Doenças Respiratórias na Reprodução

Msc. Gefferson Silva

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XVIII Encontro Regional
Abraves PR **2024**

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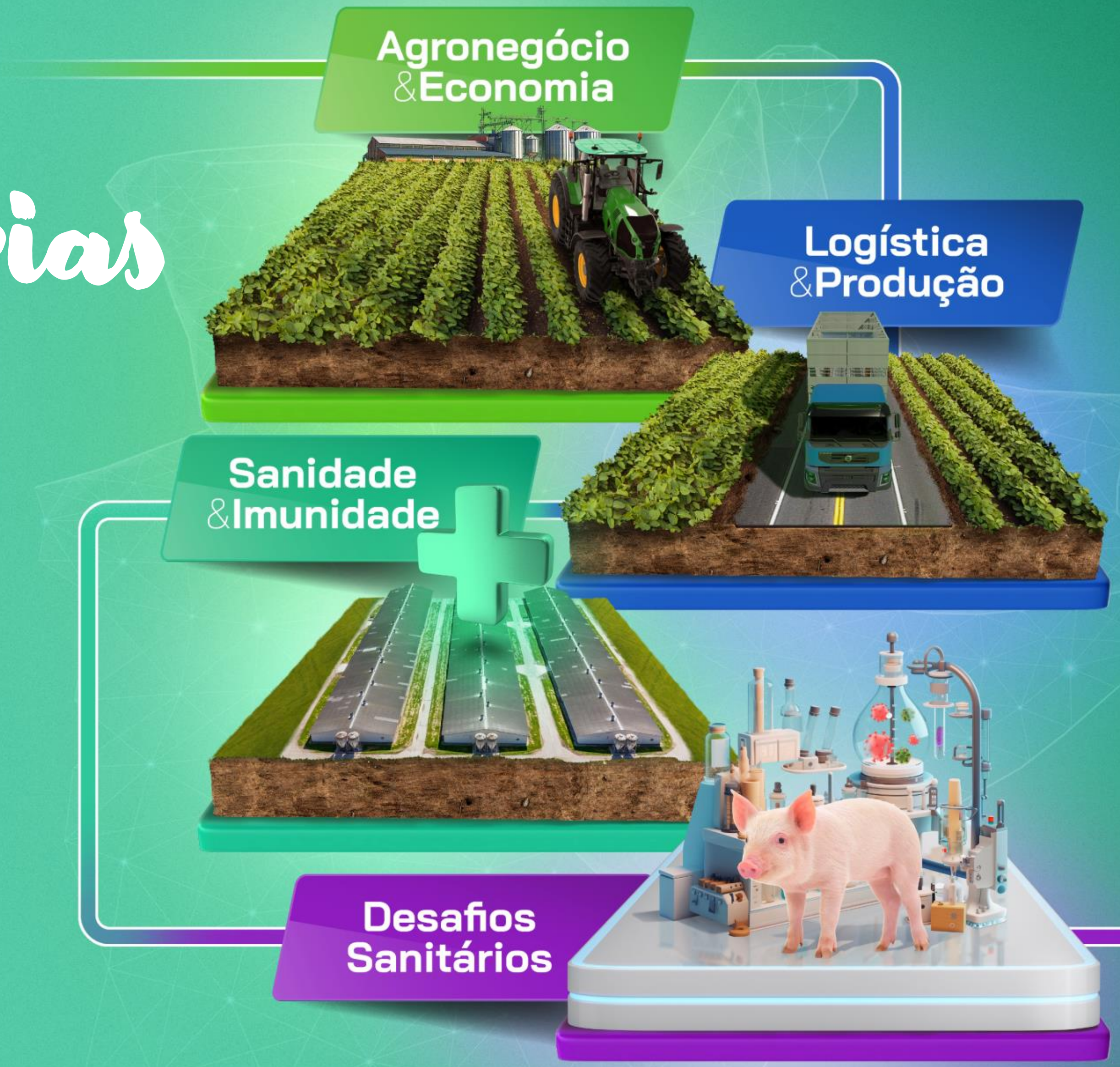
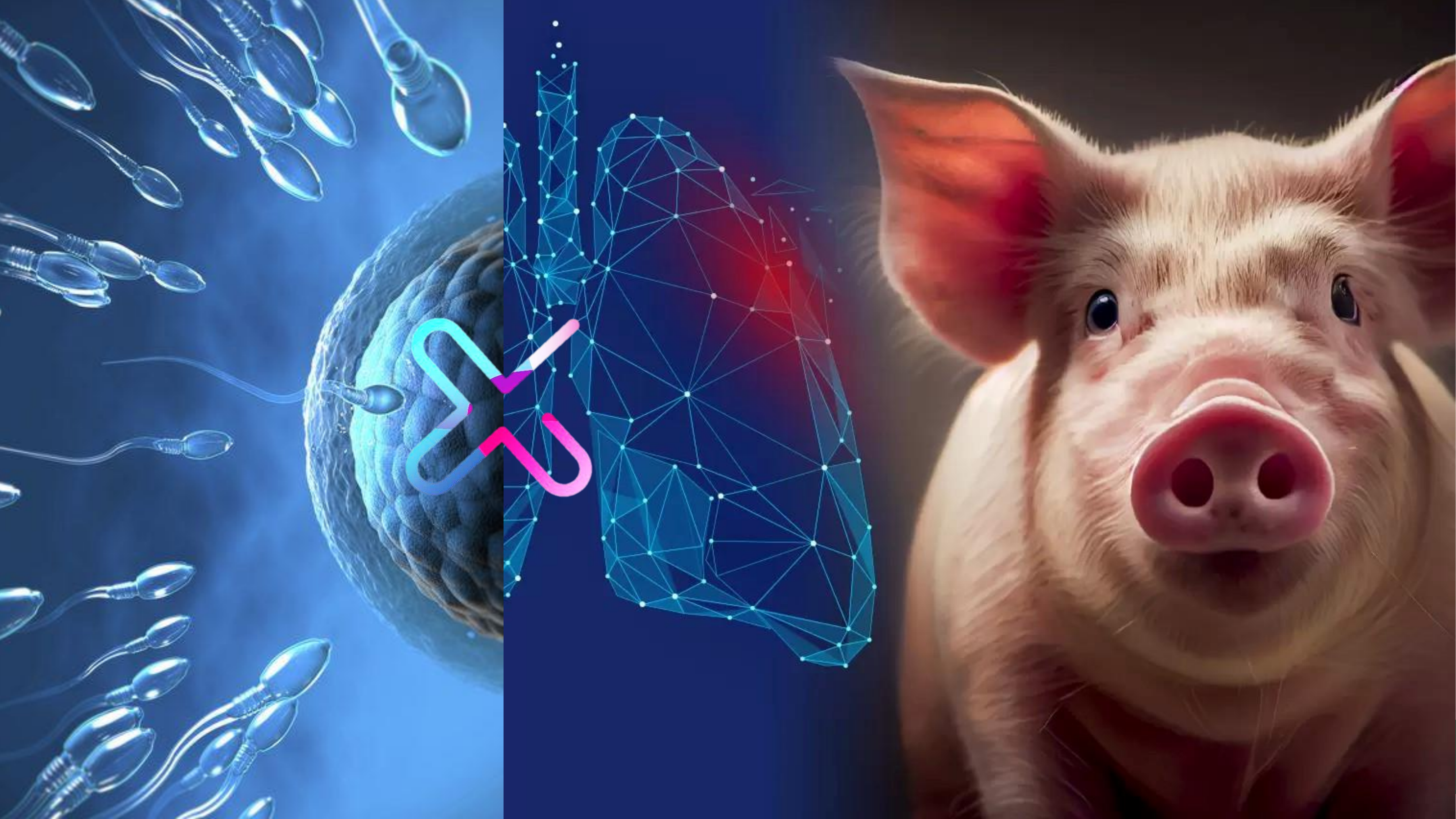
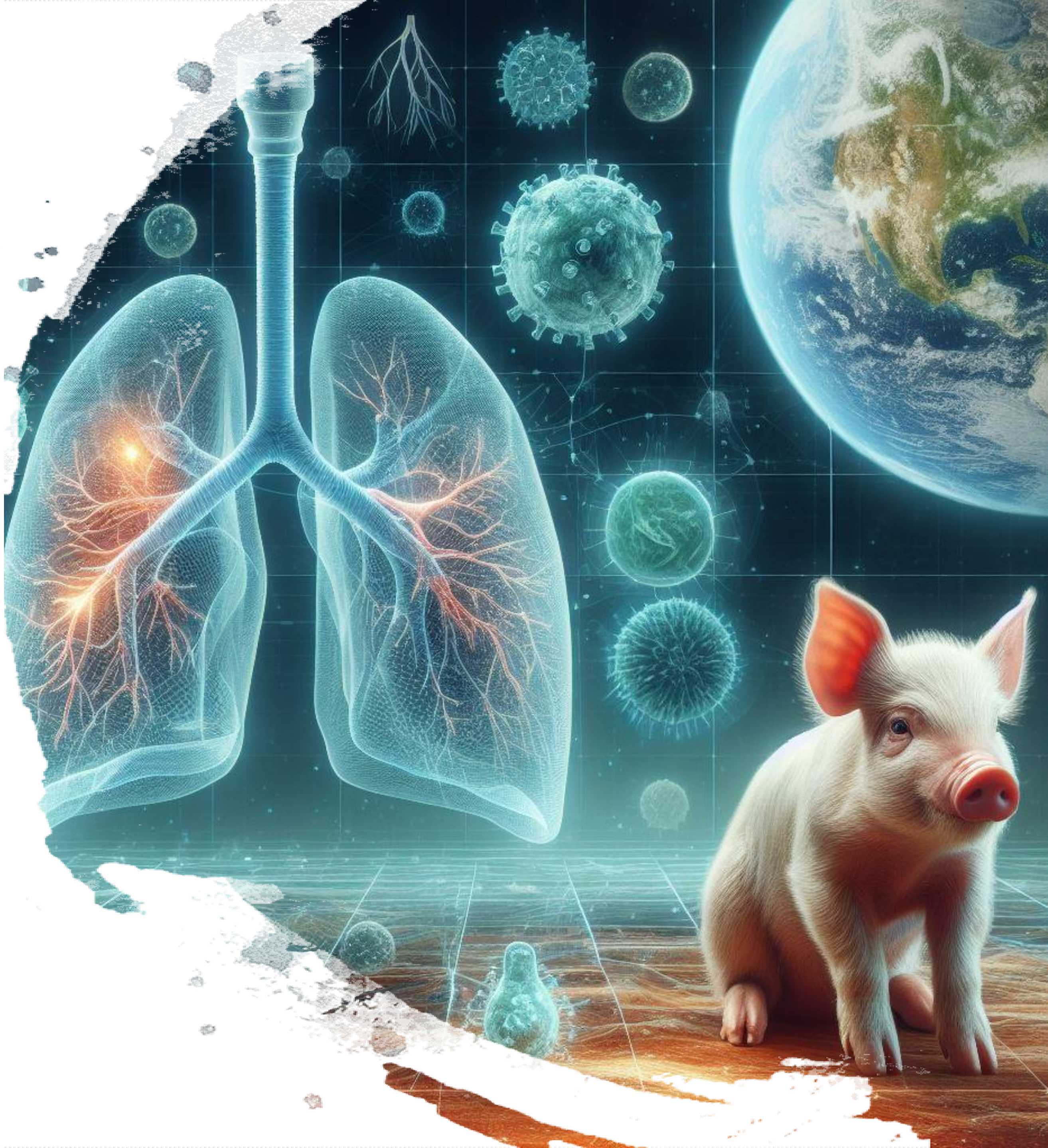
Regional Paraná



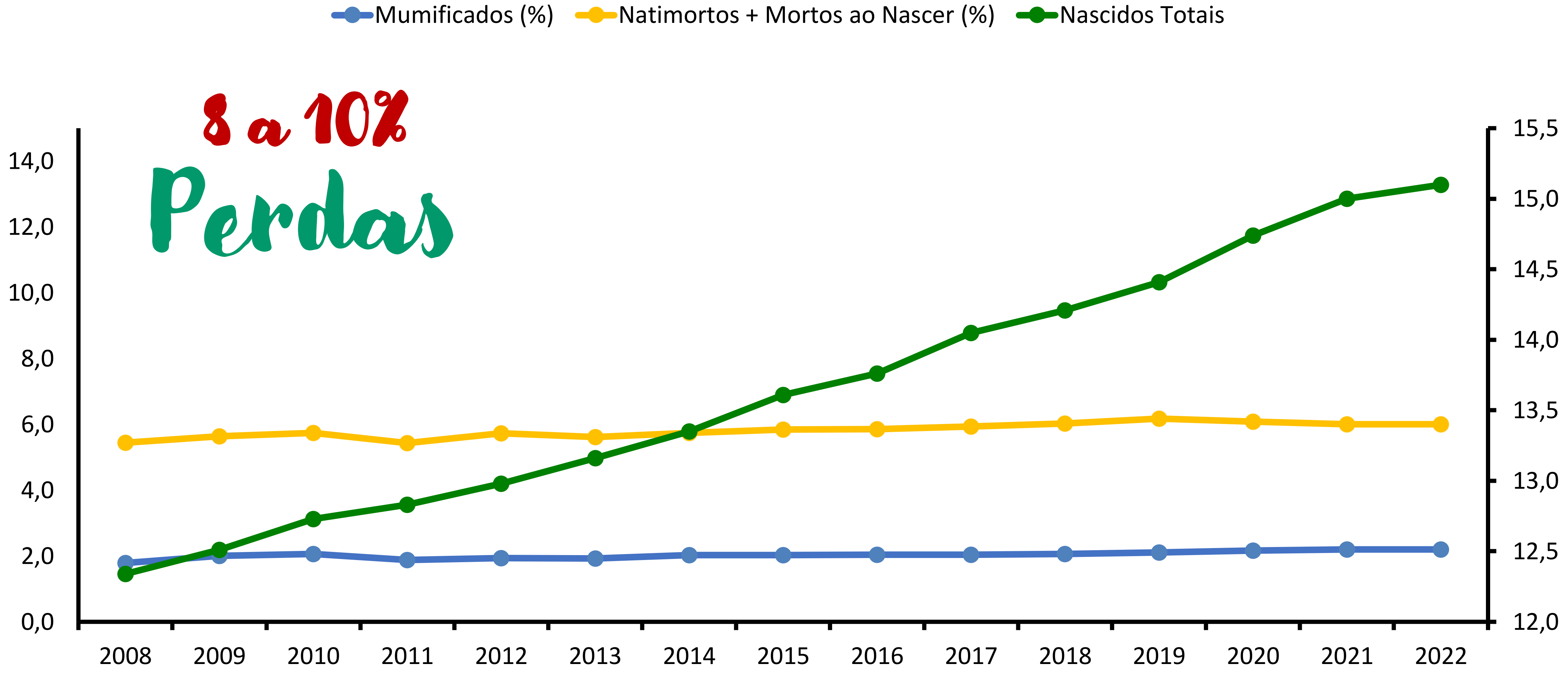


Agenda

- **Indicadores Zootécnicos**
- **Mortalidade de Fêmeas**
- **Agentes infecciosos primários**
  - PRRS
  - Influenza suína
  - Circovírus suíno tipo 2 (PCV2)
  - *Mycoplasma hyopneumoniae*
  - *Actinobacillus pleuropneumoniae*
- **Papel da inflamação na reprodução**
- **Um olhar para o futuro**
- **Considerações finais**



