PNPh5.5
Rearing of entire male pigs in a “farrow-to-finish-system” – effects on boar taint substances and animal welfare

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Background

- **Prosject: ”Slaughter of pigs at low age / weight”**
- **Aggressive / sexual behaviour in entire male pig production**

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Aims of the study

- **Investigate if keeping the littermates together in stable groups (”Farrow to Finish System”) compared to groups with pigs mixed from 3 litters will**
  - **influence puberty**
  - **affect the levels of androstenone and skatole**
  - **affect aggressive and sexual behaviour**
  - **affect the occurence of skin wounds**

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Study design

- **3 FTF-herds**
  - **min. 200 male pigs yearly**
  - **batch farrowing**
  - **carcass weight: 80 kg**
  - **3 slaughter rounds per herd**

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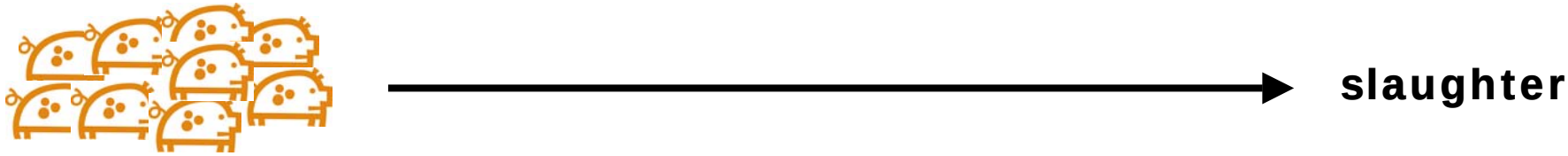
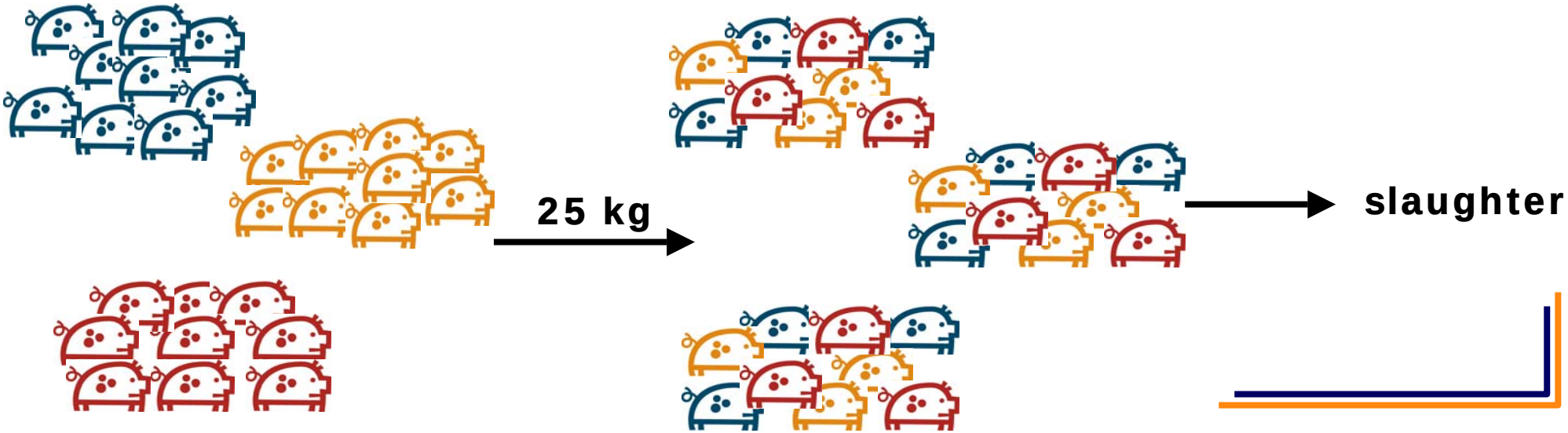
Study design

