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Pig Production without Antibiotics



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- Why?
- How?
- Effect on economics of farms?
- Alternatives?



Pig Production without Antibiotics?



Some remarks:

- Car without a motor?
- Dog without teeth?
- Restaurant without waiters?



- Are we crazy?





WHY?

NEWSFOCUS

INFECTIOUS DISEASE

From Pigs to People: The Emergence of a New Superbug

The discovery of a novel strain of MRSA able to jump from livestock to humans has sparked a multicountry effort to see how dangerous it might be

The first infection was puzzling, almost inexplicable. In July 2004, Andreas Voss of Radboud University Nijmegen Medical Center in the Netherlands admitted a 6-month-old girl for surgery to repair a congenital heart defect.

Because an infection with the common bacterium *Staphylococcus aureus* would pose a grave risk following heart surgery, Voss and his colleagues screened the baby girl for the microbe. They found not just *S. aureus* but also a menacing drug-resistant form known as methicillin-resistant *S. aureus* (MRSA). The physicians were flummoxed. Although MRSA has reached epidemic proportions in

or other livestock harbored MRSA, and no MRSA strain had ever been known to jump from livestock to humans. If the Dutch doctors' fears were correct, a novel strain had just gained that ability, opening up a new route for a potentially dangerous superbug to spread among humans. "Initially, we were very much afraid that this would be a major problem that could spread to the entire population," says Jan Kluytmans, a microbiologist at VU University Medical Center in Amsterdam

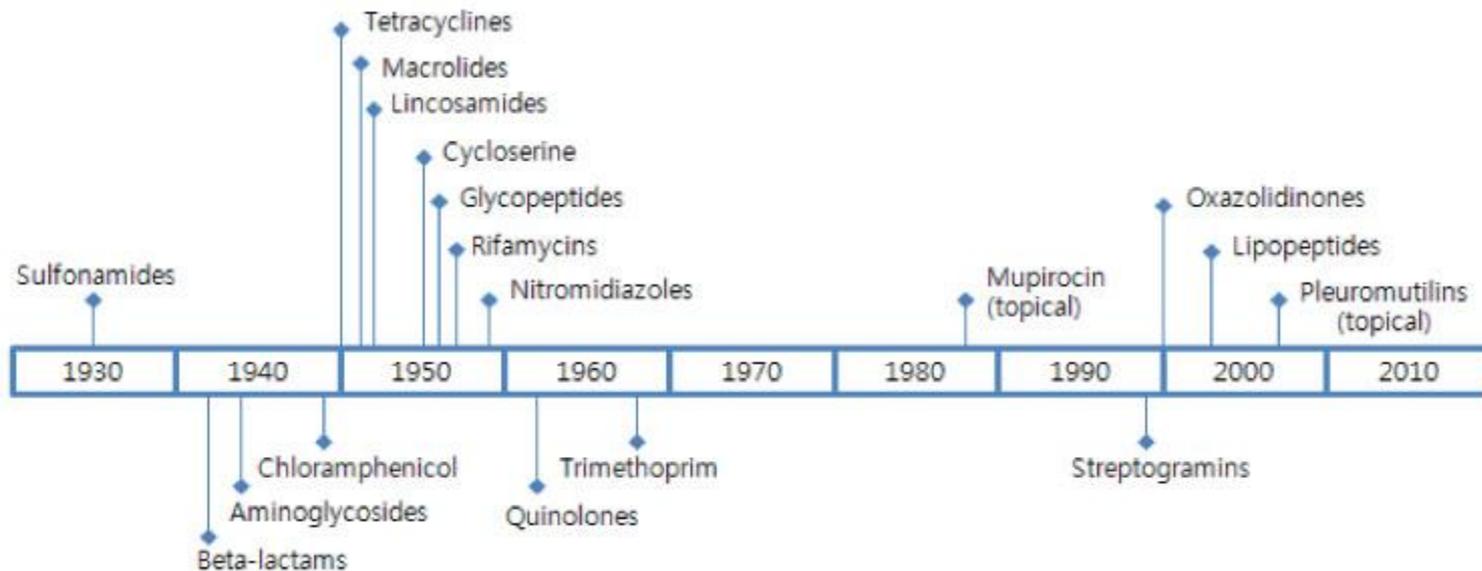




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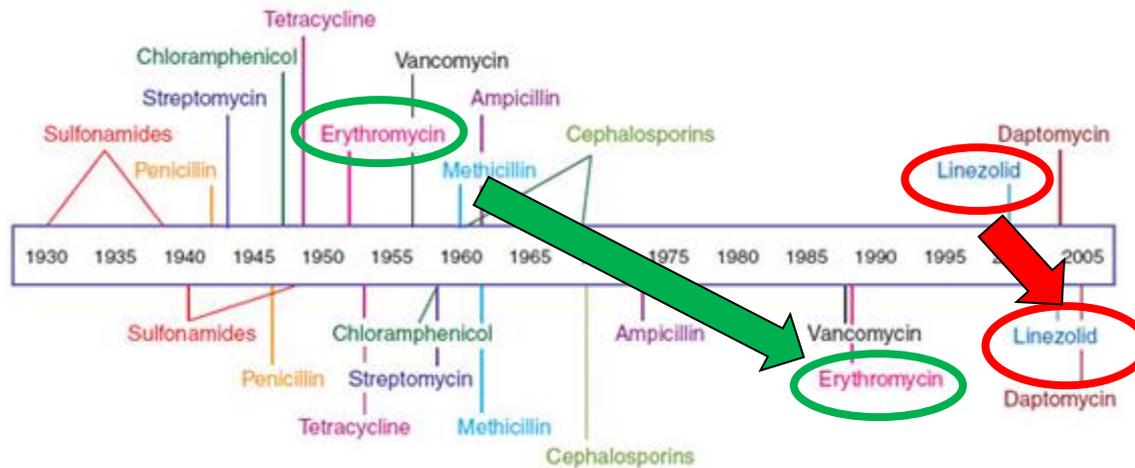
**Development of antimicrobials: since 1968 only 5 new classes,
1935-1968: 14**