NÚMERO DE NASCIDOS E PERDAS DE LEITÕES



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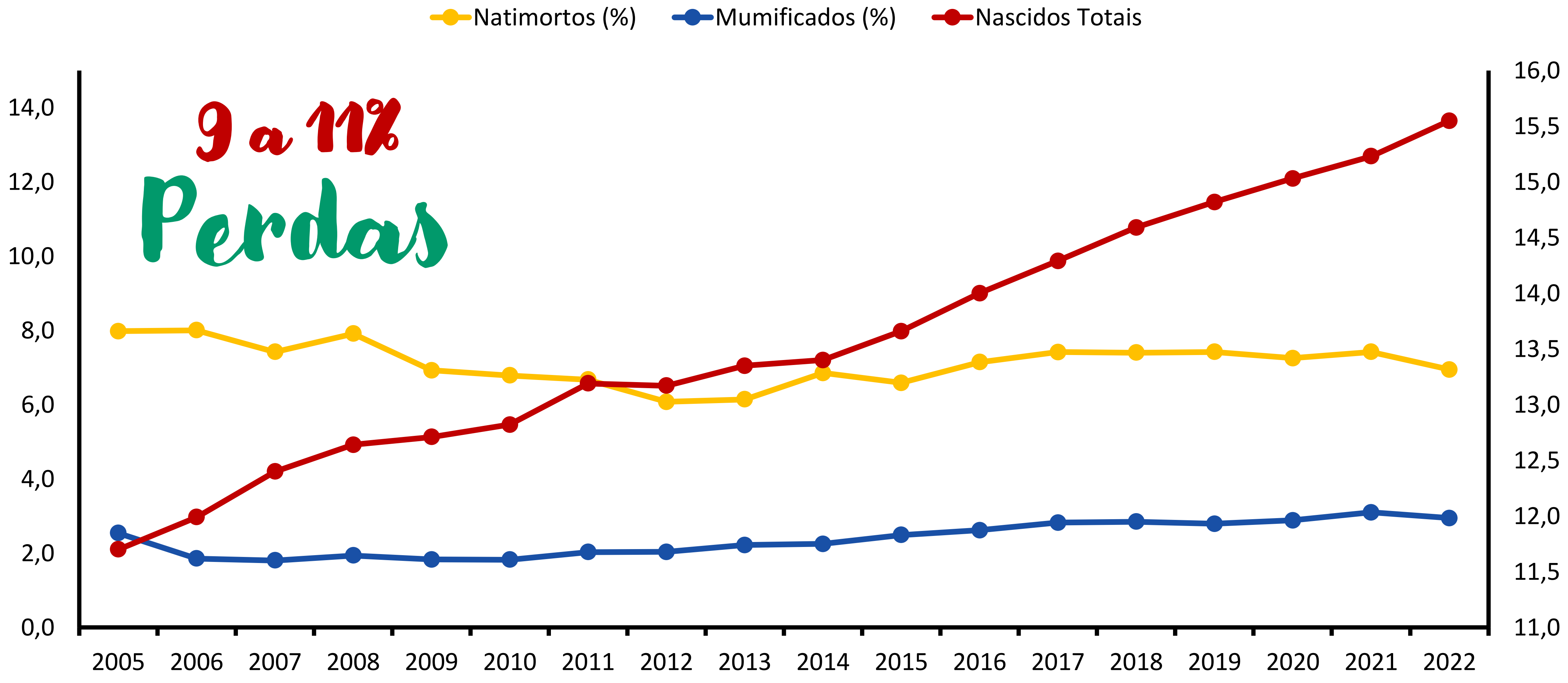
Fonte: Agriness (2023) - Maiara Dahmer

NÚMERO DE NASCIDOS E PERDAS DE LEITÕES



Fonte: Pig Champ (2023)

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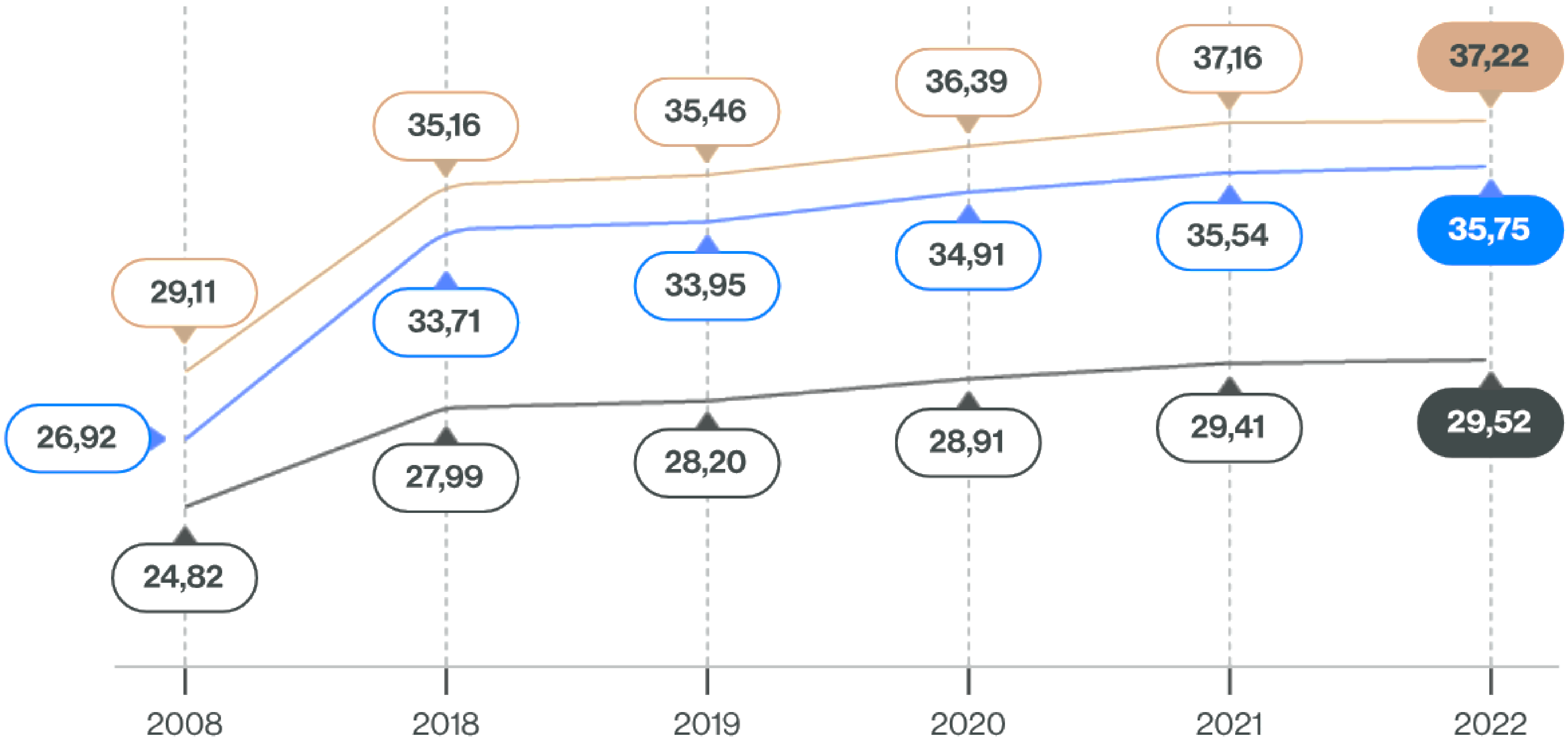
Desmamados/Fêmea/Ano (DFA)



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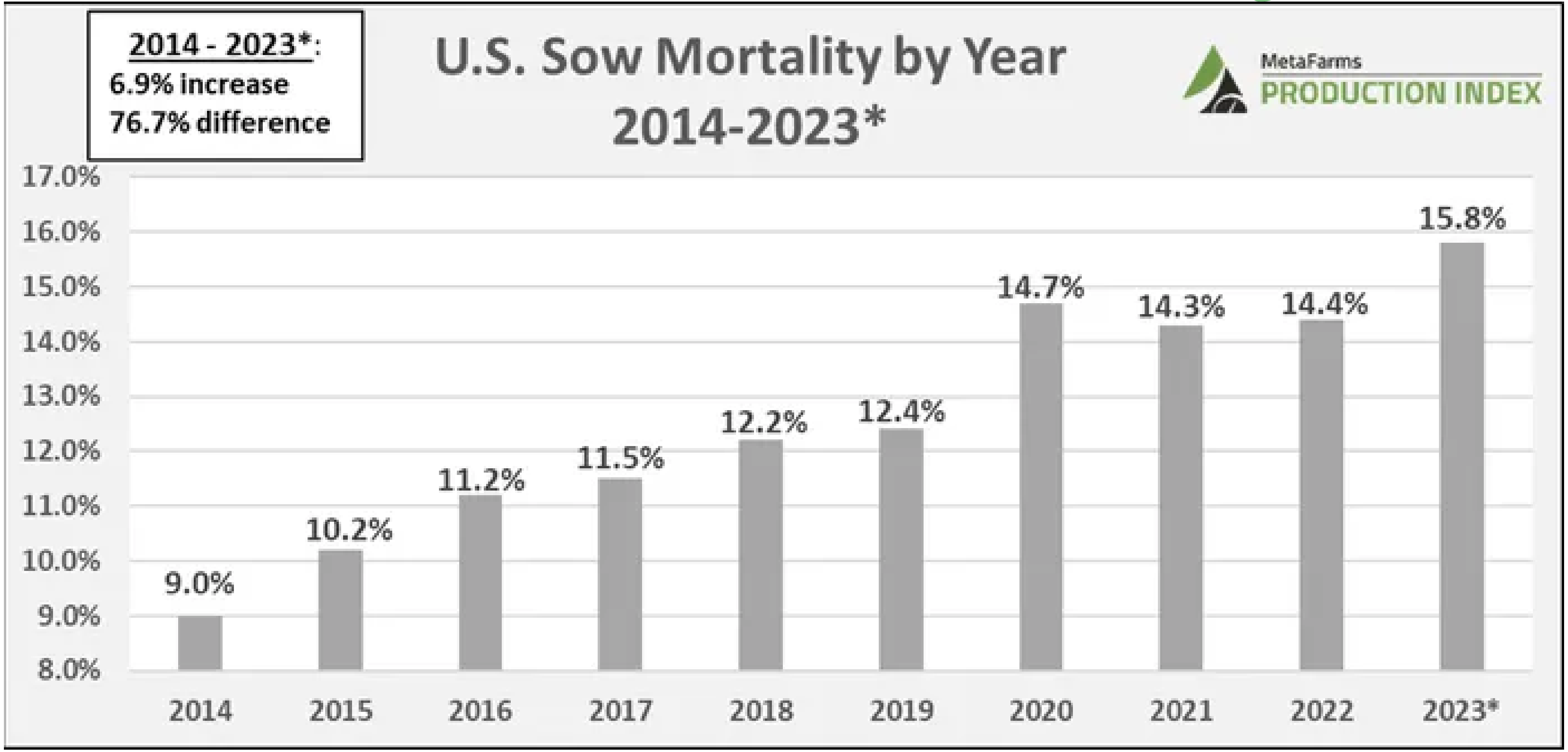
FONTE: https://indd.adobe.com/view/177775ca-905d-4b64-b2bb-7b20bac84452?utm_source=site+melhores&utm_medium=bot%C3%A3o+topo&utm_campaign=15ed

Mortalidade de Matrizes



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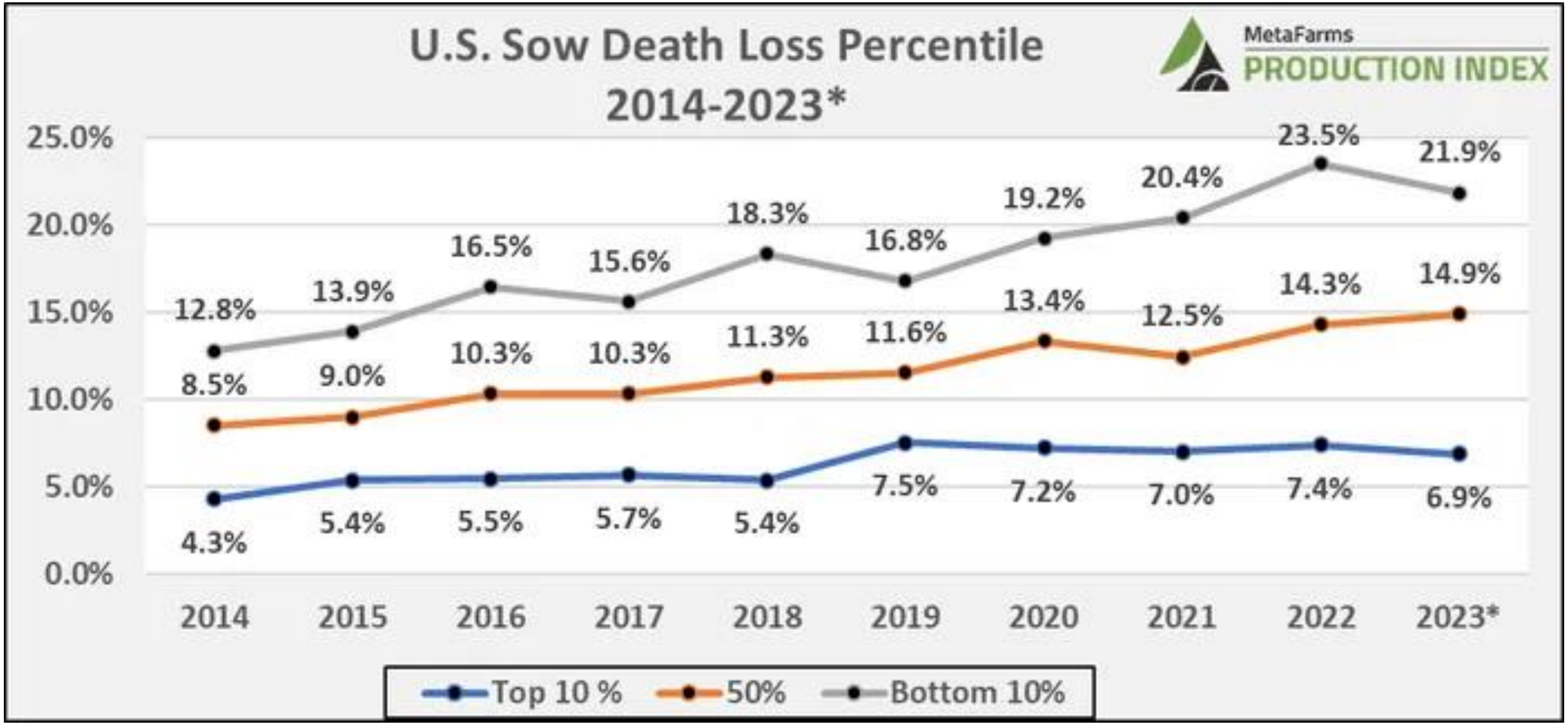
FONTE: https://www.nationalhogfarmer.com/livestock-management/u-s-sow-mortality-trends-continue-to-climbCC

Mortalidade de Matrizes



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FONTE: https://www.nationalhogfarmer.com/livestock-management/u-s-sow-mortality-trends-continue-to-climbCC

Mortalidade de Matrizes

2023 Sow Death Removals by Month			
Removal Month	Prolapse	Structure/Body Condition	General Health
January	17.8%	6.8%	11.5%
February	20.8%	7.9%	13.2%
March	20.2%	8.2%	13.5%
April	20.0%	9.1%	13.8%
May	17.6%	7.8%	13.7%
June	18.9%	9.3%	15.2%
July	15.1%	7.0%	17.2%
August	12.7%	8.0%	17.3%
September	18.7%	11.8%	13.5%
October	21.0%	9.9%	15.4%
November	24.8%	9.3%	15.4%

MetaFarms PRODUCTION INDEX

2023* Sow Removal by Reason	
Removal Reason	% of Total
Farrowing	5.5%
Gut	1.4%
Age/Parity	0.3%
Production	1.1%
Prolapse	22.6%
Structure/body Condition	23.5%
Other/Unknown	34.0%
General Health	11.6%

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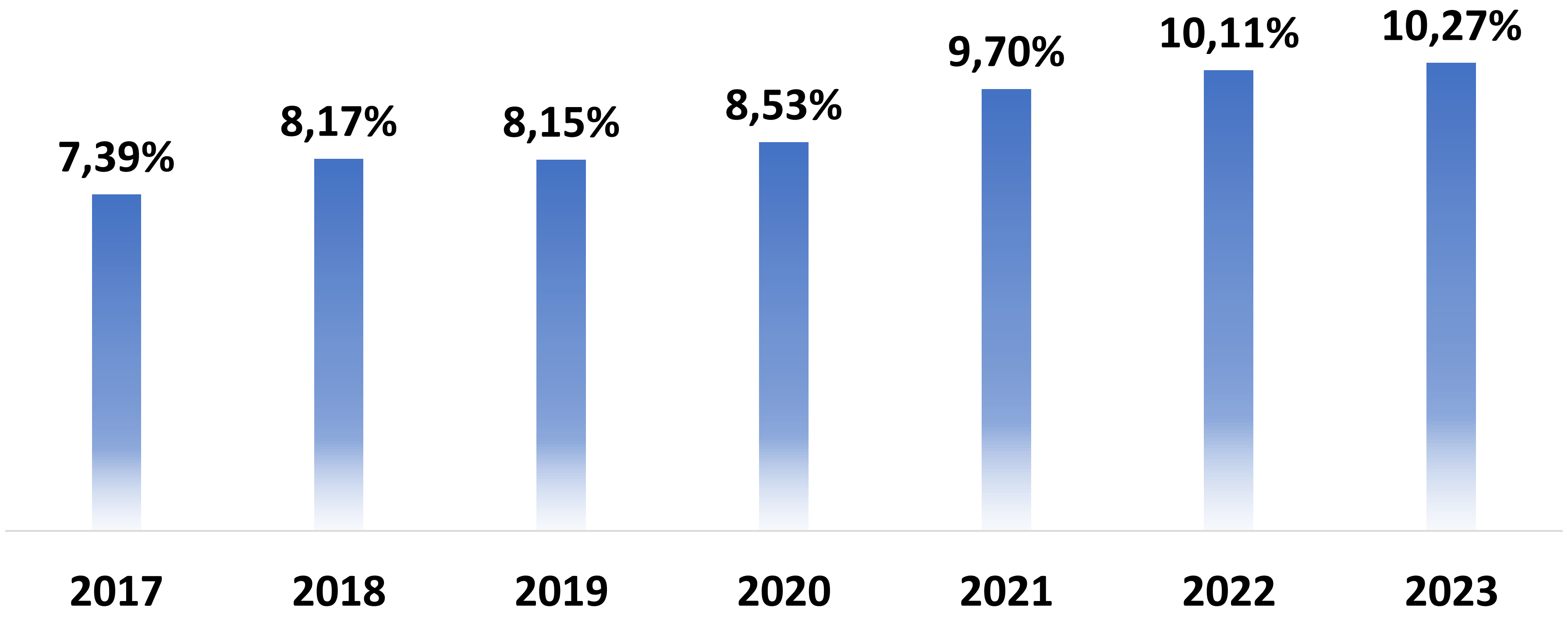
FONTE: https://www.nationalhogfarmer.com/livestock-management/u-s-sow-mortality-trends-continue-to-climbCC

