Food and Agriculture Organization of the United Nations

FMM/RAS/298: Strengthening capacities, policies and national action plans on prudent and responsible use of antimicrobials in fisheries Final Workshop in cooperation with AVA Singapore and INFOFISH

12-14 December, Concorde Hotel, Singapore

NAP AMR The Netherlands
Reduction in Antimicrobial Usage in Animals – Do We See Effects on Antimicrobial Resistance?

Daniela Ceccarelli, PhD (presented by Olga Haenen)

Daniela.Ceccarelli@wur.nl

- *Also presented at Dutch Knowledge Day, Hyderabad - November 20th 2017*

The Netherlands

- 12 million swine
- 100 million poultry
- 1,5 million dairy cows
- 1 million veal calves
- 1,5 million sheep and goats
- 6 million pets
- 500.000 horses
- A large wildlife population

Source: Ministerie EZ – publicatie 2016: Veterinary system in the Netherlands

WBVR: Antimicrobial Resistance Group

- **Dik Mevius** (Prof., Head)

- **Daniela Ceccarelli** (Sr. Res.)
- **Kees Veldman** (Sr. Post-doc)
- **Mike Brouwer** (Post-doc)
- **Ayla Hesp** (PhD)
- **Arie Kant** (Res. Tech.)
- **Yvon Geurts** (Res. Tech.)
- **Joop Testerink** (Routine Tech.)
- **Marga Japing** (Routine Tech.)

Monitoring/Research

Kees Veldman

Marga Japing

Joop Testerink

Research

Daniela Ceccarelli

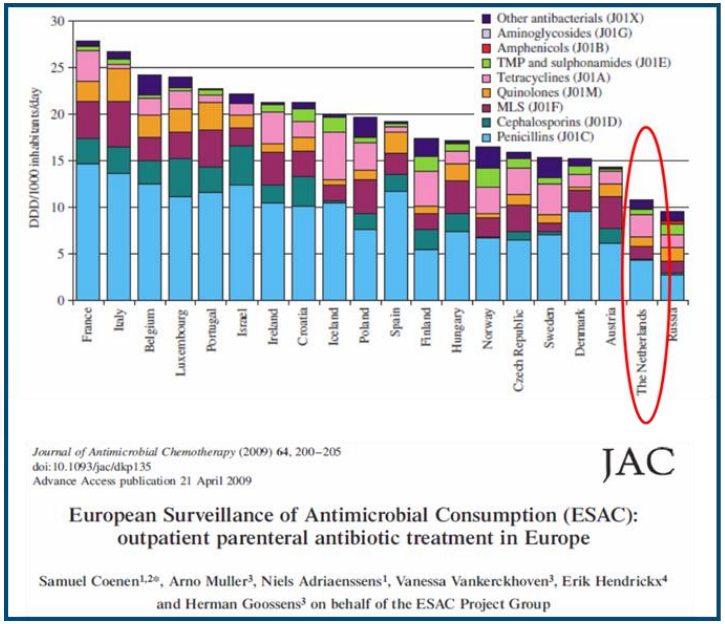
Mike Brouwer

Ayla Hesp

Yvon Geurts

Arie Kant

A few years back (2007): Antibiotic usage in humans and animals



Journal of Antimicrobial Chemotherapy (2009) **64**, 200–205
doi: 10.1093/jac/dkp135
Advance Access publication 21 April 2009

JAC

European Surveillance of Antimicrobial Consumption (ESAC): outpatient parenteral antibiotic treatment in Europe

Samuel Coenen[1,2]*, Arno Muller[3], Niels Adriaenssens[1], Vanessa Vankerckhoven[3], Erik Hendrickx[4] and Herman Goossens[3] on behalf of the ESAC Project Group

