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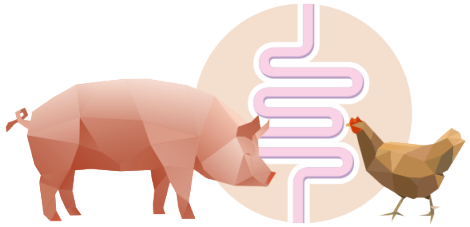

monogut health

Optimal gut function in monogastric livestock

Effect of creep feeding (dry or liquid) and pen hygiene (standard or optimal) on pre-weaning feed intake and growth in pigs.

Shiv Ramveer Vasa; Gillian E. Gardiner, Keelin O'Driscoll, Giuseppe Bee, Peadar G. Lawlor

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 955374.

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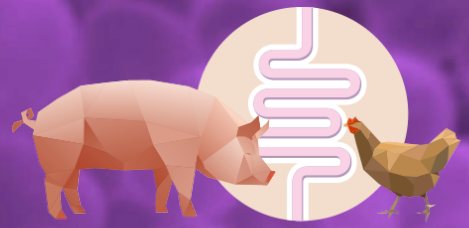

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01

Introduction

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Introduction

- Litter size ↑ but ↑ colostrum/milk → limiting growth & weaning weight of piglets

Creep feeding

Commonly practiced with dry pelleted starter diet

- **↑ weaning weight**
- **Early exposure to plant ingredients**
- **↑ pw feed intake**

- Liquid creep feeding can ↑ feed intake (Byrgesen et al., 2021; Lyderik et al., 2023)
- Hygiene status of farrowing room can affect creep feed intake (Halpin et al., in review, Le Floc'h et al., 2009; Kahindi et al., 2014)

Hypothesis:

Liquid creep feeding & optimal pen hygiene environment will increase feed intake & growth of suckling piglets while reducing the need to medicate pigs leading to increased post-weaning intake & growth.

Research questions:

Does environmental hygiene influence the response to liquid creep feeding of suckling pigs?

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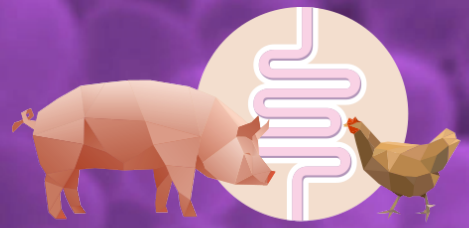

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02

Materials and methods

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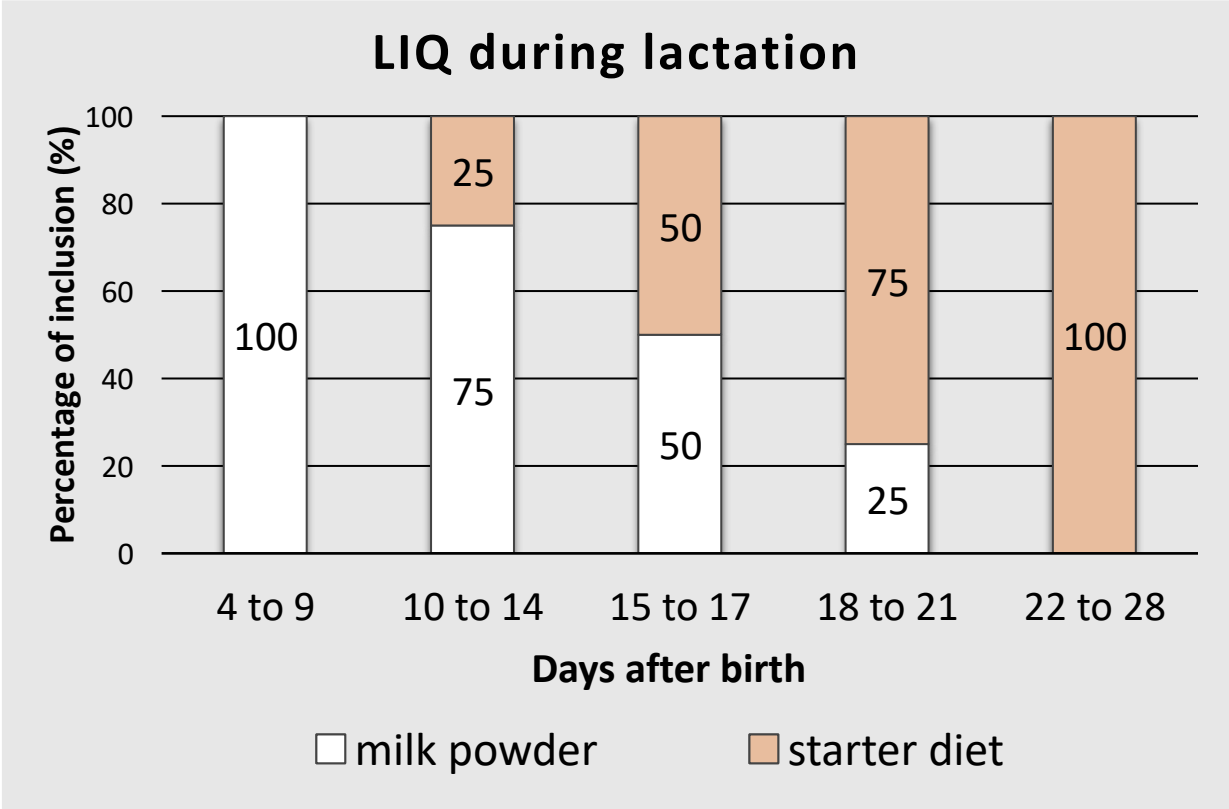
2.1 Material & Methods

- 87 sows blocked by parity, piglets weaned in previous farrowing and body weight at d107 of gestation
- Similar litter size within each block
- Piglets - (Large White x Landrace) x Duroc

Pre-weaning treatments		
Creep Feed / Pen Hygiene	**Dry pelleted starter diet from D10 (DRY)**	**Liquid creep feeding from D4 (LIQ)***
OPTI (Optimal)	OPTI-DRY	OPTI-LIQ
STAN (Standard)	STAN-DRY	STAN-LIQ



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*** Liquid mixture of milk (Swinco) and starter diet with 14 to 15% DM**

2.2 Materials & Methods

Table: Nutrient and energy content of the milk powder and starter diet.

