HIPRA

High-quality piglet at weaning.

Sergi Bruguera

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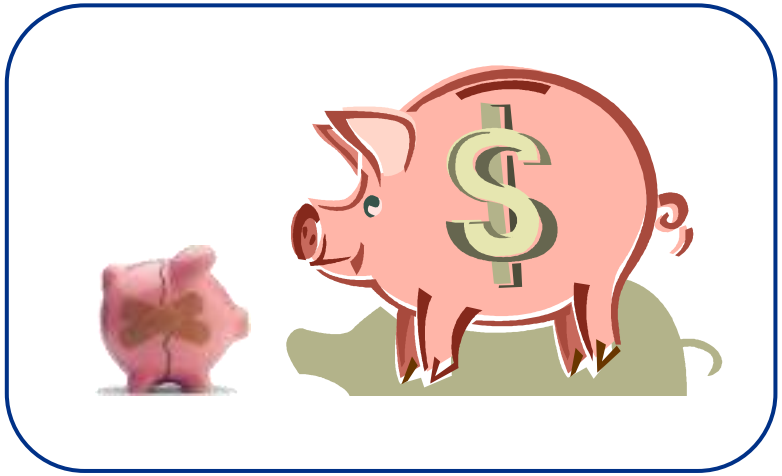
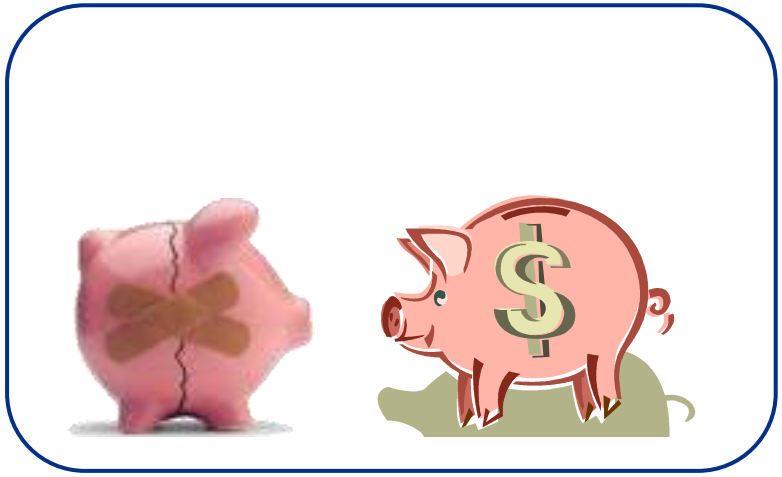
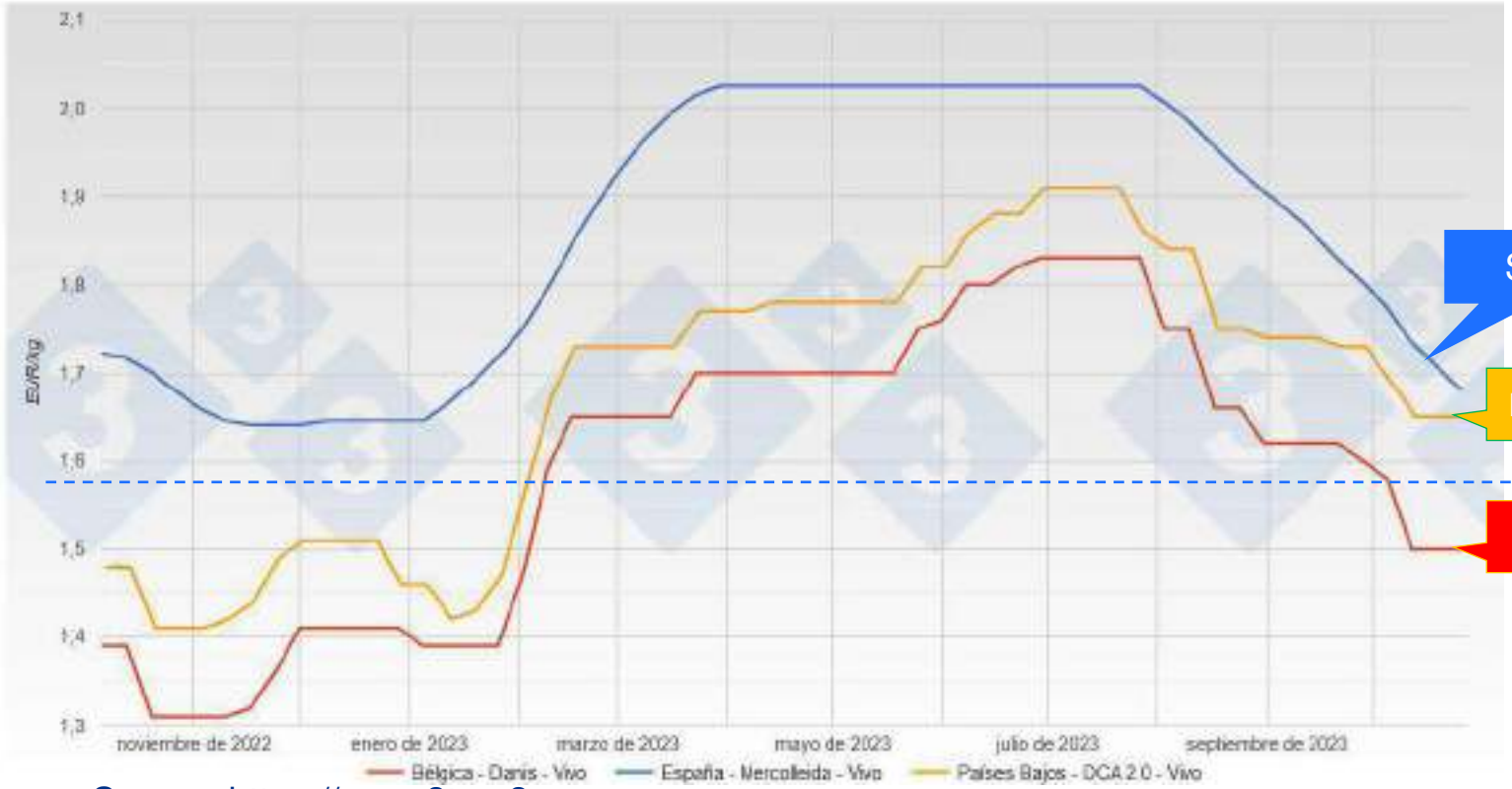
Improving **cost efficiency**





Currently (31/10/2023) EUR/Kg Live weight prices and margins?



Source: https://www.3tres3.com

Current situation

1. Modern farms
    - Higher new gilts batches entrance. Higher ratio primiparous/farrowing batch.
    - Antibiotic supply restrictions. OZN, Colistin.

2. Hyper-prolific sows
    - Colostrum competition
    - More piglets =more density
    - Needed more efficient skilled personnel
        - Split nursing
        - Fostering sows

3. Animal welfare regulations
    - Gestating in groups , changing disease epidemiology

THE BOSS

Increased demand for meat raised without antibiotics

UK supermarkets move to cut antibiotic use in farming

Iceland, Asda and Aldi lag behind but other major retailers make good progress

What are the upcoming demands?

CONSUMERS

Meat without antibiotics

AUTHORITIES

Without residues or atb. resistance

Patogenia
y epidemiología

Enfermedades Infecciosas y Microbiología Clínica

www.elsevier.es/eimc

ELSEVIER

Original article

Epidemiology of *Clostridioides difficile* infection in hospitalized patients in Spain: An eight-year review (2012–2019)

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ARTICLE INFO

Article history:
Received 30 December 2020
Accepted 7 April 2021

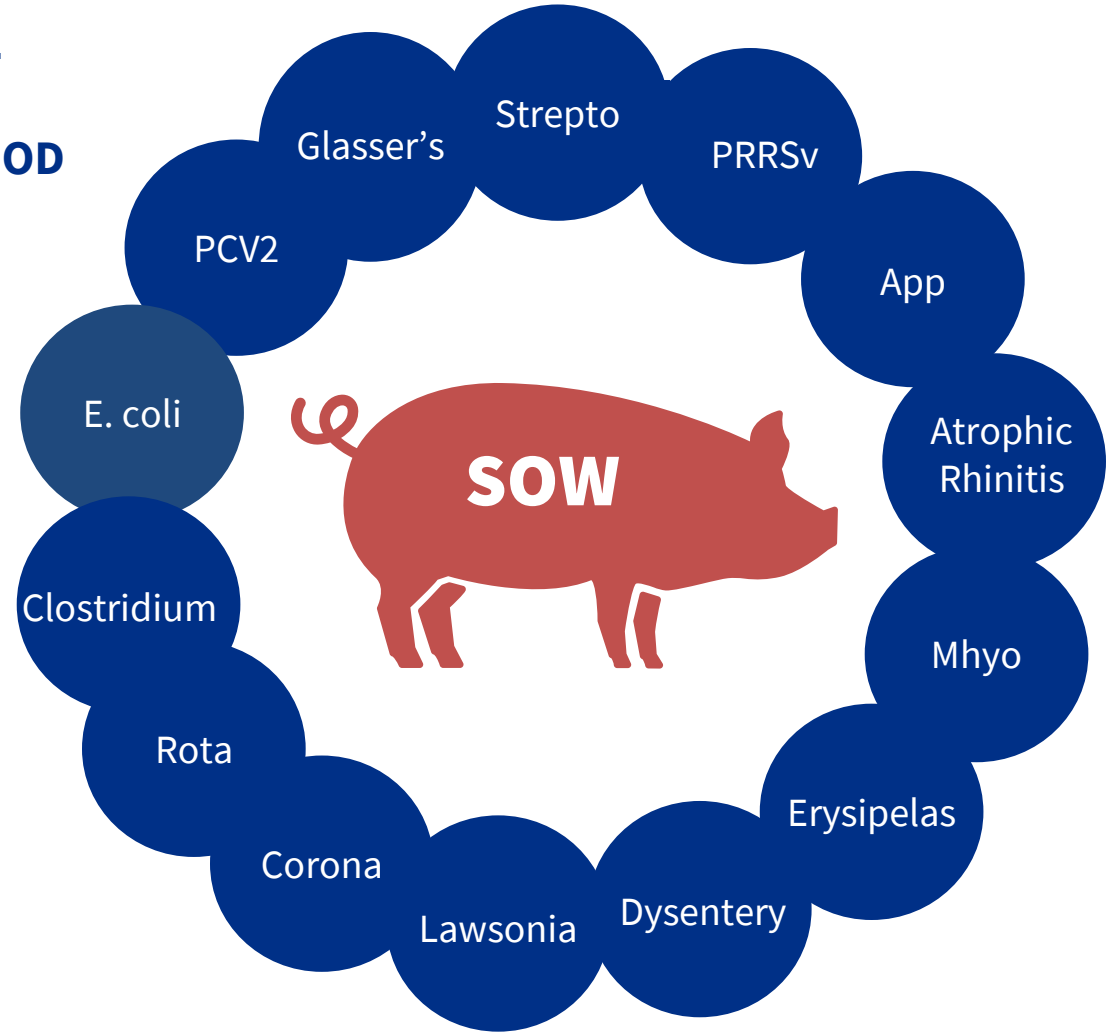
ABSTRACT

Background: *Clostridioides difficile* infection (CDI) is a disease that is potentially preventable by vaccination. A good knowledge of its epidemiology, which can change over time, is warranted for prevention purposes and to help decision-making on the use of vaccines in public health programs. The objec-

1-Prevalence of *CL.Difficile* cases in hospitalized patients increased exponentially in Spain from 1999 (3.9%) to 2019 (35.9%).

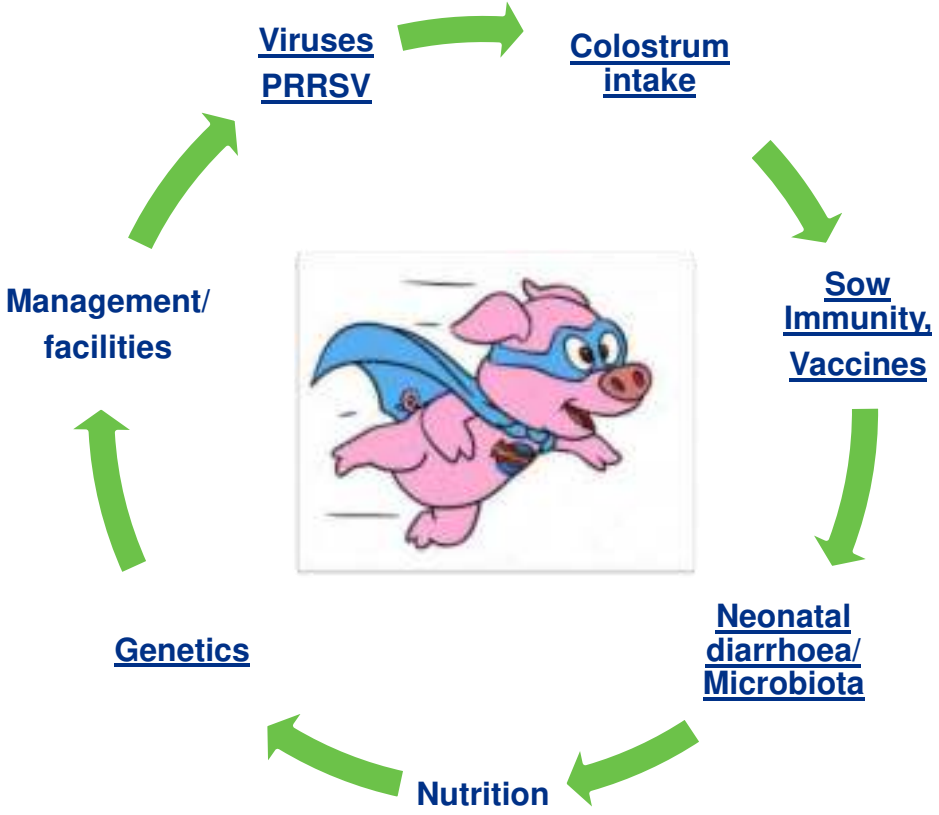
2- 87% of patients were 50 years old and beyond.

