

**SUSTAINABLE PROTEIN
SOURCES PEAS AND LUPINS
REPLACE SOY PROTEIN IN
PIGLET DIETS**

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AGENDA



BACKGROUND



**2 DIGESTIBILITY
STUDIES SOYA VS
LUPINS AND PEAS**



**PERFORMANCE
TRIAL PIGLETS**



**CONCLUSIONS AND
IMPLICATIONS**

AGENDA



BACKGROUND



SOY VERSUS LUPINS AND PEAS

- **Soy**

- World production of soybeans in 2022 was app. **350 million mtons** (Wikipedia), of which app. 3% in the EU.
- Import from US, Brasil, Argentina → Sustainability (CO2-eq.) depending mainly on land use, not on transport distance.
- Soy bean meal (SBM) still most used protein source in animal feed
- GMO or non-gmo



- **Lupins**

- World production 2022 (Tridge.com): **2 million mtons**, 58% Australia, 22% Poland, 3.3% Germany, 0.05 % Fr. Total EU: 26%.
- Hard beans, difficult to mill, bitter taste in some varieties.
- Non-GMO



- **Peas**

- World production of dry peas is app. **14 million mtons** in 2023 (Tridge.com): 28% Russia, 19% Canada, 14% EU (mainly Romania, Germany, France)
- Non-gmo



NUTRIENT VALUES OF SOYBEANMEAL, LUPINS AND PEAS

		Soybean meal Super Hypro	Sweet lupin	Peas
Crude protein	g	493	323	195
Crude fat	g	36	70	18
Crude fibre	g	35	150	53
Ash	g	63	27	29
Moisture	g	121	105	143
Starch-E	g	58	94	387
Sugars	g	89	53	43
FC	g	219	372	138
IC	g	26	54	69
Ca	g	2.7	2.4	1.1
P-tot	g	6.5	2.8	4.4
dP-Pig	g	2.5	1.4	2.0
K	g	22.3	8.2	11.0
NEv	MJ	8.8	8.9	9.6
CO ₂ -eq. total	g	4325	1106	983

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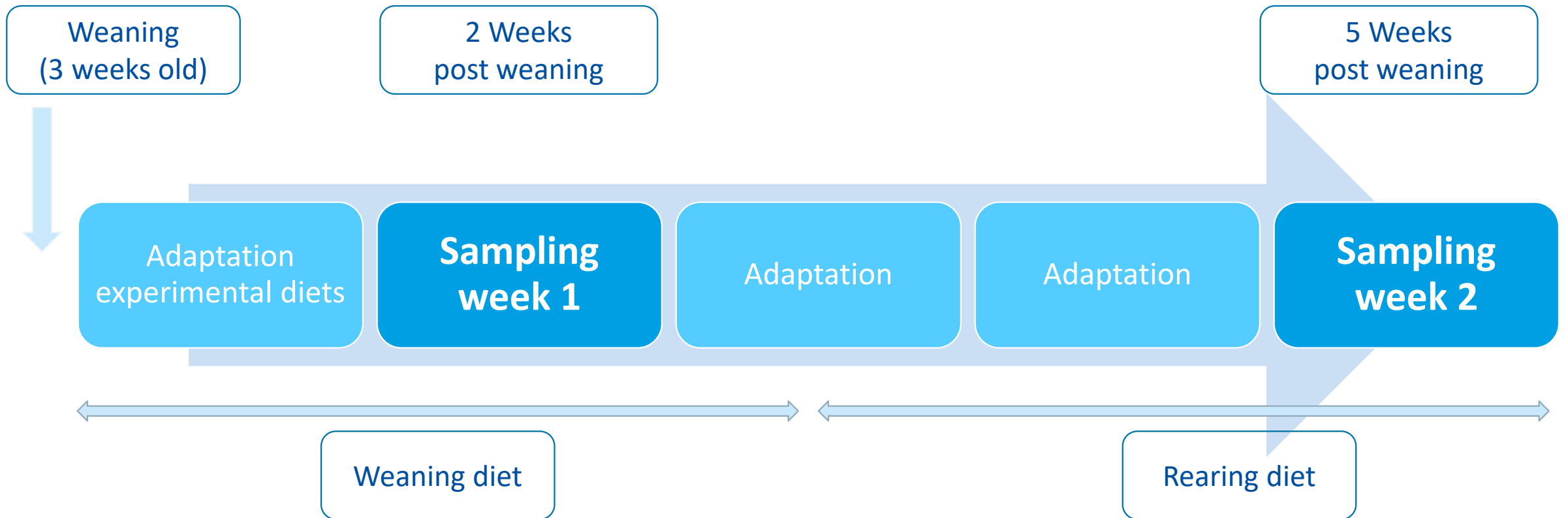
**2 DIGESTIBILITY
STUDIES SOYA VS
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DIGESTIBILITY TRIAL WITH SOY AND LUPINS

