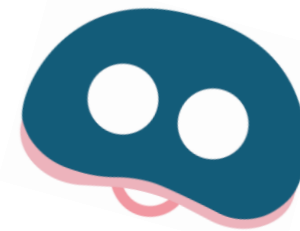


Pre- and post-weaning, are they a perfect match?

Pre-weaning strategies to get piglets eating and prepare them for weaning

Anouschka Middelkoop



Introduction

- Background
- Pre-weaning strategies
- Overview and take home message

Foraging in the farrowing room
to stimulate

FEEDING

Getting piglets to eat is
bittersweet



Anouschka Middelkoop

PhD at Wageningen University from 2016-2020

From 2020: Researcher swine at **SFR**
SCHOTHORST FEED RESEARCH



WAGENINGEN
UNIVERSITY & RESEARCH

HELLO



Rooting



Chewing



Playing



Image credits: S. Elson, O. Spata, J-L Klein and M-L Hubert

Weaning and eating creep feed

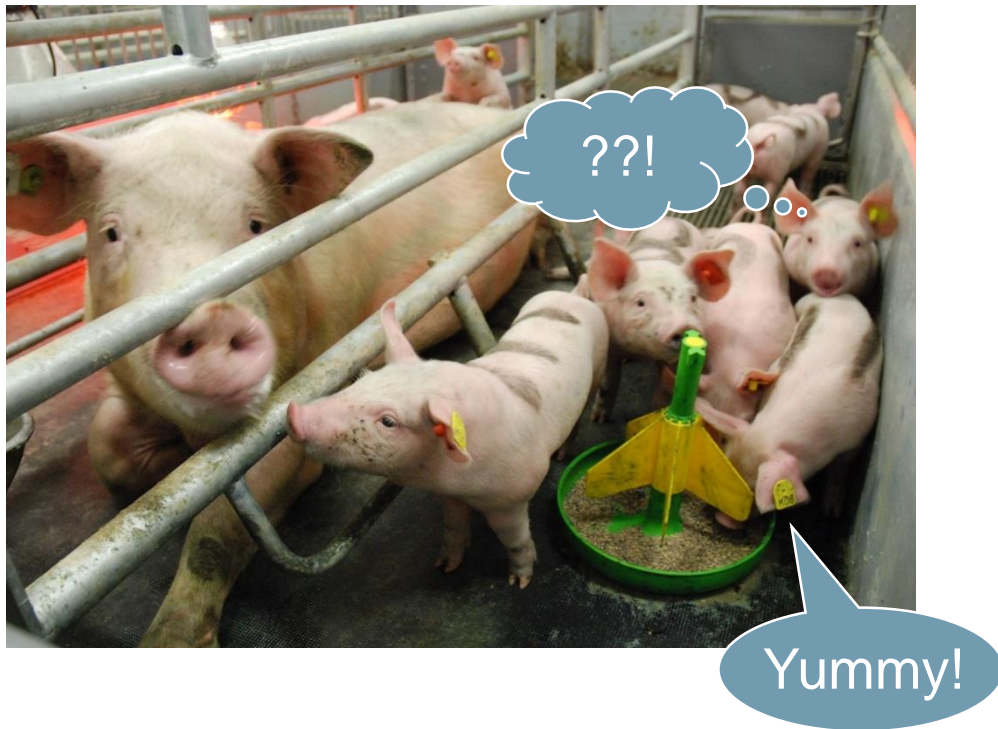
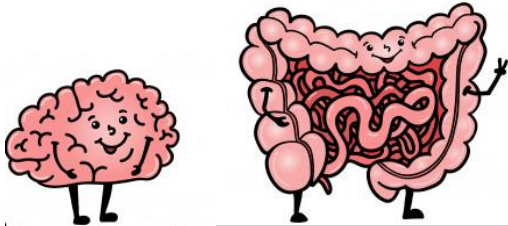
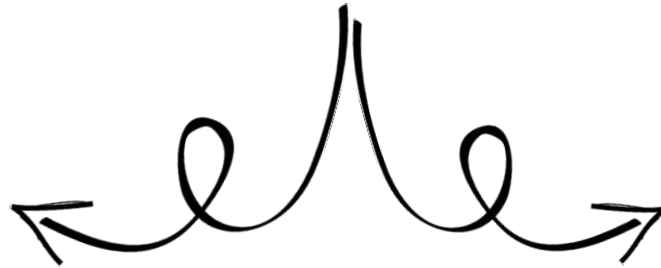


Image credits: A. Middelkoop, P.J.E. Roek, K.S. Pedersen and N. Toft

PhD thesis



What is the effect of fibrous creep feed on piglet behaviour, gut development and gut colonisation?



How can we get more piglets to eat and improve creep feed intake, to facilitate weaning?