SOURCE OF ALL THE GOOD AND THE NOT SO GOOD AS WELL.



And with all this perfect environment what do we have to produce??

Main factors to consider to obtain High quality piglets.

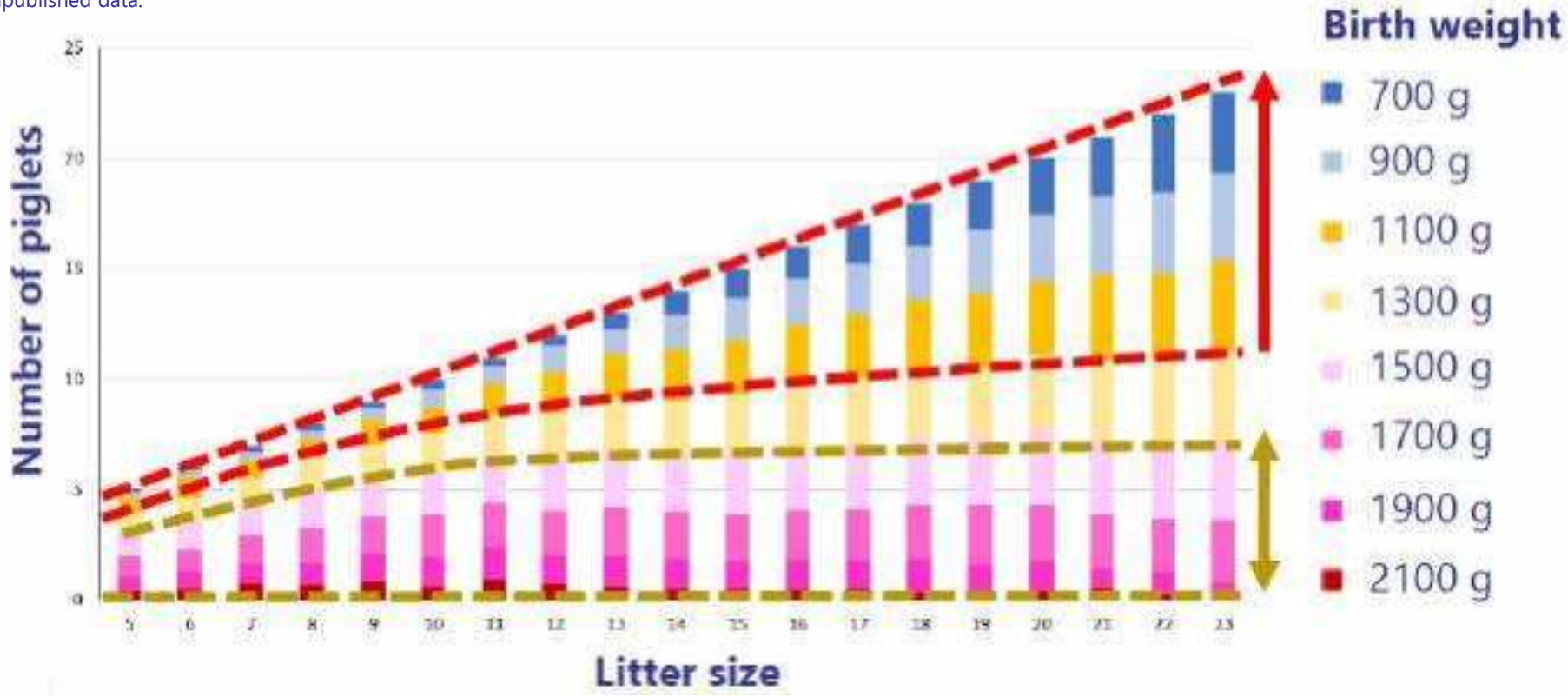


GENETICS / Hyper-prolific sows.

www.pig333.com (Prof. Bruno Silva, Brazil).

Bigger litters → more piglets with a low birth weight (<1100 g)

Dr. Francesc Molist from Schothorst Feed Research / 3113 litters / 2011-2017, unpublished data.



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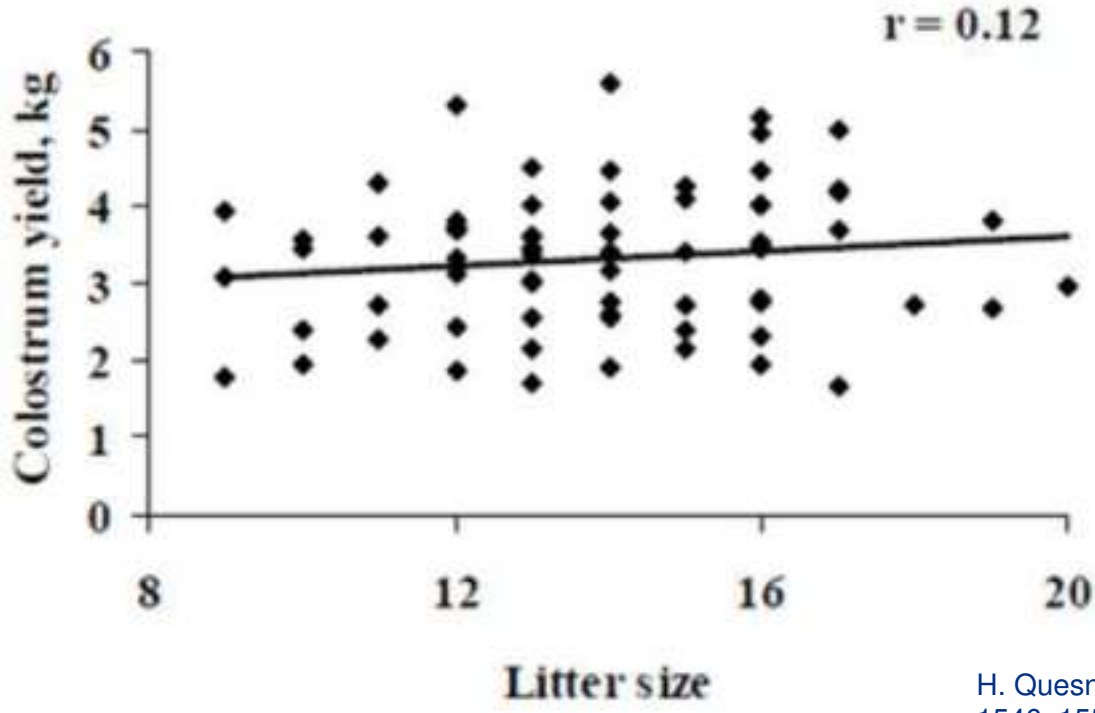
Colostrum yield is variable.



H. Quesnel, H. Animal (2011), 5:10, pp 1546–1553 & The Animal Consortium 2011.

GENETICS / Hyper-prolific sows.

Main concerns

- Too restricted feed intake during lactation can provoke in the next farrowing a decrease on piglet litter size and piglet weight at weaning. (De Bettio et al. 2016).

-Sow feed intake before farrowing is important (last meal before):

-Affect farrowing length. Longer farrowings delay colostrum intake from last born piglets, more hypoxia, les survavility.

- Cross fostering with Gilts:

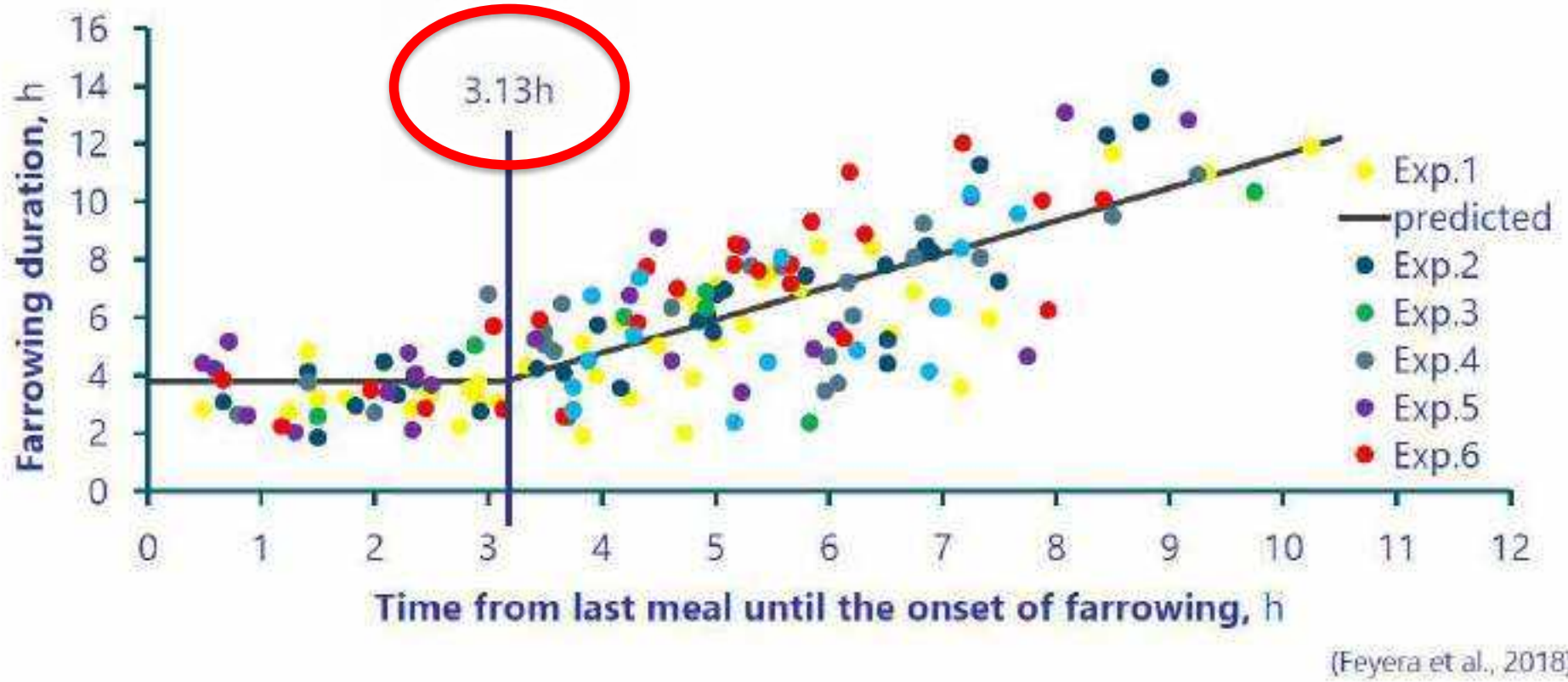
-Controversy: Supply to gilts bigger/medium piglets. Smallest piglets may not suckle and stimulate enough to gilts.

-McRebel system if there are PRRSV viraemic born piglets or PRRSV outbreak.

-Strictly reduce piglets movements and strictly not movements after 24 of age.

-Weaning small piglets whatever weight. Euthanise piglets if no chances to survive.

-All in/ All out.



