

Antibiotic use in Canada: How are we doing?

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Main topics



- Antibiotic use in food animals and swine
 - The situation in Canada and abroad
- New rules driving antibiotic use in farm animals
 - Worldwide and in Canada
- How can we do better and use less
 - Health Canada vision (label and clear language)
 - Role, responsibilities, tools
- Conclusion

Antimicrobial use vs. resistance

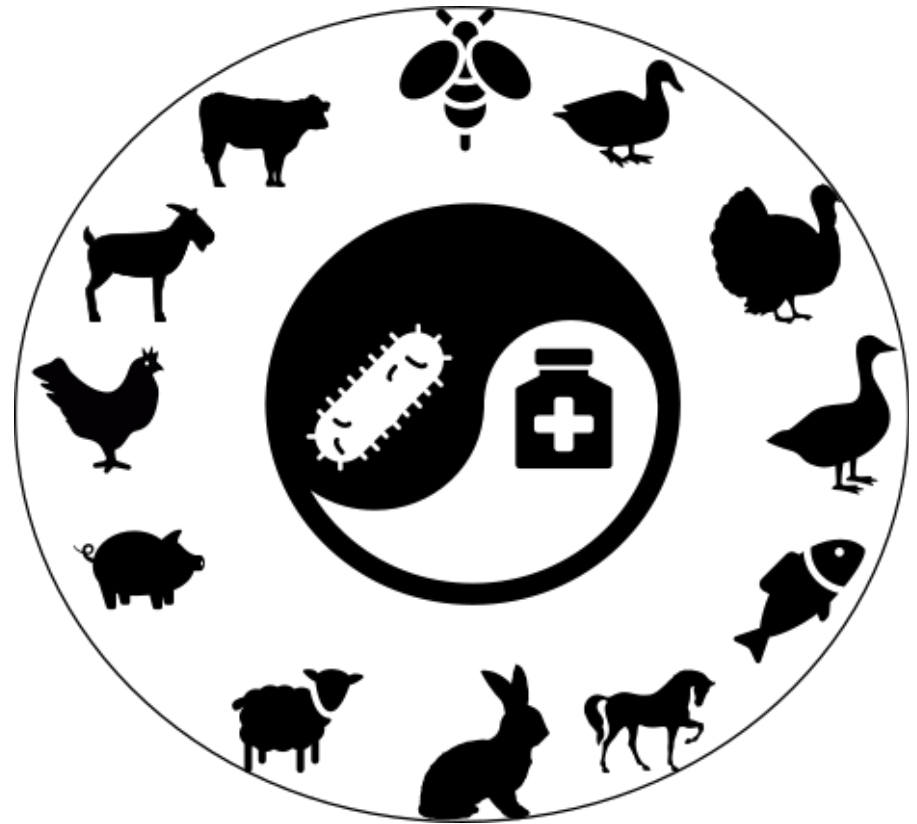


- Antimicrobial resistance (AMR), a worldwide concern for humans and animals.
 - AMR a consequence of Antimicrobial Use (AMU)
 - WHO makes 3 major recommendations on AMU in food animals
 1. Overall reduction of AMU in food producing animals
 2. Complete restriction of AMU for growth promotion
 3. Complete restriction of AMU for prevention of diseases
- WHO also recognizes they are making **STRONG** recommendations with **LOW QUALITY EVIDENCE** of the strength of the links between human and animal population bugs

