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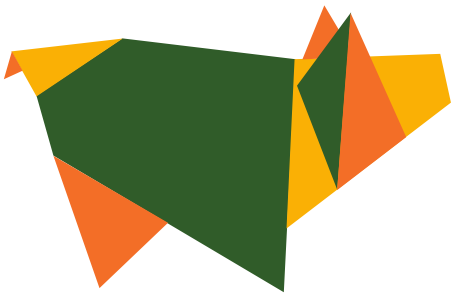

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Achieving breeding targets in weaned sows by not breeding or oestrus checking on day 3 post-weaning. Saving time in a busy world

John Carr. Apiam Animal Health. Carrsconsulting.com. swineunit1@yahoo.com

Introduction

The purpose of breeding a batch of sows is to achieve the target quality and quality of weaned pigs at the allotted weaning age.

Reviewing the physiology of oestrus and ovulation allows for time savings in a busy breeding unit. Ovulation occurs at 70% of the way through standing oestrus and the length of standing oestrus is longer shortly after weaning period than later. Peak conception rates occur 4-6 days postweaning, with mating before day 4 postweaning having a conception rate below 80%[1]. Whilst sperm will survive in the oviducts for 24-48 hours post-insemination the ovulated egg must be impregnated within 6 hours.

Null hypothesis

There is a herd performance advantage in checking for oestrus 1,2, and 3 days post-weaning and breeding any sows in oestrus from day 3 post-weaning.

Materials and Methods

A trial was conducted on a commercial farm with a weekly batch target of 1420; 7.5kg weaners at 27 days of age. This equated to 11 weaned per batch weaning sow from 120 weaned sows per batch. The sows were pure bred Large White and Landrace and the farm was SPF but PRRS positive. The trials were conducted consecutively.

Group 1

Sows were weaned and oestrus checked each day twice post-weaning. Oestrus sows were mated twice (am/am) from day 3 of weaning. There were 156 batches in Group 1 records (3 years)

Group 2

Boar exposure and oestrus-checking only commenced from day 4 post-weaning. Oestrus checking was only conducted once daily in the morning the sows were mated twice (am/am) if seen in oestrus.

There were 104 batches in Group 2 records (2 years).

Note that sows bred after day 7 were considered late sows, as they had missed the batch requirements; breeding targets were achieved with weaned sows, gilts, late sows and returns; and sows were mated by cervical artificial insemination.

The time required for oestrus checking and mating for each trial groups was compared.

Results

Breeding day distribution for weaned sows

Day post-wean	3	4	5	6	7
Group 1 %	10.5	65.6	16.5	4.7	2.7
Group 2 %		64.5	28.4	5.5	1.6

Batch Farrowing Rate analysis

	Group 1	Group 2
μ	87.2	85.4
σ	3.8	3.8
Max	98	98
Min	70	78
10 percentile	83 %	81 %

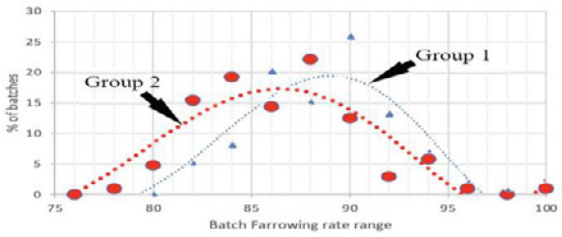

Figure 1. The distribution of batch Farrowing Rate results. Triangles Group 1 mating included day 3 post-weaning. Circles Group 2 mating not including day 3 post-weaning Difference p<0.01.

Weaning number analysis

	Group 1	Group 2
μ	10.4	11.0
σ	8	9.1
Max	13.5	13.7
Min	8	9.1

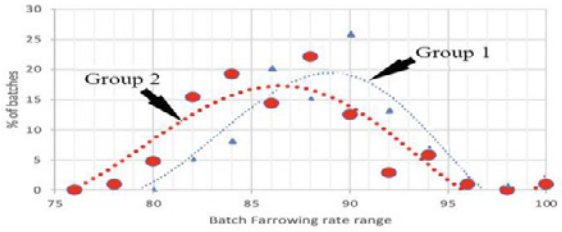

Figure 2. The distribution of batch weaning results. Triangles Group 1 mating included day 3 post-weaning. Circles Group 2 mating not including day 3 post-weaning. Difference p<0.02

Time management

Minimum batch breeding target determined by the 10% percentile (1st decile), to ensure batch is full 90% of the time.

Minimum breeding females		Breeding time h	Oestrus detection h	Total hours
Group 1	145	17.4	10	27.4
Group 2	149	11.9	3	14.9

Discussion and Conclusion

Checking oestrus in sows from day 1 post-weaning and mating from day 3 resulted in a higher farrowing rate %. However, not oestrus checking of sows and mating only from day 4 resulted in a higher number of piglets weaned per sow. As the farm was batching, both systems achieved the required goal of filling all the farrowing places and weaning sufficient piglets.

Leaving the weaned sows until day 4 for oestrus detection and simultaneous mating saves the farm considerable time, while still allowing for batch targets to be achieved, with minimal impact on performance indicators. Single serving would decrease the man-hour time requirements further to only 10 hours.