(Feyera et al., 2018)

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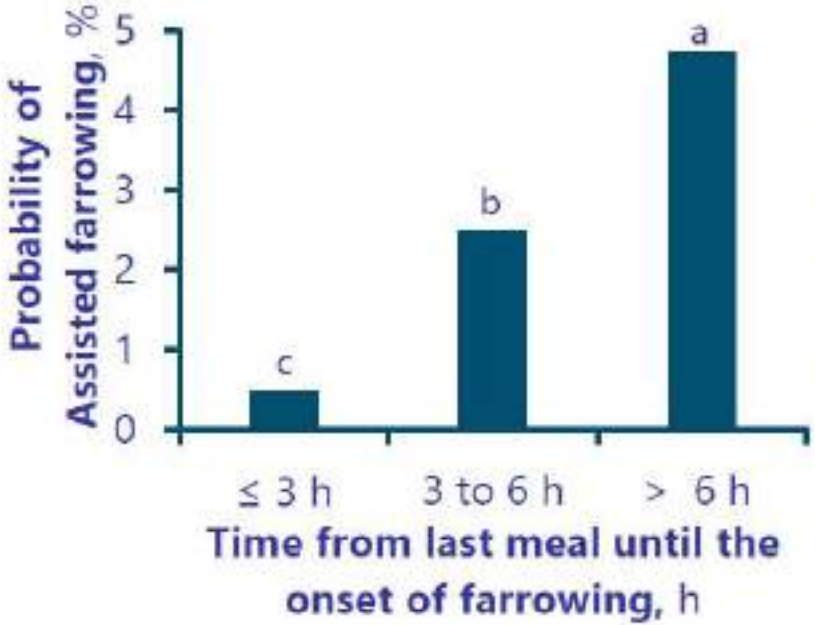
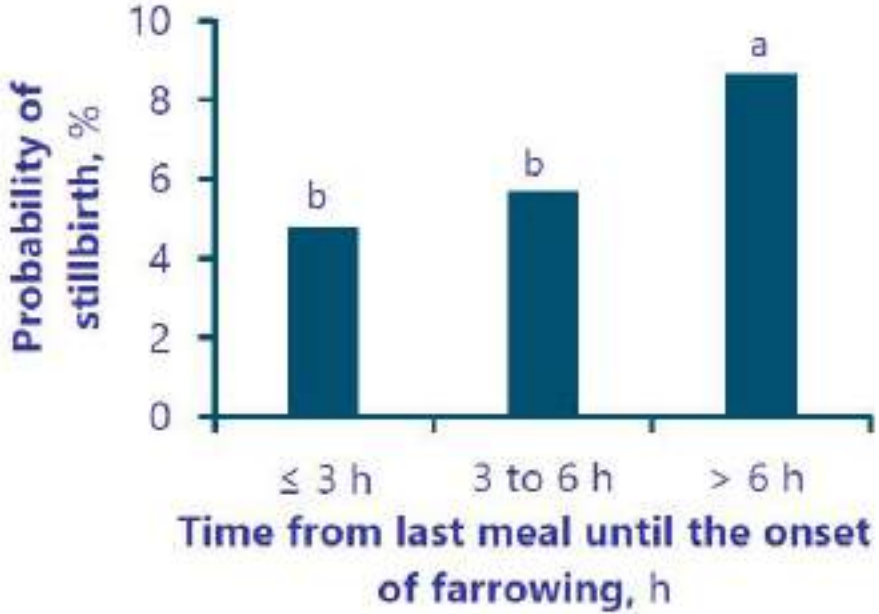
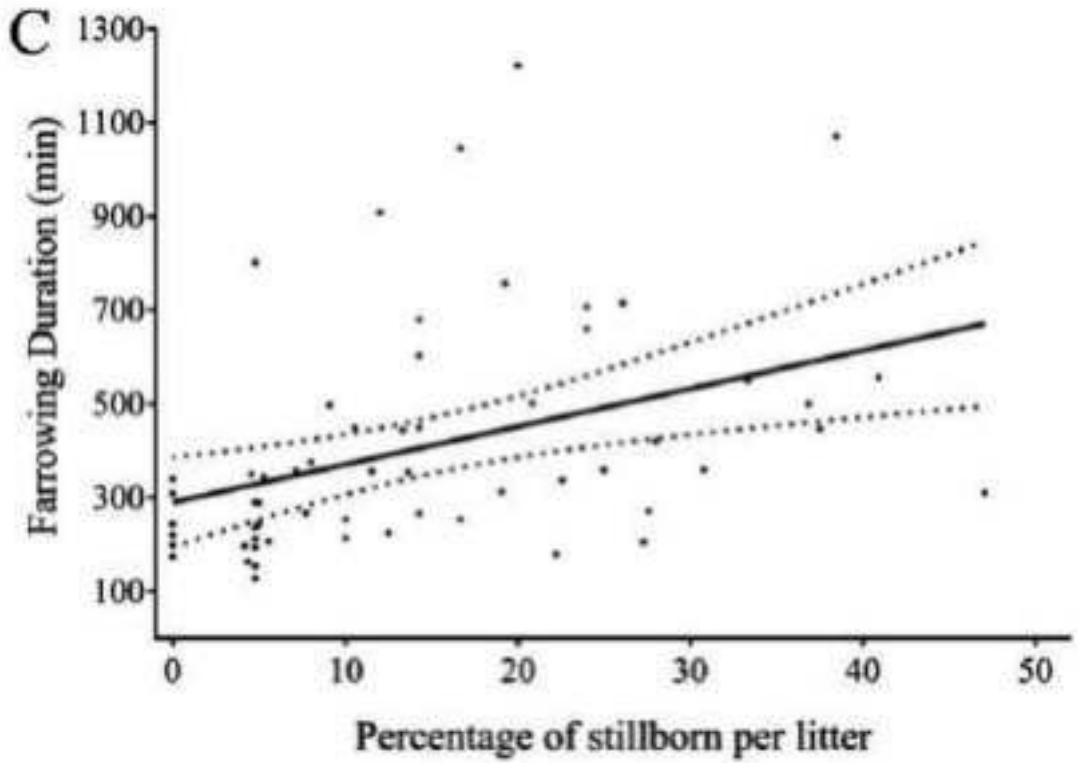
Consequences





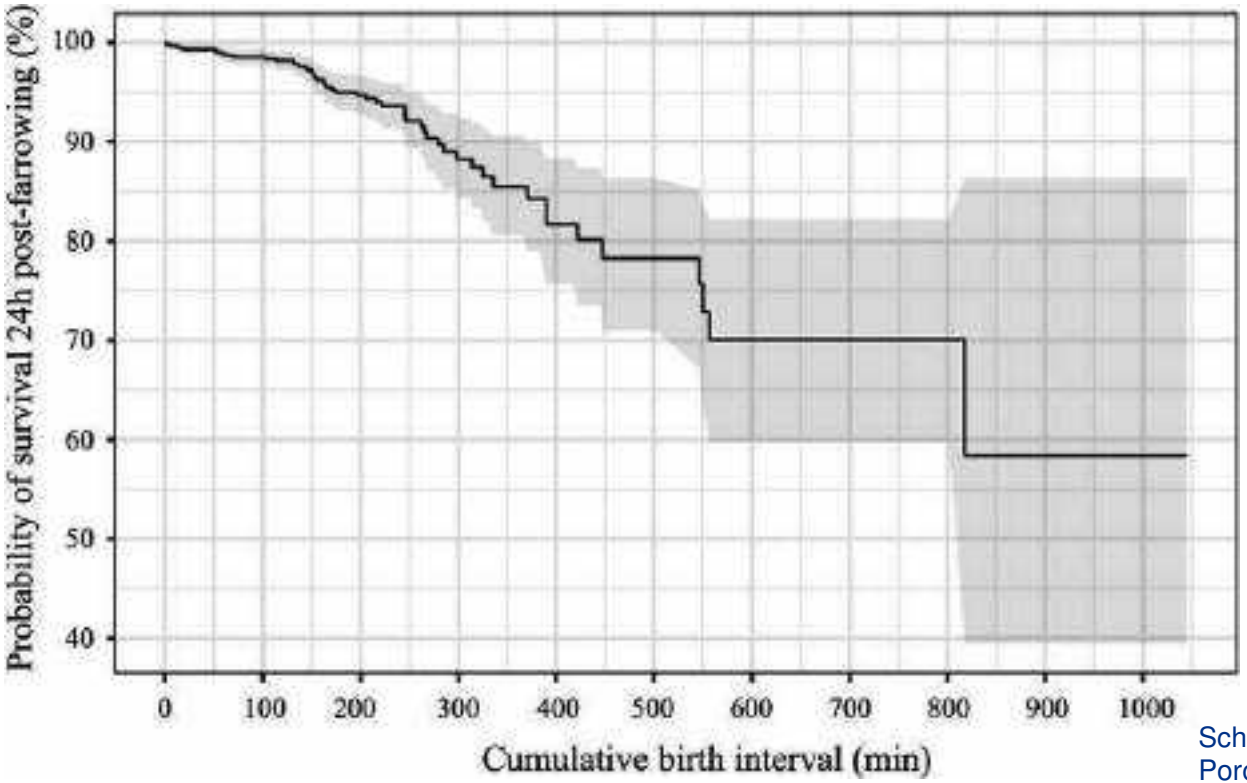
Feyera et al., 2018.

Longer farrowing duration more Stillborn



Schoos et al. 2023.
Porcine Health management.

Longer farrowing duration les probability to survive



Schoos et al. 2023.
Porcine Health management.

Colostrum Intake

Piglet's suckling ability

Sow's colostrum yield

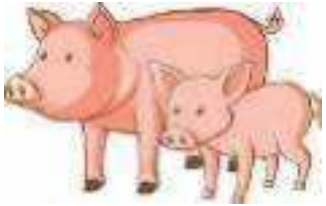
COLOSTRUM AND HYPERPROLIFIC SOWS

Split nursing

Exclusivity only for 45-60 min

Limiting the access to the teats of the sow in order to ensure that all the piglets receive a sufficient amount of colostrum

Who should teat first?.



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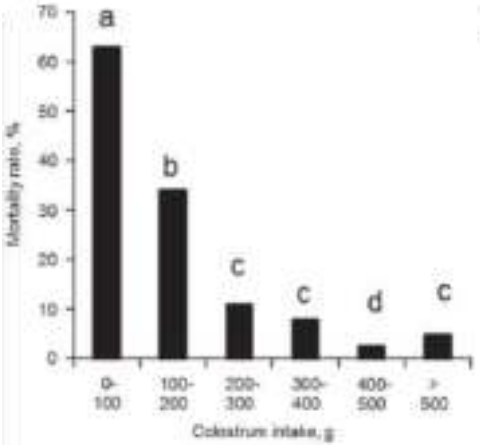
How Much colostrum? 250 g/piglet

- **Recommended intake** is **200-250 g/piglet.**
- **Hyper-prolific:** Difficult to reach the recommended quantity in all the piglets.
- **Fostering:** Piglets should be only fostered once they took their colostrum portion.

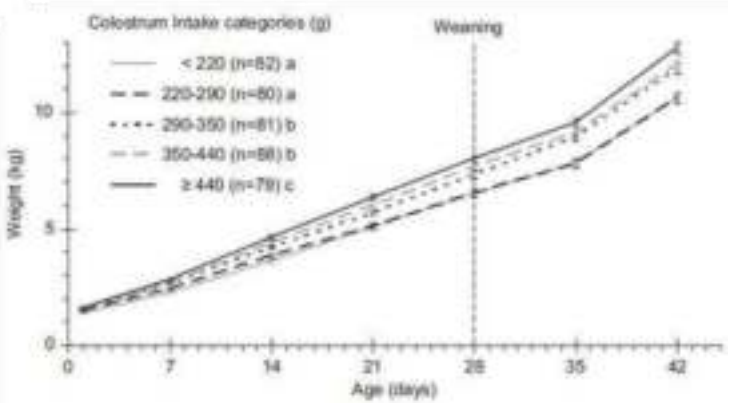
Influence of colostrum intake during the first 24h

Mortality rate until weaning



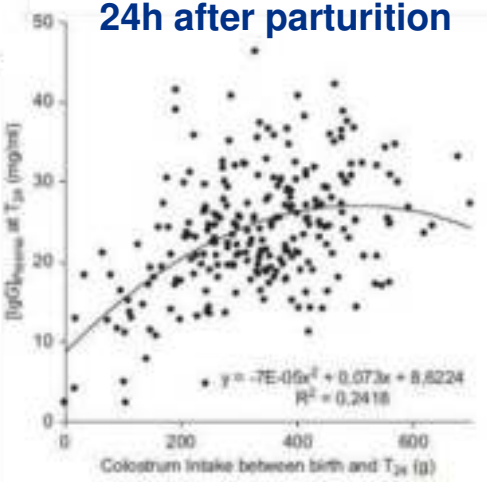
Mortality rate was as low as **7.1%** when piglets ingested **>200 g** and **increased** to **43.4%** when intake was **<200 g**

Piglet growth from 1 to 42 days of age



Colostrum intake has **long-term effects** on piglets' growth from 3 weeks of age **until after weaning**

Plasma [IgG] of piglets 24h after parturition

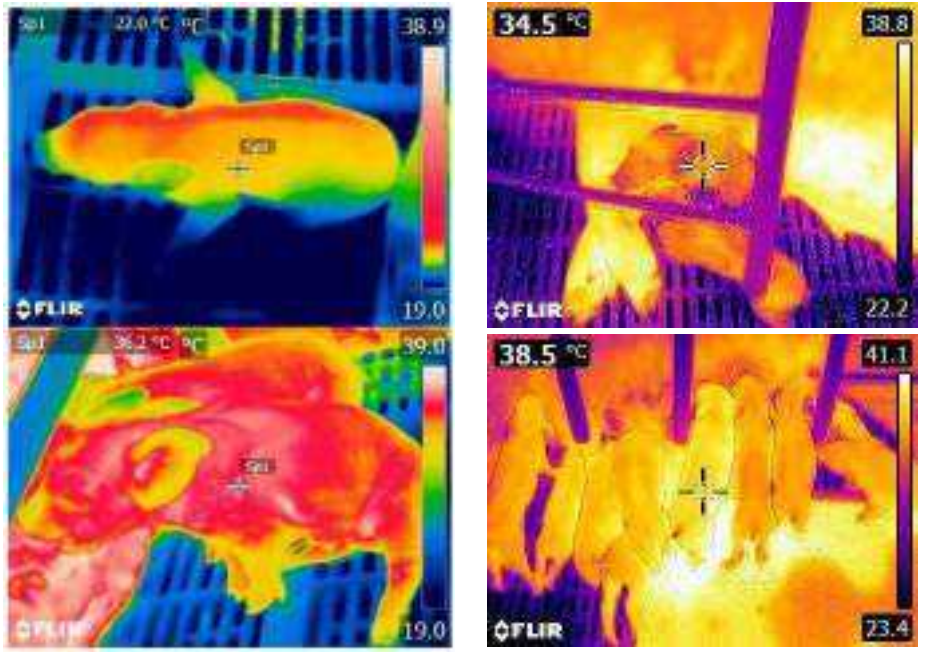


Plasma **[IgG] reaches** a **plateau** when colostrum intake increases **beyond 200-250 g**

