis.usda.gov.

Numerous citations in scientific literature each year, offers opportunity for hypothesis generation

Benchmarks progress and practices in animal agriculture production sectors, allows examination of trends.
Veterinary Accreditation
State and Federal Cooperation

The “VCPR”

The VCPR is defined in different ways by States laws, Federal agencies, and by the American Veterinary Medical Association in AVMA policy, *Principles of Veterinary Medical Ethics*

Accredited veterinarians act as agents of APHIS and under State authorities for health certification

Module 23 – Use of Antibiotics in Animals

Module 29 – Veterinary Feed Directive
Laboratory Information and Services

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National Veterinary Services Laboratories
APHIS laboratory services are provided by the National Veterinary Services Laboratories (NVSL) in Ames, Iowa and Orient Point (Plum Island), New York. The NVSL provides a wide variety of information and services, centered around diagnosis of domestic and foreign animal diseases, support of disease control and eradication programs, reagents for diagnostic testing, training, and laboratory certification.

NVSL Submission Forms
This section contains downloadable laboratory-related forms.

Diagnostic Testing
Authorized individuals may submit specimens to the NVSL facilities for diagnostic testing. This section describes the types of tests performed at the NVSL and provides instructions for submitting samples. Includes statement regarding ownership of specimens.

Reagents and Proficiency Tests
Diagnostic reagents are produced by the National Veterinary Services Laboratories as needed when a commercial source of reagent is not available or when commercial sources are not fulfilling diagnostic needs. This section contains a list of available reagents, including proficiency tests, and instructions for ordering.

Frequently Asked Questions About Testing and Reagents

Approved Laboratories
Some diagnostic testing may be conducted by APHIS-approved state, federal, or private laboratories. This section includes lists of laboratories currently approved by APHIS to conduct specific tests.

Diagnostic Training
The NVSL provides a variety of courses on diagnostic testing, specimen collection, and disease recognition. This section describes courses and instructions to register for a course.

National Animal Health Laboratory Network (NAHLN)
The NAHLN is part of a nationwide strategy to coordinate the work of all organizations providing veterinary surveillance and testing services.
International Cooperation and Coordination

World Organization for Animal Health (OIE)
- Chief Veterinary Officer (CVO) serves as USA delegate to the World Organization for Animal Health (OIE)
  - The US has a Senior Leader in that role.
  - Harmonization with the Terrestrial Code, AMR issues

GHSA
-APHIS is USDA’s representative voice
- G7

Veterinary International Conference on Harmonization (VICH) Guidance Documents
- Center for Veterinary Biologics is active
  - the VICH process works to establish harmonized, common technical requirements for veterinary medicinal products active
“I guess everything does change, except what we choose to recall...”

*My Favorite Memory,*
Merle Haggard

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https://www.aphis.usda.gov/aphis/ourfocus/animalhealth