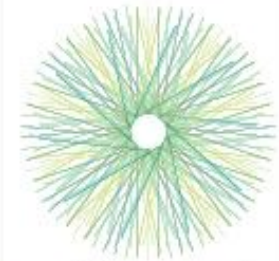
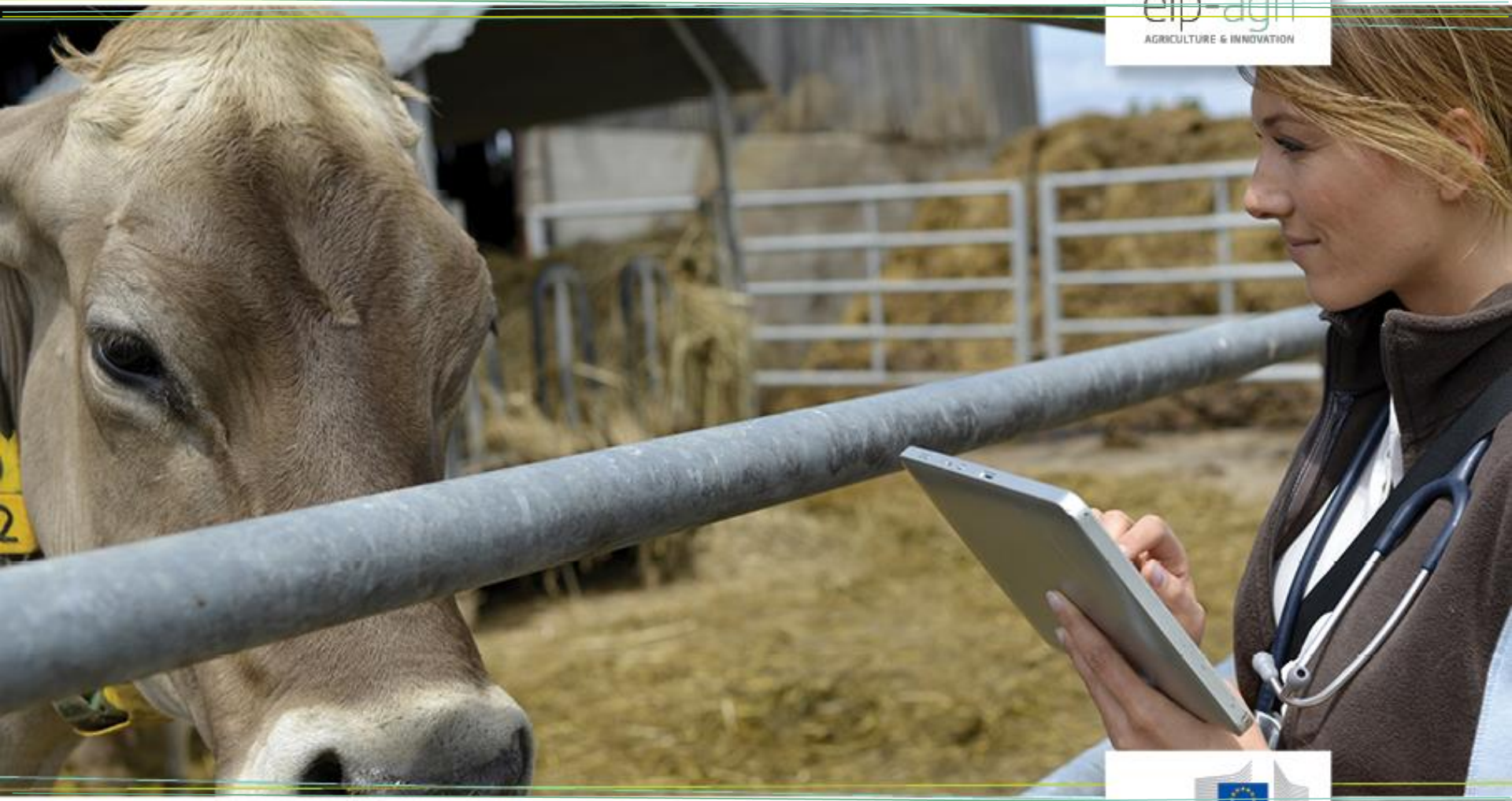


EIP-AGRI Workshop 'Biosecurity at farm level: challenges for innovation'

22-23 January 2015 – Brussels, Belgium



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Biosecurity in animal farming

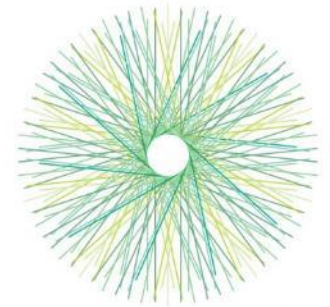
Prof. Dr. Jeroen Dewulf

Jeroen.Dewulf@UGent.be

In collaboration with Maria Laanen, Merel Postma, Philippe Gelaude
and Steven Sarrazin

What is biosecurity?

All measures taken to prevent:



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1. disease introduction
■ 6%
2. disease spread
■ 3%
3. disease introduction and disease spread
■ 91%



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

'assessing risk and implementing measures to decrease that risk and to safeguard and improve health status on a farm'

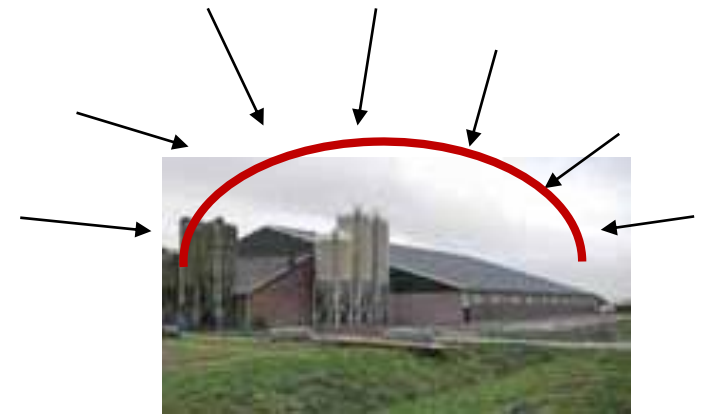


What is biosecurity

EXTERNAL BIOSECURITY

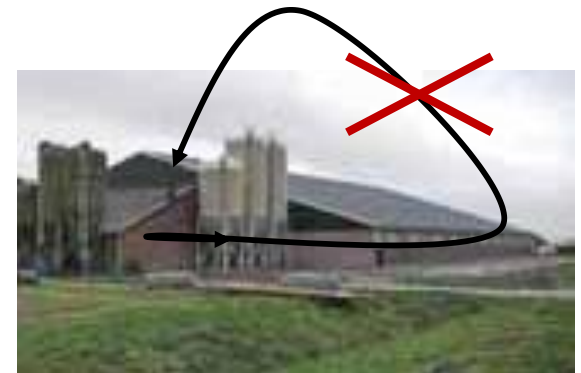
= Reduce introduction

- endemic diseases
- "exotic" diseases



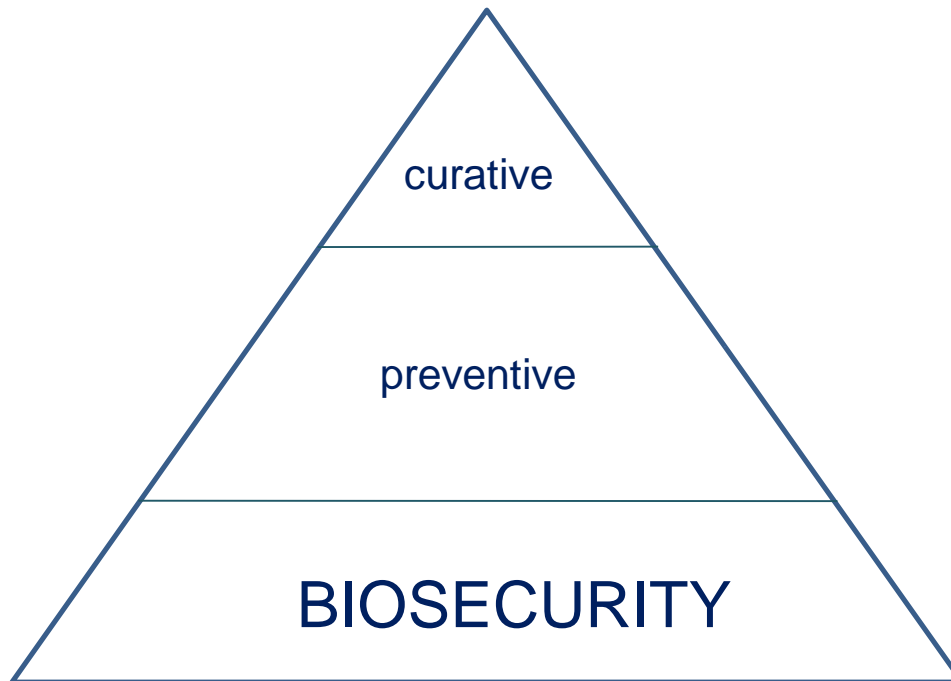
INTERNAL BIOSECURITY

= reduce spread



Why biosecurity

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



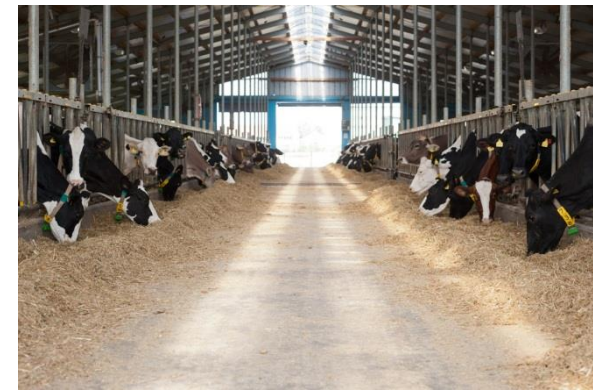
Why biosecurity

- **Better biosecurity** ↔ **less disease**
 - **Better production results**
 - reproduction
 - growth
 - feed conversion
 - uniformity
 - **Less antimicrobial use**
 - **Higher prices when selling the animals**