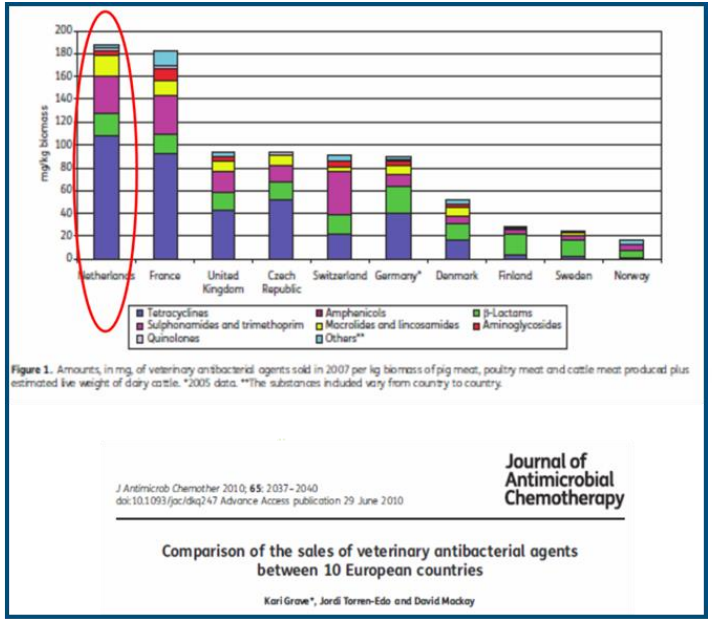


Figure 1. Amounts, in mg, of veterinary antibacterial agents sold in 2007 per kg biomass of pig meat, poultry meat and cattle meat produced plus estimated live weight of dairy cattle. *2005 data. **The substances included vary from country to country.

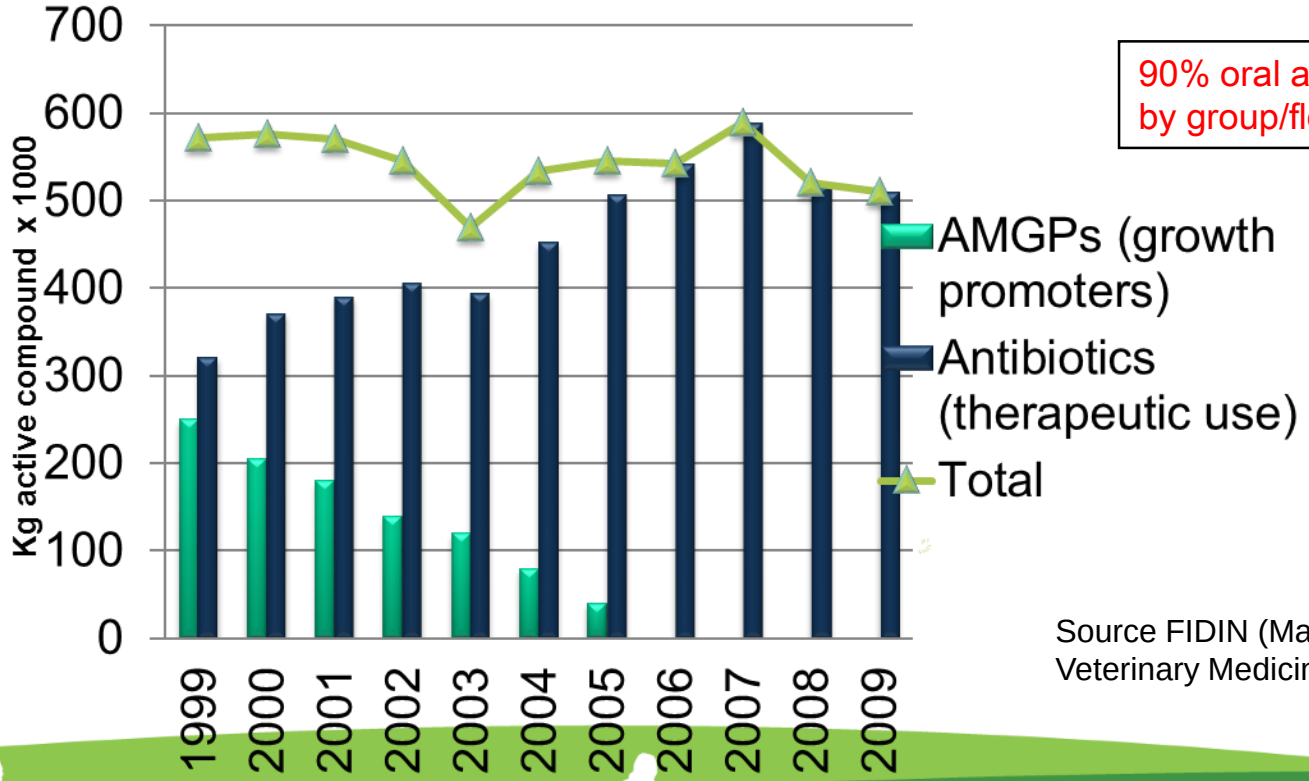
J Antimicrob Chemother 2010; **65**: 2037–2040
doi:10.1093/jac/dkq247 Advance Access publication 29 June 2010

