



Growth Performance and Semen Quality of Stress Negative Piétrain Pigs and Their Hybrids with Duroc in Vietnam

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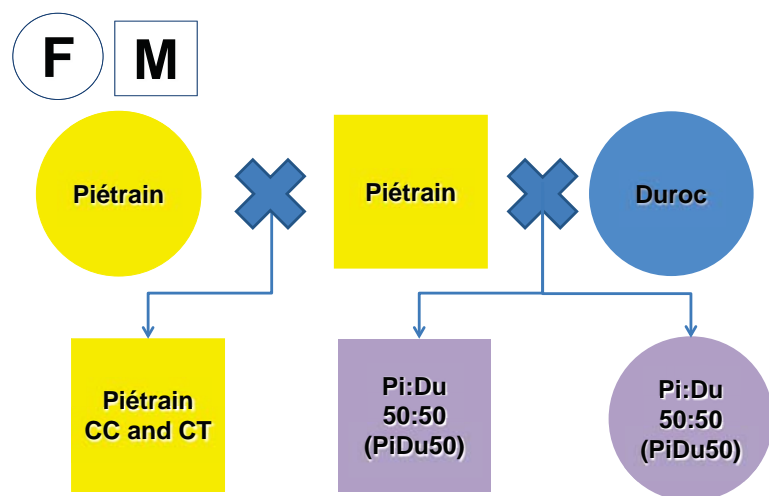
Introduction

- Stress-negative Piétrain pig (Piétrain RéHal) was developed from classical Piétrain by the Faculty of Veterinary Medicine, University of Liège, Belgium
- Since 2007, these animals have been raising under tropical conditions in North Vietnam
- Piétrain RéHal is used not only as a terminal boar but also as a genetic resource for the production of hybrid boars with Duroc

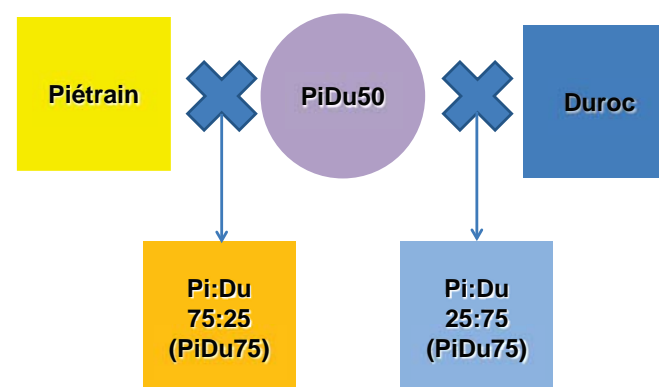
Introduction

- In Vietnam, most of crossbred boars between Piétrain and Duroc (PiDu) are provided by private companies and used as terminal boars under industrial conditions as well as household farm conditions
- So far little attention has been paid to genetic constitution of PiDu boars.
- The objectives of this study were to evaluate the growth performance and semen quality of pure Piétrain boar and Piétrain x Duroc hybrid boars with different genetic components.

Material and Methods



Material and Methods



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• Animal

A total of 41 boars:

Halothane genotype CC

8 PiDu25

14 PiDu50

8 PiDu75

5 Piétrain

Halothane genotype CT

6 Piétrain

Material and Methods

- Growth performances: February 2009 to April 2011
 - Starting weight (BW60, kg)
 - Finishing weight (BW225, kg)
 - Average daily gain (ADG, g/day)
 - Backfat thickness (BF, mm)
 - Longissimus depth (LD, mm) between the third and fourth last ribs
 - Lean meat content (LM, %) was estimated from BF and LD using the regression equation

Material and Methods

- Sperm traits: January 2010 to November 2012
 - Ejaculation volume (VOL, ml)
 - Spermatozoon motility (MO, %)
 - Sperm concentration (CO, $\times 10^6/\text{ml}$)
 - Total number of spermatozoon per ejaculate (NT, $\times 10^9/\text{ejaculate}$)
 - Rate of abnormal spermatozoon (R, %)
 - pH of semen (pH)

Results and Discussion

Table 1. Results of the effect of genetic group (PiDu 25, 50 75, PiCC and PiCT) and season on growth performance and semen quality

Variable	Genetic group	Season	R ²
Body weight on 60 days of age (kg)	NS	-	13.77
Bodyweight on 225 days of age (kg)	**	-	36.34
Average daily gain (g/day)	***	-	51.11
Backfat thickness (mm)	**	-	34.97
Longissimus depth (mm)	***	-	42.52
Lean meat percentage (%)	***	-	53.36
Ejaculation Volume (ml)	***	NS	36.79
Spermatozoon Motility (%)	***	***	18.82
Sperm Concentration ($\times 10^6/\text{ml}$)	***	***	24.82
Total number of spz ($\times 10^9/\text{ejaculate}$)	***	**	23.87
Rate of abnormal spermatozoon (%)	***	NS	14.31
pH of semen	***	***	16.32

-.: season effect was not tested

NS: not significant, *: $P < 0.05$, **: $P < 0.01$, ***: $P < 0.001$, R²: coefficient of determination

Material and Methods

Statistical analysis

- Growth performance (BW and ADG) were analysed using a linear model including the different genetic groups (PiDu25, PiDu50, PiDu75, PiCC and PiCT) considered as a fixed effect.
- For the sperm quality, the different genetic groups and the seasons (Spring, Summer, Autumn and Winter) were the only effects included in the model.

