Antimicrobials - Are we using them responsibly?

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JONES P CONSULTING LTD: GLOBAL ADVICE ON VETERINARY MEDICINES
Who am I?
Not a bad place to live!
I am a veterinarian who graduated from the Faculty of Veterinary Science at the University of Liverpool in the United kingdom in 1971
Others in Liverpool at the same time
Antimicrobials - Are we using them responsibly?
The use and misuse of antimicrobials in human medicine and animal husbandry over the past 70 years has led to a relentless rise in the number and types of microorganisms resistant to these medicines - leading to death, increased suffering and disability, and higher healthcare costs.

*World health Organization (WHO) 2010*

The development and spread of antimicrobial resistance is a global public health problem that is affected by both human and non-human antimicrobial usage. All uses of antimicrobial agents lead to the emergence of antimicrobial-resistant micro-organisms and further promote the dissemination of resistant bacteria and resistance genes. Thus, a holistic approach is needed to best control the problems of antimicrobial resistance, one that takes into account the likely spread of resistant bacteria and resistance genes.  

Do we understand what this implies?

- Diseases in man cannot be treated with antimicrobials because the bacteria are resistant partly as a result of irresponsible use in animals

  OR

- Failure to treat/control zoonotic diseases in animals because bacteria are resistant as a result of irresponsible use in those same animals

  Or both

  This is the interface of human and animal health:
  One World – One Health = The Public Good

- So there is a risk – how do we deal with it? - by analysing the problem and not by blanket bans

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Risk Analysis Components

- Risk Analysis
  - Risk Assessment
    - Release
    - Exposure
  - Risk Management
  - Risk Communication
    - Consequence
Risk Management - what are the options?

1. Regulatory decisions based on scientifically sound risk assessment (Codex Task Force to report in October)

2. Removal or restriction on the use of certain antimicrobials
   1. Apply the ban now to certain of the newer classes
   2. Prohibit the use in animals of all new human antimicrobials

3. Resistance surveillance and use monitoring – consistent methodology required

4. Research on new interventions

5. Reinforce food hygiene measures (HAACP at all steps post-harvest)

6. Responsible use guidelines firmly based on clinical judgment
1 Regulatory decisions based on scientifically sound risk assessment

* Regrettably this has not always been the case
* Decisions often based on disproportionate application of the precautionary principle
* Maintaining the status quo is not an option
* Question how risk management changes in current use affect human health risks and benefits now and later
* Better to focus on future consequences not on blame/attribution of past health effects

Action > Predicted Consequences > Recommendation

Not

Situation > Action

* Risk assessment must precede management: Codex Alimentarius Task Force of which EU is a member is intended to ensure this approach
2 Removal or Restriction?

* Past experience does not support such moves

**Withdrawal of growth-promoting antibiotics in Europe and its effects in relation to human health - Ian Phillips**

The withdrawal of growth promoting antimicrobials began in the European Union between 1995 and 1999 on the basis of the Precautionary Principle.

Before the ban, human clinical isolates of enterococci resistant to vancomycin or teicoplanin were uncommon in many, but not all, parts of Europe and resistance to quinupristin/dalfopristin in the case of *Enterococcus faecium* was very rare.

After the ban, these resistances increased in prevalence almost universally, to the detriment of human health. Campylobacters, normally susceptible to macrolides, increased in prevalence before and after the ban.

Analyses suggest that the added risk to human health from resistance among enterococci and campylobacters selected by growth promoter use is small, whilst the benefit to human health from their use, hitherto largely ignored, might more than counterbalance this.

Figure 39. Consumption of prescribed antimicrobials and growth promoters in animal production and prescribed antibacterials in humans, Denmark

Figure 4. Amounts of tetracyclines for oral use in weaning pig herds, grouped by number of prescriptions per herd per year, Denmark 2003-2008
Figure 27. Trends in resistance to selected antimicrobials among Salmonella Typhimurium isolated from pigs, pork and from human cases, Denmark

a) Few Salmonella Typhimurium isolates were available from Danish pork before 2005.
b) Until 2007, includes cases where origin of infection is not documented and may therefore include some isolates acquired abroad but not documented as such.
c) In 2008, several larger outbreaks caused by e.g. S. Typhimurium phage type U292, DT3 and DT135 occurred. These isolates were excluded here. See also introduction on Salmonella, regarding the outbreaks in 2008.
Figure 28, Trend C. jejuni. Trends in resistance to selected antimicrobials among Campylobacter jejuni isolates from broilers, broiler meat and human cases, Denmark.

a) Until 2007, including cases where origin of infection was not documented and may therefore include isolates acquired abroad but not documented as such.
Enrofloxacin use in animals & Quinolone-resistant
*Salmonella Typhimurium DT104* (UK)
(data presented by WHO at TFAMR in Korea)

![Bar chart showing the percent of isolates from 1992 to 1997 for different animal species.]

- **November 93 – Enrofloxacin licensed for animal use**

1992 93 94 95 96 97

- **Chickens**
- **Cattle**
- **Pigs**
- **Humans**

1RST SESSION CODEX TASK FORCE ON AMR, KOREA, 22-26 OCTOBER 2007
What happened after 1997?

- In England and Wales, isolations of multiresistant DT 104 from humans increased from about 200 in 1990 to >4000 in 1996. However, over the last two years there has been a significant decline in isolations, with numbers dropping by 48% in 1998, to 2000.

Figure 3.2: Total sales of antibiotics in the Netherlands, 1998 to 2008.
Risk Management: what are the options continued?