Antibiotic resistance: always occurs

Antibiotic deployment

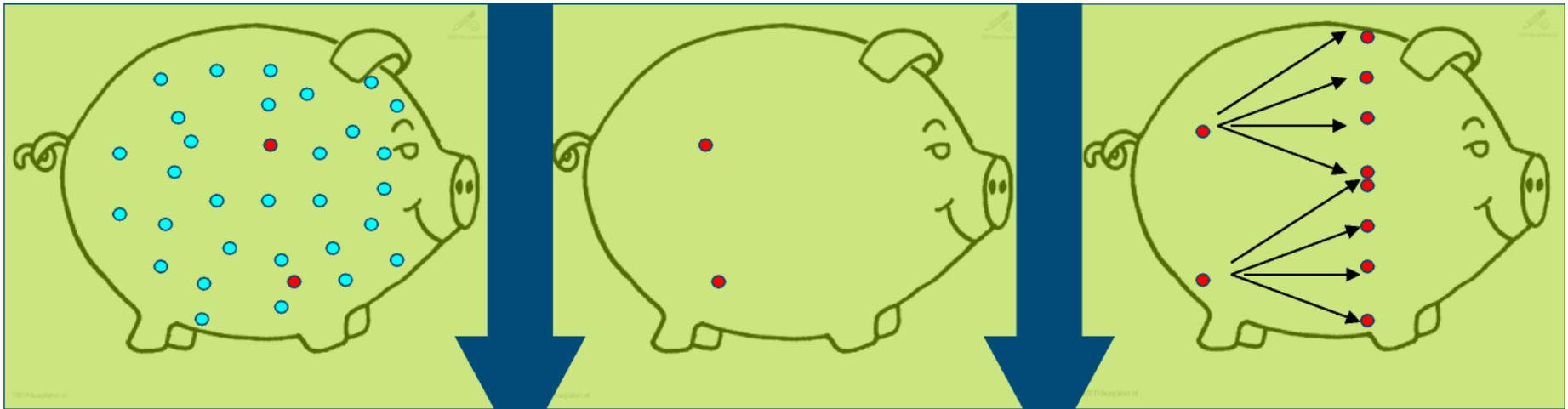


Antibiotic resistance observed



How does it occur?

- More antibiotic use → better selection of resistant variants ●





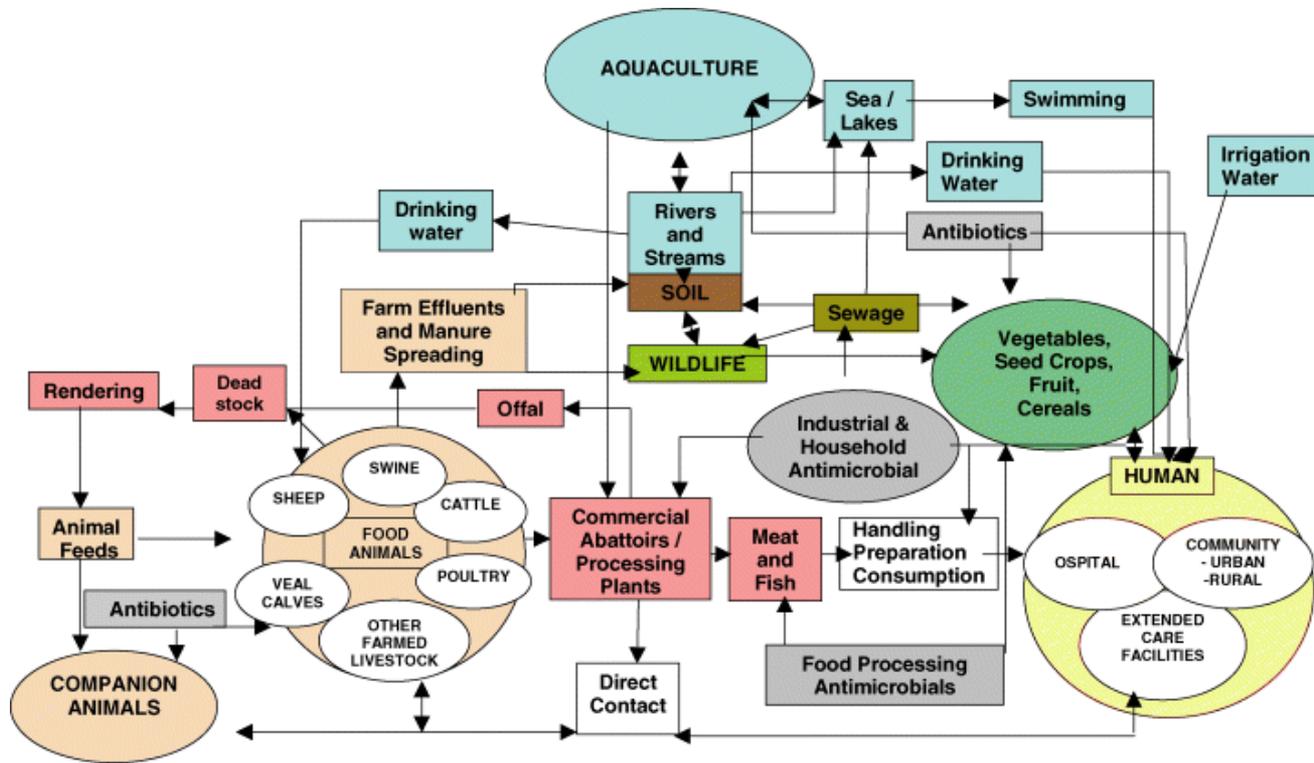
“It does not reach us, we cook the meat!”

