Antibiotics

used for promoting growth

by the end of this lecture you should

 understand the benefits and problems associated with the use of antibiotics to promote growth in food animals

growth promoters

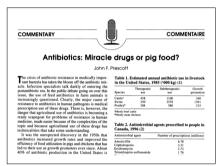
- · anabolic steroids
- · antibiotics
- somatotropins
- · probiotics
- · banned drugs

growth promoters

- animals do not grow well unless they are :
- -fed properly
- -looked after properly
- kept healthy

use of antibiotics

- · treatment
- -sick animals, full doses
- metaphylaxis
- -healthy contact animals, full doses
- · prophylaxis
- -healthy animals, low doses
- · growth promotion
- healthy animals, (very) low doses



Every time an antibiotic is given, there is selection pressure for resistance in pathogens and commensals.

history

· 1949

-pigs fed old cultures of *S. rimosus* for vit B12 grew faster

· 1967

-Swann report - only non therapeutic drugs to be used for growth promotion

· 1997

-Denmark gets EU to ban avoparcin

mechanism

- gnotobiotic animals grow about 5% faster
- · inhibition of G+ bacteria in gut
- inhibition of protozoa in ruminants???

residues

- · fed at very low level
- · most are not absorbed
- · no residues at GP doses
- may be residues at prophylactic doses

resistance

- exposure to antibiotics selects for resistance
- · animals exposed for long periods

resistance

- pathogens
- commensals
- targets unknown in growth promotion

species

- poultry
- pigs
- · feedlot cattle
- calves
- grazing cattle

transfer of resistance

- · drug causes emergence of resistance in animal
- · carcase contaminated by resistant organisms
- · resistant organisms survive cooking and eating
- · resistant organisms colonise people
- · resistant organisms cause disease in people, or
- resistant organisms pass on resistance to human pathogens

politics

- 1960s
- widespread emergence of tetracycline resistance
- · 1967
- -Swann report
- · 1980s / 1990s
- emergence of VRE & MRSA

politics now

- WHO recommendations
- · most banned in EU
- · most under pressure in USA & Australia
- Most banned as growth promoters in NZ, but allowed for prophylaxis

drugs · avilamycin · avoparcin · bacitracin · dimetridazole · macrolides · monensin · quinoxalines virginiamycin avilamycin · broiler chickens • pigs · cross resistance -everninomycin · still used in NZ, recently banned in EU avoparcin · cross resistance -vancomycin · now history - not manufactured any more bacitracin · broiler chickens

- pigs
- calves
- · no cross resistance
- toxic parenterally
- banned in EU, RVM in NZ

-prevention of necrotic enteritis

dimetridazole • pigs · carcinogenic · cross resistance other nitroimidazoles banned everywhere except NZ -swine dysentery macrolides & similar · tylosin · lincomycin · tiamulin & valnemulin • pigs · cross resistance -other macrolides, streptogramin Bs? • RVM in NZ and EU monensin · coccidiostat · cattle & broiler chickens · toxic to horses and dogs -pigs in combination with macrolides · no relevant cross resistance oxytetracycline RVM -respiratory disease in pigs · grossly over / ab used

quinoxalines · carbadox · olaquindox · dinitro-o-toluamide · carcinogenic banned everywhere except NZ · do not use ·swine dysentery virginiamycin · broiler chickens and horses · (feedlot cattle overseas) · cross resistance -other streptogramins - Synercid RVM with notification · avoid if at all possible legal status · growth promoters -general sales -being phased out · disease preventers -RVM The future?? · more paperwork · surveillance system · vets will have to be able to justify

their actions

role of the vet

- only use as part of an integrated herd health plan
- ensure good husbandry before use
- do not use drugs for disease prevention without evidence of disease
- provide written protocols for farmers (with withholding times)
- · keep records
- · monitor results culture & sensitivity
- · investigate outbreaks of disease properly