INSPIRED
BY
NATURE

PhD thesis

Strategy



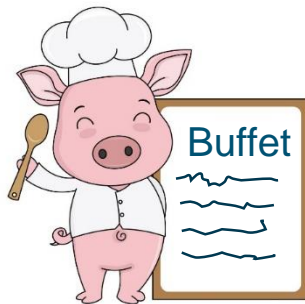
1

2

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m²



How can we get more piglets to eat and improve creep feed intake, to facilitate weaning?

Environmental enrichment

- Extra space, alternating toys and substrates

Creep feed intake (g/piglet/d)	Enriched	Barren	<i>P</i> -value
d7-22	3 ± 1	2 ± 1	0.98
d22-28	34 ± 12	26 ± 10	0.35
d28-30	87 ± 15	45 ± 13	0.03
Total, d7-30	18 ± 5	12 ± 4	0.07



Seddon et al., 2015



Luo et al., 2020



Play-feeder



To stimulate exploratory and play behaviour, from 4 days of age



CON

Control



PL

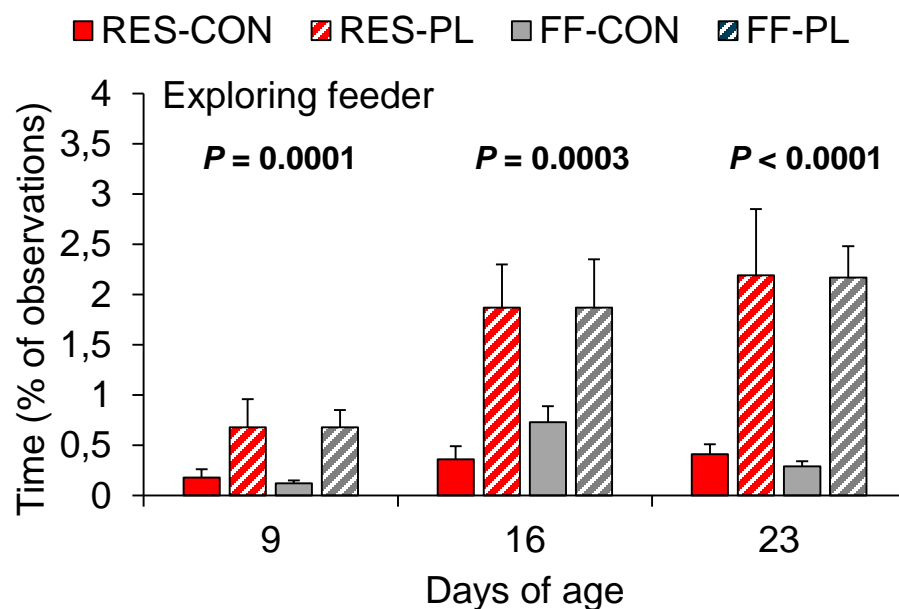
Play-feeder



Video

Play-feeder

➤ Play-feeder increased exploratory behaviour



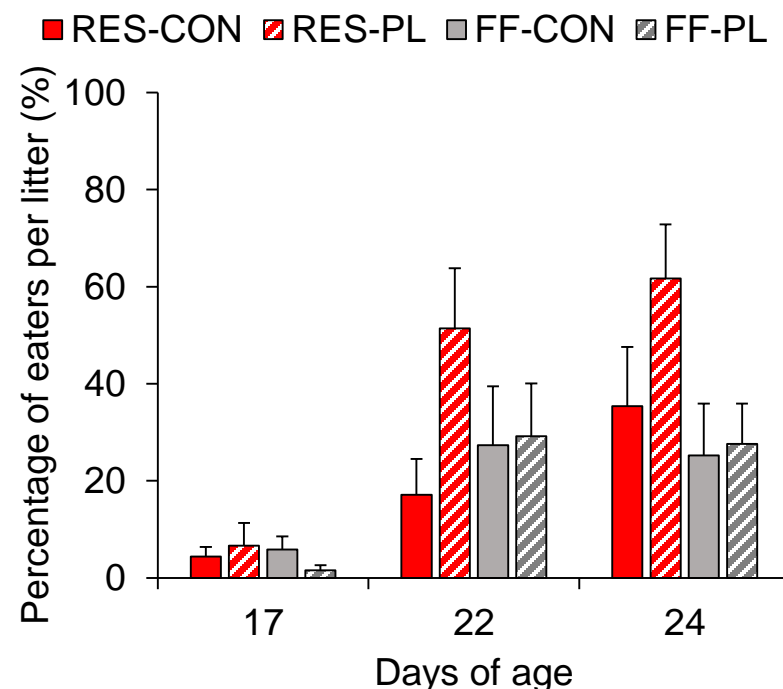
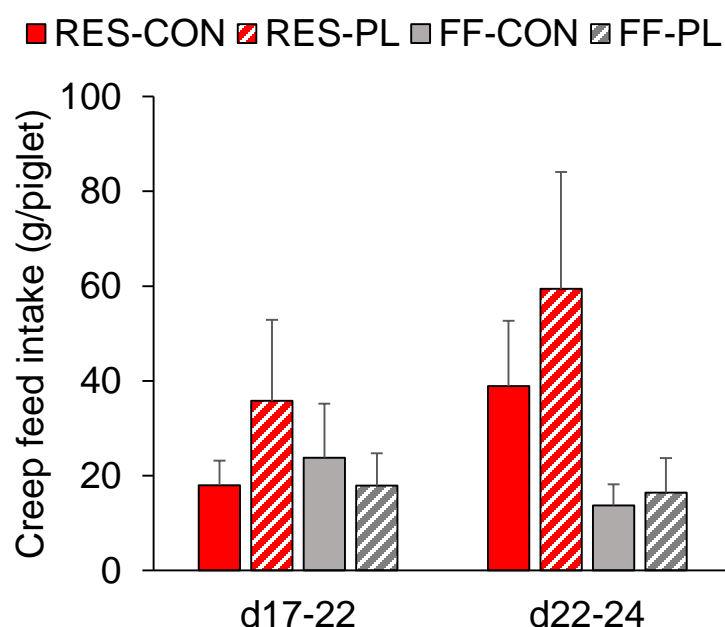
Piglets per litter visiting the feeder