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Altrenogest supplementation in sows from day 6 to 12 of pregnancy improves piglet performance at birth

Ana C. R. Oliveira[1*]; Bruno B. D. Muro[1]; Rafaella F. Carnevale[1]; Diego F. Leal[2]; Matheus S. Monteiro[1]; André P. Poor[1]; Francisco A. Pereira[1]; Glen W. Almond[2]; Juliana B. Ferreira[2]; Leury J. Souza[3]; Cesar A. P. Garbossa[1]
[1]*School of Veterinary Medicine and Animal Science, University of São Paulo, São Paulo, Brazil;* [2]*North Carolina State University, Raleigh, North Carolina, United States;* [3]*Luiz de Queiroz College of Agriculture, University of São Paulo, Piracicaba, Brazil;* *anaclara0904@usp.br

Introduction

Although it has long been recognized that increasing litter size would increase production's efficiency, significant improvements have not been achieved due to a disproportional increase in prenatal mortality (1). The causes have been linked to embryonic heterogeneity, competition for space and/or nutrients and compromised placental development. All these aspects may influence piglet performance (1,2). Thus, improve early embryo development is essential to achieve a better reproductive performance. Progesterone (P4) plays a crucial role on initial conceptus development once it modulates a specific intrauterine environment (2). However, the effects of P4 or its analogues supplementation on litter performance at birth are unknown. Therefore, the aim of this study was to evaluate the effects of altrenogest supplementation from day 6 to 12 of pregnancy on the number of piglets born, stillbirth rate, piglet birth weight and percentage of piglets born under 800g.

Materials and Methods

A total of 301 females were randomly allocated in two groups: non-supplemented females (NS; n = 163) or females supplemented orally with 20 mg of altrenogest (Regumate® - MSD Saúde Animal) from day 6-12 of pregnancy (ALT; n = 138). The ovulation was considered as occurred 48 hours after the estrus detection to determine the first day of pregnancy. The results are presented as mean ± SEM and were considered significant at $p < 0.05$

Results

The results are shown in Table 1. The treatment increased ($p < 0.05$) the number of total piglets born. The stillbirth rate was lower ($p < 0.05$) in ALT-sows. The sows from both groups had piglets with similar ($p > 0.05$) average birth weight. Additionally, ALT-sows had lower percentage of piglets born under 800 g compared to sows from CON ($p < 0.05$).

Discussion and conclusion

In the present study, the altrenogest supplementation from day 6-12 of pregnancy increased the number of total piglets born. In contrast with our findings, Soede et al. (2012) treated sows with altrenogest prior to day 6 of pregnancy and found reduced number of foetuses at day 42 of pregnancy and litter size at birth. The differences between the studies may be related to the period of altrenogest supplementation. Mathew et al., (2011) demonstrated that progesterone supplementation performed prior to day 6 of pregnancy impairs embryo survival.

Table 1. Effects of altrenogest (Regumate®, MSD Saúde Animal) supplementation from day 6 to 12 of pregnancy on litter performance at birth

VARIABLE	CON[1]	ALT[2]	P-VALUE
Total piglets born (n)	16.6 ± 0.36	17.3 ± 0.37	0.03
Stillbirth rate (%)	7.6 ± 0.58	5.9 ± 0.56	0.02
Birth weight (kg)	1.288 ± 0.02	1.293 ± 0.02	0.80
Piglets born < 800 g (%)	8.0 ± 0.60	6.6 ± 0.56	0.02

[1]CON: non-treated sows; [2]ALT: sows treated with altrenogest (Regumate®, MSD Saúde Animal) from day 6 to 12 of pregnancy

In our study, the altrenogest supplementation from days 6-12 of pregnancy reduced the stillbirth rate and the percentage of piglets born under 800g. Similarly, Muro et al. (2020) demonstrated that sows treated with altrenogest from day 6-12 of pregnancy had greater embryo size and weight at day 28 of pregnancy with no impacts on embryo survival (5). Indeed, other studies demonstrated the positive impacts on uterine environment of P4 or its analogues supplementation during early pregnancy (6,7). An enriched uterine environment may be related to an improvement on conceptus development and, consequently, number of piglets born under 800g and stillbirth rate. In conclusion, altrenogest (Regumate® - MSD Saúde Animal) supplementation from day 6-12 of pregnancy may be used to increase the number of total piglets born as well to decrease the stillbirth rate and the percentage of piglets born under 800g in order to improve productivity and welfare at maternity.

Acknowledgments

The author would like to acknowledge MSD Saúde Animal and Agroceres Multimix for the support to perform the present study.

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Are uterine lymph nodes appropriate specimens for the diagnosis of genital diseases? – A preliminary report

Nina Bauske[1], Christoph Stiebritz[2], Johannes Kauffold[1]
[1]*University Leipzig, Clinic for Ruminants and Swine, Department of Swine and Reproduction, Leipzig, Germany.* [2]*Boehringer Ingelheim Vetmedica, Ingelheim, Germany*
Contact: kauffold@vetmed.uni-leipzig.de

Introduction

Post mortem analyses (PMA) of genital tracts are appropriate in order to help determining reasons for reproductive problems. PMA usually includes gross-morphology and histology of different genital organs (i.e. ovaries, uteri etc.), as well as bacteriology (i.e. of uteri) and mykotoxicology [i.e. for zearalenone (ZEA) and DON], but virology is commonly not. Lymphatic organs are appropriate for the detection of bacterial and viral pathogens for e.g. intestinal or respiratory diseases, but have never been included into PMA. Regional lymph nodes (Lnn) supplying the uterus are often enlarged in females suffering from reproductive problems. It appeared thus reasonable to include these Lnn into PMA, which is reported in this preliminary study.

Materials and Methods

Fifteen genital tracts (including the urinary bladder) of reproductively failed gilts and different parity sows of six farms (1–7 tracts/farm) were submitted for PMA. Fertility problems included e.g. high rates of returns, low/fluctuating pregnancy rates or vaginal discharge. PMA included gross-morphology and histology of different parts of the genital tract (i.e. uterus, cervix, vagina etc.). Uterine specimens (n=8) were submitted for bacteriology and bile samples (n=8) for the analysis of ZEA and DON by HPLC/MS. The regional Lnn located within the broad ligament were collected (bilaterally if available) and stored at -80°C until analysis for PCV2, PRRSV, PPV and also for different chlamydial species by real-time PCR. While detailed information on PCV2 and PRRSV vaccination is not available, all animals had been routinely vaccinated against PPV.