Nonsense:

- Also contamination during preparation possible
- Other routes transmission



It does reach us! → contact wth animals, contaminated animal products





That is why Decrease in animals - benefit for humans

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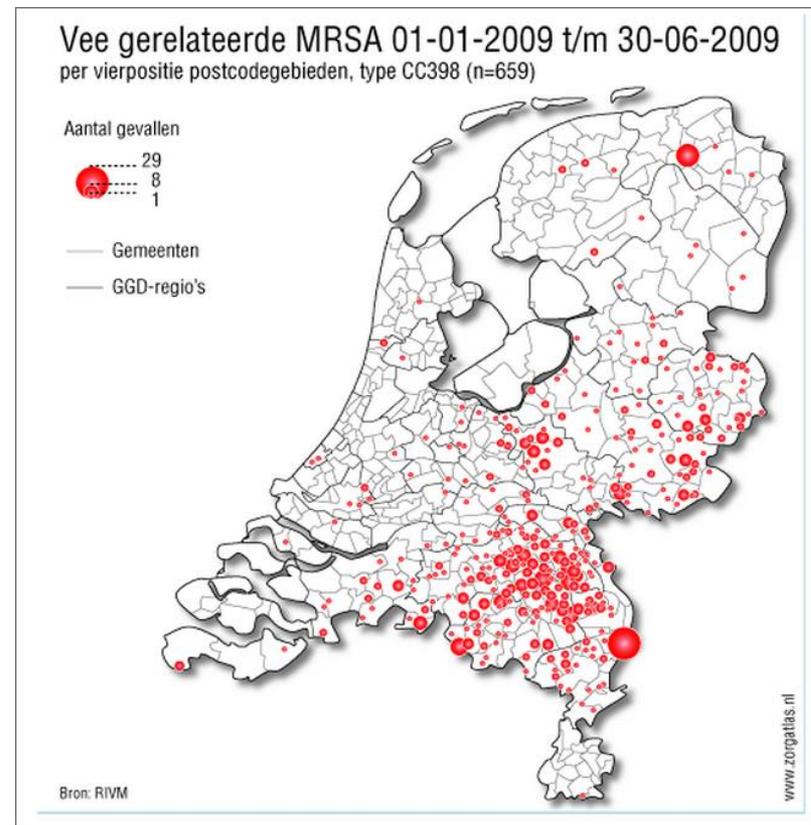
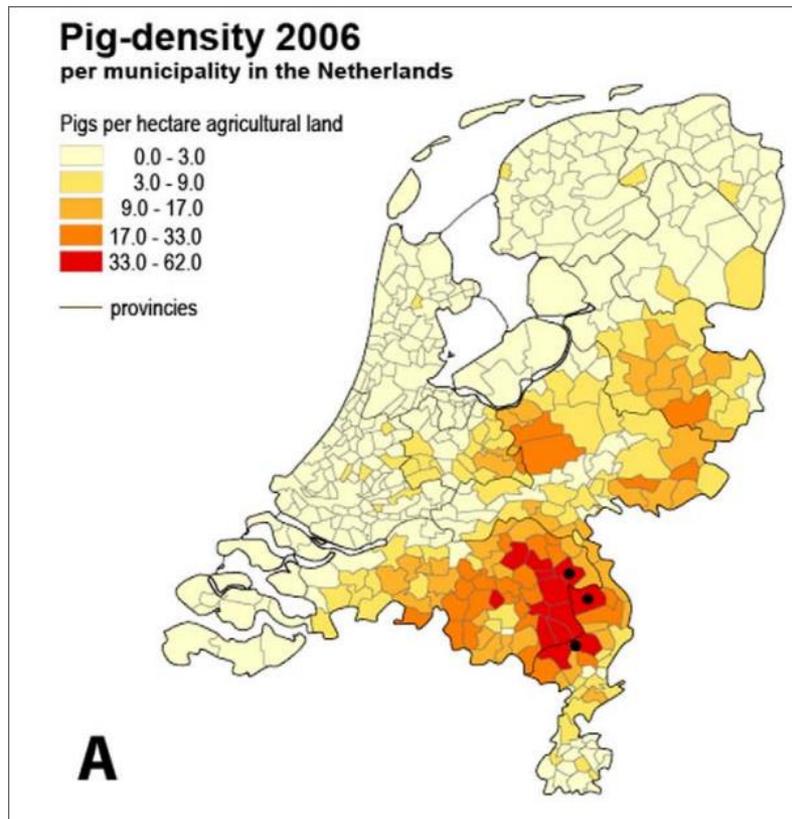
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Pig density and livestock associated MRSA in humans