Age	Control	Play-feeder	<i>P</i> -value
d9	22%	57%	<0.01
d16	56%	81%	<0.01
d23	70%	95%	<0.01

Striped bars: litters with access to the play-feeder

Play-feeder

- Play-feeder did not stimulate creep feed intake
- Play-feeder did not increase number of eaters
- No effect on weaning weight



Red bars: litters of sows with low feed intake → low milk production

Middelkoop et al., 2019

Weaning

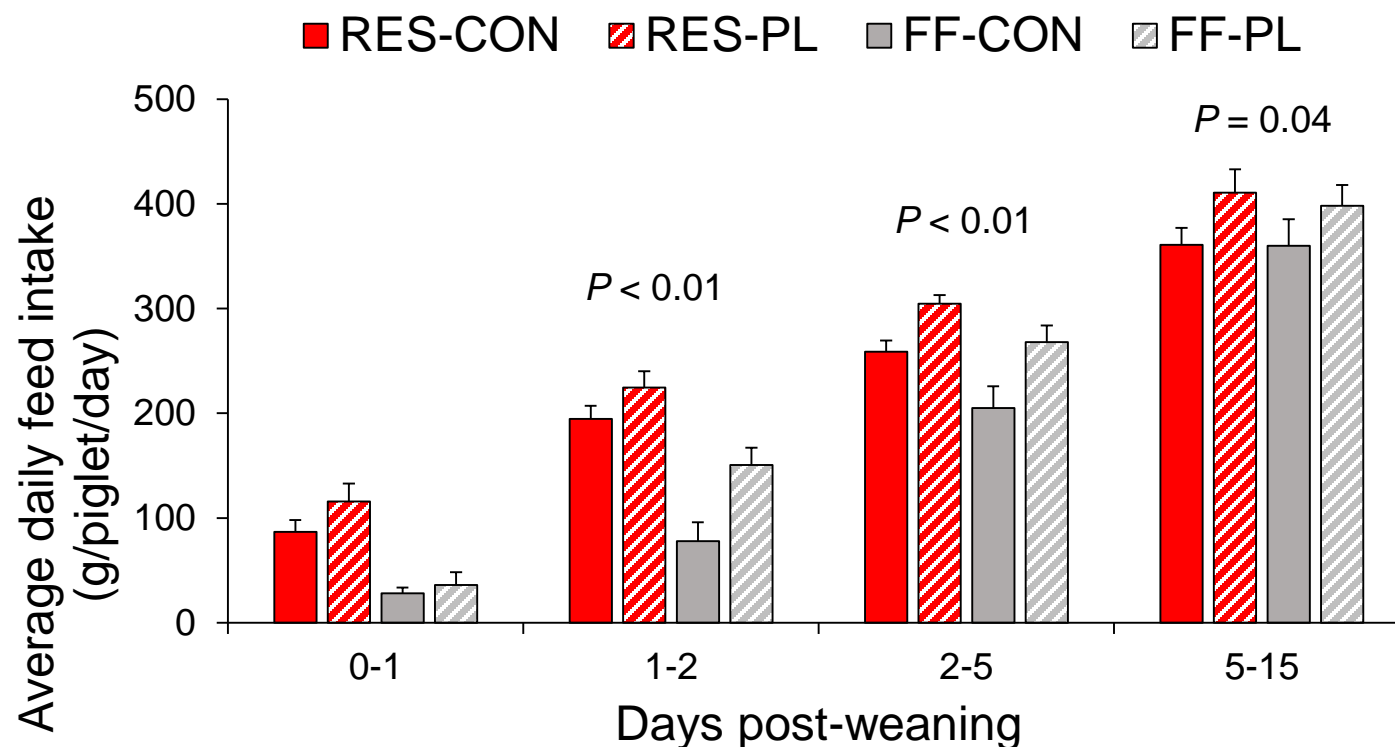
- Conventional feeder with a commercial weaner diet
- No medicinal zinc oxide, 161g crude protein, 11.8g SID lysine/kg dry matter