Results

All genital tracts had inflammations in one or more organs tested (Tab. 1), which were mostly sub-acute and moderate to high in severity. All uteri were bacteriologically positive with up to ten different bacterial species, and 6/8 bile specimens mostly severely positive for DON (while ZEA was found only in a few samples in neglectable concentrations; not shown in Tab. 1). Some of the uterine Lnn collected were markedly enlarged. None of them were positive for PCV2, PRRSV and Chlamydia. In contrast, Lnn of 4 animals from 3 farms were tested positive for PPV.

Discussion and Conclusion

Results of this report confirm the validity of PMA in cases of reproductive disorders. While PMA usually includes gross-morphology, histology, bacteriology as well as occasionally also mycotoxicology, a virological examination of genital specimens is rather uncommon. This preliminary report demonstrats that PPV, i.e. a virus that can be linked to reproductive disordes, is detectable in uterine Lnn. This was inspite the fact that animals had been routinely vaccinated with an attenuated PPV vaccine suggesting that infection and replication were still possible. Another interesting observation was that 3/4 PPV positive anaimls were also highly contaminated with DON suggesting that DON may have facilitated a PPV infection. As to whether PPV contributed to the reproductive problems remains, however, unanswered. The fact that other pathogens were not detected in uterine Lnn does not exclude their principal ability to colonize them. Further studies are requested.

Table 1. Results of histology, bacteriology (B; uterus only; number species) and analysis for DON (bile; µg/l), as well as of RT-PCR for PPV (uterine Lnn; ct-value) (n = 15)

n/Farm	Inflamed organs[1]	B	DON[3]	PPV[4]
1/1	V, C, U, S	2	>200	34.0
2/1	V, C, U, S	3	>200	26.4
1/2	V, C, U	5	<10	neg
1/3	V, C, U	2	63.0	neg
1/4	V, C, U, S	---[2]	---[2]	neg
2/4	V, C, U, S	---[2]	---[2]	neg
3/4	V, C, U, S	---[2]	---[2]	neg
4/4	C, U, S	---[2]	---[2]	neg
5/4	V, U, S	---[2]	---[2]	neg
6/4	V, C, U	---[2]	---[2]	34.6
7/4	V, C, U	---[2]	---[2]	neg
1/5	U	1	24.9	neg
2/5	U	3	12.4	neg
1/6	V, C, U, S	10	>200	neg
1/6	V, C, U, S	7	>200	34.0

[1]V = vagina; C = cervix; U = uterus; S = salpinx; [2]--- = not tested; [3]DON plus Deepoxydeoxynivalenol/ 3-Acetyl-Deoxynivalenolund/ 15-Acetyl-Deoxynivalenol; [4] neg = negative

Acknowledgments

The authors thank Dr. Conradts (Official Laboratory for Public and Veterinary Health Saxony, Leipzig, Germany) for performing the real-time PCR.

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Comparison of reproductive performance of sows in herds with partial and complete reproductive vaccination schedules

Padet Tummaruk[1*], Sawang Kesdangsakonwut[2], Rachod Tantilertcharoen[3], Alongkorn Buakhiew[4], Sittikorn Traiyarach[4], Ming Hsun Wu[5], Joaquín Miguel[5]

[1]Centre of Excellence for Swine Reproduction, Department of Obstetrics, Gynaecology and Reproduction, [2]Department of Veterinary Pathology and [3]Veterinary Diagnostic Laboratory, Faculty of Veterinary Sciences, Chulalongkorn University, Bangkok, 10330, Thailand; [4]HIPRA Thailand; HIPRA HQ, Amer (Spain)

E-mail: Padet.t@chula.ac.th

Introduction

Porcine parvovirus (PPV) is a primary cause of reproductive failure in pigs (1,2). In a susceptible herd, sows between 1 to 60 days of gestation are susceptible to PPV infection (2). Under field conditions, a cross-sectional study reveals that 99.0% of the replacement gilts in Thai swine commercial herds are infected with PPV before entering the breeding herd (3). Therefore, awareness on the PPV infection and associated clinical symptoms should be raised. The present study aims to evaluate reproductive performances, especially the evidence of mummified fetuses in sows in relation to PPV vaccination schedule (partial vaccination and complete vaccinations) in large scale swine breeding herds in Thailand.

Materials and Methods

A retrospective study was conducted in two commercial swine breeding herds in Thailand and included data of 78,492 litters from 28,996 Landrace x Yorkshire crossbred sow. The numbers of sow-on-production in each herd were 4,800 and 8,000 sows, respectively. Reproductive performance data including total born, born alive, stillbirth (%) and mummified fetuses (%) were collected and analyzed. The analyses were based on individual records of 44,262 litters from 13,301 sows from PPV partial vaccination schedule herd (i.e., the PPV vaccination is performed only in replacement gilts but not in sows) and 34,230 litters from 15,695 sows from PPV complete vaccination schedule herds (i.e., the PPV vaccination is performed in both replacement gilts and all parities of sows). Multiple analyses of variance (ANOVA) and least-squares means procedure were used to analyze the data.

Results

Reproductive performance of sows from herds with complete and partial vaccination schedules for PPV are presented in Table 1.

Table 1. Reproductive performance of sows in completed and partial PPV vaccination schedules

Variables	PPV vaccination schedule	
	Complete	Partial
Observations	34,227	44,262
Sows	15,695	13,301
Parity	3.7 ± 2.1	3.6 ± 2.0
Total born	13.2 ± 3.4[a]	13.1 ± 3.6[b]
Live born	12.0 ± 3.2[a]	11.8 ± 3.8[b]
Stillbirths (%)	6.5[a]	5.6[b]
Mummified (%)	2.6[a]	4.6[b]
Litters with mummified piglets >30%	0.9[a]	3.3[b]

[a,b] Different superscripts differ at $P<0.05$

Conclusions and Discussion

The incidence of mummified fetuses and the percentage of litters with >30% of mummies in the herd that uses a partial PPV vaccination schedule was significantly higher than the herd that uses a complete PPV vaccination schedule. Therefore, to reduce the percentage of mummified fetuses per litter in the partial PPV vaccination herds, a completed PPV vaccination schedule in all parities of sows every 4 – 6 months is strongly recommended (2).