Food animals

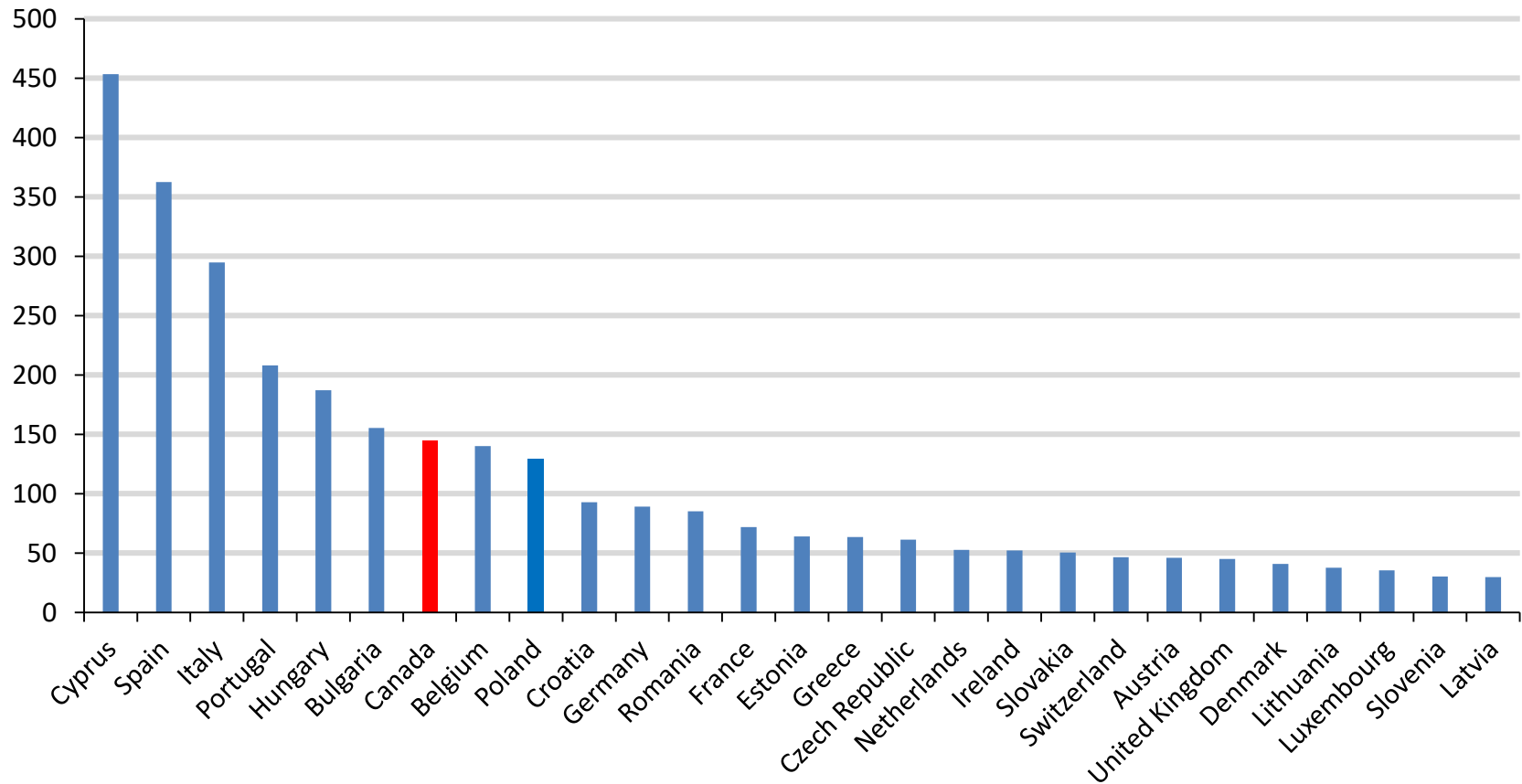


- Cattle (*Bos taurus*)
- Swine (*Suides*)
- Sheep (*Ovis aries*)
- Goat (*Capra hircus*)
- Horse (*Equus*)
- Rabbit (*Cuniculus*)
- Chicken (*Gallus*)
- Turkey (*Melagris*)
- Goose (*Anser*)
- Duck (*Anas*)
- Bees (*Apis*)
- Fish and shellfish