Calculated nutrient composition	Milk powder	Dry starter diet
Net energy (MJ/kg)	11.9	12.1
Fat (g/kg)	90	122
Protein (g/liter)	215	200
Lysine (g/liter)	18	16.2

Automatic delivery system

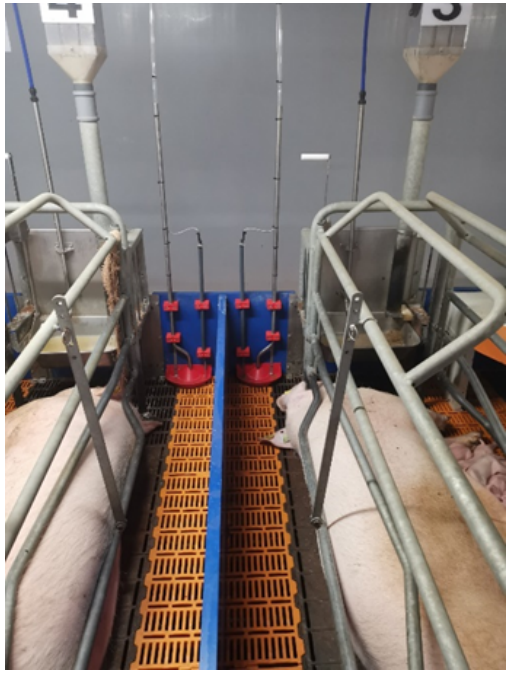
- Babyfeed from Schauer

- Trough feeder

- Feeding for ~18 hours/day

- Sensor check every ~25 mins.

- Versatile feeding programs



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2.3 Material & Methods

Cleaning protocol- farrowing room* Prior to moving sows	
STAN pen environment	**OPTI pen environment**
Washing with water only No detergent and/or disinfectant applied	Pre-soaking with water Apply detergent, wash, dry, chlorocresol disinfectant application, dry
≤ 18 hours of drying time	6 days drying
Sows not washed prior to entry	Sows washed and disinfected prior to entry

Measurements

- **Microbiological plating- pen floor swabs**
- **Weighing and feed disappearance**
  Day 4 and day 28 (at weaning)
- **Medication usage and clinical cases**
- **Visually scored incidence of diarrhoea**
- **Dissect sub-set d4 post-weaning**
  Intestinal histology
- **Statistical analysis- SAS v 9.4**
  PROC MIXED|PROC GENMOD
  Tukey-Kramer adjustment

*Halpin et al., in review

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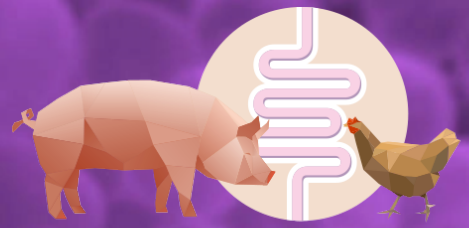

