Reducing antibiotic use in food animals: Status, challenges and initiatives in Vietnam

Juan J. Carrique-Mas

Oxford University Clinical Research Unit, Ho Chi Minh City, Vietnam

Workshop on National Action Plan on AMR for Developing Countries
New Delhi, 10-11 November 2016
Agenda

• Background
  – Drivers of AMU in Vietnam
  – Quantification of AMU and AMR in animal production

• Legal framework and initiatives
  – The current state
  – Vietnam Action Plan for the reduction of AMU and AMR

• Intervention studies: the ViParc Project
Vietnam: Drivers of antimicrobial usage
Drivers of AMU in animal production

• Rapid intensification of animal production

• High incidence of infectious diseases (30-50% Mt in poultry)

• Access to a vast range of antimicrobials ‘over the counter’

• ~50-75% commercial feed rations medicated

• Lack of veterinary advisory and diagnostic capacity
Antimicrobial usage in chicken and pig farms in the Mekong Delta of Vietnam

<table>
<thead>
<tr>
<th></th>
<th><strong>Pigs</strong></th>
<th><strong>Chickens</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Administered by farmer</td>
<td>46 mg</td>
<td>52 - 276 mg</td>
</tr>
<tr>
<td>Included in feed</td>
<td>287 mg</td>
<td>77 mg</td>
</tr>
<tr>
<td>Total</td>
<td>333 mg</td>
<td>129 - 353 mg</td>
</tr>
</tbody>
</table>
Estimated consumption of antimicrobials in feed in Vietnam

Cuong et al. (2016). ECOHEALTH, 13(3):490-498
Legal framework and legislative initiatives
Legislation of AMR in animal production in Vietnam

- Veterinary Law (2015)
- Compulsory Register of all veterinary products authorized in terrestrial and aquatic animals (~6,000 are antimicrobials)
- List of banned products, annually updated
- June 2015: Signature of an Aide Memoire on AMR by MoH, MoA and FAO, USAID, JICA, OUCRU
National Action Plan to control AMU and AMR

• Developed by MoA with the support from FAO

• 4 areas of activity:
  1) Strengthen policy and governance
  2) Improve awareness on AMR in the agriculture community
  3) Regulate AMU and implement good practices
  4) Develop capacity for surveillance of AMU/AMR
Vietnamese Platform for Antimicrobial Reduction in Chicken production

www.viparc.org
Research aims of ViParc

• To reduce 33-50% antimicrobial usage among chicken farmers by providing farmers with a locally-adapted farm veterinary support system

• To elucidate the relationship between antimicrobial usage, farming practices and antimicrobial resistance
Randomised before-and-after controlled trial

Exclusion criteria:
• Raise < 50 chickens
• Raise chickens <50% time
• Raise only layer chickens

Phase I: Baseline phase
(12 months)

Phase II: Intervention phase
(18 months)

Dong Thap province, Mekong Delta
Trial outcomes (endpoints)

(I) Antimicrobial usage
(II) Antimicrobial resistance
(III) Antimicrobial residues in chicken meat
# Sampling and data collection

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chicken faecal samples</strong></td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>Additional samples</strong></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>High quality data collection</strong></td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
</tbody>
</table>

- High quality data collection
Intervention phase

• 18 months
Farmer training programme (FTP)

I. Good farming practices and record keeping
II. Prevention and control of diseases in chickens
III. Waste management and environmentally-sustainable practices
Farm Health Plan (FHP)

- Each farm in Arms I & II to be assigned to a Project Veterinarian (PV)
- Visits to advice and audit the farm and on nutrition, productivity, disease control (vaccination, biosecurity, C&D and rodent control, etc.)
- Farms in Arm II to be supplemented with antimicrobial replacements (competitive exclusion, enzymes, probiotics, etc.)
Diagnostic support

• PVs will carry out diagnostic investigations of disease in their assigned farms:
  - Diagnostic necropsy
  - Bacterial diagnostics and AMR (SDAH-DT); viral diagnostics (UCT)

• PVs will provide results to the farmer and liaise with the pharmacist and will recommend optimal treatment
# Cost-benefit analyses

<table>
<thead>
<tr>
<th>Costs of the intervention</th>
<th>Benefits of the intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Costs of farmer training, veterinary advice support</td>
<td>• Savings in antimicrobials</td>
</tr>
<tr>
<td>• Costs of diagnostic support (advisory visits, laboratory, tests)</td>
<td>• Increased productivity (less disease, better output)</td>
</tr>
<tr>
<td>• Upgrade of farming practices as a result of the advice</td>
<td></td>
</tr>
<tr>
<td>• Antimicrobial replacements</td>
<td>• Reductions in AMR</td>
</tr>
</tbody>
</table>

### Conditioning factors
- ‘Take up’ of the intervention by the farmer (compliance with FTHP, diagnostic requests)
- Changes in GoV policy, market fluctuations
Acknowledgements

• Nguyen Van Cuong
• Nguyen Thi Nhung
• James Campbell
• Mary Chambers
• H. Mohammed Hafez
• Jonathan Rushton
• Viet Thu Ho Thi
• Bach Tuan Kiet, Vo Be Hien

• Funding: The Wellcome Trust (Grant No. 110085/Z/15/Z)
Thank you very much!

www.viparc.org