



Expertise Centre for Farm Management and Knowledge Transfer WUR

# Management of antibiotic use in Dairy Herds in The Netherlands

EAAP 2014

[Abele.Kuipers@wur.nl](mailto:Abele.Kuipers@wur.nl)

Livestock Research WUR Harm Wemmenhove  
Animal Production Systems WUR Wiebe Koops  
Veterinary Practices

# Data farms 2005-2012

- 40 farms; guided from 2008-2010
- 41 farms; not guided
- 13 environmental project farms;  
not guided

From 25 veterinary practices



## Indicator for antibiotic use on herd level:

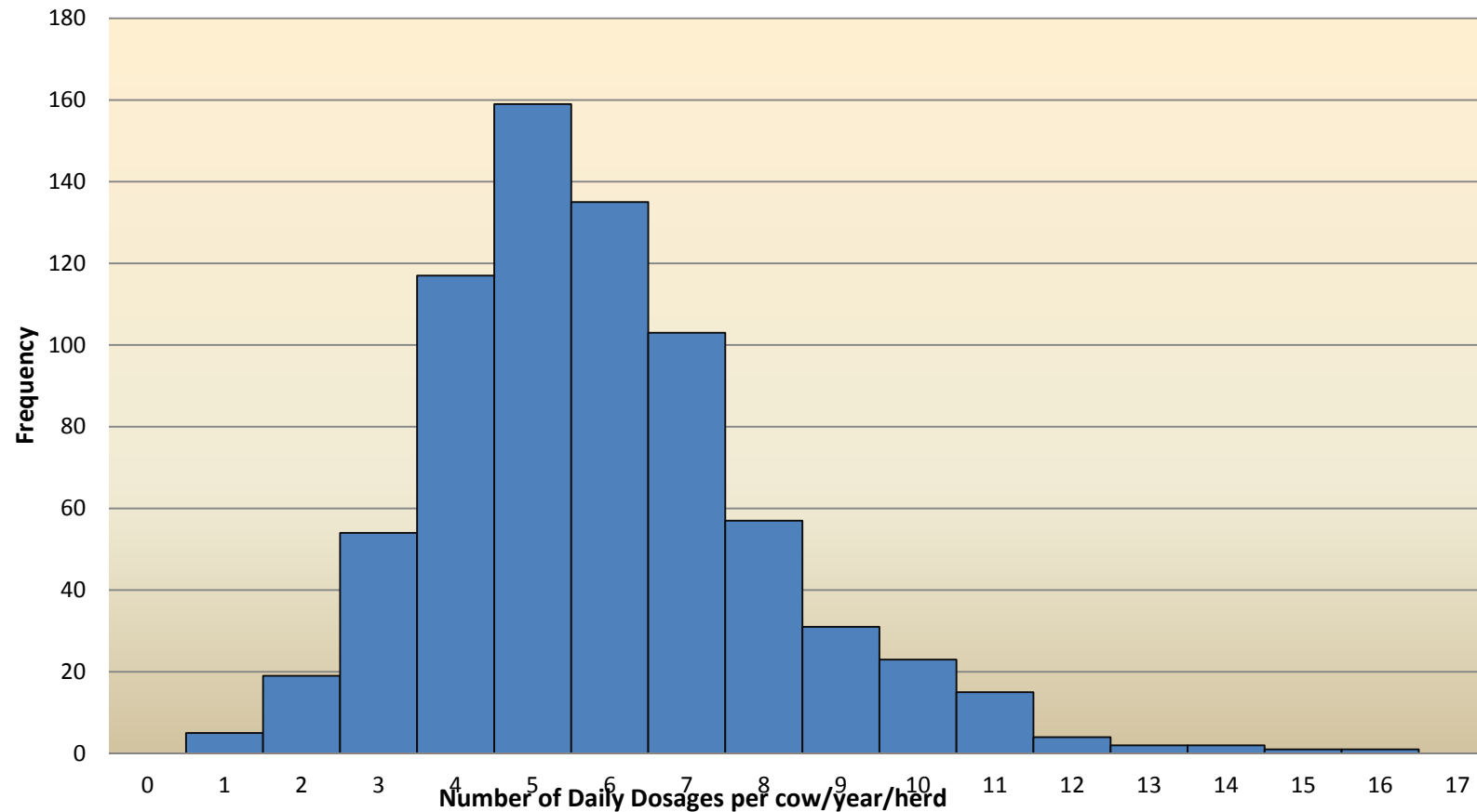
Number of daily dosages per cow per year (ADDD) indicates how many days per year an average cow in the herd under treatment of antibiotics is