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03

Results

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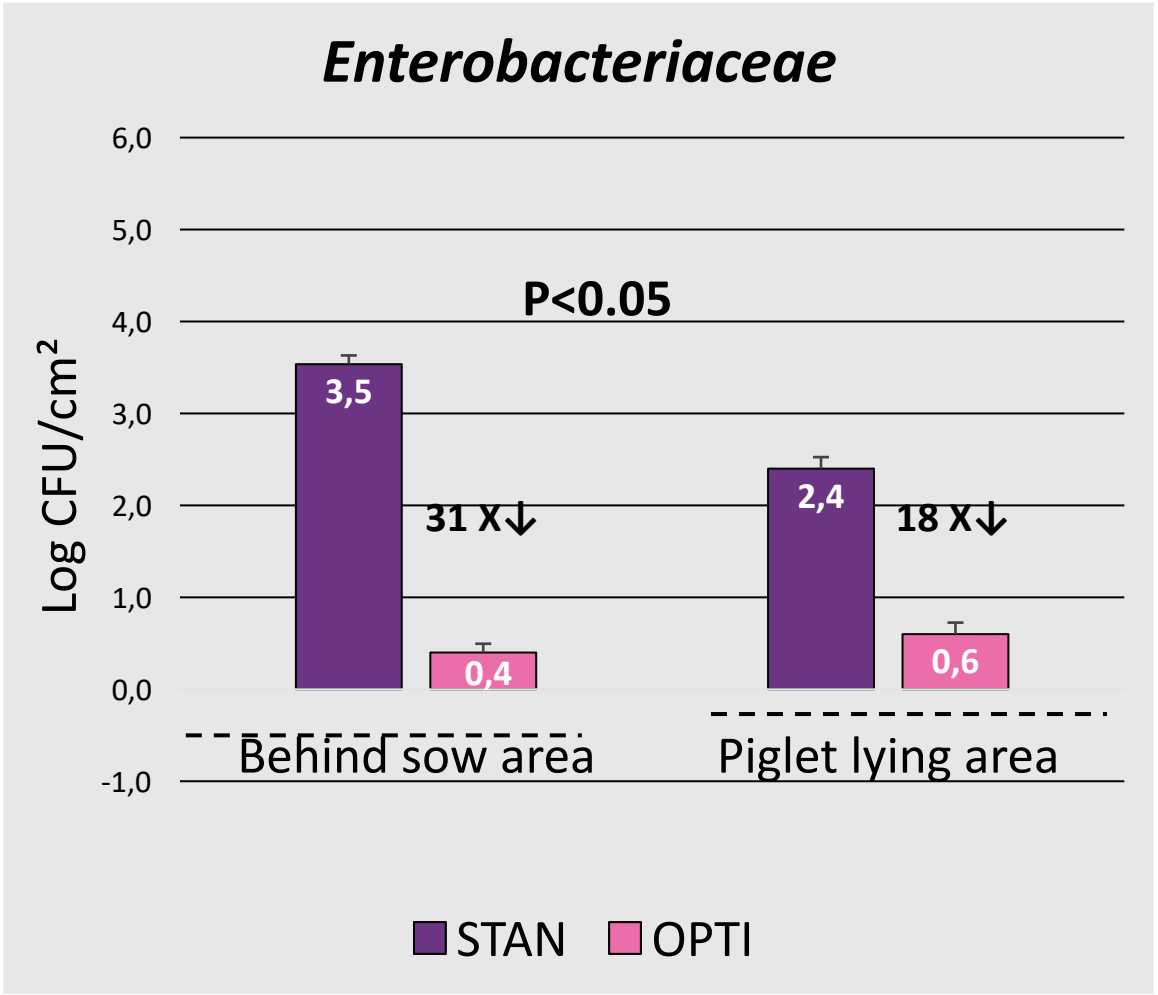
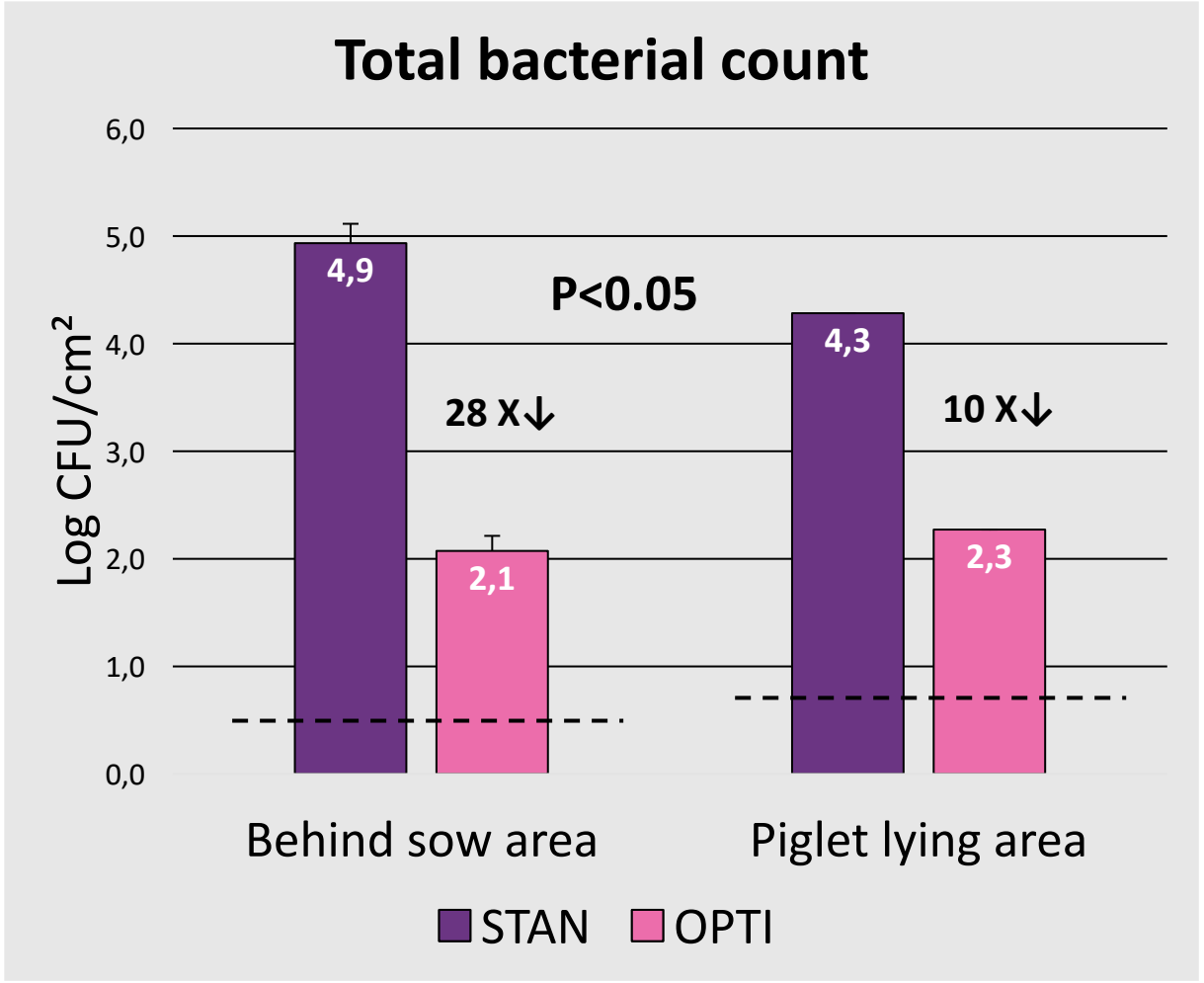
3.1 Results