Acknowledgements

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Comparison of two commercial altrenogest based products on estrus synchronisation in gilts under a field conditions.

Naritsara Boonraungrod[1]*; I-rawin Nimmansamai[1]; Sasithorn Numkanisorn[1]; Thanida Hawangchoo[1]; Juliana Calveyra[2]
[1]*Ceva Animal Health Thailand Ltd., Bangkok, Thailand,* [2]*Ceva Animal Health Brazil,* naritsara.boonraungrod@ceva.com

Introduction

The proper age at first service in gilts is directly connected to the future performance results and longevity of sows. Effective gilt management programs allow to meet replacement targets and to maintain optimal size of gilt pool. This gives the opportunity to plan precisely mating of the gilts which are to be introduced into the batch of weaned sows (1).

Altrenogest is the synthetic steroid with the progestagenic activity, which acts the similar way as progesterone from the corpus luteum (2). The use of altrenogest for estrus synchronization in gilts is widely used in swine farms and proven effective management tool (1). There are several commercial altrenogest based products registered and available in Thailand. Formulation of pharmaceutical products and their pharmaceutical properties are important parameters with significant influence on the drug absorption, concentrations in the target tissues and consequently the therapeutic effect (3). Therefore, the objective of the presented study was to compare the synchronization efficacy and effect on wean estrus interval (W-E) of two selected products under the field conditions.

Materials and Methods

The study was conducted on integrated swine farms in Thailand. Cycling gilts after confirmed first estrus were divided into 2 groups and treated according to SPC of products (20 mg altrenogest / animal), 18 days with Altresyn® (group 1) and competitor altrenogest product (group 2). After the withdrawal of altrenogest treatment, standard estrus detection was performed every day same way in both groups. Number of detected gilts on heat and W-E interval were recorded. The estrus rate (%) and average W-E interval were calculated for both groups.

Results

The results are presented in table 1. There are no significantly differences observed between Altresyn and second altrenogest product that farm used. Numerically difference and positive trend has been observed in the estrus rate of group 1 (1.9% higher than group 2) and average W-E interval in group 1 was 7.68 h shorter than group 2.

Table 1. Comparison of the results of two treatment groups.

Parameter	Group1	Group 2	p-value
No. of gilts	424	321	
No. of detected gilts on heat	399	296	
Estrus rate (%)	94.1%	92.2%	0.705
Average wean- estrus interval (days)	5.43	5.57	0.820

Conclusions and Discussion

In our study we have proven the product of Group 1 as effective tool for synchronization of heat of gilts under the field condition in Thailand. Numerically higher % of synchronization rate and shorter W-E interval was recorded in group 1.

Optimal and predictable estrus rate enable more effective introduction of optimal number of replacement gilts.

Short W-E interval is reducing the cost of the production and is consider as predictor of high breeding efficiency. Nevertheless, the use of effective gilt synchronisation must be done in parallel with the good management in gilt development unit to achieve the highest efficacy and performance.

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Effects of an energy supplement on farrowing duration and blood glucose concentration of parturient sows

Rafaella F Carnevale[1*], Bruno B D Muro[1], Laya K S Alves[1], Nadia A C Gomes[1], Diego F Leal[2] Cesar A P Garbossa[1*]

[1] Department of Animal Nutrition and Production of University of São Paulo.[2] Department of Population Health and Pathobiology of North Carolina State University. cgarbossa@usp.br

Introduction

Delivering piglets is one of the most energy demanding activities hyperprolific sows undergo in their lifetime (1). Extended farrowing leads the sows to exhaustion and plasma glucose concentrations below those required, which can impair uterine contractions and, consequently, farrowing outcomes (2). Therefore, the objective of the present study was to provide an energy supplement based on carbohydrates and glycerol, administered orally to sows at the beginning of farrowing, to decrease farrowing duration.

Materials and Methods

The sows were blocked according to parity and allocated to one of the following groups: SUP (sows supplemented with energy supplement; n = 85) and CON (sows not supplemented; n = 95). The energy supplement was provided to the females of the SUP group at the beginning of farrowing (birth of the first piglet). The farrowing duration (FD) was defined as the time elapsed between the birth of the first and last piglets in the litter. The number of total born (TB) was recorded. Glucose concentrations was measured in the ear vein with a digital glucometer (Accu-Chek Guide®, Roche) at five moments during farrowing: T0 (immediately after expulsion of first piglet and prior supplementation to the SUP-sows), T20 (20 minutes after T0), T40 (40 minutes after T0), T80 (80 minutes after T0), (20 minutes after T0) T180 (180 minutes after T0). Statistical analyzes were performed using the software R (version 4.1.0). All data were tested for normality and when necessary, they were transformed. Statistical significance was considered when $p < 0.05$.

Results

The TB was similar between both groups ($p > 0.05$) (table 1). FD was shorter ($p < 0.05$) for SUP-sows compared to CON-sows (table 1). Blood glucose concentration at T0 was similar for both groups ($p > 0.05$) (4.31mmol/L vs 4.38 mmol/L for CON and SUP respectively). Sows which received the energy supplement had higher blood glucose ($p < 0.05$) at T20 (4.33 mmol/L vs 4.69 mmol/L) and T40 (4.39 mmol/L vs 4.65 mmol/L). At T80 (CON = 4.35 mmol/L; SUP = 4.39 mmol/L) and T180 (CON = 4.46 mmol/L; SUP = 4.66 mmol/L) blood glucose concentration did not differ ($p > 0.05$) between CON-sows and SUP-sows as shown in figure 1.