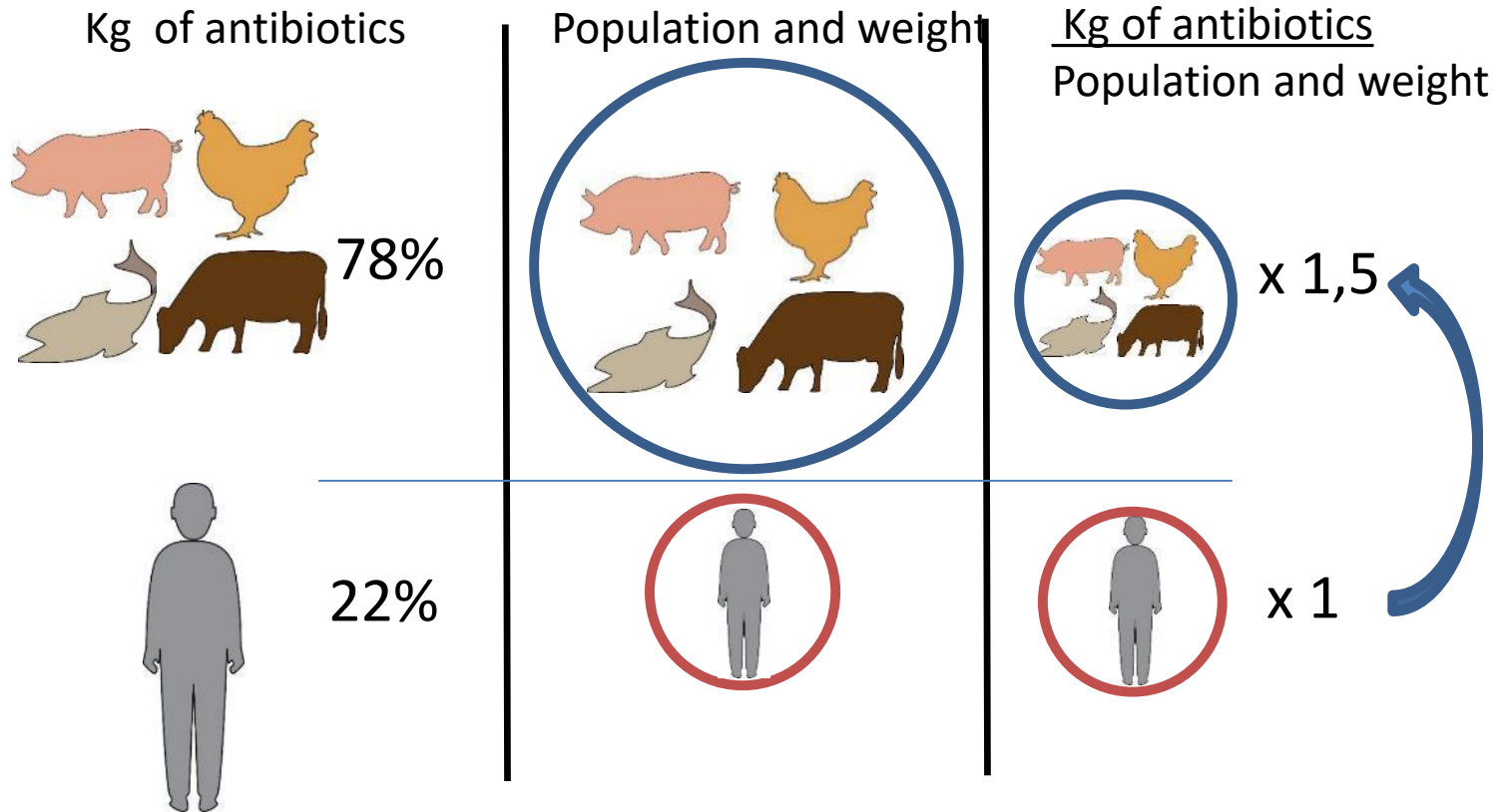
Canada, is among high users

mg/Population corrected unit (PCU) - 2016



Antimicrobial sales for animals (**quantity adjusted by populations and weights**) for Canada (2016) and countries participating in the European Surveillance of Veterinary Antimicrobial Consumption Network (2016)

Antibiotic use in food animals



Source: Data: Canadian Antimicrobial Resistance Surveillance System 2016, Infographics CRSV Université de Montréal



Swine sector, where we are



- Canada Swine
 - 2016, > 300 mg/pcu
 - Target 2020, ?
- Quebec Swine
 - 2016, 300 mg/pcu
 - Target 2020, < 240 (20%)
- England
 - 2016, > 150 mg/pcu
 - Target 2020, 100 mg/pcu
- US Swine
 - 2017 vs. 2016 (- 35%)
 - 360 mg/pcu to 220 mg/pcu**
- One Sow
 - 5 - 25 mg/pcu
- 27 Piglets
 - Less than 1 mg/pcu
- 27 Nursery pigs
 - 15 - 150 mg/pcu
- 27 Grow-Finish pigs
 - 82 - 485 mg/pcu
- Total use
 - 100 - 761

**US is not using the European “mg/pcu” statistic. This is an estimate.

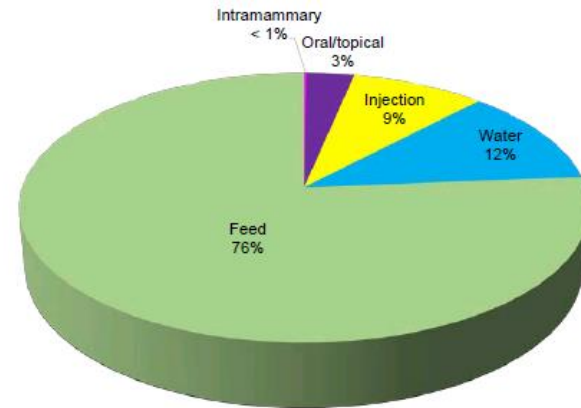
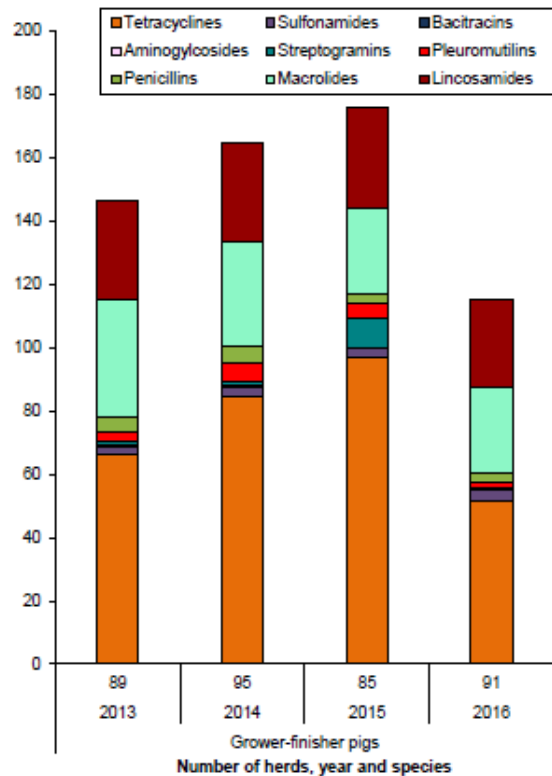
Antibiotic use, CIPARS statistics (2016)