- **FTF group (entire male pigs + sows)**



- **Control group (entire male pigs + sows)**



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The herds

	Herd 1	Herd 2	Herd 3
Feed / feeding	Wet feeding – self composed	Dry feeding	Wet feeding – concentrate
Number of animals	529	452	372
Carcass weight	79kg	76kg	75 kg
Age at slaughter (days)	155	139	145
Daily weight gain	754 g	804 g	766 g
Androstenone (FTS) (mean / median)	1.06 / 0.76	2.09 / 1.69	0.91 / 0.76
Skatole (FTS) (mean / median)	0.08 / 0.06	0.11 / 0.07	0.06 / 0.05

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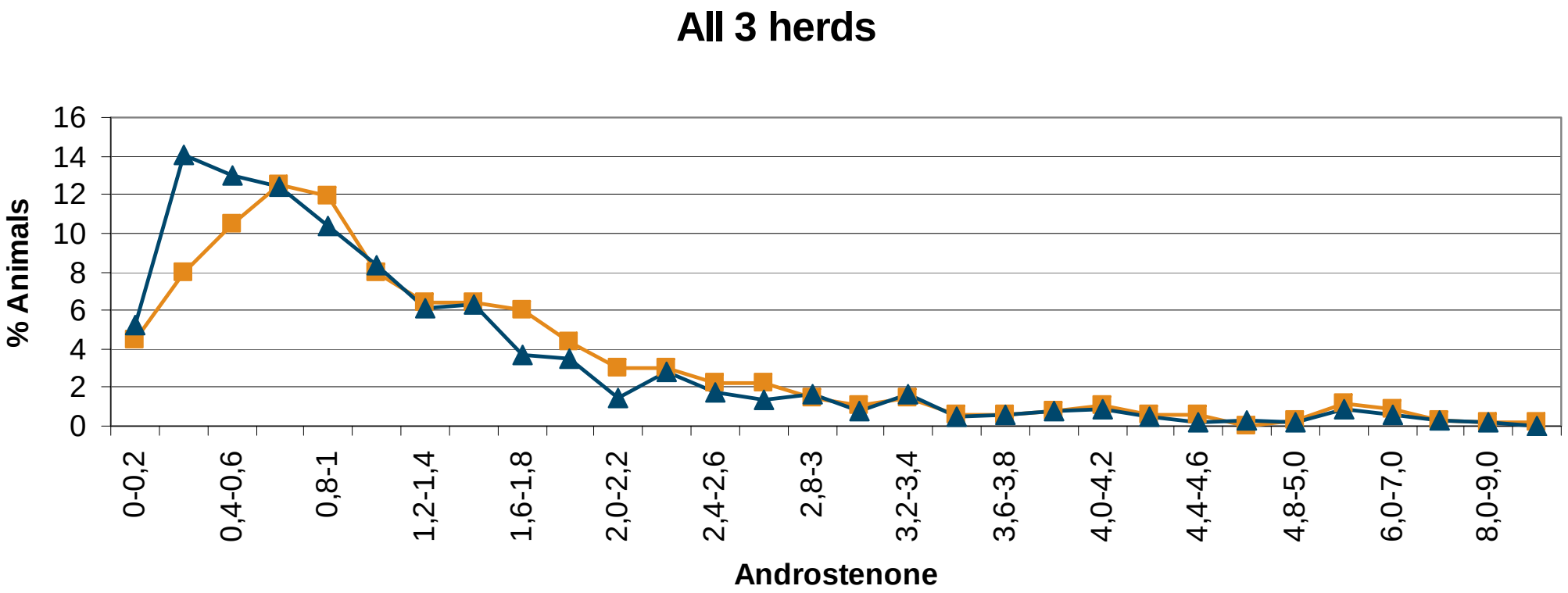
Androstenone-level per group



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Results of final general linear model with androstenone level as outcome variable