Mortalidade de Matrizes

MORTALIDADE MATRIZES – BRASIL (%)



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Fonte: Serviços técnicos Agroceres PIC: BI gestão de mortalidade de fêmeas Fonte: Pig Champ; Agriness

animals

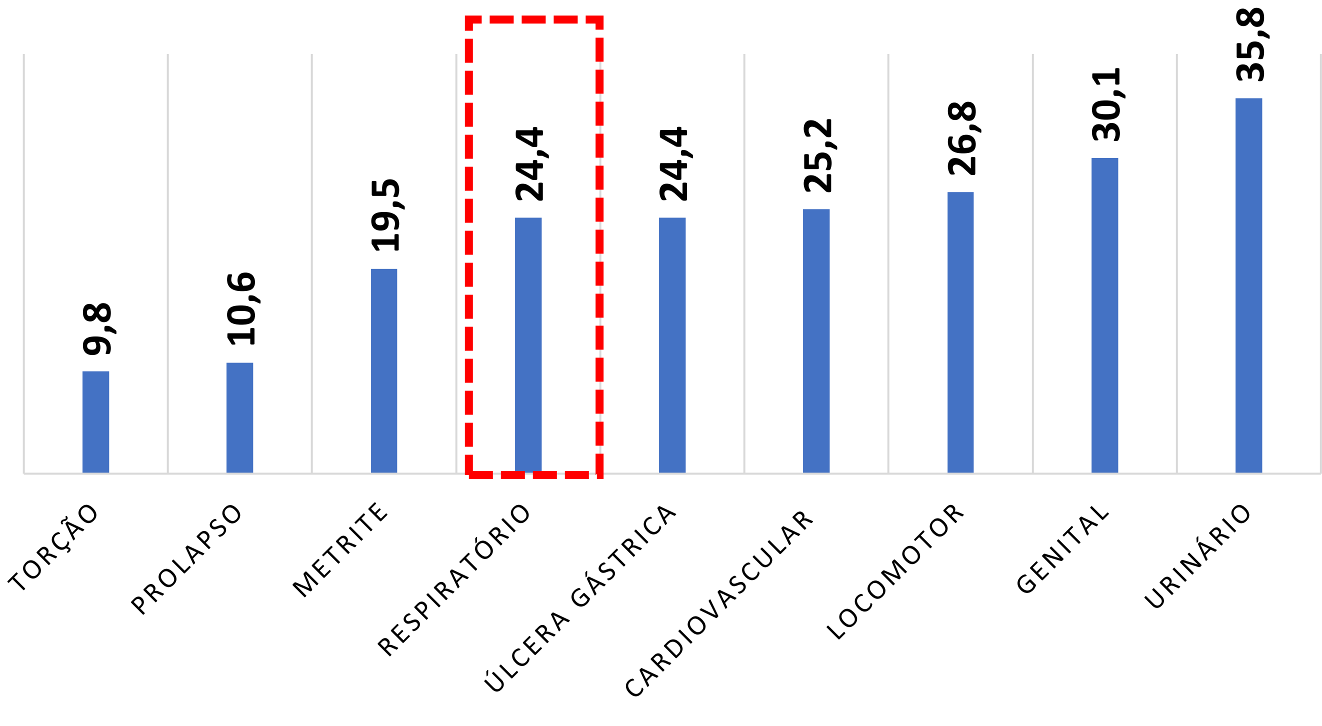
MDPI

Article

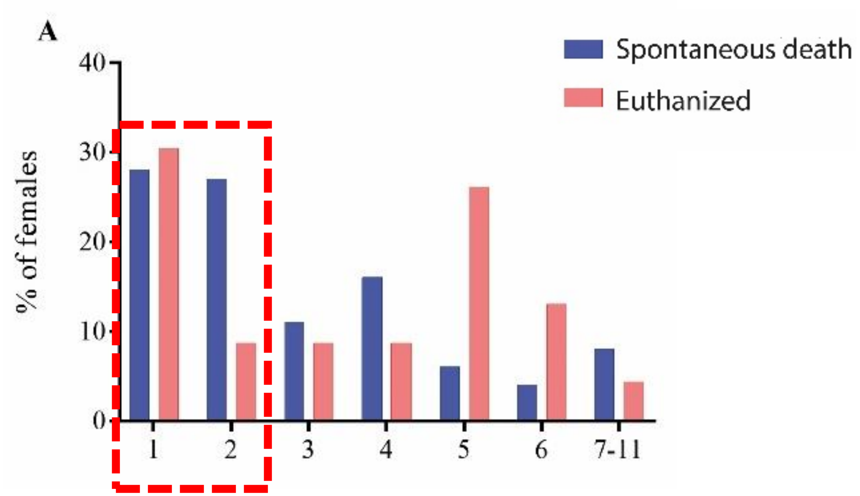
Causes of Sow Mortality and Risks to Post-Mortem Findings in a Brazilian Intensive Swine Production System

Matheus Saliba Monteiro [1], Débora Novais Matias [2], André Pegoraro Poor [1,3], Maurício Cabral Dutra [1], Luisa Zanolli Moreno [1,3], Beatriz Martins Parra [1], Ana Paula Santos Silva [1], Carlos Emílio Cabrera Matajira [1,4], Vasco Túlio de Moura Gomes [1], Mikaela Renata Funada Barbosa [5], Maria Inês Zanoli Sato [5] and Andrea Micke Moreno [1,*]

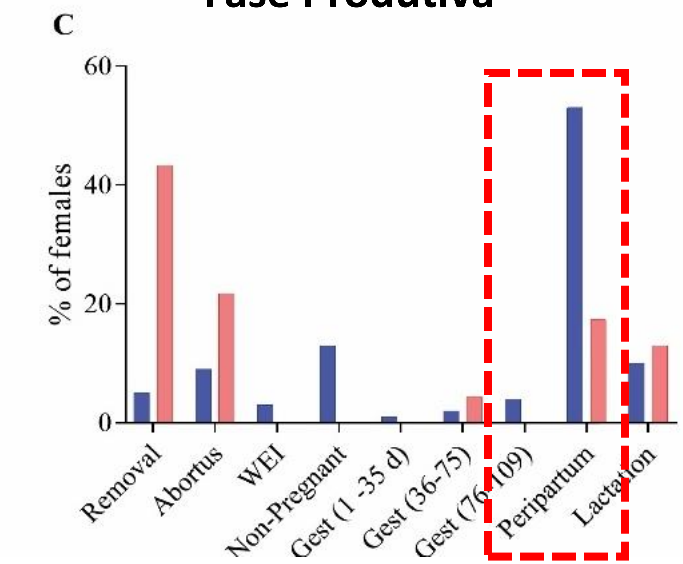
% FATORES DE RISCO PÓS-MORTE



Ordem de Parto



Fase Produtiva



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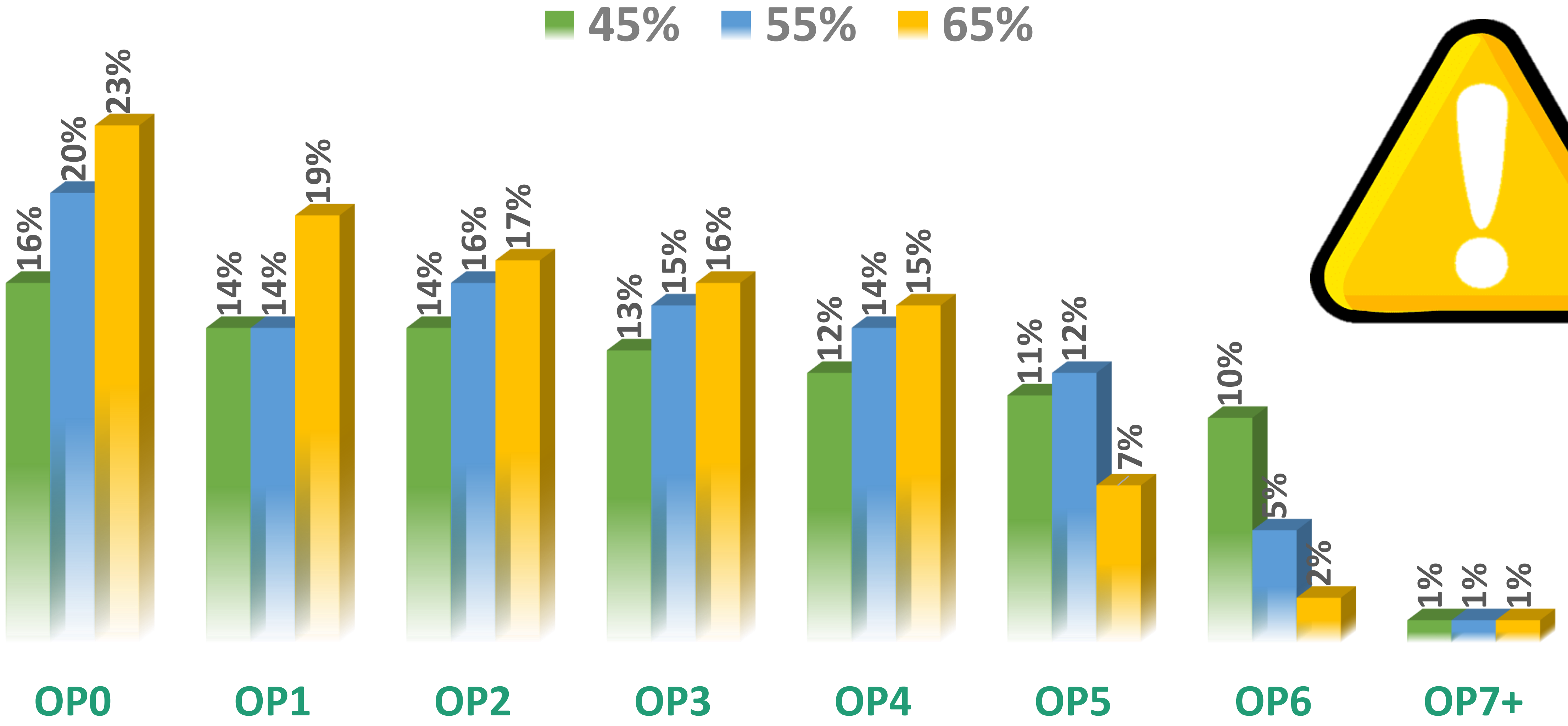
Animals **2022**, 12, 1804. https://doi.org/10.3390/ani12141804

ESTRUTURA DO PLANTEL – REPOSIÇÃO (%)



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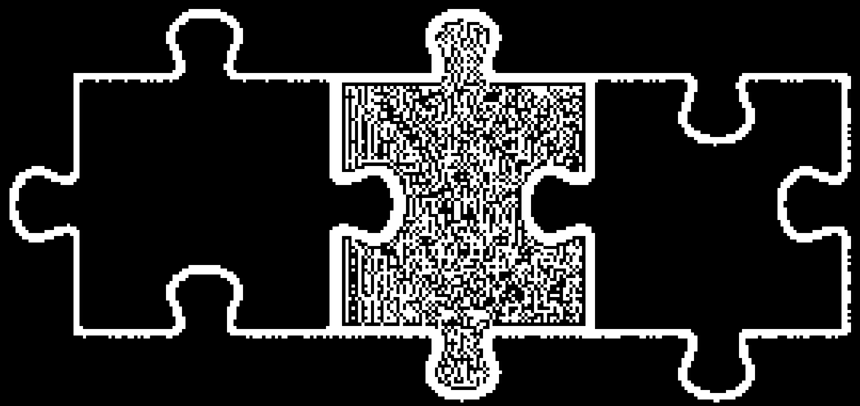