Microbial counts - pen floor swabs after cleaning





- - - - **Limit of detection**

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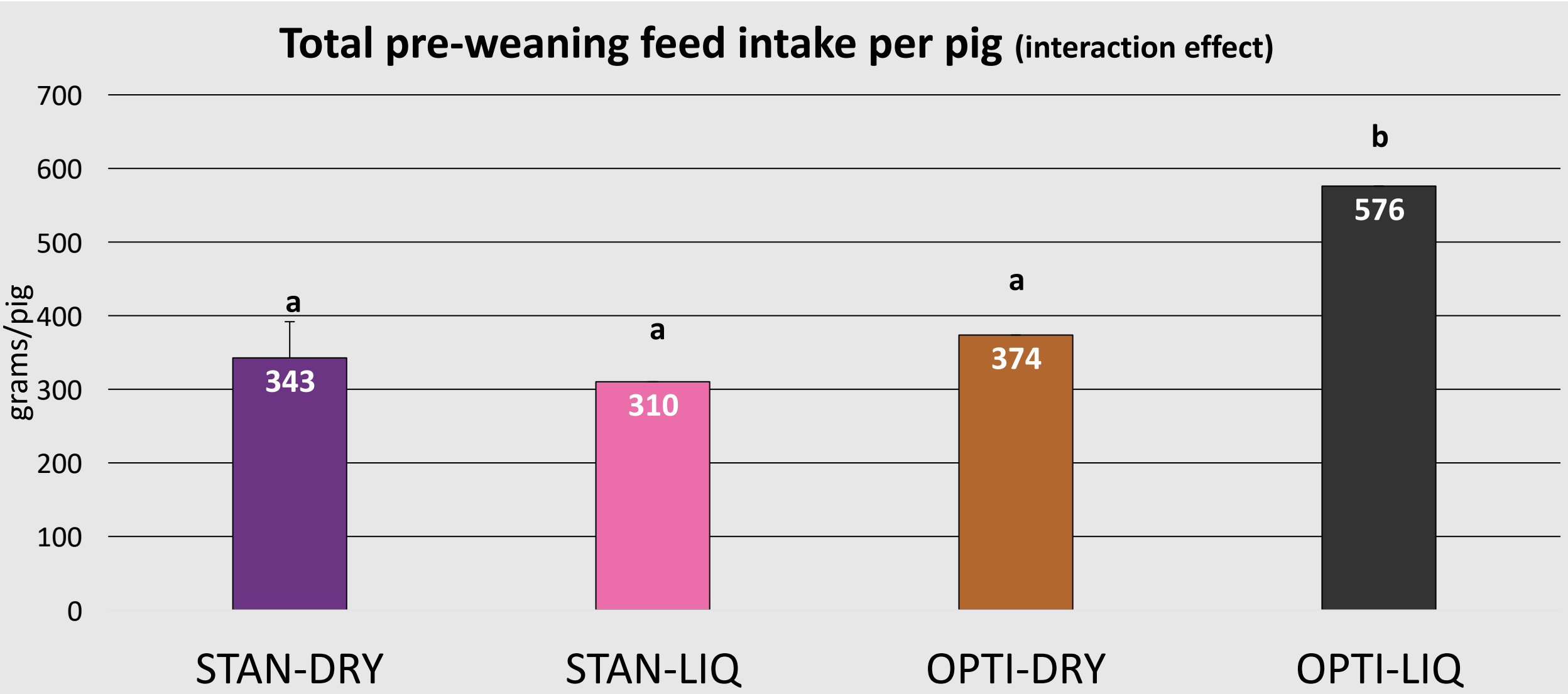
3.2 Results



a-b Bars that do not share a common superscript differ significantly at P<0.05

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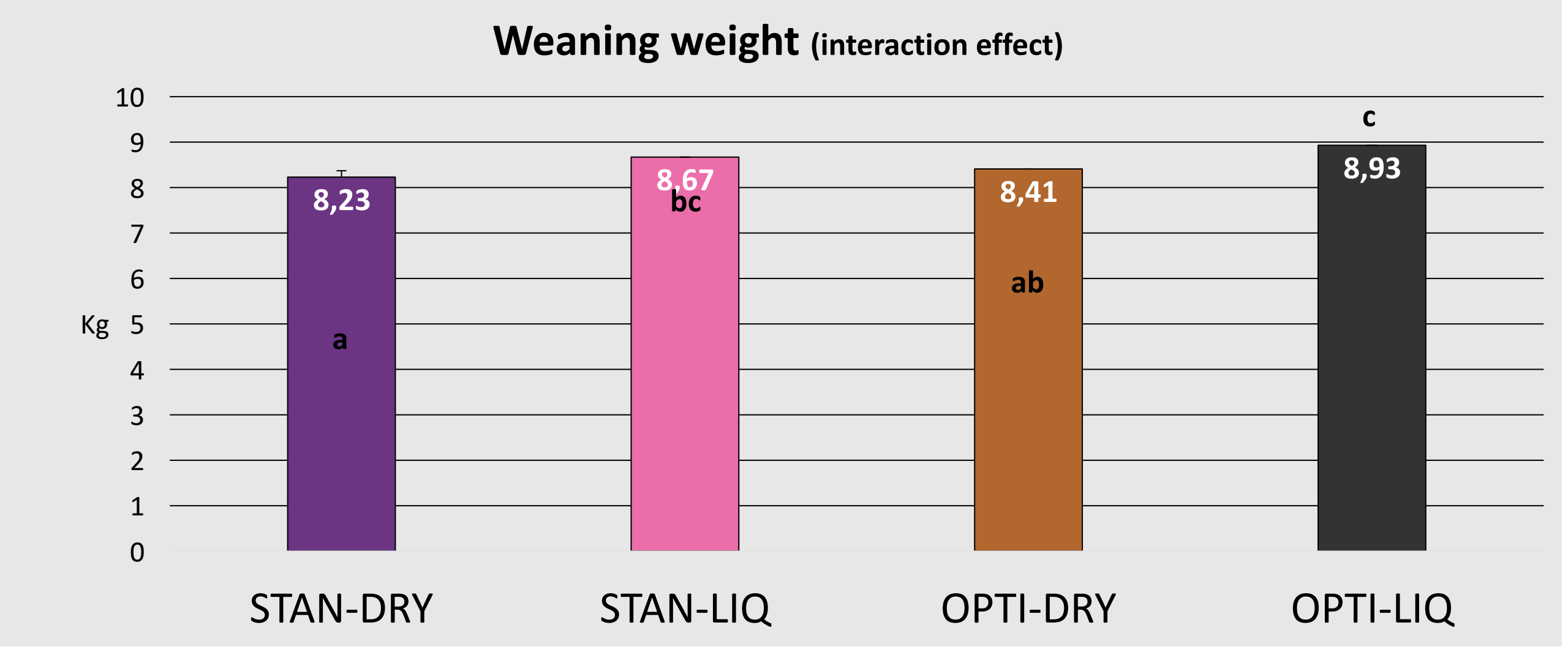
3.3 Results