Why biosecurity

- Better biosecurity ↔ less disease
 - Eradication programs ↑
 - Free / Obligated (*Salmonella Action Plan*)
 - Risk of exotic diseases
 - Public health, animal welfare, public opinion ('sustainable meat production')
 - Legislation



Why biosecurity

- Farmers motivators to take disease prevention measures (=558)
 1. To improve profit due to higher productivity
 2. To have farm stability
 3. To improve quality and safety of produced products
 4. To improve animal welfare
 5. To fulfill the duty of keeping my animals healthy

Principles of biosecurity

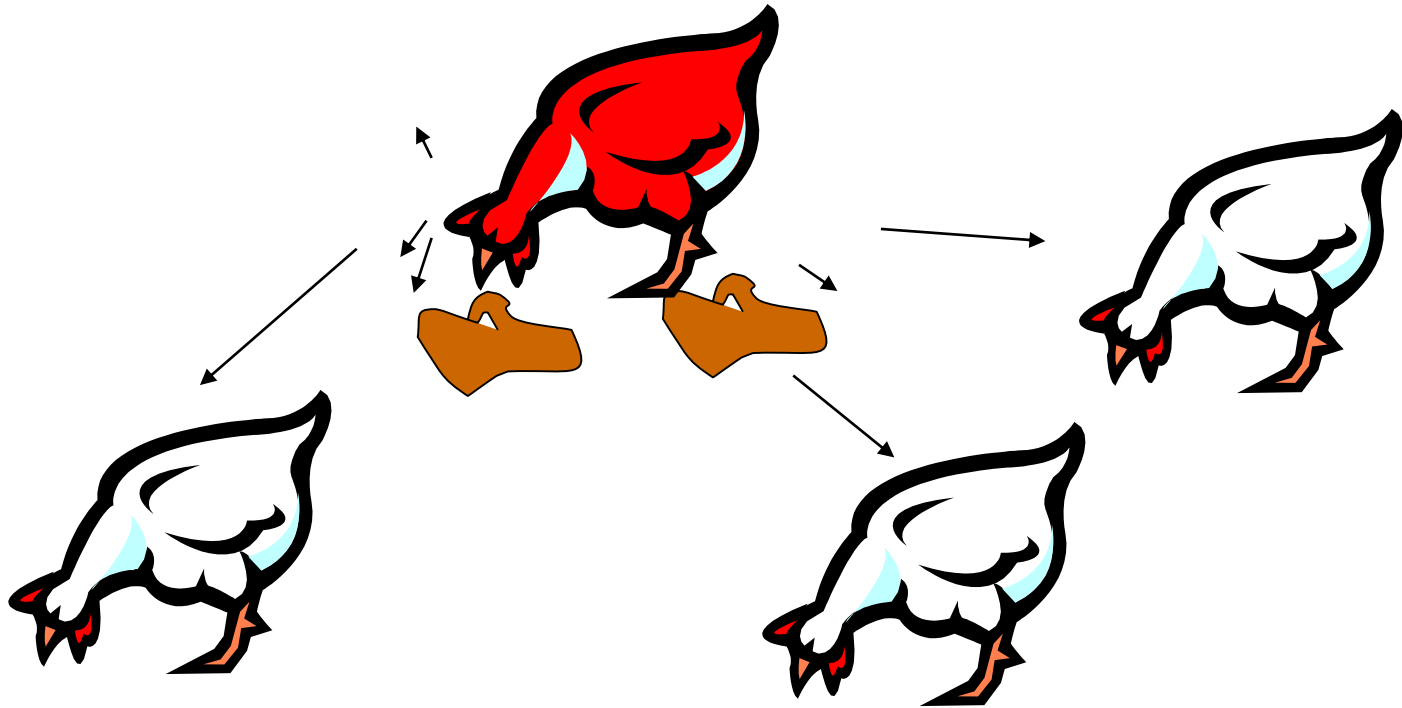
Separation of infected and diseased animals

→ avoid both direct and indirect contact!
(all-in/all-out, working lines, hospital pen, ...)



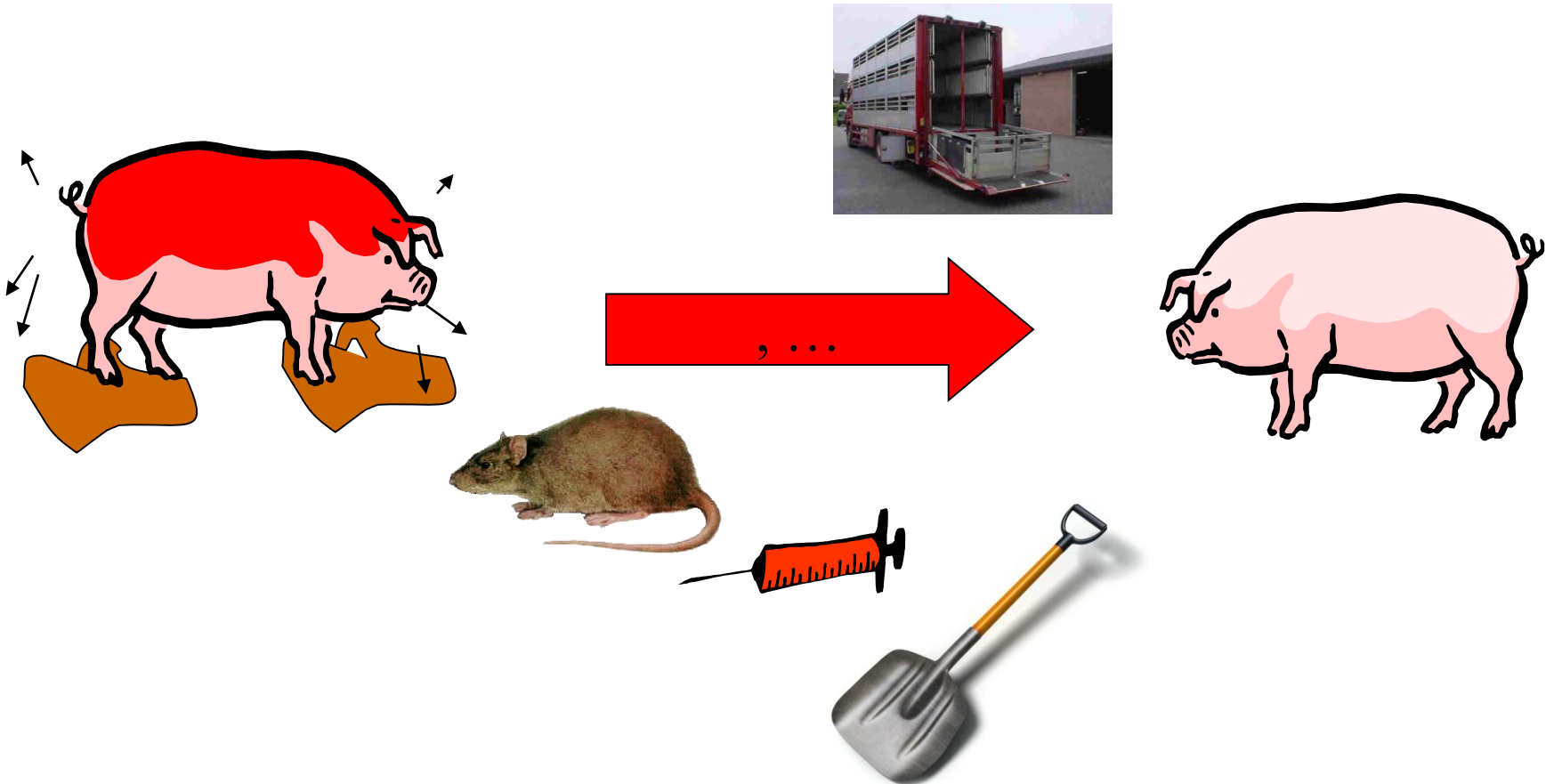
Principles of biosecurity

Direct disease contact:



Principles of biosecurity

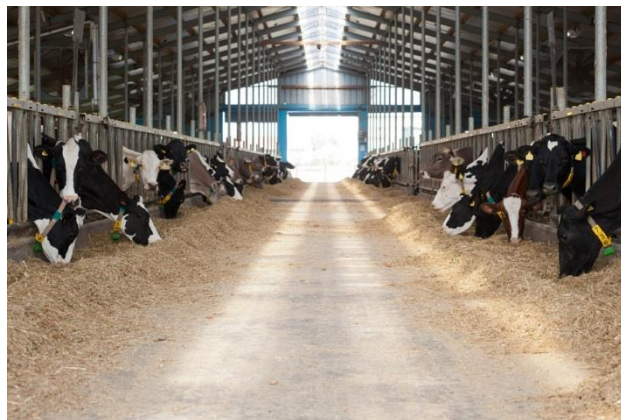
Indirect disease contact:



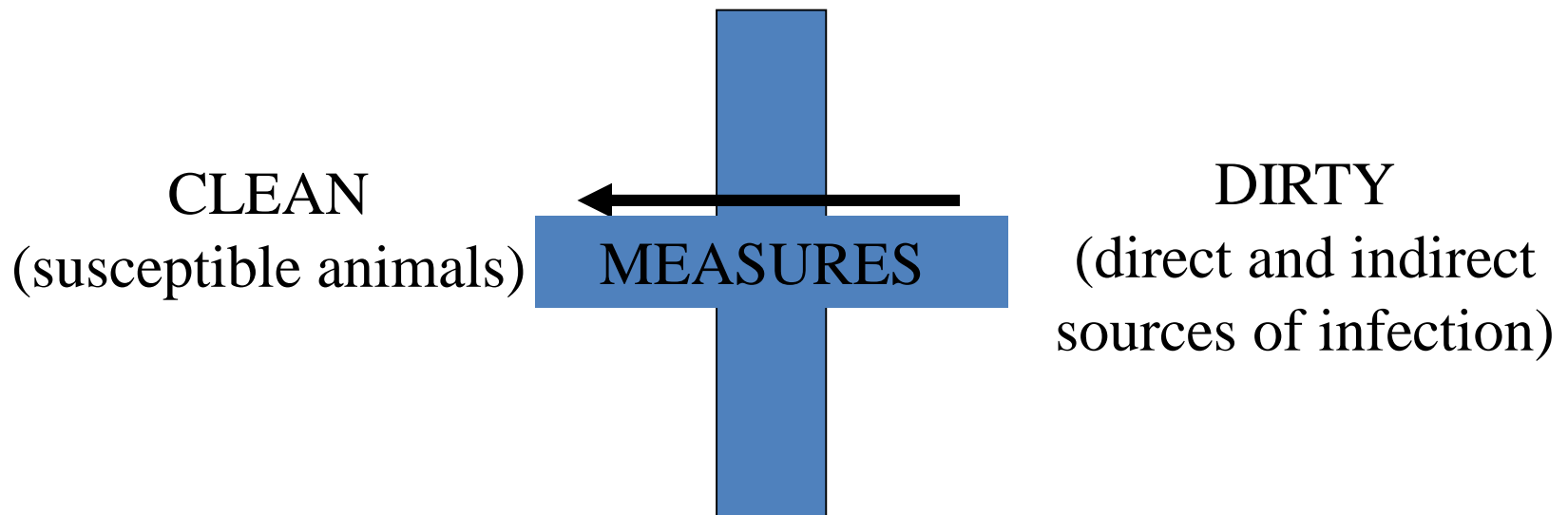
Principles of biosecurity

Reduction of the general infection pressure

→ breaking the infection cyclus, reducing the burden on the immune system ↓
(cleaning, desinfection and empty period, vaccination, ...)



Principles of biosecurity



- Dependent upon herd situation (status, type,...)
- Perform well and consequent

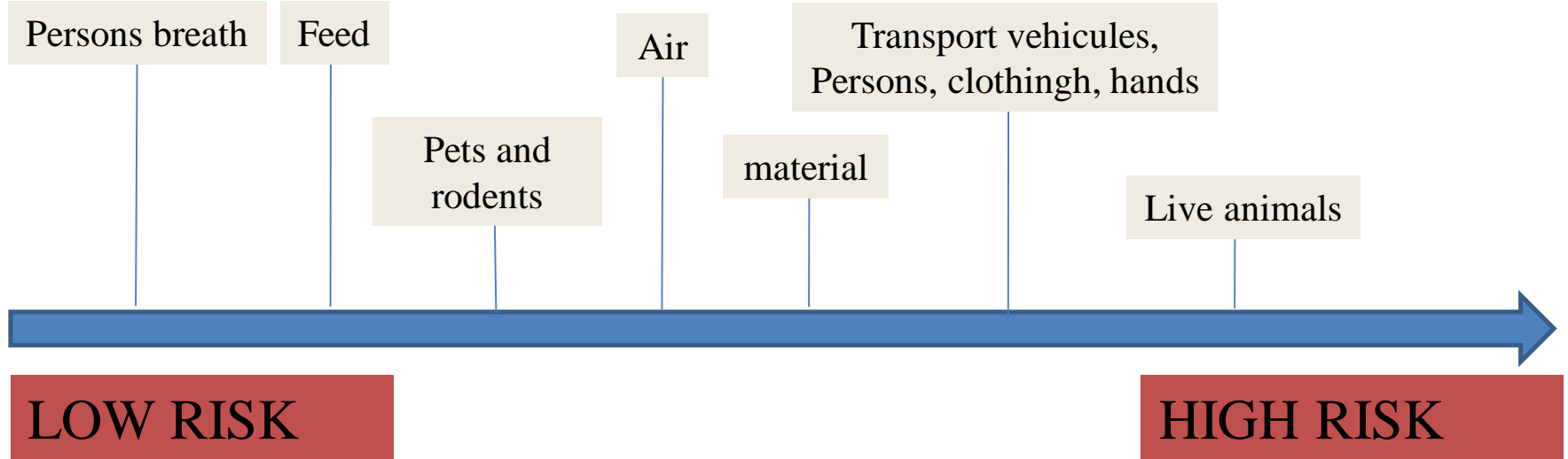
Principles of biosecurity

- Based on knowledge of
 - disease transmission
 - survival of sources of infection
- General and species specific
- General and disease specific
 - Pulmonary diseases versus enteric diseases
 - Multifactorial diseases (PRRS & influenza, PMWS, PIA,...)

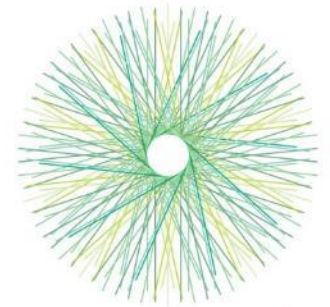
<i>Amass S. (2005)</i>	<u>Pers.</u>	<u>Sperm</u>	<u>Faeces</u>	<u>And./ birds!</u>	<u>Rodents</u>	<u>Insect.</u>	<u>Aerosol</u>	<u>Feed</u>	<u>Water</u>	<u>Fomites</u>
M. hyopneumoniae							*		*	*
P. multocida	*		*				*		*	
Parvo		*	*							*
PRRSV	*	*	*	*		*	*		*	*
Aujeszky		*	*	*	*	*	*			*
Salmonella spp.	*		*	*	*	*	*	*	*	*
Strept. suis	*		*	*		*	*		*	*
Influenza	*		*	*			*			
Blaasjesziekte	*	*					*			*

<i>Amass S. (2005)</i>	<u>Pers.</u>	<u>Sperm</u>	<u>Faeces</u>	<u>And. / vogel</u>	<u>Rodents</u>	<u>Insect.</u>	<u>Aerosol</u>	<u>Feed</u>	<u>Water</u>	<u>Fomites</u>
APP							*			
B. bronchiseptica				*	*		*		*	
B. hyodysenteriae			*	*	*				*	
Brucella. suis	*	*		*						
Swine Fever	*	*	*	*		*	*			*
Clostr. perfringens							*		*	
E. coli	*		*		*	*	*		*	*
Food and mouth disease	*	*	*				*			*
Leptospirose	*	(*)		*	*				*	

Principles of biosecurity



Principles of biosecurity



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Assume: risk of disease introduction on your herd through feed delivery is 1 out of 1000 and the feed delivery truck comes weekly, what is the annual risk?

1. +/- 0,5%



2. +/- 5%



3. +/- 50%

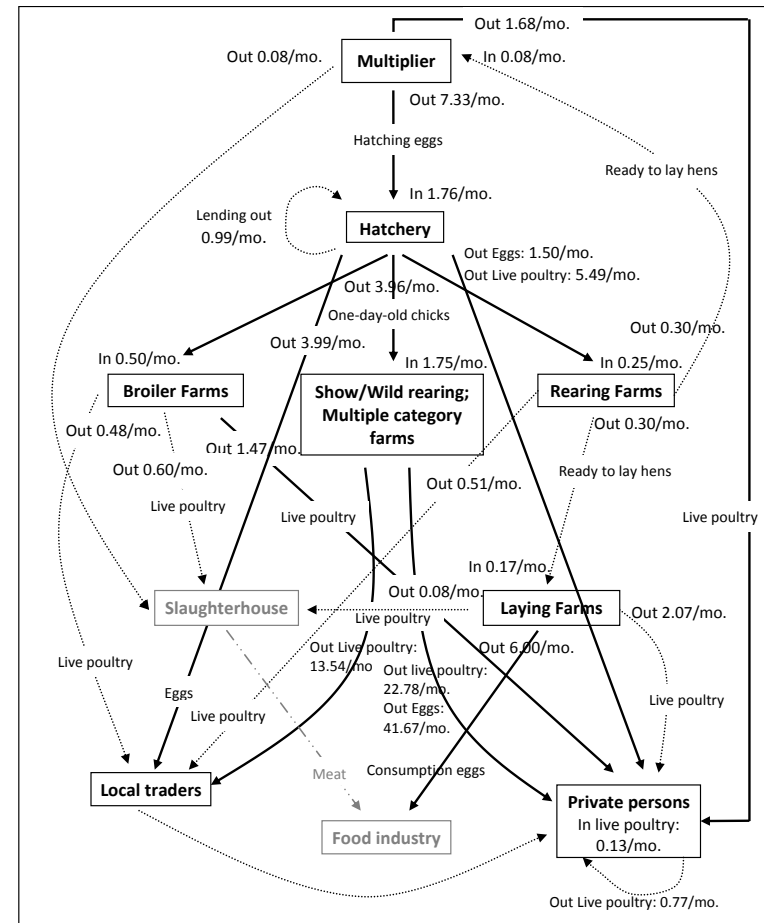
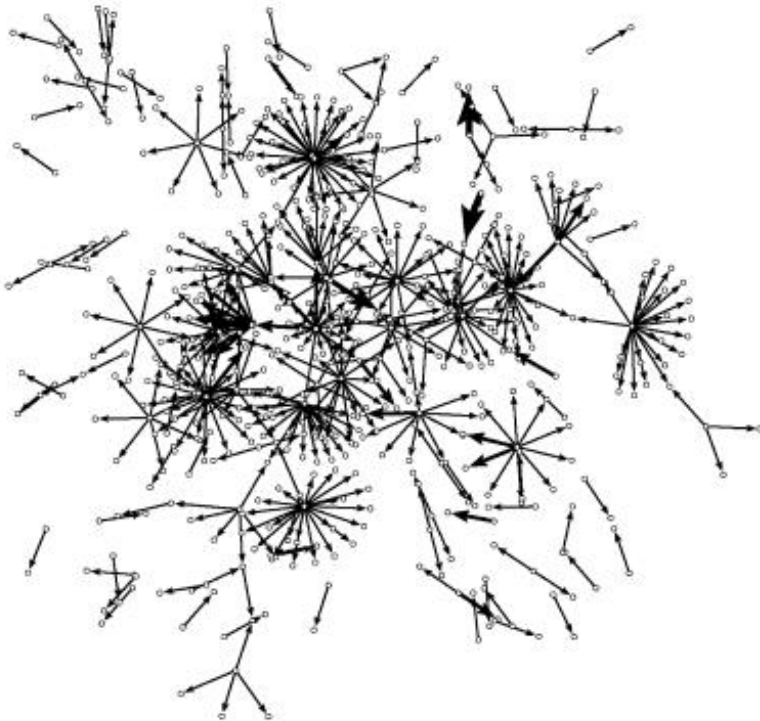