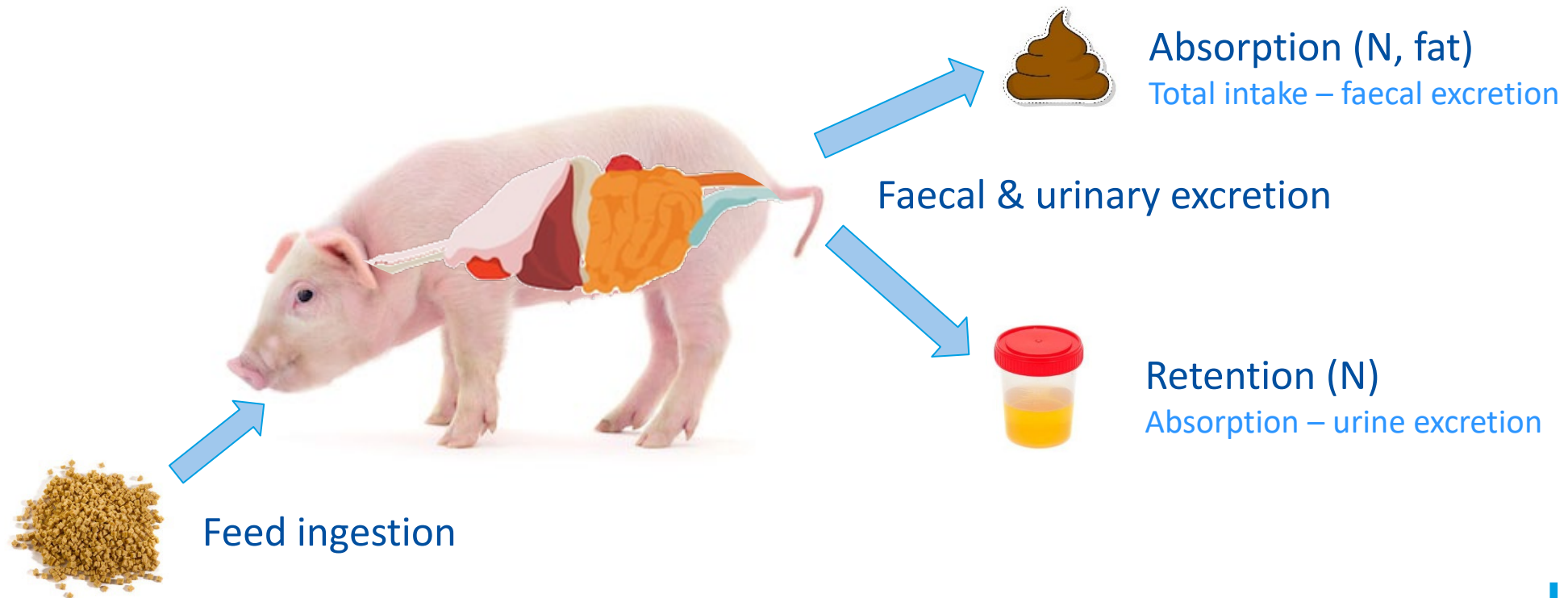
- Digestibility department at Denkavit Innovation Centre
- Housed in digestibility cages
 - 2 piglets per cage
 - 48 cages per treatment
 - n=96 piglets
- Piglets are fed semi-*ad libitum*
 - 3.2x maintenance requirements.



