

# IS IMMUNOCASTRATION A RELIABLE AND SUSTAINABLE ALTERNATIVE FOR PIG PRODUCTION?

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# Introduction



- 2010:** European stakeholders of the pork chain committed themselves voluntarily to end surgical castration of male pigs by 2018
- 2019:** still more than 60% of all male piglets are surgically castrated within their first week of life, as problems in pork production with entire male pigs e.g. concerning meat quality and welfare are larger than expected

**Immunocastration might be a sustainable alternative, that meets animal welfare as well as economic goals. For a high market acceptance, the technique must be reliable and competitive:**

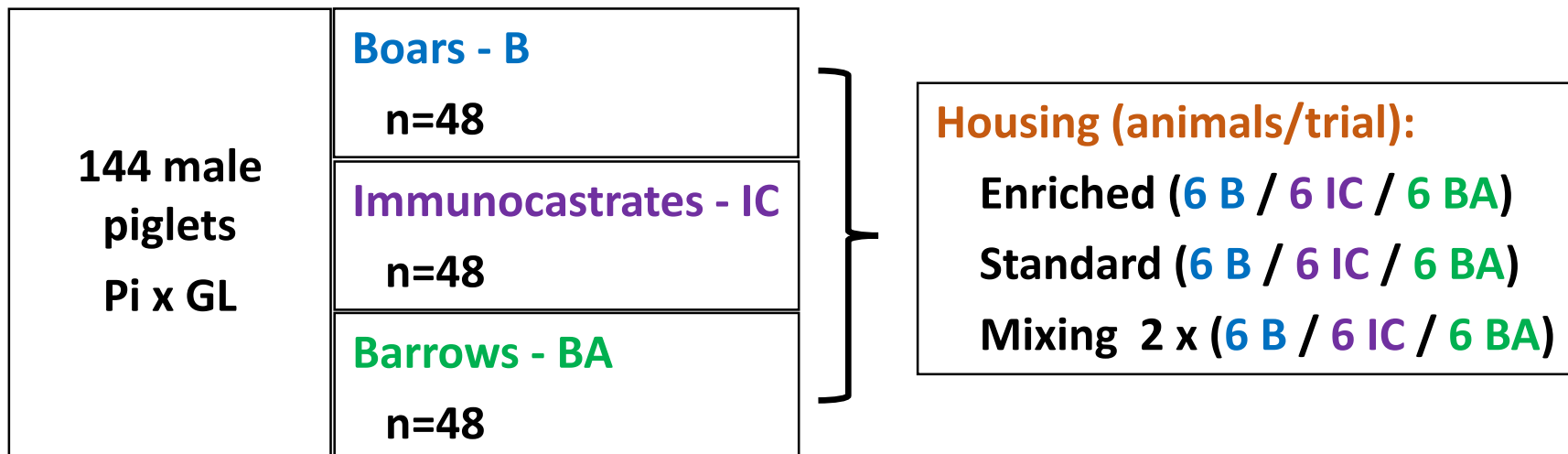
- **No non responders under various housing conditions**
- **High growth performance**
- **Low welfare problems (mounting, aggressions)**
- **High product quality**