Principles of biosecurity

- ‘Thousand times a small chance becomes a large chance’
 - Risk transmission route (p)
 - **Frequency transmission route (n)**
- $P = 1 - (1-p)^n$
 - $p = 0.1\%$ (1 out of 1000)
 - $n = 52$ (e.g. weekly)
 - **$5,06\% = 1 - (1-0.001)^{52}$**

External Biosecurity

- Purchase of animals and sperm



External Biosecurity

- Purchase of animals and sperm



External Biosecurity

- Purchase of animals and sperm



External Biosecurity

- pasture contact between animals



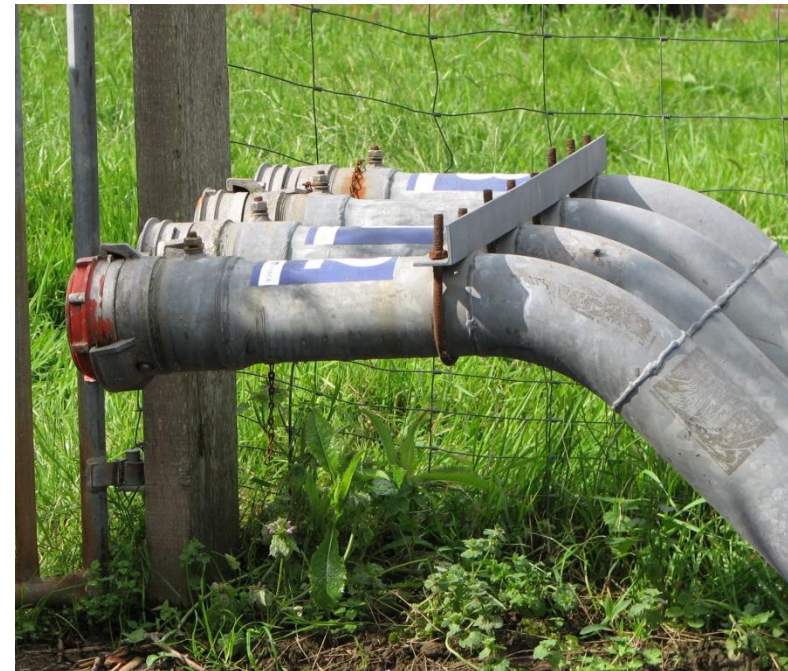
External Biosecurity

- Disposal of animals and material



External Biosecurity

- Disposal of animals and material



External Biosecurity

- management and storage of carcasses



External Biosecurity

- Supply of feed, water and goods



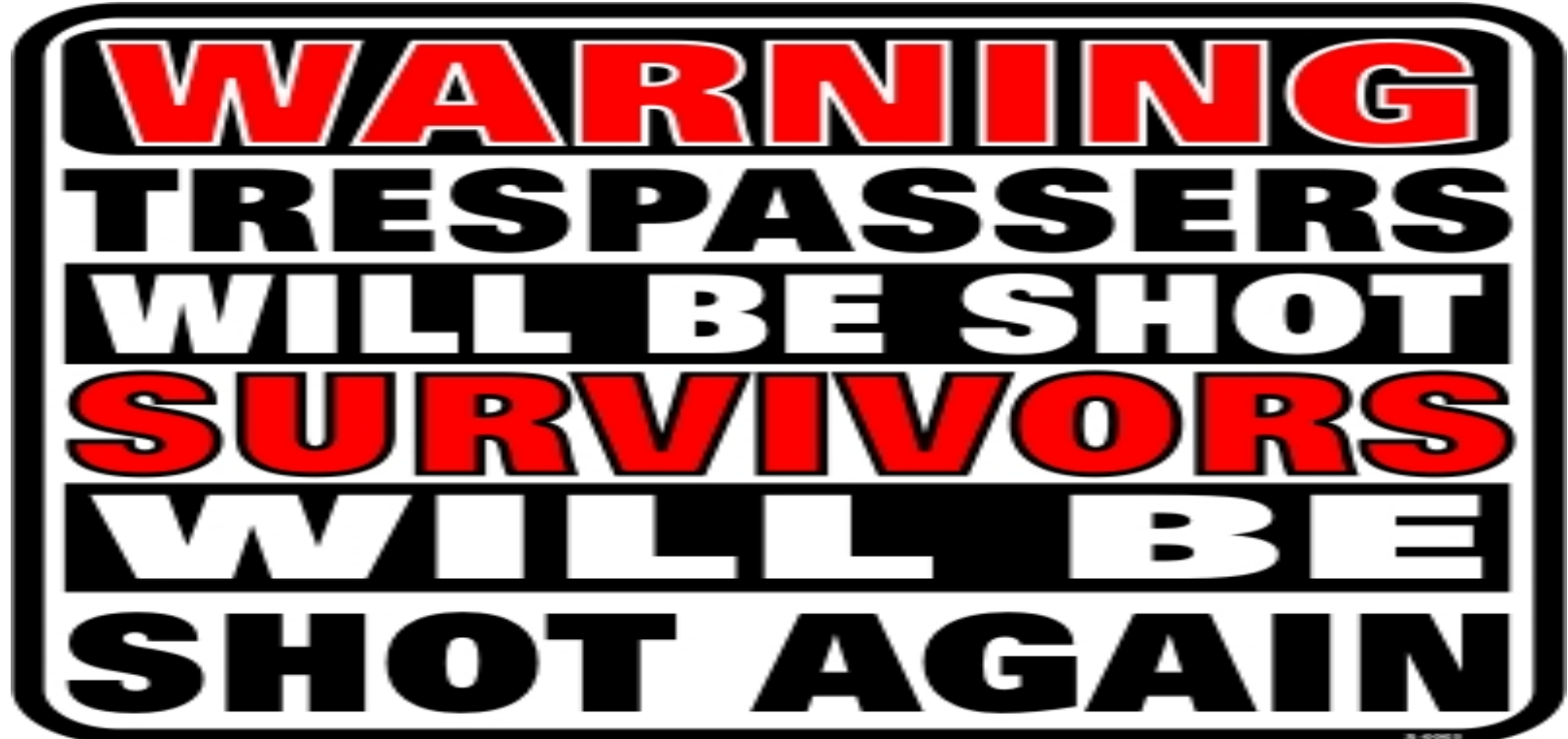
External Biosecurity

- Entrance control



External Biosecurity

- Entrance control



External Biosecurity

- Entrance control



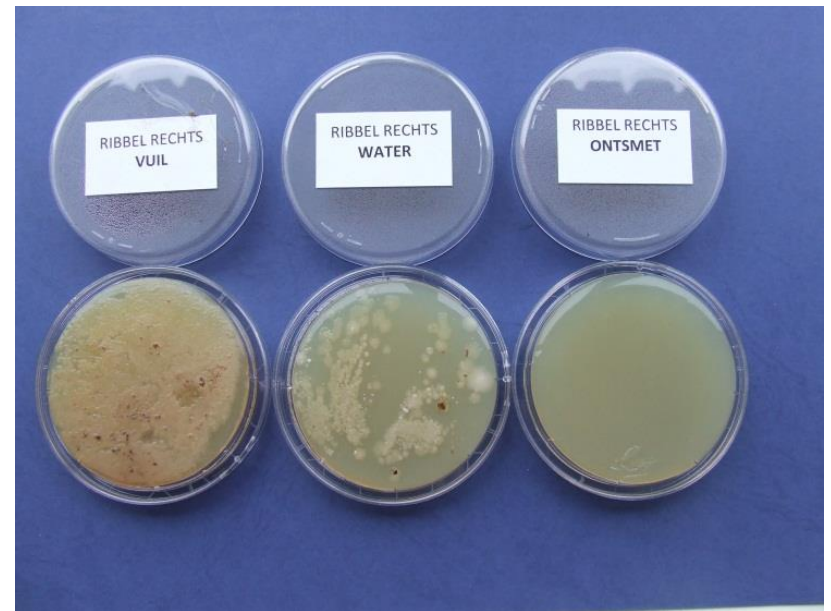
External Biosecurity

- Entrance control



External Biosecurity

- Entrance control



External Biosecurity

- Entrance control



External Biosecurity

- Vermin and bird control



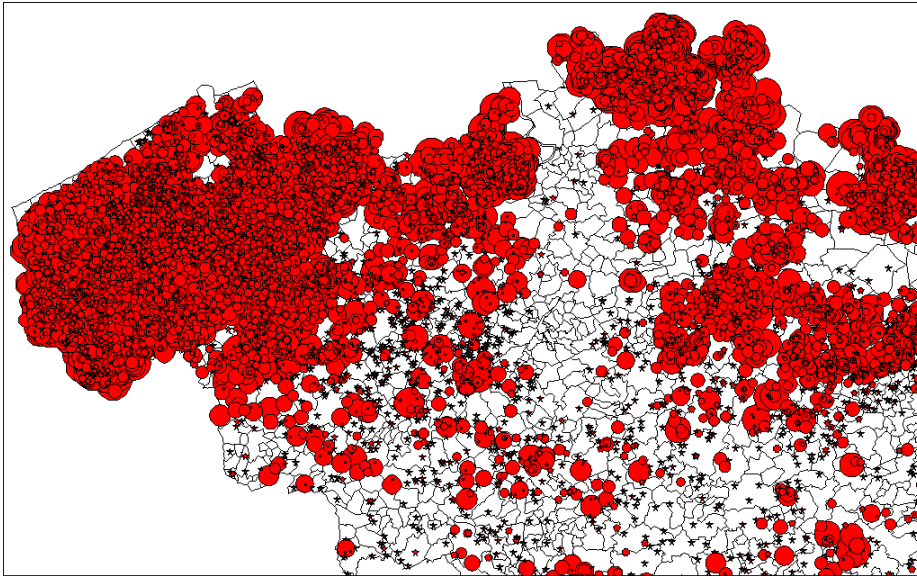
External Biosecurity

- Vermin and bird control



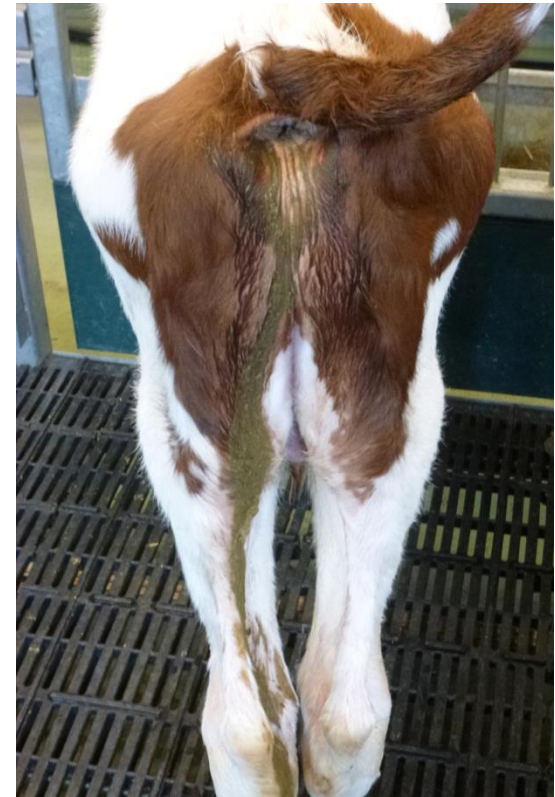
External Biosecurity

- location and surrounding



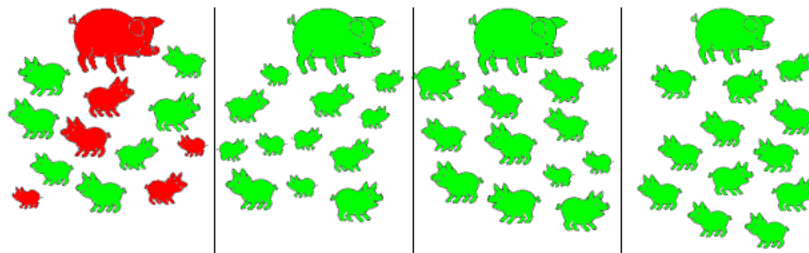
Internal Biosecurity

- Disease management



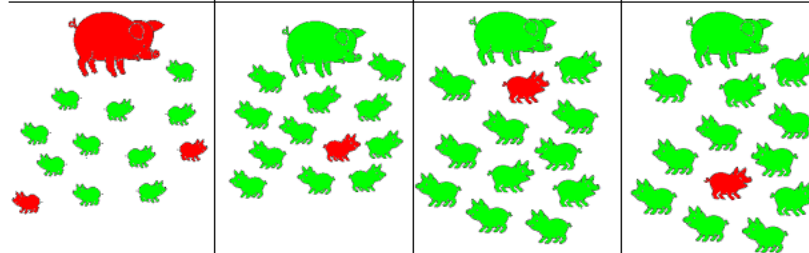


Suckling pen



12%

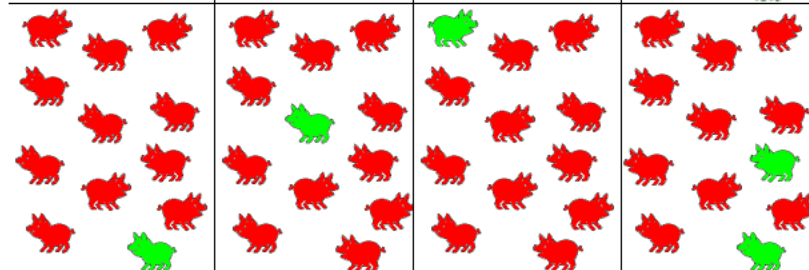
Suckling pen



12%

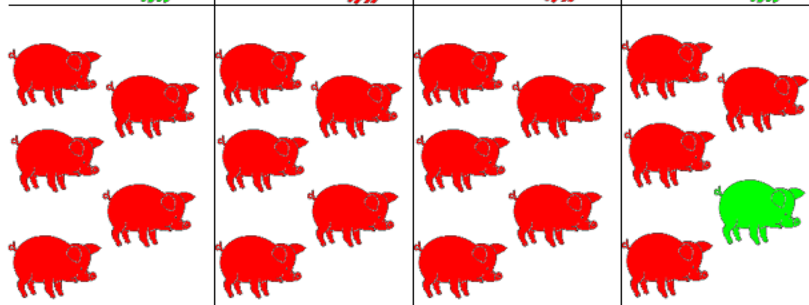
1 week of age

Piglets after weaning



90%

fatteners



95%

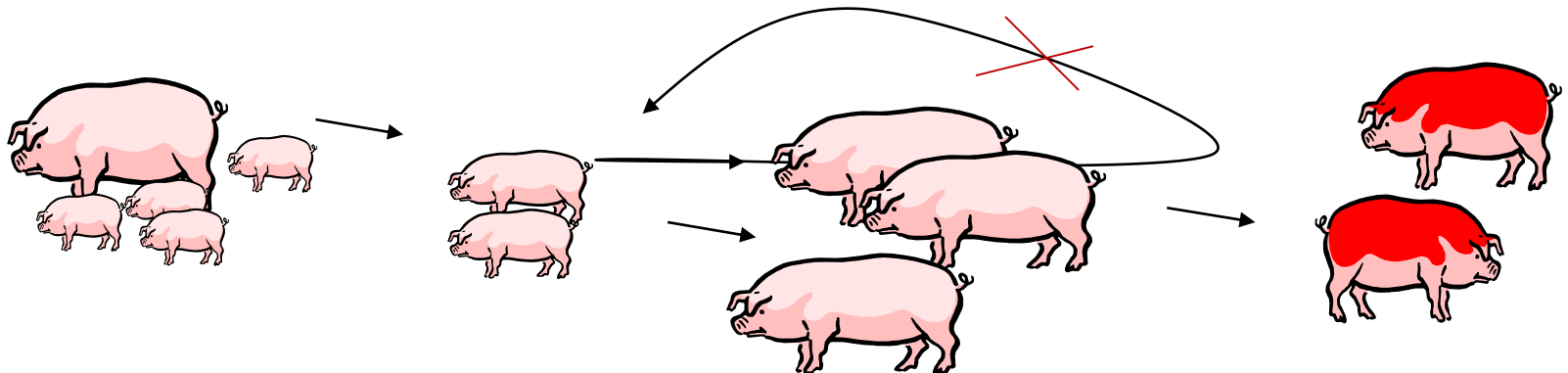
Internal Biosecurity

- All-in/ All-out



Internal Biosecurity

- Separate age groups



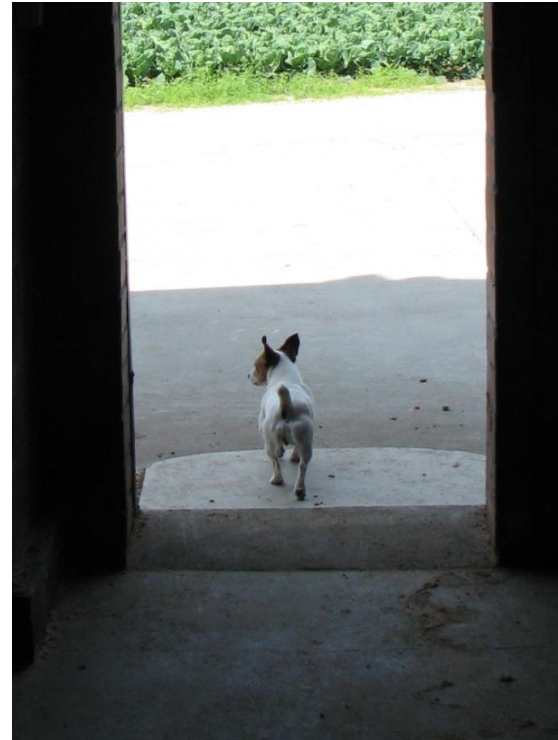
Internal Biosecurity

- Compartments and working lines



Internal Biosecurity

- Pets