Image credits: A. Middelkoop

Play-feeder

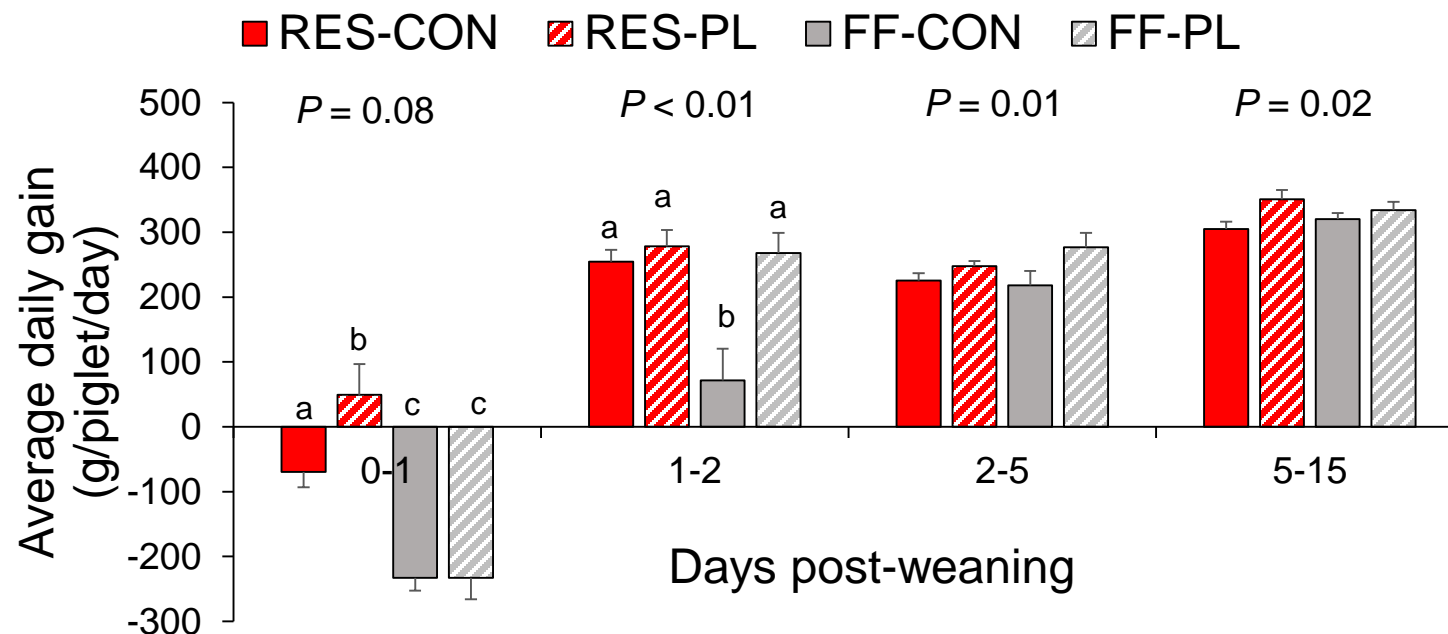
➤ Play-feeder stimulated post-weaning feed intake



Middelkoop et al., 2019

Play-feeder

- Play-feeder stimulated post-weaning weight gain & body weight



Body weight at day 15 post-weaning

Control	Play-feeder	P-value
10.0 ± 0.2 kg	10.6 ± 0.1 kg	0.02

Play-feeder

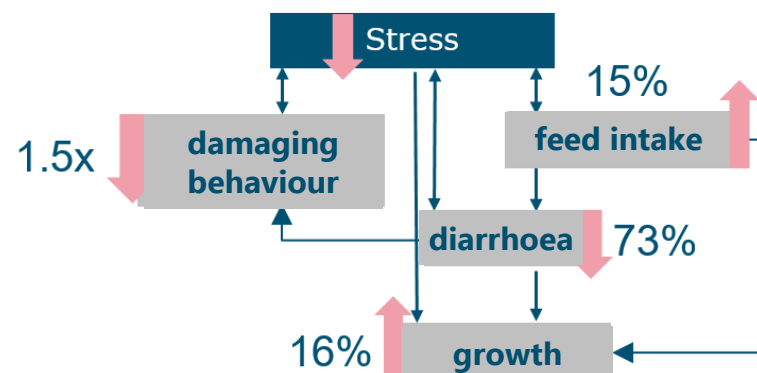
➤ In the post-weaning period, the pre-weaning play-feeder:

↓ nr. of body lesions, and piglets with ear and tail damage

↑ eating and drinking behaviour

↓ diarrhoea

no effect on feed efficiency



Diarrhoea	Control	Play-feeder	P-value
Duration of diarrhea, days/pen	3.0 ± 0.5	1.7 ± 0.4	0.04
% of pens with watery diarrhoea	61.1	16.7	0.01
Faecal consistency score	0.26 ± 0.04	0.14 ± 0.03	0.02

Dietary diversity



VS.

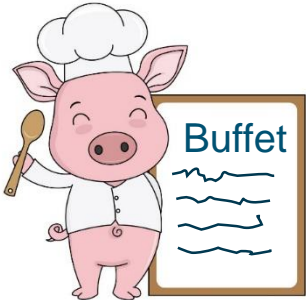
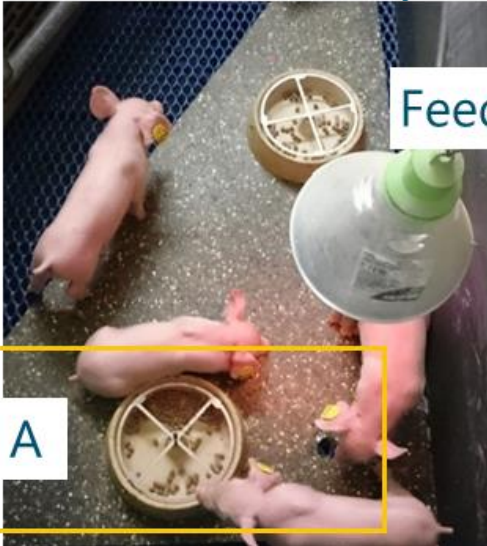
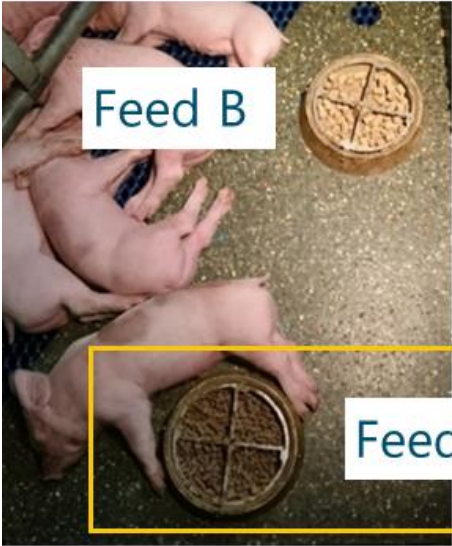