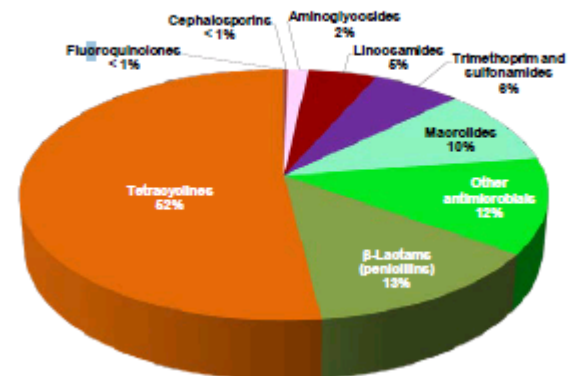
Antibiotic use in GF swine (feed only)

ROA (Feed +++); ATB (Tetracyclins +++)

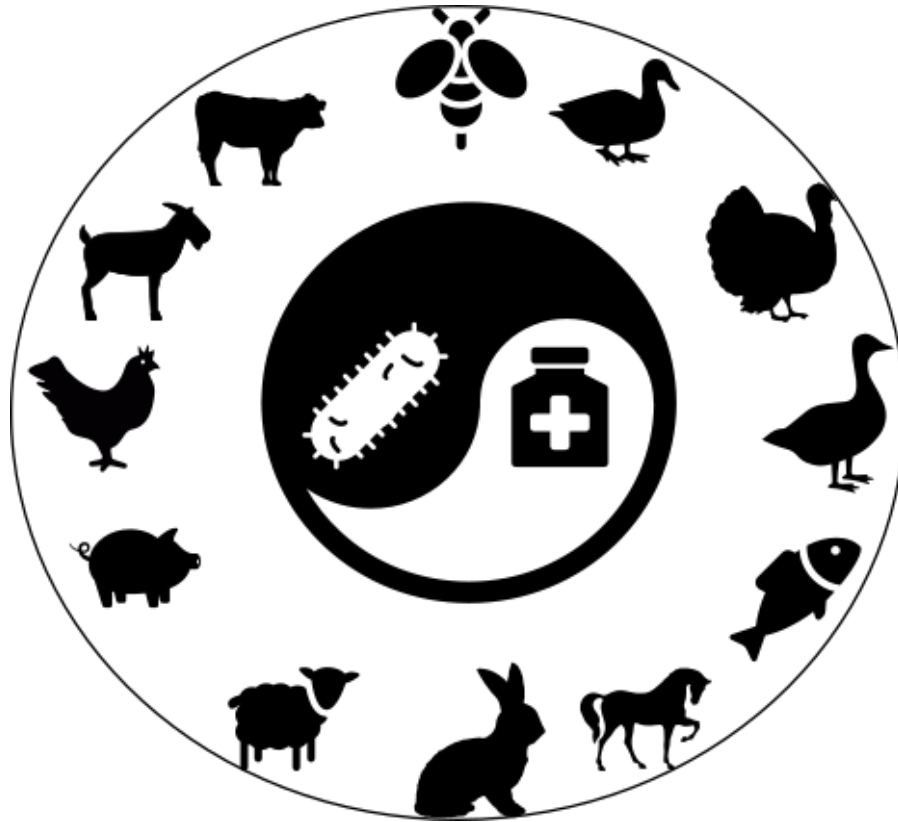
b) Grower-finisher pigs



c) Production animals



New Rules...



Major changes (local and global)



- **Antibiotic use in farm animals**
 - **Old way:** Safe, efficient, easy, low cost
 - **New way:** Safe, efficient, minimal, low cost

- **Justification for the use (MIA)**
 - **Old way:** Prevention, control, treatment **and performance**
 - **New way :** *Prevention*, control and treatment **only**
 - Europe (2006); US (January 1st 2017) and Canada (December 2018)

- **Oversight**
 - Mandatory prescription by a health professional
 - Rules for many years in Europe and Quebec
 - New in the US (January 1st 2017)
 - New in Canada (December 1st 2018)

Classification according to “importance”



- **Level 1**
 - Health Canada Category I, Very high importance
 - WHO* Critically important, highest priority

- **Level 2**
 - Health Canada Category II, High importance
 - WHO* Critically important, high priority

- **Level 3**
 - Health Canada Category III, Medium importance
 - WHO* Highly important

- **Level 4**
 - Health Canada Category IV, Low importance
 - WHO* Important

*Note: WHO recognizes they use STRONG words with LOW QUALITY EVIDENCE. AMR and AMU is obviously a complex issue.