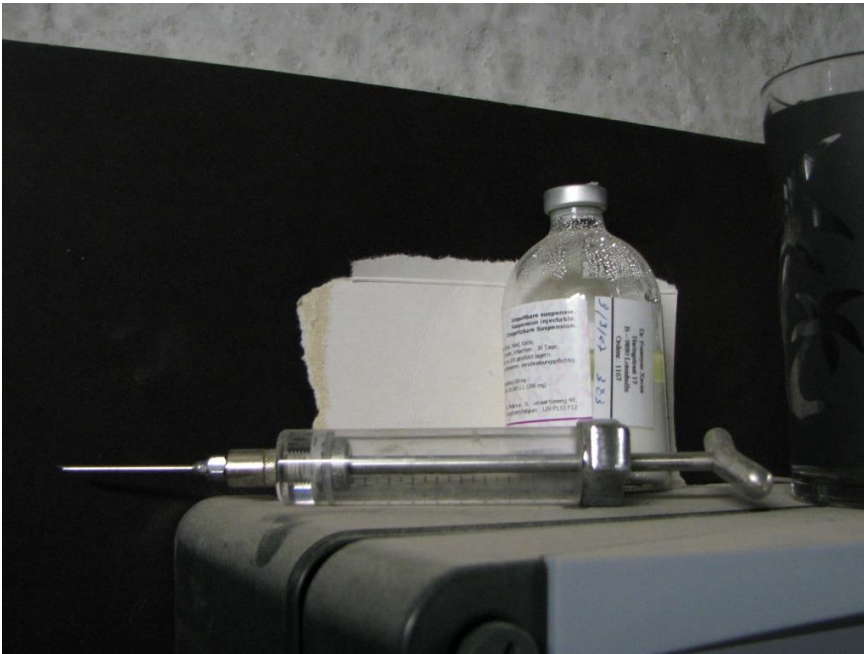
Internal Biosecurity

- Materials



Internal Biosecurity

- Needles and medicines



Internal Biosecurity

- Cleaning and disinfection

1. Dry



2. Soak



3. Wet



Internal Biosecurity

- Cleaning and disinfection

4. Dry



5. Disinfect



6. Empty

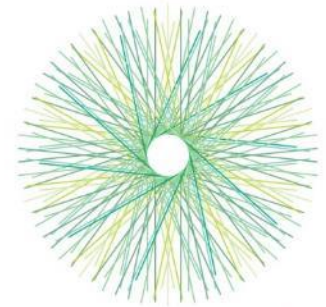


7. Check






Principles of biosecurity

What is more important?

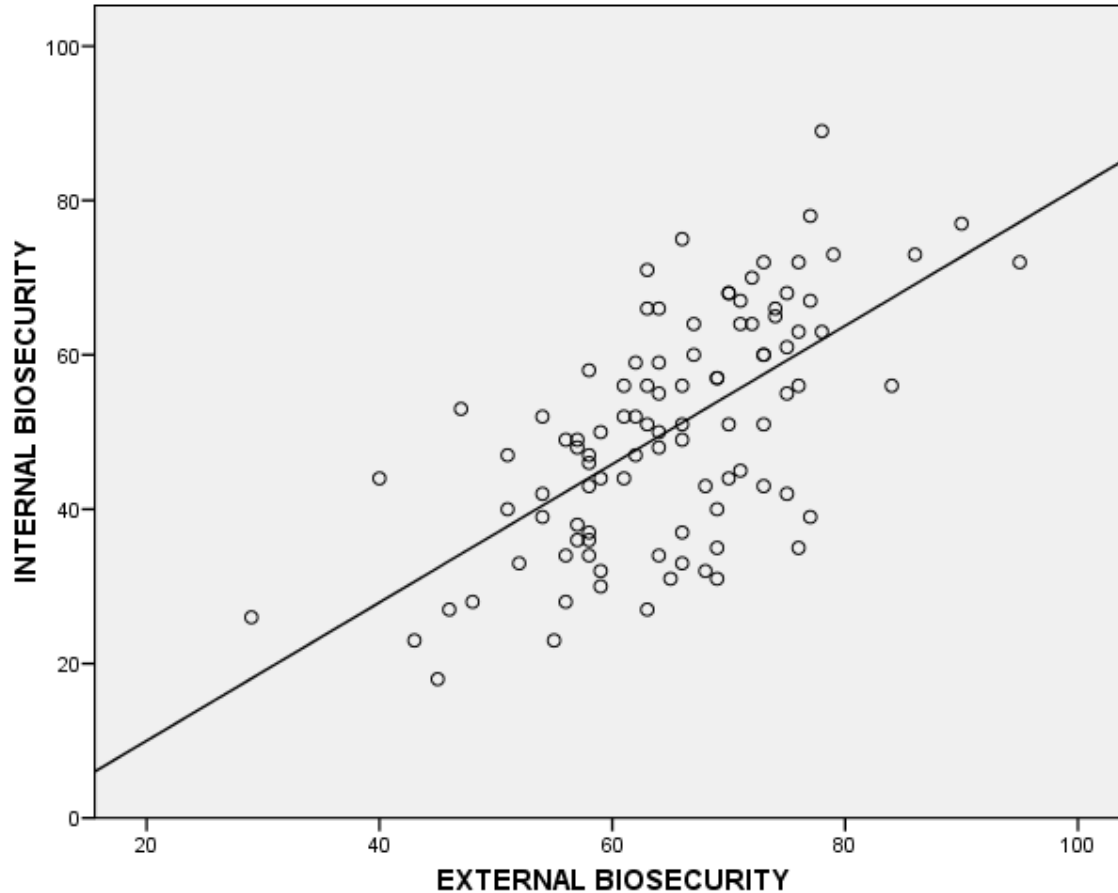


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1. External biosecurity
 24%
2. Internal biosecurity
 7%
3. Equally important
 69%



Positive correlation between scores for external and internal biosecurity



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!



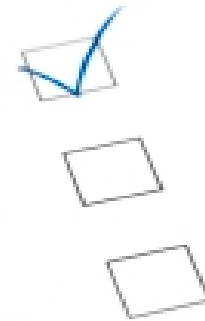
www.biocheck.ugent.be

Biosecurity Scoring System

- **Quantification of biosecurity status**
 - Comparing of scores between different herds
 - Comparing of scores in time
 - Taking different risks into account

Scoring System

- External and internal biosecurity
- 6 subcategories per part
- 2-13 questions per subcategory
- Questionnaire in Dutch, English, French, German, Swedish,.....




Scoring System

- **Weighted scores**


- Based on scientific research
- Risk for transmission: direct vs. indirect contact
- Weight factor for each subcategory and each question



- **Free** online application: www.biocheck.ugent.be



NL | EN



Biocheck, prevention is better than cure!

Login | Register |

You are here: [Home](#)

Welcome

On this website, you can evaluate the quality of the biosecurity on your pig farm through a scientific based questionnaire and accompanying scoring system and this is completely **free** and **independent**.

Before you can fill in the survey, you have to [log in](#) first.

Furthermore, this website offers an extensive review of information concerning biosecurity and biosecurity measures on pig farms. You can find this information in the '[About Biocheck](#)' section in the menu on the left.