Discussion and Conclusion

The increased blood glucose concentration observed in SUP sows until at least 40 minutes after the energy supplement was associated with a decrease of 20 minutes in FD. It is noteworth that the farrowing duration was short in the present study even for sows from CON. In agreement with these results, Oliveira et al. (3) observed a reduction of 44 minutes in farrowing duration in sows fed an energy supplement based on lactation diet (250g) and sugar (250g) at day of farrowing. All these findings support the notion that the gravid uterus is reliant on energy from glucose oxidation to support its intense contractions (2). Collectively, these results demonstrate the feasibility of using nutritional interventions to reduce FD and enhance farrowing outcomes.

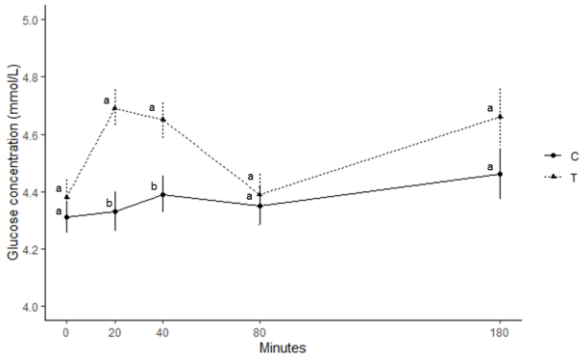

Figure 1 Blood glucose concentration during farrowing

Superscripts indicate statistically significant differences ($p \leq 0.05$).

Table 1. Effects of energy supplement on farrowing traits.

Variables	Groups	
	CON	SUP
Farrowing Duration (min)	228 ±8.6[a]	208 ±9.6[b]
Total born	17.5 ± 0.3	17.4 ± 0.4

Data are presented as mean ±SEM.

Superscripts indicate statistically significant differences within the columns ($p \leq 0.05$).

Acknowledgments

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Effects of gilt growth rates from birth to breed on subsequent performance

Gefferson Almeida da Silva[1], Fernanda Radicchi Campos Lobato de Almeida [2], Vanderlei Zappani[3]; Evandro Cezar Beraldin[3]; Geraldo Camilo Alberton[4]; Daiane Donin[4]; Ray Nascimento[1]; Carine Vier[5]; Uislei Orlando[5] and Amanda Pimenta Siqueira[1]

[1]Agroceres PIC, SP, Brazil; [2] UFMG, MG, Brazil; [3]Lar, PR, Brazil; [4] UFPR, PR, Brazil; [5]PIC, USA.

gefferson.silva@agroceres.com

Introduction

The modern gilts have showed a high growth rate and sexual precocity. Age at puberty has been suggested as an indicator of lifetime reproductive performance (1). It has been shown that gilts mated at a younger age are culled later in life than gilts mated at an older age (2). The objective was to evaluate the effects of gilt growth rate from birth to breed on subsequent reproductive performance and retention rate until parity 3.

Materials and Methods

Data on 1,962 gilts (Camborough®) collected at a sow farm in South of Brazil. Weight (with a scale) and age at first breeding were obtained. Gilt growth rate from birth to breed was calculated as follow: Growth rate, kg/d = (Gilt weight at breeding – 1.35)/(Gilt age at breeding). Females were followed until their third farrow. Reproductive performance in each cycle was recorded. Growth Rate Categories Gilts were categorized based on their growth rate from birth to breed as follow: Bellow 650g (average AGD g/d 622 – N 382), 650 to 750(average AGD g/d 696 – N 1161) and Above 750 (average AGD g/d 622 – N 364). All gilts were breed with >135kg, second estrus, 20 days after second shot reproductive vaccine and 14 days on cage to adaptation. Data were analyzed using linear or logistic regression models in R, gilt was the experimental unit. Explanatory variable: growth rate categories. Total born and weaned pigs were analyzed following a normal distribution. Retention rate was analyzed following a binomial distribution. Tukey multiplicity adjustment was used to avoid type I error.

Results were considered significant at $P \leq 0.05$.

Results

Gilt growth rate from birth to breeding was positively correlated with weight at first breeding and negatively correlated with age at first breeding. Total pigs born in the first parity was higher for gilts with birth to breed growth rate above 750 g/d, followed by gilts with 650 to 750 g/d ADG then gilts <650 g/d ADG (Figure 1). Total pigs born up to parity 3 was higher for gilts with a birth to breed growth rate above 750 g/d compared to gilts with a growth rate between 650 to 750 g/d or below 650 g/d (Figure 2). There was no evidence for differences in retention rate and weaned pigs up to parity 3 according to the different birth to breed growth rate categories (Figure 3 and 4).

Conclusions and Discussion

Gilts with high growth rate are more productive in terms of total born on the first parity and up to parity 3. No differences were evidenced in terms of retention rate. These results show an important economic opportunity, as high grow rate gilts produce more, they can be breed earlier (respect weight >135kg, second estrus and sanity acclimatation).

Acknowledgments

Lar, UFPR, UFMG and Agroceres PIC.

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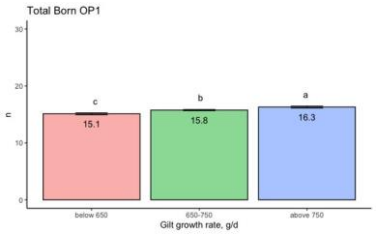

Fig. 1. Results from total born Parity 1.

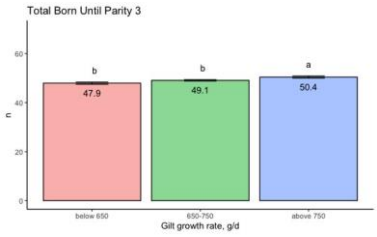

Fig. 2. Results from total born until Parity 3.

