



Food and Agriculture
Organization of the
United Nations

FMM/RAS/298: Strengthening capacities, policies and national action plans on
prudent and responsible use of antimicrobials in fisheries Final Workshop
in cooperation with AVA Singapore and INFOFISH

12-14 December, Concorde Hotel, Singapore

NAP on AMR: Singapore

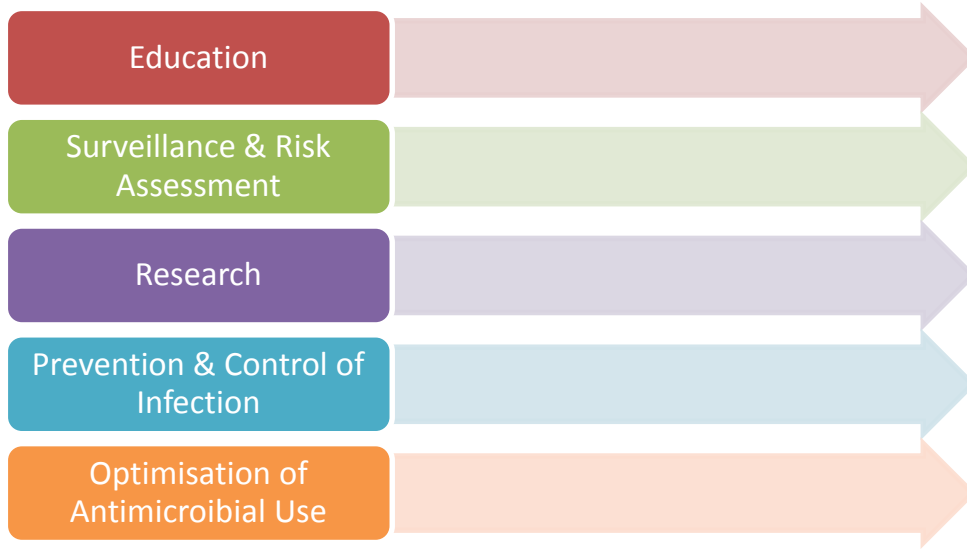
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NATIONAL STRATEGIC ACTION PLAN ON AMR

5 Core Strategies in line with the Global Action Plan



Aim of National Plan:

To reduce the emergence and prevent the spread of drug-resistant organisms

Global Plan objective :

To ensure, for as long as possible, continuity of the ability to treat and prevent infectious diseases

Agri-Food & Veterinary Authority (AVA)

Ministry of Health (MOH)

National Environment Agency (NEA)

PUB, Singapore's National Water Agency



Education

Surveillance &
Risk Assessment

Research

Prevention &
Control of
Infection

Optimisation of
Antimicrobial Use

One Health

- Coordinate national strategy for improving awareness and understanding of AMR
- Reinforce food safety and hygiene practices

Public

- Activities organized to commemorate World Antibiotic Awareness Week
- Social hygiene and vaccination promotion campaigns

Professionals

- AMR included in education curricula of veterinary tertiary colleges recognised by Singapore
- Regular activities to raise AMR awareness to vets & farmers

Industry

- Schemes to encourage good animal husbandry practices and biosecurity
- Messages on proper waste disposal in national campaigns
- Education efforts to promote prudent use of antimicrobials in animals and emphasize infection control

Ongoing

Priority areas
for further action

- AMR awareness campaigns

- Continuing education and new postgraduate training programmes for healthcare and veterinary professionals
- Increase awareness among veterinary sector stakeholders



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Antimicrobial Use

One Health

- Integrate surveillance for AMR and antimicrobial utilization across sectors
- Establish a national coordinating body
- Publication and reporting

Human

Animal

Food

Environment

- AMR surveillance and antimicrobial utilization in hospitals
- All public hospital labs and NPHL have AMR detection capability

- Antimicrobial sales and utilization is monitored
- Major livestock pathogens of public health significance are monitored, and AMR profiles are determined

- Food products routinely tested for antibiotic residues, foodborne pathogens especially resistant types

- Baseline surveys are ongoing

- Harmonise lab methods and data reporting
- Establish national AMR reference laboratory
- Extend surveillance to private hospitals and community

- Expand AMR surveillance to include all animal production sectors
- Harmonise AMR surveillance with antimicrobial utilization on farms

- Enhance laboratory capacity for testing in food products
- Strengthen surveillance in food products, to include retail food and meat, and assess risk to consumers

- Develop a systemic environmental surveillance system
- Conduct risk assessment to guide follow-up actions e.g. policy and operations

Ongoing

Priority areas
for further action

WAAW!

It's the
World Antibiotic Awareness Week

FREE TOTE BAG

Marine Parade Public Library | 25-26 Nov | 10am-4pm

Learn more about GERMS & ANTIBIOTIC RESISTANCE

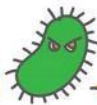
BE A GERM BUSTER



Learn all about antibiotics



Peek at bacteria under the microscope



See germs glow on your hands



Master the art of handwashing



Pledge support against antibiotic resistance



Listen to tales of germs



Saw Sivee Hoek
School of Public Health

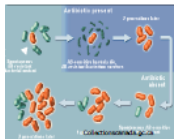


Antimicrobial Resistance in Companion Animals: What's the big deal?