Other changes



- **Focus on some antibiotics (Category I)**
 - Cephalosporins (3 | 4), fluoroquinolones, polymyxins (colistin) and penicillin's with β lactamase inhibitors
 - **Globally:** Lots of pressure to reduce (abolish) their use especially for prevention
 - **Locally (government of Québec):** Restrict their use for medically justified reasons (expected in 2019)
- **Reinforcement of the oversight on antibiotic use**
 - Prescription, Labels, Compounding, etc.
- **Drug use policy of the Canadian pork excellence program**
 - Transparency, marketing, pork quality
- **Others**



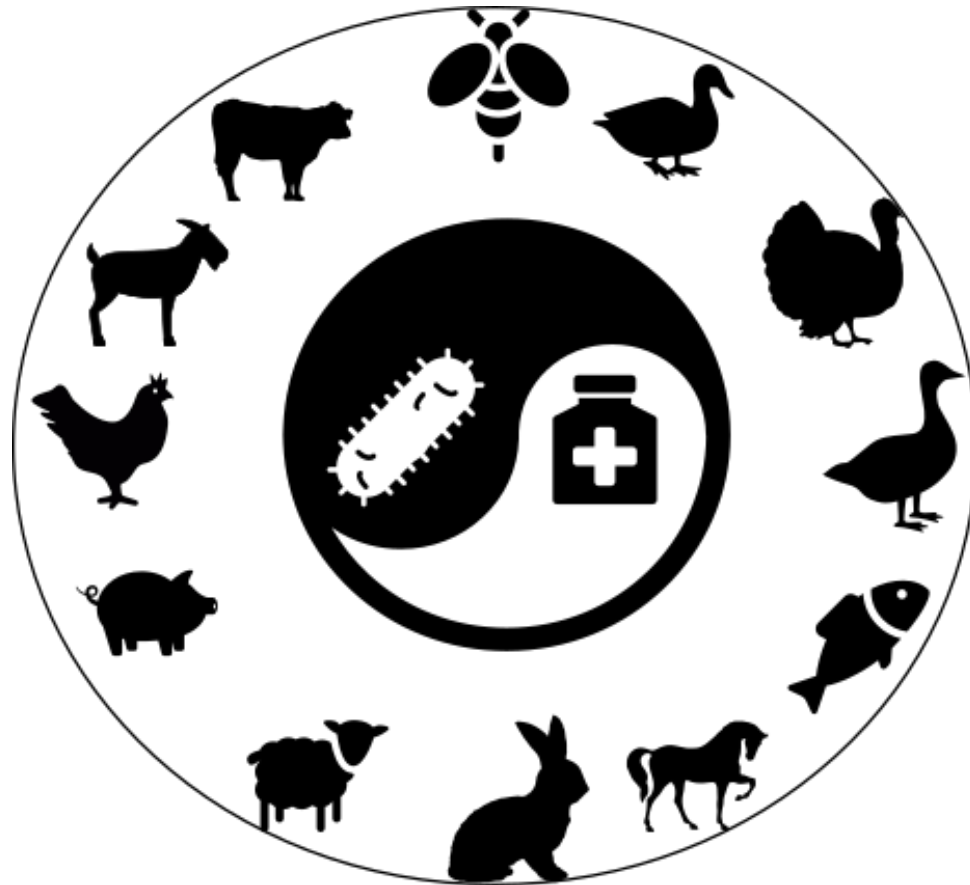
Ideas to be retained



- Antibiotics are a recognized and necessary tool but it should be used prudently (more prudent than up to now).
- Antibiotic should be used as little as possible but as much as necessary (source: EPRUMA).
- When disease has to be treated or controlled we have to : 1) choose the right product; 2) the right dose; 3) the right duration; 4) insure they are delivered to animals as recommended (clear instructions).
- When the animals are close to market some extra care needs to be taken in the drug selection, the dose and withdrawal time to insure absence of residue



A wiki to summarize ideas and data...





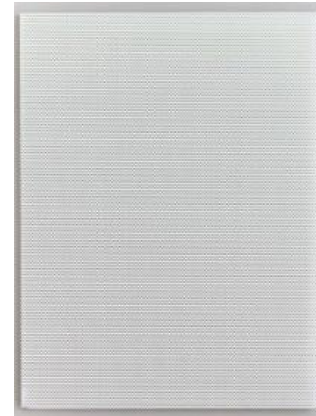
My Genetic background



Committee working frame

2004-06 QC

2016- CAN



Putting data together is simple...