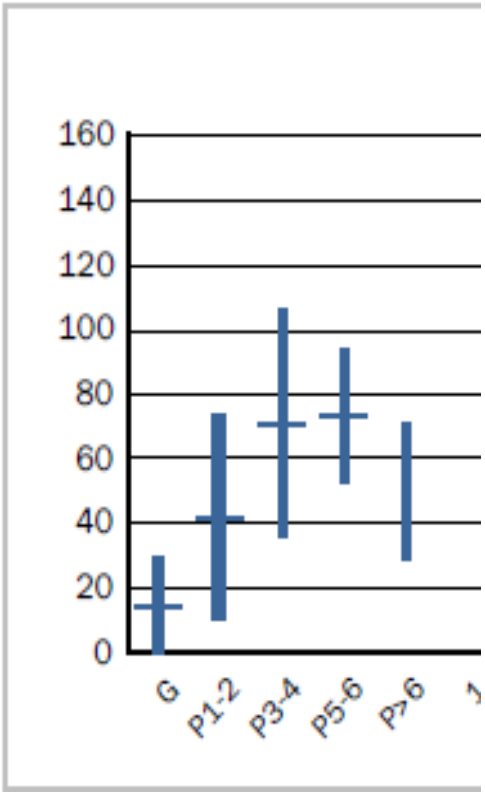
Measuring colostrum intake

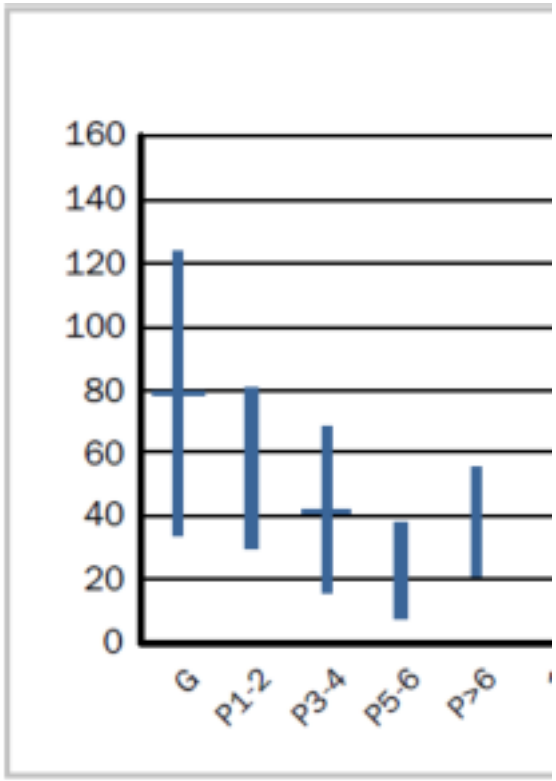
Thermography

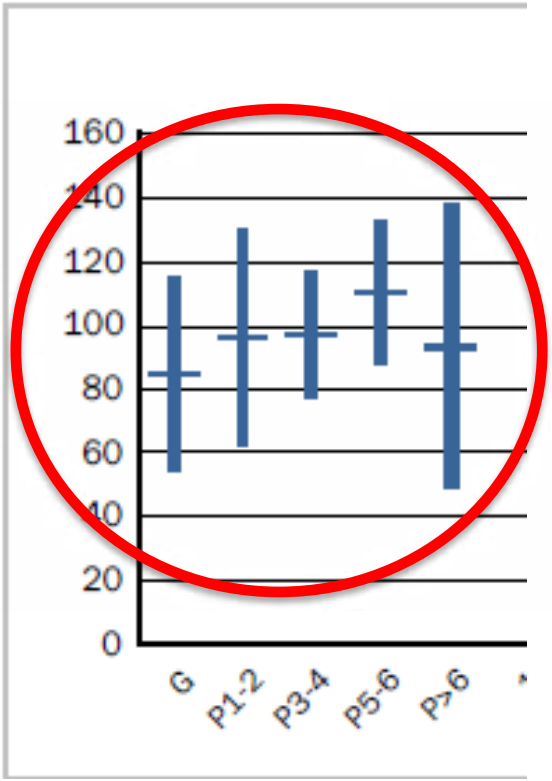
If the piglet does not take enough colostrum, there is a decrease in body temperature between 2.5°C - 4°C.



The importance of the sow age/epidemiology







Gilts/Sows vaccination can make a difference.

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VACCINATION PROTOCOL

Sows/gilts: 2 ml/animal. Intramuscular (IM)

Vaccination in Gilts

6 weeks — 3 weeks — Farrowing

Revaccination in Sows

3 weeks — Farrowing

Hyper-immunisation: adding one dose more before farrowing in sows

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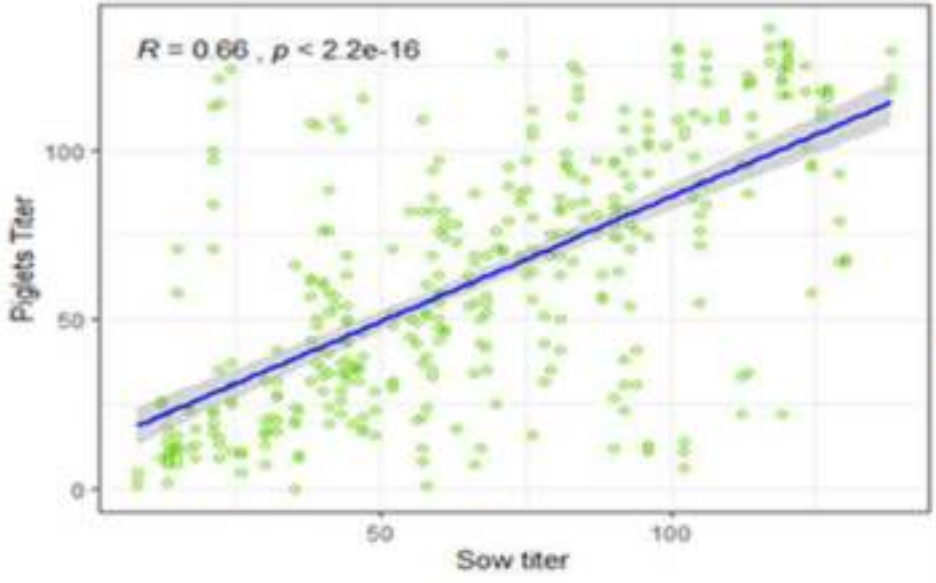
MDA TRANSFERTEST

Colostrum Intake occurs as expected?

To assess the correct transfer of immunity from mother to piglet.
Our farrowing crates management is doing Good for colostrum intake??



At 7 days of age Erysipelas antibody titres in piglets should be the same as in their mother sows.

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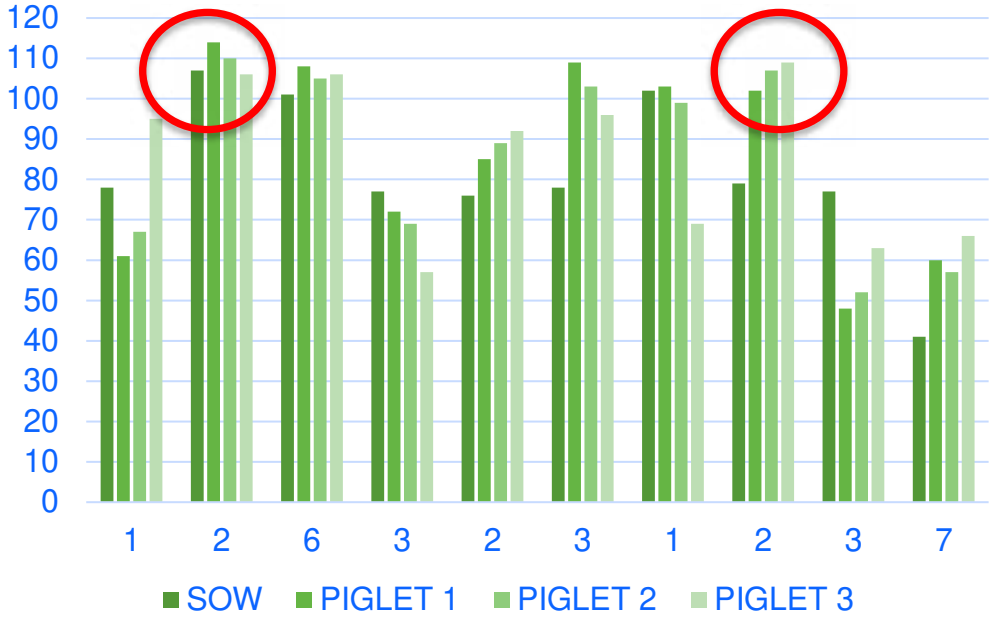
MDA TRANSFERTEST

HIPRA

MDA TRANSFERTEST

Right Colostrum intake management

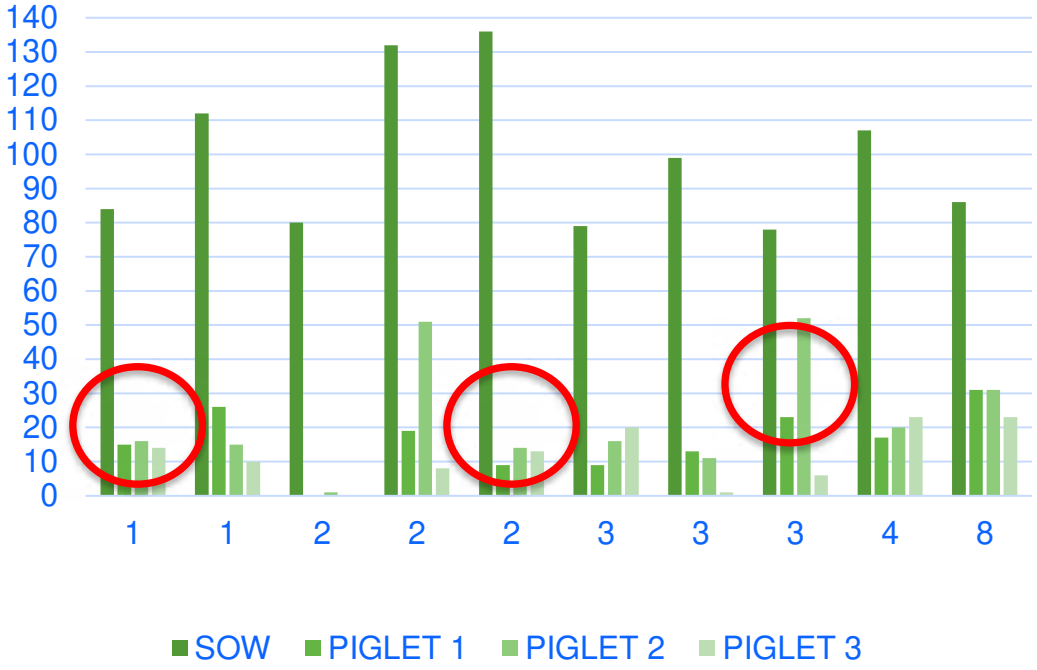


France: 250 sows / weaning at 21 days

HIPRA

MDA TRANSFERTEST

Wrong Colostrum intake management



Spain: 2500 sows, weaning at 24 days

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Neonatal diarrhoea/intestinal integrity

-Water quality/Temperature/Sow colonization/colostrum intake.

-Neonatal diarrhoea and post-weaning diarrhoea is a disbiosis.

- -Probiotics/too much protein.
- -As more progressive changes in feeds as posible.
- -Cleaning habits/Plasmid gene transfer/antibiotic resistance features.
- -Sow vaccination.

- Clostridum sp

- -Cl.perfringens type C and A.
- -Clostridium difficile.
- -Enterocheck kits service.

-Oedema disease, subclinical effect.