By Dr Jason Stull, VMD, MPVM, PhD, DACVPM
Assistant Professor, Department of Veterinary Preventative Medicine, Ohio State University

The availability of antimicrobials has revolutionized veterinary medicine and is critical in preventing and controlling infectious disease in our patients. Unfortunately, the emergence and dissemination of antimicrobial resistance (AMR) threatens this. The importance of AMR in human health is well-recognized, with a similar problem in veterinary medicine more recently identified. Great attention is being paid to the importance of prudent antimicrobial use and infection control practices in controlling AMR. There is more focus on AMR in companion (small) animal veterinary medicine.



Any antimicrobial use leads to some pressure for resistance development. Widespread or indiscriminate use of antimicrobials results in even greater resistance without the therapeutic benefits. Certain antimicrobial resistant organisms are of particular concern because of the potential impacts on animal and human health. Additionally, some antimicrobial resistance genes are present on plasmids that can move between bacteria, resulting in further dissemination of resistance. Many of the affected bacteria species are part of the common gastrointestinal flora of people and animals, AMR can have far-reaching effects.

In companion animal veterinary medicine, AMR pathogens are likely to be transmitted from numerous sources including the environment (home/clinic surfaces), animals, and people. Transmission among animals and between animals and people is well-described for several AMR pathogens. A number of bacteria species has been identified as critically important or concerning AMR pathogens affecting companion animal veterinary medicine on a regional or global scale – staphylococci, enterococci, *Escherichia coli*, *Enterobacter*, and *Salmonella*.¹

"Factors associated with veterinary MRSA colonization or infection in dogs include prior antimicrobial use, prior hospitalization, and longer hospitalization"

Staphylococci provides an excellent example of AMR in companion veterinary medicine. *Staphylococcus pseudintermedius*, and to a lesser extent *Staphylococcus aureus* are concerns through acquisition of the *mecA* gene (referred to as methicillin-resistant *S. pseudintermedius* (MRSP) and methicillin-resistant *S. aureus* (MRSA), respectively when the gene is present). The *mecA* gene confers resistance to penicillins, cephalosporins, and carbapenems. Additionally, resistance to other classes of antimicrobials is frequently observed, including lincosamides (clindamycin), fluoroquinolones, macrolides (erythromycin), tetracyclines, and trimethoprim-sulfonamides. Factors associated with veterinary MRSA colonization or infection in dogs include prior antimicrobial use, prior hospitalization, and longer hospitalization (>3 days).²⁻⁴ The use of fluoroquinolones and cephalosporins has been linked to the emergence of MRSA in people and may play a role in veterinary species.⁵ MRSP has rapidly spread globally in canine populations, often with high levels of antimicrobial resistance. In one study, more than 90% of MRSP isolates were resistant to four additional antimicrobial classes.⁶ Recent prior hospitalization and β -lactam antimicrobial administration have been associated with MRSP infections,⁷ suggesting nosocomial transmission may be a factor in MRSP disease. This highlights the importance of clinic infection control practices in limited transmission (e.g., cleaning and disinfection, use of isolation for infectious patients).

ANTIBIOTICS USE-RESPONSIBLY

Continued emergence and dissemination of resistance in MRSP may pose even greater challenges as the limited range of effective drugs further decreases.



Foodfish Newsletter

Issue 5

Contingency Planning for Coastal Fish Farms

In February 2015, AVA-licensed coastal fish farms were severely affected by a plankton bloom causing fish deaths. To help the fish farmers develop capability to mitigate effects of plankton blooms, AVA with Temasek Polytechnic developed and customised a

Inside this issue:	
Contingency Planning for Coastal Fish Farms	1.3
Basic Guide to Fish Pathogen	4.5
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Poultry Newsletter

ISSUE 3

Avian Influenza A at a glance

2014

Basics of Influenza Virus

With the constant emergence of new strains of Avian Influenza (A.I.), we revisit the basics of A.I.

There are 3 types of Influenza viruses: A, B and C.

Influenza A: Infects both humans and animals. Wild birds commonly act as a reservoir for type A viruses. A virus is highly contagious and rapidly changing for

are responsible for seasonal human flu epidemics, influenza type C only causes mild respiratory illnesses in humans.

(NA). There are 18 subtypes (H1-18) and 11 different neuraminidase subtypes (N1-11).

H5 and H7 subtypes are notifiable under the OIE Terrestrial Animal Health Code as they are the only 2 subtypes known to have the ability to become highly pathogenic.