Free literature on biosecurity is also available on this site. For an overview, click [here!](#)


Four times a year a "biocheck" newsletter is made containing each time an hot topic of biosecurity in pig production, explained in a very practical manner. If you want to receive this newsletter [subscribe here](#).

This website and the accompanying scoring system have been developed by [Prof. Jeroen Dewulf](#), [Dr. Stefaan Ribbens](#) and [Drs. Maria Laanen](#) with technical support of [Steven Bruneel](#).

For remarks, questions, suggestions about this website or the scoring system, please mail to Steven.Bruneel@UGent.be.

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Info


This questionnaire and scoring system is designed by the
Faculty of Veterinary Medicine



APPROVED BY THE EAEV

THE FACULTY HAS BEEN

in collaboration with
Flemish Animal Health
Organization



C. External biosecurity: Purchase of breeding pigs

*

Are breeding pigs (sows /gilts /boars) being purchased?

Yes No



[More info about this question](#)

*

Do the breeding pigs come from the same supplier or from different suppliers?

Choose one of the following answers

- Same supplier
 Different suppliers



[More info about this question](#)

*

Is attention paid
or higher to the


Yes No



[Herd with a kr](#)

*

Are hygienic cri



Help - Windows Internet Explorer

http://www.biocheck.ugent.be/v2/pages/en/help/C_Q1a.html

Limiting the number of farms of origin

If animals are bought, then the number of farms of origin should be limited to a minimum. Preferably, animals always come from one and the same farm. Several studies have pointed out that buying animals from more than one farm entails a greater risk of introduction of disease-causing agents, including *Mycoplasma hyopneumoniae*, *Actinobacillus pleuropneumoniae* (Hege et al., 2002) and salmonella (Lo Fo Wong et al., 2004).