Journal of Antimicrobial Chemotherapy

Comparison of the sales of veterinary antibacterial agents between 10 European countries

Kari Grave*, Jordi Torren-Edo and David Mackay

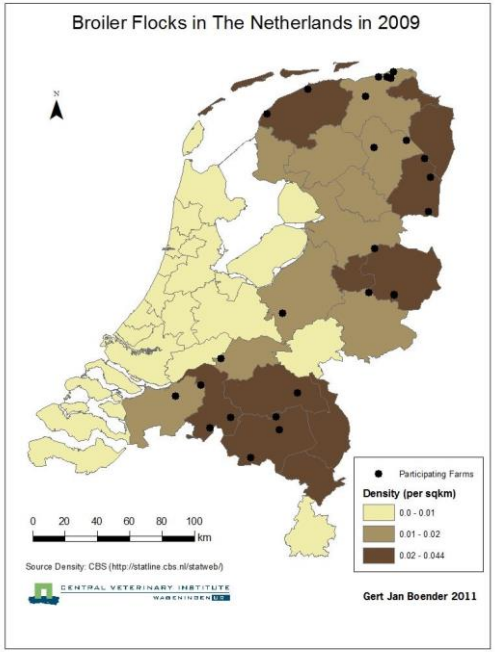
Antibiotic sales for animal usage in the Netherlands

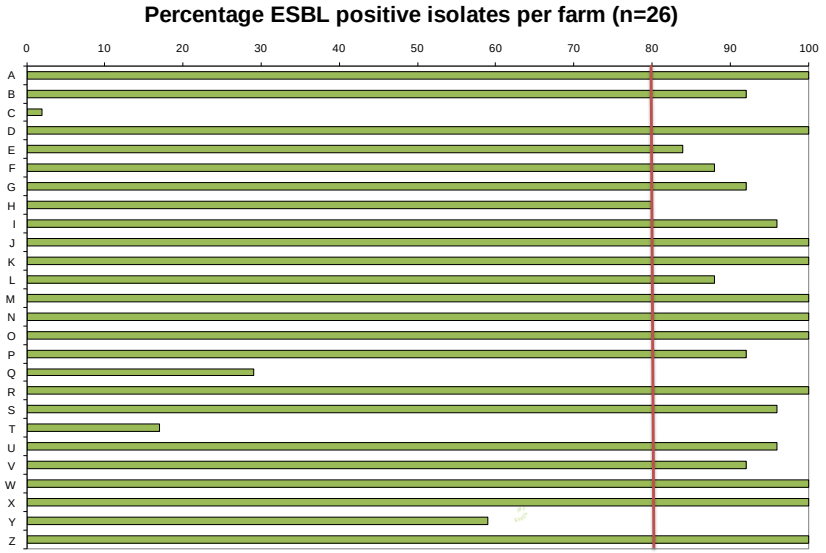


90% oral administration by group/flock mediation

Source FIDIN (Manufacturers Importers Veterinary Medicines Netherlands)