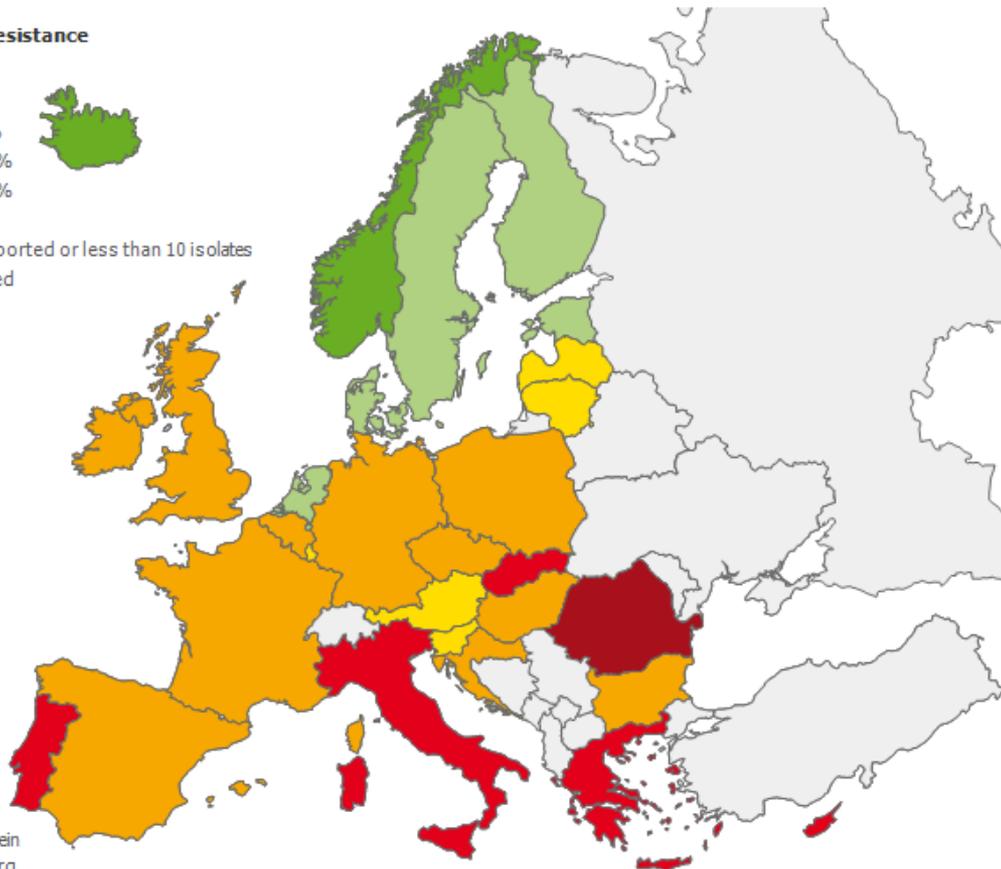
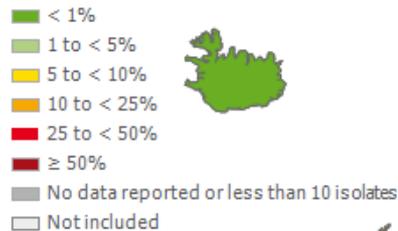
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Proportion of Methicillin Resistant *Staphylococcus aureus* (MRSA) Isolates in Participating Countries in 2013

Percentage resistance



■ Liechtenstein
■ Luxembourg
■ Malta

(C) ECDC/Dundas/TESSy

→ More human disease and deaths



How? Example-NL

- Goals set by the Dutch government
- Agreement with industry:
 - Target -20% in 2011)
 - Target -50% in 2013)
 - Target -70% in 2015)
- Setting up of Veterinary Drug Authority (SDA)
- Mandatory recording of prescription and usage



SETTING OF BENCHMARK VALUES

Based on prescriptions pro farm:

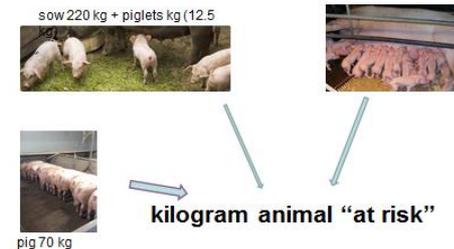
‘Animal Daily Dose’:

Calculated by treatable weight (based on prescriptions) divided by “kg animal” at risk