# Aims of the Study

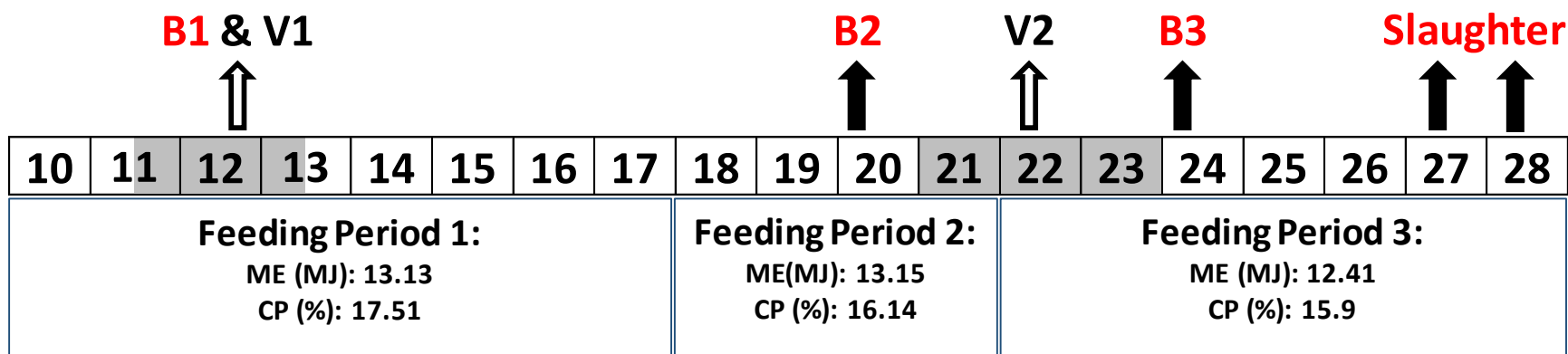


- 1. Reliability of immunocastration under varying housing conditions**
- 2. Impact of immunocastration on growth performance and boar taint**
- 3. Impact of housing conditions on growth performance**