DD

Diverse Diet

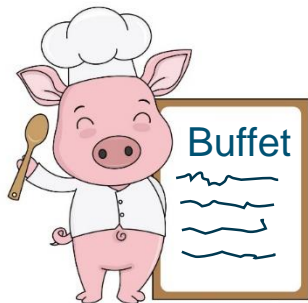
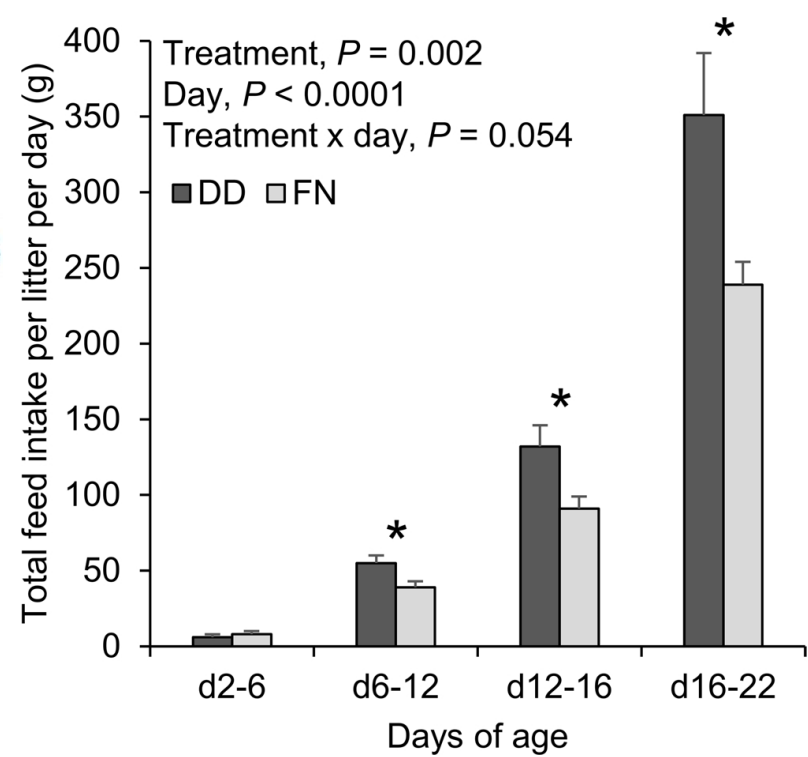
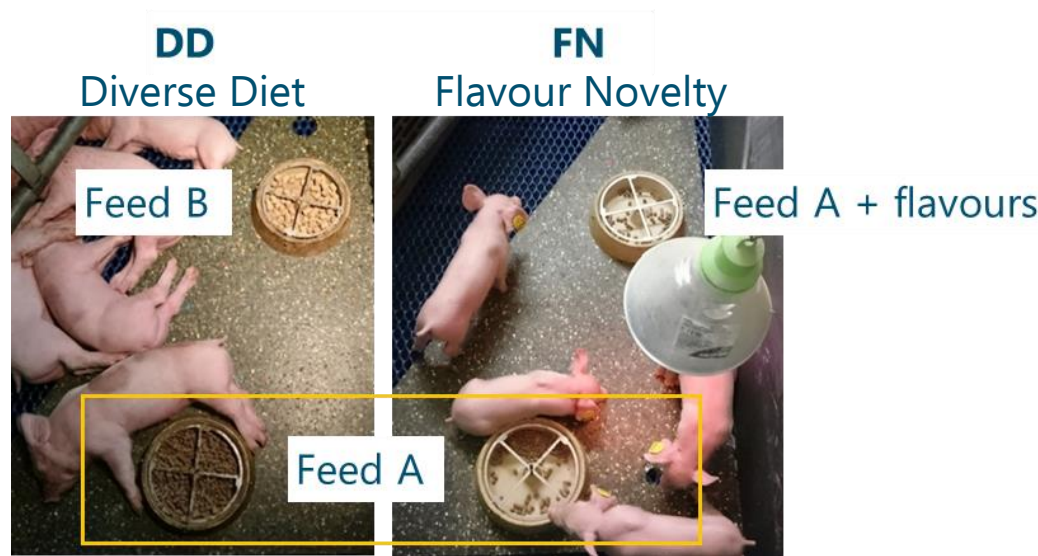
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Flavour Novelty



Middelkoop et al., 2018

Dietary diversity



➤ Diverse diet vs. flavour novelty
↑ 1 kg/litter, d2-22

Middelkoop et al., 2018

Dietary diversity



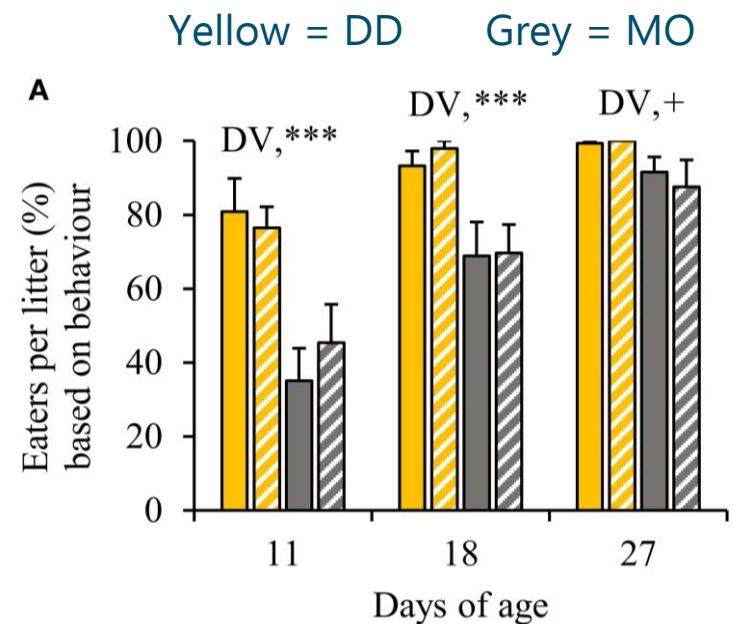
Middelkoop et al., 2019

Dietary diversity



- Diverse diet (DD) vs. monotonous diet (MO): ↑ 1 kg/piglet, d4-28

Feed intake, g/piglet	DD	MO	P-value
d4-12	72 ± 17	9 ± 6	<0.0001
d12-19	206 ± 38	64 ± 17	<0.001
d19-23	291 ± 53	58 ± 14	<0.001
d23-28	696 ± 96	129 ± 18	<0.001
Total, d4-28	1267 ± 169	260 ± 38	< 0.0001