TRIAL OVERVIEW



DIGESTION, ABSORPTION AND RETENTION

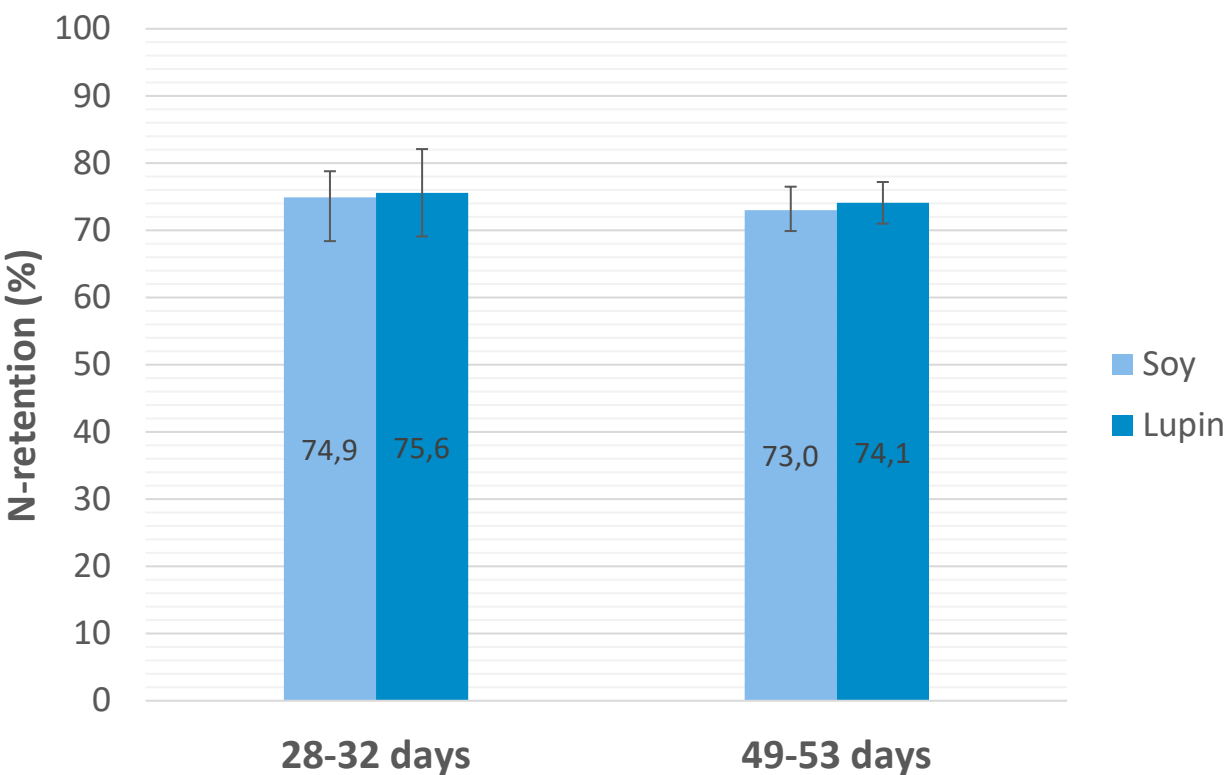
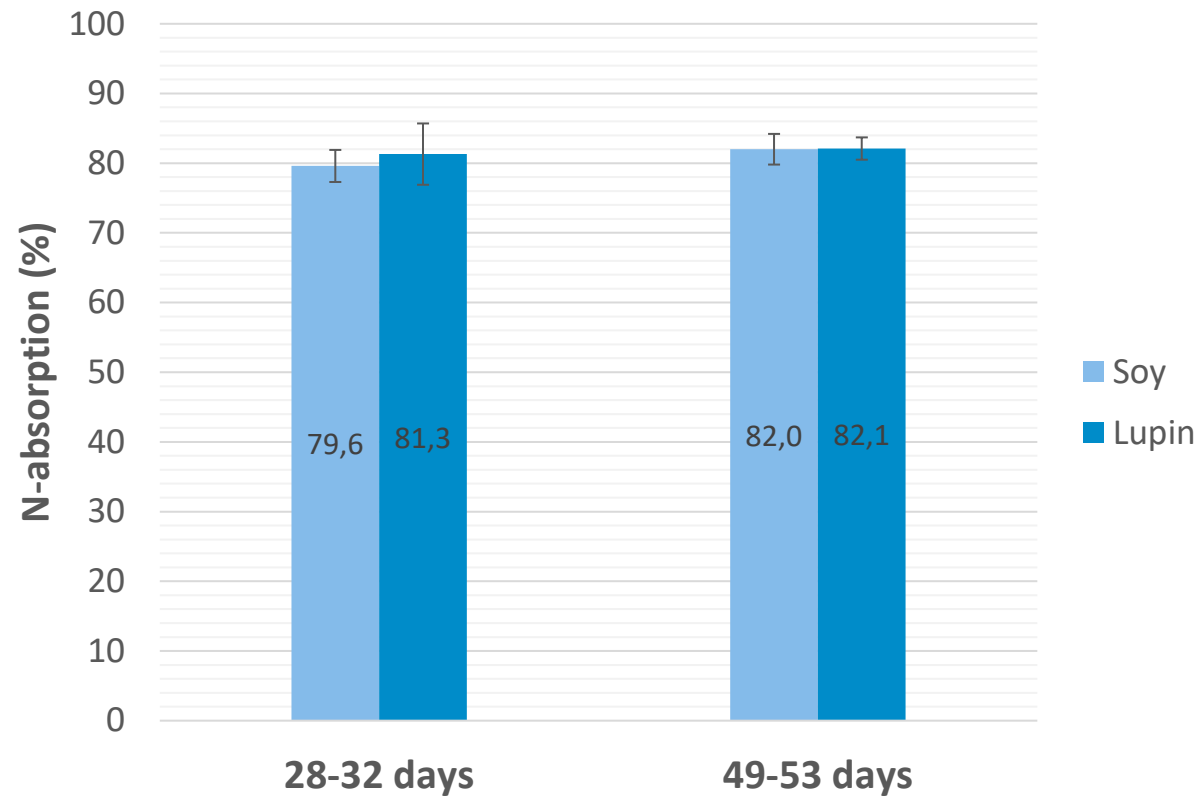


