



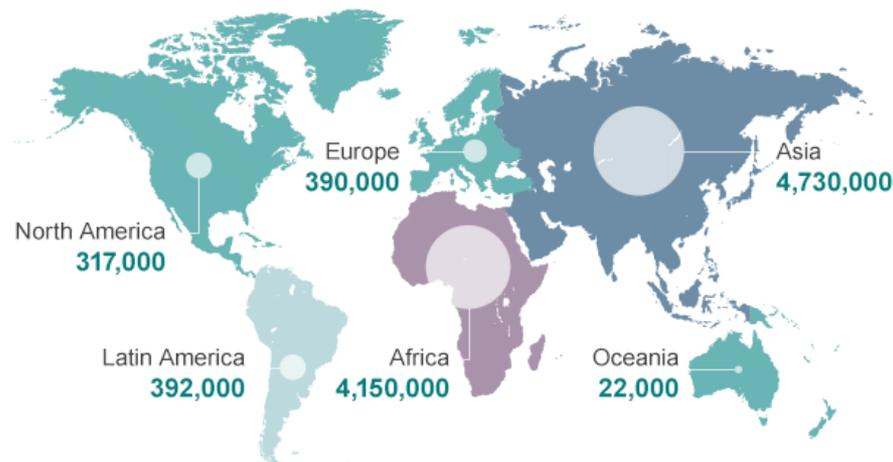
Antimicrobial resistance in food production

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Antimicrobial resistance (AMR)

- Recognised worldwide as one of the greatest threats to human and animal health, with potential serious consequences for public health, animal welfare and the agri-food sector (FSAI, 2015).
 - Can result in longer illnesses, more hospitalisations, and more fatalities
- ECDC estimates that 25,000 deaths per year associated with AMR and €1.5 billion in healthcare costs and lost production in the EU.

Deaths attributable to antimicrobial resistance every year by 2050



Antibiotics in food production

- Introduced in veterinary medicine in the 1950s
 - therapy
 - prophylaxis
 - growth promotion
- Administered to groups, particularly in early life
- Often high usage in aquaculture
- Usage in plant disease prevention

Antibiotics in food production

- In some countries, the quantities of antibiotics used in food production may exceed the amounts used in clinical medicine.
- In the US, of the antibiotics defined as medically important for humans by the FDA, over 70% of the total volume used are sold for use in animals (Review on Antimicrobial Resistance, 2016).

Antimicrobial resistance in food production

- Antibiotic usage impacted on antibiotic resistance levels almost immediately
 - In England the prevalence of tetracycline resistant *E. coli* in poultry increased from 3.5% to 63.2% from 1957 to 1960 (Sojka and Carnaghan, 1961).
- Foods of animal origin are considered an important source of AMR bacteria. Whilst studies on foods of non animal origin are more limited they may also become contaminated with AMR bacteria during primary production, or at a later stage (FSAI, 2015).

Antimicrobial resistance in food production

- Antimicrobial resistant bacteria are transmitted to humans through the food chain, although the contribution of this transmission pathway to the overall problem of AMR in humans is not readily quantified (FSAI, 2015).
- General consensus is that unnecessary use of antibiotics in animals and agriculture is a significant concern for human health (Review on Antimicrobial Resistance, 2016).

What can be done to minimise dissemination of AMR in food production?



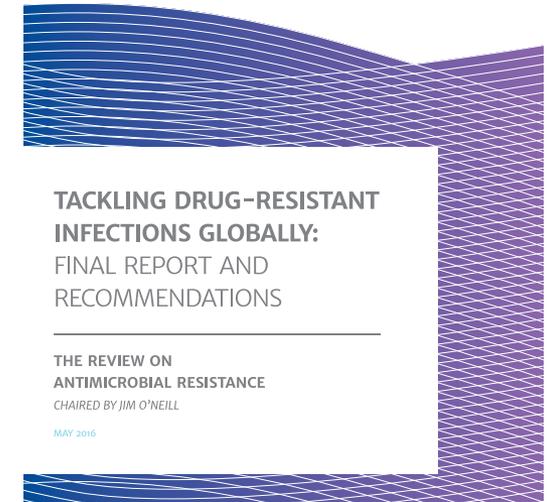
Addressing AMR in food production

- Where possible the requirement for antimicrobial agents in food production should be reduced;
- Use of targeted, as opposed to herd/flock-wide administration;
- Surveillance of antimicrobial usage should be based on actual use and distinguished based on species and production stage;
 - One Health approach;
- Enhanced surveillance systems to clarify occurrence and sources of AMR bacteria.



