Reducing Antimicrobial use in Animals and Promoting a Mindset Change

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Antimicrobial use in animals is result of human behavior/decision

Reduction of antimicrobial use requires adoption of different behaviors:

- Disease prevention should replace antimicrobial application where possible
- Waive prophylactic use and antimicrobial growth promotors
- Tailored/prudent therapy should replace ‘indiscriminate’ antimicrobial use
  - Ban highest priority critically important antimicrobials, restrictive use of critically important antimicrobials
  - Use of prescription guidelines, formularies, diagnostics
Human behavior often not based on rational reflections

=> more/less automatic response on different stimuli:

- Internal stimuli (motivation, self-control etc.)
- External stimuli (social environment, physical context etc.)

Understanding these stimuli and the effects on behavioral outcome essential for behavior change interventions

“Why is someone behaving in a certain way and what can be done to change this behaviour?”
The behaviour change wheel: A new method for characterising and designing behaviour change interventions

Susan McKee III, Maartje M van Stralen, and Robert West
Implementation Science 2011 6:42
The Dutch approach

- Veterinary guidelines developed
- Formularies updated
- Public pressure
- Compulsory reduction targets
- Establishment Veterinary Medicines Institute
- Ban specific antimicrobial classes
- Market changes
  - Alternative broiler breeds
  - ABF chains
- Low users less requirements (#vet visits etc.)
- Usage transparent => benchmarking
- Voluntary restrictions on use HPCI antimicrobials
- 1-on-1 relationship farmer <> vet
  - Farm Health Plan
  - Farm Treatment Plan
- Quality system vets (post grad education)
- Workshops/trainings
  - Vets
  - Farmers
- Compulsory reduction targets
- Establishment Veterinary Medicines Institute
- Ban specific antimicrobial classes
- Legislative measures
- Fiscal measures
- Environmental restrictions
- Education
- Persuasion
- Communication/Marketing
- Service provision
- Motivation
Effects on resistance levels

- Broilers
- Pigs
- Veal calves
- Dairy cows

Effects on veterinary antimicrobial sales

- EU ban on AGPs
- additional multi-stakeholder measures on national level

63.4% decline (2009 to 2017)
Are we there yet?

Farm A: Recent building
55 dairy cows, 9559kg ECM
Antimicrobial use: 3.31 DDDA

Farm B: Old building
103 dairy cows, 9893kg ECM
Antimicrobial use: 1.40 DDDA
### Research projects Critical Success Factors for low antimicrobial use*

**Veal Calves: Low versus High users**
- More often smaller herds
- More laborers per 1000 calves
- More often higher proportion of heifers
- More often calves with a higher weight at the start
- Both perceive little control over their antimicrobial use
- High users do not perceive their antimicrobial use as a problem
- Perceived more pressure from their social environment to reduce

**Sows: Low versus High users**
- More often smaller farms
- More often lower number of live born piglets
- Vaccinate less
- More often have varying treatment durations
- Perceived more control over their antimicrobial use
- High users do not perceive their antimicrobial use as a problem
- Received more information on reduction from their vet and other advisors

Both technical and socio-psychological factors involved in low use of antimicrobials

* Conducted by Wageningen UR, Animal Health Service GD & Utrecht University. Commissioned by the Dutch Ministry of Agriculture
**VET-ENHANCE Study:** Using the Intervention Mapping approach to promote implementation of veterinary guidelines

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II) Explore barriers & drivers for implementation  
III) Selection of theory-based Behavior Change Techniques (BCTs)  
IV) Development of a Monitoring & Evaluation Plan |
| 2. Implementation Intervention | Stepped Wedge design Field Trial using BCTs. Using peer consultation meetings, E-learning and others |
| 3. Evaluation | RE-AIM framework to evaluate effectiveness, sustainability etc. |

**Consortium of:**
- Faculty of Veterinary Medicine
- Dept Behavioral and Health Sciences, Wageningen UR
- University Medical Centre Utrecht
- Institute for Responsible Use of Medicines (IVM)
- Royal Dutch Veterinary Association (KNMvD)
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