DIETS

		Diet Soya	Diet Lupins
Weaning diet (day 1-16 p.w.)			
Soybean meal HP	%	17.83	5.33
Lupins sweet	%		19.05
Rearing diet (17-35 p.w.)			
Soybean meal HP	%	12.85	
Soybeans toasted	%	10.27	10.49
Lupins sweet	%		19.58

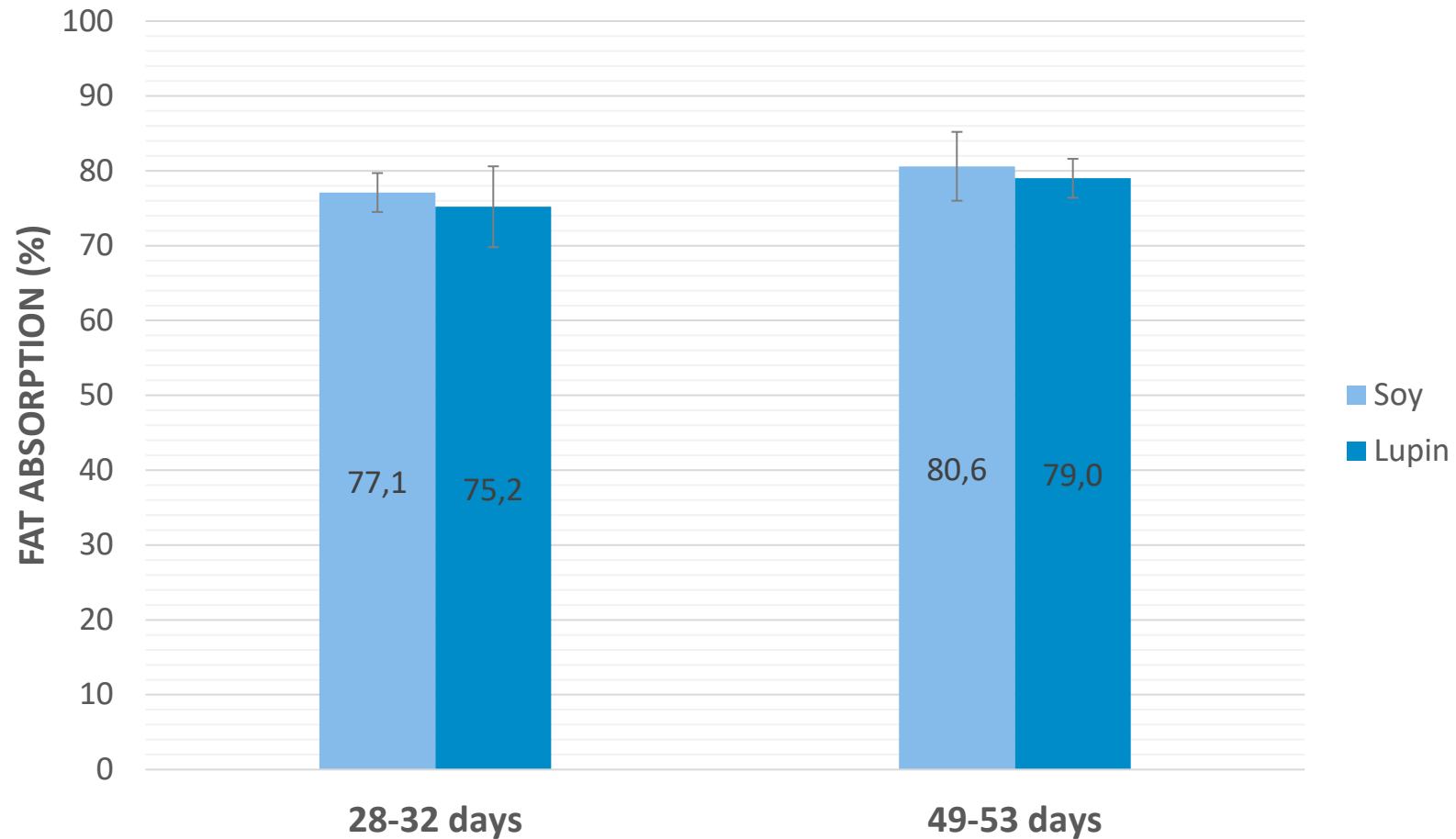
N-ABSORPTION AND RETENTION OF DIETS WITH SOY OR LUPINS