3 Resistance surveillance and use monitoring – consistent methodology required
- Essential to develop effective mechanisms for identifying, collecting and interpreting the information that will detect relevant developments concerning antimicrobial resistance in organisms in animals.

4 Research new interventions
- The animal health industry must be guaranteed a stable predictable regulatory environment to encourage investment and innovation to develop new products.
5 Reinforce food hygiene measures (HAACP at all steps post-harvest)

Continuum of Risk Management Options

“All interventions guided by National Risk Assessments”

Food Animals Release → Food Exposure → Humans Consequence

- Responsible Use
- Quality Assurance
- Regulatory Risk Assessment

- Appropriate Level of Protection (ALOP)
- HACCP
- Interventions
- Cooking, Hygiene

- Food Preparation
- Diagnostics
- Appropriate Rx

Measurements to determine the effectiveness of actions to protect human and animal health?

Resistance Surveillance and Risk Assessment “Prediction”
RESPONSIBLE USE OF ANTIMICROBIALS IN VETERINARY PRACTICE: THE 8-POINT PLAN

1. Work with clients to avoid need for antimicrobials
   - Integrated disease control programmes
   - Animal Health and Welfare Planning
   - Isolate infected animals wherever possible

2. Avoid inappropriate use
   - For example, for uncomplicated viral infections
   - Restrict use to ill or at-risk animals
   - Advise clients on correct administration of products and completion of course
   - Avoid underdosing

3. Choose the right drug for the right bug
   - Identify likely target organisms and predict their susceptibility
   - Create practice-based protocols for common infections based on clinical judgement and up-to-date knowledge
   - Know how antimicrobials work and their pharmacodynamic properties
   - Use antimicrobials with a spectrum as narrow as possible

4. Monitor antimicrobial sensitivity
   - While clinical diagnosis is often the initial basis for treatment, microbiological sensitivity must be determined whenever possible so that a change of treatment can be implemented if necessary
   - Use only when necessary and supported by strict aseptic techniques alongside written practice guidelines
   - Be able to justify your choice of antimicrobial and dose
   - Keep accurate records of treatment and outcome to help monitor therapeutic regimens

5. Minimise prophylactic use
   - Use only when necessary and supported by strict aseptic techniques alongside written practice guidelines
   - Be able to justify your choice of antimicrobial and dose
   - Keep accurate records of treatment and outcome to help monitor therapeutic regimens

6. Minimise use perioperatively
   - Use only when necessary and supported by strict aseptic techniques alongside written practice guidelines
   - Be able to justify your choice of antimicrobial and dose
   - Keep accurate records of treatment and outcome to help monitor therapeutic regimens

7. Record and justify deviations from protocols
   - Use only when necessary and supported by strict aseptic techniques alongside written practice guidelines
   - Be able to justify your choice of antimicrobial and dose
   - Keep accurate records of treatment and outcome to help monitor therapeutic regimens

8. Report suspected treatment failure to the VMD
   - Use only when necessary and supported by strict aseptic techniques alongside written practice guidelines
   - Be able to justify your choice of antimicrobial and dose
   - Keep accurate records of treatment and outcome to help monitor therapeutic regimens

SPECIAL NOTE
Fluoroquinolones and third-/fourth-generation cephalosporins:
- Reserve these antimicrobials for clinical conditions that respond poorly to other classes of antimicrobials and where antibacterial sensitivity has been carried out
- Do not administer systemically to groups or flocks of animals except in very specific situations and special attention should be given to the risk of antimicrobial resistance as part of the benefit/risk assessment
- Avoid off-label use whenever possible

FOR FURTHER GUIDANCE VISIT
www.bva.co.uk

ANTIMICROBIALS ARE ESSENTIAL FOR THE TREATMENT AND PREVENTION OF INFECTIOUS AND ZOONOTIC DISEASES IN BOTH ANIMALS AND HUMANS

EVERY USE INCREASES THE RISK OF DEVELOPMENT OF MICROBIAL RESISTANCE

RESPONSIBLE USE OPTIMISES THERAPEUTIC EFFECTS WHILE MINIMISING RESISTANCE DEVELOPMENT

RESPONSIBLE USE—AS LITTLE AS POSSIBLE, AS MUCH AS NECESSARY
Key Messages for Responsible Use:

**Antimicrobials must be used on the basis of clinical diagnosis by a veterinarian**

**Bullet 2: Avoid inappropriate use**

- Restrict to ill or at-risk animals
- Advise clients on correct administration of product and completion of course
- Avoid under-dosing

**Bullet 3: Choose right drug for right bug**

- Identify target organisms and predict susceptibility
- Create practice based protocols for common infections based on clinical judgment and up to date knowledge
- Use narrow spectrum where possible

**Bullet 4: Monitor antimicrobials sensitivity**

- Whilst clinical diagnosis is often the basis for treatment, sensitivity testing should be carried out wherever possible so a change of treatment can follow if necessary
Where next and how?

• FVE is committed to ensuring its member associations use antimicrobials responsibly according to the guidance model.

• Guidelines on use recommendations in specific disease situations in the different species may need to be considered.

• Should clinical governance embrace use of antimicrobials?

• FVE opposes a ban on the newer classes of antimicrobials now approved for veterinary use according to European legislation.

• FVE agrees that some controls on the use of currently available antimicrobials may be considered – animals need medicines too.

• Further discussion required as to whether to prohibit use of new antimicrobials for man in animals.
Thank you