



Antimicrobial resistance
can affect **anyone**, at any **age**,
in any **country**



————— **#AntimicrobialResistance** —————



World Health
Organization

DIETARY FEED ADDITIVES WITH ANTIBACTERIAL EFFECTS AND THEIR IMPACT ON PERFORMANCE OF WEANED PIGLETS: A META-ANALYSIS!

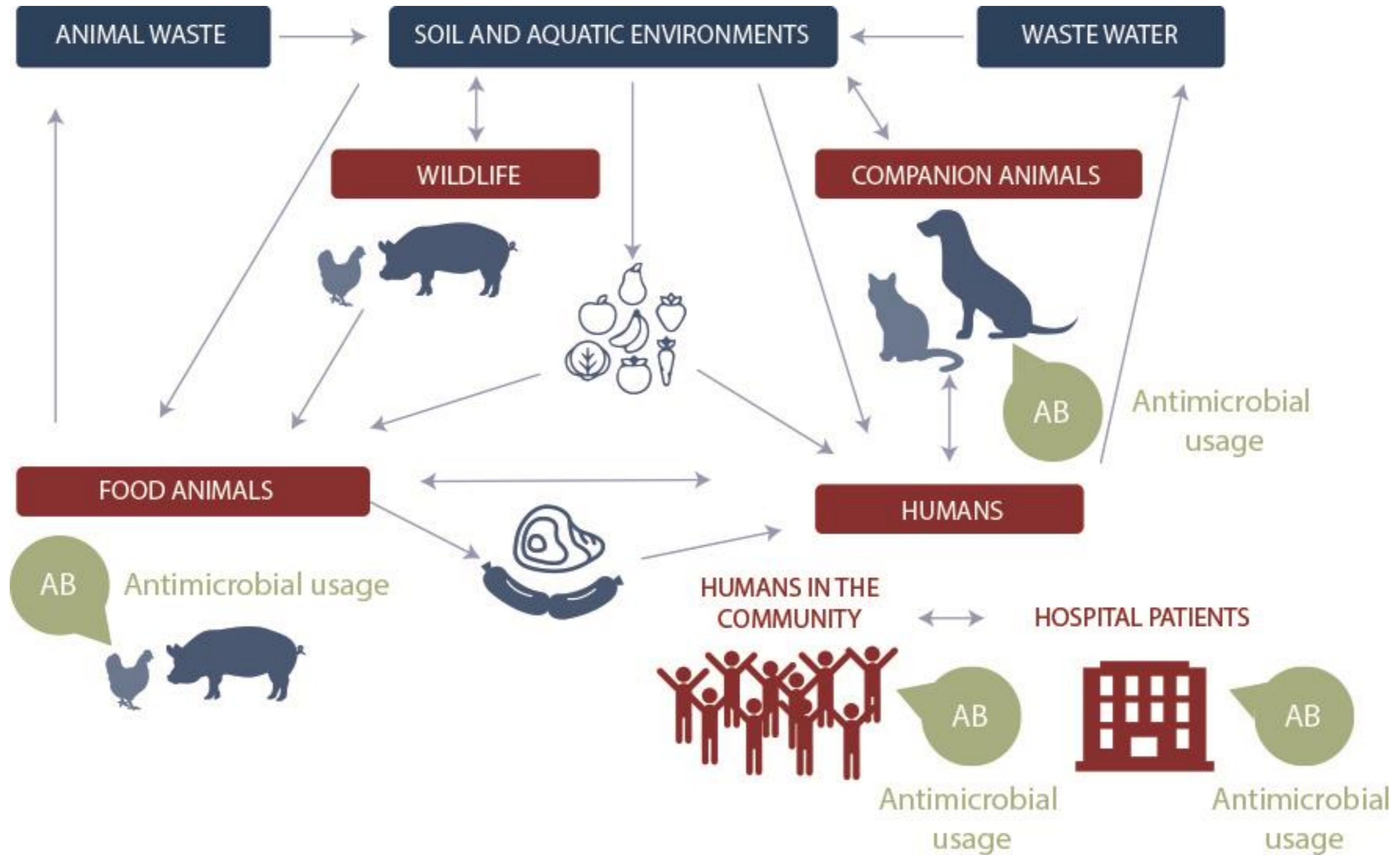
Prof. Jeroen Dewulf

Vanrolleghem, W., Tanghe, S., Verstringe, S., Bruggeman, G.,
Papadopoulos, D., Trevisi, P., Zentek, J., Sarrazin, S.,

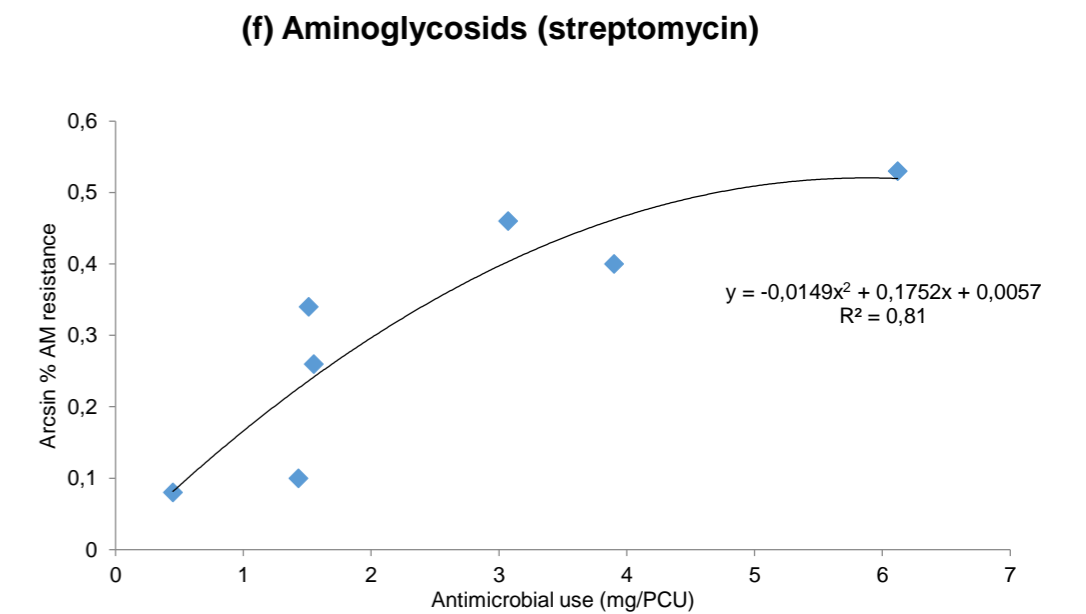
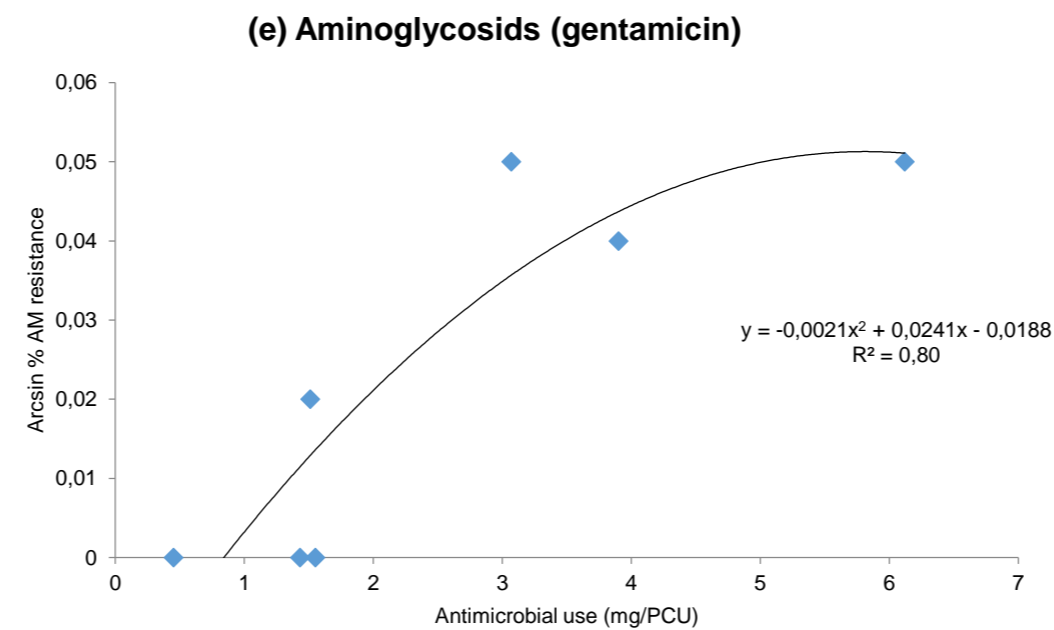
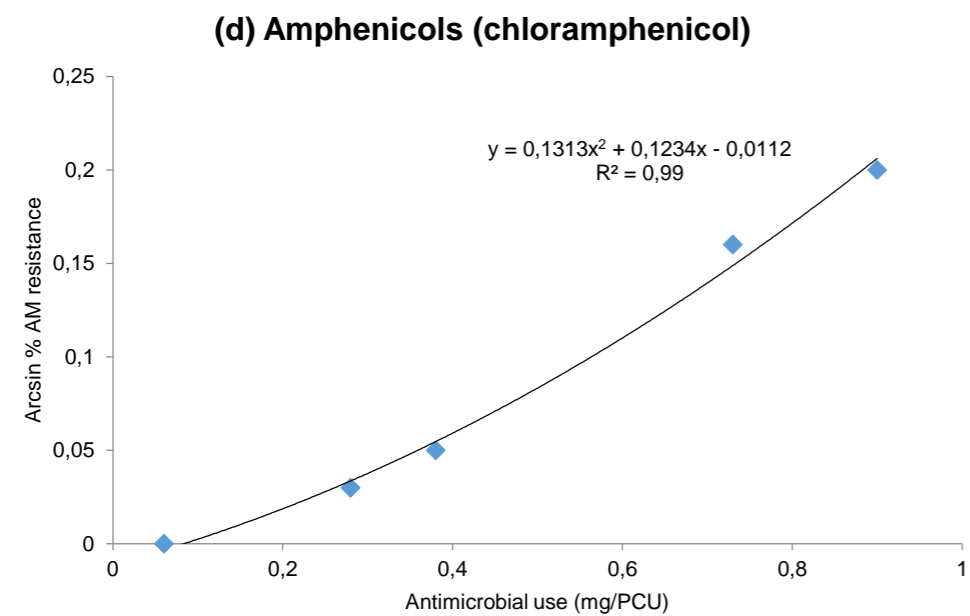
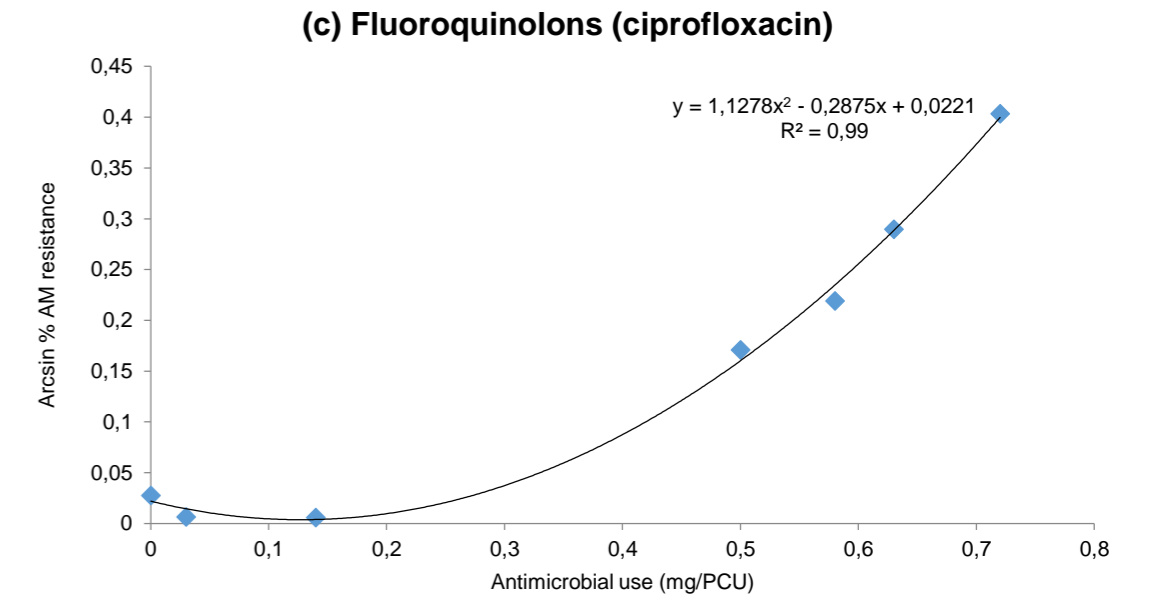
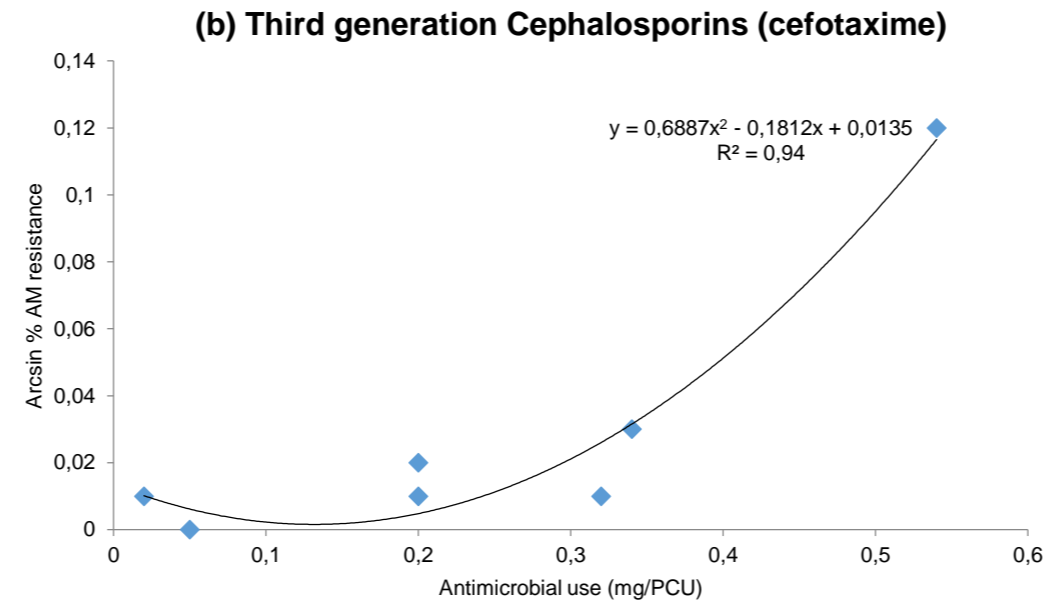
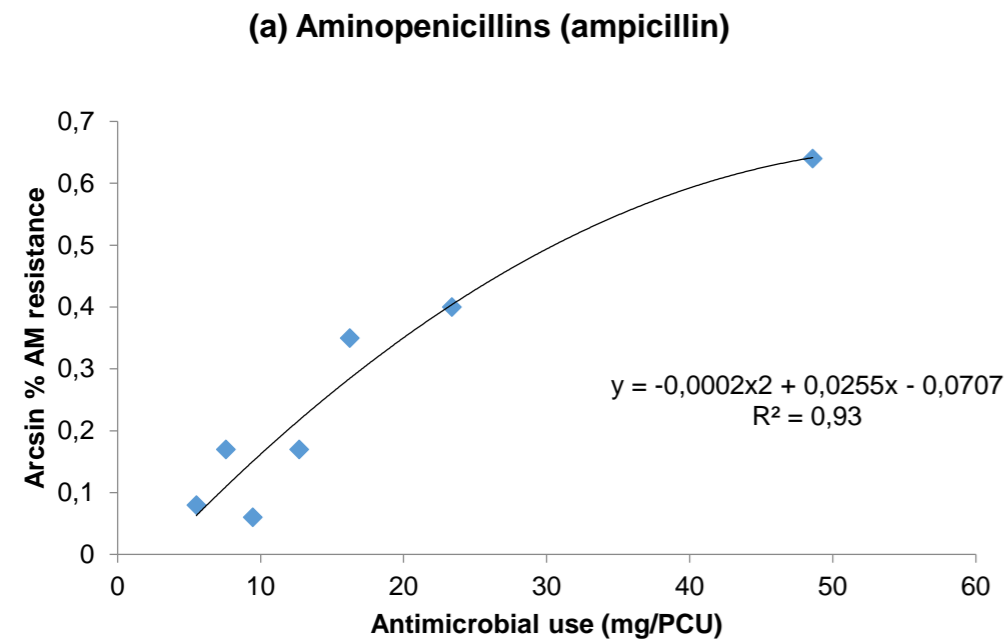
VETERINARY SCIENCES