- N-absorption (%) and N-retention (%) of both diets were not significant different.



FAT ABSORPTION OF DIETS WITH SOY OR LUPINS

- Fat absorption (%) of both diets was not significant different.



DIGESTIBILITY TRIAL WITH SOY AND PEAS - OVERVIEW

Weaning
(3 weeks old)

Adaptation
weaning diet

**Sampling
day 8-12 p.w.**

Adaptation
rearing diet

**Sampling
day 22-26**

Weaning diet with 7.5% peas

Rearing diet with 15% peas

DIETS

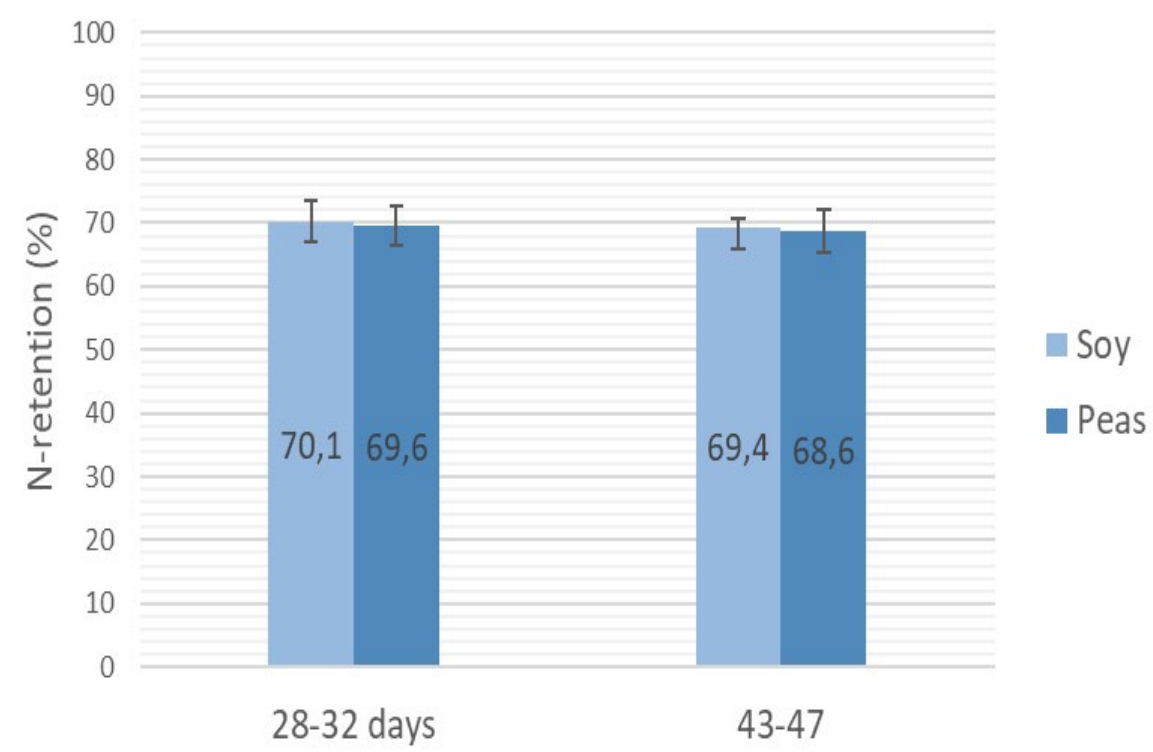
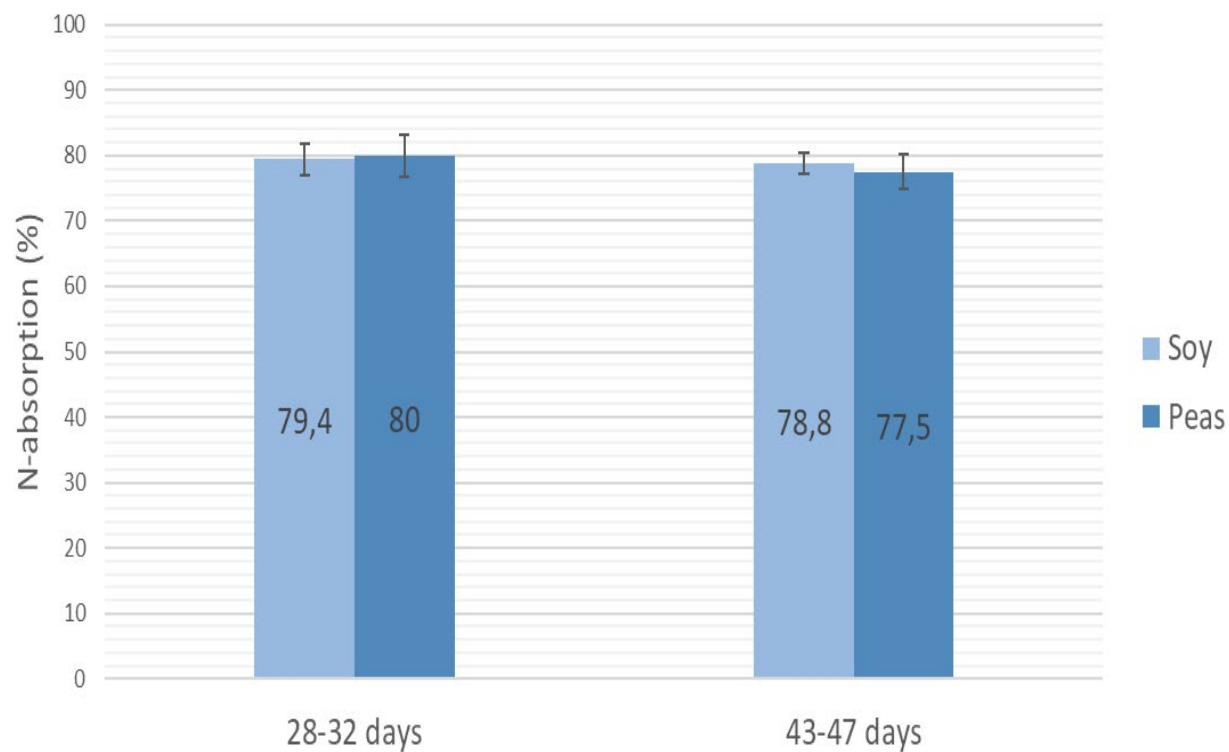
		Diet Soya	Diet Peas
Weaning diet (day 1-14 p.w.)			
Soybean meal HP	%	17.87	14.32
Barley	%	49.40	45.22
Peas	%		7.50
Rearing diet (15-35 p.w.)			
Soybean meal HP	%	8.31	1.23
Barley	%	24.78	16.35
Peas	%		15.00