- **Extract data**

- WHOCC ATCvet code - online
- Health Canada - Online
- Compendium labels - online



- **Transform the data**

- Standardize coding, naming and classification
- Rearrange data for various customers

- **Reload and share data lists (information)**

- Web sites (wiki)
- Information system developers
- Monitoring documents (MAPAQ, CIPARS)

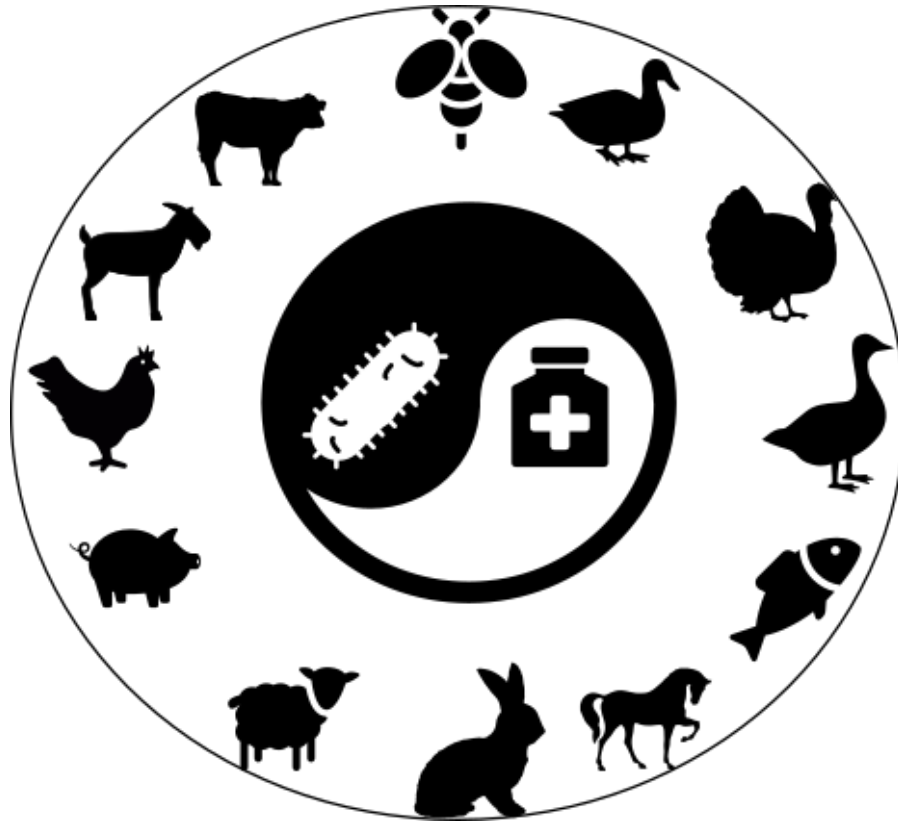
Registered antimicrobial



Species	DIN (SC)	Dosage form
Cattle (Bos taurus)	159	90
Swine (Suides)	158	84
Chicken (Gallus)	84	50
Sheep (Ovis aries)	68	36
Turkey (Melagris)	48	30
Horse (Equus)	39	23
Goat (Capra hircus)	8	5
Bees (Apis)	5	5
Rabbit (Cuniculus)	5	4
Salmonidae	4	4
Duck (Anas)	2	2
Goose (Anser)	2	2
Others	82	65
Animals	398	199
Humans	464	



How can we do better...



Actions to be taken



- Globally in Canada
 - Better documentation on the different options to treat animals
 - Research on AMR and AMU
 - Standardized data to allow automatization (prescription, surveillance, etc.)

- At the farm level
 - Clarify conditions that require the use of antibiotics
 - Review routine treatments
 - More Diagnostics

 - Shorten treatment duration
 - In feed, longest treatment period, good indication for product use
 - Water, shorter treatment period, worse indication for product use
 - Injectable, shortest treatment period, good indication for product use

- Notice to the user
 - Indications on antibiotic use (clear language)
 - Right drug, right dose and the right duration