a-c Bars that do not share a common superscript differ significantly at P<0.05

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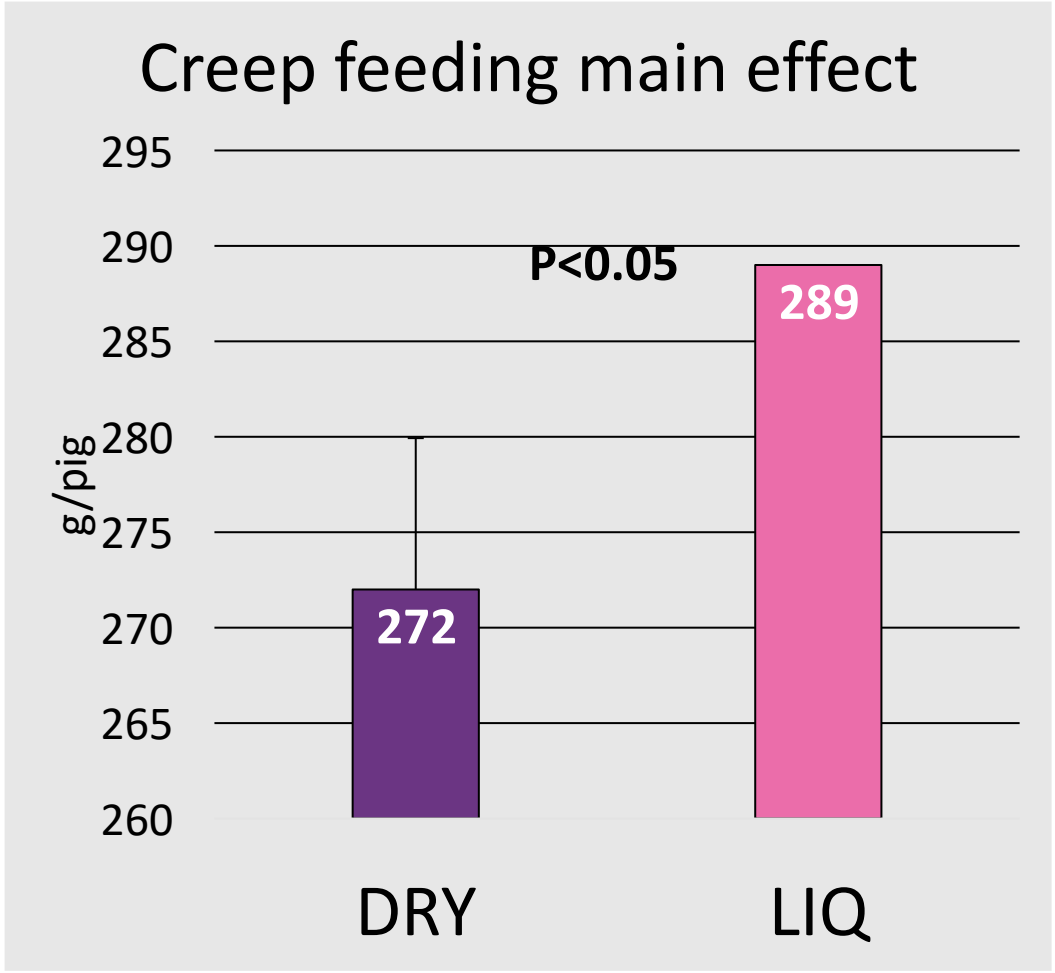
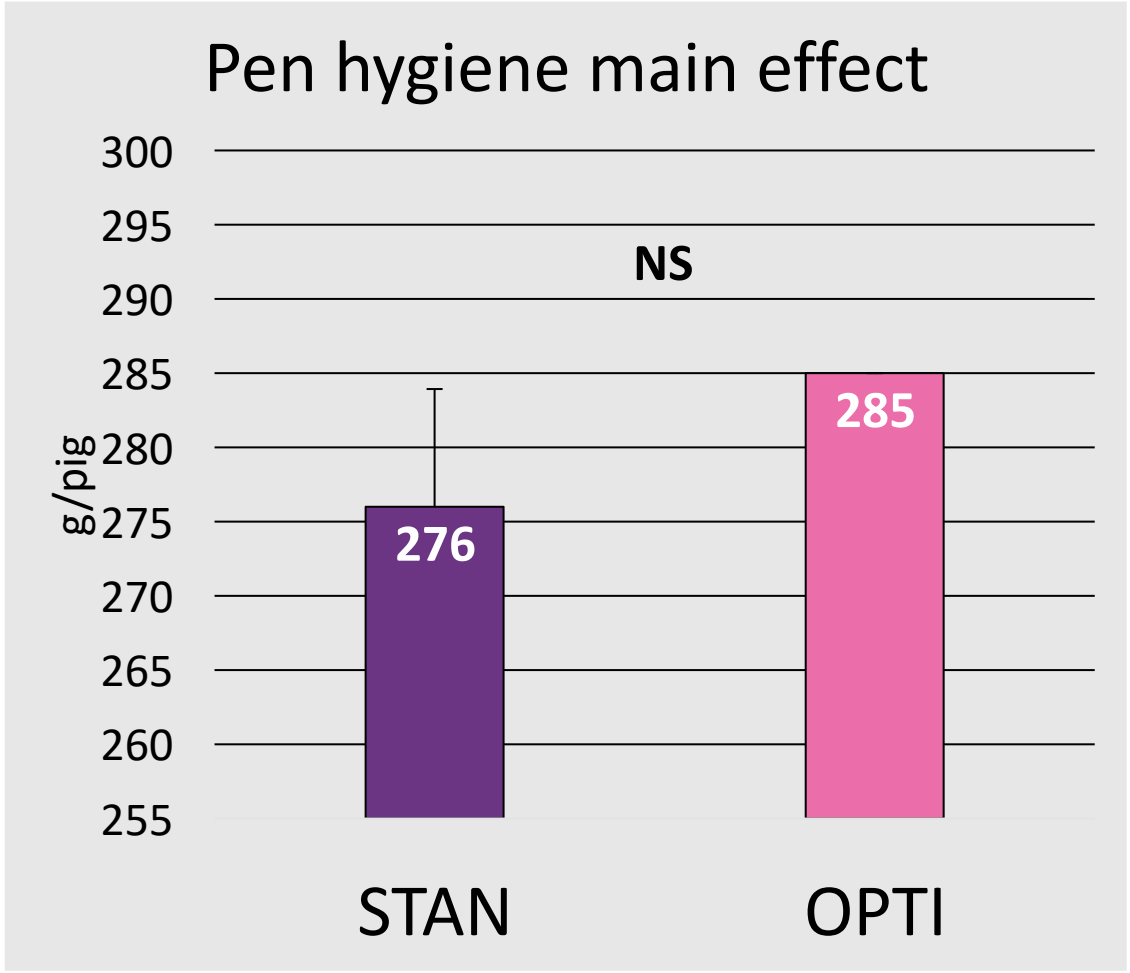
3.4 Results