Diets were reformulated to have similar nutrient levels



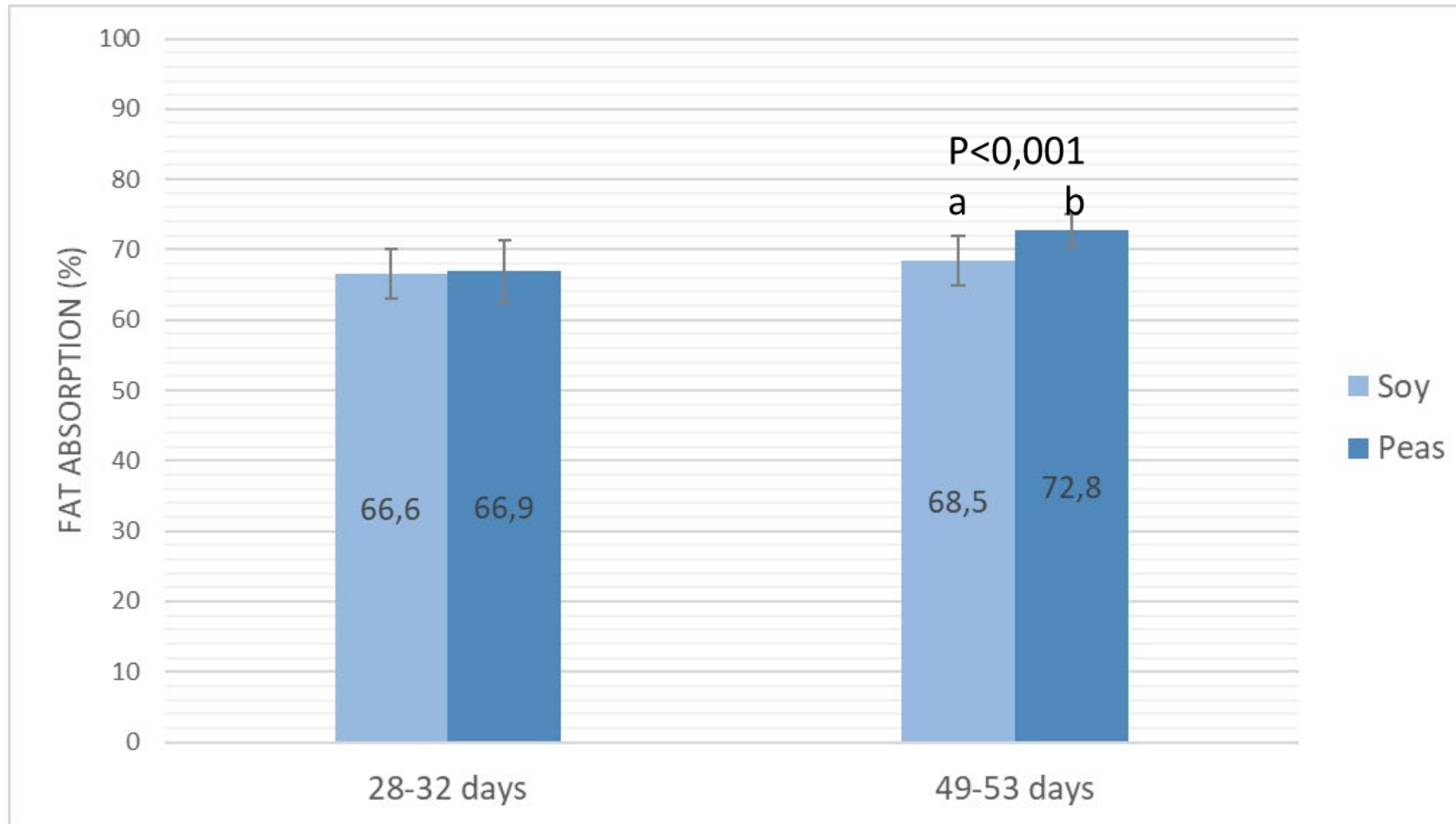
DIGESTIBILITY TRIAL WITH SOY OR PEAS

- No significant differences in N-absorption or N-retention.



DIGESTIBILITY TRIAL WITH SOYBEANMEAL AND VS PEAS

- Fat absorption (%) was significantly higher for diet with peas compared to soya in the 4th week p.w.



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**PERFORMANCE
TRIAL PIGLETS**



DIETS IN PERFORMANCE TRIAL WITH SOYABEANMEAL, LUPINS OR PEAS

- 3 treatments, 130 piglets per group, 6 piglets per pen, 22 replicates per group, weaning age 27 days.