Addressing AMR in food production

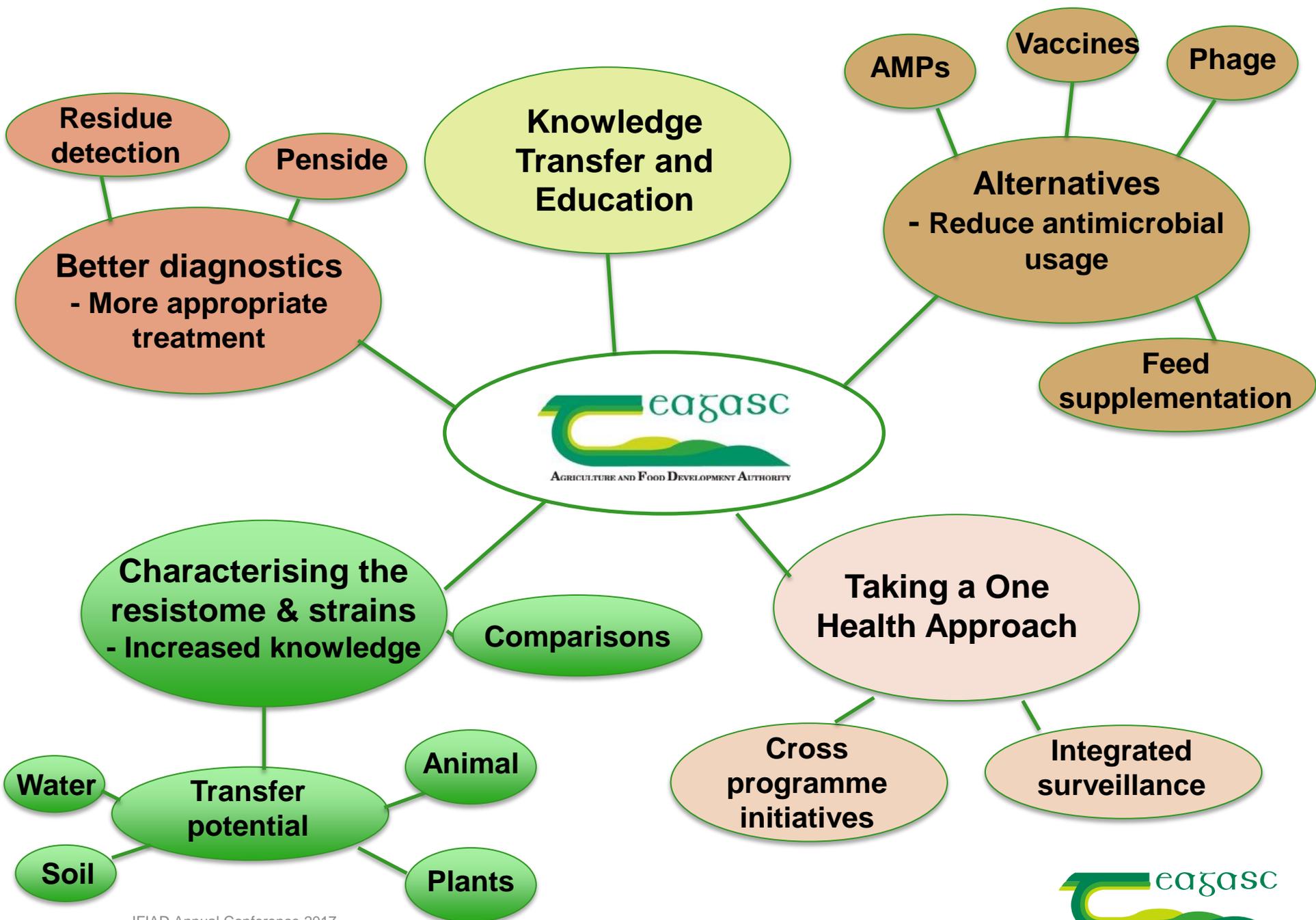
- Set targets to reduce unnecessary antibiotic use in agriculture;
- Restrictions and/or bans on certain types of highly critical antibiotics;
- Improve transparency from food producers;
- Improve surveillance data regarding usage and resistance development;
- Improved biosecurity and husbandry practices;
- Alternative options, including cost analysis.



Teagasc Technology Foresight 2035

- AMR in livestock production is a major global public and animal health issue of increasing concern.
- If pathogens develop resistance, the antimicrobials will stop working, animals will not respond to treatment, performance will suffer and death or other losses may increase.
- Antimicrobial resistant livestock pathogens may be able to pass their resistance on to human pathogens.





AMR in low and middle income countries

- Public awareness of AMR is lacking.
- Surveillance is often inadequate
 - Lack of laboratory capacity or infrastructure
 - Data management capability
- Access to appropriate antibiotics
 - Sale without prescription
 - Counterfeits
 - Internet sales
- No national regulatory authority.
- These regions will need support to address AMR.



No action today, no cure tomorrow

- Chan, 2011

Questions?

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