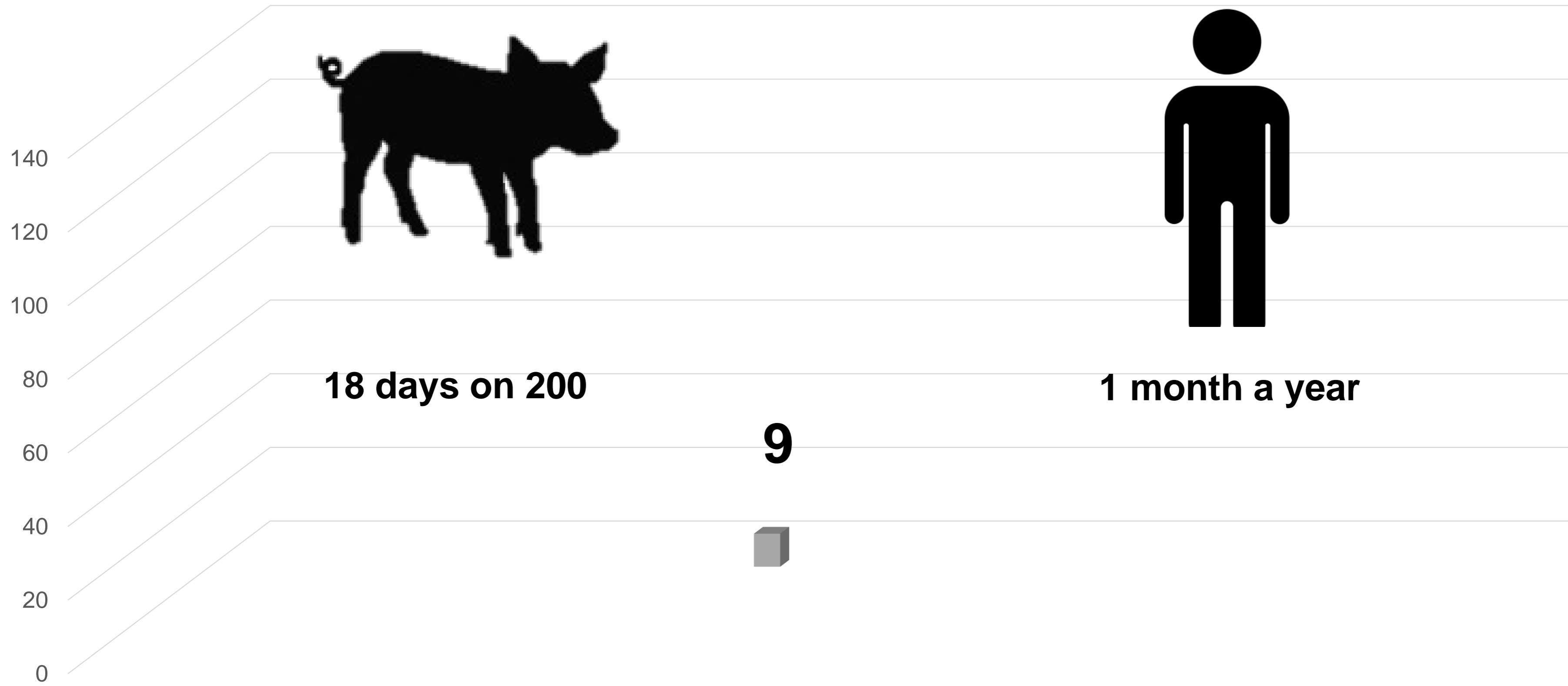


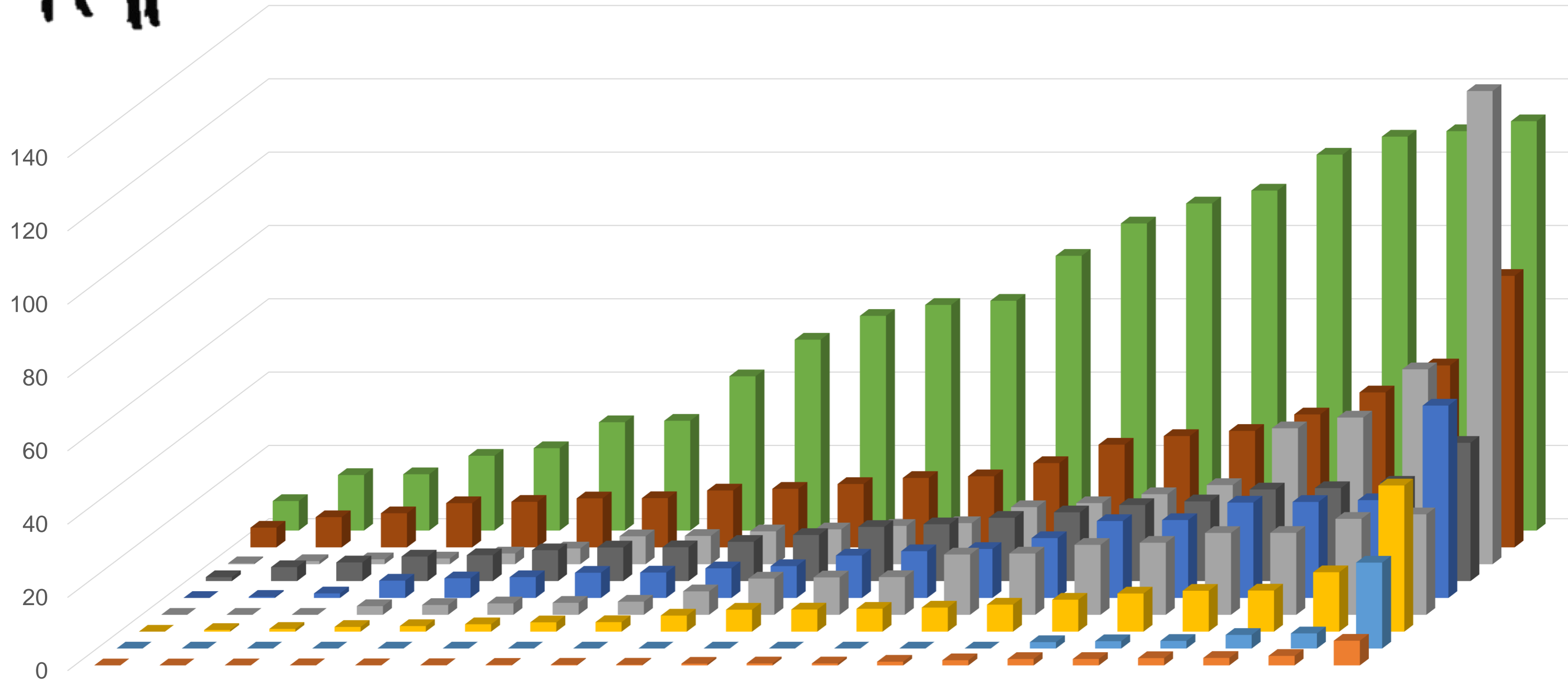
One world, One health



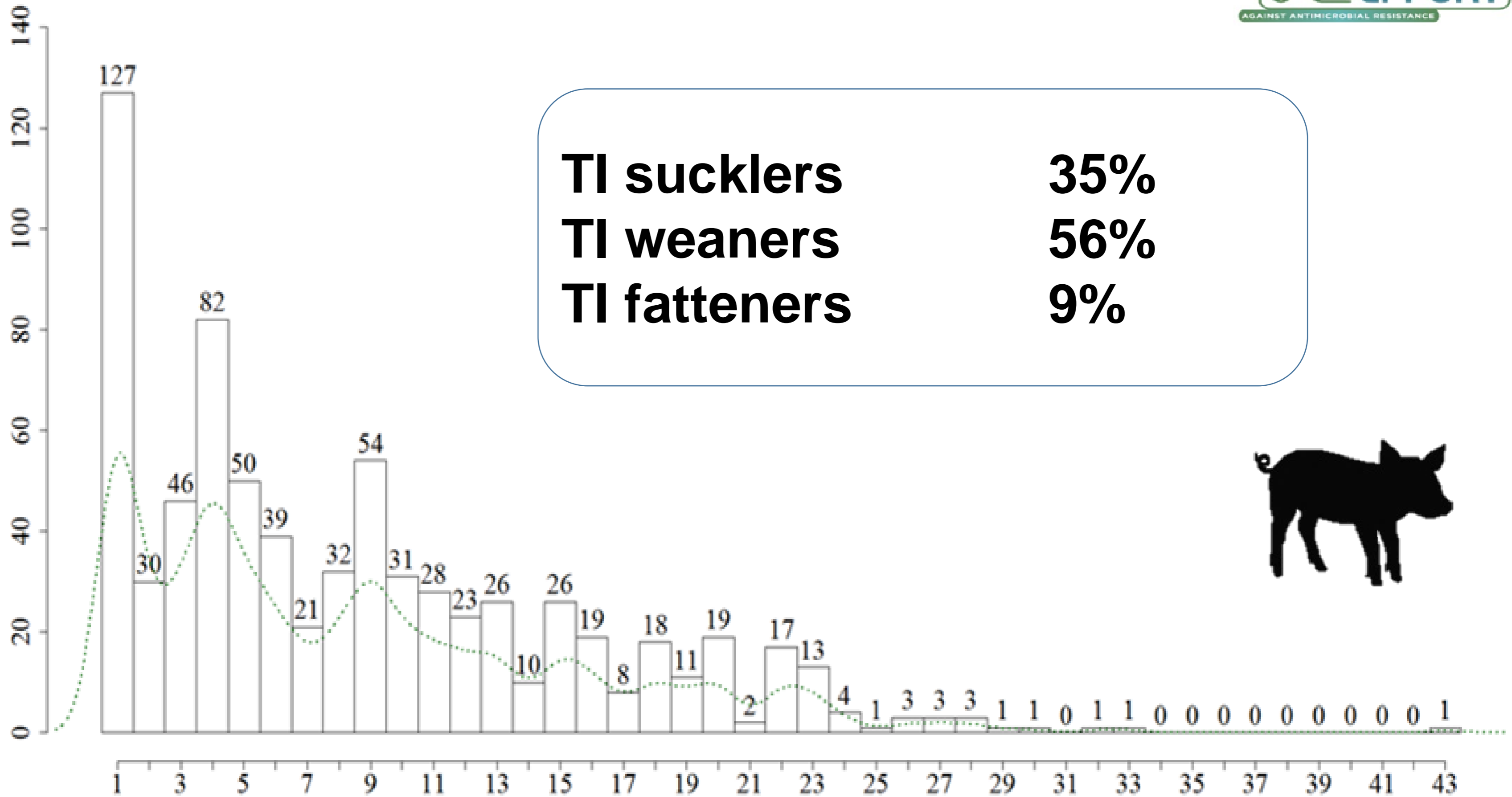
Linking antimicrobial use to antimicrobial resistance in 7 EU countries based on monitoring data