Based on veterinary invoices

Youngstock is included

# Daily dosages on anual basis

8 years



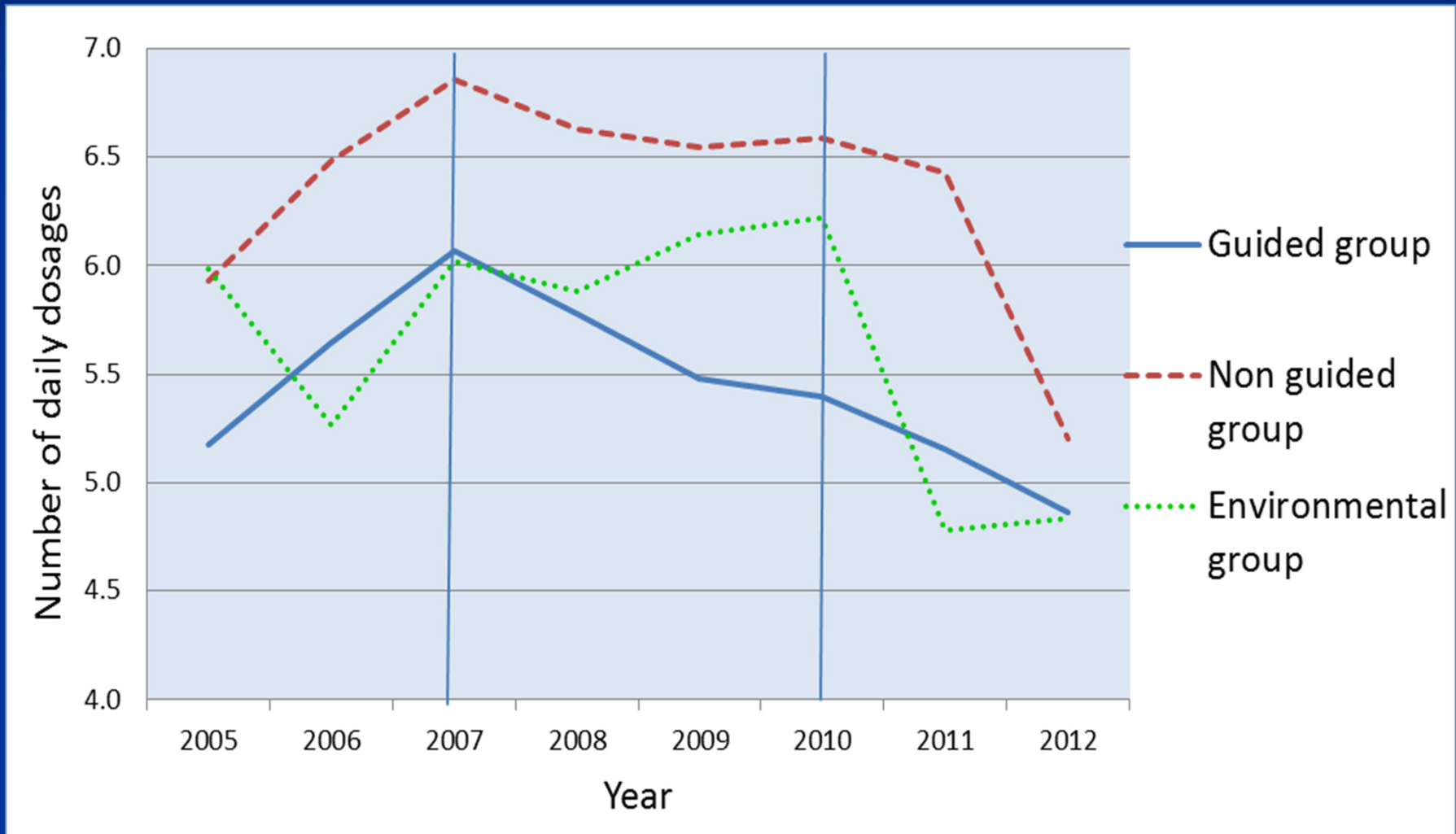
Avg.  
5.86

# Trends in guided and non guided groups in period 2005-2012

not aware