# Material & Methods: Experimental Design



## Timeline of Trials (Age in Weeks)

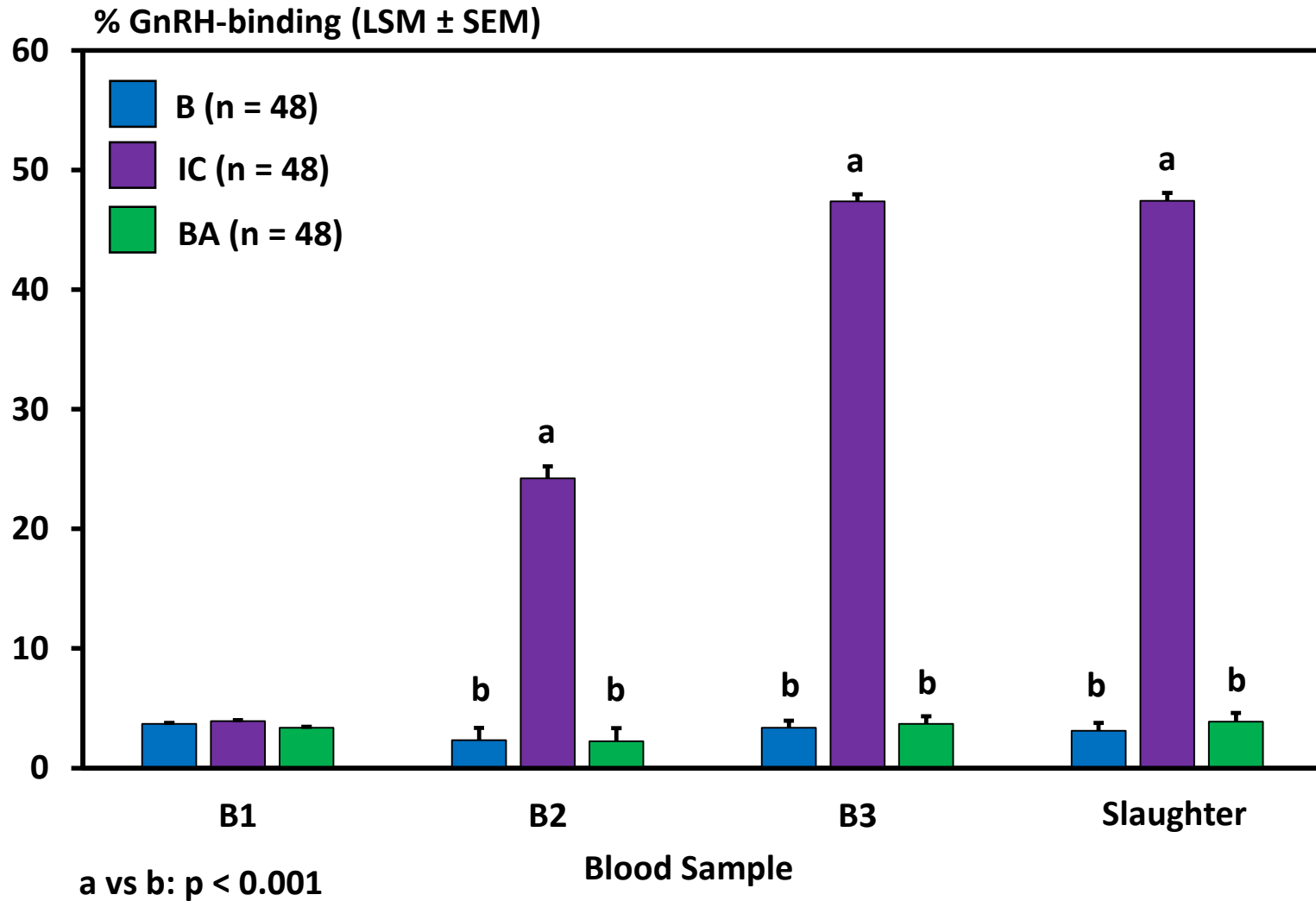


# Materials & Methods: Analytical Methods

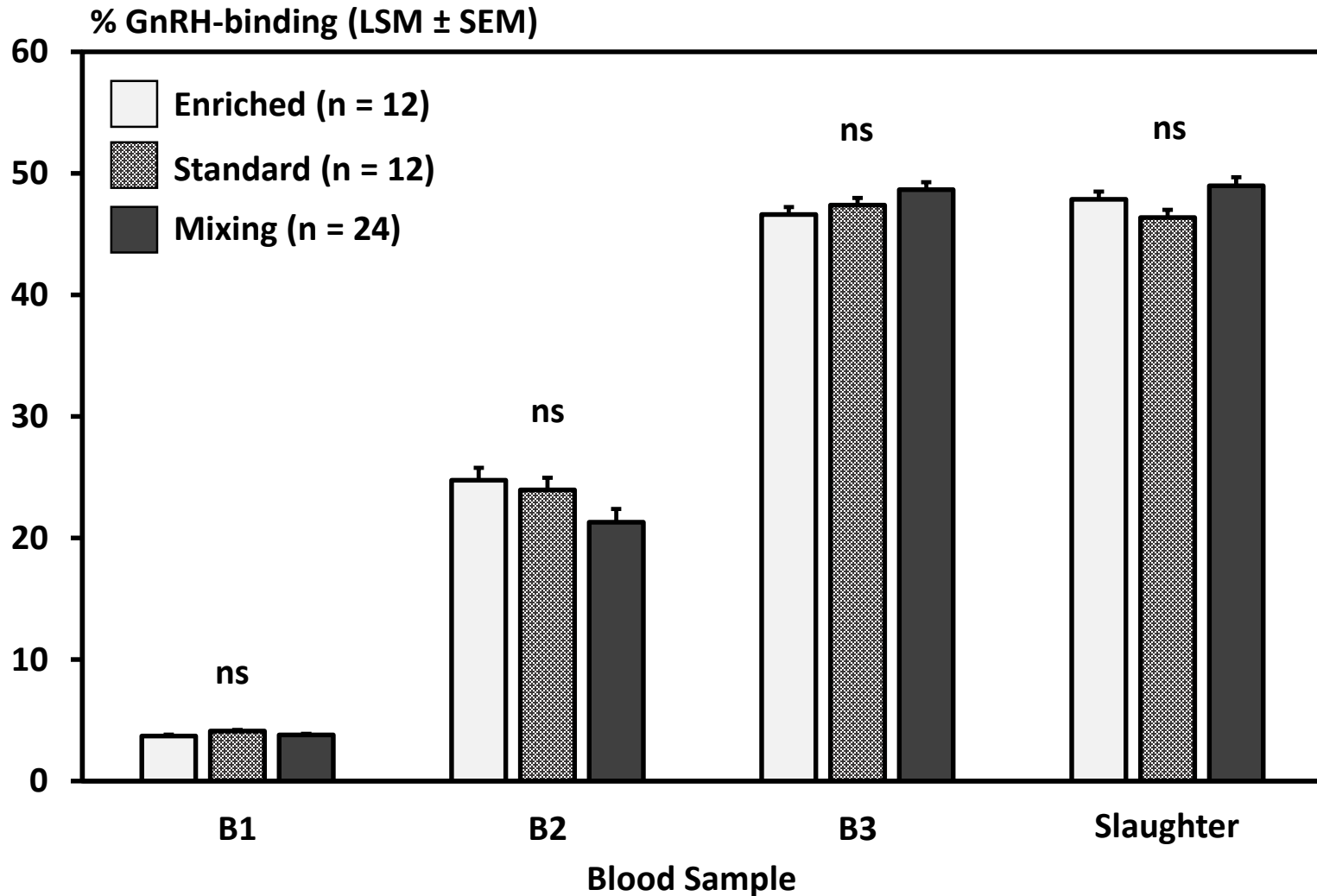


- **GnRH-antibody level in blood (% binding of  $^{125}\text{I}$ -GnRH)**
- **Testosterone in blood (ng/ml;  $^3\text{H}$ -RIA)**
- **Androstenone and skatole in fat ( $\mu\text{g/g}$ ; HPLC)**
  
- **Growth rate (weight at week 17, 21 and 27 / 28 (slaughter))**
  
- **Statistics: IBM SPSS (Version 24), UNIANOVA**
  - **Fixed Effects: Treatment (=sex category) + Housing + Treatment x Housing**
  - **Random Effects: Trial (Slaughter Date) + Genotype (Sire x Dam)**
  - **Covariates: depending on parameter**

