



UNIVERSITY OF
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Antibacterial resistance in companion animals and potential risk to human health

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Companion animals

- Pets in households – half of households
 - Dogs 8-10 million dogs
 - Cats – 8-10 million cats
 - Other pets
- Horses – 3.5 million people have been horse riding in last 12 months (6% population)
- Direct contact with people



Veterinary Use of Antibiotics

- ❑ POM-V
- ❑ Treatment of and prophylaxis for bacterial disease in animals
- ❑ Prescribed by vets
- ❑ Administered by vets, owners, stable owners etc
- ❑ Compliance



Cascade

- ❑ Veterinary surgeons must prescribe and use veterinary medicines where available
- ❑ If no medicine is authorised can then use
 - A vet medicine authorised in UK for another species or another condition
 - ❑ Or if not a medicine authorised for human use in UK
 - ❑ Or imported from another member State



Vets prescribing - dogs

- Completion of a prescription log over 5 days; antimicrobial used and presenting complaint
- **25.9%** of dogs seen by vets were prescribed antimicrobials
- **Penicillins** (esp. amoxicillin/clavulanic acid) were the most frequently prescribed
- Fluoroquinolones 5.6% of antibacterial prescriptions; 3rd generation cephalosporins 1.3%

Vets prescribing – dogs cont.

- ❑ No prescriptions for carbapenems recorded
- ❑ Most commonly used for wounds, abscesses or skin infections
- ❑ 16% prescriptions for prophylaxis
- ❑ 3.3% of prescriptions were for products not licensed for dogs



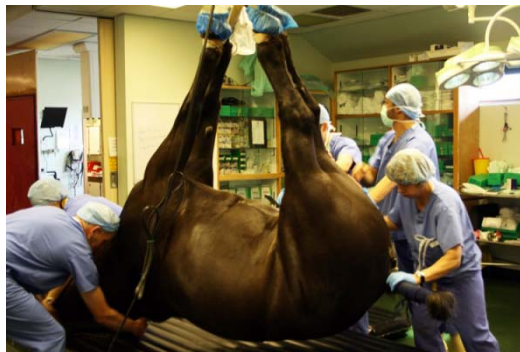
Vets prescribing - horses

- **17%** of horses attended by vets were prescribed antibacterials
 - 34.4% **potentiated sulphonamides**
 - 23.5% penicillins
 - 14.3% aminoglycosides
 - 5.1% fluoroquinolones
 - 3.1% 3rd and 4th gen cephalosporins



Vets prescribing – horses cont

- ❑ **38%** of prescriptions were for products not licensed for horses
- ❑ 74% of horse vets reported that they were not aware of any available antibiotic guidelines
- ❑ Information gained from cpd events, pharmaceutical companies, datasheets



Prevalence of antibacterial resistant *E.coli* in healthy dogs (183 dogs)

- Dogs in the community
- **29%** of dogs carried at least one AMR *E.coli*
- **24%** dogs had isolates resistant to ampicillin
- 20% to tetracycline
- 17% to trimethoprim
- **15%** of dogs had multidrug resistant isolates (3 or more)
- Only one ESBL

Dogs attending vets (581 faecal samples)

- **45%** of faecal samples had AR E.coli
- Ampicillin 37%
- Tetracycline 30%
- Trimethoprim 24%
- Ciprofloxacin 5%
- **18%** samples had multidrug resistant E.coli
- **4.1%** ESBL

Resistant *E.coli* in hunt dog kennels

- ❑ 4 hunt kennels; 110 faecal samples
- ❑ Ampicillin resistant *E.coli* found in **100%** faecal samples
- ❑ Over **80%** multidrug resistant
- ❑ No ESBL producing *E.coli* identified
- ❑ Use of antibacterials was reported to be frequent; wounds and injuries

Prevalence of antimicrobial resistant *E.coli* in horses (650 faecal samples)

- **72%** samples positive for any resistance
- 56% trimethoprim
- 51% tetracycline
- 46% ampicillin
- 5.4% ciprofloxacin
- **38%** multidrug resistance
- 6.3% ESBL resistance

Horses in referral hospitals

- 103 horses; 457 faecal samples
- Samples collected within 48 hours of arrival and every two days until discharge
- **29%** samples positive for **ESBL** producing bacteria
- Prevalence of resistance lower at admission with a peak at 4 days of hospitalisation
- PFGE suggested transmission between horses

ESBL producing *E.coli* in horses

- Majority carried bla_{CTX-M-1}
- Also carried bla_{CTX-M-14}, bla_{CTX-M-9}, bla_{CTX-M-20}, bla_{CTX-M-65}
- Median duration of shedding 22 days

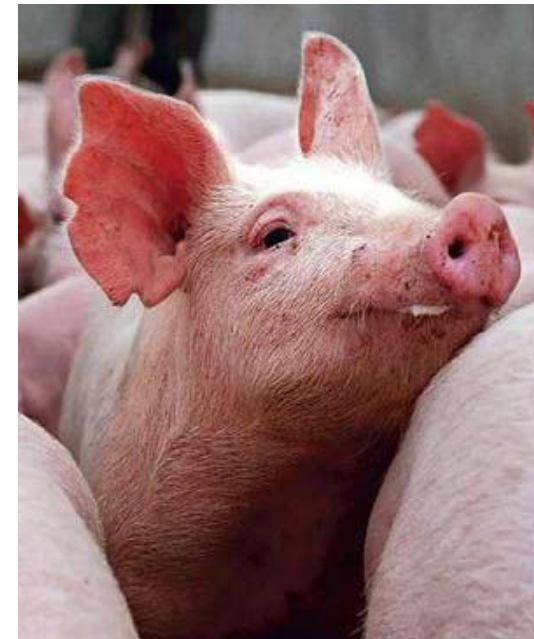


MRSA in humans

- ❑ Healthcare associated MRSA – HA-MRSA
- ❑ Community associated MRSA – CA-MRSA
- ❑ Livestock associated MRSA – LA-MRSA



Educate your children and teens on how to prevent the spread of MRSA infections



MRSA in companion animals

- ❑ Dogs attending vets (consultation only)
- ❑ 724 dogs
- ❑ MRSA 1%
- ❑ MSSA 6.5%
- ❑ MR-CNS 5.5%
- ❑ *S.pseudintermedius* 11% (none MR)



MRSA in horses

- Horses attended by vets (not hospitalised)
- 678 horses
- MRSA 0.6%
- MRS 29%
- 78% of isolates were multidrug resistant

Risk to humans

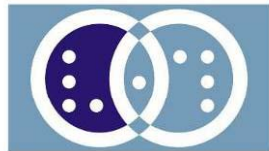
- High level of contact
- Low levels of MRSA carriage; transmission has been demonstrated
- Transmission of MRSA from humans to animals
- High prevalence of *E.coli* carrying AR especially in certain populations of dogs and horses

Aims

- Maintain efficacy in animals
- Maintain efficacy in people
- Develop new drugs
- Maintain our ability as vets to prescribe
- Ensure infection control with other measures



Thank you for your attention!



NCZR
National Centre For
Zoonosis Research

- Nicola Williams
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- Pete Clegg
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