Condition requiring antibiotics



- Condition (bacteria)
 - Disease

- Neonatal enteritis (*Escherichia coli*)
 - Neonatal colibacillary diarrhea

- Neonatal enteritis (*Clostridium* spp.)
 - Neonatal *Clostridium* enteritis

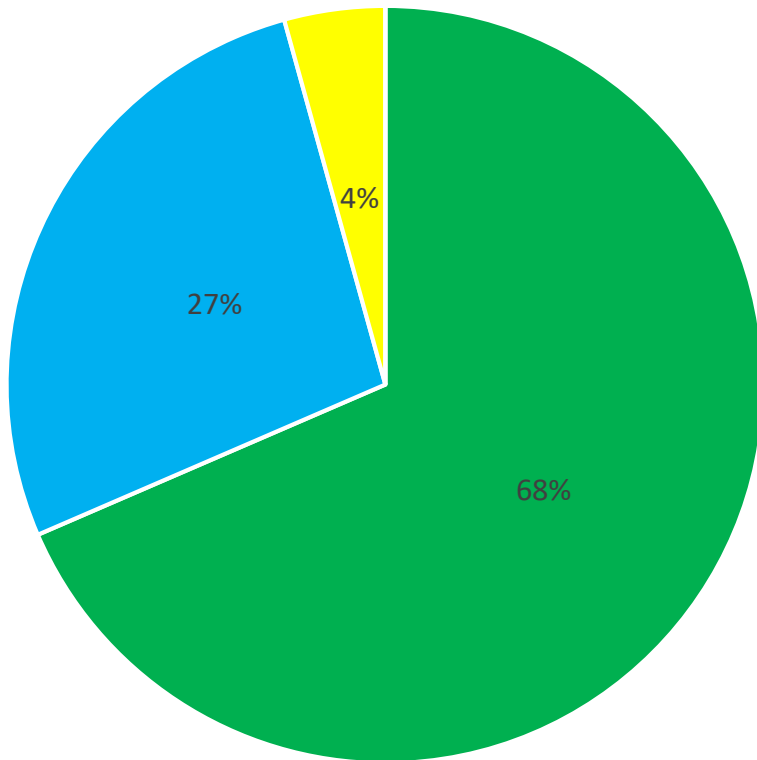
- Exudative Epidermatitis (*Staphylococcus hyicus*)
 - Exudative epidermatitis

- Enteritis (*Salmonella* spp.)
 - Salmonellosis

Route of administration

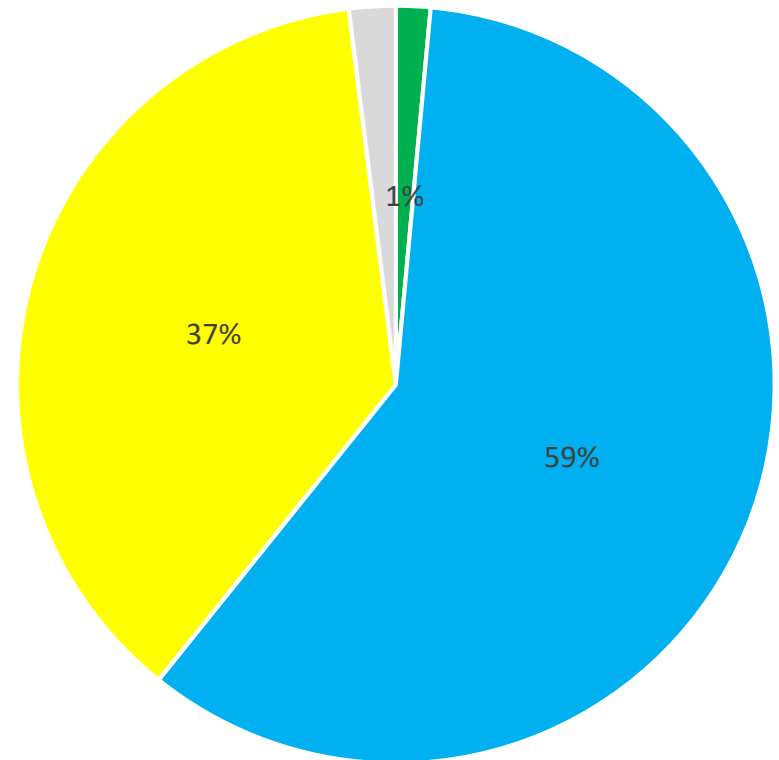


Spain (360 mg/pcu)



■ Feed ■ Water ■ Injectable ■ Other

Denmark (40 mg/pcu)