Done Internet 100%

Biocheck report

Vakgroep Voortplanting, Verloskunde
en Bedrijfsdiergeneeskunde

Your subtotal for external biosecurity is **59 %** (avg. 65 %)

Your subtotal for internal biosecurity is **56 %** (avg. 50 %)

The total score is **58 %** (avg. 58 %)

Nr	Description	Score	Avg
<i>External biosecurity</i>			
A	<u>Purchase of animals and semen</u>	62 %	87 %
B	<u>Transport of animals, removal of manure and dead animals</u>	61 %	66 %
C	<u>Feed, water and equipment supply</u>	53 %	39 %
D	<u>Personnel and visitors</u>	59 %	63 %
E	<u>Vermin and bird control</u>	30 %	60 %
F	<u>Environment and region</u>	80 %	54 %
	<i>Subtotal External biosecurity:</i>	59 %	65 %
<i>Internal biosecurity</i>			
A	<u>Disease management</u>	40 %	56 %
B	<u>Farrowing and suckling period</u>	64 %	62 %
C	<u>Nursery unit</u>	43 %	57 %
D	<u>Fattening unit</u>	93 %	57 %
E	<u>Measures between compartments and the use of equipment</u>	50 %	40 %
F	<u>Cleaning and disinfection</u>	48 %	46 %
	<i>Internal biosecurity:</i>	56 %	50 %
	Totaal:	58 %	58 %

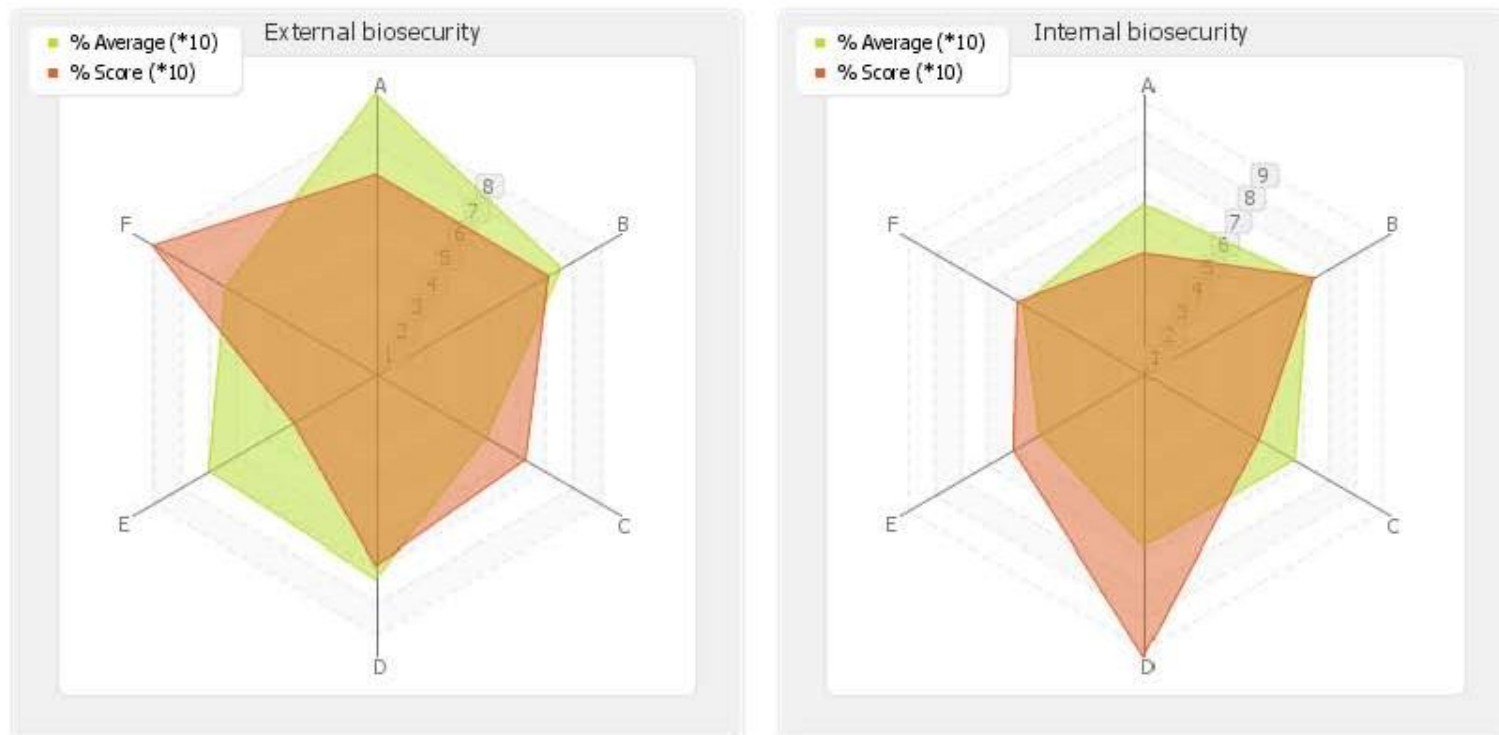
NA = Not applicable



Biocheck report

Vakgroep Voortplanting, Verloskunde
en Bedrijfsdiergeneeskunde

Bellow, a **figure** showing your results (red area) graphically compared to the average scores (green area), is given. The bigger the red area, the better the result. The names of the axes correspond to the numbering in report above.



Naming of the axes is linked to the numbering on the first page

For **more explanation** about biosecurity on pig herds and how to improve this, you can always look at the extensive information available on the [biocheck website](#) in the sections "[about biocheck](#)" and "[download and links](#)". You can also contact your **veterinarian** for advice on biosecurity measures on your farm.

www.biocheck.ugent.be



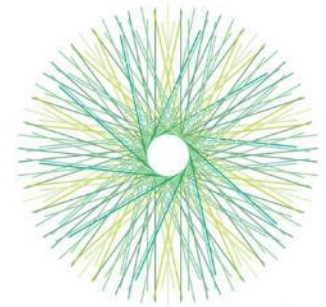
Biocheck, prevention is better than cure!






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Who should apply biosecurity

Where is biosecurity most important?



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1. large herds
 21.1%
2. small herds
 1.4%
3. independent of herd size
 77.5%

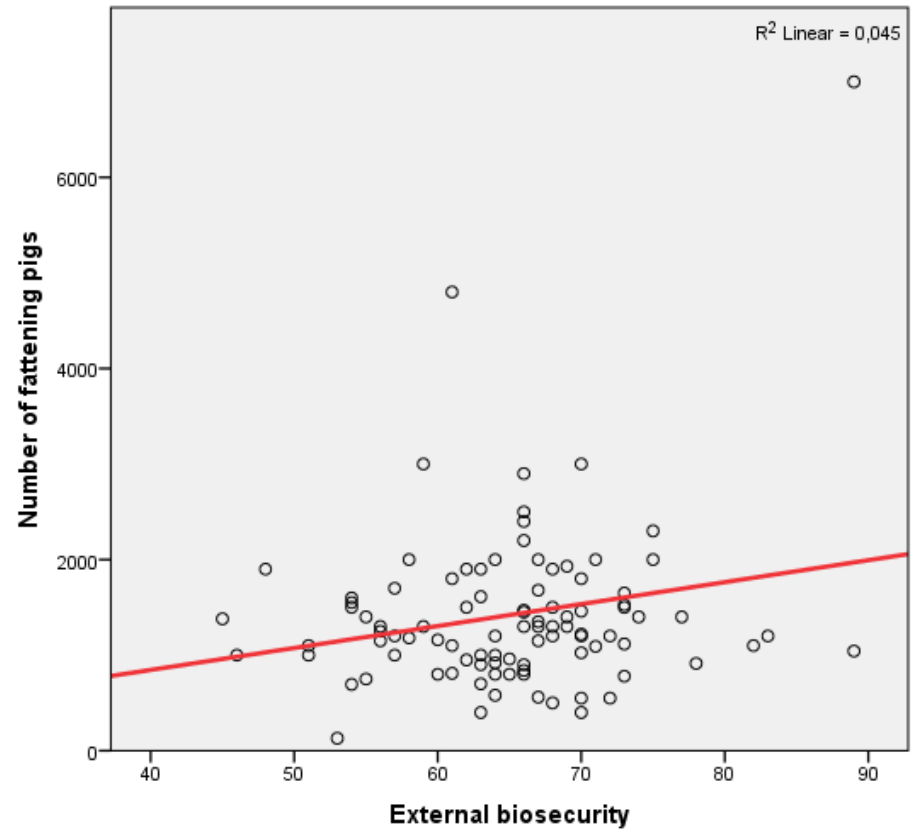
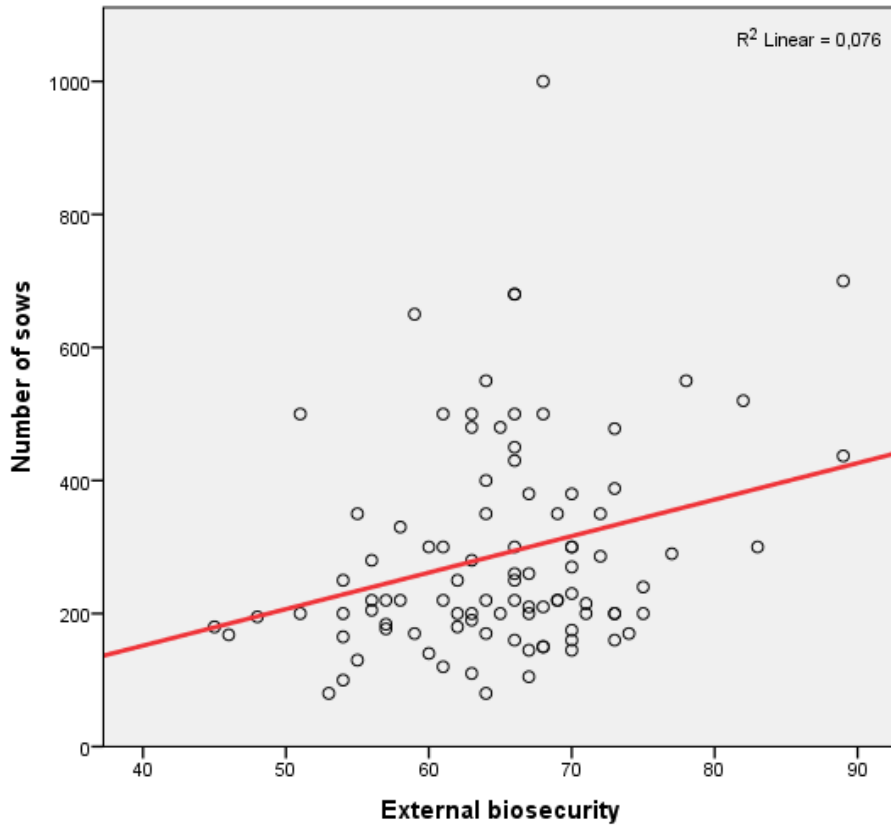