Number of treatment per week



TI sucklers 35%
TI weaners 56%
TI fatteners 9%

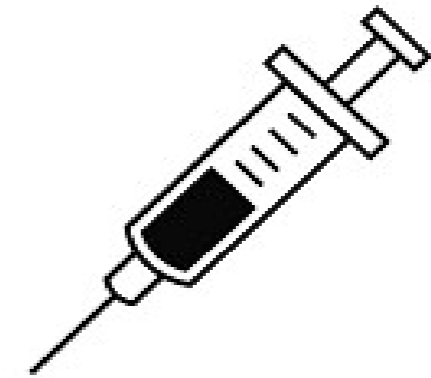


Age of pigs at onset of treatment (weeks)

FACTORS RELATED TO ANTIMICROBIAL USE



1. Total amount of antimicrobial agents



2. Treatment dose and duration



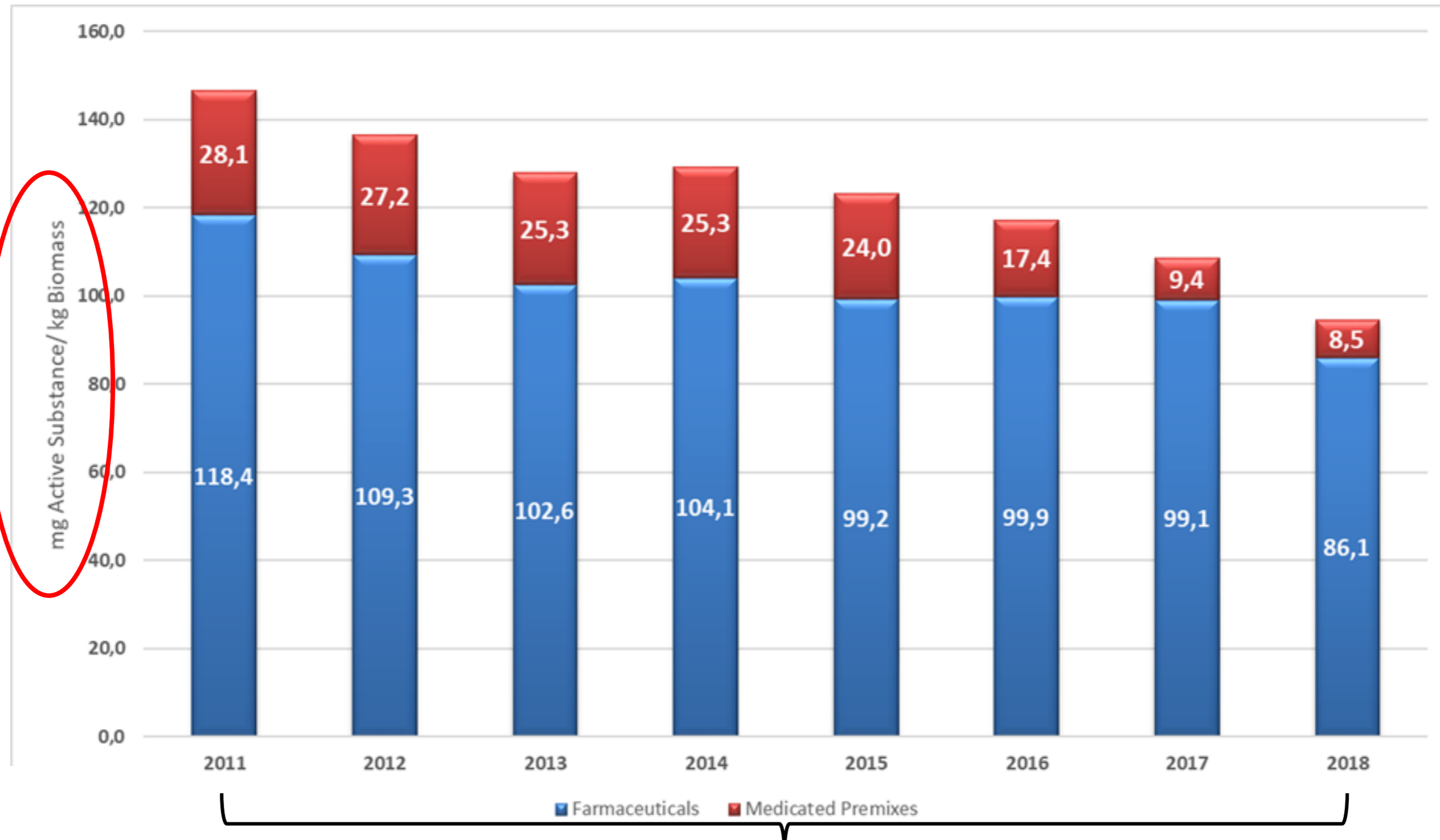
3. Choice of antimicrobials



4. Administration route

Using less antimicrobials results
in **less resistance**

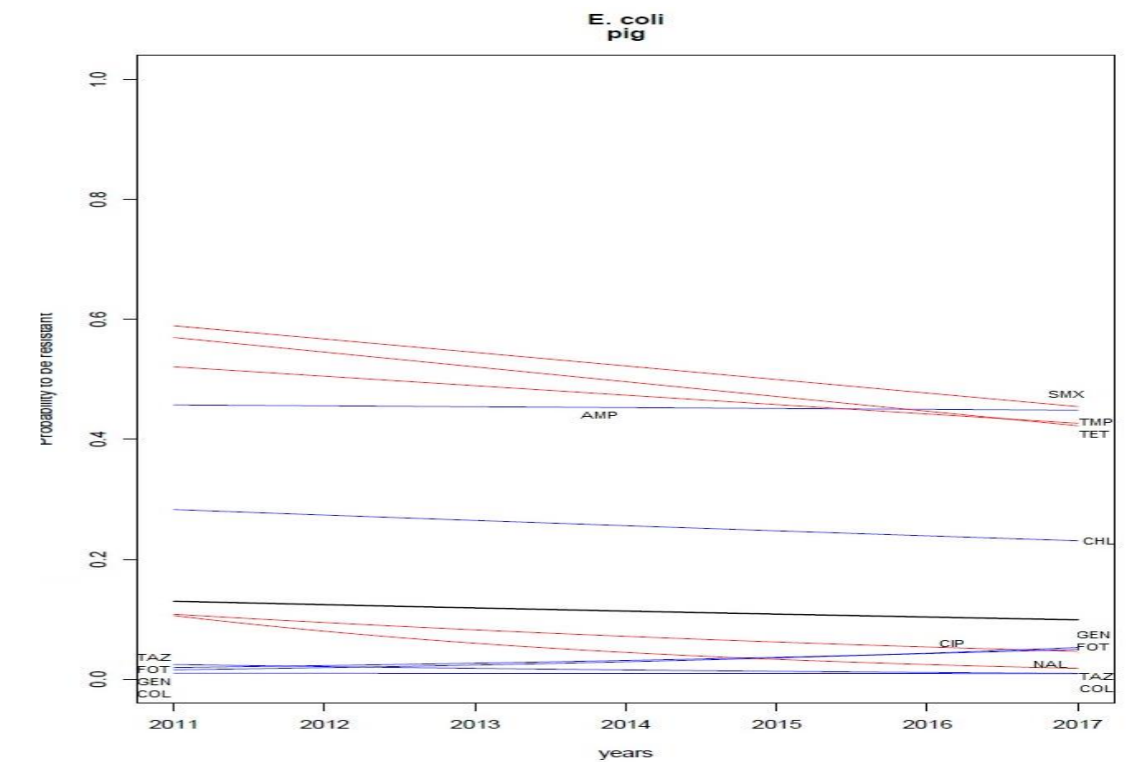
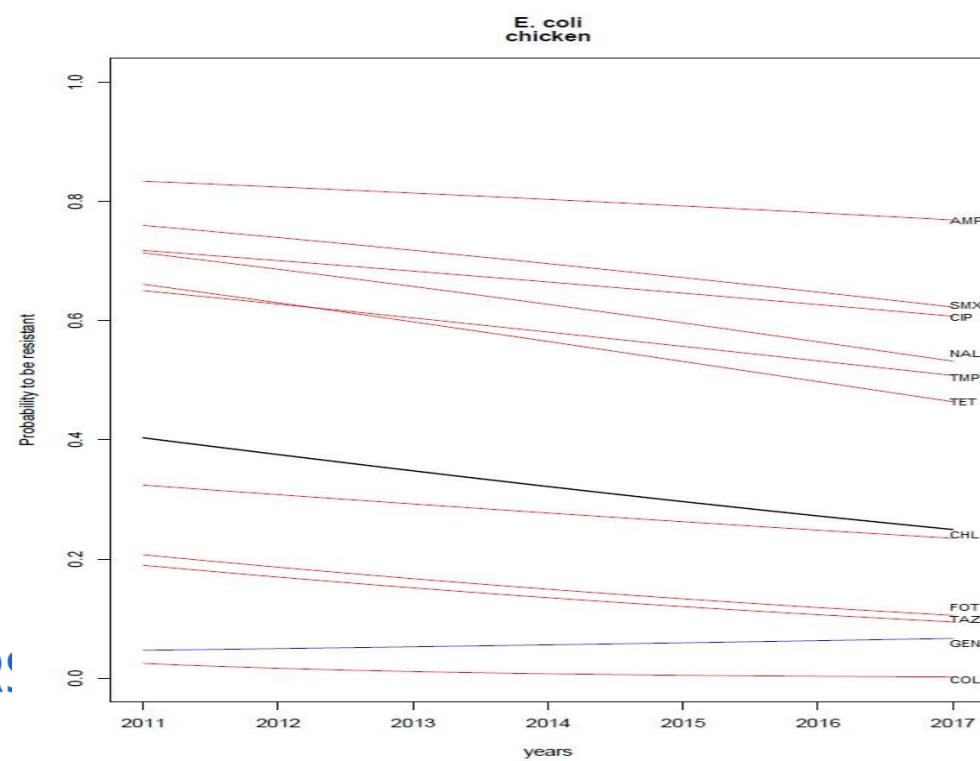
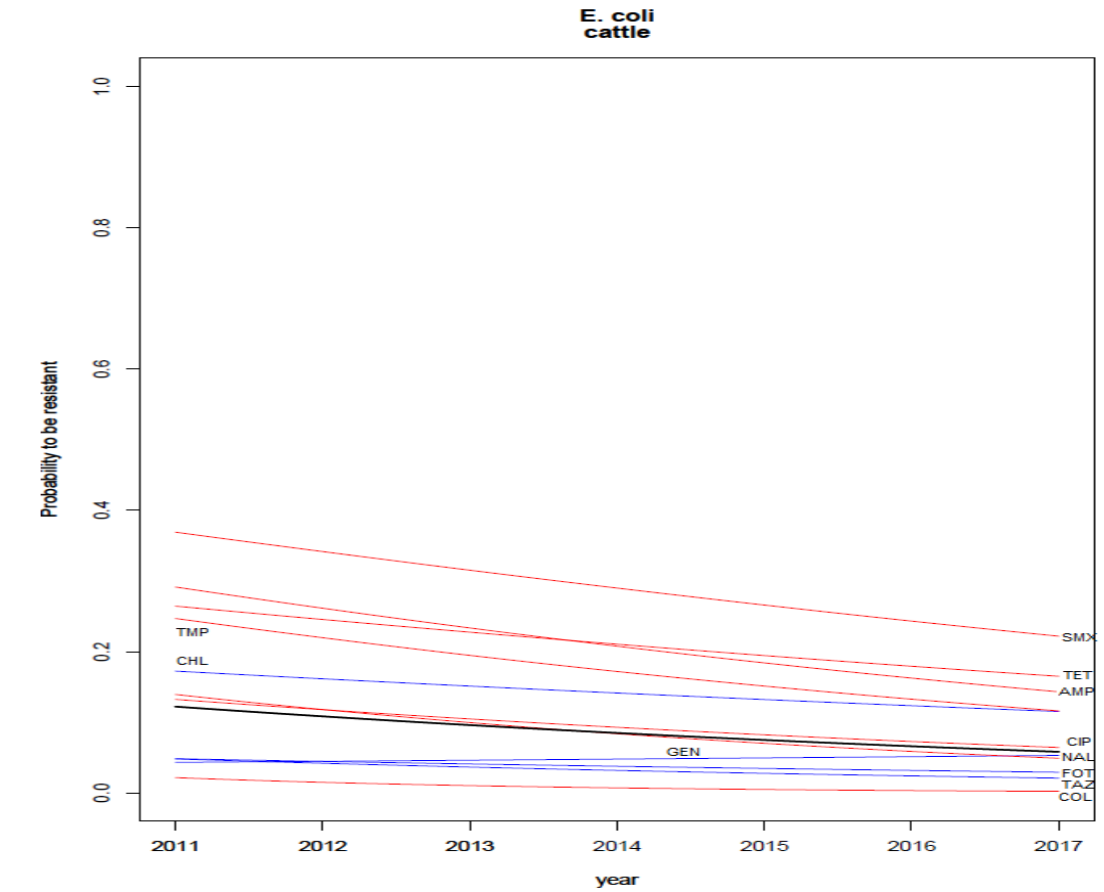
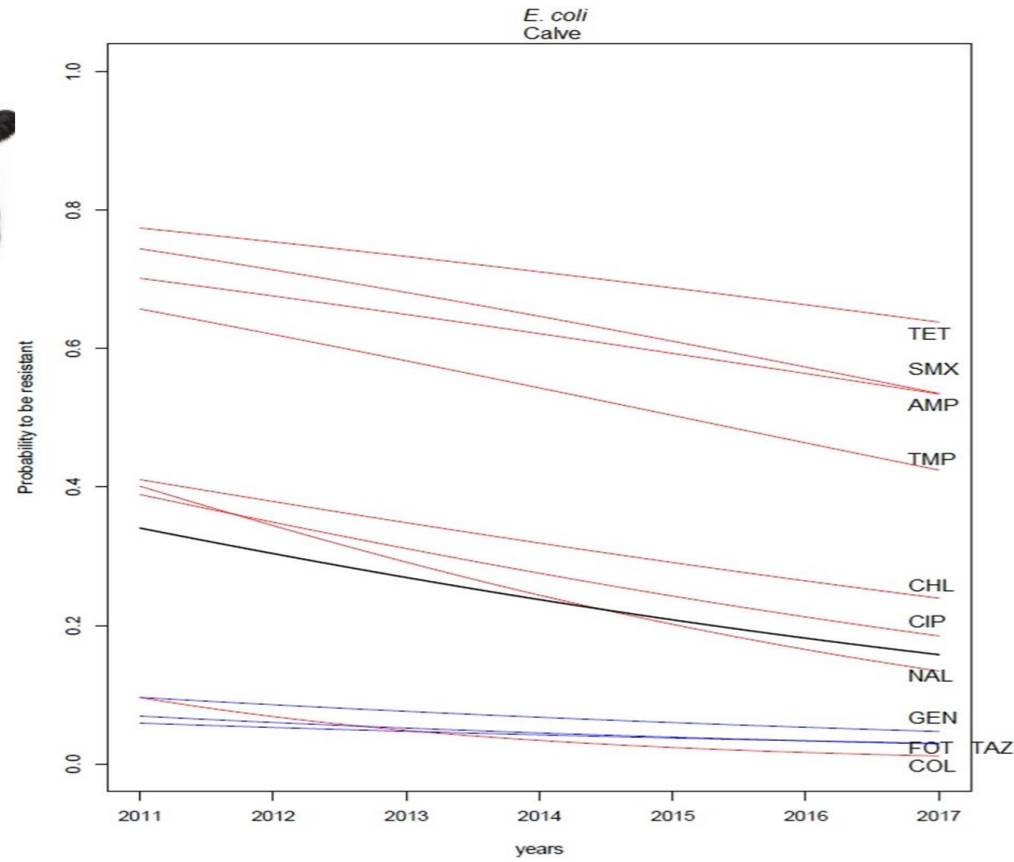
Antimicrobial use in animals in Belgium