Factor		Adjusted LSM (µg/g)	95 %CI	P-value (likelihood ratio)
Herd	1	0.74	0.64-0.84	<0.0001
	2	1.62	1.48-1.77	
	3	0.70	0.60-0.80	
Group	**FTF**	**0.85**	**0.76-0.96**	**<0.0001**
	Control	**1.03**	**0.93-1.15**	
Quarter of the year	I	0.95	0.80-1.12	<0.0001
	II	0.99	0.87-1.13	
	III	1.09	0.91-1.30	
	IV	0.76	0.68-0.85	
Breed	Noroc	1.07	1.01-1.14	0.02
	Landswine/Yorkshire	0.95	0.80-1.15	
	Landswine	0.81	0.67-1.02	

$R^2 = 0.25$

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Results of final general linear model with skatole level as outcome variable

Factor		Adjusted LSM (µg/g)	95 %CI	P-value (likelihood ratio)
Herd	1	0.065	0.060-0.070	<0.0001
	2	0.075	0.070-0.080	
	3	0.050	0.045-0.060	
Quarter of the year	I	0.055	0.045-0.060	<0.001
	II	0.065	0.060-0.070	
	III	0.075	0.065-0.080	
	IV	0.065	0.060-0.070	

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Pecentage of animals to be sorted out according to levels of androstenone and/or skatole

				Skatole > 0.2 and/or
		Skatole > 0.20	Androstenone > 1.0	Androstenone > 1.0
Herd 1	FTF group	6.7	29,1	31.9
	Control group	8.0	42.9	43.6
Herd 2	FTF group	10.7	77.3	78.5
	Control group	13.2	78.5	79
Herd 3	FTF group	1.5	26.5	27
	Control group	4.0	35.8	36.4
Total	FTF group	6.6	44.8	46.4
	Control group	8.7	52.7	53.3

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Measures of puberty

	FTF	Control	p-value
Weight of both testis (g)	368	381	0.003
Weight of gl. bulbouretralis (g)	105	112	<0.001
Length of gl. bulbouretralis (cm)	10,6	10,8	0.02

LSM adjusted for herd, breed, age and quarter of the year

Study design - aggressive and sexual behaviour

FTF-group (entire males + sows)

Mix-group (entire males + sows)

Control group (sows + barrows)

- One herd
- 4 entires/barrows per pen (15 pens/60 animals per group)
- Registrations at two feedings
  - bites
  - mounting
  - head knocks

Results - behaviour

	Average frequency of behaviour per observation period and group			Kruskal-Wallis test	
	FTF-group	Mix-group	Control group (sows and barrows)	Individual level	Pen level
Biting	1.48a	2.47b	0.70a	<0.0001	0.003
Head knocks	1.56a	2.30b	0.96c	<0.0001	<0.001
Mounting	0.13a	0.23a	0.009b	0.04	0.15

a,b,c Indicates differences between the groups for each of the factors significant at 5% level

Study design - skin wounds

Herd I

FTF-group (entire males + sows)

Mix-group (entire males + sows)

Control group (sows + barrows)

Herd II

FTF-group (entire males + sows)

543 animals

Mix-group (entire males + sows)

635 animals

660 animals

Study design - skin wounds

- **Two slaughter rounds**
- **<u>All pigs</u> (entires, sows and barrows) inspected 14 days before slaughter**
- **Individual recording**
  - **front (0-3)**
  - **back (0-3)**

➔ **Index per animal**

Results - skin wounds

		Average index per herd, round and group		
		FTF	MIX	Control
Herd I	1. Round	0.29	0.61	0.31
	2. Round	0.62	0.78	0.31
Herd II	1. Round	0.23	0.39	
	2. Round	0.51	0.83	
Total, adjusted for registrator		0.32	0.55	0.34

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Conclusions

- **Compared to groups of pigs mixed with other litters at 25 kg live weight, the FTF system resulted in**
  - **Reduced levels of androstenone in fat**
  - **Delayed onset of puberty**
  - **Reduced frequency of aggressive behaviour**
  - **Reduced frequency of skin wounds**

→ Improved animal welfare in entire male pig production

- **But**
  - **The level of androstenone is still high (0,83 microgram / gram)**
  - **Factors as herd, breed and season affect the androstenone level significantly**

➔ **We still have a long way to go to solve the problem**