KARSAP implementation: Animal Health sector

Dr. Robin J. Paul, M.V.Sc (Food Hygiene & Public Health)
State Laboratory for Livestock, Marine & Agri Products (SLMAP), Animal Husbandry Dept., Govt. of Kerala, Ernakulam
AMR and Animal Health

- In Veterinary Medicine, antimicrobials play a critical role in protection of animal health, animal welfare, and food-safety.

- Humans and animals are often affected by similar, or even the same, pathogens and many of the antimicrobials used to treat these infectious diseases are similar.

- Farm animals are exposed to considerable quantities of antimicrobials and act as an important reservoir of AMR genes (ARGs), which can be transmitted to humans through the food chain, direct animal contact and the wider environment.

- Kerala has operationalized the National Action Plan in Animal Health by the conceptualization of Kerala AMR Strategic Action Plan- KARSAP- A One Health response to AMR containment.
Interdisciplinary One-Health approach

- This complex epidemiology of AMR emphasizes the need for highly interdisciplinary research approaches, comprising humans, animals, and the wider environment.

- This together with the socioeconomical factors make this topic the quintessential One Health issue. Hence reducing the dissemination and transmission of resistant bacteria within and between animal and human populations is central when aiming to fight AMR.

- The ability of bacteria to disseminate from one setting to another, over large geographic distances and among the different populations, makes it difficult to explain the origin of resistant bacteria strains.
1. Awareness & understanding
   Communication & IEC
   Education & Training

2. Knowledge & evidence
   Laboratories
   Surveillance

3. Infection prevention & control
   IPC in human health
   Animal feed & food
   Environment

4. Optimise use of antibiotics
   Regulations
   Hospitals & healthcare
   Veterinary & aquaculture
   Surveillance of AM use

5. Research & Innovations
   Research
   Innovations

6. Collaborations
   Public private partnerships
   Disease control programs
KARSAP-One Health-Release by Hon. CM, Kerala
Institutions involved in KARSAP-Animal Health

From the Department

1. Directorate of Animal Husbandry, Thiruvananthapuram
2. State Institute of Animal Diseases, Palode
3. State laboratory for Livestock, Marine & Agri Products, Ernakulam
4. Avian Disease Diagnostic Laboratory, Thiruvilla
5. Rinderpest Laboratory & RDDL, Palakkad
6. Institute of Veterinary Biologicals, Palode

From Veterinary University

7. College of Veterinary & Animal Sciences, Mannuthy
8. College of Veterinary & Animal Sciences, Pookode

Sample Collection

All Veterinary Hospitals/Dispensaries/VPCs/DVCs under AHD
Strategic priority 1: Awareness & Understanding

Communication & IEC
- The working group on AMR of the Animal Husbandry Department is hosted by SLMAP, Govt. Ernakulam which review all the activities proposed under KARSAP, last one was on 20/03/19

Education & Training
- Awareness programs for Farmers/Vets through LMTCs
- Training program to veterinarians on AMR at Trivandrum and Pathanamthita
- Kerala State Veterinary Council conducted first Continuing Veterinary Education (CVE) program on AMR on 14-5-19 at Peerorkada
Strategic priority 2: Knowledge & evidence

- Laboratories- strengthening
  - ISO 17025 – NABL accreditation for Labs, Accreditation of Apex Labs SAID, Palode & SLMAP completed; ADDL Thiruvilla recommended after the final assessment by NABL team.
  - ISO 9001 for Directorate completed & select hospitals in every district are being upgraded to obtain ISO 9001 & Lab Staff training is ongoing
  - Two lab staff attended FAO supported WHO-NET training at CIFT Kochi
Strategic priority 2: Knowledge & evidence

- **Surveillance.**
  - Residue Monitoring for Antibiotics in Broiler Chicken in Kerala
  - Antimicrobial Resistance (AMR) In Food and Food Animals: An Integrated Veterinary Surveillance Program For Kerala (Meat, Milk, Poultry)
  - Molecular Identification and Resistance Study of bacterial isolates from Animal Products
  - Detection of Oxytetracycline & Penicillins in Milk in Thiruvanathapuram dist; screening by Immuno chromatography & Quantification of Oxytetracycline by HPLC by SIAD
  - AST for Bacterial Avian Diseases by ADDL is an ongoing activity.
Strategic priority 3: Infection prevention & control

- Animals & Farms
  - To optimize the use of antibiotics, the AMR working group at (ADDL, Thiruvalla) is developing a SOP for IPC in veterinary hospitals and will distribute among DVC/VPC’s in Kerala.
  - An SOP for biosecurity for livestock and Poultry farms, is being developed by the AMR working group at SIAD, Palode so that the same can be given to departmental farms in the first phase.
Strategic priority 4: Optimize use of antibiotics

- **Regulations**
  Kerala Livestock and Poultry feed (Regulation of manufacture and sale Act 2018) in draft stage, work is going on at Directorate Thiruvanthapuram.