2011-2018: - 35,4%

Antimicrobial Resistance in commensal *E. coli*

Trend analysis



What can we do about it?



Replacing antimicrobials by:

- Improved feed
- Improved housing
- Feed additives
- Improved Biosecurity
-



Contents lists available at [ScienceDirect](#)

The Veterinary Journal

journal homepage: www.elsevier.com/locate/tvjl



Potential dietary feed additives with antibacterial effects and their impact on performance of weaned piglets: A meta-analysis



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^c Department of Agricultural and Food Science (DISTAL) – University of Bologna, Viale G. Fanin, 46-40127 Bologna, Italy

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^e Veterinary Epidemiology Unit, Faculty of Veterinary Medicine, Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium

Study design

Literature search:

- Web of science
 - 2010-2017
- In vitro trials on **weaned piglets**
- Action of DFA compared to feed without and with antimicrobials
- Potential dietary Feed Additives:
 1. Antimicrobial peptides (amp)
 2. Chitosan
 3. Lysozyme
 4. Medium chain fatty acids or triglycerides (mcfa)
 5. Plant extracts

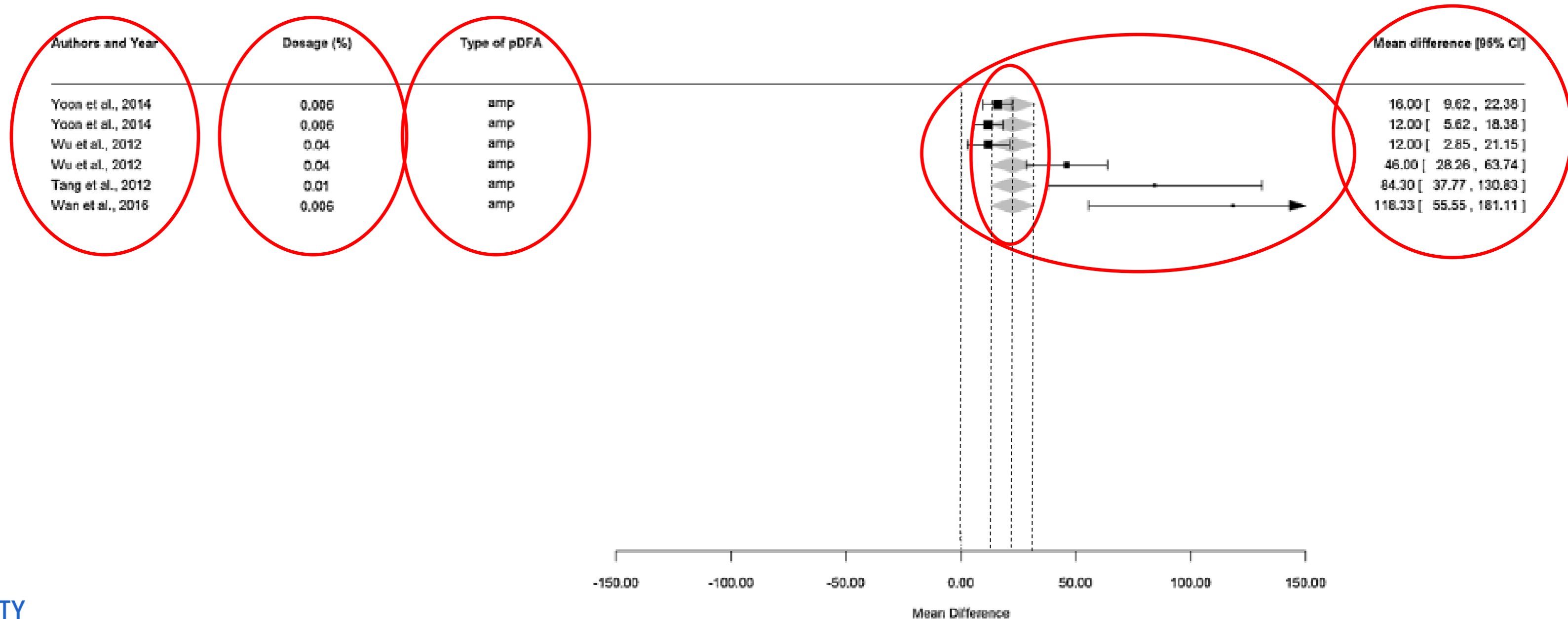
Study design

Data analysis:

- **23 studies (50 trials) included**
- **Major outcome variables:**
 - **ADG**
 - **FCR**
- **Mixed effect meta-analysis**
- **DFA compared to:**
 - **Negative control group (no AB, no DFA)**
 - **Positive control group (AB)**
- **Forrest plot**