ANIMAL DAILY DOSE/Y

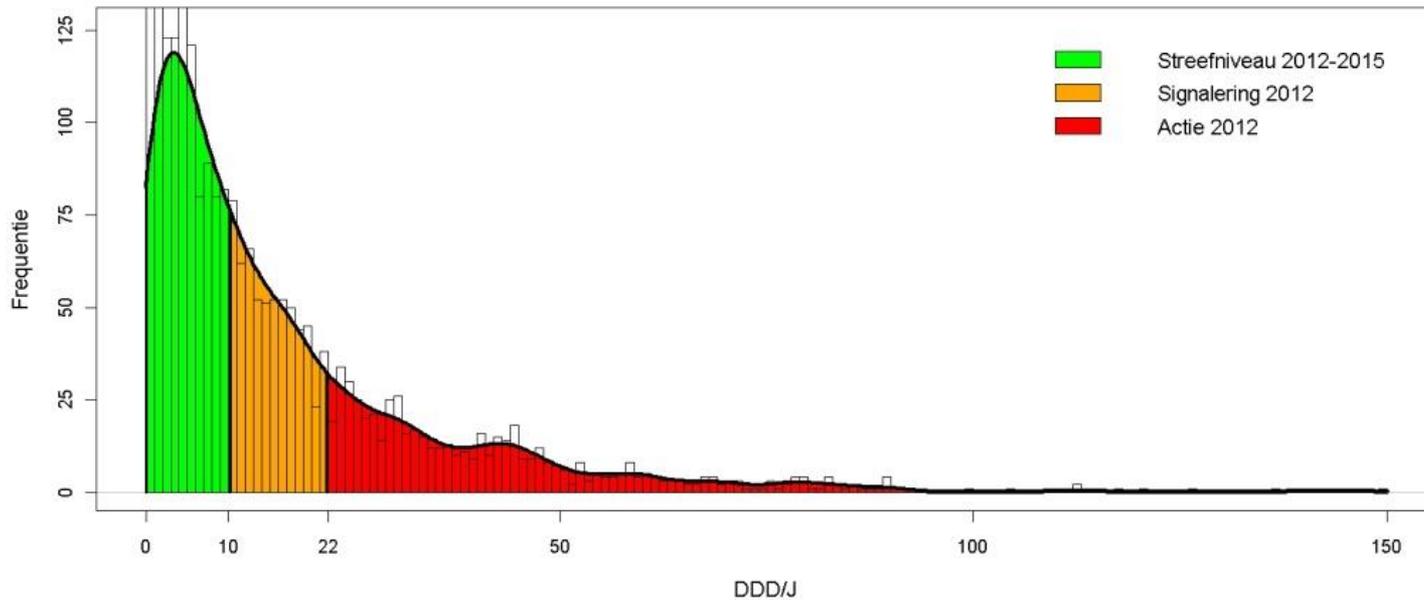


DENOMINATOR FOR PIGS





DISTRIBUTION OF AM USAGE



Sows with piglets farms, based on data of 2011



SETTING OF BENCHMARK

Table 2. Quantitative benchmark indicators for antibiotics usage (AADD/Y) in broilers, sows/piglets, fattening pigs, cattle and veal calves for 2013. Green means 'no immediate action required'; orange means 'high usage, requires additional attention'; and red means 'immediate action required'.

**> 22
AADD/Y**

ACTION THRESHOLD

Direct measures required which reduce use of antimicrobials immediately

10 - 22

SIGNALING THRESHOLD

Use of antimicrobials requires attention

< 10

TARGET VALUE

No action required

Animal Type	Benchmark Indicators for Individual Farms (AADD/Y)		
	Target Level 2012 - 2015	Signaling Level 2013	Action Level 2013
Cattle			
- Dairy cattle	0 - 3 (4#)	> 3 - 6 (> 4 - 7#)	> 6 (7#)
- Suckler cows	0 - 1	> 1 - 2	> 2
- Beef bulls	0 - 1\$	> 1 - 2\$	> 2\$
- Rearing cattle	0 - 1\$	> 1 - 2\$	> 2\$
Veal calves			
- White veal calves	0 - 23	> 23 - 39	> 39
- Rosé starter	0 - 67	> 67 - 110	> 110
- Rosé fattening	0 - 1	> 1 - 6	> 6
- Rosé combination	0 - 12	> 12 - 22	> 22
Pigs			
- Sows and piglets	0 - 10	> 10 - 22	> 22
- Fattening pigs	0 - 10	> 10 - 13	> 13
Broilers			
- AADD/Y	0 - 15	> 15 - 30	> 30
- Treatment days*	0 - 17*	> 17 - 34*	> 34*



The figure between parentheses is the value determined on the basis of the 'LEI' methodology.¹

* Expressed as the number of treatment days per year.

\$ Indicative values; will be adjusted in the autumn of 2013 or 2014 as necessary.



SETTING OF BENCHMARK VALUES FOR VETS

- Based on one-to-one relationship
- Vet is responsible for population of farms
- Based on $DDDA_F$ of each farm

Voorschrijfniveau	Veterinaire Benchmarkwaarde streefniveau, signaleringsniveau en actieniveau
Actiegebied	> 0,30
Signaleringsgebied	0,10 – ≤ 0,30
Streefgebied	< 0,10



Results of antibiotic usage reduction:

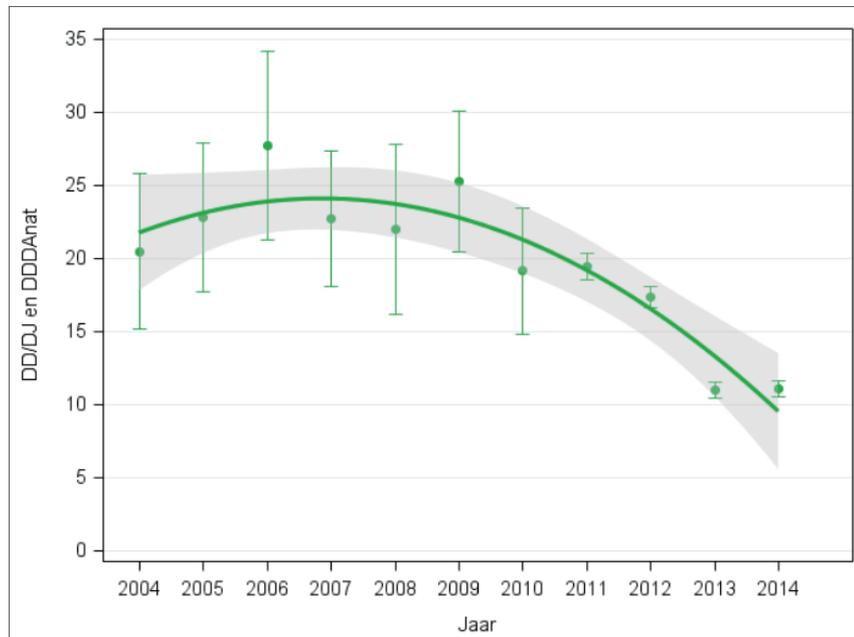
- 2011: -32 % (target 20% in 2011)
- 2012: -49 % (target 50% in 2013)
- 2013: sows, piglets: -60%, fatteners -69% (target -70% in 2015)
- Limit reached?