ADG from D4 to 28 (No interaction effect; P>0.05)





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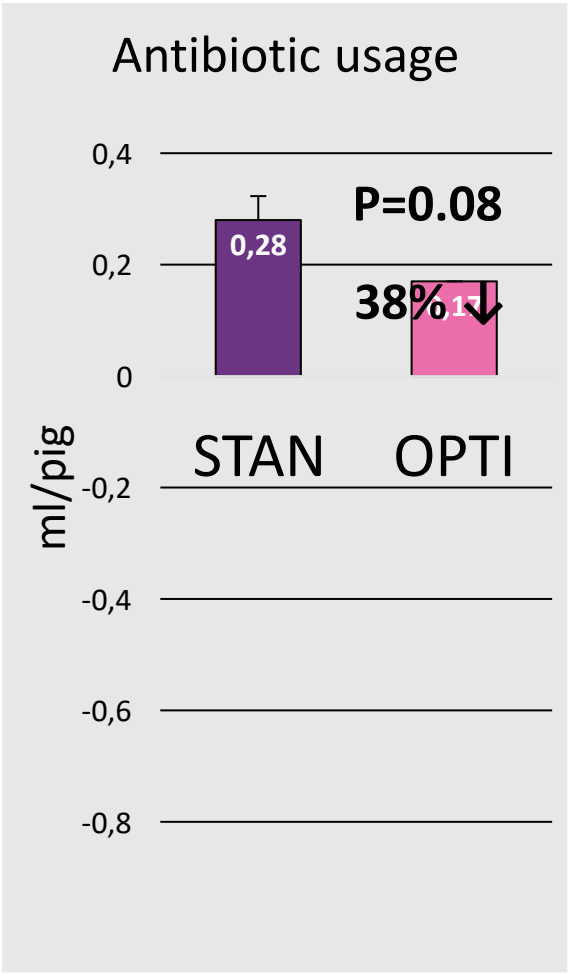
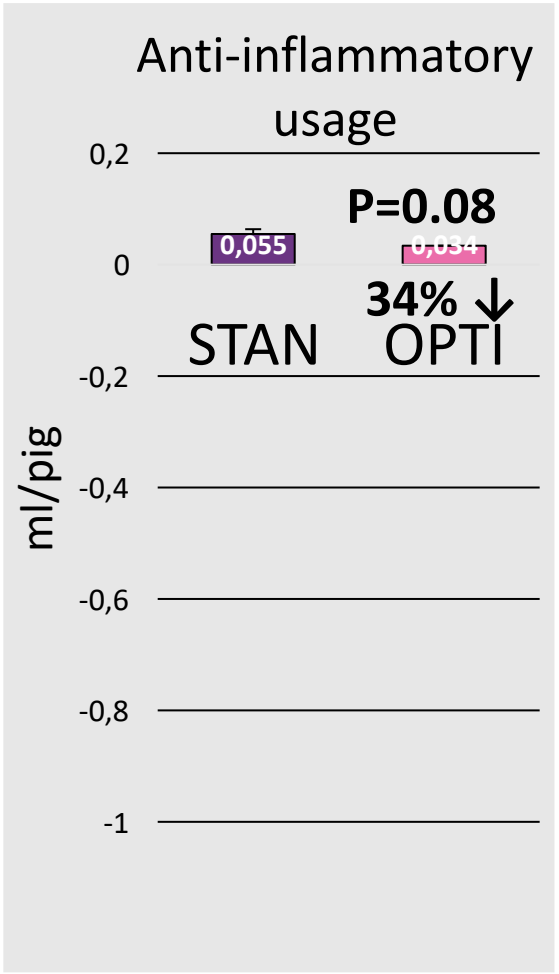
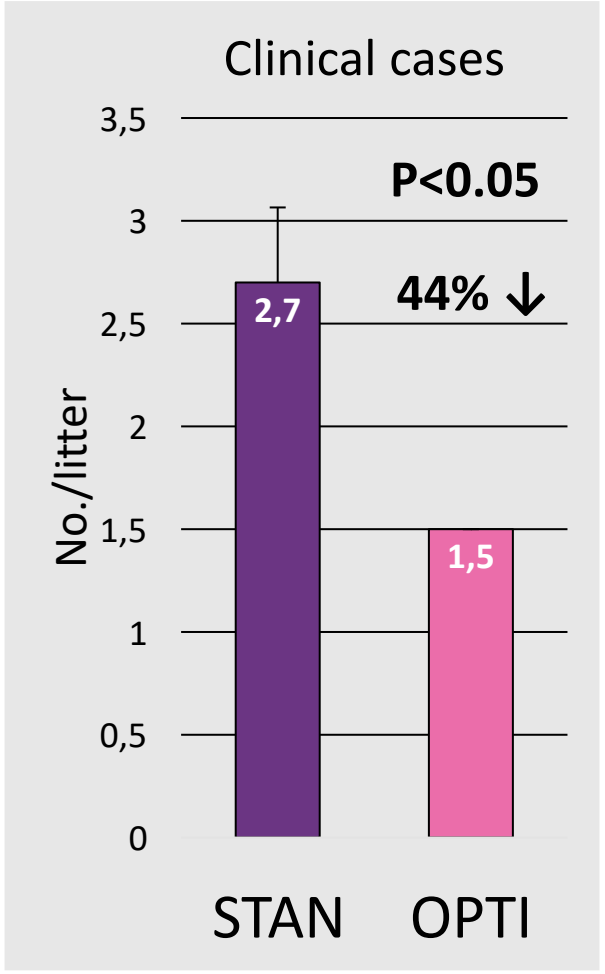
3.5 Results