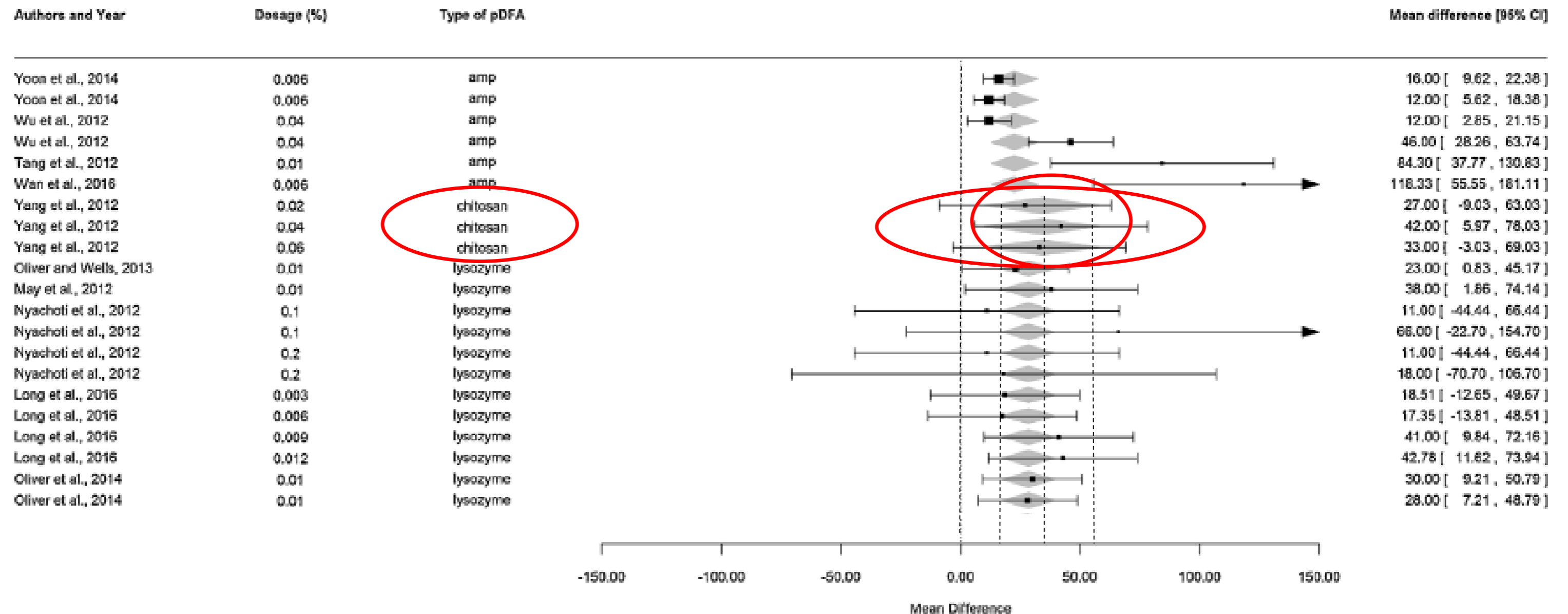
Results meta-analysis

1) Daily weight gain: Treatment group Vs negative control group



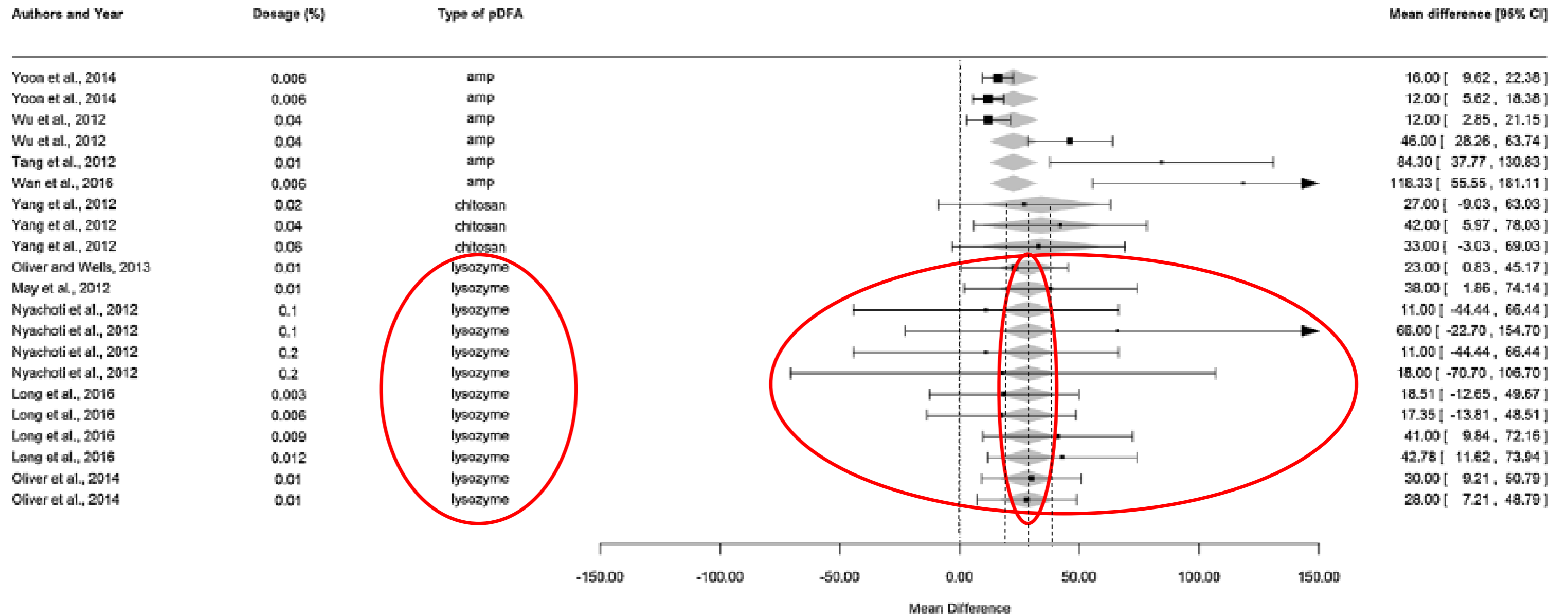
Results meta-analysis

1) Daily weight gain: Treatment group Vs negative control group



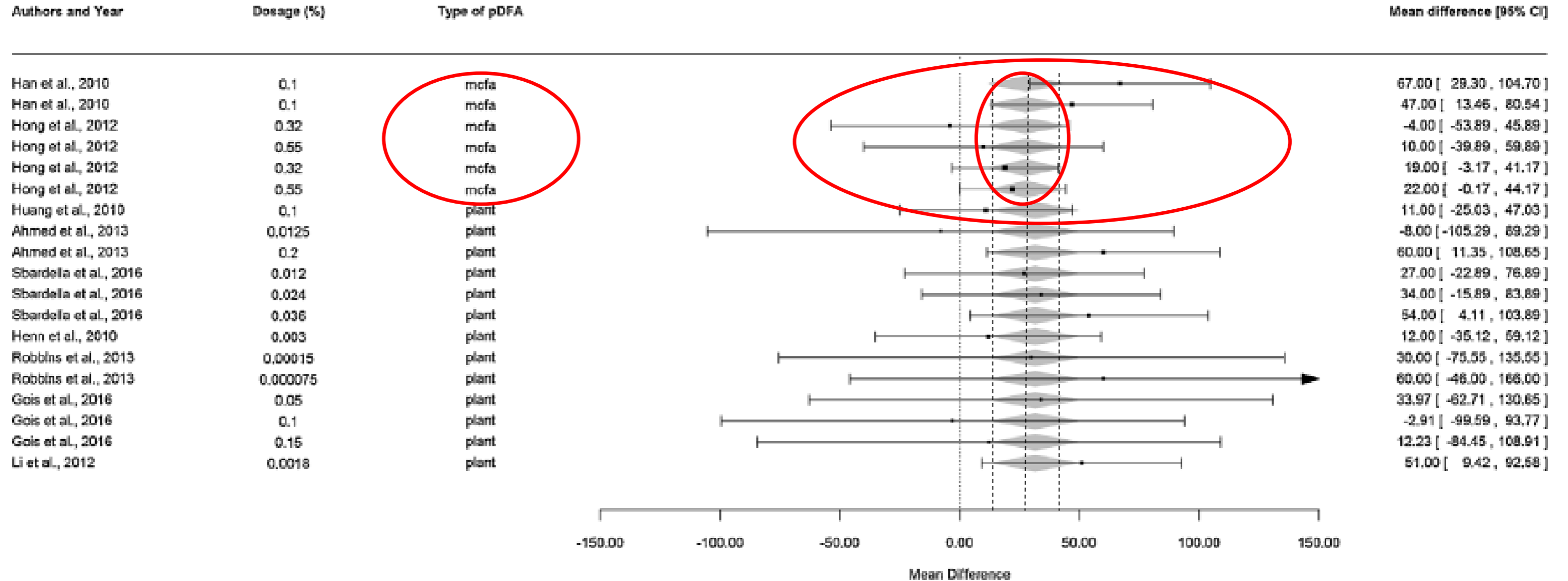
Results meta-analysis

1) Daily weight gain: Treatment group Vs **negative control** group



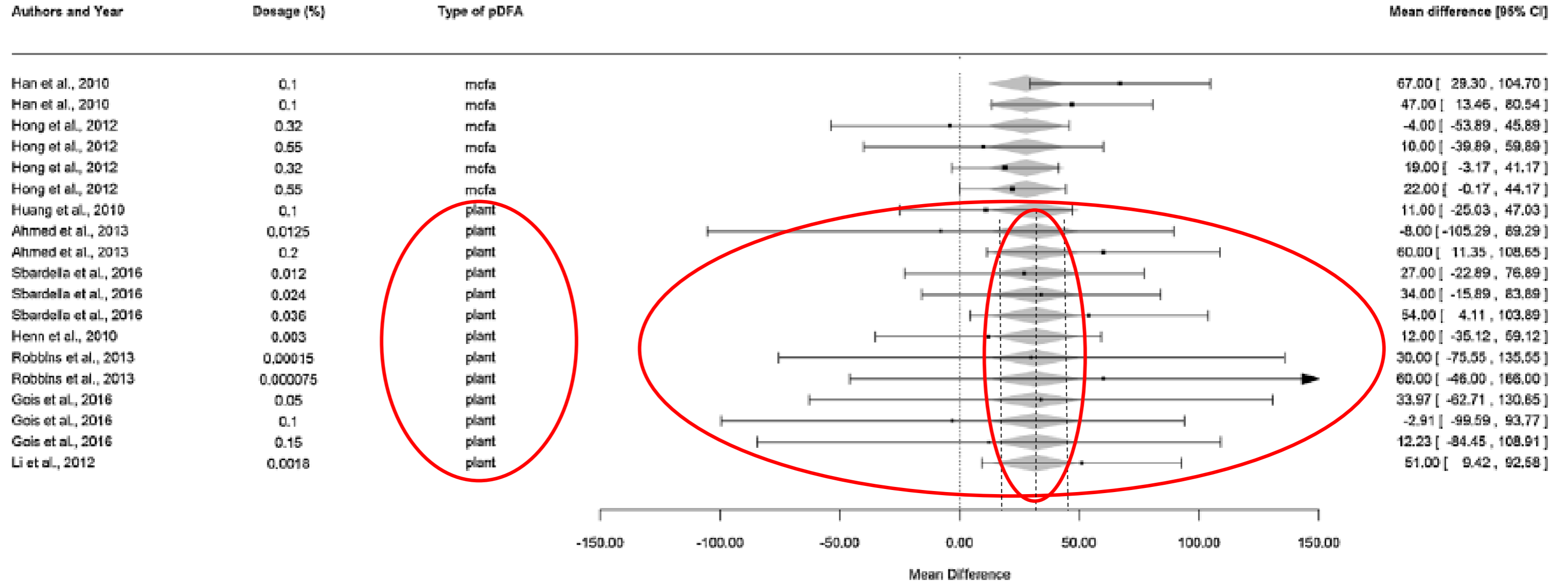
Results meta-analysis

1) Daily weight gain: Treatment group Vs **negative control** group



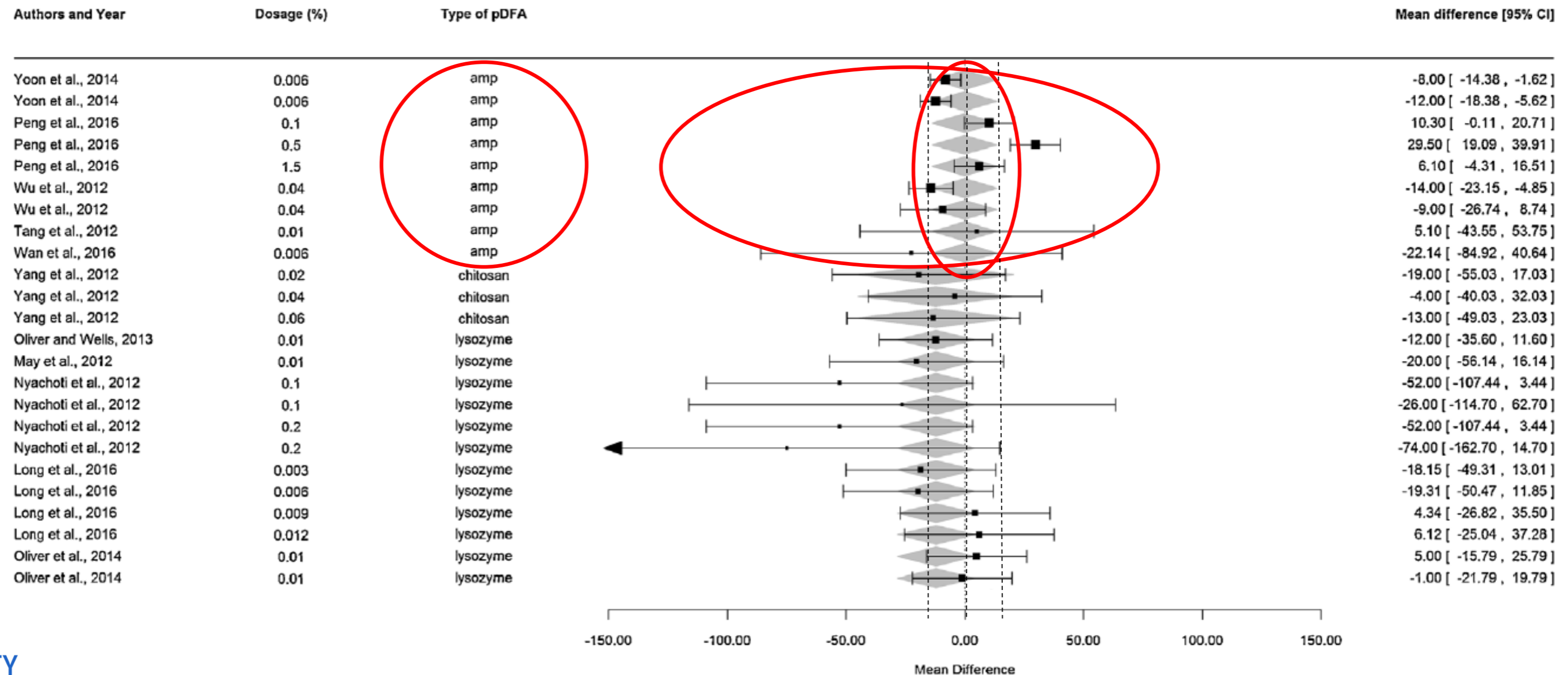
Results meta-analysis

1) Daily weight gain: Treatment group Vs **negative control** group



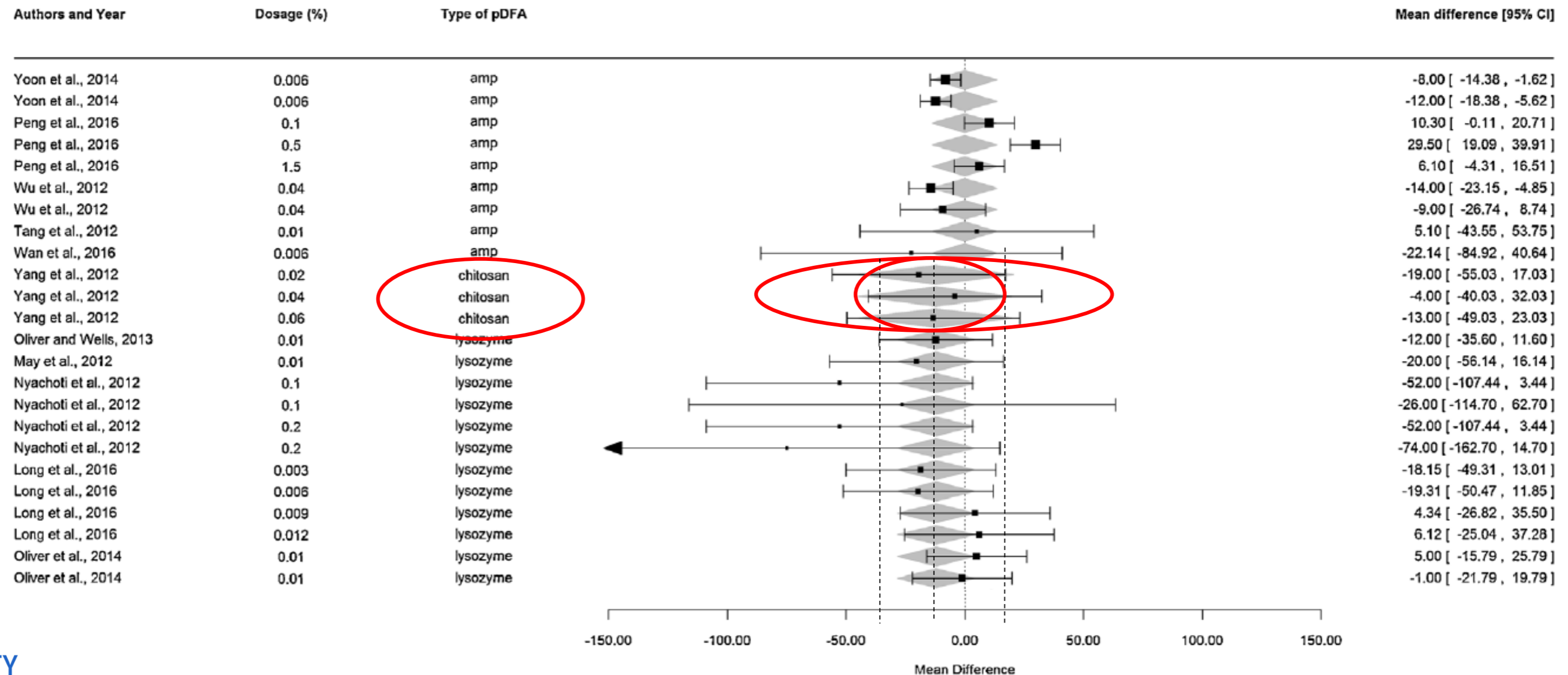
Results meta-analysis

2) Daily weight gain: Treatment group Vs positive control group



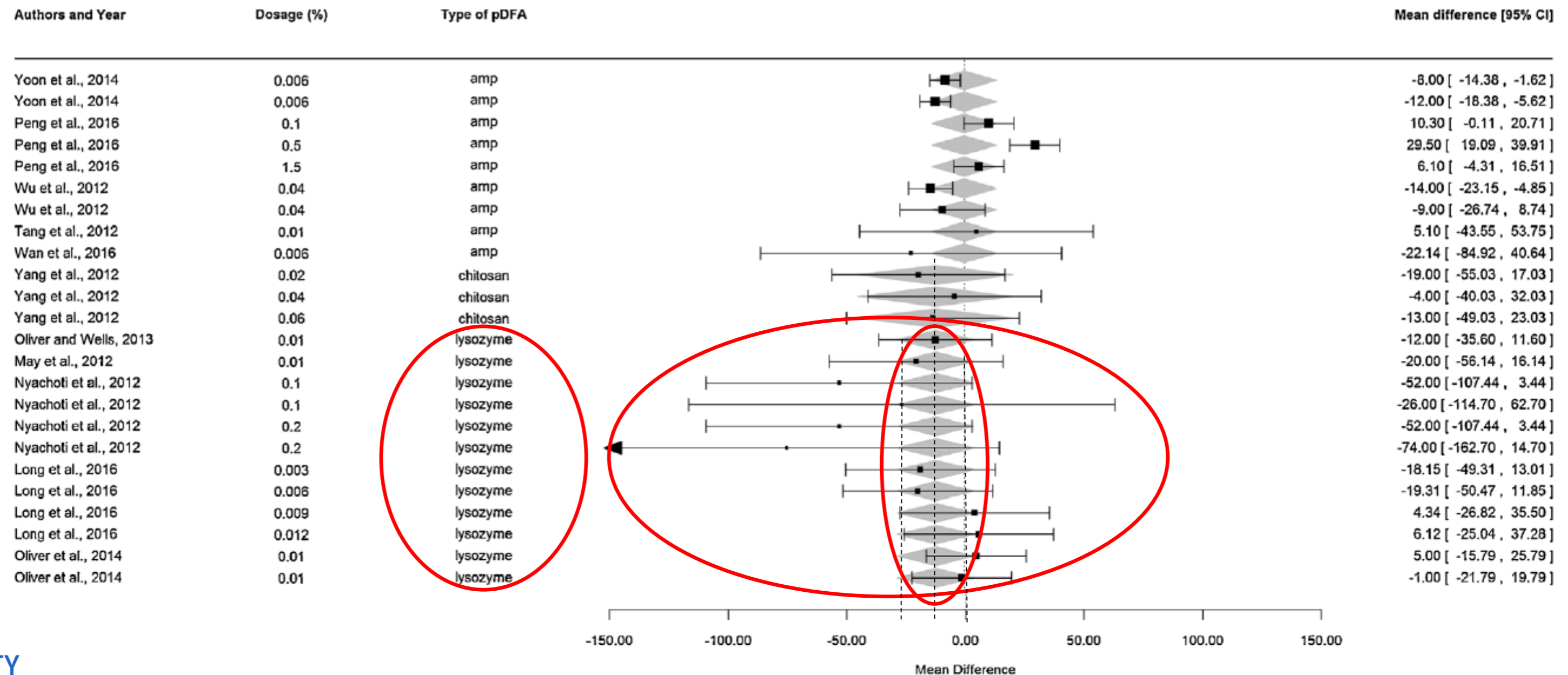
Results meta-analysis

2) Daily weight gain: Treatment group Vs positive control group



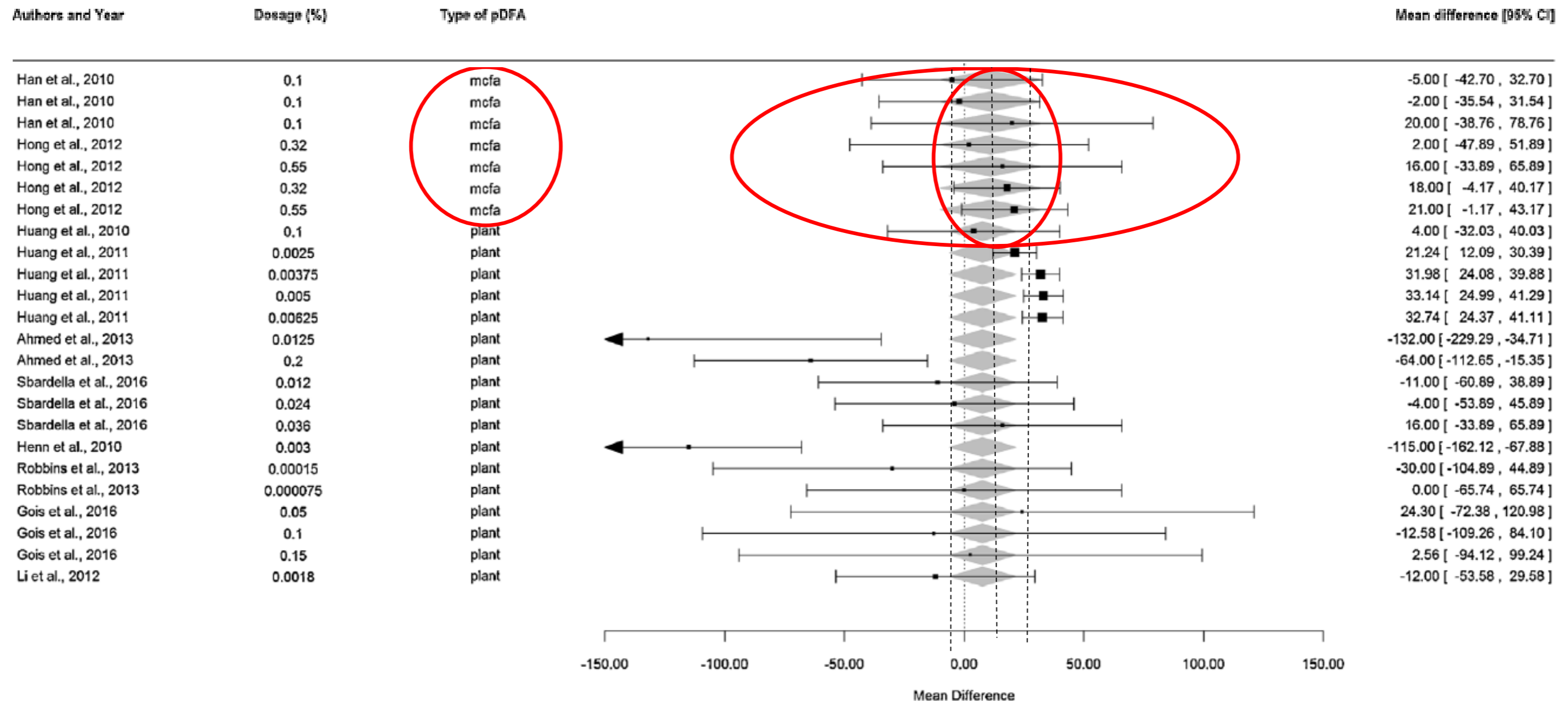
Results meta-analysis

2) Daily weight gain: Treatment group Vs positive control group