- **Veterinary & aquaculture**
  AHD dept. manual revised and reissued, this has recommendation of antibiotics for select diseases

- **Surveillance of AM use**
  Restricting Veterinary Antibiotic use by making them prescription only medicines by RVP and conducting a web survey on prescription practice w.r.t Antimicrobials among Veterinary Doctors in select districts is planned in 2019
Strategic priority 5: Research & Innovations

Research
- AMR research being undertaken at Kerala Veterinary University (KVASU)
- New R & D project on Studies on AMR gene flux between livestock and society, risk assessment and development of management strategies Collaboration of SIAD, Palode with Mahatma Gandhi University, Kottayam

Innovations
- AHD/KSPDC+ Kudumbashree (State Livelihood Mission) launches “Kerala Chicken” tested for antibiotic residues
- Distribution of field level rapid antibiotic sensitivity kits to Veterinary Institutions throughout Kerala by IH & VB, Palode (Aprox 5000 nos per year)
- Mapping and geo tagging of all animal farms in Kerala along with individual animal identification. (BHUMIKA app)
Strategic priority 6: Collaborations

- **Public private partnerships**
  - ReAct Asia Pacific conducted a one day workshop at Ernakulam on Biosecurity and Antibiotic issues in Poultry Industry
  - Training program for veterinarians on AMR are being organized by Indian Veterinary Association, Kerala

- **Disease control programs**
  - The department of animal husbandry had two major diseases control programs viz. ADCP and ASCAD for control of major diseases in Animals and Poultry. Better Animal Health Management is very important as ‘Healthy Animals and Birds, just like Healthy Humans do not require any antibiotic’.
AMR related Projects at SLMAP

Completed Projects (2017-18)
- Residue Monitoring for Antibiotics in Kerala

Surveillance Projects (2018-19)
- Residue Monitoring for Antibiotics in Broiler Chicken (New Districts)
- Antimicrobial Resistance (AMR) In Food and Food Animals: An Integrated Surveillance Program For Kerala (Meat, Milk, Poultry)
- Molecular Identification and Resistance Study of Bacteria isolated from Milk, Meat and Eggs
Residue Monitoring for Antibiotics in Kerala

Broiler Meat/Liver Screened for 10 Antibiotics (3 groups)

- **TETRACYCLINES**
  - Oxytetracycline
  - Chlortetracycline
  - Tetracycline
  - Doxycycline

- **FLUORQUINOLONES**
  - Enrofloxacin
  - Ciprofloxacin

- **SULFONAMIDES**
  - Sulfadiazine
  - Sulfadimidine
  - Sulfathiazole
  - Sulfadimetrazole
## AMR in IN FOOD AND FOOD ANIMALS ; AN INTEGRATED VETERINARY SURVEILLANCE PROGRAME FOR KERALA

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample description</th>
<th>Name of Bacteria</th>
<th>Level of sampling</th>
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<tbody>
<tr>
<td><strong>Clinical Sample</strong></td>
<td>Mastitis Milk</td>
<td>Staph. aureus</td>
<td>Veterinary Hospitals</td>
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<td>E. coli</td>
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<tr>
<td><strong>Food Sample</strong></td>
<td>Poultry Meat</td>
<td>Salmonella</td>
<td>Farms/Retail Markets</td>
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<td>E. coli</td>
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<td>Beef</td>
<td>Salmonella</td>
<td>Retail Markets</td>
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<tr>
<td></td>
<td></td>
<td>E. coli</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Milk ( Unpasteurised)</td>
<td>Staph. aureus</td>
<td>Farms/Milk societies</td>
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<tr>
<td></td>
<td></td>
<td>E. coli</td>
<td></td>
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<tr>
<td></td>
<td>Fish</td>
<td>Vibrio</td>
<td>Farms/Retail Markets</td>
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Other Planned future activities

1) Antimicrobial Resistance in Food and Food Animals (Meat, Milk, Poultry) minimum 50 isolates from foods

2) Molecular identification and resistance study of bacterial isolates

3) Awareness programs in various districts for farmers through LMTCs and Vets

4) Distribution of antibiotic sensitivity kits to Veterinary Institutions throughout Kerala by IH & VB, Palode and new AMR projects by apex labs of AHD SIAD, Palode & ADDL Thiruvilla. Upgradation of Microbiology div. in Dist. Clinical Labs

5) Restricting Veterinary Antibiotic use by making them prescription only medicines by RVP and Conducting a web survey on prescription practice among Veterinary Doctors

6) Upgradation in Quality of Veterinary services- ISO 9001 for Directorate completed & select hospitals in every district is ongoing & Lab Staff training

7) AHD + Kudumbashree (State Livelihood Mission) launches “Kerala Chicken” tested for antibiotic residues
Govt. of Kerala initiative on Animal Health & traceability-Geo Tagging

- Mapping and geo tagging of all animal farms in Kerala along with individual animal identification
- More than 4000 mobile computing device provided to all field staff of Veterinary Department (BHUMIKA app)
- Already mapped around 2.5 lakhs farms across Kerala, probably first of its kind
- Better Animal Health Management “Healthy Animals and Birds, just like Healthy Humans do not require any antibiotic”
Animal Resource Management System

FARM IDENTIFICATION
Management of Disease Outbreak

Buffer zone estimation

Vaccination/Insurance

Farmer Location
Lessons from KARSAP

As with the human health, the Animal Health aspect of AMR is a complex issue that requires concerted, coordinated action as Drug-resistant infections know no borders.

- **The lack of detailed Antibiotic Usage (AMU)**, epidemiological, molecular data (ARGs) impacts our ability to interpret prevalence/surveillance data on AMR and to design efficient interventions. Therefore, monitoring systems on use and residue monitoring in animal products is essential to fill this knowledge gap is prioritized.

- Finally, the ecology of AMR should be addressed with a holistic, One-Health approach combining expertise from different disciplines, such as medical doctors, veterinary clinicians, Fisheries professionals, public health scientists, microbiologists, wildlife specialists, environmental scientists (ecologists), and epidemiologists. **the KARSAP for AMR is a first such endeavor.**
Thank You