

Benchmarking livestock farms and veterinarians



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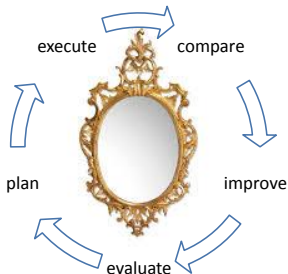


benchmarking

WHAT ...
WHY ...
WHO ...
HOW ...



benchmarking



How?



Benchmarking farms: DDDA/Y (ADD/Y)

- Defined Daily Dose Animals (ESVAC EMA London) at farm level
(http://www.ema.europa.eu/ema/index.jsp?curl=pages/includes/document/document_detail.jsp?webContentId=WC500136456&mid=WCOB01ac058009a3dc)
- $DDDA/Y = \frac{\sum \text{treatable kg days per mass unit}^{\Psi} * \text{mass medication used}}{\sum \text{Number of animals in target categories} * \text{weight in target categories}}$
- Dutch registered medicines EAN, REG-NL
- DG Standard NVMA (under development)
- Since last year data available for >40 000 Dutch farms in the major livestock sectors

^Ψ Adjusted for duration of activity

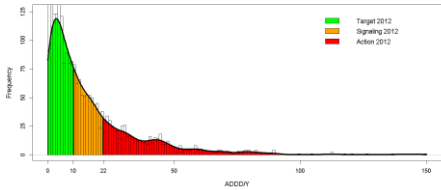


Sows and piglets benchmark values 2013

<p>> 22 ADD/Y</p>	<p>ACTION ZONE Direct measures required which reduce use of antimicrobials immediately</p>
<p>10 - 22</p>	<p>SIGNALING ZONE Use of antimicrobials requires attention</p>
<p>< 10</p>	<p>TARGET ZONE No action required</p>



Benchmarking sows and piglets 2012



Cut points were based on MARAN surveillance data (50 and 75 percentiles and projected reduction deducted)

Benchmark for fluoroquinolones and 3rd and 4th generation cephalosporines = 0



Trends benchmark categories 2011-2012

Sows and piglets ADDD/Y -17%

Finisher pigs ADDD/Y -10%

		2012			Total
		Green	Orange	Red	
2011	Green	864	160	43	1067
	Orange	199	272	107	578
	Red	48	172	331	551
Total		1111	604	481	2196

		2012			Total
		Green	Orange	Red	
2011	Green	2486	180	288	2954
	Orange	178	44	76	298
	Red	360	126	524	1010
Total		3024	350	888	4262



Benchmarking

- Potential weaknesses benchmarks used:
 - Farms heterogeneous with regard to the animal population
 - Homogenization by use of categories within a sector
 - Not all animals are target animals for medication
 - Denominator inflated
- Do more heterogeneous farms have generally lower ADDD/Y?
- Sensitivity analyses indicate that phenomenon has a limited effect (< few %, but can still involve a considerable number of farms)
- Question remains: "why do some farms score consistently high?"



Benchmarking veterinarians

Data from 3020 pig farms with 266 veterinarians

	ADDD/Y	Treatable kg
	R ²	R ²
Veterinarian	17.2	21.1
Farm type (4 categories)	3.1	5.8

'the veterinarian' explains a considerable proportion of variability between farms in antimicrobial consumption



Benchmarking veterinarians

- Link with benchmarking livestock farmers
- 1-1 relations between farm and veterinarian
- Should take a population of farms into account
- Per animal species
- Key: Ratio= DDD/Y realized at a farm / action level applicable to that farm

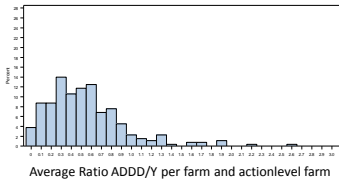


Calculation Veterinary Benchmark Indicator VBI

Farm	Type	ADDD/Y	Benchmark action level	Ratio
1	Sow/piglets	66	22	3
2	Sow/piglets	22	22	1
3	Finisher	4	13	0.31
4	Finisher	11	13	0.85
5	Sow/piglet	39.6	22	1.8
6	Piglet	2	13	0.15



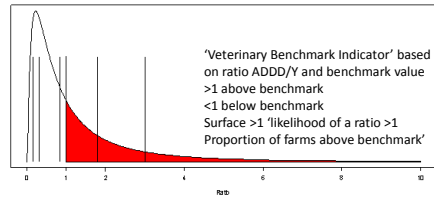
Benchmarking veterinarians



1-20 fold differences in ratios between veterinarians
Most differences < 5 fold



Benchmarking veterinarians: ADDD/Y /benchmark

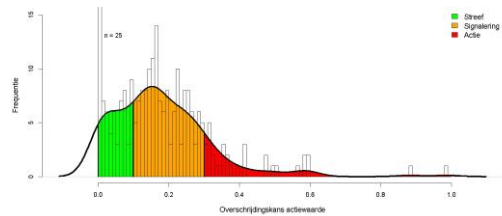


Benchmarking veterinarians: ADDD/Y /benchmark

	Veterinary Benchmark Indicator (VBI) zones
Action zone	> 0,30
Signaling zone	0,10 – ≤ 0,30
Target zone	< 0,10



VBI pig sector



VBI realisation across sectors

Diersector	VBI for veterinarian with multiple farms		
	Target	Signal	Action
	VBI < 0,10	0,10 < VBI ≤ 0,30	VBI > 0,3
Veal	39	57	37
Pigs	77	142	33
Poultry	21	26	10
Cattle	272	366	17



Future activities

- Evaluate systematic high use farms
- Include new (small) sectors
- Update benchmarking farms, re-fine and re-establish methodology (predicted use based on animal population?)
- Implementing benchmarking over longer periods of time (trends)
- Advice on sector specific issues (cycle length vs annual benchmarking)



Expert Panel NVMA



- Ms Inge van Geijlswijk, PhD, pharmacist, VF UU Utrecht
- Prof Dick Heederik (chair), epidemiologist, IRAS UU Utrecht
- Prof Johan Mouton, medical microbiologist, Erasmus University Rotterdam
- Prof Jaap Wagenaar, clinical microbiology, I&I UU Utrecht

- Ms Jose Jacobs, PhD, epidemiologist
- Ms Femke Taverne, pharmaco-epidemiologist in training