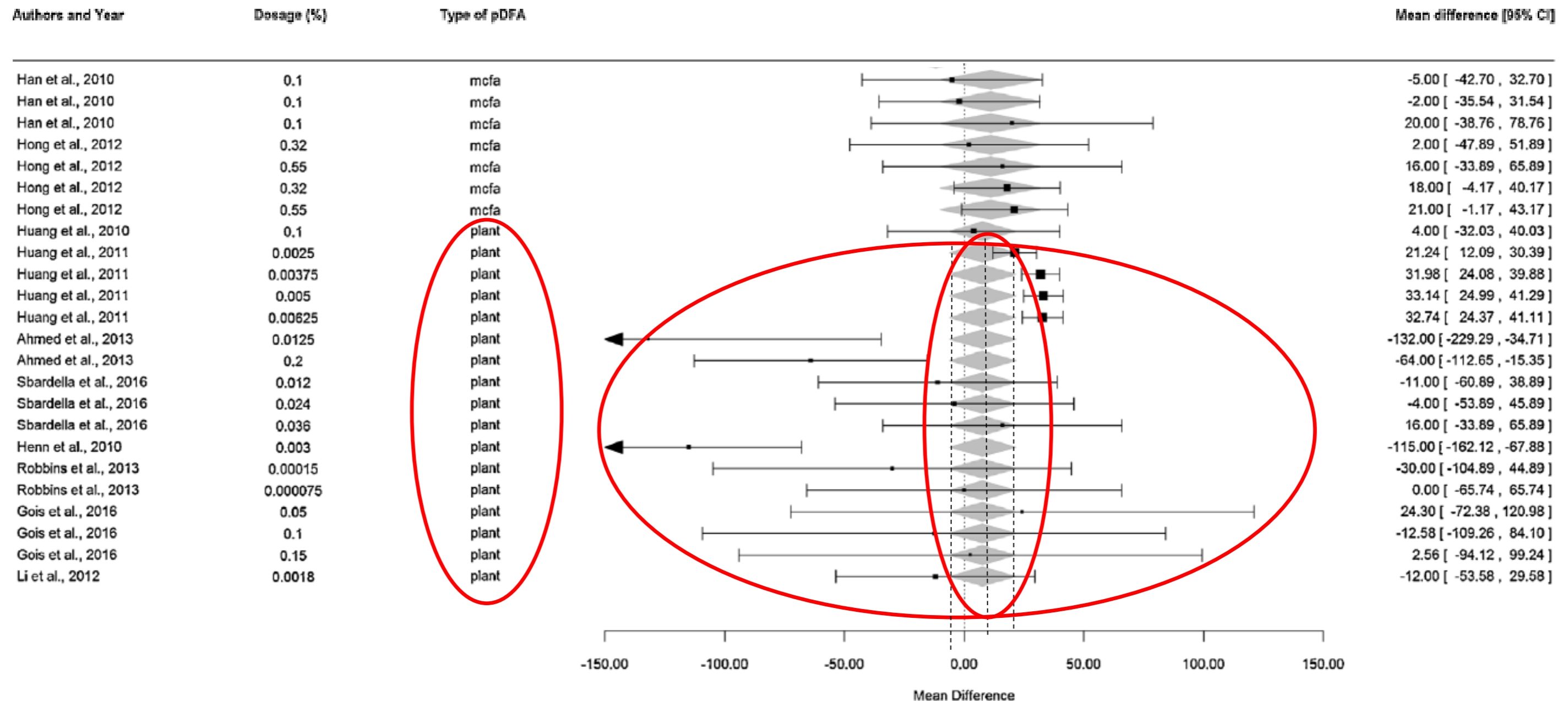
Results meta-analysis

2) Daily weight gain: Treatment group Vs positive control group



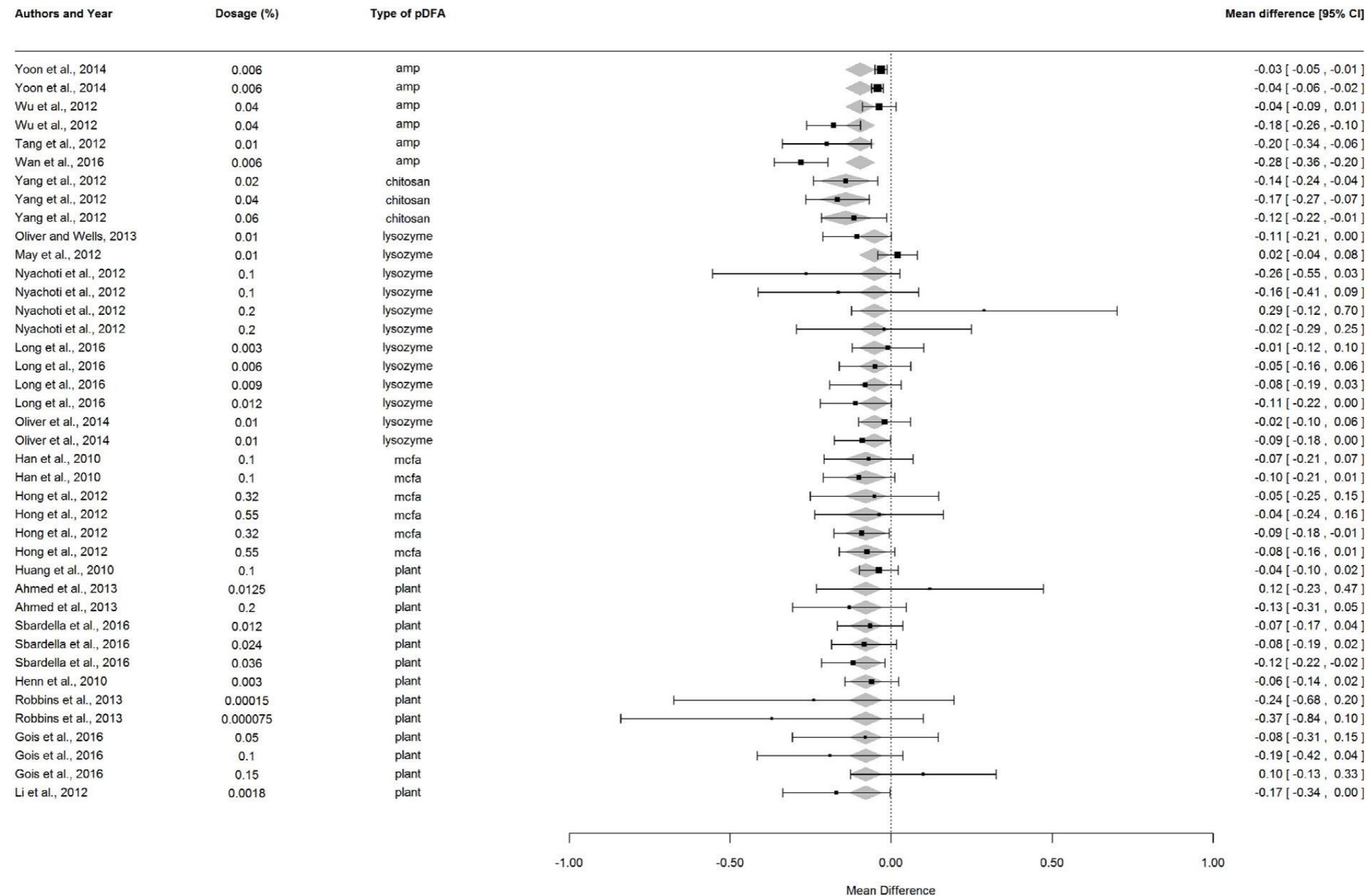
Results meta-analysis

2) Daily weight gain: Treatment group Vs positive control group



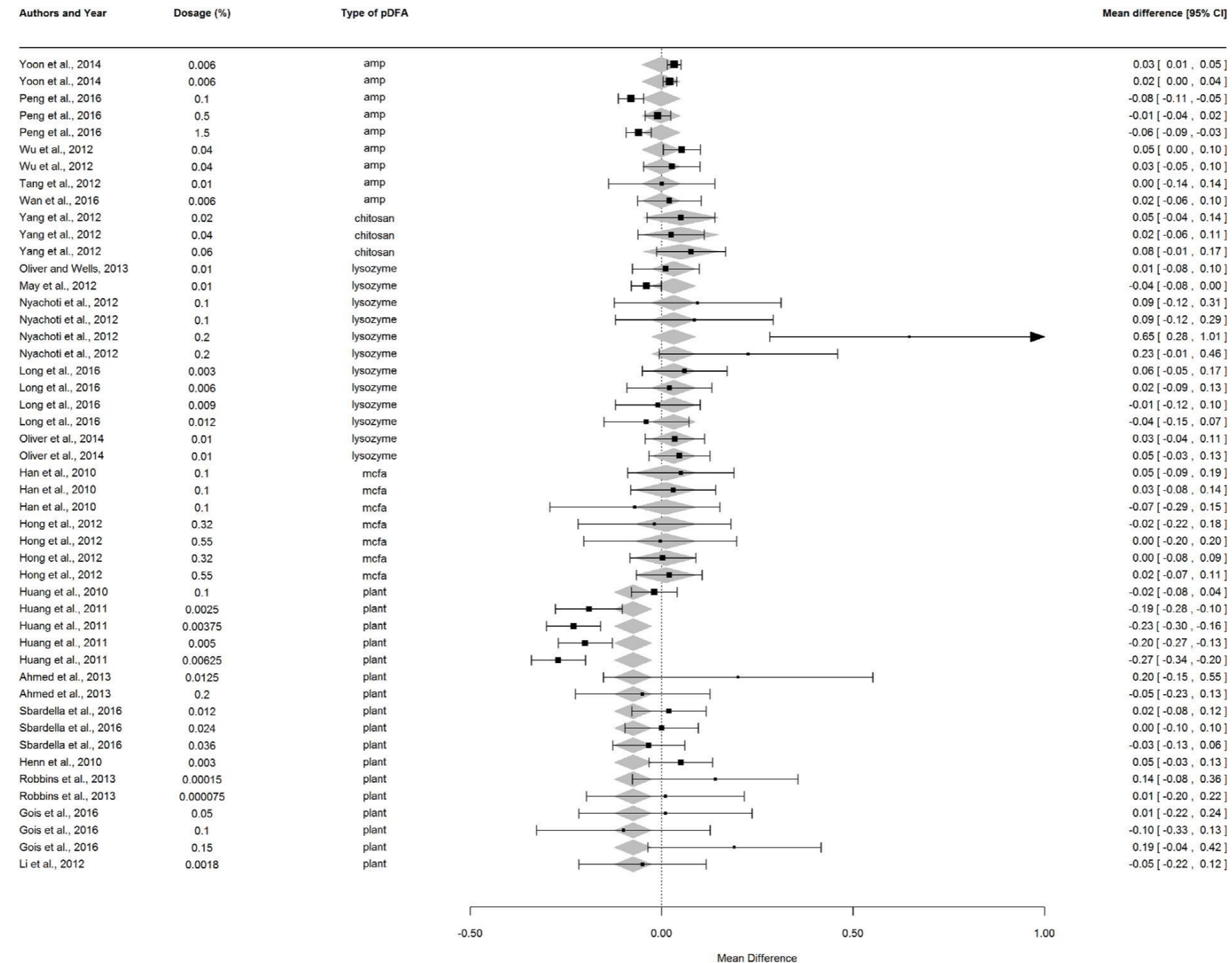
Results meta-analysis

3) Feed conversion ratio: Treatment group Vs **negative control** group



Results meta-analysis

4) Feed conversion ratio: Treatment group Vs **positive control** group



Discussion feed additives

- Be aware of publication bias



Discussion feed additives

1. Antimicrobial peptides (AMP)

- **Beneficial effect on ADG and FCR compared to negative control**
- **No significant difference from positive control**

2. Chitosan

- **Limited trials available**
- **Beneficial effect on ADG and FCR compared to negative control**
- **No significant difference from positive control**

Discussion feed additives

3. Lysozyme

- **Beneficial effect on ADG and FCR compared to negative control**