start political pressure

awareness



## Modelling adaptation

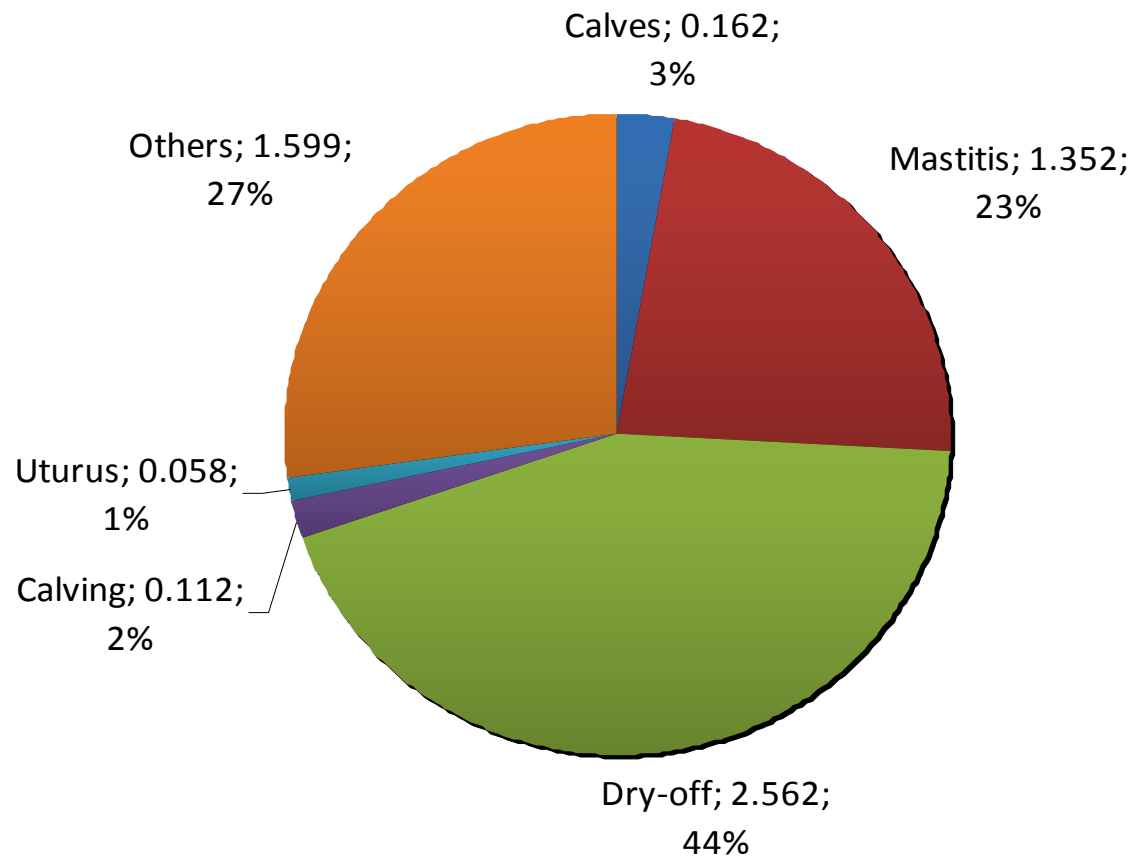
### Rogers' Diffusions of innovation theory

y= no daily dosages; t=year; a=start level;  
b=acceleration coeff.; c= level 1/2a