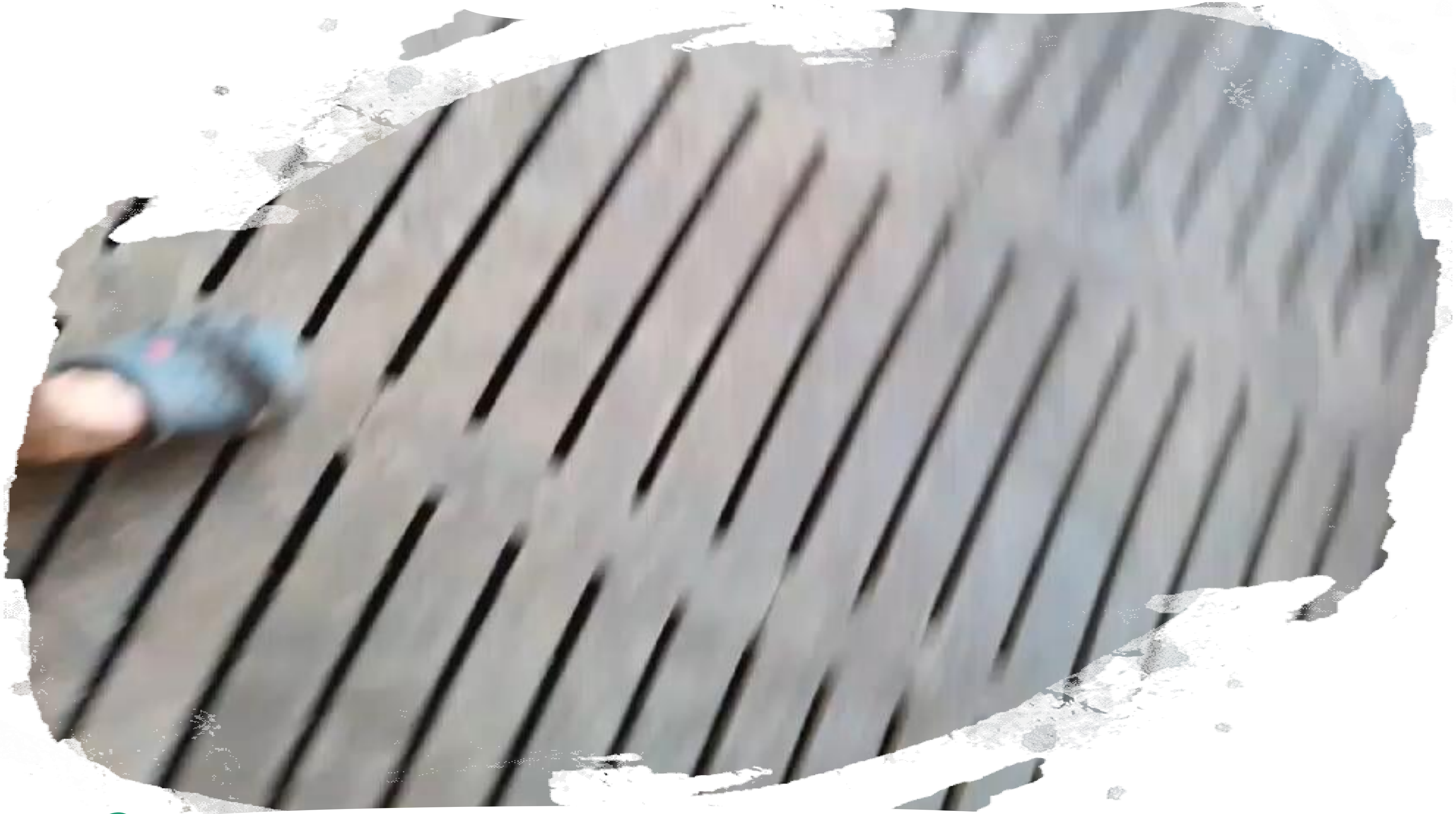

Pré-Cobertura

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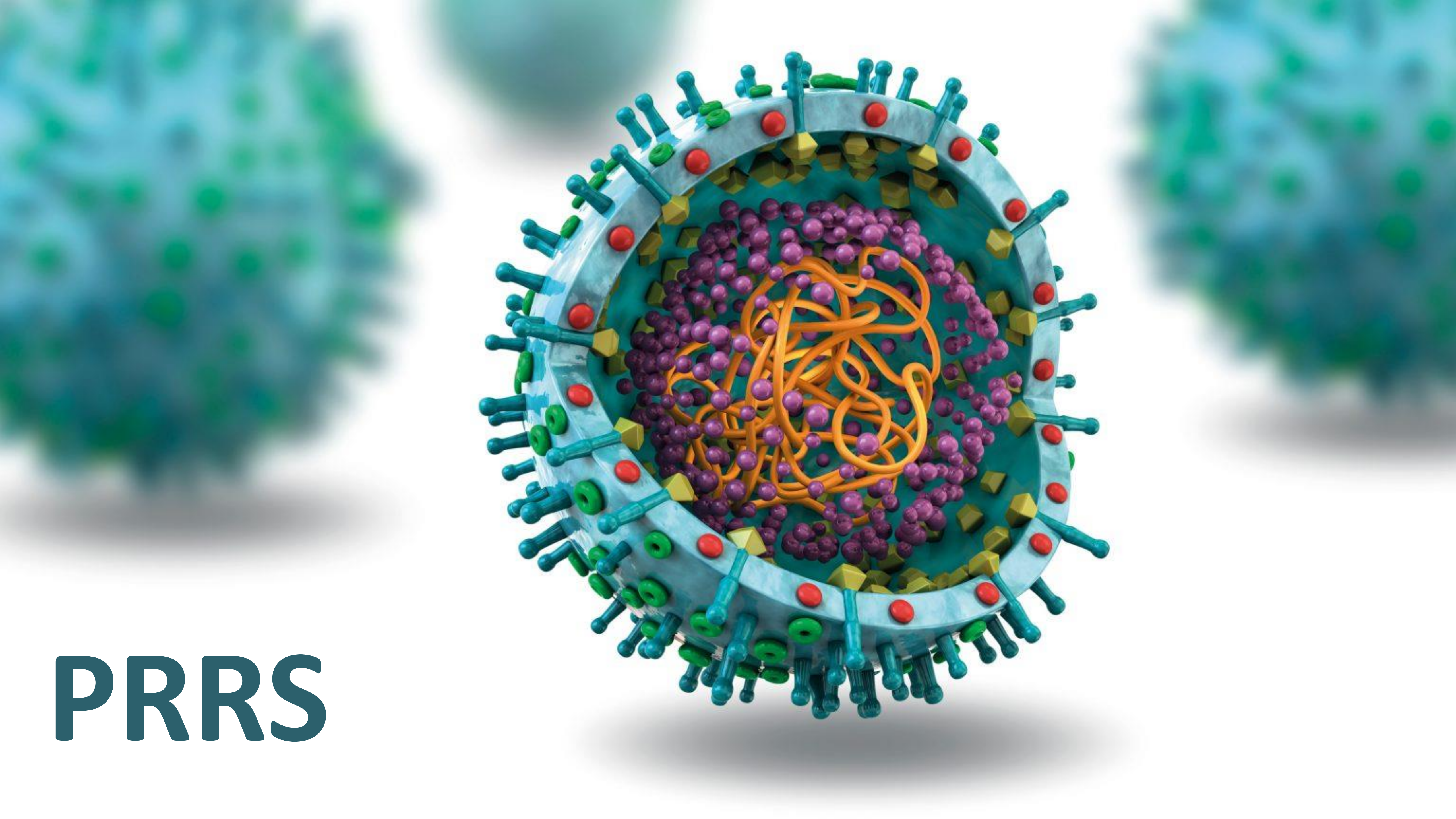
Pós-Cobertura

Complexo Respiratório

- **Agentes infecciosos primários**
  - PRRS
  - Influenza suína
  - Circovírus suíno tipo 2 (PCV2)
  - *Mycoplasma hyopneumoniae*
  - *Actinobacillus pleuropneumoniae*

- **Agentes infecciosos secundários**
  - *Glaesserella parasuis*
  - *Pasteurella multocida*
  - *Bordetella bronchiseptica*
  - *Actinobacillus suis*



PRRS

Karniychuk and Nauwynck *Veterinary Research* 2013, **44**:95
http://www.veterinaryresearch.org/content/44/1/95

VETERINARY RESEARCH

REVIEW Open Access

Pathogenesis and prevention of placental and transplacental porcine reproductive and respiratory syndrome virus infection

Uladzimir U Karniychuk* and Hans J Nauwynck

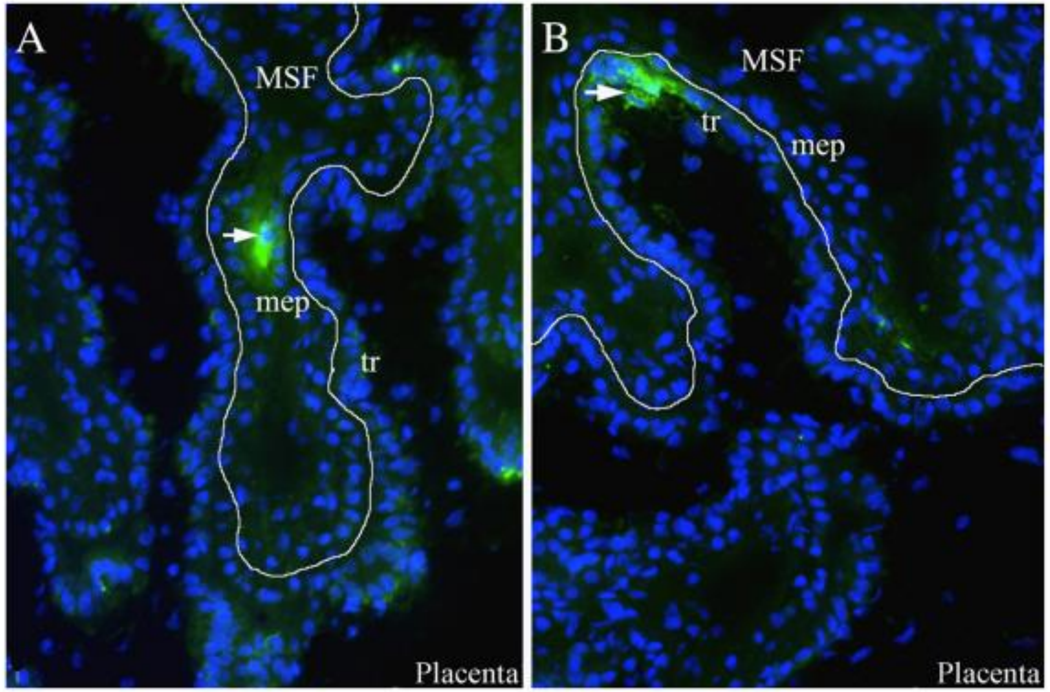
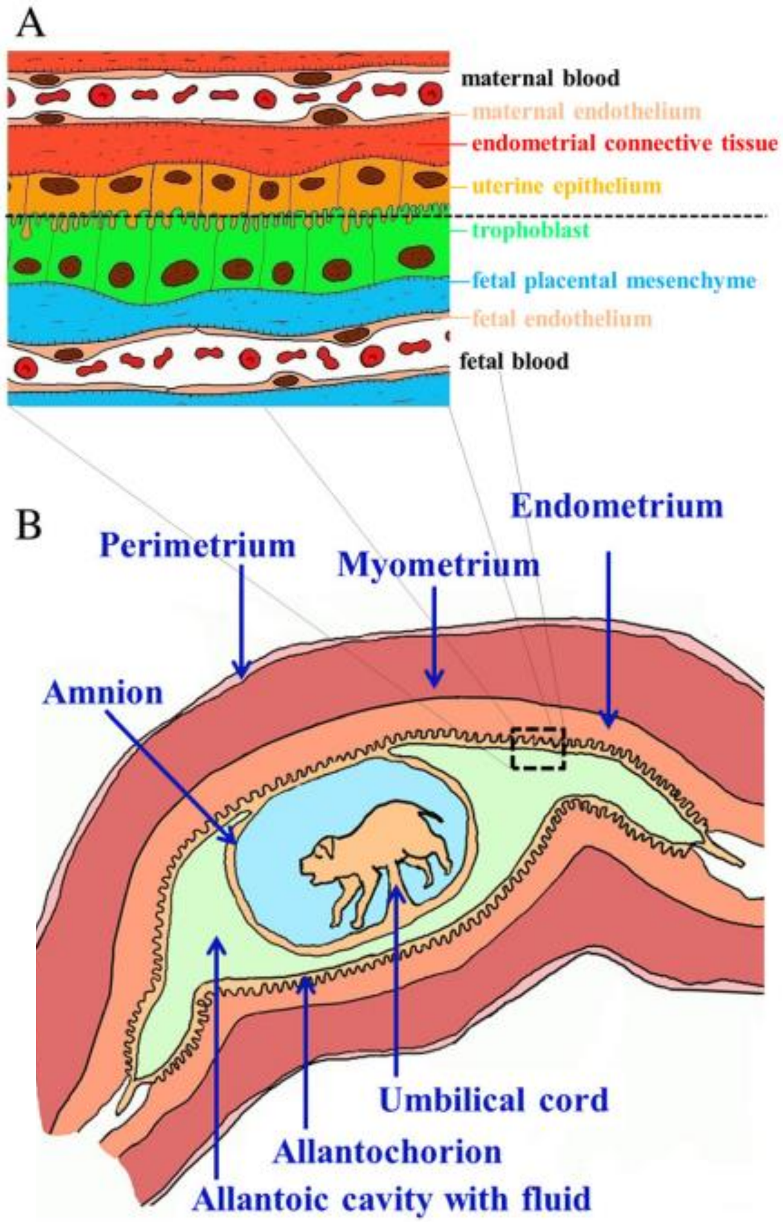


Figure 3 PRRSV-positive macrophages in the endometrium (A) and placenta (B). PRRSV-positive macrophages (arrowed) in close proximity to the uterine (maternal) epithelium (mep) and fetal trophoblast cells (tr). MSF: maternal secondary fold.



ABRAVES
Regional Paraná

Open Access | Article

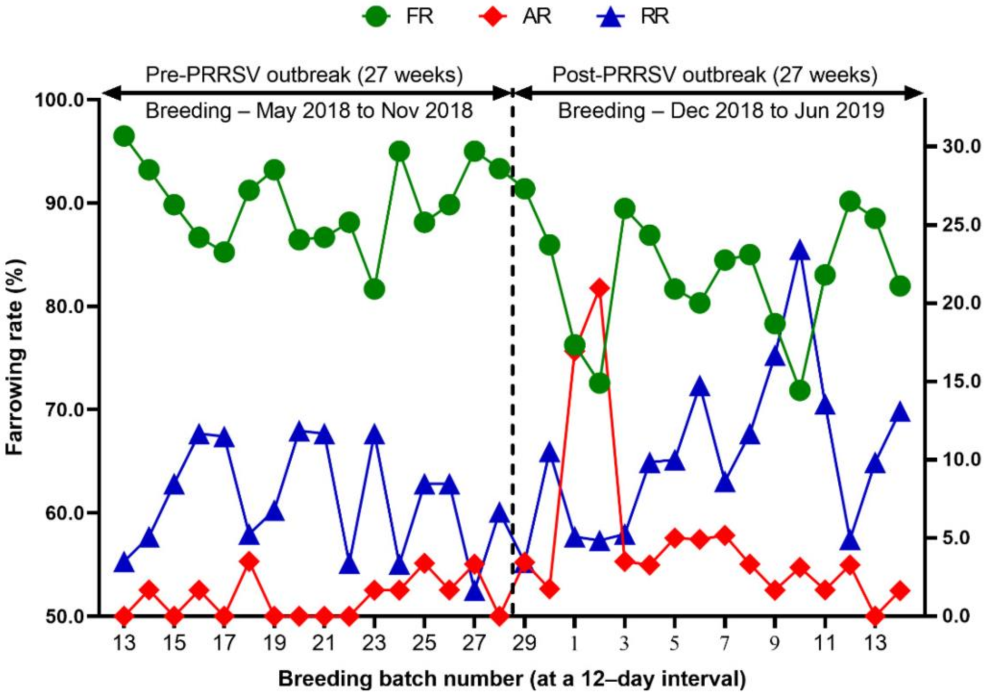
Insight into the Economic Effects of a Severe Korean PRRSV1 Outbreak in a Farrow-to-Nursery Farm

by Jung-Hee Kim [1,2,†], Seung-Chai Kim [2,†], Hwan-Ju Kim [2], Chang-C
Gyeong-Seo Park [2], Jong-San Choi [3] and Won-Il Kim [2,*]

[1] Department of Veterinary Clinic, Dodram Pig Farmers Cooperative, Daejeon 35377, Ko
[2] Department of Veterinary Medicine, Jeonbuk National University, Iksan 54596, Korea
[3] Department of Agri-Food Marketing, Jeonbuk National Univeristy, Jeonju 54896, Korea
* Author to whom correspondence should be addressed.
† These authors contributed equally to this work.

Animals **2022**, *12*(21), 3024; https://doi.org/10.3390/ani12213024

Submission received: 26 September 2022 / Revised: 30 October 2022 / Accepted: 1
Published: 3 November 2022



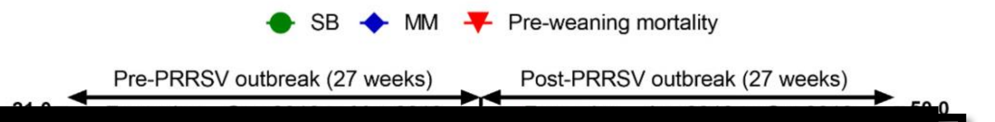


Table 3. The ec… …se.

…e
Reduced numbe
Difference i
Value of we … USD 4.2)
Reduced re … (USD 75.7)
Additional feed
Feed price/ … USD0.4)
Feed intake … day
Feed intake … day
Delayed we … ys
Increased f … (USD6.3)
Wasted semen/
Increased i … USD 0.8)
Total cost/mated … (USD 82.8)

USD 1 = KRW

Table 4. The economic impact of PRRS on the nursery growth phase.

Variable	Value
Cost of increased mortality rate	
Increased death loss	2.83%
Value of a weaned pig	KRW 29,449 (USD 24.5)
Cost of death loss/pig	KRW 833 (USD 0.69)
Adjusted cost of death loss	KRW 857 † (USD 0.71)
Cost of reduced weaning weight and feed efficiency	
Feed price/kg	KRW 430 (USD 0.4)
Difference in total feed intake to reach 30kg/pig	8.13 kg
Increased feed cost/pig	KRW 3497 (USD 2.9)
Cost of reduced weaning weight and average daily gain	
Facility cost/day [2]	KRW 120 (USD 0.1)
Difference in pig-rearing period to reach 30kg/pig	13.5 days
Increased facility cost/pig	KRW 1620 (USD 1.3)
Increased fixed and non-feed variable costs	
Labor cost/pig	KRW 1061 (USD 0.9)
Building and facility cost/pig	KRW 458 (USD 0.4)
Insurance and tax	KRW 256 (USD 0.2)
Water, power, fuel and transport cost/pig	KRW 298 (USD 0.2)
Veterinary and medicine cost/pig	KRW 314 (USD 0.3)
Excretion disposal cost/pig	KRW 517 (USD 0.4)
Interest and miscellaneous materials cost/pig	KRW 91 (USD 0.1)
Total increased cost/pig	KRW 8968 (USD 7.5)

USD 1 = KRW 1200, † Cost per pig divided by the percentage survivability in the nursery phase of production (KRW 833/0.972).