Pathogenicity: HPAI and LPAI

All strains can be classified as low pathogenic (LPAI) or



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One Health

- Set up a national coordinating body to coordinate research in line with a national AMR research agenda

Human

- Funding available through various institutions and funding streams
- E.g. surveillance of healthcare-associated infections in public and private hospitals

Animal

- Industry involved in developing rapid test kits to detect bacterial pathogens and guide appropriate treatment
- Industry developing alternatives to antimicrobials e.g. vaccines, pre-/probiotics

Environment

- Research studies to understand environmental gene reservoirs and association with phenotypic expression
- Prevalence study of drug-resistant organisms in ready-to-eat food samples, crops and meat

- AMR is one of the top 3 infectious disease focus areas for research under the RIE2020 Plan

- Establish baseline AMR data for target bacteria in local farms
- Facilitate applied research into development of viable alternatives

- The on-going studies will guide priority area determination

Ongoing

Priority areas
for further action



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Environment

Ongoing

- National immunization policies for children, travelers and healthcare workers
- Infection control programmes in hospitals
- NIPC issues National Infection Control Guidelines
- Outbreak response and control

- Promote and implement farm biosecurity measures to prevent & control outbreaks
- Guidelines for good animal husbandry practices have been established
- Use of vaccines and alternatives to antimicrobials encouraged

- Regulations for good food safety and hygiene to prevent foodborne diseases
- Regulations for environmental hygiene to prevent waterborne diseases
- Hospitals required to disinfect sewerage before discharge
- Regulations for proper disposal of pharmaceutical waste (including antibiotics) to minimize risk of acquiring drug-resistant organisms

Priority areas
for further action

- Increase uptake of vaccination among adults
- Enhance IPC measures in hospitals

- Improve animal health management practices in local food animal establishments
- Promote and facilitate the use of vaccines and alternatives to antimicrobials

- Enhance surveillance and programmes for food safety



SUSTAINABLE AQUACULTURE - A SINGAPORE PERSPECTIVE

TUESDAY 21 NOV 2017
0800-1700HRS

SEMINAR RM D1.110
NANYANG POLYTECHNIC

**FREE
REGISTRATION**

A PARALLEL PUBLIC ENGAGEMENT
EVENT WITH TALKS ON
SEAFOOD SAFETY, NUTRITION
& CULINARY TIPS WILL
TAKE PLACE FROM 0900-1230HRS
@ SEMINAR RM D1.111



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Human

Animal

Ongoing

- HSA regulates products containing antimicrobial agents
- Antimicrobial stewardship programmes implemented in all public hospitals

- Certain antimicrobials prohibited for use in feed, and all food producing livestock and aquaculture farms
- Non-therapeutic use of antimicrobials, e.g. for growth promotion in absence of risk analysis, is not considered prudent use

Priority areas
for further action

- Strengthen antimicrobial stewardship in hospitals
- Ensure appropriate antimicrobial use in the community

- Establish a robust regulatory framework for supply chain control of all antimicrobials
- Strengthen the system to ensure prudent use of antimicrobials in veterinary medicine and reduce inappropriate use of antimicrobials in food-producing animals e.g. guidelines, stewardship programmes, directives



38TH AMAF JPS STATEMENT ON COOPERATION ON ANTIMICROBIAL RESISTANCE IN AGRICULTURE



**38th AMAF, October 2016,
Singapore**

- Formalised cooperation on AMR in agriculture
- Provided political support

“Recognising the expansive and adverse impact of Antimicrobial Resistance (AMR) in agriculture on public and animal health, livelihoods, food security and safety, we agreed to strengthen regional cooperation in AMR mitigation through:

- (i) Raising awareness and advocacy on AMR issues and promote the prudent use of antimicrobials;
- (ii) Enhancing capacities on surveillance, diagnosis and research on AMR and antimicrobial usage (AMU);
- (iii) Promote good animal husbandry practices and the development of viable alternatives; and
- (iv) Enhancing collaboration with relevant sectors and stakeholders including development partners and donor agencies.”



39TH AMAF JPS STATEMENT ON COOPERATION ON ANTIMICROBIAL RESISTANCE IN AGRICULTURE



39th AMAF, September 2017, Thailand

- Sustained emphasis on cooperation on AMR in agriculture, and aquaculture

Food Safety and Agricultural Product Quality

“We welcomed the initiative to protect human and animal health from the expansive and adverse impact of antimicrobial resistance (AMR) in agriculture on public and animal health, livelihoods, food security and safety. **We endorsed the ASEAN guidelines on prudent use of antimicrobials in livestock and welcomed Singapore’s initiative on the ASEAN Cooperation Activities for AMR in aquaculture sector**”



ASEAN LEADERS' DECLARATION ON ANTIMICROBIAL RESISTANCE (AMR): COMBATING AMR THROUGH ONE HEALTH APPROACH

Adopted in Philippines, November 2017



Develop an ASEAN strategic plan to combat AMR with nineteen key priority areas



UPCOMING WORK SHOP IN SINGAPORE

“Surveillance of Antimicrobial Resistance (AMR) through the Whole Genome Sequencing Methods and Conventional Methods”

Singapore from 5-7 Feb 2018, by AVA and Nanyang Technological University Food Technology Centre (NAFTEC)

Member States interested or needing more information, to contact Dr Lee Song Hao (lee_song_hao@ava.gov.sg)

Limited places, self-funding basis (*travel & accommodation*) *Workshop is free*



THE END