- -Vaccination

Neonatal diarrhoea
Intestinal integrity

Environment

Microbiome

GUT

Host

Schokker et al., 2015

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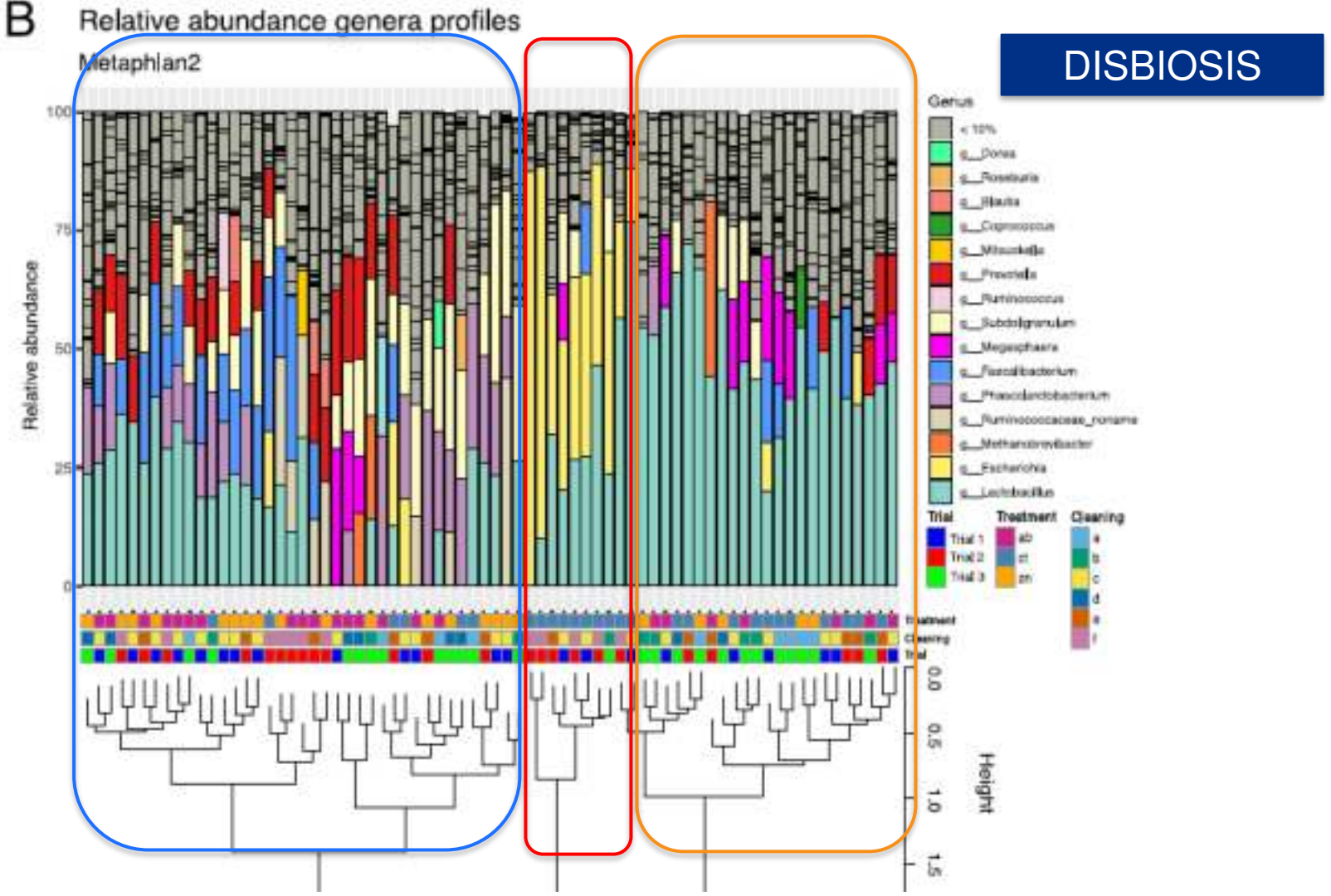
DISBIOSIS



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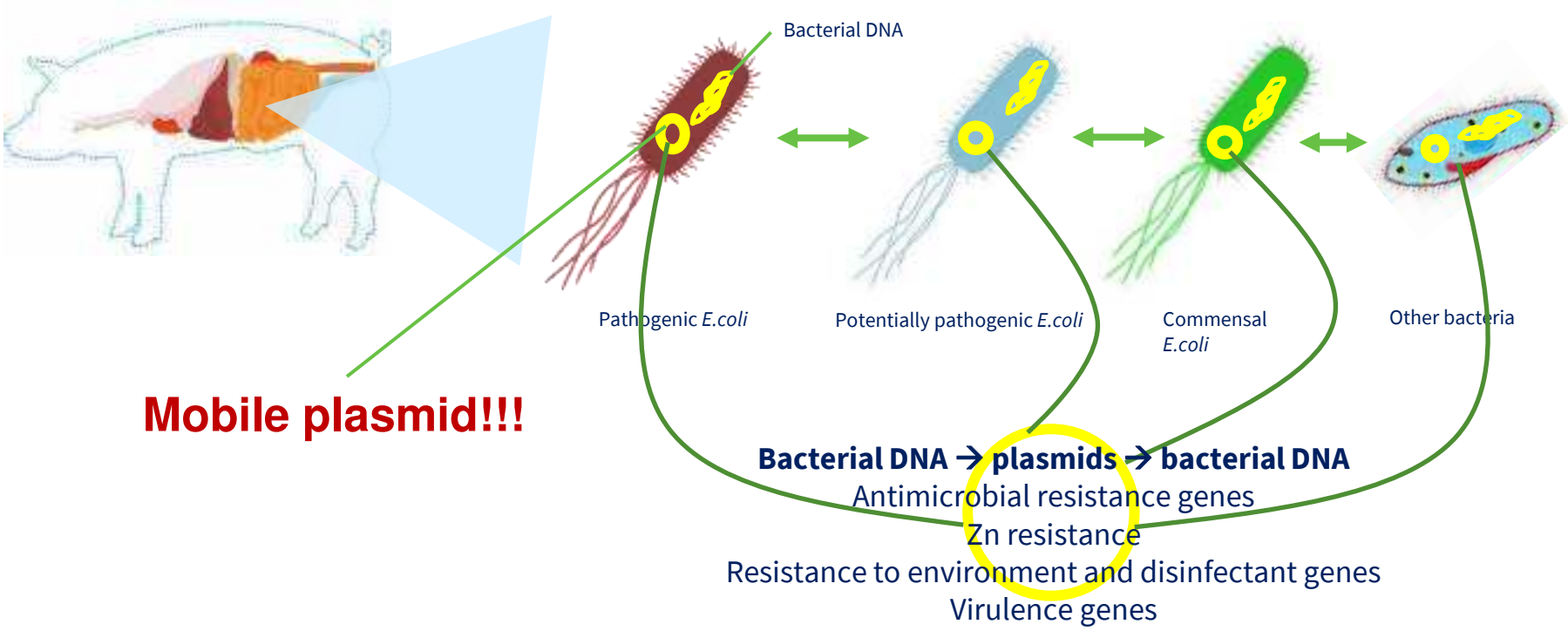
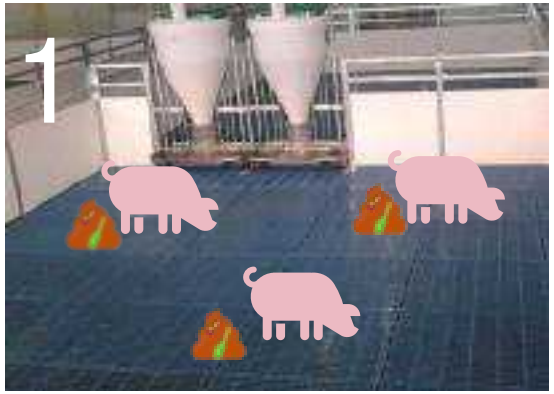
Double pipeline

Progressive feed adaptation pre and post-weaning.
Facilitates intestine maturity.
-Transition solid feed before weaning.
-Transitional change of feeds postweaning.

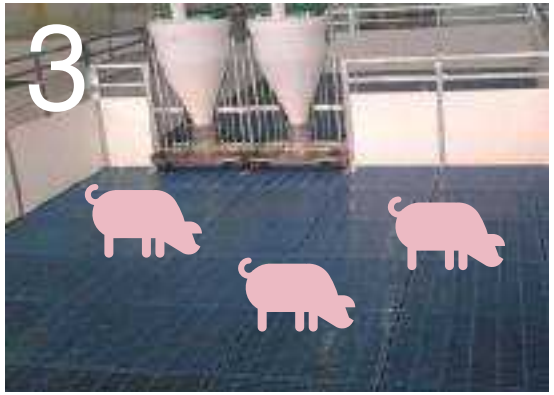
Resting period & Plasmids

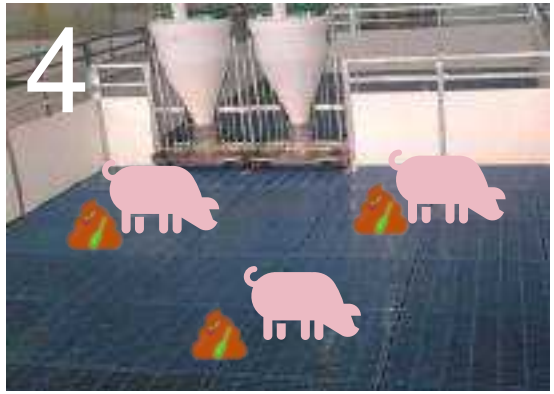


Resting period & Plasmids

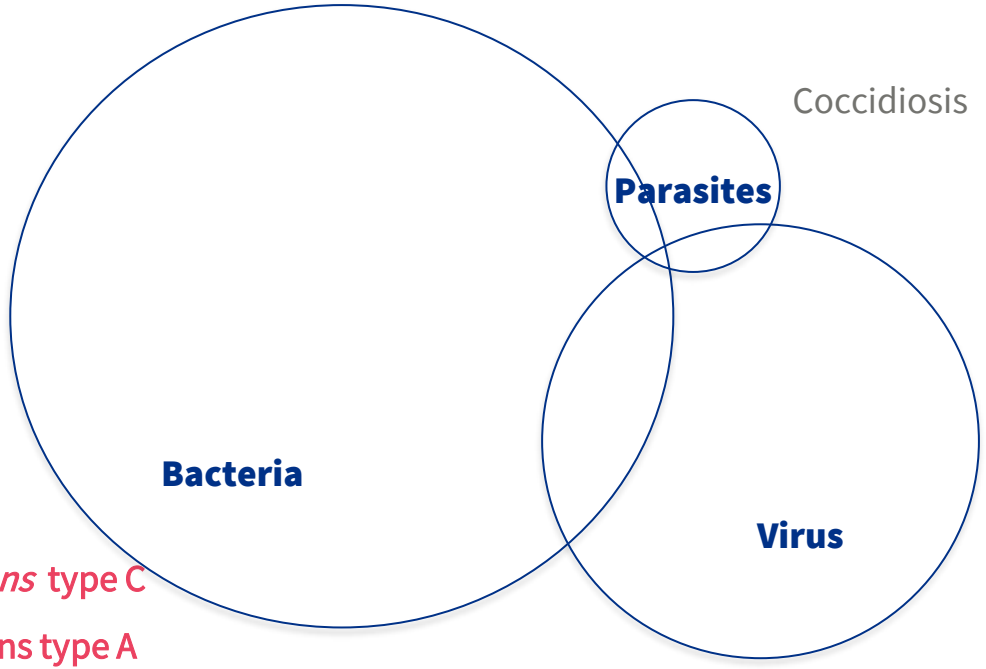


2. Plasmids and multidrug resistant *E.coli* may remain in pens after cleaning





Lactation period



Coccidiosis

Escherichia coli

Clostridium perfringens type C

Clostridium perfringens type A

Clostridium difficile

Rotavirus A or C

Coronavirus (PED / TGE)

PRRSv

Seneca virus

Delta coronavirus

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ENTEROCHECK Plus

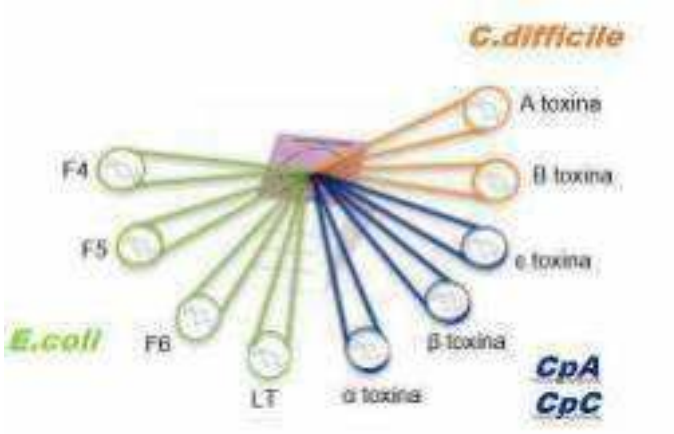
E.coli
F4 / F5 / F6 / LT

C.perfringens
α / β / ε

C.difficile
A / B

Rotavirus
A / C

PED



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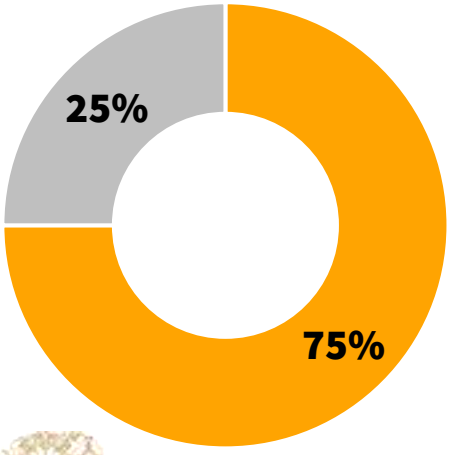
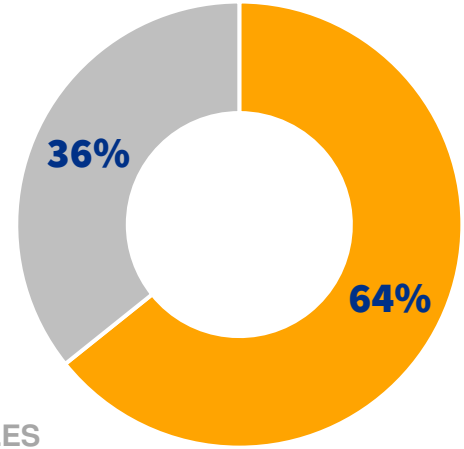
AVERAGE PREVALENCE