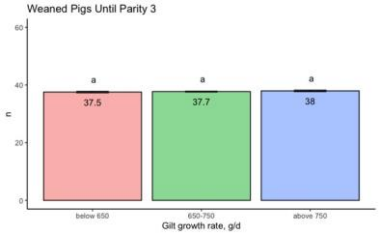

Fig. 3. Results from weaned pigs until Parity 3.

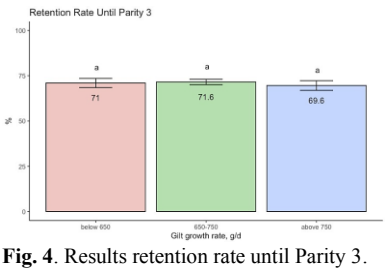

Fig. 4. Results retention rate until Parity 3.

Encapsulation of boar semen in alginate beads with natural extracts and silver nanoparticles as an antioxidant and antimicrobial agents

Andrea Guerrero-Guzmán[1]; Adalberto Zamudio-Ojeda[2]; Gilberto Velázquez-Juárez[3]; David R. Sánchez-Chipres [1,4].
[1]*Posgrado Maestría Interinstitucional en Producción Pecuaria, Universidad de Guadalajara, Jal., Mex.*
[2]*Departamento de Física, Universidad de Guadalajara, Jal., Mex.* [3] *Departamento de Química, Universidad de Guadalajara, Jal., Mex.* [4] *División de Ciencias Veterinarias, Universidad de Guadalajara, Jal., Mex.*
mvzandrea8@hotmail.com

Introduction

The boar semen encapsulation in alginate beads is one of the main innovations in Artificial Insemination (A.I.) techniques. In this methodology usually used of the seminal doses is with commercial- swine extender (1). However, a low sperm viability it has been seen once that the spermatozoa were released of the alginate beads, because of that we propose the use of natural extracts like swine extender (2,3). On the other hand, due the bacterial load in the seminal doses and the resistance of them for the excessive use of the antibiotics commonly uses, for those reasons we propose the incorporation of Silver Nanoparticles (AgNPs) like antimicrobial agent against of two principal strains: *Pseudomonas spp.* and *Staphilococcus aureus,* which are related with reproductive problems in the pigs (4).

Materials and Methods

The seminal doses were collected from a Yorkshire boar. The natural extracts were synthetized with two different dehydrate leaves of plants: *Cymbopongo citratus* (Cc) e *Hipericum perforatum* (Hp). The synthesis of AgNPs were made with green chemistry using like reducing agents the natural extracts and 1 mM of Silver nitrate ($AgNO_3$) in 25 ml of distilled water in two different solutions. According to a previously reported method of Torre, M.L., Barium chloride (0.07M), Hydroxypropyl-metylcellulose (HPMC) (0.03gr) and the natural extracts with the seminal doses were dropped into a Sodium alginate (0.5%) solution with AgNPs to obtain alginate beads with liquid matrix. The evaluation of sperm motility was determined by Optical microscopy and by a Seminal Quality System (SQS). The AgNPs solution was evaluated by UV-Vis spectroscopy, Scanning and Transmission Electron Microscopy (SEM and TEM) for the exact size of the NPs and their antimicrobial effect in two different strains: *Pseudomonas spp.* and *Staphilococcus* in TBS culture media. The size and the morphology of the beads were analyzed by SEM.

Results

The viability of the seminal doses was analyzed previous of the encapsulation while obtained 80% of viability. The samples of AgNPs were analyzed by UV-Vis spectroscopy gave an absorbance peak between 440 nm for *Cc* and 460 nm for *Hp* according to the literature for silver colloid solutions, the presence of NPs in the surface of the alginate beads by SEM with the technique of backscattered electrons (fig.1b) and their size lower than 50 nm by TEM (fig.1c). The antimicrobial effect of the AgNPs was evaluated by well diffusion method obtaining inhibition halos between 0.34 and 0.64 cm after their incubation. The interaction and the seminal viability with both natural extracts were evaluated for two consecutive days, we observed their viability at 5% after 48 hours. Finally, we obtained a good percentage of motility for the spermatozoa after being released from the alginate beads with liquid matrix (fig.1a).

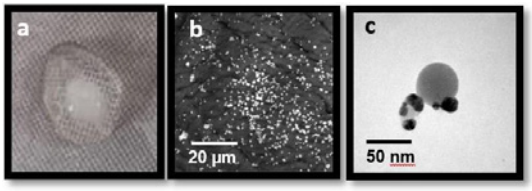

Figure 1. a) alginate bead with liquid matrix with boar semen, b) AgNPs in the Surface of the alginate bead with backscattered electrons by SEM and c) Size of AgNPs by TEM less than 50 nm.

Conclusions and Discussion

The encapsulation was achieved in alginate beads with a liquid matrix of Silver Nanoparticles, that have antimicrobial properties which are released into the sow reproductive tract acting against specific strains reducing reproductive problems, and semen in natural extracts maintaining an appropriate sperm viability for their use due to the antioxidant properties of the plants chosen to be released at specific times for 3 consecutive days due to temperature destabilization of the alginate membrane.

Acknowledgments

To CONACYT for my scolarship and the MIPE for the help that they bring to me.