PCV2/3

Oropeza-Moe *et al. Porcine Health Management* (2017) 3:25
DOI 10.1186/s40813-017-0072-3

Porcine Health Management

CASE REPORT | Open Access

CrossMark

Porcine circovirus type 2 associated reproductive failure in a specific pathogen free (SPF) piglet producing herd in Norway: a case report

M. Oropeza-Moe[1*], A. J. Oropeza Delgado[2] and Tore Framstad[3]

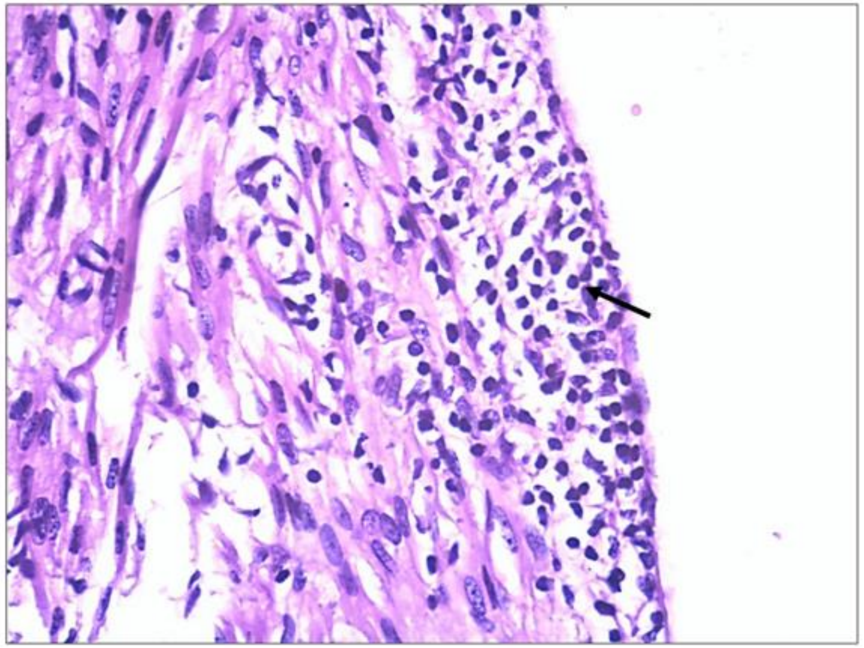


Fig. 2 Myocardial inflammatory changes characterized by infiltrating mononuclear cells (arrows). Hematoxylin and eosin (HE) (magnification × 40)

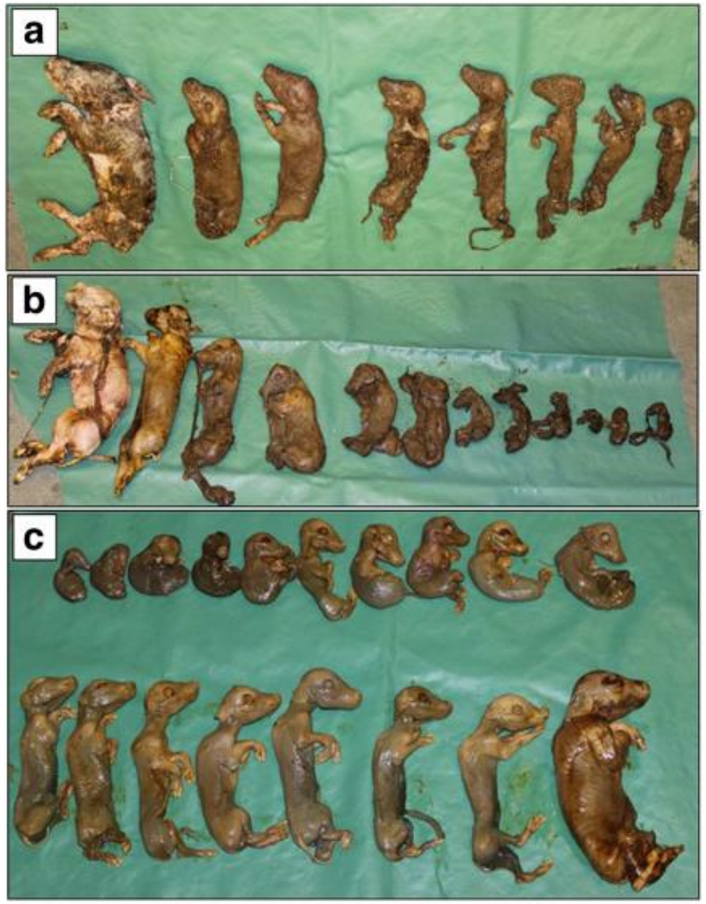


Fig. 1 Mummified fetuses and stillborn piglets were submitted for post mortem examination. Two of the litters (**a** and **b**) were recovered by the farmer in the farrowing pens where gilts showing signs of imminent farrowing (nest building activity and mammary development) farrowed at a delayed stage (> 118 days of gestation). One of the litters (**c**) was recovered after the gilt was slaughtered at the abattoir. The uterus with contents was delivered to NMBU for sampling

Vargas-Bermúdez *et al. BMC Veterinary Research* (2021) 17:150
https://doi.org/10.1186/s12917-021-02862-5

BMC Veterinary Research

CASE REPORT Open Access

Field infection of a gilt and its litter demonstrates vertical transmission and effect on reproductive failure caused by porcine circovirus type 3 (PCV3)

Diana S. Vargas-Bermúdez, Mayra A. Vargas-Pinto, José Darío Mogollón and Jairo Jaime*

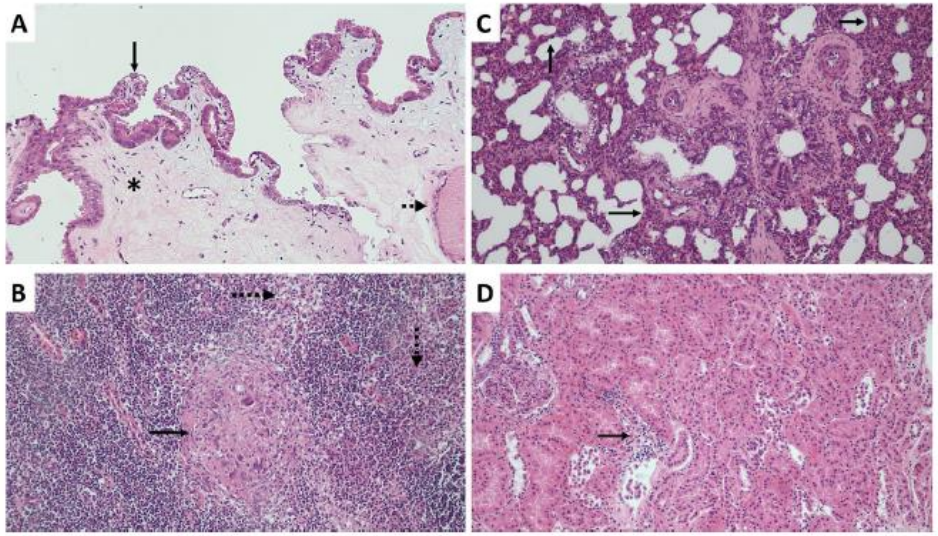


Fig. 2 Histopathology of tissues from the gilt and weak-born piglets, processed with hematoxylin and eosin staining. 20x magnification. **a** Placenta with necrotic changes in the epithelium (continuous arrow), severe congestion (dotted arrow), and incipient submucosa-lymphoplasmacytic inflammatory infiltrate (asterisk). **b** Mesenteric lymph node with moderate lymphoid depletion (dotted arrow), presence of a histiocytic infiltrate and some giant cells, Formation of a small microgranuloma (continuous arrow). **c** Lung with moderate multifocal thickening of the alveolar septa associated with congestion and lymphoplasmacytic mononuclear inflammatory infiltrate. Depletion of lymphoid tissue associated with the bronchi. **d** Kidney with moderate inflammatory lymphoplasmacytic infiltrate (interstitial nephritis), with slight focal desquamation of the tubular epithelium

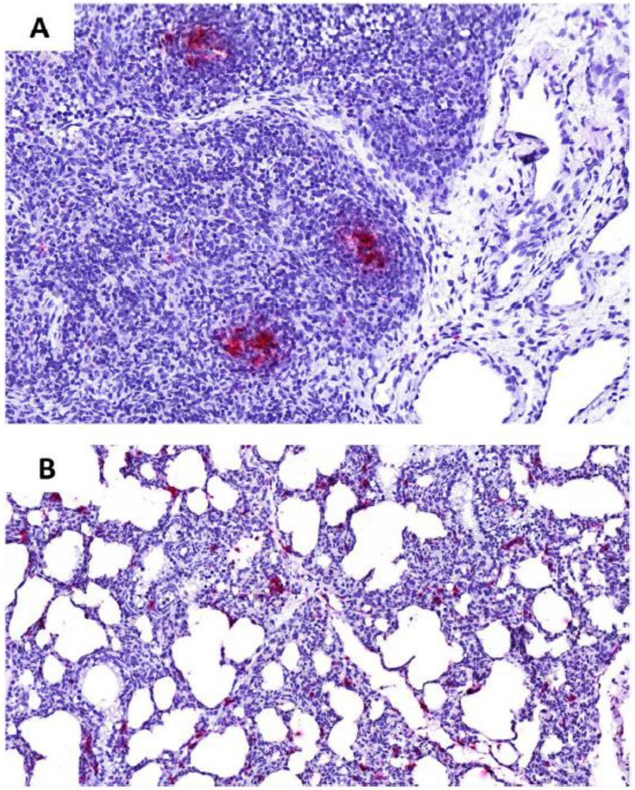


Fig. 3 RNAscope in situ hybridization (ISH) on tissues from a weak-born piglet. **a** PCV3 replicating was demonstrated in lymphoid follicles of a lymph node that had depletion. Hematoxylin counterstain (20x). **b** PCV3 mRNA (red) was detected in the cytoplasm of cells infiltrating the lung septal interstitium (may be macrophages). Hematoxylin counterstain (20x)


MHY

Impactos da contaminação por *Mycoplasma hyopneumoniae* em uma granja livre - relato de caso no Brasil

Freitas TF*[1], Pigozzo R[1], Brandalise L[1], Saraiva LHG[1], Carmo KL[1] & Simão GMR[1]

[1] *Departamento de Serviços Veterinários - Agroceres PIC, Rio Claro, SP – BR;*
**Autor para correspondência: thiago.freitas@agroceres.com*

SINSUI 2023

Tabela 1. Desempenho de gestação e custos anterior e posterior a contaminação por Mycoplasma hyopneumoniae.[1]

Item	*12 meses anterior ou posterior a contaminação por Mycoplasma hyopneumoniae*		Dif. (A - D) [3]	EPM [4]	Valor de p [5]
	Antes [2]	Depois [2]			
Aborto, %	1,92	2,46	-0,5	0,3	0,07
Taxa de parto, %	89,9	86,9	3,0	0,9	0,004
Morte fêmeas, %	1,14	1,88	-0,7	0,2	0,002
Custos veterinários, R$/mês	74308,00	127790,00	-53.482	9157,0	<.0001

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Regional Paraná

Qual o impacto da infecção por *Mycoplasma hyopneumoniae* na performance reprodutiva de fêmeas suínas ao primeiro parto?

Tabela 1 - Nascidos vivos e totais de fêmeas detectadas negativas ou positivas para *Mycoplasma hyopneumoniae* por PCR no momento da cobertura

Item[1]	Detecção[2]		Valor-p[3]
	Negativa	Positiva	
Fêmeas, n	112	203	-
Nascidos totais, n[4]	15,6 ± 0,41	14,4 ± 0,29	0,03
Nascidos vivos, n[4]	14,6 ± 0,40	13,6 ± 0,29	0,05

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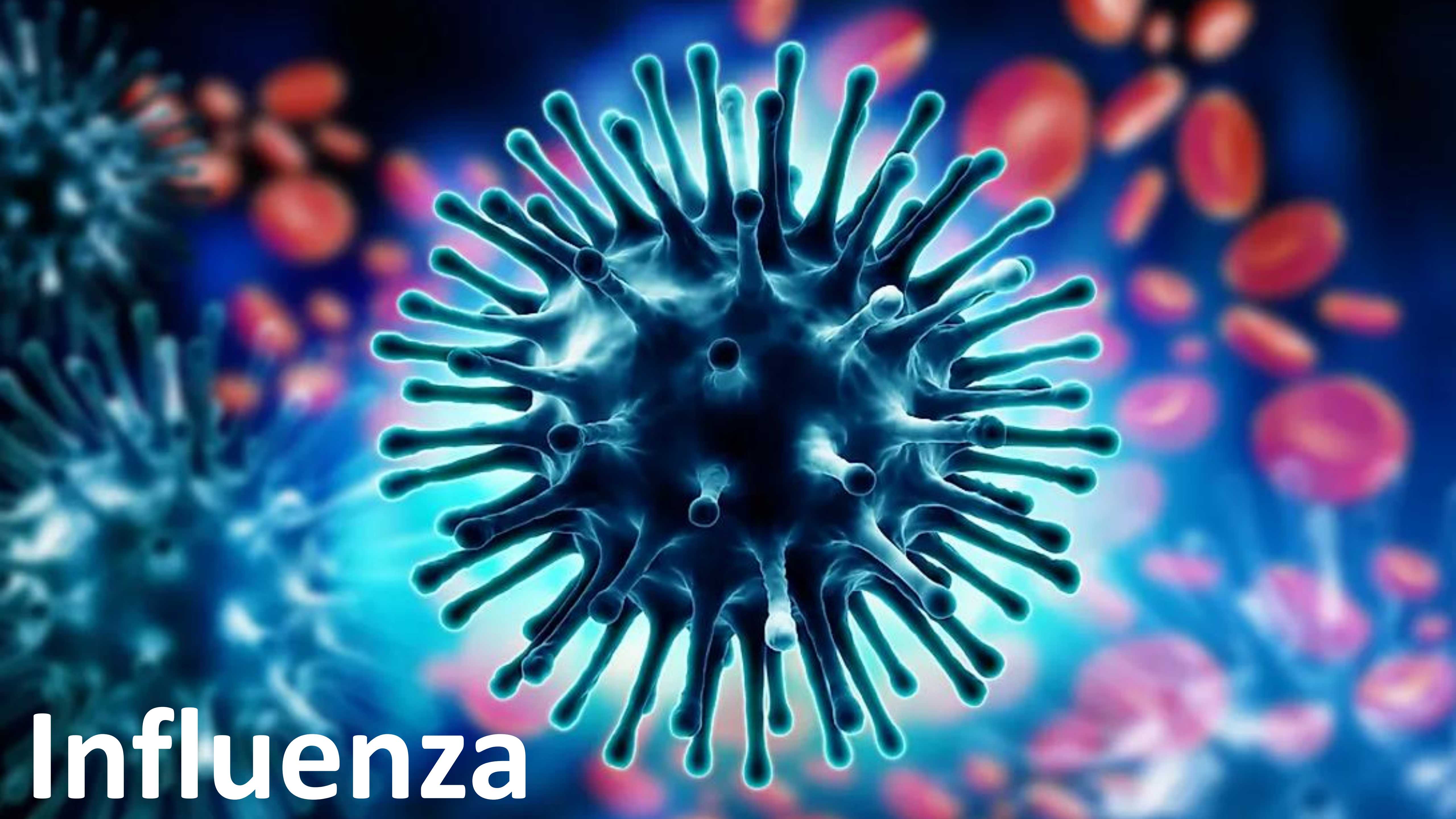
2023


Influenza

Gumbert et al. Porcine Health Management (2020) 6:4
https://doi.org/10.1186/s40813-019-0141-x

Porcine Health Management

RESEARCH Open Access

Reproductive performance of pandemic influenza A virus infected sow herds before and after implementation of a vaccine against the influenza A (H1N1)pdm09 virus

Sophie Gumbert*, Sebastian Froehlich, Anna Rieger, Julia Stadler, Mathias Ritzmann and Susanne Zoels

Table 1 Reproductive performance data prior to and after implementation of vaccination

parameter	before vaccination		after vaccination			alteration in the farms			
parameter (n = number of farms)	mean (SD)	median (Q_{25}; Q_{75})	mean (SD)	median (Q_{25}; Q_{75})	p-value[a]	decrease (%) (n)	stagnation (%) (n)	increase (%) (n)	p-value[b]
return to oestrus rate (%)	13.52	12[a]	10.18	9.9[a]	< 0.001	74.8	5.3	19.8	
(n = 131)	(6.65)	(8.8; 18)	(4.61)	(7; 12)		(98)	(7)	(26)	< 0.001
abortion rate (%)	2.31	1.45[a]	1.42	1[a]	< 0.001	57	21.5	21.5	
(n = 93)	(2.52)	(0.8; 3.0)	(1.67)	(0.4; 2.1)		(53)	(20)	(20)	< 0.001
stillbirth rate (%)	7.79	7.8[a]	7.95	8.2[a]	> 0.05	40	8.0	52	
(n = 50)	(3.75)	(5.3; 9.8)	(3.44)	(6.8; 9.9)		(20)	(4)	(26)	0.376
piglets born alive/litter (n)	13.24[a]	13.2	13.56[a]	13.5	0.001	25.9	3.7	70.4	
(n = 54)	(1.12)	(12.5; 13.6)	(1.17)	(12.8; 14.2)		(14)	(2)	(38)	0.001
preweaning mortality (%)	14.34	14.7[a]	13.59	13.7[a]	0.023	49.6	16	34.4	
(n = 125)	(3.5)	(12.5; 16)	(4.0)	(11.6; 16)		(62)	(20)	(43)	0.08
piglets weaned/sow/year (n)	26.06[a]	26.2	27.39[a]	27.2	< 0.001	18.1	4.8	77.1	
(n = 105)	(3.03)	(23.8; 28.5)	(3.15)	(25.5; 29.9)		(19)	(5)	(81)	< 0.001