C.difficile A toxin



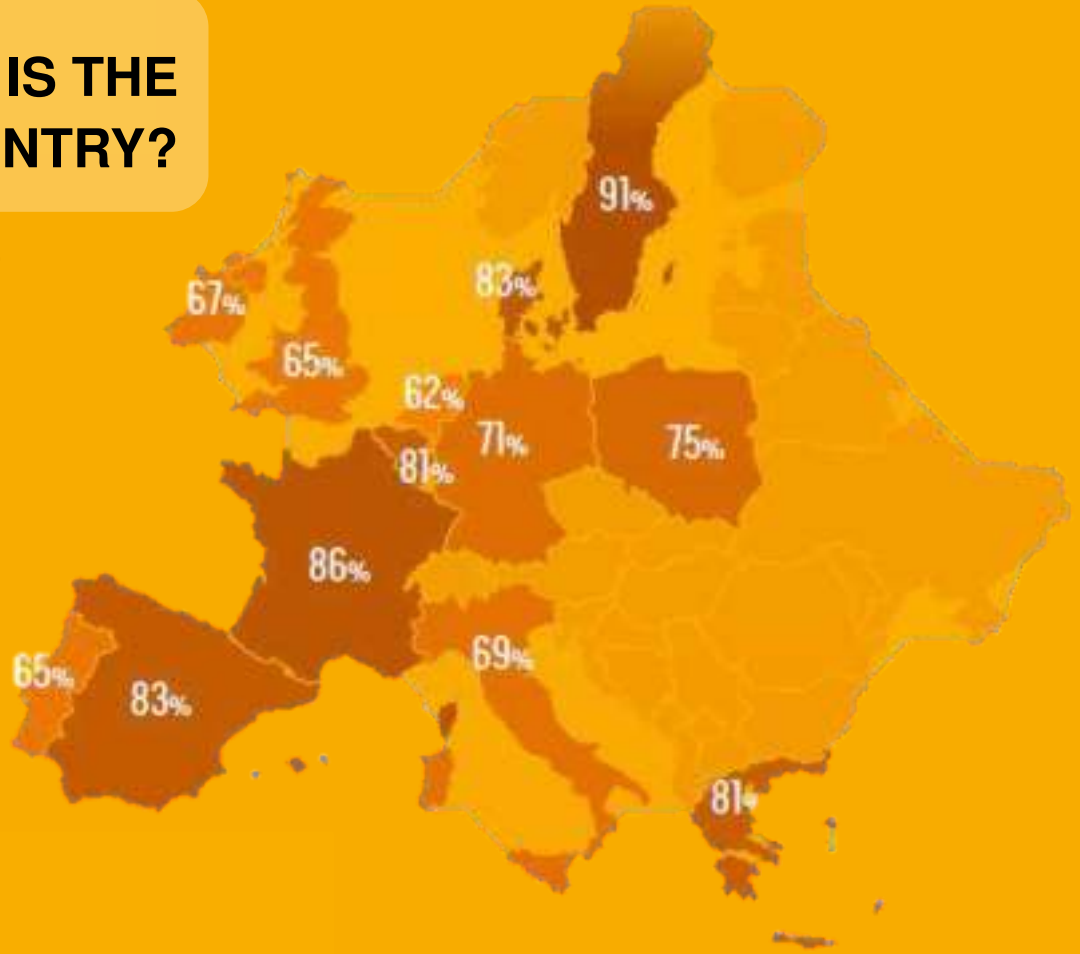
C.difficile B toxin



NEGATIVE SAMPLES
POSITIVE SAMPLES

1. HOW PRESENT IS THE BACTERIA BY COUNTRY?

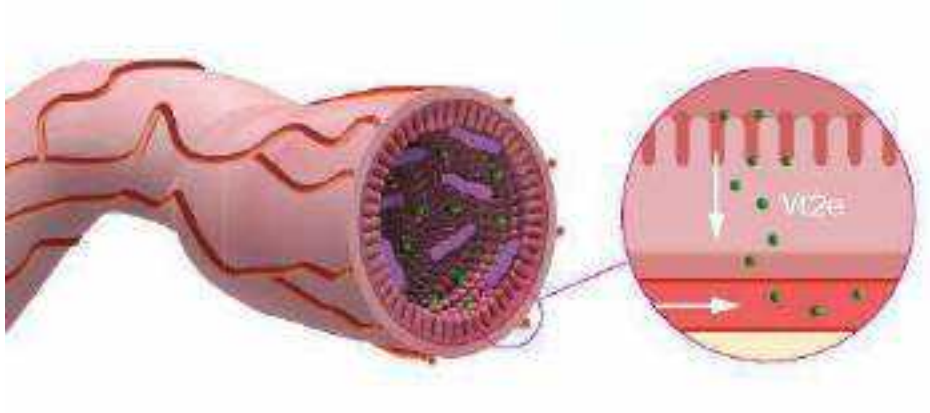
A toxin positive samples

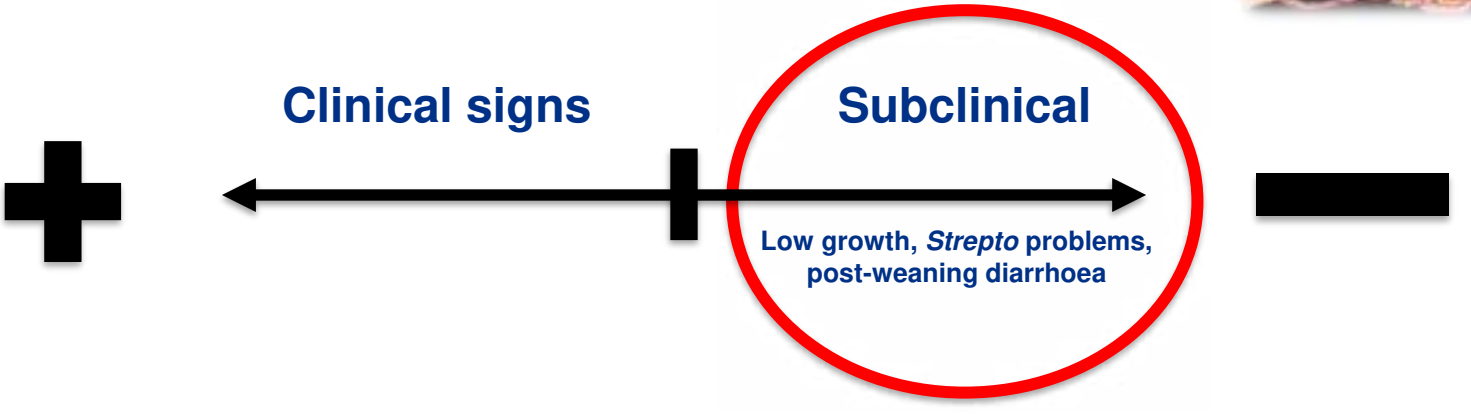



HIPRA
SUISEN6
Diff/A
10
SUISEN6
Coli/C
10

OEDEMA SUBCLINICAL DISEASE, VTEC *E.Coli (F18, F4)*

Oedema disease: The verotoxin effect is dose-dependent





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DRUNK STAGES

SUBCLINICAL

CLINICAL

ALCOHOL INTAKE

Self-dignity limits.

HIPRA

DIAGNOSTIC: Check if your farm is Vt2e +

VEROCHECK by VEPURED®

Diagnostic service by Oral fluids, FTA and PCR to assess **the presence of *Escherichia coli* verotoxigenic on a farm.**

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RESULTS

Subclinical

	VT2e PCR-REAL TIME
6 Semanas 6S-1	POS ++ (Ct 33,5)
6 Semanas 6S-2	POS + (Ct 35,5)
9 Semanas 9S-1	NEG
9 Semanas 9S-2	NEG
9 Semanas 9S-3	POS + (Ct 36,1)

COMENTARIO

Valores de referencia para VT2e (Ct): POS < 38,5
NEG: No se ha detectado DNA bacteriano
POS (+): Se ha detectado DNA bacteriano en baja cantidad
POS (++): Se ha detectado DNA bacteriano en moderada cantidad
POS (+++): Se ha detectado DNA bacteriano en alta cantidad

DIAG. MOLECULAR

Clinical

	VT2e PCR-REAL TIME
7 Semanas T2	POS ++ (Ct 33,7)
7 Semanas T2	POS ++ (Ct 34,0)
7 Semanas T2	POS + (Ct 35,5)
9 Semanas T1	POS +++ (Ct 26)
9 Semanas T1	POS +++ (Ct 27,8)
9 Semanas T1	POS +++ (Ct 29,7)

COMENTARIO

Valores de refereencia para VT2e (Ct): POS < 38,5
NEG: No se ha detectado DNA bacteriano
POS (+): Se ha detectado DNA bacteriano en baja cantidad
POS (++): Se ha detectado DNA bacteriano en moderada cantidad
POS (+++): Se ha detectado DNA bacteriano en alta cantidad

Subclinical disease - CASE 1

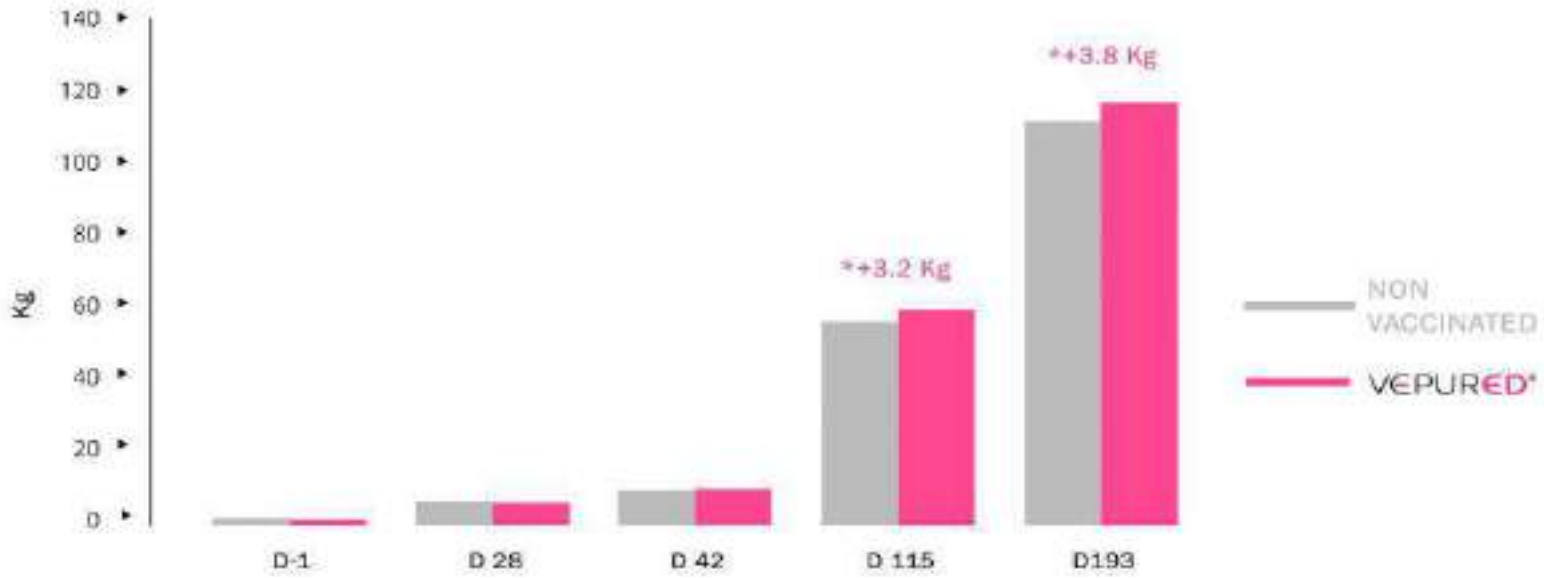
- No ED clinical signs
- No ED mortality
- ED suspicion – Stunted grow
- Diagnosis:

Animals in each study group	
Control	VEPURED®
181	181

	Nursery	Fattening	
		Beginning	*Mid*
Nº of samples	*101*	*21*	*43*
% positive IRS	0.99%	71.4%	62.4%

IRS: Incidence rectal swabs

Subclinical disease - CASE 1



*Statistically significant (P<0,001)**

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PRRSV

-Main target: Non-viraemic born piglets.

-Gilt adaptation period is key.

-1 month at least to develop protection after vaccination with a MLV vaccine. Better 2 doses than one.

-New arrival negative Gilts requires special monitoring.

-GILT MLV vaccination (UNISTRAIN-PRRS ID).

-Two doses before first mating.