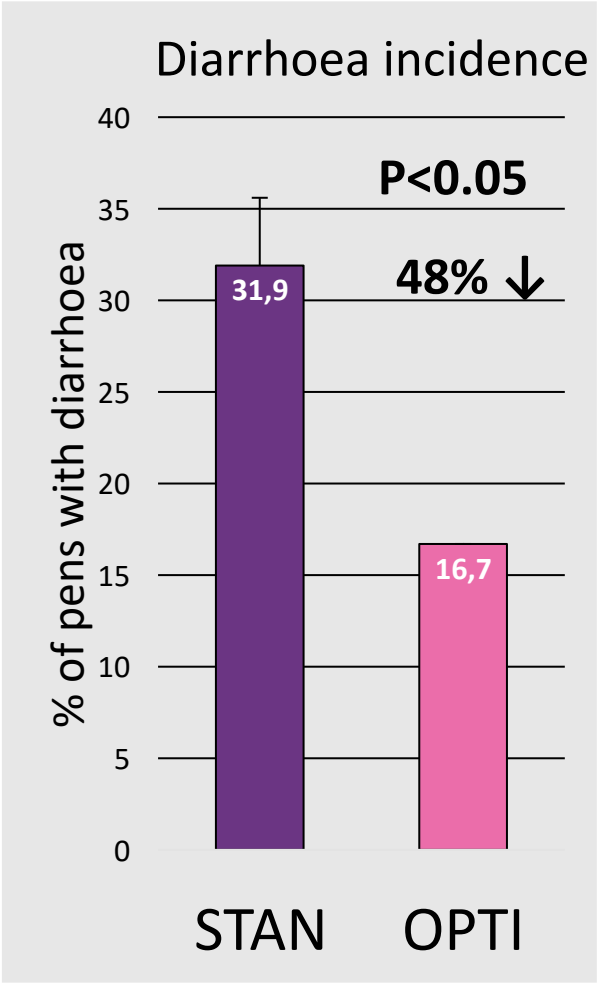
Medication usage, clinical cases and incidence of diarrhoea

(No interaction & feeding effect; P>0.05)