Prevalence of ESBL-producing *E. coli* in Dutch broiler farms (2009)



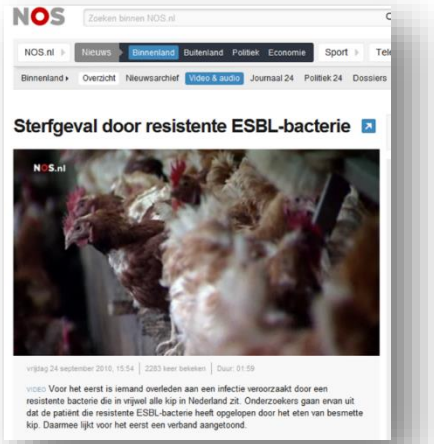


- 100 % of the farms: ESBL-*E. coli* positive
- On 85 % (22/26) within-farm prevalence ≥ 80%
- Prevalence UK: 3.6%

Dierikx C et al., 2013.
Extended-spectrum-β-lactamase- and AmpC-β-lactamase-producing Escherichia coli in Dutch broilers and broiler farmers.
J Antimicrob Chemother. 2013 Jan;68(1):60-7. doi: 10.1093/jac/dks349. Epub 2012 Sep 4.

Determinants for change in policy

- Consecutive crises in animal production
  - BSE, Q-fever, MRSA, **ESBLs**
- Debate about effects of increase in farm sizes
- Public health concern



Report of the Health Council Committee

Measures taken

Measures by Competent Authorities

- **Legally binding measures:**
  - **AB preventive use is no longer allowed** (diagnosis required)
  - **3rd choice drugs** (FQs and 3rd/4th Gen Cephs)
    - Only allowed based on antibiogram demonstrating that no alternative option are available
    - NRL-AMR needs to control the quality of susceptibility tests of diagnostic laboratories
  - **Mandatory treatment and health plan for each farm**
    - Only 1st choice drugs allowed to be present on farms

Measures by Veterinary Association

- **Implement a Quality Assurance System for veterinarians**
  - Guidelines for treatment of certain diseases, appropriate use of antibiotics
  - Update of formularies according to changed regulations
  - Write a guideline for 1st, 2nd, 3rd choice drugs
    - Accepted by both ministries (Health and Agriculture)
    - Formularies are the binding source for treatment plans

Measures by Livestock producers:

Ban use of certain products

Implement certification system for farms and vets

Private control system on prescription patterns

Mandatory formularies

New targets added

No use in animals of all new antibiotics:
Carbapenems, tigecycline, daptomycin, oxazolidones, mupirocin

Fluoroquinolones and 3rd/4th generation Cephalosporins:
No use in animals unless demonstrated that no alternative treatment options are available