-Regular sow vaccination:

- 3-4 mass vaccination a year.

-Piglet vaccination is worthy; ID vaccination stops spreading the virus by iatrogenic transmission.

-McRebel system if there are PRRSV viraemic born piglets or PRRSV outbreak.

-Strictly reduce piglets movements and strictly not movements after 24 of age.

-Weaning small piglets whatever weight. Euthanise piglets if no chances to survive.

HIPRA

PRRSV

Main target: Non-viraemic born piglets

-SERUMPROFILES are ESSENTIAL.

-PCR monitoring: Processing fluids, Oral fluids, Stillbirths.

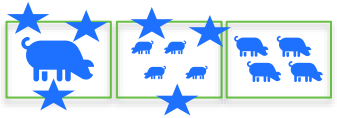
-PRRSV negative external replacement Gilts should be checked 100%.

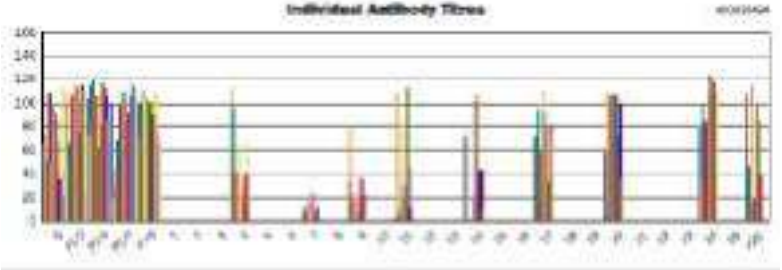
-McRebel system if PRRSV viraemic born piglets or PRRSV outbreak.

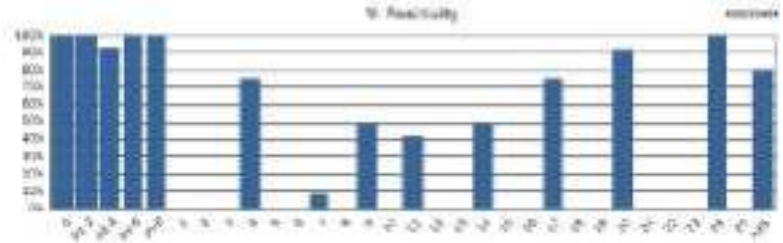
- -Strictly reduce piglets movements and strictly not movements after 24 of age.
- -Weaning small piglets whatever weight.
  - -Euthanise piglets if no chances to survive.
- -All in/ All out.

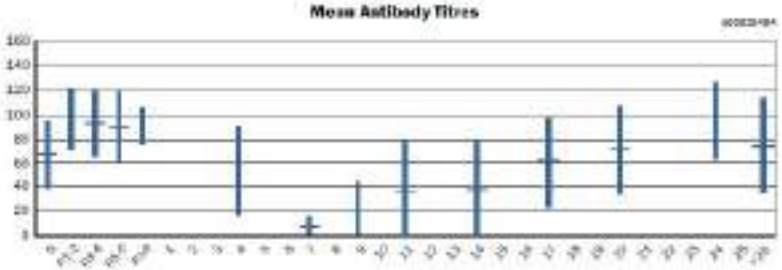
The serumprofile

2









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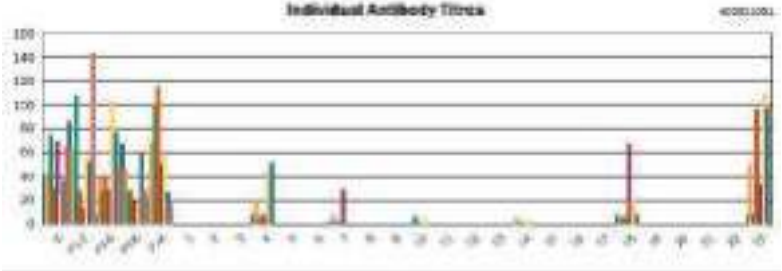
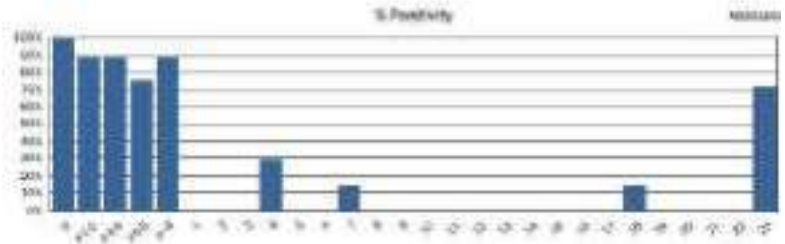




Adaptation

TEST

individual ELISA + PCR (pooling of 5 animals each) 7 days before entering into the sow herd

OBJECTIVE 1:

Ensure all gilts get in contact with the PRRSv farm strain

OBJECTIVE 2:

Ensure that all gilts **stop shedding** after exposure when introduced into the to sow herd

HIPRA

How many weeks for adaptation?

Ideal **12 weeks** / Minimum 8 weeks

Ideal to enter gilts with 12-14 weeks of age

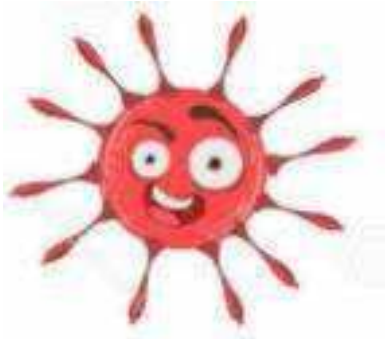
TEST

By PCR (pooling of 5 animals) 100% of animals

HIPRA

2 PRRS strategies for gilt adaptation

+



Vaccination

Exposure

About gilt vaccination, what first?

1st  2nd 

- **Naive** gilts vaccinate at arrival to diminish clinical signs and start exposure 3 weeks later
- In case of doubts use always this protocol

1st  2nd 

- Not important if gilts already infected at origin with a different strain

HIPRA

About exposure to PRRS virus

Material

Placen[X]etuses

Faeces [X]n sows

Oral fluids - ropes

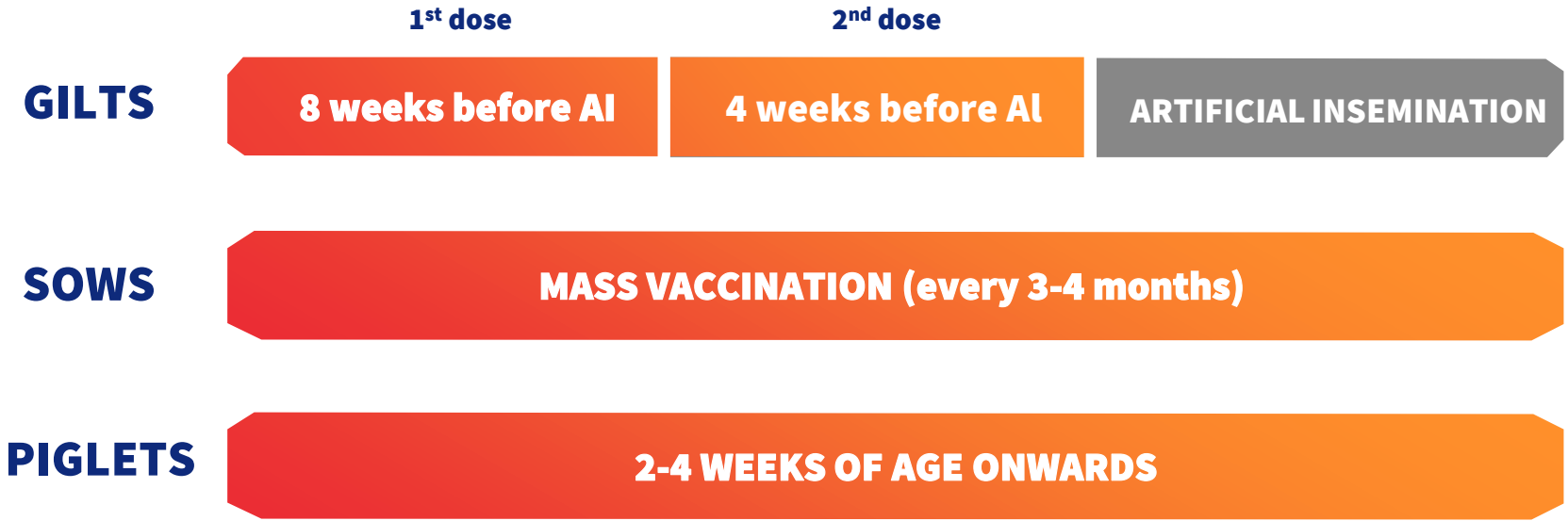
Live animals

Cul[X]sows

Nursery pigs

HIPRA

Vaccination program



SIMPLICITY

Lighter and more ergonomic
2,3 times faster
Less risk self injections

WELFARE

Less stress and pain
Reduces broken needles in the carcass
Less muscle injuries and abscess

BIOSECURITY

Reduction iatrogenic transmission (ASF, *PCV2, PRRSV, SE, S. suis, A. suis, M. suis, Leptospira)*
Reduction in the use of antibiotics

EFFECTIVE IMMUNE RESPONSE

High concentration of immune cells
Less MDA neutralization
Equal or better immune response

ECO-FRIENDLY

Less vials and cardbox used
No needles used

Hipradermic® prevents ASF and PRRS transmission

IPVS2022

Evaluation of ASF and PRRS virus transmission between pigs when using conventional needles and a needle-free device

Dachrit Nilubol[1,2,*]; Joel Miranda[3]; Salvador Romero[3]; Sittikorn Traiyarach[3]; Angkana Tantituvanont[2,4]; Dante Palabrica[5]

[1]Swine Viral Evolution and Vaccine Development Research Unit and [2]Department of Veterinary Microbiology, Faculty of Veterinary Science, Chulalongkorn University, Thailand, [3]HIPRA, Amer (Girona), Spain, [4]Department of Pharmaceutic and Industrial Pharmacies, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand, [5]Robina Farms Diagnostic Laboratory, Universal Corn Products Compound, Philippines,

**Corresponding author: dachrit@gmail.com*

HIPRA

IPVS2022

The peak of PRRS and ASF viraemia in seeders was at 7 DPC

Sentinel pigs of Needle-ASF and Needle-PRRS groups were PCR positive at 7 DPI (ASF and PRRS)

Group	Seroconversion of sentinels to ASF and PRRS after ID and IM inoculation				
	0 DPI	7 DPI	14 DPI	21 DPI	28 DPI
Needle-ASF	0/6 (Negative)	0/6 (Negative)	4/6 (Positive)	6/6 (Positive)	6/6 (Positive)
HIPRADERMIC®-ASF	0/6 (Negative)	0/6 (Negative)	0/6 (Negative)	0/6 (Negative)	0/6 (Negative)
Needle-PRRS	0/6 (Negative)	0/6 (Negative)	2/6 (Positive)	6/6 (Positive)	6/6 (Positive)
HIPRADERMIC®-PRRS	0/6 (Negative)	0/6 (Negative)	0/6 (Negative)	0/6 (Negative)	0/6 (Negative)

UNISTRAIN® PRRS cross-protection

American or type II

Efficacy of commercial genotype 1 porcine reproductive and respiratory syndrome virus (PRRSV) vaccine against field isolate of genotype 2 PRRSV

Seong-sik Ko[a], Sang-won Seo[a], Sun-young Sunwoo[a], Sang J. Yoo[a], Myung-hyee Kim[b], Young S. Lyoo[a,*]

Immune response, IL-10 and protective efficacy against a single HP-PRRSV challenge or in conjunction with PRRSV1 of pigs intradermally and intramuscularly vaccinated with modified live PRRSV1

Madapong[1], A., Saeng-Chuto[1], K., Miranda[*2], J., Tantituvanont[1], A., Nilubol[1], D.