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Endometrial cytology applied to the diagnosis of subclinical endometritis in sow

Fages Sofia M[1,4*], Piñeyro Pablo[2], Williams Sara I[1,3]
[1]*Pig Production, College of Veterinary Sciences, National University of La Plata (UNLP),* [2]*Vet Diagnostic and Production Animal Medicine, Iowa State University* [3]*Animal Reproduction, College of Veterinary Sciences, UNLP,* [4] *National Council of Sciences and Technology (CONICET), Argentina* sfages@fcv.unlp.edu.ar

Introduction

Endometritis is characterized by inflammation of the endometrium. A negative relationship between endometritis and production level in dairy cows [1] and low fertility in mares has been demonstrated[2]. The early stage of the disease without clinical manifestation is considered subclinical endometritis. The correlation of endometrial inflammation and reproductive performance is normally assessed by endometrial cytology *in vivo*. Cervical cytology is unexpensive, quick and sensitive diagnostic tool not only used diagnosis of clinical endometritis but also during early or subclinical endometritis. Due to current husbandry practice, (i.e farrowing assistance, large litter size, confined farrows) sows are prone to develop acute/chronic endometritis. The role of endometritis in the reproductive performance of the sows has not been evaluated, making it imperative to develop an *in vivo* diagnostic method that allows develop and early detection method to determine the role of this pathology on the sow reproductive performance. **The objective of this study was to evaluate the clinical use of endometrial cytology *in vivo* as a diagnostic method for endometritis in post-weaning sows.**

Material and methods

A total of 46 females of different parities allocated in individual farrowing/gestation crates in a commercial farm were assigned into three groups: 16 females at the day of weaning (D1), 18 females sampled three days post-weaning (D3) and 12 females were sampled twice at weaning date and third day post-weaning (D1-3). Cytology samples were collected with an endocervical brush (Medibrush Plus®, Medical Engineering Corporation S.A.) The brushes were immediately spread on a glass slide, stained with Romanovsky (Stain 15®, Biopur SRL) and mounted for cytological preservation. Cytological evaluation was performed under a light microscope (100X) in immersion oil. A total of 200 cells were counted including endometrial cells and neutrophil. The cut-off value for presence/absence of subclinical endometritis in sows has not been determined yet, therefore the presence of 7% of neutrophils was used based on average cut-off values previously reported in cows [2,3]. The presence/absence of purulent material in the endocervical brushes, presence/absence of vulvar discharge, was recorded during sample collection. In addition, dates of last estrus and culled sows was recorded.

Results

The sample day resulted in a variation in the proportion of sows detected with endometritis. Thus, endometritis was diagnosed in a 33.3 in D1, 50 % D3. The sows from the group D1-3 showed that 50% (6/12) had a reduction in the number of neutrophils with no changes in cellular composition of the samples, while in 41% (5/12) there was an increase in number of neutrophils. There was not a significant difference (p=0.63) in the proportion of sow with cytological diagnosis of endometritis and vulvar discharge (Table 1)

Table 1. Relationship between sows with vulvar discharge and those with a positive diagnosis for endometritis

		Vulvar discharge		Total
		Yes	No	
Endometritis	Yes	2	8	10
	No	5	31	36
Total		7	39	46

Is important to highlight that 80% of the sows diagnosed with endometritis 80% (8/10) did not show vulvar discharge. Therefore, all of them were A.I, but 30% were culled due to reproductive reasons (3/10). When the weaning-to-estrus interval (WEI) was analyzed, the greatest WEI was found in females with vulvar discharge (5.42 days), while the group of females with the presence of pus in the brush had the shorter WEI (4.28 days).

Conclusions

Multiples sample collection seems not to affect the proportion of inflammatory cells due to mechanical irritation of the cervical mucosa. Differences in the proportion detected at weaning and post-weaning can be due to physiological changes and not purely to the technique's sensitivity. In addition, 80% of the females diagnosed with endometritis did not present vulvar discharge, and 30% were culled due to reproductive reasons. Thus it can be concluded that further studies are necessary to define a cut-off value for the diagnosis of subclinical endometritis in sows and its importance as a predictive parameter to evaluate the future reproductive performance of the sows

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Enhancement of reproductive parameters on two Vietnamese farms using ERYSENG® PARVO/LEPTO

Nhat Duong[1*]; Huong Vu[1]; Sittikorn Traiyarach[2]; Irene Galé[2]; Joaquín Miguel[2]; Daniel Angelats[2]

[1]HIPRA Vietnam; [2]HIPRA HQ, Amer (Spain)

*Corresponding author: nhat.duong@hipra.com

Introduction

Sow vaccination against Swine Erysipelas (SE), Porcine Parvovirus (PPV) and *Leptospira* spp. to prevent reproductive disorders is commonly used in the vaccination plan of breeding farms (1, 2). Apart from stimulating protective immunity, vaccines must also have no or minimal adverse effects that can potentially impair the sows' performance (3).

The aim of this study was to compare the safety and the efficacy of two different reproductive vaccines on two commercial farms in Vietnam.

Material & Methods

The study was carried out on two farms of 1,200 sows each one (Farm A and Farm B) located in the North of Vietnam. On each farm, during 3 consecutive weeks, a total of 90 sows were divided into 2 groups. Group EPL, 15 sows/weeks (N=45, G. EPL) were vaccinated with ERYSENG® PARVO/LEPTO (EPL), a 2 ml (dosage) trivalent vaccine including antigens of SE, PPV, 6 serovars of *Leptospira* spp and adjuvanted with HIPRAMUNE® G[d]. Group B (G. B), vaccinated with a trivalent vaccine but including 5 serovars of *Leptospira* spp., 5 ml (dosage) and an aluminium hydroxide adjuvant. Both groups were vaccinated at day 10 after farrowing. Animals were randomly assigned to each group, based on the parity and previous reproductive data. There were no other differences in management between groups, except the vaccine.

For the safety evaluation, rectal temperature (RT) was measured the day before vaccination (D-1), at vaccination moment (D0), and +6, +24 and +48 hours later. Feed intake (FI) was also measured at the same points in time as RT, except +6 hours. In terms of efficacy, reproductive parameters in the subsequent cycle were recorded. For the statistical analysis an ANOVA of a logistic regression with the farm as random farm effect and, a Poisson regression for reproductive parameters.