Results and Discussion

Table 2. Production performance, Least square means (LSM) of PiDu and Piétrain boars

Variable	PiDu25 (n=8)	PiDu50 (n=14)	PiDu75 (n=8)	PiCC (n=5)	PiCT (n=6)
BW60 (kg)	16.05	16.92	18.08	17.01	14.49
BW225 (kg)	118.27 ^a	119.67 ^a	113.88 ^{ab}	107.17 ^{ab}	101.22 ^b
ADG (g/ngày)	624.09 ^a	635.07 ^a	577.48 ^{abc}	552.93 ^{bc}	516.00 ^c
BF (mm)	11.96 ^a	10.79 ^{ab}	8.96 ^b	8.72 ^b	8.42 ^b
LD (mm)	51.46 ^a	57.08 ^b	57.44 ^b	57.64 ^b	61.65 ^b
LM (%)	59.02 ^a	61.55 ^{ab}	63.57 ^{bc}	63.87 ^{bc}	65.11 ^c

BW60: Bodyweight on 60 days (kg), BW225: Bodyweight on 225 days (kg), ADG: Average daily gain (g/day), BF: backfat thickness (mm), LD: longissimus depth (mm), LM: Lean meat percentage (%)

- Least square means with differing letters in each row within an effect differ ($P < 0.05$)

- Pi: Piétrain, Du: Duroc, CC and CT: halothane genotypes

Results and Discussion

Table 3. Semen quality, Least square means (LSM) of Piétrain x Duroc hybrids and Piétrain boars according to genetic group

Variable	PiDu25 (n=65)	PiDu50 (n=79)	PiDu75 (n=31)	PiCC (n=111)	PiCT (n=42)
VOL (ml)	217.20 ^{ab}	241.66 ^a	154.11 ^d	299.46 ^c	201.10 ^b
MO (%)	78.14 ^a	76.53 ^{ab}	79.20 ^{ac}	80.49 ^c	75.19 ^b
CO (x10 ⁶ /ml)	553.44 ^a	502.59 ^{ab}	425.47 ^{bc}	400.33 ^c	334.02 ^c
NT (x10 ⁹ /ej.)	92.45 ^a	93.99 ^a	53.78 ^b	92.27 ^a	49.83 ^b
R (%)	3.92 ^a	5.60 ^{bc}	1.86 ^d	4.67 ^{ab}	6.25 ^c
pH	7.49 ^a	7.52 ^a	7.71 ^b	7.44 ^a	7.45 ^a

- VOL: ejaculation volume (ml), MO: spermatozoon motility (%), CO: sperm concentration (x10⁶/ml), NT: total number of spermatozoon in ejaculate (x10⁹/ejaculate), R: rate of abnormal spermatozoon (%), pH: pH of semen

- Least square means with differing letters in each row within an effect differ (P<0.05)

- Pi: Piétrain, Du: Duroc, CC and CT: halothane genotypes

Results and Discussion

Table 4. Semen quality, least square means (LSM) of Piétrain boars and their hybrids as influenced by season

Variable	Spring (n=51)	Summer (n=84)	Autumn (n=144)	Winter (n=49)
VOL (ml)	206.25	221.63	231.90	231.04
MO (%)	80.33 ^a	76.81 ^a	77.82 ^a	76.68 ^b
CO (x10 ⁶ /ml)	467.96 ^a	392.79 ^b	394.92 ^b	517.01 ^a
NT (x10 ⁹ /ej.)	80.45 ^{ab}	66.87 ^b	70.06 ^b	88.49 ^a
R (%)	3.69	4.62	4.72	4.81
pH	7.63 ^a	7.49 ^b	7.61 ^a	7.37 ^b

- VOL: ejaculation volume (ml), MO: spermatozoon motility (%), CO: sperm concentration (x10⁶/ml), NT: total number of spermatozoon in ejaculate (x10⁹/ejaculate), R: rate of abnormal spermatozoon (%), pH: pH of semen

- Least square means with differing letters in each row within an effect differ (P<0.05)

Conclusion

- The Piétrain x Duroc hybrid boars (PiDu25, PiDu50 and PiDu75) have a better growth rate, but lower lean meat percentage in comparison to purebred Piétrain, except PiDu75 boars
- PiDu25, PiDu50 and PiCC boars show high semen quality traits
- The ADGs were similar between hybrids boars but the lean meat percentage of PiDu75 was highest
- This suggests that Piétrain x Duroc hybrid boars, especially PiDu75, should be used as terminal boars to improve lean meat percentage.

Acknowledgement

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Illustrations



Illustrations



Illustrations



Illustrations



Illustrations



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Nông nghiệp Việt Nam

Thanks
for your
attention