European or type I

Heterologous cell-mediated immune responses against PRRS virus in gilts vaccinated with UNISTRAIN® PRRS

HP Chinese-like

Effects of challenge with a virulent genotype II strain of porcine reproductive and respiratory syndrome virus on piglets vaccinated with an attenuated genotype I strain vaccine

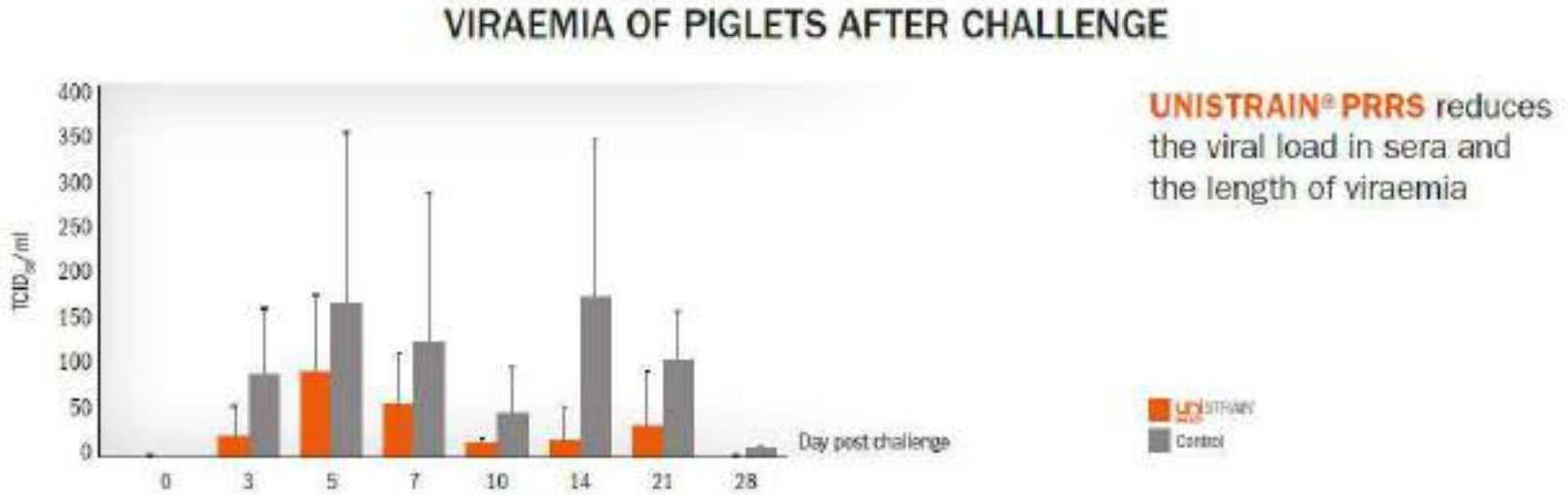
M. Roca[a,1], M. Gimeno[b,c,1], S. Bruguera[a], J. Segalés[b,c], L. Díaz[b,c], LJ. Galindo-Cardiel[b,c], E. Martínez[a], L. Darwich[b,c], Y. Fang[d,2], J. Maldonado[e], R. March[a], E. Mateu[b,c,*]

Subtype III (Lena strain)

"VACCINATION WITH UNISTRAIN® PRRS IN PIGLETS REDUCES VIREMIA AND PRRSV SECRETION AFTER CHALLENGE WITH AN EAST EUROPEAN SUBTYPE 3 ISOLATE (LENA STRAIN)"

PRRSV2 challenge trial

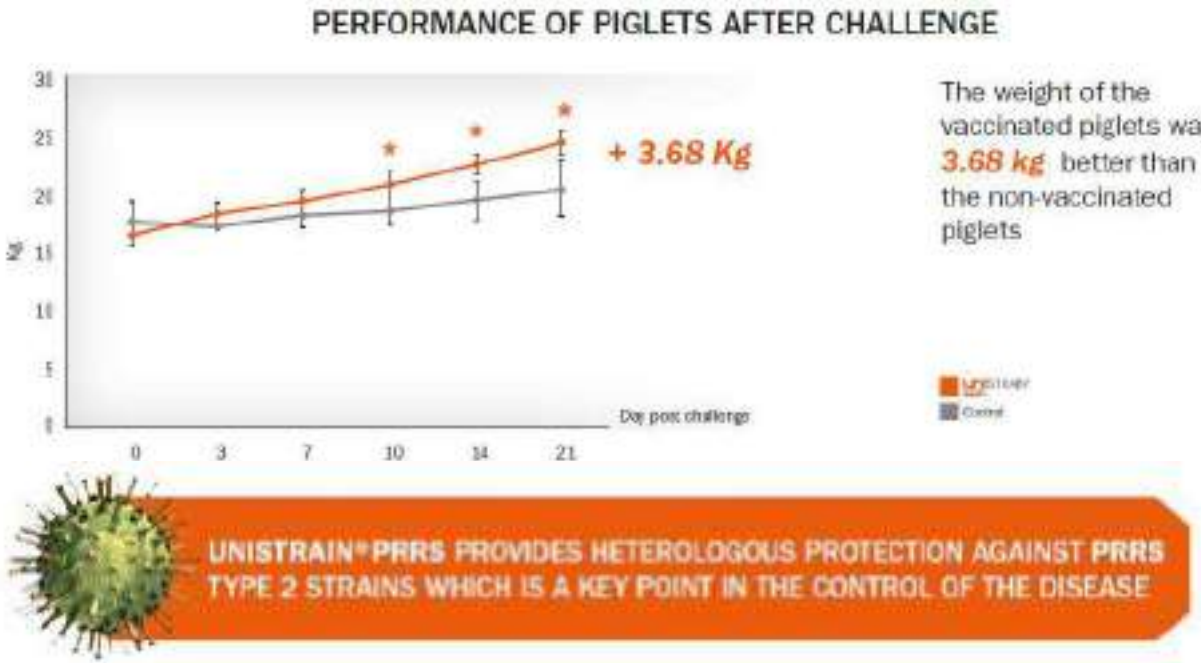
1.500 sow farm in South Korea. UNISTRAIN-PRRS Vaccination at 4 weeks of age.



Miranda, J *et al.*; Asian Pig Veterinary Society Congress, 2019

HIPRA

Piglet performance



Miranda, J *et al.*; Asian Pig Veterinary Society Congress, 2019

HIPRA

THANK YOU

Sergi Bruguera

sergi.bruguera@hipra.com

ZnO situation from june 2022

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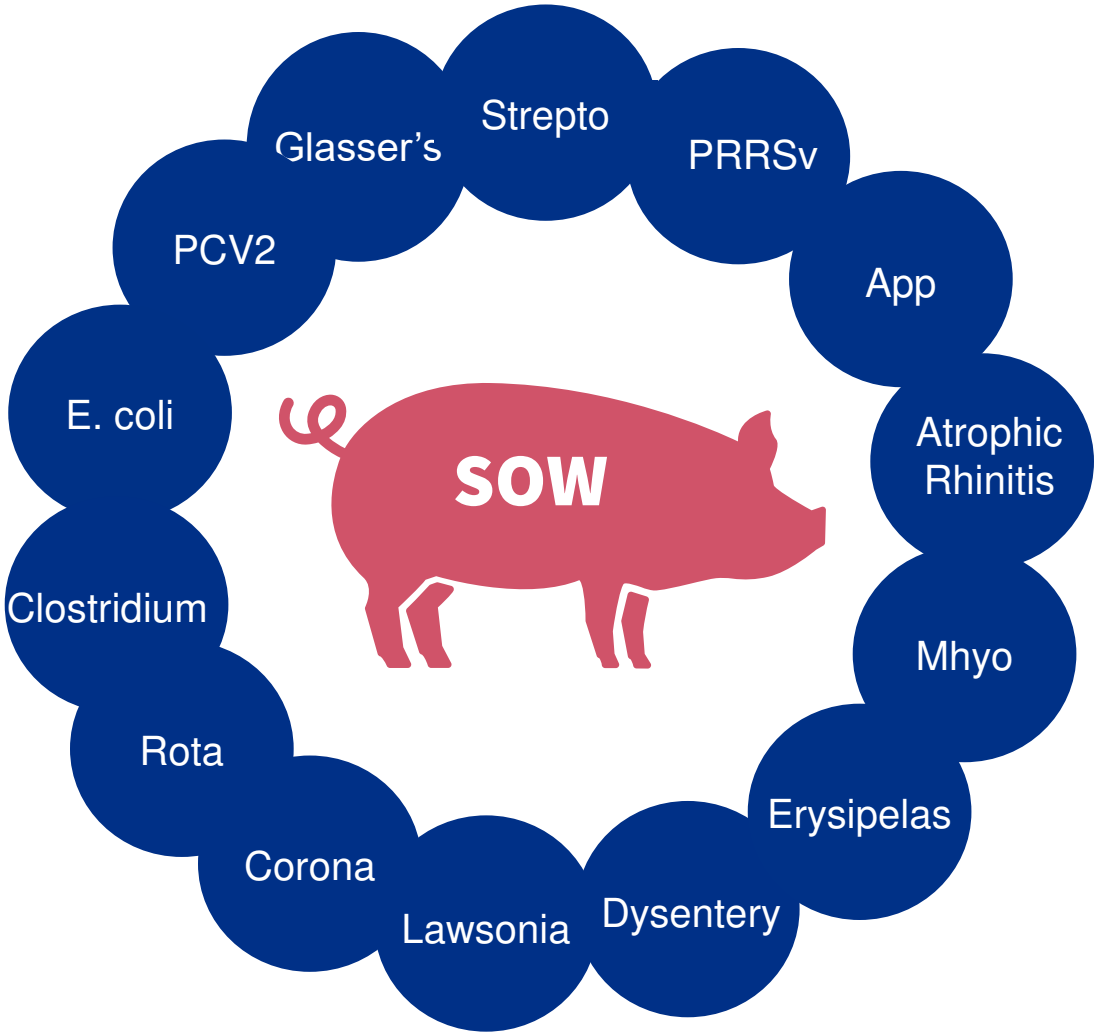
changes on infection dynamics


Strepto
PRRSv
App
Atrophic Rhinitis
Mhyo
Erysipelas
Dysentery
Lawsonia
Corona
Rota
Clostridium
E. coli
PCV2
Glasser's
SOW

Emerging reproductive diseases

PRRS
Influenza
Circovirus
Aujeszky's disease
Brucella suis
African Swine Fever

Swine Erysipelas
Leptospirosis
Mycoplasma suis
Chlamydia
Toxoplasmosis

Parvovirus
Teschovirus
Cardiovirus
Citomegalovirus
Enterovirus

Emerging respiratory diseases

PRRS
Influenza
Aujeszky's
PCV-2
Mhyo
Corona respiratory

=

Streptococcus
Glasser's
Bordetella
App
A. suis
Pm type A
Pm type D
Mycoplasma hyorninis
Mycoplasma suis

↑

↓

. . . ?

Emerging enteric diseases

E. coli neonatal
C. perfringens type C
Rotavirus type C
Coccidiosis

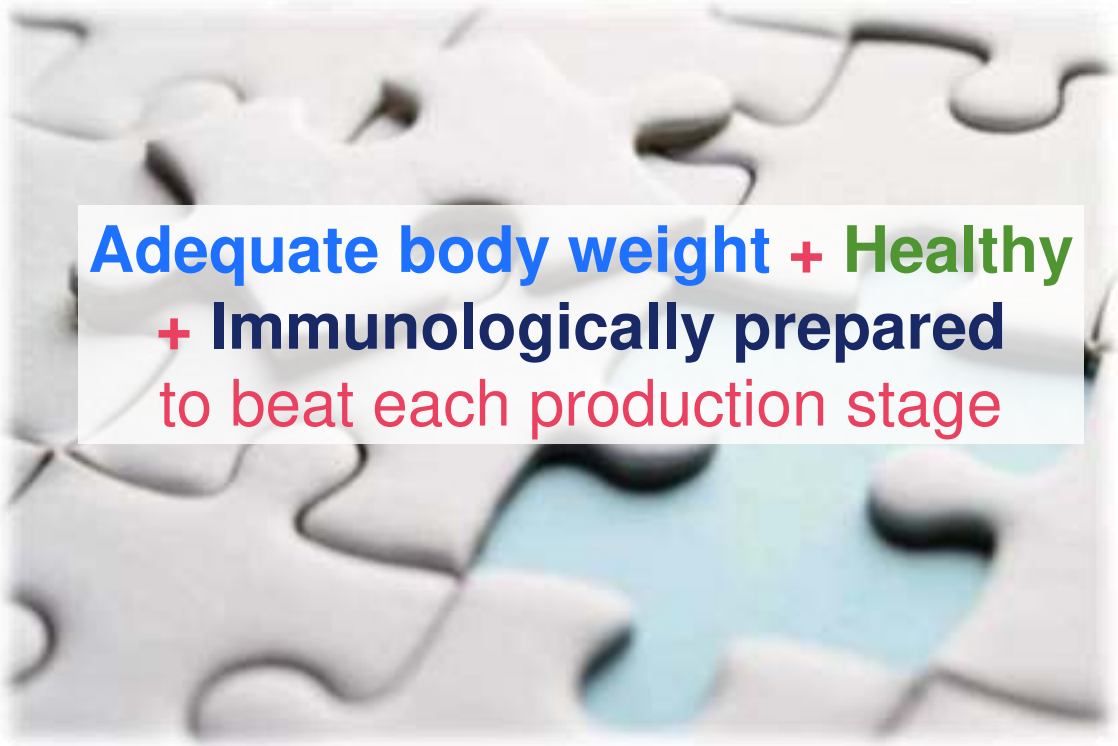
Edema disease
E. coli post weaning diarrea
C. difficile
C. perfringens type A
Lawsonia
Brachyspira
Salmonellosis

Coronavirus
Rotavirus type A

How to raise pigs without Antibiotics, and without Zinc Oxide?

HIPRA

Antibiotic reduction is about producing a **high quality piglet** at weaning; at nursery and during fattening period



HIPRA

It requires an **holistic approach**

HIPRA

Diarrhea and PRDC

...					1	2	3	4	...	12	13	14	15	16	1	2	3	4	5	6	7	...

Gestation

Immunising gilts and sows - gilt adaptation

Feeding the sow and the piglet – the role of the microbiota

Preparing the piglet infront main disease is going to be challenged in nursery unit: PRRS, PCV2, Mhyo vertical infection, Oedema subclinical, SIV

Lactation Nursery

The sow:

Good farrowing duration

Good colostrum production

The piglet:

Good colostrum intake

HIPRA

HIPRA

Building Immunity
for a Healthier World