[a]comparison of the parameters before and after immunisation, t-test or Wilcoxon signed-rank test, respectively
[b]stagnation was not included in the chi-squared test

Arch Virol (2015) 160:2415–2425
DOI 10.1007/s00705-015-2518-8

CrossMark

ORIGINAL ARTICLE

Pregnancy outcome and clinical status of gilts following experimental infection by H1N2, H3N2 and H1N1pdm09 influenza A viruses during the last month of gestation

Krzysztof Kwit[1] · Małgorzata Pomorska-Mól[1] · Iwona Markowska-Daniel[1]

Virus used for inoculation
H1N2 (A/swine/Granstedt/IDT3475/2004)
H1N2 (A/swine/Granstedt/IDT3475/2004)
H3N2 (A/swine/Gent/172/08)
H3N2 (A/swine/Gent/172/08)
H1N1pdm09 (A/California/04/09)
H1N1pdm09 (A/California/04/09)
Control
Control

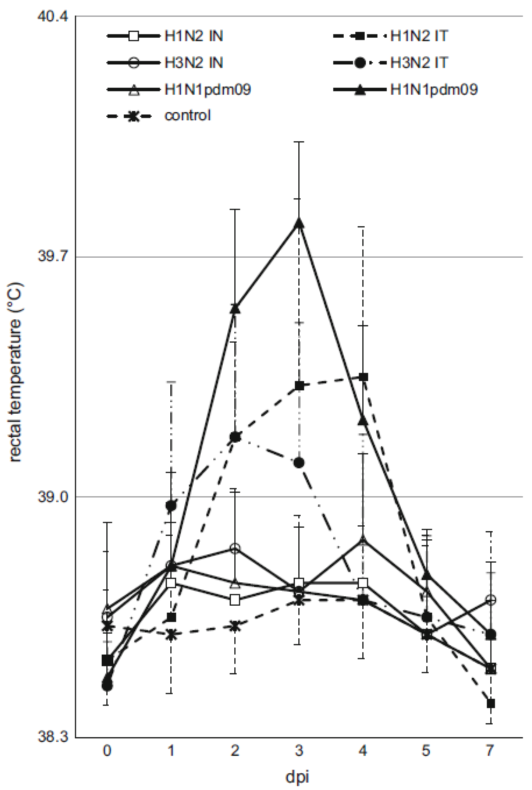
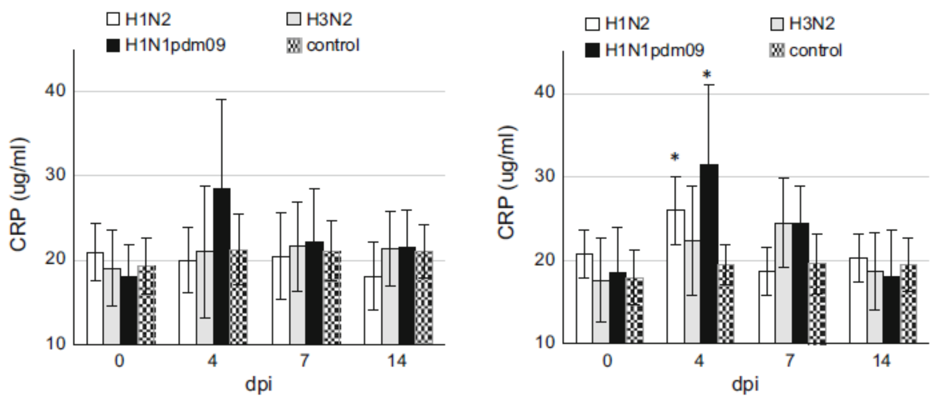
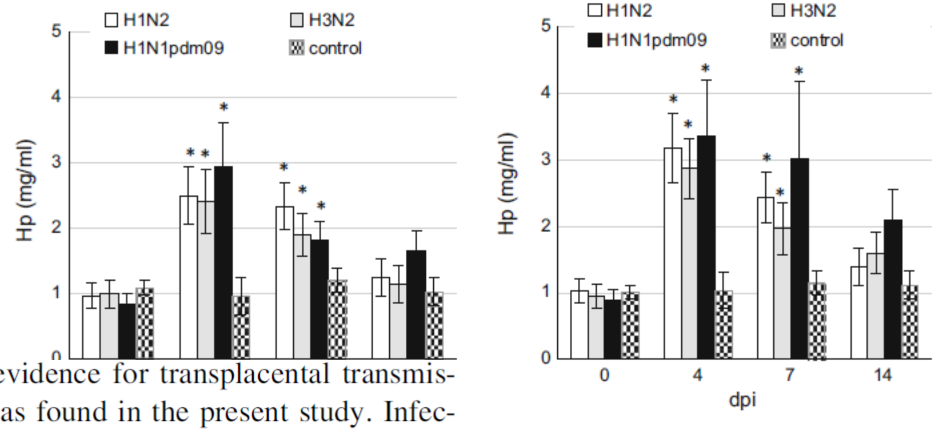


Fig. 1 The mean (±SD) temperature in gilts infected intranasally (IN) or intratracheally (IT) with H1N2, H3N2 or H1N1pdm09 swine influenza viruses and in control gilts

IN-inoculation
IT-inoculation
IN-inoculation
IT-inoculation
IN-inoculation
IT-inoculation





In conclusion, no evidence for transplacental transmission of SIV in pigs was found in the present study. Infection of naïve gilts during the last month of gestation with various subtypes of SIV did not produce significant clinical changes or reproduction disorders. Viremia was also not observed in any of the infected females. On the basis of recent results, we hypothesize that pregnancy failure observed during swine influenza under field conditions is probably related to high fever and pro-inflammatory cytokines rather than a direct effect of the virus on the placenta, embryo or fetus.

ABRAVES
Regional Paraná

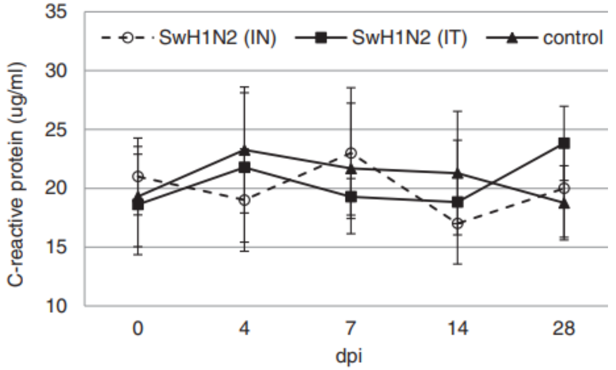
Kwit *et al. BMC Veterinary Research* 2014, **10**:123
http://www.biomedcentral.com/1746-6148/10/123

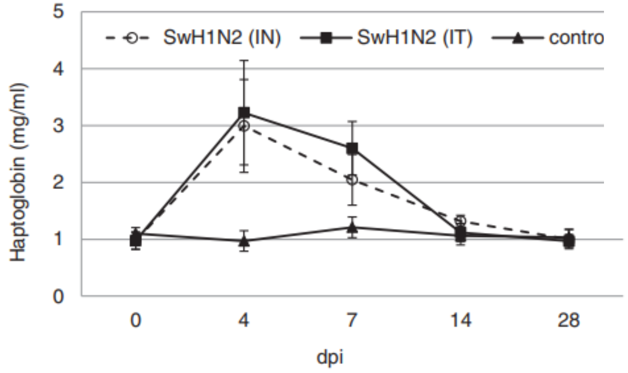
BMC Veterinary Research

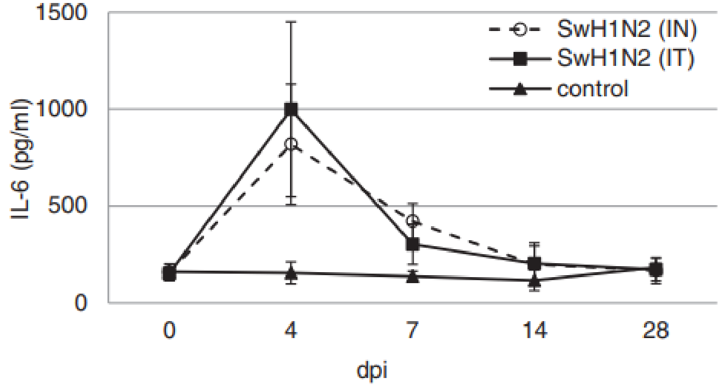
RESEARCH ARTICLE **Open Access**

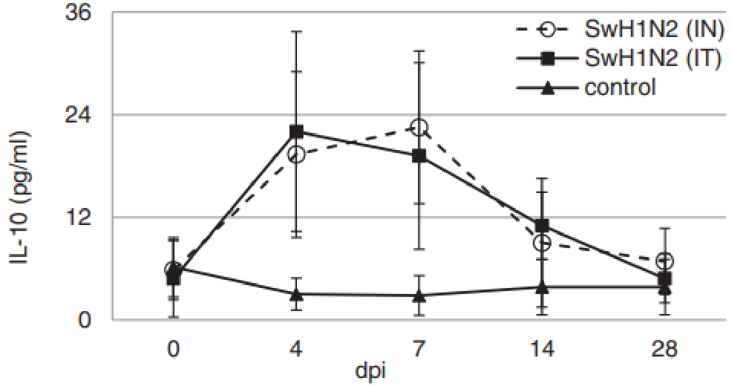
The influence of experimental infection of gilts with swine H1N2 influenza A virus during the second month of gestation on the course of pregnancy, reproduction parameters and clinical status

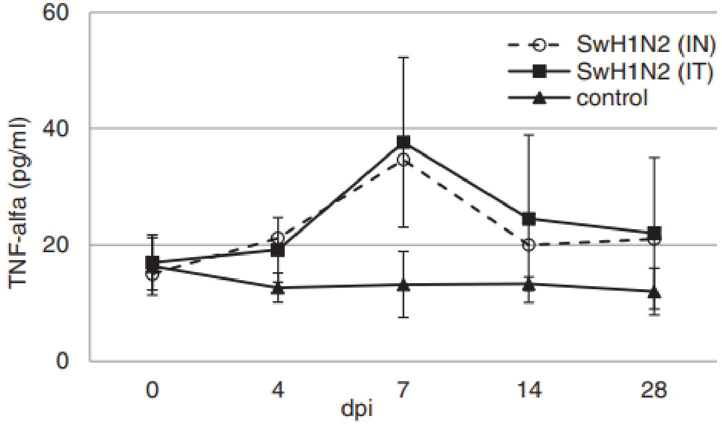
Krzysztof Kwit, Małgorzata Pomorska-Mól* and Iwona Markowska-Daniel











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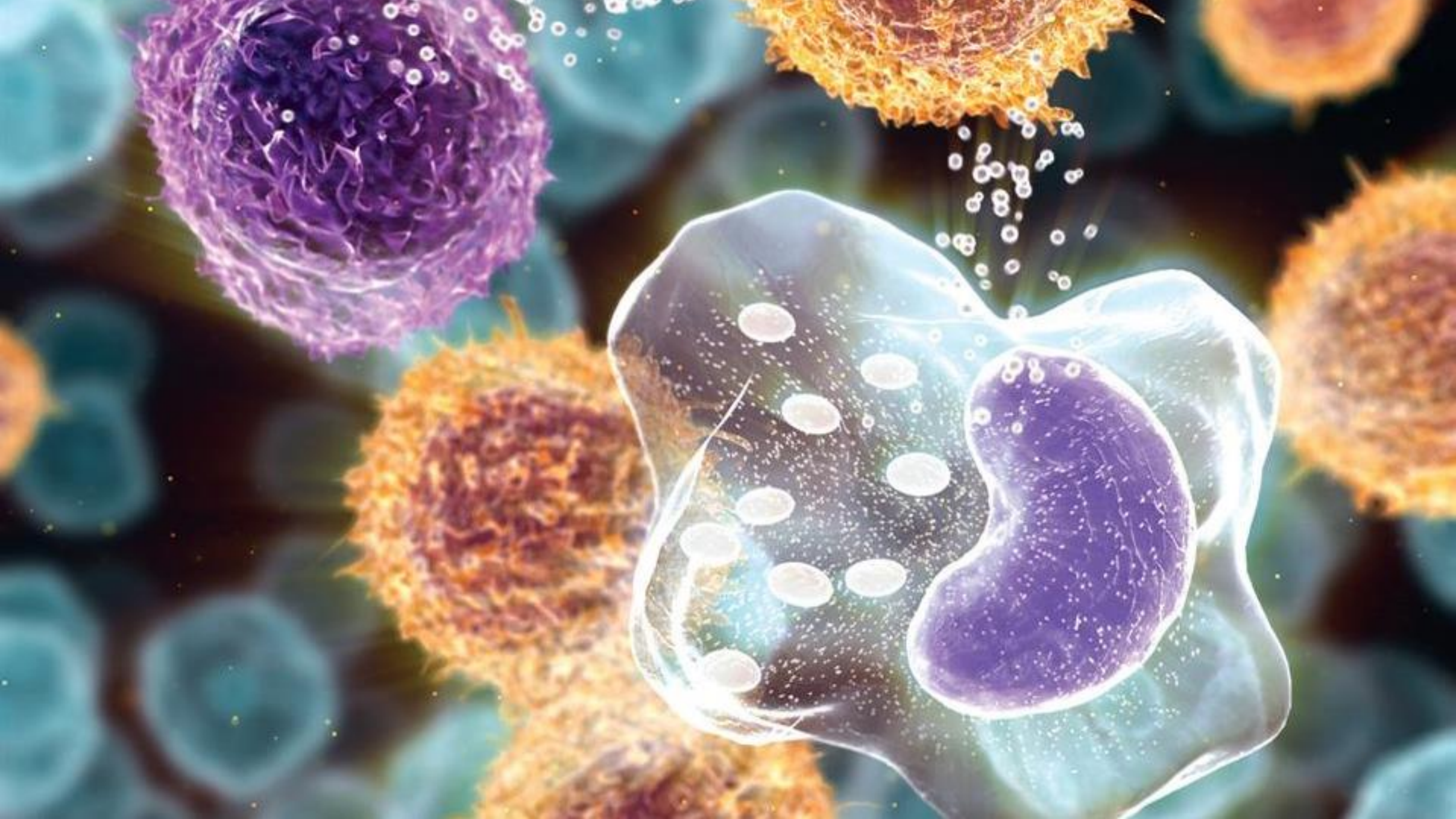
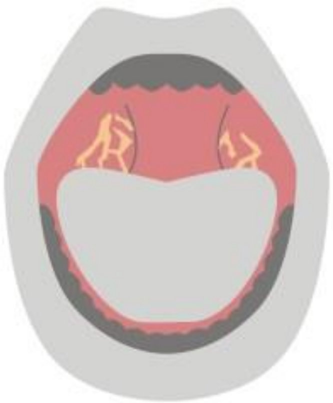


Calor

Rubor

Aumento do aporte sanguíneo



Edema

Acúmulo de fluídos e células

Dor

Estímulo de neurônios sensorias por mediadores inflamatórios

Perda da Função

Dano Tecidual

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NIH Public Access
Author Manuscript
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Reprod Sci. 2009 February ; 16(2): 216–229. doi:10.1177/1933719108330087.