Principles of biosecurity

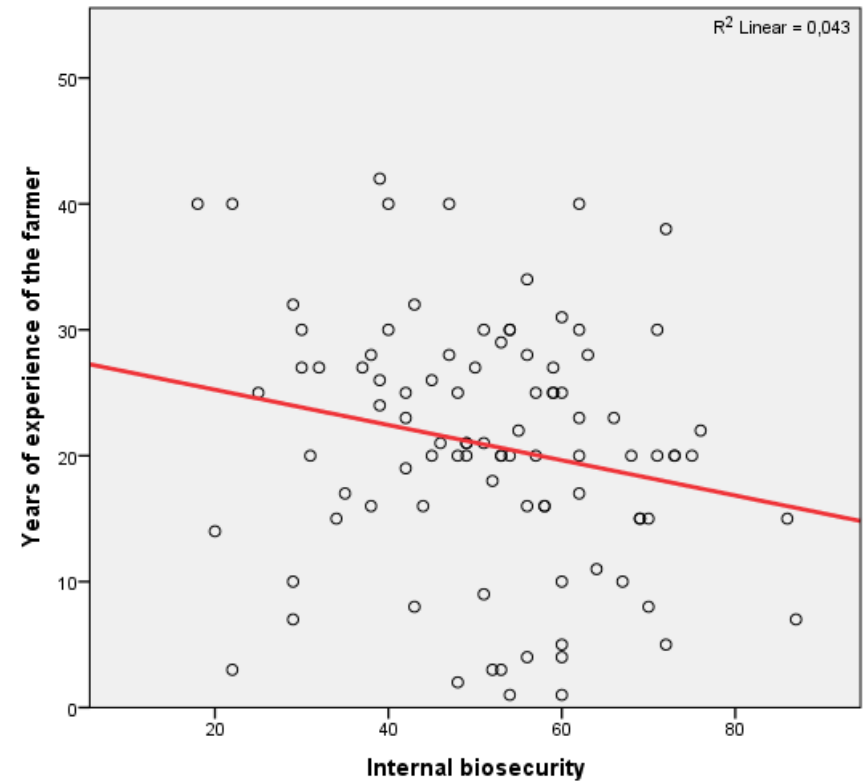
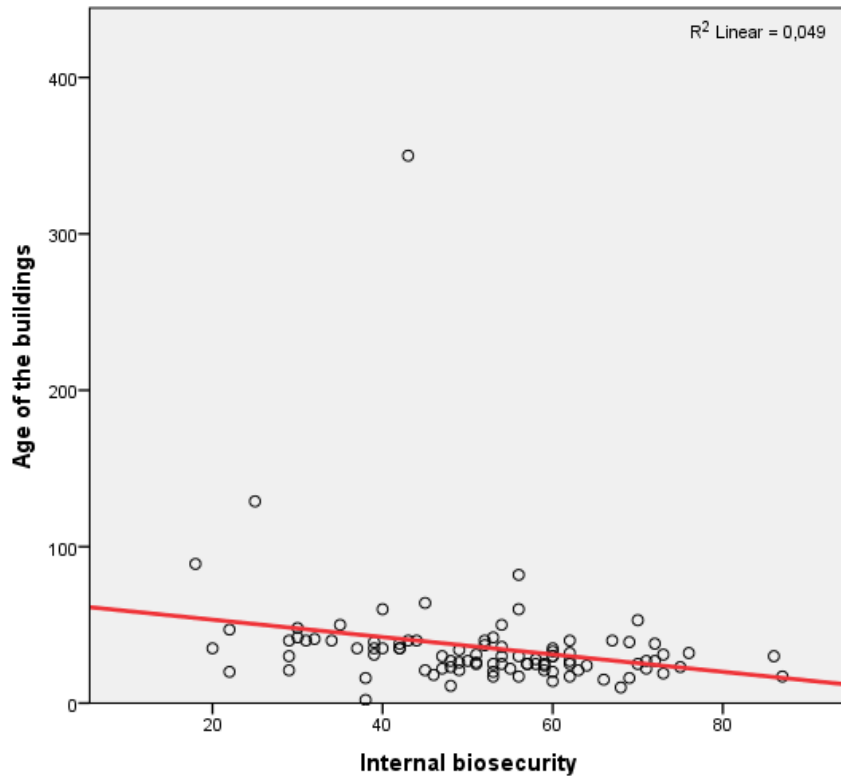
- It's a numbers game



Biosecurity and herd and farmer characteristics

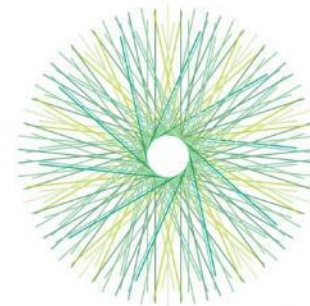


Biosecurity and herd and farmer characteristics



Who is responsible for biosecurity

Biosecurity is primarily a responsibility of...



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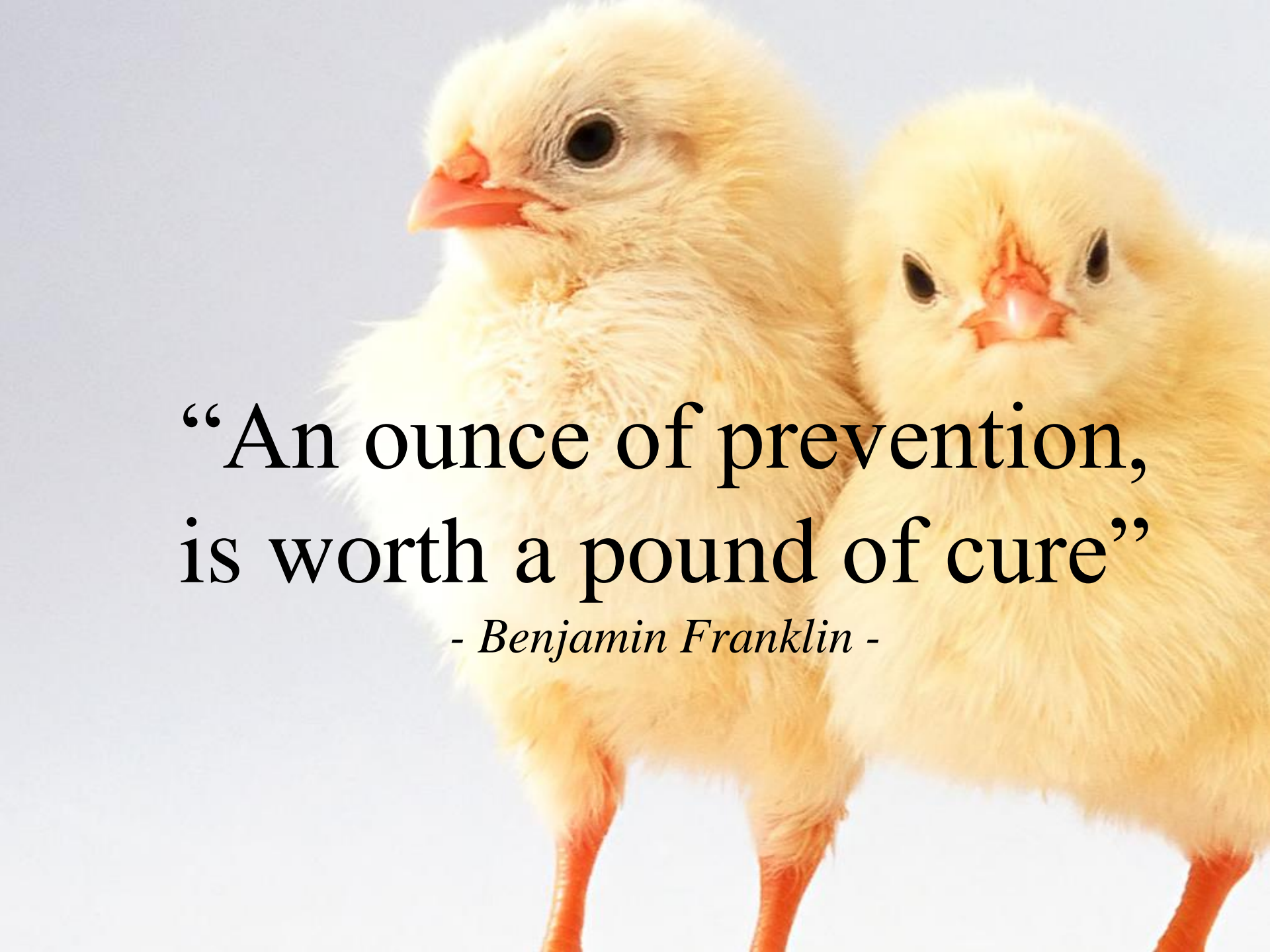
Biosecurity is a joint venture...



Biosecurity is a joint venture...

...often threatened by lack of time





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

- *Benjamin Franklin* -