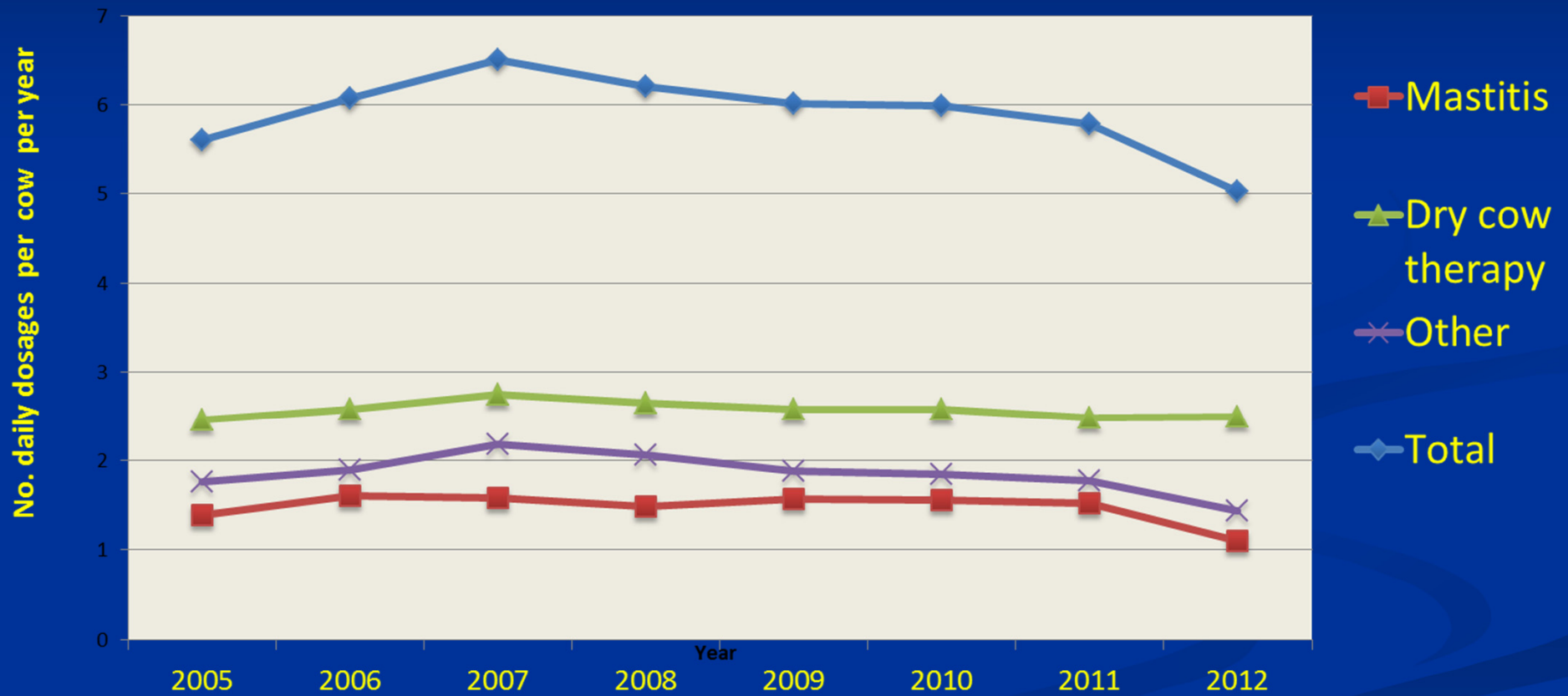
- *Using function (Brown and Rothery, 1993):*

- $$y = a \left( \frac{1}{1 + e^{-b_1(t - c_1)}} \times \frac{1}{1 + e^{b_2(t - c_2)}} \right)$$