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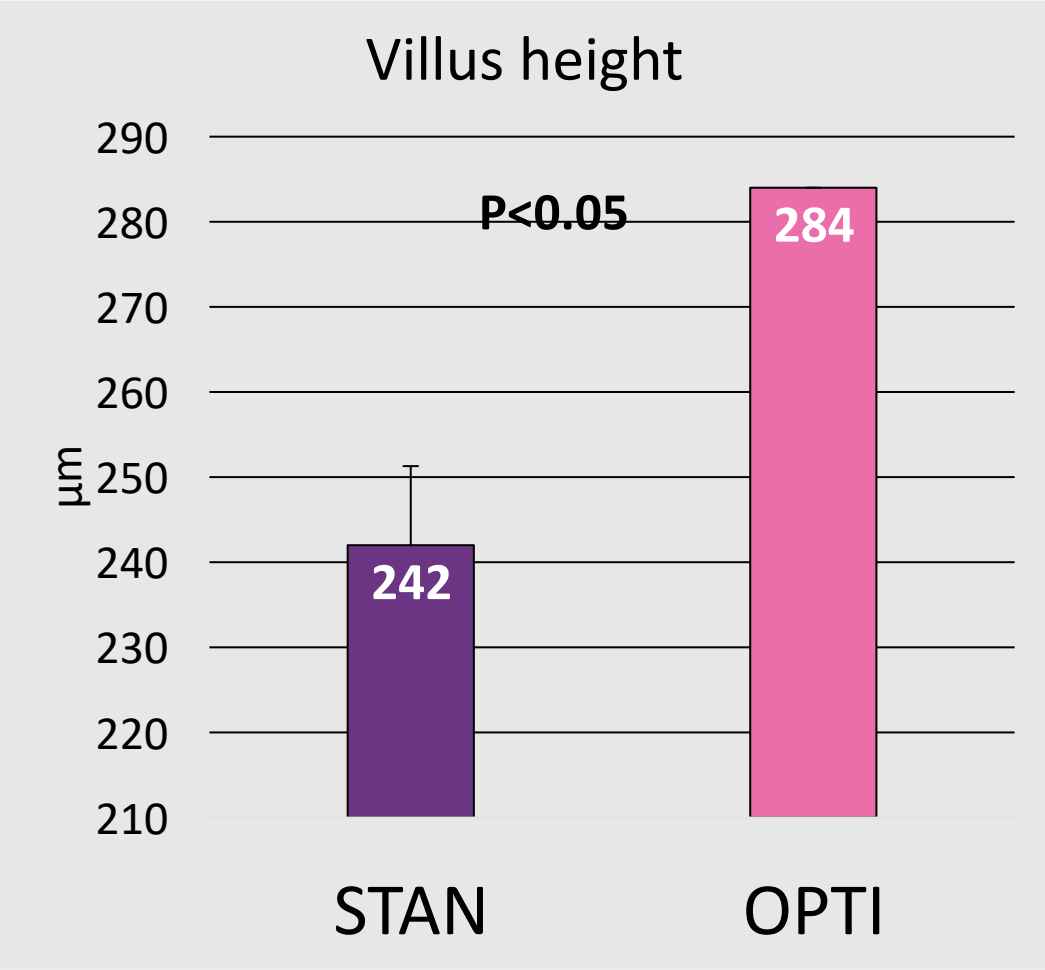
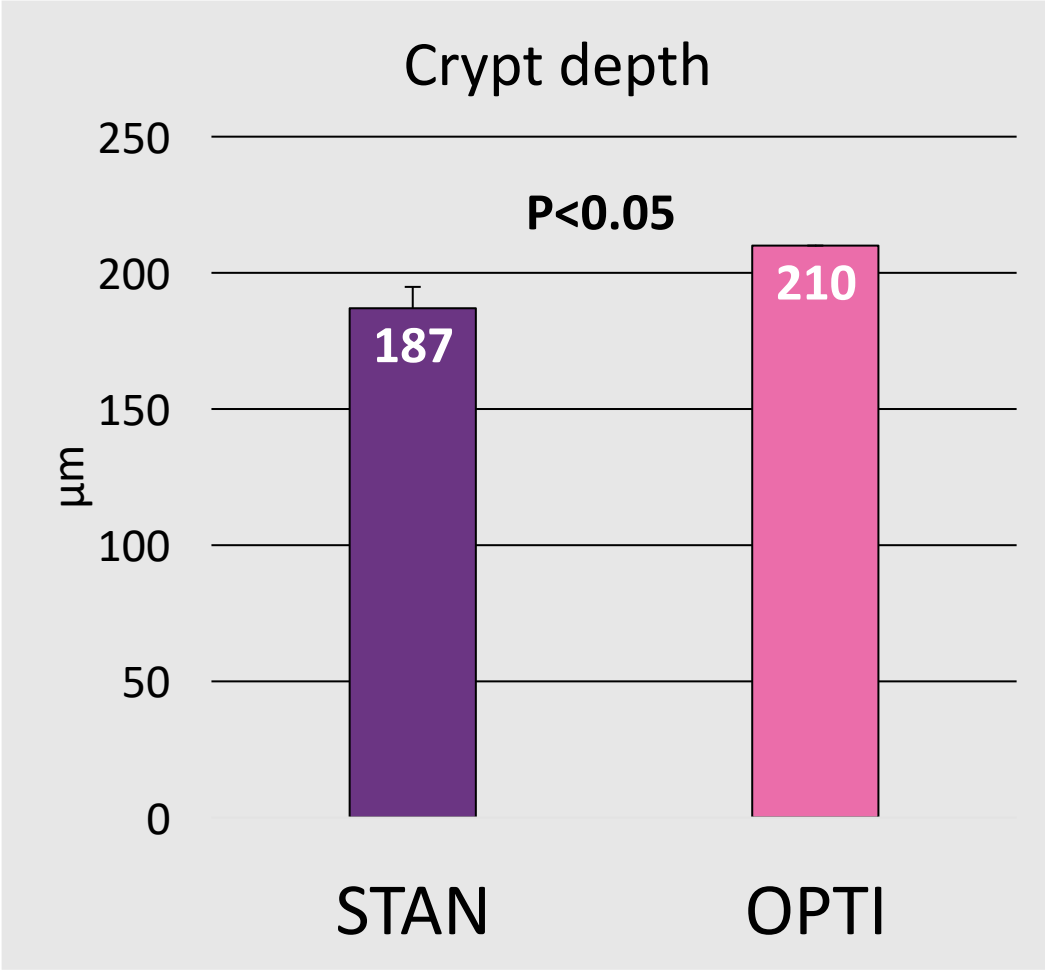
3.6 Results

Jejunal histology at day 4 pw (No interaction & feeding effect; P>0.05)





No difference in villus height to crypt depth ratio

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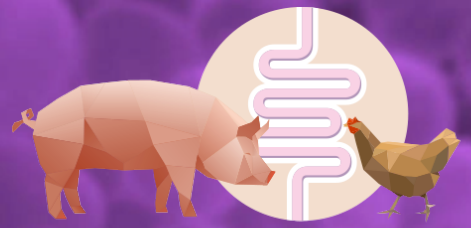

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04

Discussion

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Discussion

- **Liquid creep feeding with optimal hygiene – best growth & feed intake pre-weaning**

- **Liquid creep feeding in standard hygiene pens → weaning weight ↑**
  - Higher lactose intake (Zhao et al., 2021)

- **Optimal pen hygiene pigs → less clinical cases + lower incidence of diarrhoea**
  - Less immune system stimulation → Increased feed intake + less energy diverted from growth (Johnson and von Borell, 1994; Dantzer, 2004, Pluske et al., 2018)

- **Optimal pen hygiene pigs → increased villus height and crypt depth post-weaning**
  - Possibly due to lower infection pressure & differences in microbiome (Duarte et al., 2020; Law et al., 2021)

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THANK YOU

Do you have any questions?

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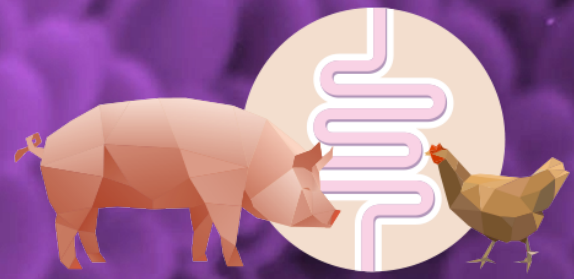

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