- **No significant difference from positive control**

4. Medium Chain fatty acids

- **Beneficial effect on ADG and FCR compared to negative control**
- **No significant difference from positive control**

5. Plant extracts and essential oils

- **Most studied group**
- **Beneficial effect on ADG and FCR compared to negative control**
- **Beneficial effect on ADFCR compared to positive control**

What is biosecurity



BIOSECURITY

=

The combination of all measures taken to reduce the risk of introduction and spread of diseases on herd, region, country,... level

What is biosecurity

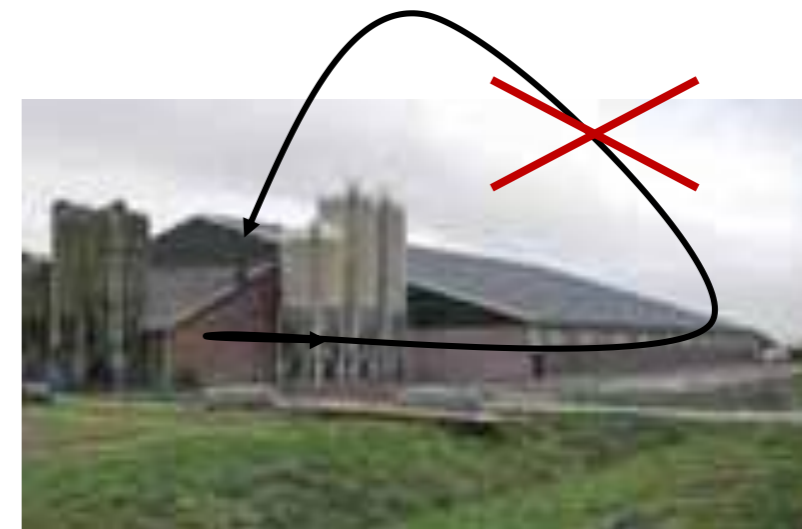
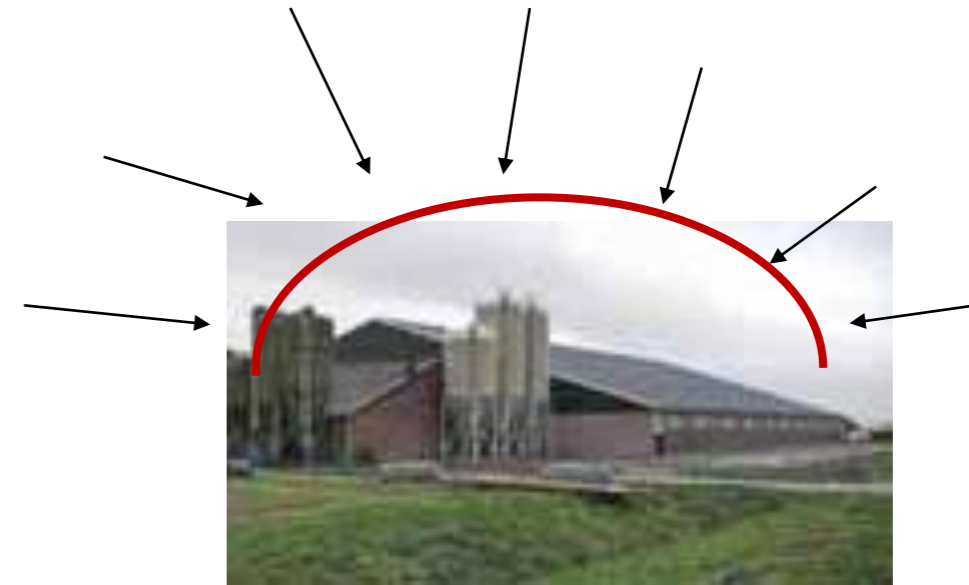
EXTERNAL BIOSECURITY

= Reduce introduction

- endemic diseases
- "exotic" diseases

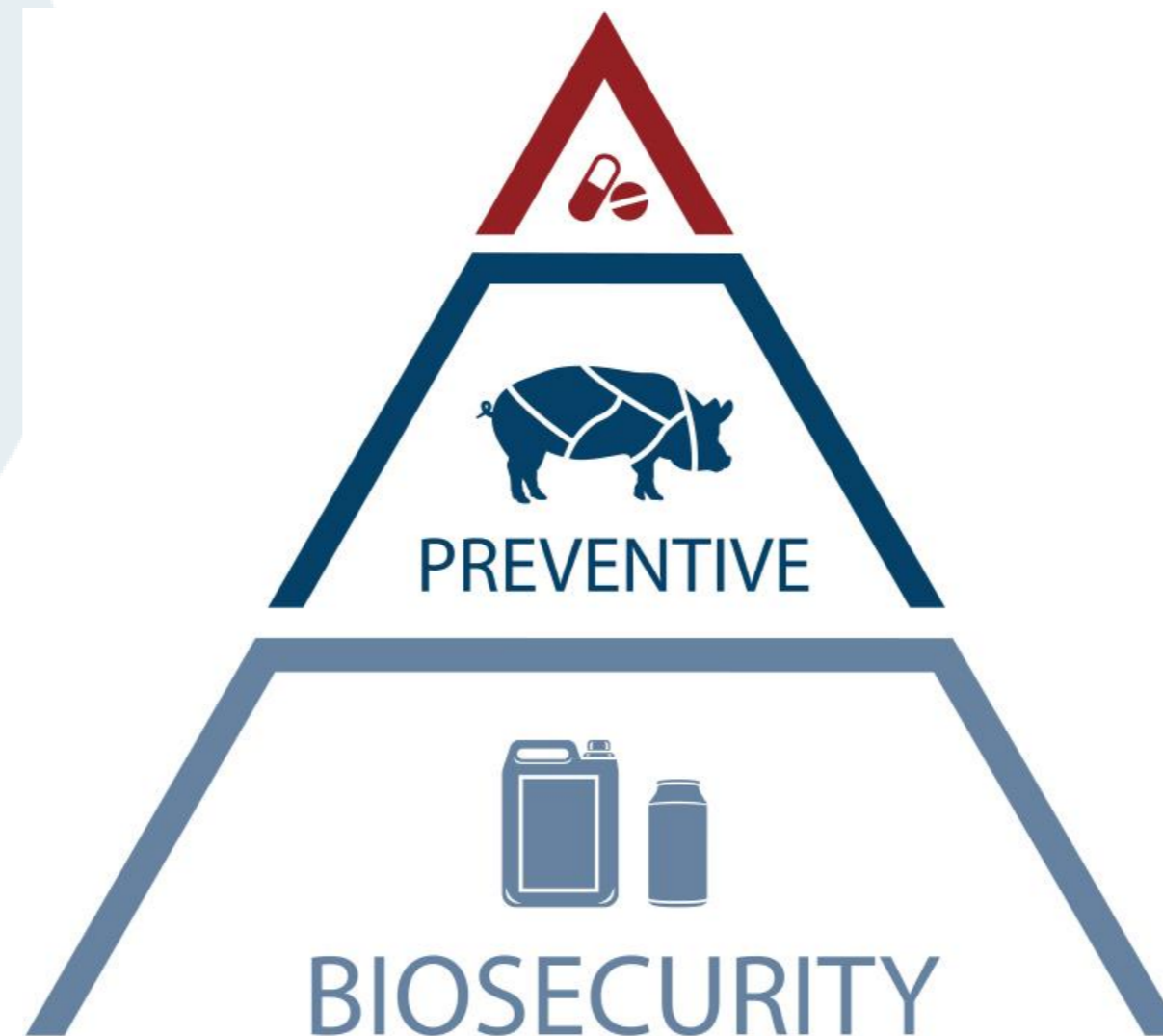
INTERNAL BIOSECURITY

= reduce spread



Why biosecurity

BIOSECURITY is (should be) the basis of any disease control program



Biosecurity = complex

- No protocol suitable for every herd
- Balance biosecurity – management
- Tool?