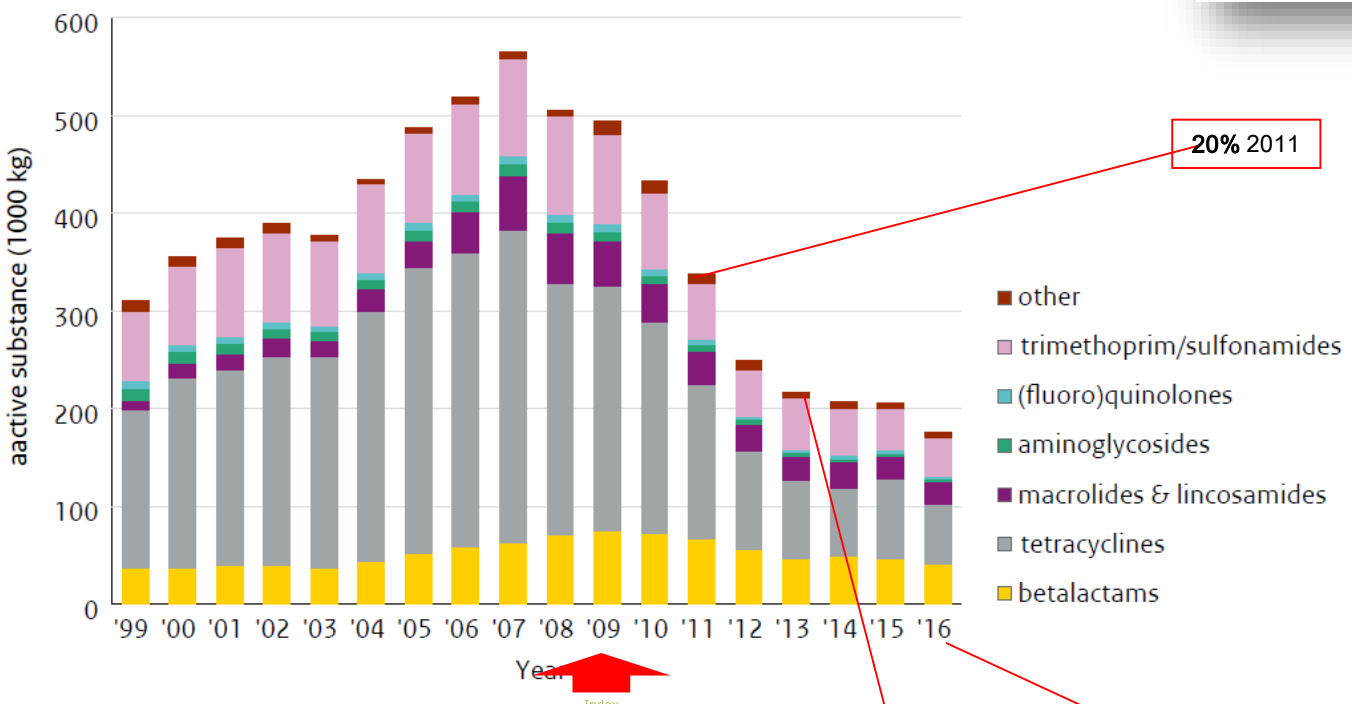
Colistin, beta-lactams, aminoglycosides

All classified as second choice antibiotics
Only allowed unless appropriate diagnostics by veterinarian

Mandatory 50% reduction of antibiotic usage in animals in 2013

Reduction of antibiotic sales

Figure ABuse01 Antimicrobial veterinary medicinal product sales 1999-2016 in kg (thousands)



The Dutch model

J. Verbr. Lebensm.
DOI 10.1007/s00003-014-0874-z

Journal für Verbraucherschutz und Lebensmittelsicherheit
Journal of Consumer Protection and Food Safety

ANNOUNCEMENTS AND REPORTS

Reduction of antibiotic use in animals "let's go Dutch"

Dik Mevius · Dick Heederik

ORIGINAL ARTICLE

Reduction of Veterinary Antimicrobial Use in the Netherlands. The Dutch Success Model

D. C. Speksnijder[1,2], D. J. Mevius[1,3], C. J. M. Bruschke[4] and J. A. Wagenaar[1,3]

[1] Department of Infectious Diseases and Immunology, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands
[2] Veterinary Clinic Tweestromenland, Wijchen, the Netherlands
[3] Central Veterinary Institute (CVI) of Wageningen UR, Wageningen, the Netherlands
[4] Chief Veterinary Officer, Ministry of Economic Affairs, the Hague, the Netherlands