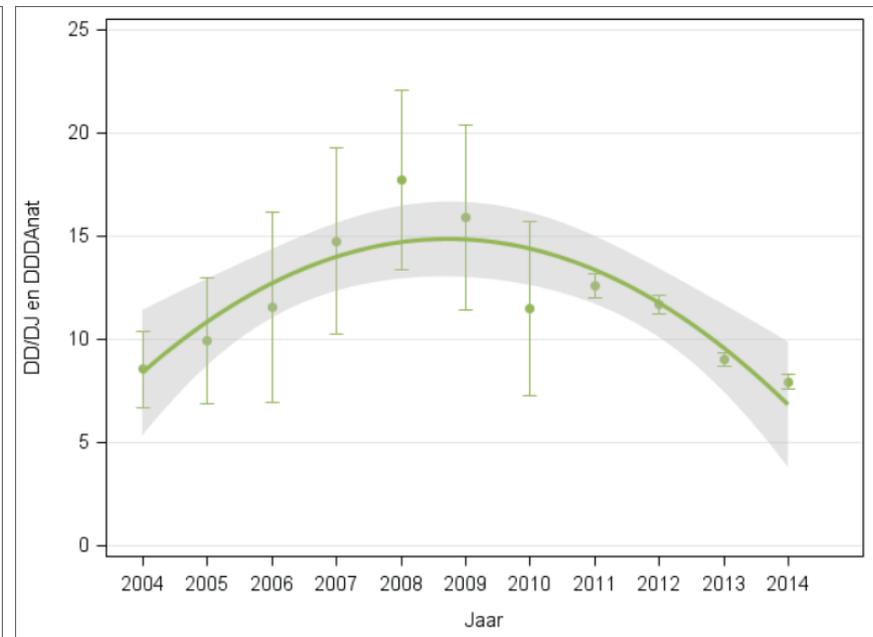
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Ab reduction in sow farms