Inflammation in Reproductive Disorders

Gerson Weiss, MD, **Laura T. Goldsmith, PhD**, **Robert N. Taylor, MD, PhD**, **Dominique Bellet, MD**, and **Hugh S. Taylor, MD**
Department of Obstetric and Gynecology, New Jersey Medical School, Newark, New Jersey (GW, LTG); Department of Obstetrics and Gynecology, Emory University School of Medicine, Atlanta, Georgia (RNT); Laboratoire d'immunologie, Faculté des Sciences Pharmaceutiques et Biologiques de Paris, France (DB); Laboratoire d'oncobiologie, Service de médecine nucléaire, Centre René Huguenin, Saint-Cloud France (DB); and Department of Obstetrics, Gynecology and Reproductive Sciences and Department of Molecular, Cellular and Developmental Biology, Yale University School of Medicine, New Haven, Connecticut (HST)

Animal (2011), **5:11**, pp 1774–1779 © The Animal Consortium 2011
doi:10.1017/S1751731111000772
animal

Oxidative stress status of highly prolific sows during gestation and lactation

C. B. Berchieri-Ronchi[1,2], S. W. Kim[3†], Y. Zhao[3], C. R. Correa[1,2], K.-J. Yeum[1] and A. L. A. Ferreira[2]

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Role of Interferons and Cytokines in Pregnancy and Fetal Development

Laura J. Yockey[1] and **Akiko Iwasaki**[1,2,*]
[1]Department of Immunobiology, Yale University School of Medicine, New Haven, CT, 06520, USA
[2]Howard Hughes Medical Institute, Chevy Chase, MD 20815, USA

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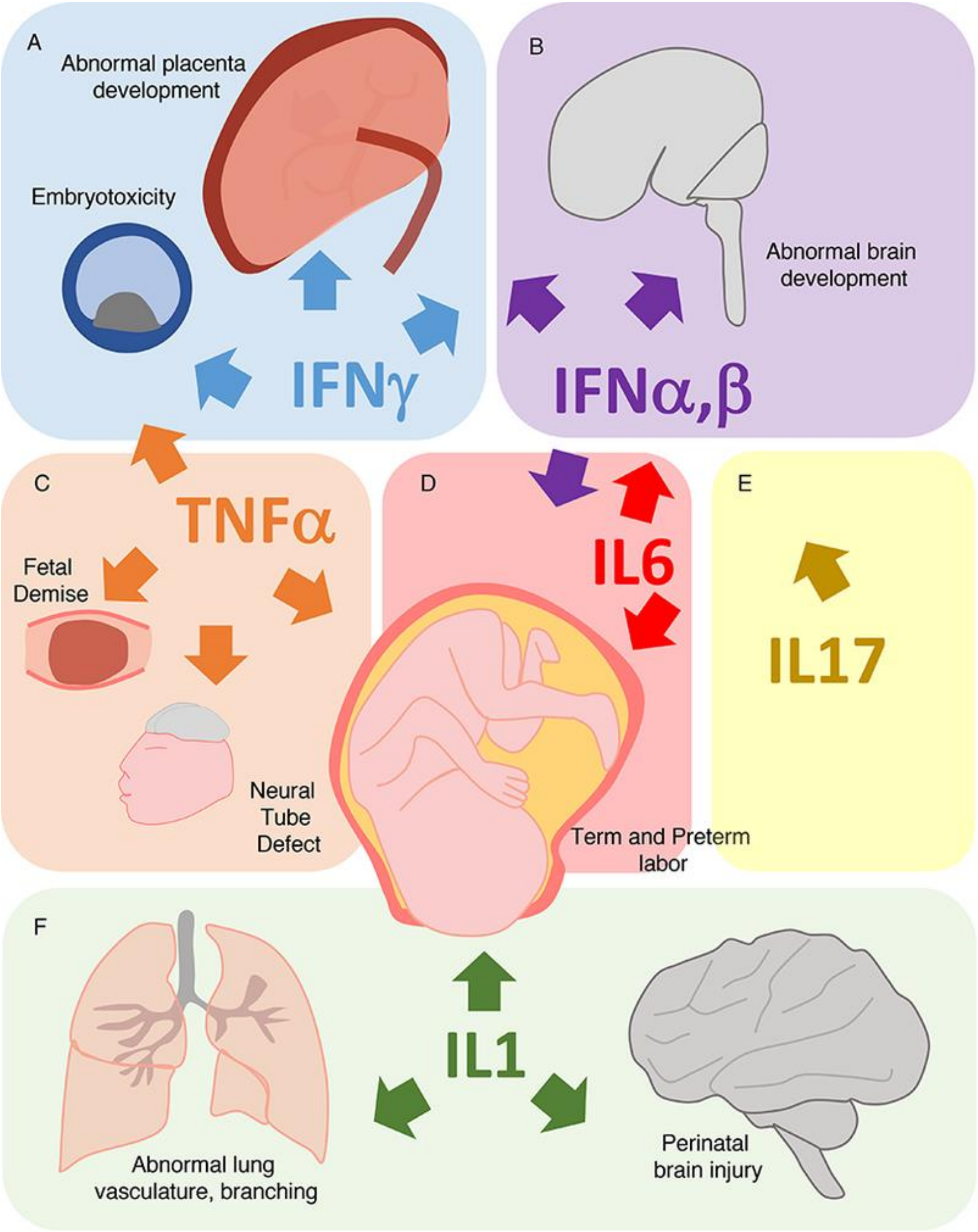

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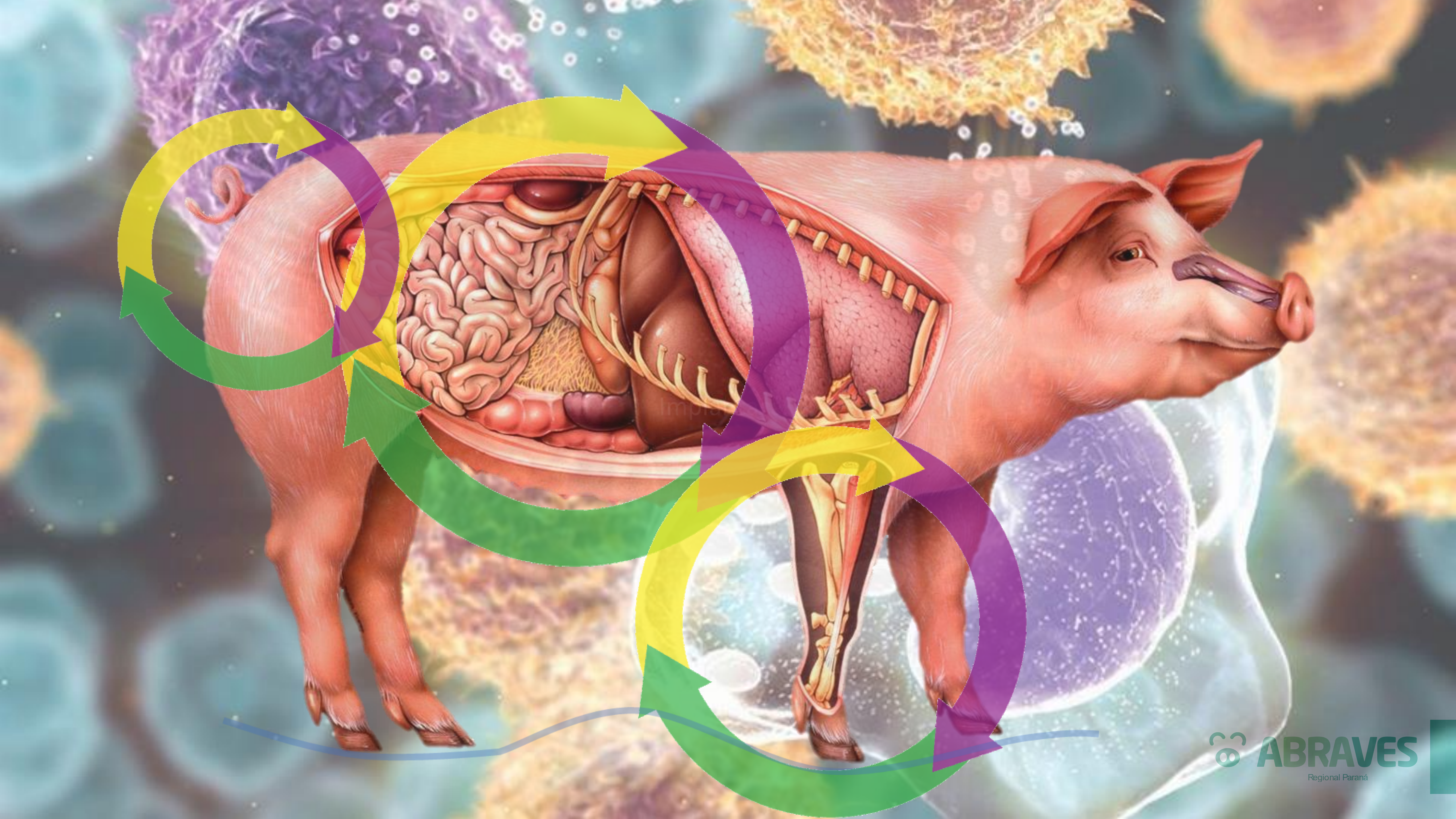
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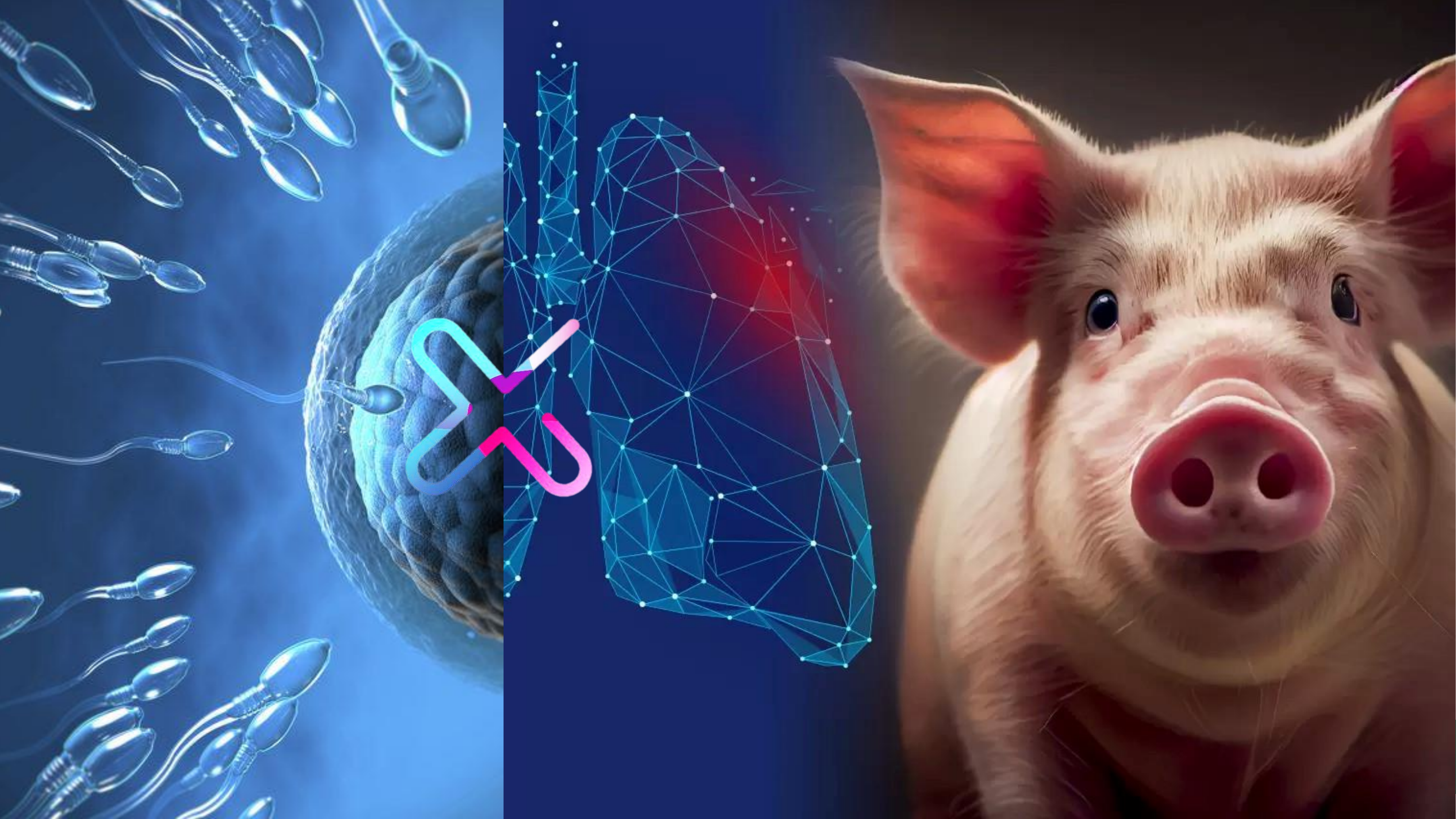
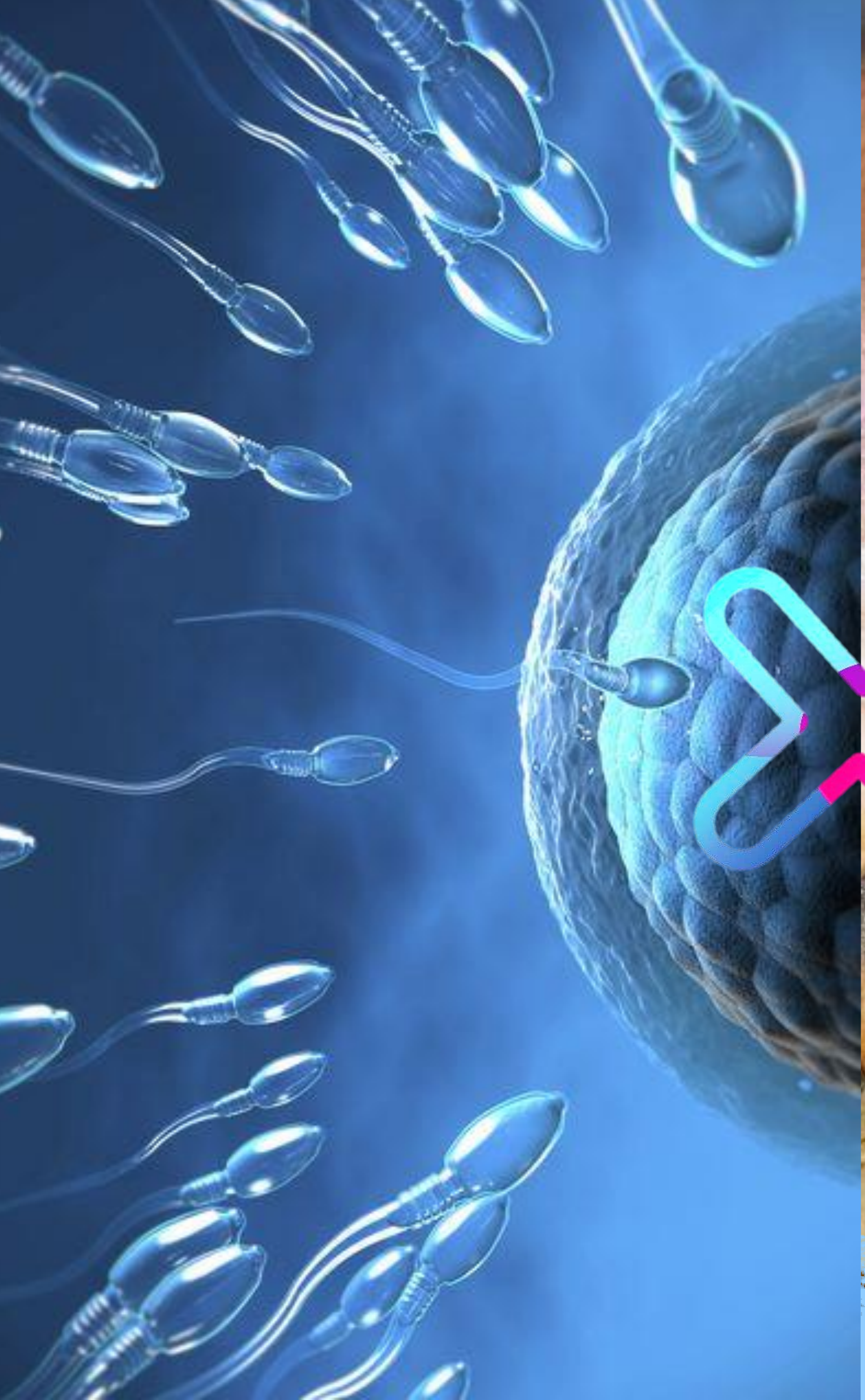
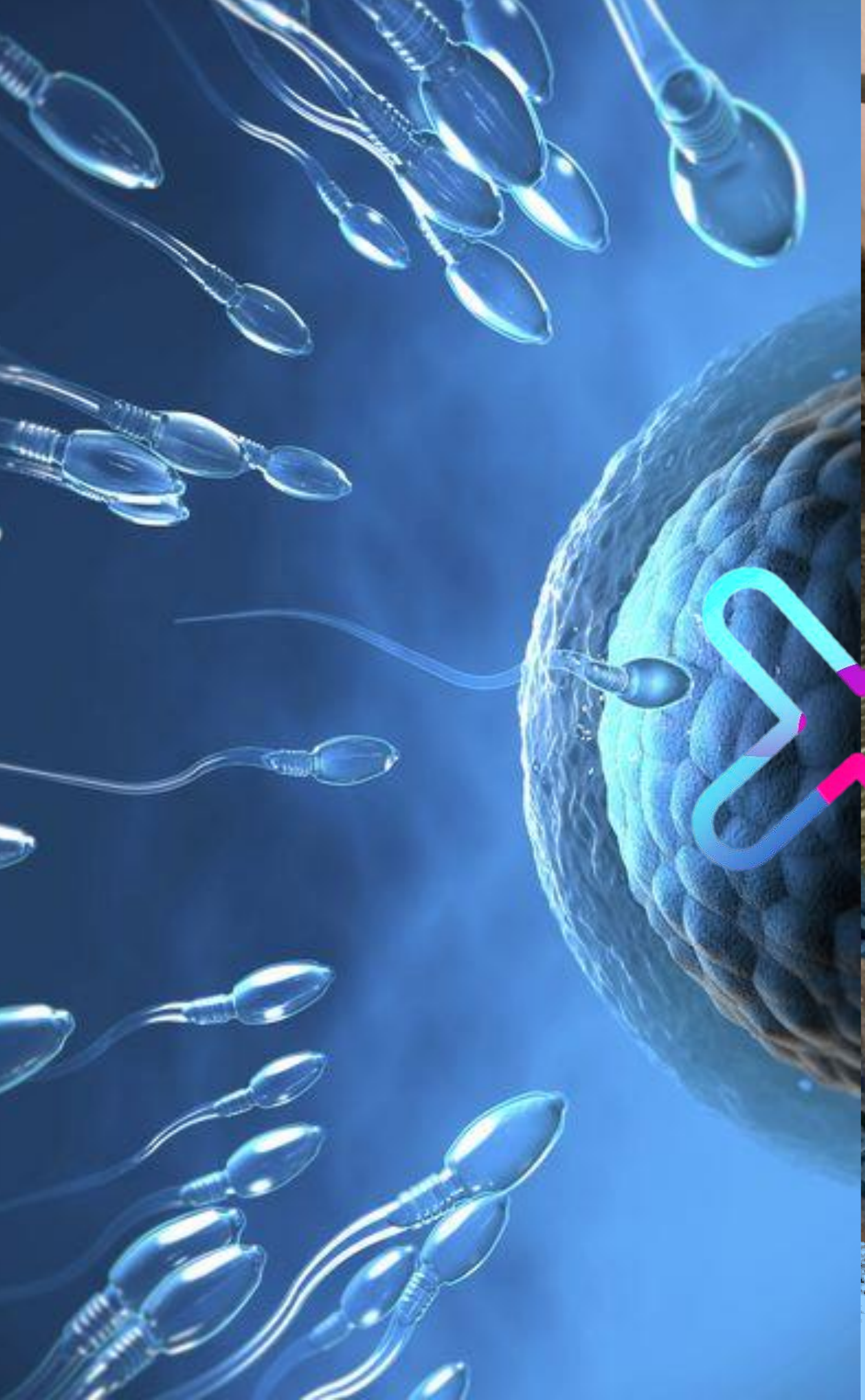