Reduction in Antimicrobial Usage in Animals

We Do See Effects on Antimicrobial Resistance

Occurrence of antimicrobial resistance in commensal *E. coli*

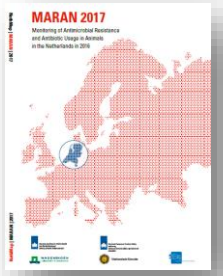
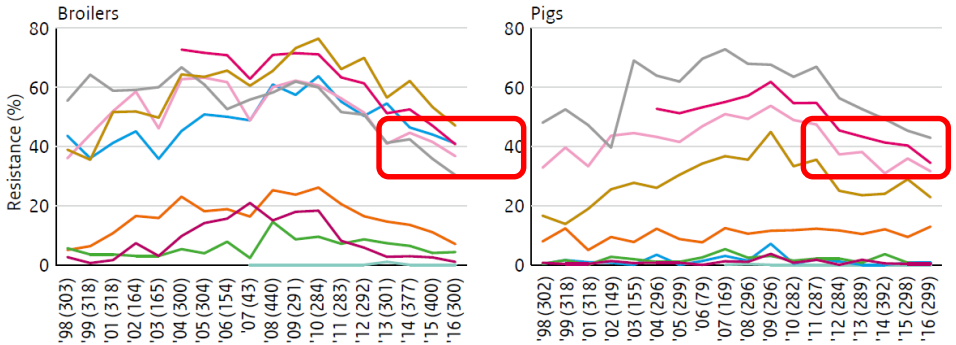
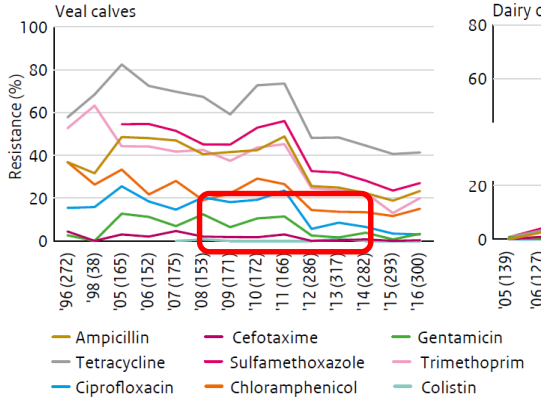


Figure Eco01 Trends in resistance (%) of *E. coli* isolated from broilers, slaughter pigs, veal calves and dairy cattle in the Netherlands from 1998-2016.





Have we realized our reduction-ambitions?

- Yes
  - Usage quantity
    - in reduction of sales
    - In reduction of prescriptions by vets and usage on farms
  - Usage quality
    - Substantial less usage of 3rd choice drugs
    - Less group treatments (pigs, calves)
    - More selective dry cow treatment
  - Surprisingly fast and substantial effect on the occurrence of resistance in food-animals

Critical success factors were

- **Clear targets** defined by the authorities
- **Collaboration** of private animal production sectors and veterinary association, aimed at prudent use and transparency
- **Independent control** institute (SDa)
  - Benchmarking of farms and veterinarians
- National **AMR monitoring** program that facilitates to follow the trends

Is it sustainable?

- Yes, but it needs <u>active ongoing policy to more sustainable animal husbandry systems</u> and awareness in all stakeholders involved

Active ongoing policy

AMR monitoring program
Salmonella, 1998
E. coli, 1998
Enterococci, 1998
STEC, 1999
Campylobacter, 2000

Targeted
Human & animal
Major livestock species

Updated
ESBL in meat, 2006
Carbapenemase, since 2014
Colistin, since 2016

Basis for (inter)national policies

Second Health Council Report (Dec. 2015)

Policy to reduce usage has been effective, however

- Reduction stopped in 2015
- Need to remain aware/vigilant
- New emerging AMR targets of concern (CP and *mcr-1*)
- Companion animals
- Policy and research should focus at
  - Characterize AMR determinants and act on them
  - Increase attention for measures that are implemented

Last but not least

- Keep the focus at innovative livestock production systems (farms and chains)
- Sustainable, adequate infection control, biosecurity, health control and minimal antibiotic usage

Thank you for your attention

National Reference Laboratory on Antimicrobial Resistance in Animals

Wageningen Bioveterinary Research

Lelystad - The Netherlands