Middelkoop et al., 2019

Dietary diversity

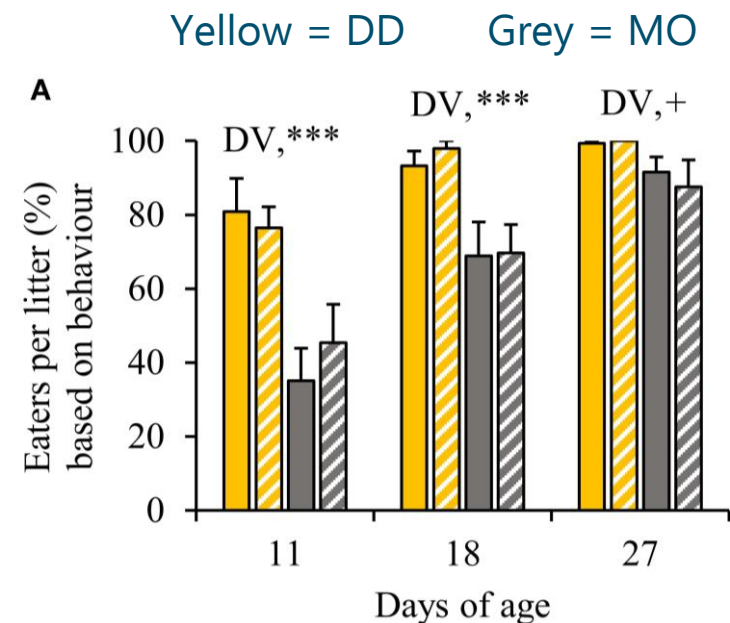


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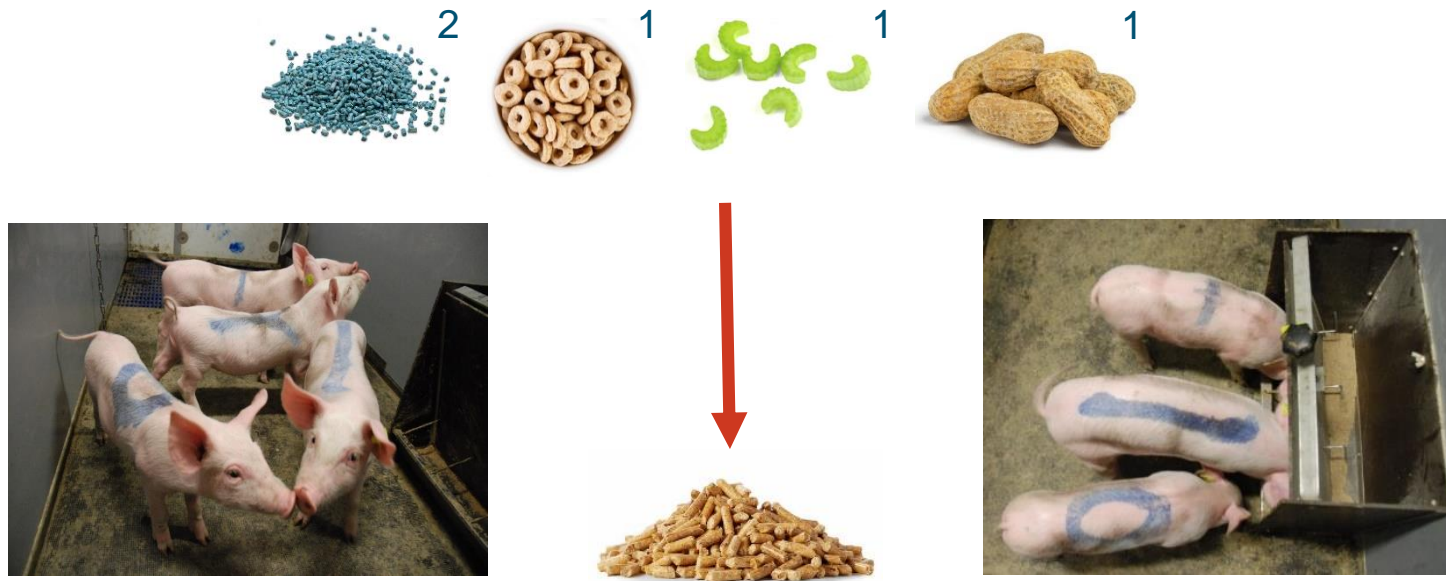
Creep feed intake, g/piglet

d4–12	6 ± 2	9 ± 6	0.82
d12–19	37 ± 10	64 ± 17	0.07
d19–23	44 ± 12	58 ± 14	0.49
d23–28	92 ± 21	129 ± 18	0.17
Total, d4–28	178 ± 34	260 ± 38	0.08