■ Feed ■ Water ■ Injectable ■ Other

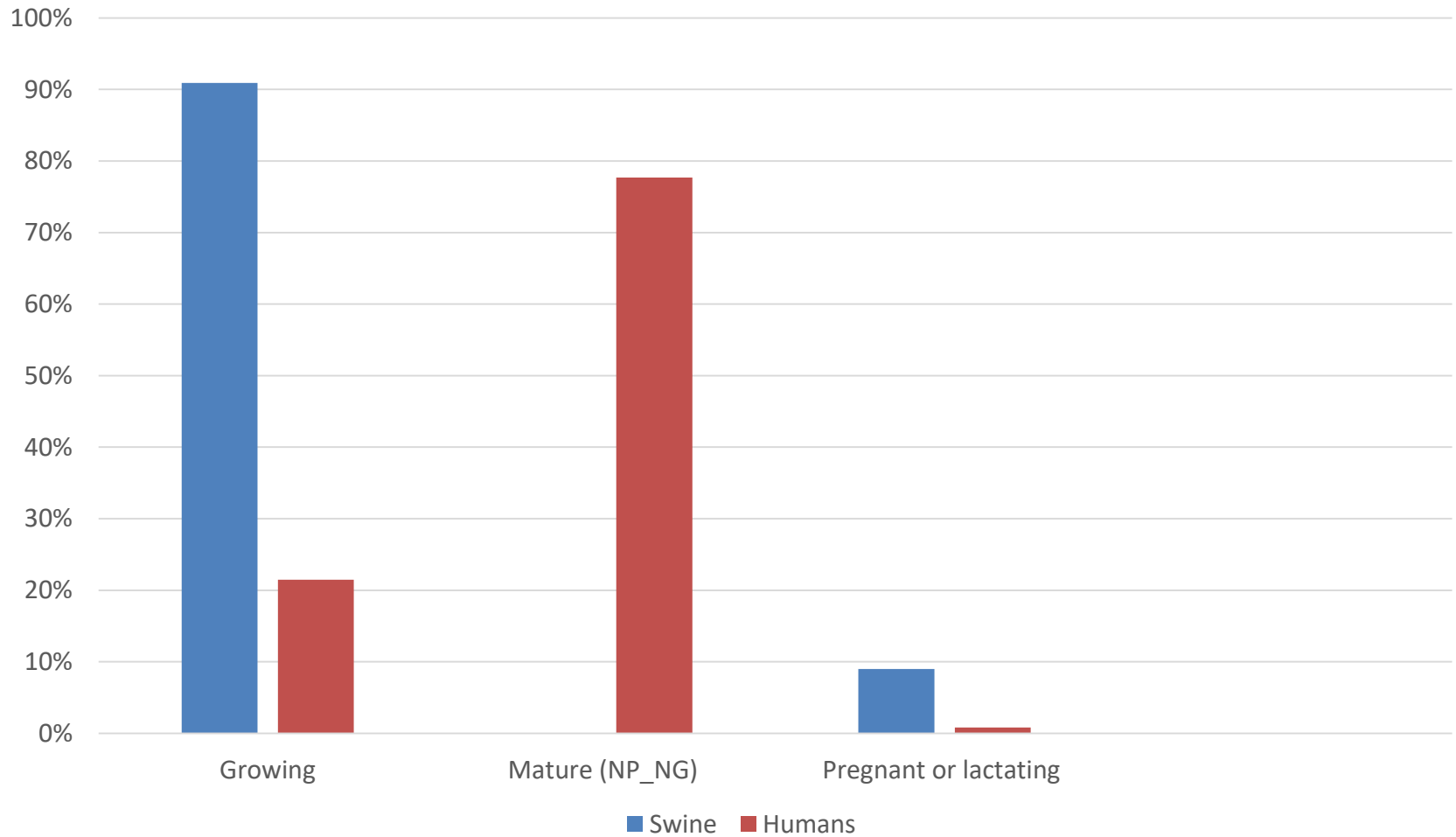
Label and clear language



- Health Canada guidelines (2017)
 - Information for the health professional
 - Scientific information about the product
 - Information for the user of the product in clear language

- Compendium on pharmaceutical products
 - Information for the health professional (++++)
 - Information for the user (incomplete)

Population characteristics



About « Label »



- Health Canada definition
 - The labels for drug products include package labels such as package inserts, prescribing information, fact sheets, or other materials containing drug product-specific information, whether
 - included in packaging
 - or supplied to the end user at the time of
 - or after purchase

- At the farm level
 - Information included with the product
 - Information provided by the health professional (veterinarian)

Examples (clear language)



This medicated feed has been prescribed to control enteritis related to Lawsonia. This medicated feed contains Tylosin at 110 mg/kg (ppm) and should be fed as a sole ration continuously to growing pigs weighing between 65 and 85 kg (\approx 21 days)

This injectable antibiotic has been prescribed to control systemic infections of the newborn piglet in order to prevent infectious arthritis and umbilical hernias. Each newborn piglet should be injected with a single dose of 0.1 ml (cc) of Borgal (295 mg / ml)

This medicated water potion has been prescribed to control bacterial pneumonia in weaner pigs. Each nursery piglet, weighing approximately 15 kg, should obtain a daily amount of 1 gram of amoxicillin distributed through the drinking water within an 8 hour period each morning.

Dose, dosing info., dosage regimen



- Dose
 - The precise amount of medication to be administered to a patient (ex: 1 ml/pig)
- Dosing information
 - 10 mg/kg of body weight, 5 mg/m² of skin
- Dosing regimen
 - Fantasy_drug, 200 mg twice a day for 3 days.

Animal size, a major issue for dosing



- Food animals

- Many age, weight, physiological states

- Swine

- New born piglet (1-2 kg)
- Piglet (2-7 kg)
- Weaner (7-25 kg)
- Grower (25-50 kg)
- Finisher (50-125 kg)
- Breeder (125-150 kg)
- Sow (gestation) (250-300 kg)
- Sow (lactation) (250-300 kg)
- Boar (300-350 kg)
- Adult (mature)

- Other species



Conclusions



- Review routine treatments
- Define and specify the conditions that require the use of antibiotics. This might require investment in laboratory testing and consultation.
- When treatment is required, minimize duration of treatment.
 - Right product, right dose, shortest duration
- If close to market... withdrawal periods requires extra attention
- Make sure all the staff working at the farm has the indications on product use in a clear language format

Thanks



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Thank you

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