Ton Kramer

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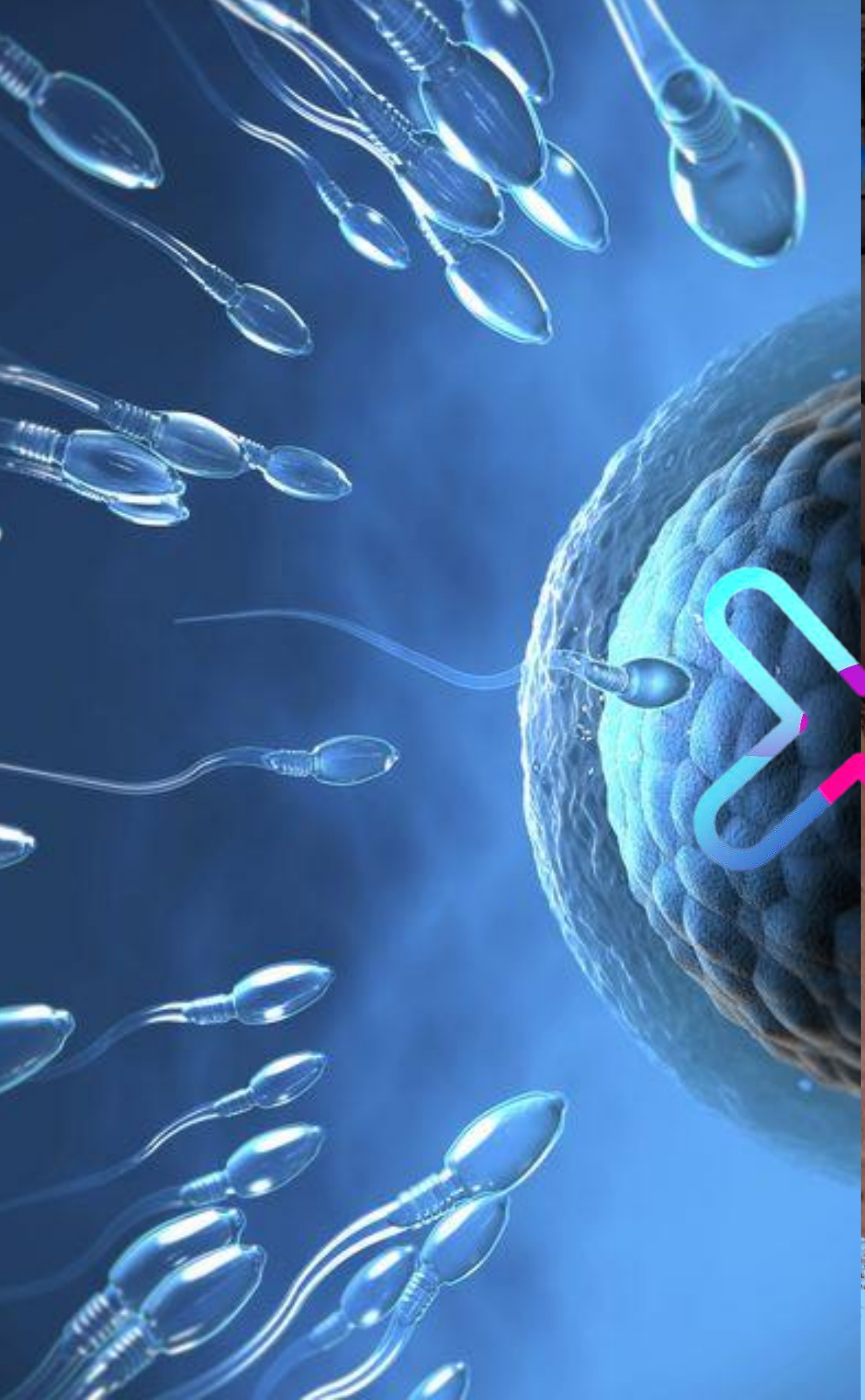
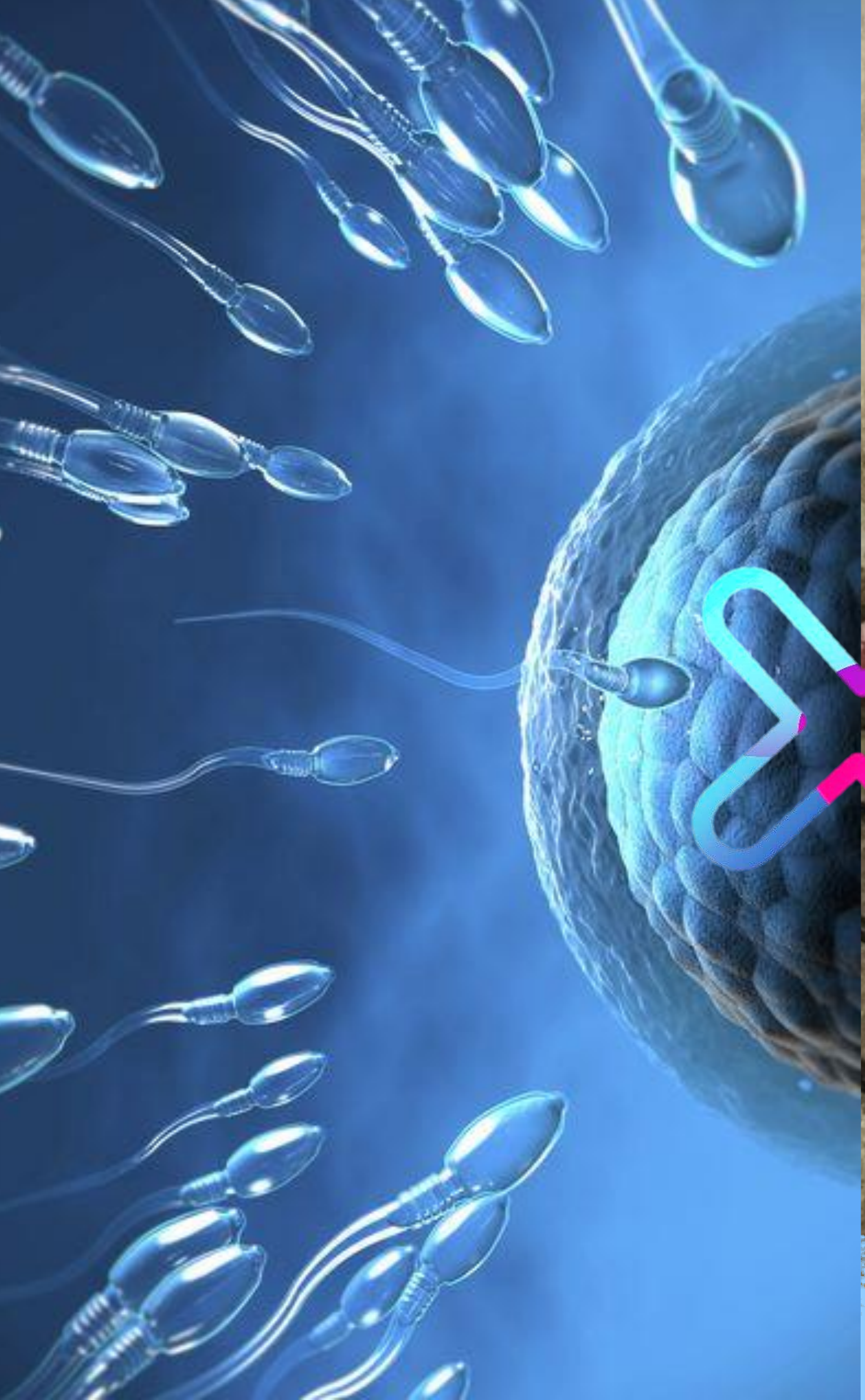





A practical approach to early intervention to reduce sow mortality

Chris J. Rademacher*, Justin T. Brown, Locke A. Karriker, Megan R. Nickel, Gabi E. Doughan, Meredith B. Petersen, Swaminathan Jayaraman, Gustavo S. Silva, Daniel C. L. Linhares

Department of Veterinary Dia
University

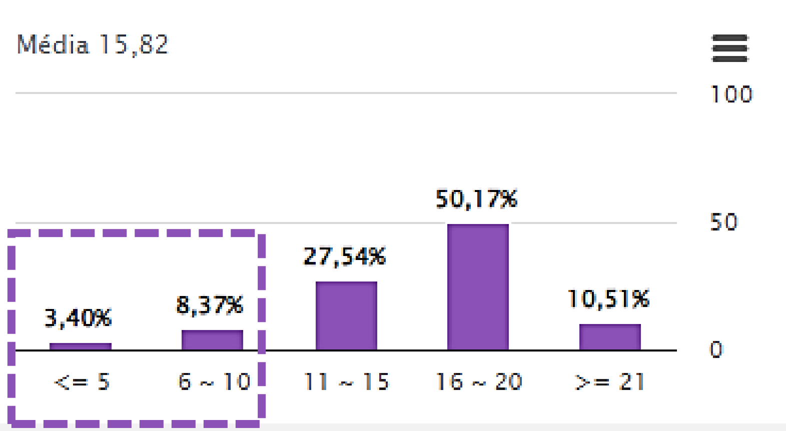
https://piglivability.org/

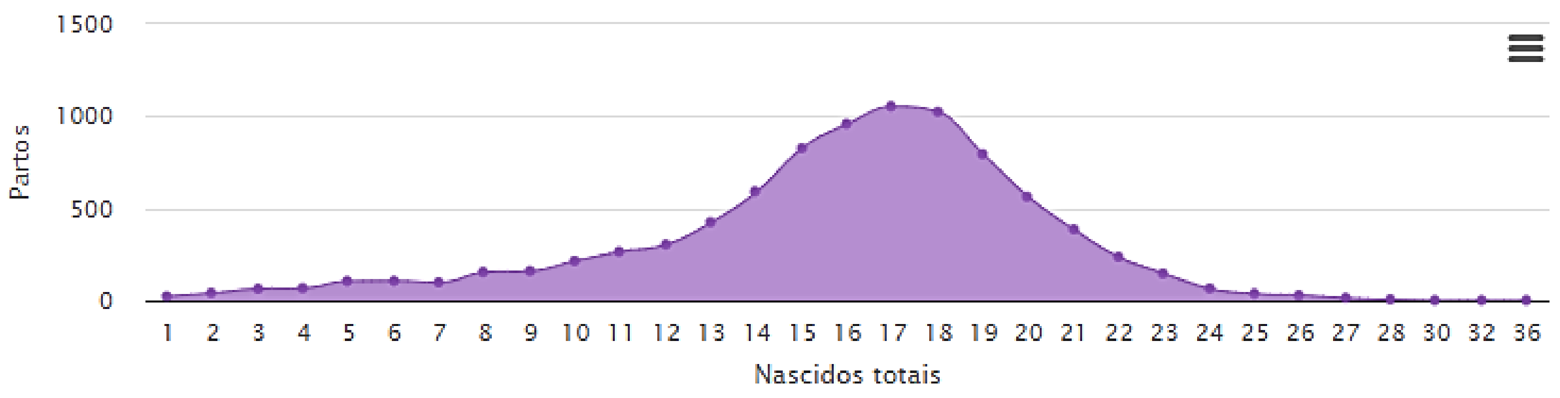
Summary

- We have not prioritized early detection and individual sow treatments, particularly in breeding and gestation
  - Lack of appetite → Fantastic early indicator in once per day fed animals
    - By the time we treat them, it may be too late
  - Individual Sow Care = Individual Pig Care
    - Treat them as "A" pigs, not as "C" pigs
- Easily implementable
  - Just flag off-feed sows while feeding and sweeping in AM
  - Come back and treat later when appropriate.

Máxima Performance

Nascidos totais





TOTAL DE PARTOS	NASCIDOS TOTAIS	% PERDAS NASCIMENTO	NASCIDOS VIVOS	PESO MÉDIO NASCIMENTO
8.754	**15,82**	**9,94**	**14,25**	**1,30**
Nascidos Vivos: **124.705**	Meta: **14,58**	Meta: **4,00** Média leitão/parto: **1,57**	Meta: **14,00**	Meta: **1,50**

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Whitworth *et al.*
CABI Agriculture and Bioscience (2022) 3:41
https://doi.org/10.1186/s43170-022-00111-9

REVIEW

Improvements in pig agric through gene editing

Kristin M. Whitworth[1], Jonathan A. Green[1], Bethany K. Redel[2]
Kevin D. Wells[1] and Randall S. Prather[1*]

PIC

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PIC PRRS-Resistant Pig

Top

Positive impacts on pigs, people and the pl

The PRRS virus has ravaged the global pork industry for over three decades. Pork producers have relied on vaccines with limited efficacy and on-farm from the PRRS virus – until now. PIC partnered with university researchers to develop a solution using gene editing technology. PIC deleted a small po protein the virus uses to attach, enter and infect the pigs' cells. Without the ability to attach or bind, the PRRS virus is unable to enter the cell, replicate

Pig producer urges Government to accelerate gene editing legislation to help tackle PRRS

By ALISTAIR DRIVER — September 26, 2023 3 Mins Read

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PTN Inflamatória

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Conclusão

- **Aclimatação sanitária**
  - **Leitoas de reposição**
- **Cuidado individual**
- **Diagnóstico preciso**
  - **Terapêutica eficiente**
- **Papel da inflamação**
  - **Custo da inflamação p/ organismo**
- **Foco na resolução do problema**

XVIII Encontro Regional Abraves PR **2024**

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Obrigado!

Gefferson Silva

gefferson@vetanco.com.br

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