## Split up daily dosages in health categories (avg. 8 years)



## Trend in number daily dosages per cow per year

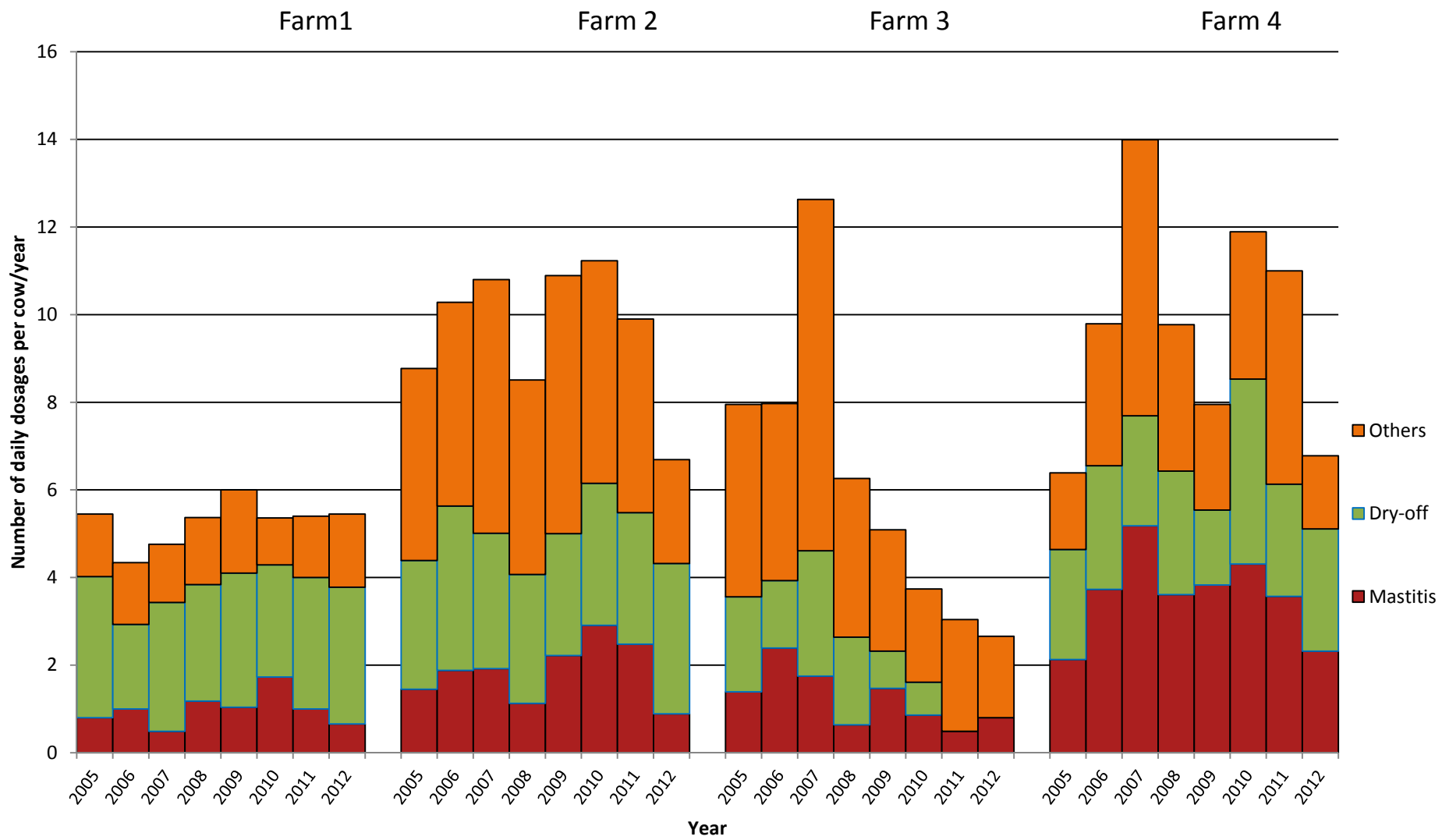




Restrictive use 3<sup>rd</sup> choice drugs  
fluorquinolonen  
cephalosporinen 3<sup>rd</sup> /4<sup>th</sup> gen

from 2012 on

3 <sup>rd</sup> choice drugs	2005-2010	19%
	2011	17%
	2012	1%



# *Do farm and farmer characteristics affect the amount of antibiotics used?*

Data collected 2005-2009:

**Farm and herd:** 28 characteristics

- production level; health; cell count; grazing

**Farmer:** socio-economic factors

-relation to veterinarian

-attitude towards treatment of cow health problems

-

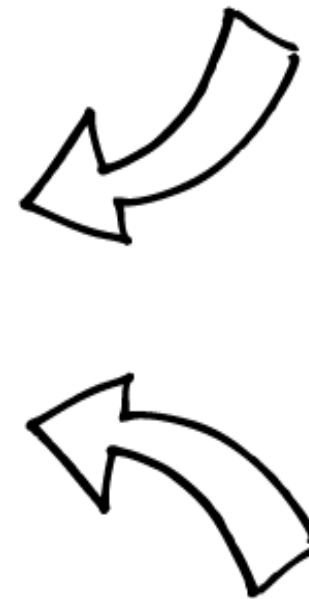
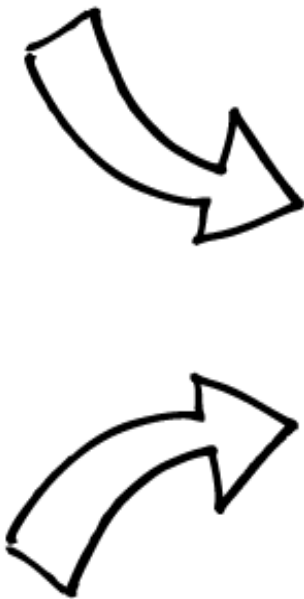
-

## Influence of farm technical indicators (59 farms)

Antibiotics indicator	Farm factors of influence	Relation	R <sup>2</sup>
Number daily dosages total	Quota Cell count Health status	+ - +	0,39
Daily dosages mastitis	Number of cows Quota Access to pasture	- + -	0,28
Daily dosages dry-off	Cellcount Calving interval Health status	- -0,50 - +	0,46
Daily dosages other	Quota Milk cows Young stock/10 mk % cows removed	+ - + -	0,36

**Higher Education**

**Higher Health Status Herd**



**Younger Farmer**

**Higher Milk Return Per Cow**



**Lower Celcount**

# Increase and decrease in use

		Daily dosages		
		2005 - 2010	2011	2012
Herds	Decreasing (20)	7,23	5,09	4,30
	Increasing (20)	4,72	5,89	5,72

In which degree have management practices contributed to the stabilisation or reduction in use in period 2005-2012?

Likert scale 1 = no adaptation ..... 5= big adaptation done

Herds	Housing	Hygiène	Milk installation	Selective dry cow therapy	Selection cows	Management at drying off	Calf rearing	Management in general
Decreasing	2.50	2.28	2.11	2.50	1.94	2.50	1.94	2.33
Increasing	1.47	1.77	1.41	1.88	1.18	1.47	1.44	1.71
Difference	*	ns	ns	ns	*	**	ns	*

# Conclusions

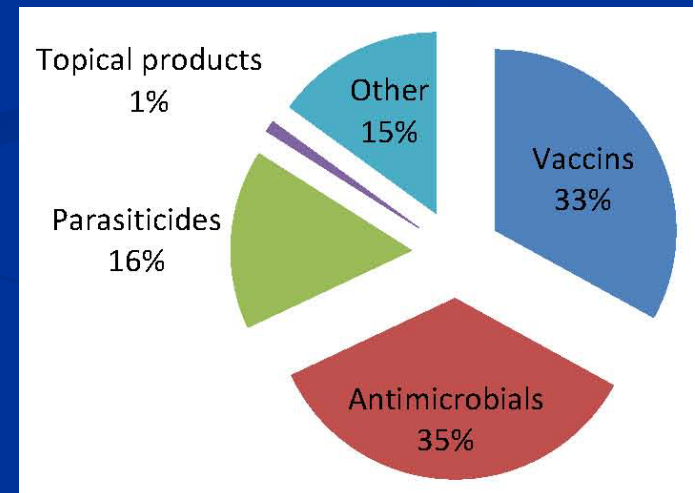
- Daily dosages useful as tool to gain a global view of antibiotics use
- Wide variation; indicator should be based on more years to give a fair impression
- More than 65% of antibiotics to udder
- Trade off between level cell count and level antibiotics use
- Antibiotics use partly explained by farm characteristics
- Mindset of farmer and veterinarian most important
- “Better” farmers used more but were also able to adapt more quickly