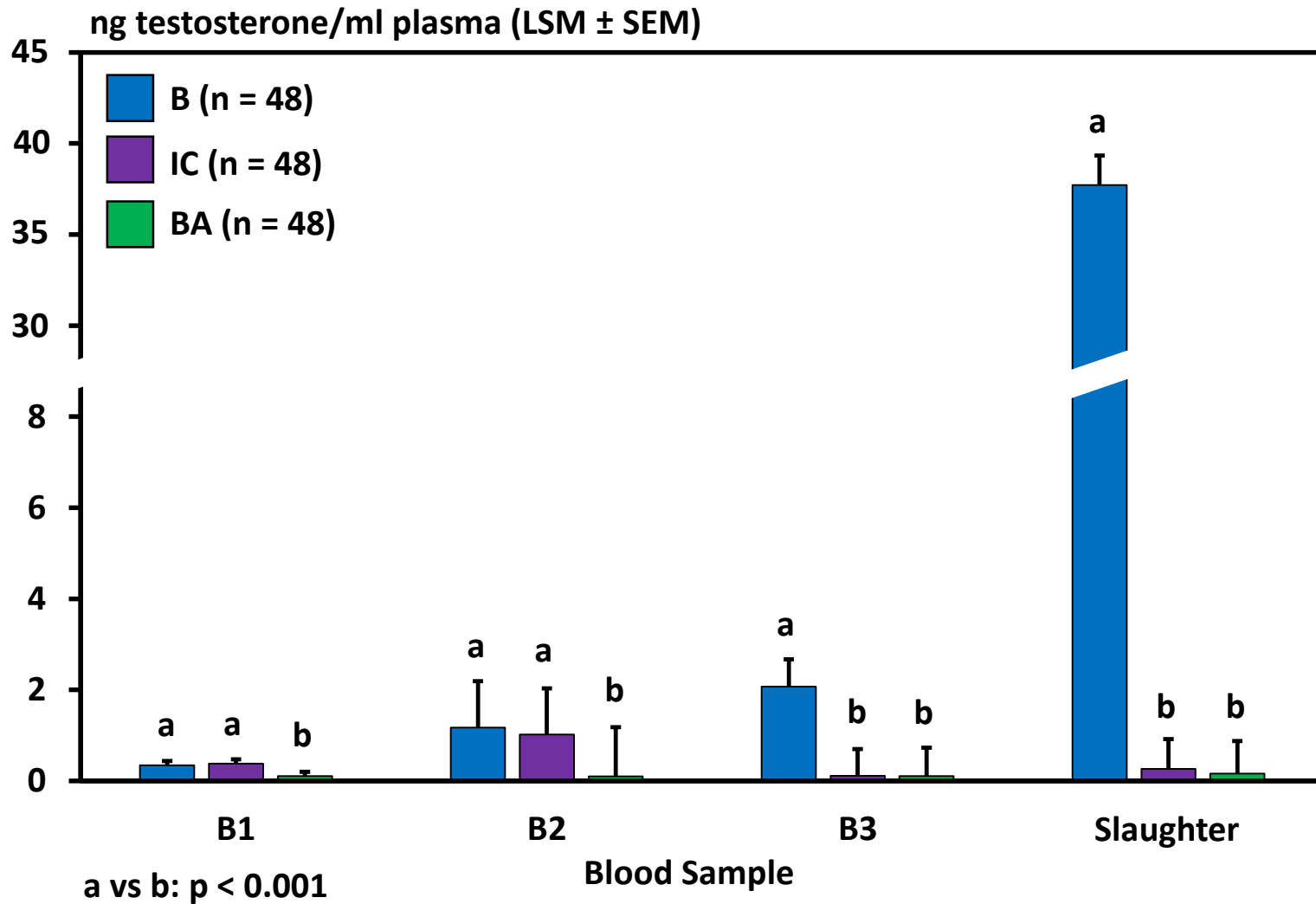
# Anti-GnRH-Antibodies in B, IC and BA



# Impact of Housing on Efficacy of IC



# Testosterone-Levels in B, IC and BA





# Growth Performance of B, IC and BA



LS-means	ADG (g/d)			Carcass Weight (kg)
	30 - 60 kg LW	60 - 90 kg LW	90 - 120 kg LW	
<b>B (n=48)</b>	<b>849<sup>b</sup></b>	<b>916</b>	<b>992<sup>d</sup></b>	<b>96.27<sup>b</sup></b>
SEM	12	21	72	1.17
<b>IC (n=48)</b>	<b>863<sup>ab</sup></b>	<b>906</b>	<b>1147<sup>c</sup></b>	<b>100.91<sup>ab</sup></b>
SEM	11	20	72	1.14
<b>BA (n=48)</b>	<b>896<sup>a</sup></b>	<b>960</b>	<b>966<sup>d</sup></b>	<b>101.50<sup>a</sup></b>
SEM	12	21	71	1.19

Parameter within a column with different superscripts differ significantly

a vs b:  $p < 0.01$

c vs d:  $p < 0.001$

# Impact of Housing on Growth Performance



LS-means	ADG (g/d)			Carcass weight (kg)
	30 - 60 kg LW	60 - 90 kg LW	90 - 120 kg LW	
<b>Enriched (n=36)</b>	<b>854</b>	<b>972<sup>a</sup></b>	<b>1077<sup>a</sup></b>	<b>101.59<sup>a</sup></b>
SEM	14	24	72	1.34
<b>Standard (n=36)</b>	<b>883</b>	<b>923<sup>ab</sup></b>	<b>1042<sup>ab</sup></b>	<b>100.1<sup>ab</sup></b>
SEM	13	23	73	1.30
<b>Mixing (n=72)</b>	<b>871</b>	<b>888<sup>b</sup></b>	<b>985<sup>b</sup></b>	<b>96.99<sup>b</sup></b>
SEM	13	16	70	0.91

Parameter within a column with different superscripts differ significantly

a vs b:  $p < 0.01$

# % Tainted Carcasses of B, IC and BA



<i>Threshold</i>	Skatole ( $\mu\text{g/g fat}$ ) <sup>1</sup>	Androstenone ( $\mu\text{g/g fat}$ ) <sup>1</sup>		
	<i>&gt; 0.25</i>	<i>&gt; 0.5</i>	<i>&gt; 1</i>	<i>&gt; 3</i>
<b>B (n=48)</b>	<b>6.25%</b>	<b>91.7%</b>	<b>79.2%</b>	<b>50.0%</b>
<b>IC (n=48)</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>
<b>BA (n=48)</b>	<b>0.0%</b>	<b>-</b>	<b>-</b>	<b>-</b>

<sup>1</sup> measured in liquid fat

# Conclusions



## 1. Reliability of immunocastration under varying housing conditions

**IC is a robust and reliable method under all tested housing conditions**

## 2. Impact of immunocastration on growth performance and boar taint

**IC has a positive impact on growth performance of male pigs, esp. after the 2nd vaccination.**

**IC is highly effective in preventing boar taint**

## 3. Impact of housing conditions on growth performance of male pigs

**Unstable social environment has a negative impact on growth performance of male pigs**

# Thanks to funders and partners



SuSI

Sustainability in Pork Production  
with Immunocastration