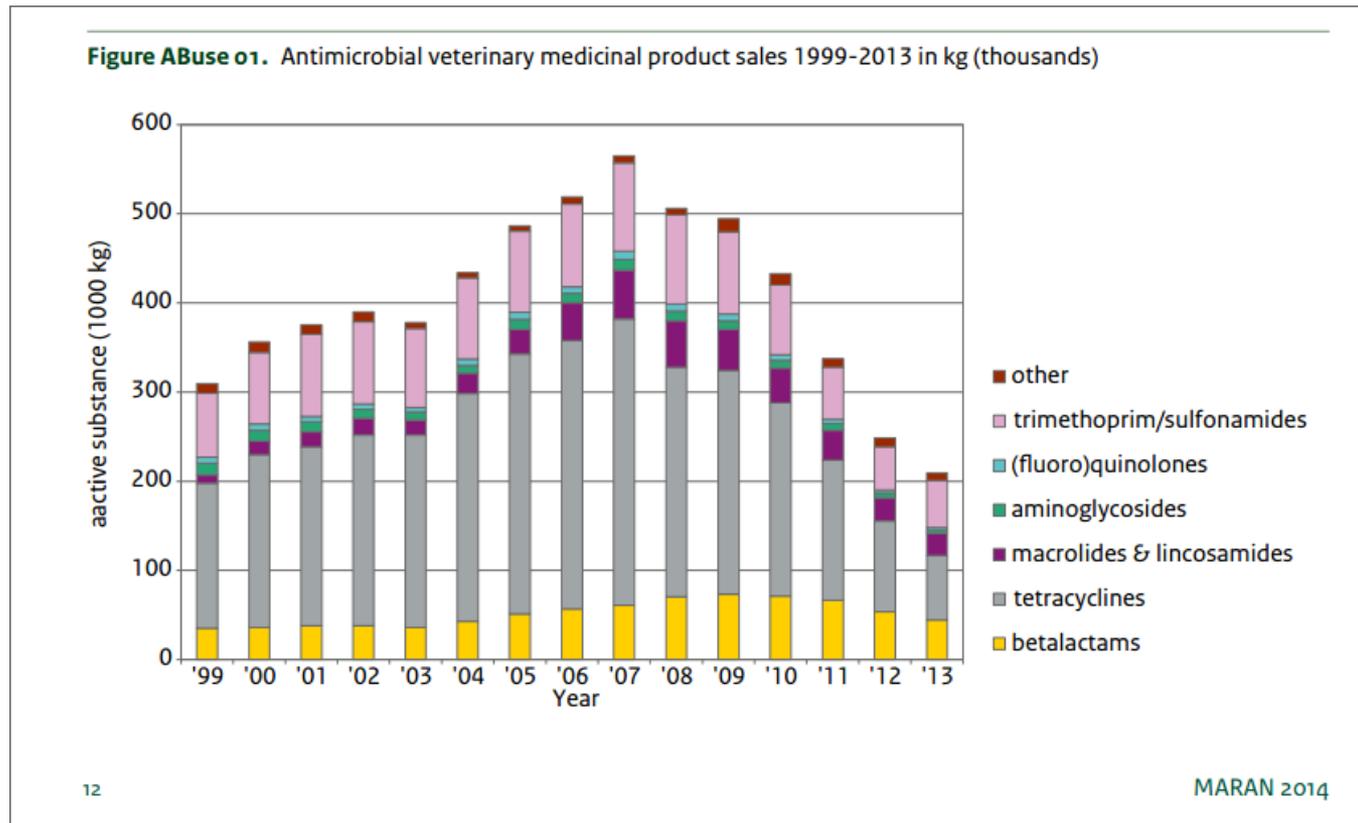


Ab reduction in fattening farms





Effect on economics - reduction of sales of antibiotics -NL





Effects on farms

- Greatest reduction on farms that use (much) more than others (benchmark)
- Old approach: antibiotics and vaccines; now: management and vaccines
- More use of vaccines:
 - Mycoplasma hyopneumoniae
 - PRRSV
 - Circovirus
 - APP (*Actinobacillus pleuropneumoniae*)
- No cover up of management deficiencies by antibiotics, more attention to improve hygiene and management



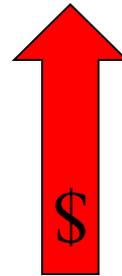
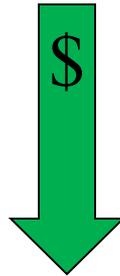
General Management Factors

- Farm system
 - greatest amount on mixed farm systems
- Number of pigs present
 - Larger farms-more AM usage
- All-in all-out
 - Less AM usage
- Population density in region of farms
 - Many pigs nearby- more AM usage
- Optimal management, hygiene and biosecurity
 - lower AM usage



Antibiotic reduction does not necessarily lead to increased costs of production, but costs factors change:

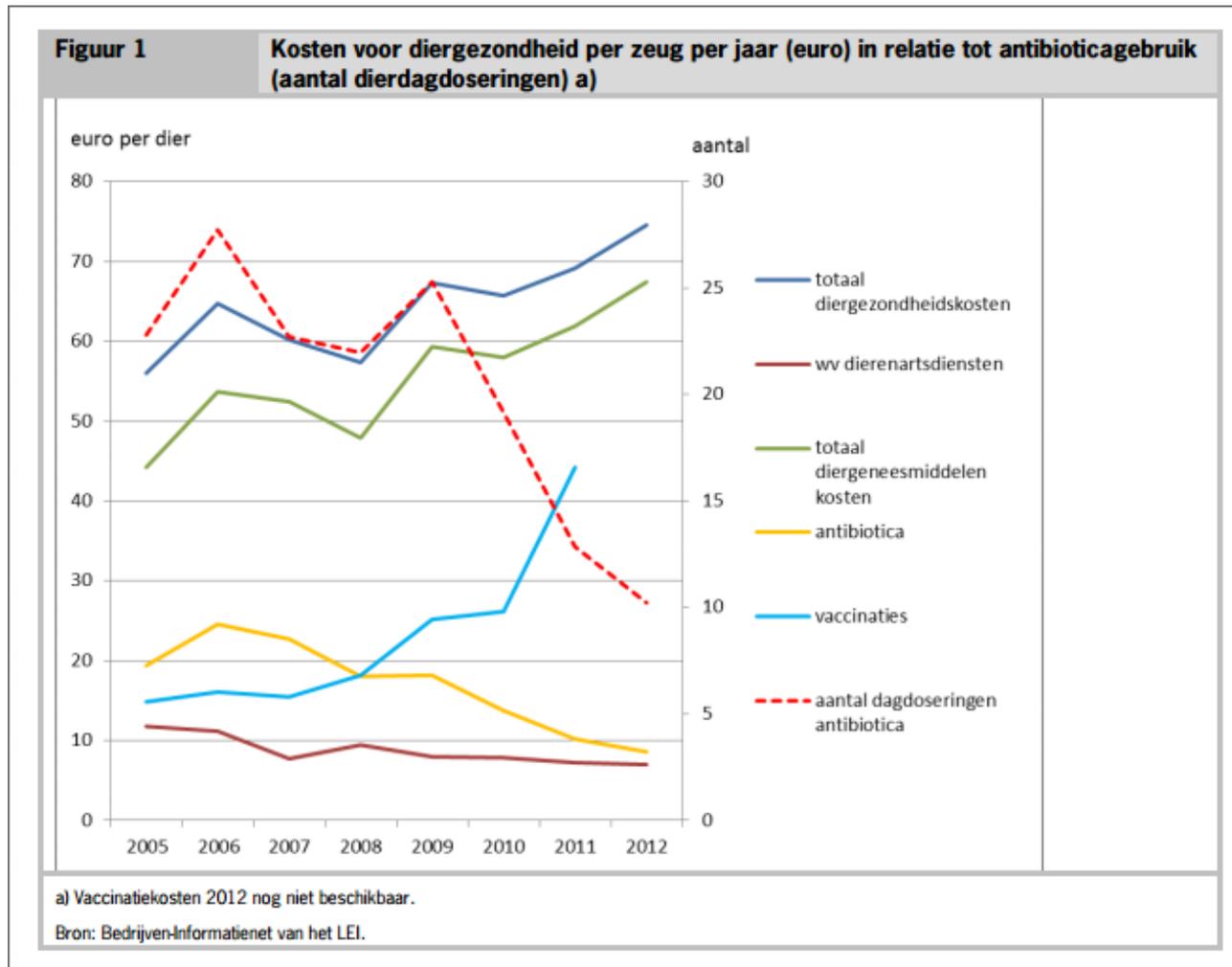
Costs of antibiotics



Costs of vaccination
Costs of improved
Management

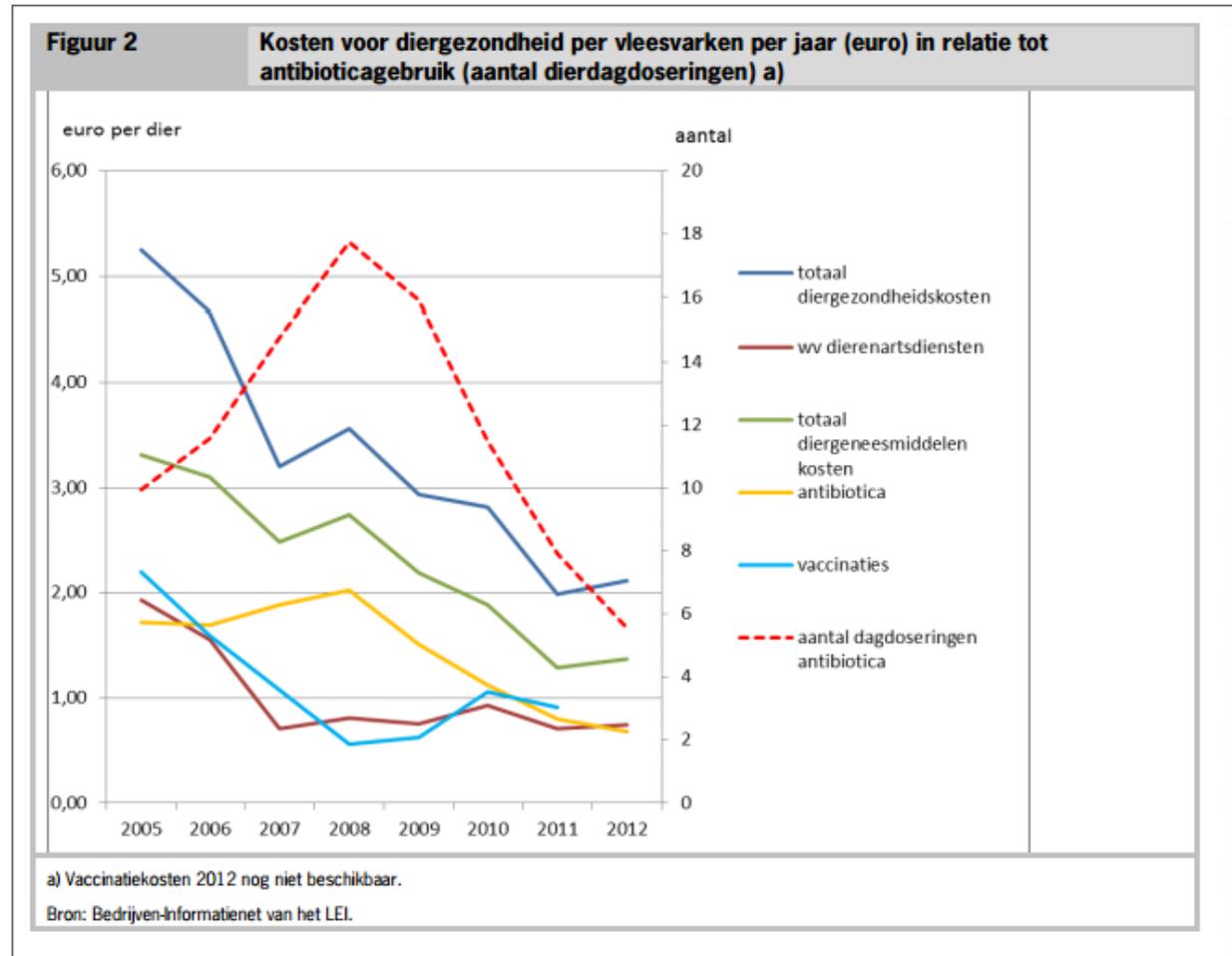


- Sow farms: 56 € → 74 € increase for animal health costs (2005-2012) Blue: total animal health costs; Red: veterinary costs; Green: veterinary drug costs; Yellow: antibiotics; Blue: vaccination costs; Dotted red: daily antibiotic usage





- Fatteners: 5,25 € → 2,12 € decrease for animal health costs (2005-2012) Blue: total animal health costs; Red: veterinary costs; Green: veterinary drug costs; Yellow: antibiotics; Blue: vaccination costs; Dotted red: daily antibiotic usage





Farm economics

- Sows: costs of antibiotics as part of animal health costs decreased from 35% (2006) to 12% (2012), vacc costs increased from 26% (2006) to 60% (2011)
- Fatteners: costs of antibiotics as part of animal health costs decreased from 60% (2007) to 32% (2012)



Search for alternatives??



- Garlic: diallylsulfide..?
- Honey: polyphenols, flavonoids..?
- Phytotherapy..?
- Homeopathy...?



- Always rely on
→ scientifically proven, evidence-based medicine



Pig Production without Antibiotics?

- We are NOT crazy
- Significant reduction possible
- Alternative strategies needed (vaccination, management,..)





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- Mrs Dr Hetty van Beers,
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