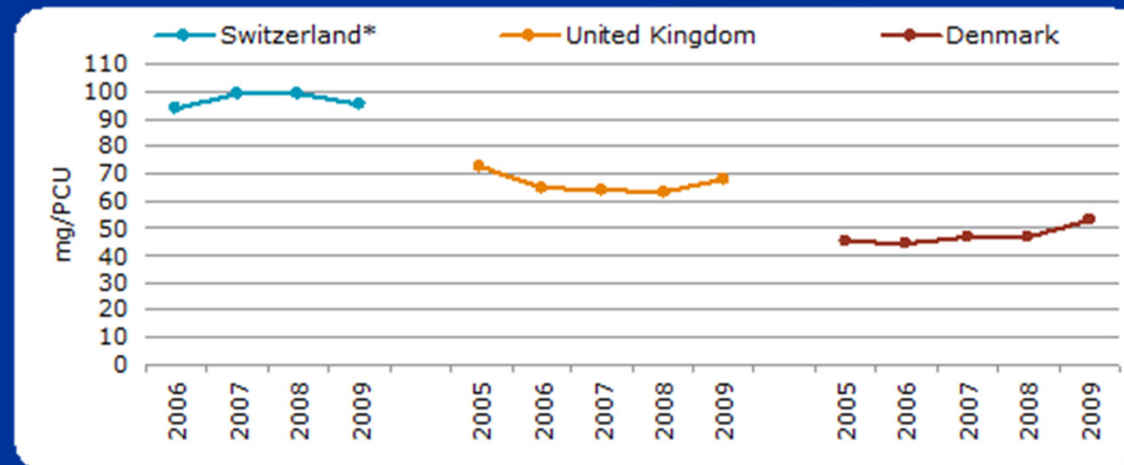
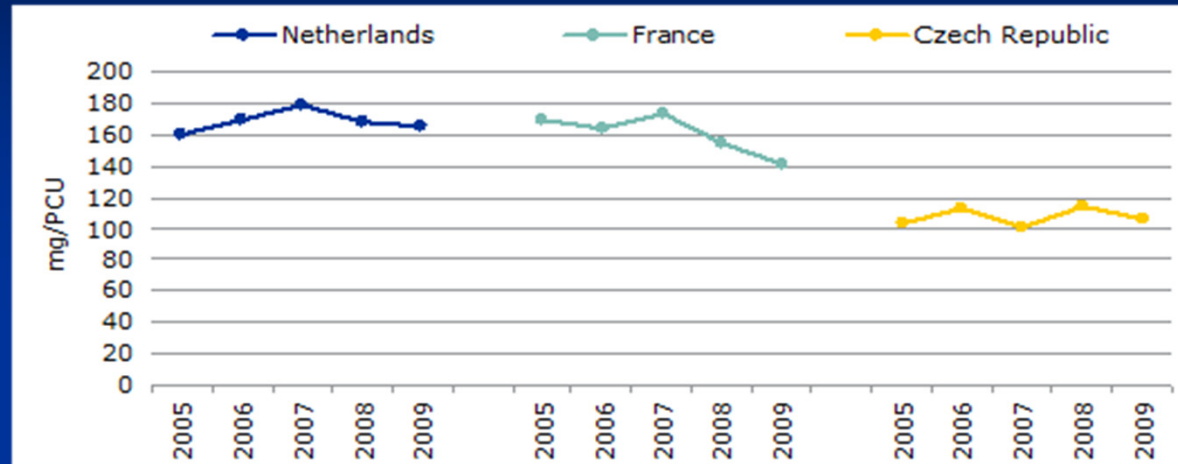
## Sales of pharmaceuticals in 2010 in The Netherlands

Drugs for human use total: € 6 billion  
comprising 6% antibiotics (€ 360 million)

Veterinary drugs total: € 250 million  
comprising 35% antibiotics (€ 87,5 million)  
(>99% for food producing animals)



# Total sales in some EU countries from European Medicine Authority, 2011



# Trend daily dosages per cow year in veterinary practice Oosterwolde