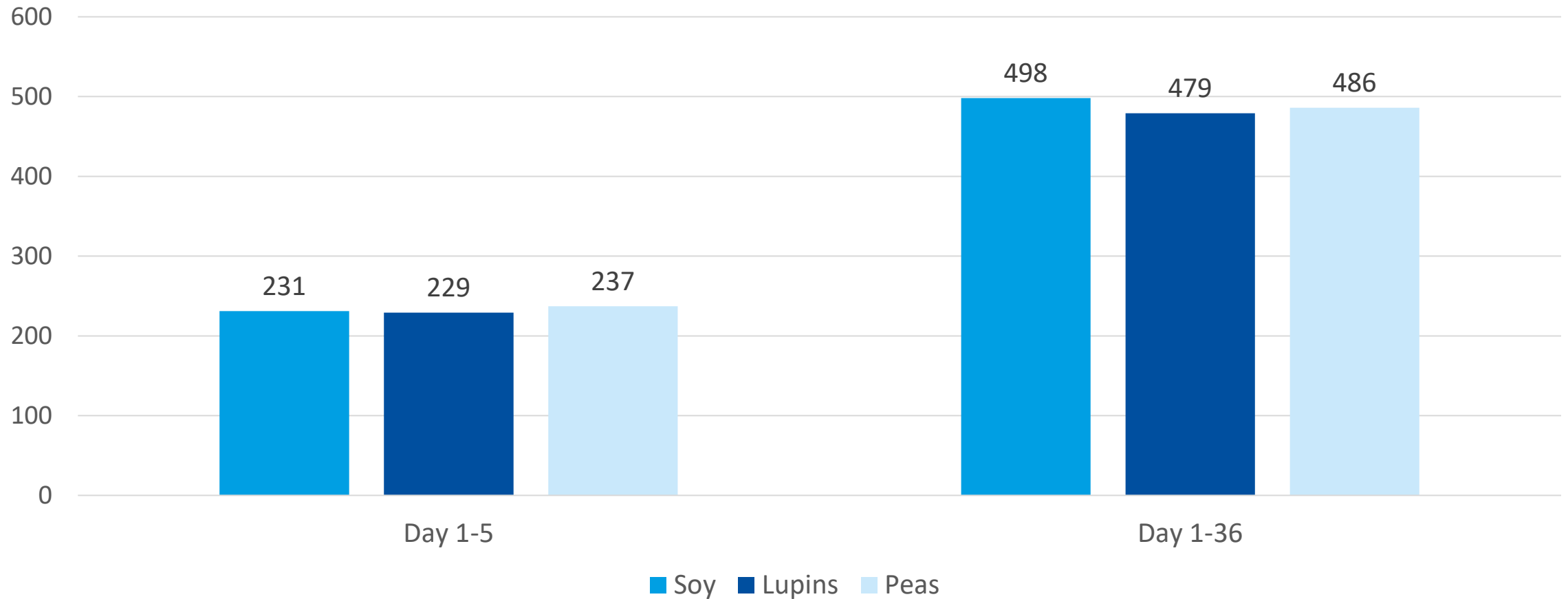
		Diet soya	Diet lupins	Diet peas
Weaning diet (day 1-14 p.w.)				
Soybean meal HP	%	17.83	14.77	15.89
Lupins sweet	%		5.27	
Peas	%			7.50
Rearing diet (15-35 p.w.)				
Soybean meal HP	%	15.27	9.18	11.18
Lupins sweet	%		10.53	
Peas	%			15.00

DIETS –NUTRIENT VALUES

	with soy	with lupins	with peas
Weaning diet			
Crude protein (%)	17.7	17.7	17.7
Crude fat (%)	4.4	4.5	4.1
Crude fibre (%)	3.3	3.9	3.4
Ash (%)	5.4	5.3	5.4
NE (MJ)	10.0	10.0	10.0
AID Lysine (%)	1.0	1.0	1.0
CO2-eq. total	906	895	886
Rearing diet			
Crude protein (%)	18.0	18.0	18.0
Crude fat (%)	3.6	4.0	3.2
Crude fibre (%)	3.6	4.8	3.8
Ash (%)	5.1	4.9	5.0
NE (MJ)	9.8	9.8	9.8
AID Lysine (%)	1.1	1.1	1.1
CO ₂ -eq. total	871	849	833

PERFORMANCE OF PIGLETS FED DIETS WITH SOYABEANMEAL VS PEAS VS LUPINS

No significant effect on daily weight gain of weaned piglets fed diets with soy, lupins or peas.



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**CONCLUSIONS AND
IMPLICATIONS**

CONCLUSIONS AND IMPLICATIONS

- These two digestibility studies and the performance study showed that in weaned piglets lupins and peas are good replacers of soybeanmeal without effect on technical performance.
- Compared to gmo-soya the diet price will increase.
- Using lupins and peas to replace soya HP from Brasil is a first step to reduce the CFP (CO2-eq.). Further testing with complete soy-free diets are planned.
- Recommended inclusion % :
 - 0-2 wks p.w: max. 5% lupins & max. 7.5% peas.
 - 2-5 wks p.w.: max. 10% lupins & max. 15% peas.