→ Scoring System





Scoring system and website Pigs and Poultry

Biocheck, prevention is better than cure!



www.biocheck.ugent.be

BIOCHECK.UGent, prevention is better than cure!

Welkom!

Biocheck.UGent is a risk-based scoring system to evaluate the quality of your on-farm biosecurity in an scientific and independent way.

Fill in the online questionnaire for free and receive valuable feedback about the biosecurity level of your farm. You get a summarizing and personal report with detailed results. These findings can help you to choose your own suitable biosecurity pathway.

Don't hesitate and get started to lift your farm to a higher biosecurity level!

Start the Biocheck.UGent!

How to use Biocheck.UGent?



The Biocheck.UGent was filled in 11498 times around the world to evaluate the on-farm biosecurity level!



8309



2716



473

In the spotlight



07-02-2018

"Biosecurity in animal production and veterinary medicine (from principles to practice)" now available for purchase!



20-11-2018

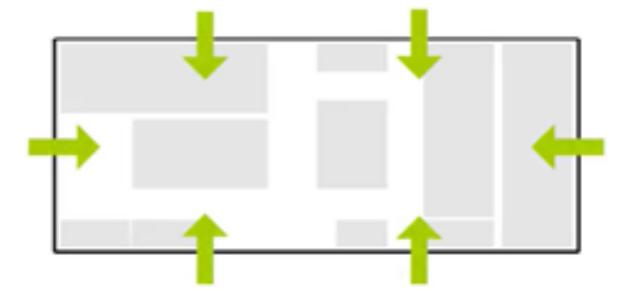
New presentation available about the Biocheck.UGent tool!

Agenda

APRIL
02

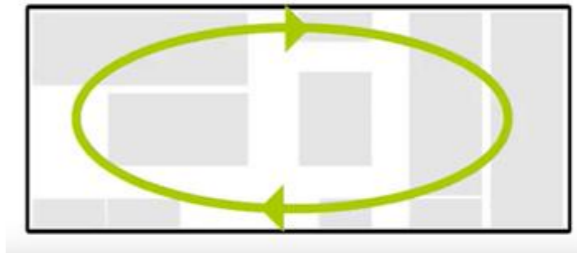
Webinar MSD on the importance of biosecurity in control of pig diseases

EXTERNAL BIOSECURITY (50)



Subcategory	Weight factor
Purchase of animals and semen	24
Transport of animals, removal of manure and dead animals	23
Feed, water and equipment supply	15
Personnel and visitors	17
Vermin and bird control	11
Environment and region	10

INTERNAL BIOSECURITY (50)



Subcategory	Weight factor
Disease management	10
Farrowing and suckling period	14
Nursery unit	14
Fattening unit	14
Measures between compartments and the use of equipment	28
Cleaning and disinfection	20





ID: 20388/691653/v/2_1/F

Entry date: 2019-03-10 13:22:08

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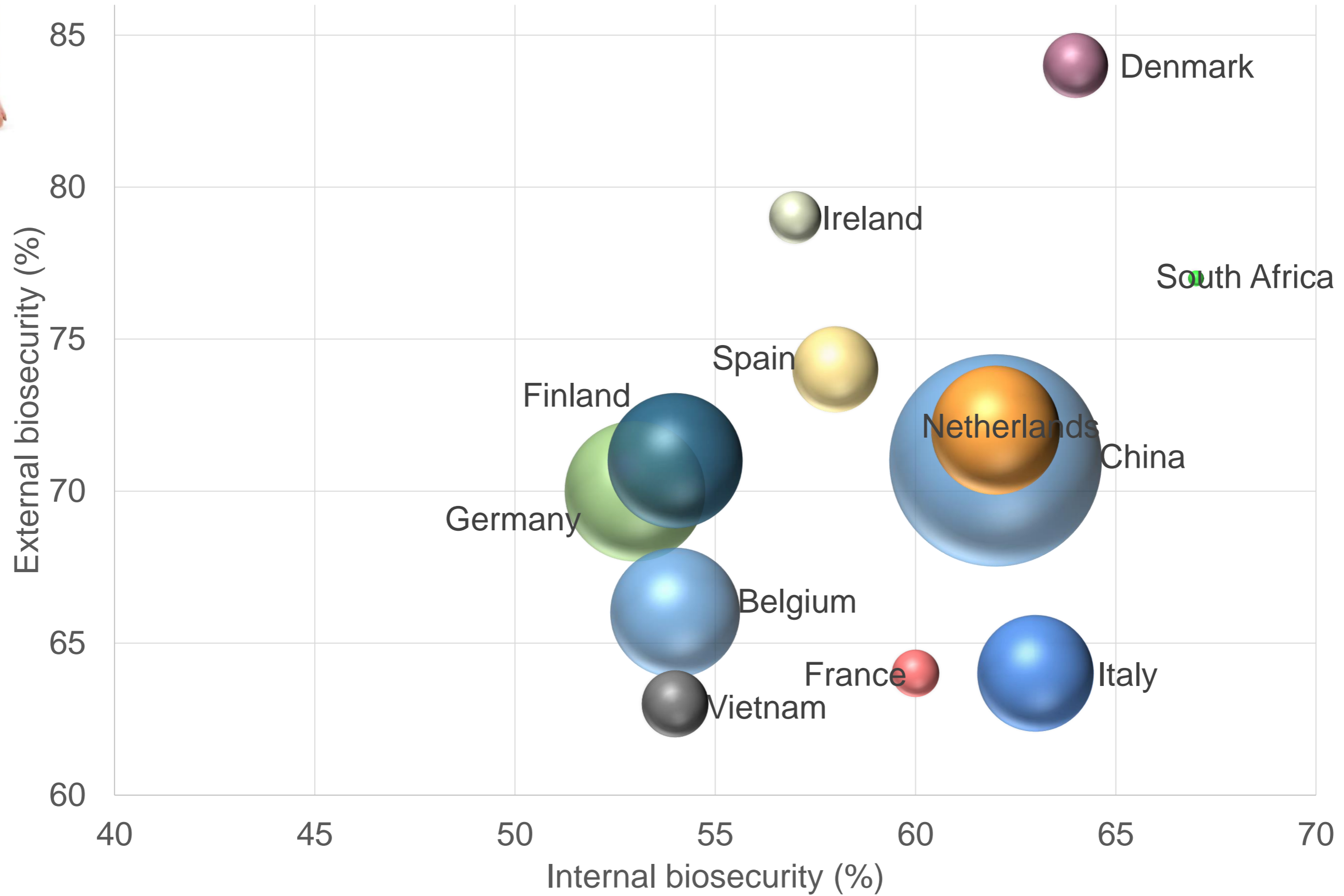
PIG

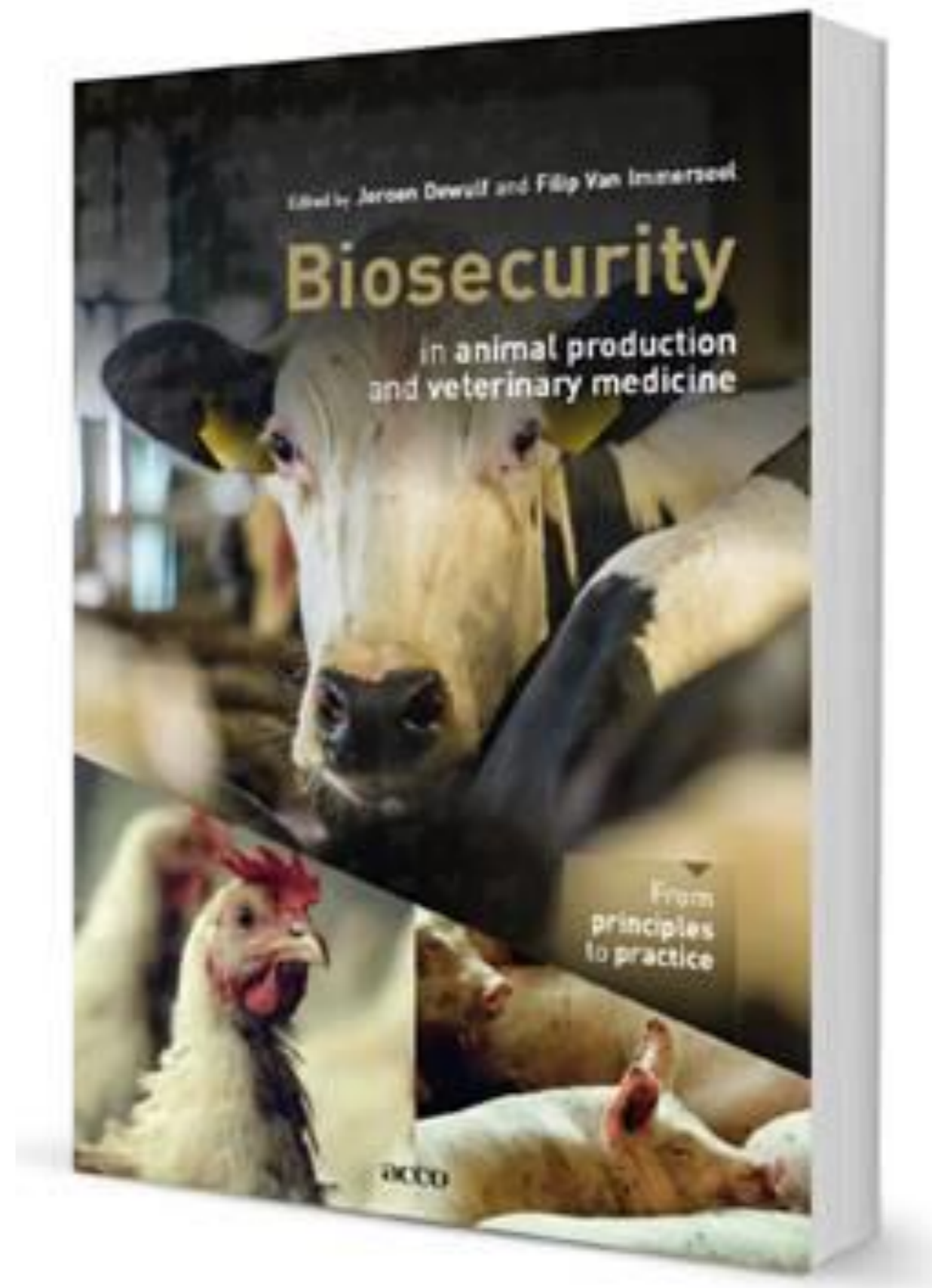
Nr	Description	Score	Country average	Global average
<i>External biosecurity</i>				
A	<u>Purchase of animals and semen</u>	100 %	88 %	89 %
B	<u>Transport of animals, removal of manure and dead animals</u>	41 %	70 %	70 %
C	<u>Feed, water and equipment supply</u>	27 %	38 %	50 %
D	<u>Personnel and visitors</u>	41 %	64 %	68 %
E	<u>Vermin and bird control</u>	50 %	64 %	67 %
F	<u>Environment and region</u>	60 %	53 %	64 %
Subtotal External biosecurity:		57 %	66 %	70 %
<i>Internal biosecurity</i>				
A	<u>Disease management</u>	40 %	56 %	67 %
B	<u>Farrowing and suckling period</u>	64 %	59 %	56 %
C	<u>Nursery unit</u>	36 %	65 %	66 %
D	<u>Fattening unit</u>	N/A	72 %	67 %
E	<u>Measures between compartments and the use of equipment</u>	39 %	44 %	48 %
F	<u>Cleaning and disinfection</u>	20 %	48 %	59 %
Subtotal Internal biosecurity:		38 %	55 %	58 %
Total:		48 %	61 %	64 %

N/A = Not applicable



Biocheck.UGent Worldwide







**“An ounce of prevention,
is worth a pound of cure”**

- Benjamin Franklin -

Jeroen Dewulf

VETERINARY EPIDEMIOLOGY

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