Middelkoop et al., 2019

Dietary diversity

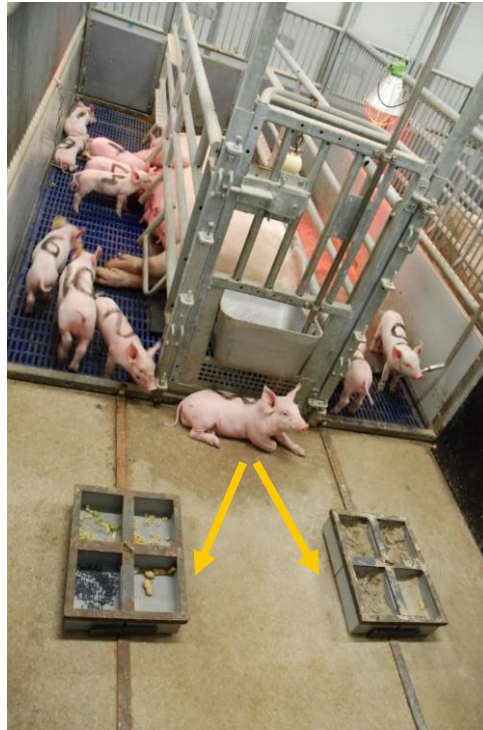


Pre- and post-weaning feeding management should match

Food seeking in sand



- Feed hidden in substrate (SUB), which was sand, or not (CON)



- Sand did not affect creep feed intake or number of eaters (SUB vs. CON)
- Piglets preferred to explore and eat from the feeder with sand (within SUB)

Middelkoop et al., 2019

Food seeking in sand



Negative effects post-weaning (no sand any longer):

↓ feed intake, growth, body weight at d15

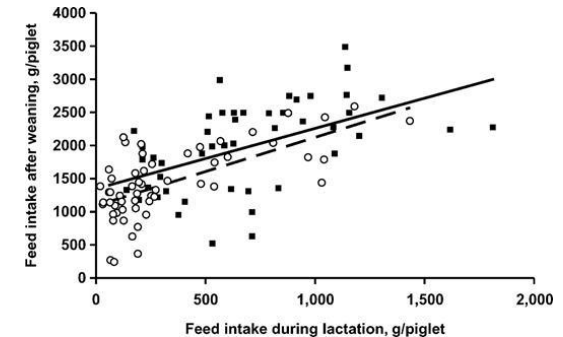
↑ manipulation & aggression, number of body lesions

Pre- and post-weaning management should match

Feed intake or composition: what's more important?

➤ Learn how to eat: prepare piglets behaviourally
→ dietary transition less stressful

➤ Learn how to digest: prepare piglets physiologically
→ less stress on the gut (microbiota)



Kuller et al., 2004

	Creep feed	Weaner diet	Sow feed
<i>Pre-weaning feed intake, g/litter/day</i>			
D14-28	441 ^a	393 ^b	314 ^b
<i>Post-weaning, D0-14, g/pig/day</i>			
Feed intake	328 ^b	369 ^a	333 ^b
Body weight gain	217 ^b	261 ^a	231 ^{ab}

Heo et al., 2018

Effect of creep feed provision on post-weaning feed intake depends on cereal source in weaner diet
e.g. barley, rice-wheat bran, corn, naked oats

Torrallardona et al., 2012

Overview of the strategies in this thesis

Pre-weaning strategy	Pre-weaning effects on feeding	Post-weaning effects when strategy stops at weaning	Post-weaning effects when strategy continues
Environmental enrichment	✓	X	✓
Play-feeder	for slow-growing litters	✓	not studied
Dietary diversity	✓	±	not studied
Food seeking in sand	±	X	not studied

What did we learn?

- Play-feeder was the best in improving post-weaning performance and behaviour
- Dietary diversity was the best in stimulating pre-weaning feeding behaviour
- The intake of creep feed is driven by a low milk intake, play and exploration
- The intake of creep feed may, just like enrichment, improve the welfare and productivity of piglets

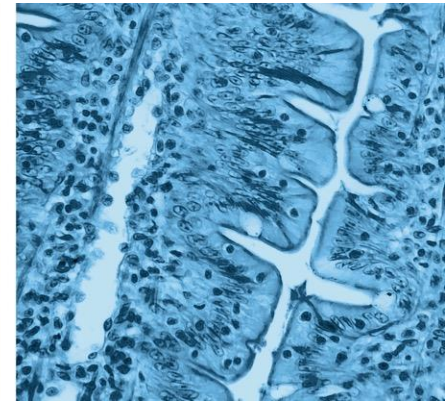
Prerequisite: Housing & management pre- & post-weaning should match

Take home message

- Pay extra attention to creep feeding litters reared by sows with a low feed intake
- Pre- and post-weaning diet composition and management should be aligned

Young piglets should get the opportunity to forage and play, and this possibility should be retained in the growth phases that follow





Thank you for your attention

amiddelkoop@schothorst.nl