Results

Regarding the safety parameters (FI and RT), no statistical differences were observed between any of the groups at any of the different time points (Table 1). In terms of efficacy, the percentages of mummified piglets were statistically significantly (*P-value* ⩽*0.05*) lower on Farm A (0.76% vs 2.08%) and the stillborn on Farm B (0.72% vs 2.19%) in the group vaccinated with EPL (Table 2).

Table 1. Rectal temperature and feed intake at different time points.

Parameter	Farm A		Farm B	
	G. EPL	G. B	G. EPL	G. B
RT (ºC)				
D-1	38.53	38.48	38.51	38.51
D0	38.63	38.62	38.65	38.66
+6h	38.54	38.53	38.7	38.69
+24h	38.58	38.6	38.65	38.6
+48h	38.52	3.54	38.57	38.5
FI (kg)				
D-1	6.45	7.02	6.97	7.09
D0	6.3	6.91	7.08	7.14
+24h	6.12	6.7	7.19	7.19
+48h	6.38	6.8	7.18	7.19

No significant statistical differences were observed *(P-value>0.05)*

Table 2. Reproductive parameters in the subsequent gestation.

Parameter	Farm A		Farm B	
	G. EPL	G. B	G. EPL	G. B
Total born	16.95	16.86	18.21	18.05
Mummified	**0.76%[a]**	**2.08%[b]**	1.73%	1.80%
Stillborn	1.06%	0.48%	**0.72%[a]**	**2.19%[b]**

Different superscripts (a, b) indicate statistically significant differences within the main parameters (*P-value ≤ 0.05*)

Discussion & Conclusion

According to these results, ERYSENG® PARVO/LEPTO is as safe as the vaccine used in G. B and offers a greater efficacy in the control of reproductive diseases, based on the reduction of the mummified and stillborn piglets observed. Furthermore, this trial demonstrates the importance of having a good and efficacious vaccination program against SE, PPV and *Leptospira* spp. infections in swine farms.

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Heatwaves on gilts insemination days impair pregnancy

Amanda A. Brito[1]; Ana L. N. Alvarenga Dias[1], Natascha A. M. Silva[1], Mara R. B. M. Nascimento[1]
[1] *Faculty of Veterinary Medicine, Federal University of Uberlândia, Uberlândia, MG, Brazil,*
analuisa@ufu.br

Introduction

The occurrence of events such as heatwaves (HW) will become more frequent, more intense, and longer-lasting due to climate change. This outlook represents a constraint on pig production since heat stress can impair sow fertility (1). However, there are few studies on the effects of heat stress over the reproductive indices of gilts reared in the tropics, especially in the Brazilian *Cerrado* biome region. Therefore, this study aimed to verify the effects of heatwaves on the insemination days of gilts reared in a tropical environment.

Materials and Methods

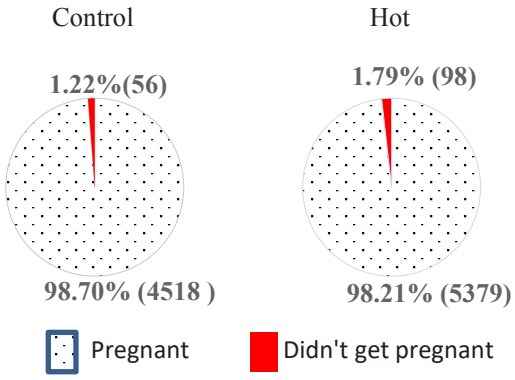
The data were collected on a commercial piglet-producing farm located in the Brazilian *Cerrado* biome (18º 91' S, 48º 25' W, and 875 m altitude) over five years. The daily air temperature and relative humidity data at 9 am, 3 pm, and 9 pm were obtained from the National Meteorological Institute and the temperature-humidity index (THI) was calculated. Three or more consecutive days of temperatures equal to or higher than 25 °C at least one of the aforementioned times together with a THI > 74 were considered a heatwave. The pregnancy and abortion numbers were calculated based on 10,051 inseminations. The gilts were divided into two groups: control (without HW) (4,574) and hot (with HW) (5,477) on the day of insemination. The data were analyzed using the chi-squared test ($P < 0.05$).

Results

A predominance of higher temperatures and THI was found at 3 pm. In the study period, 1,163 days with temperatures ≥ 25 °C and THI > 74 and 160 HW were verified. May, June, July, and August presented the lowest mean air temperatures (22.1 ºC to 24.4 ºC), THI (65 to 68), and consequently the lowest number of HW (1 to 12). The number of pregnancies of gilts inseminated during HW was lower in relation to those inseminated in thermal comfort ($P = 0.0267$) (Figure 1). The number of abortions of gilts inseminated during HW (3.20%) did not differ from those inseminated in thermal comfort (2.42%) ($P = 0.1065$) (Figure 2).

Conclusions and Discussion

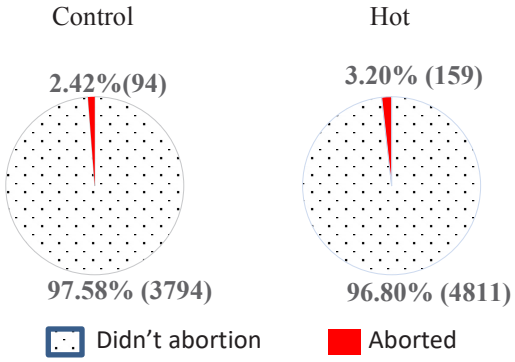
In this study it was verified that HW on gilt insemination days negatively influenced pregnancy numbers. One possible explanation for this result would be the sensitivity of the hypothalamic-pituitary-gonadal and hypothalamic-pituitary-adrenal axes to heat stress, resulting in alterations in glucocorticoid levels, impairing the production of the gonadotropin-releasing hormone (2). Moreover, gilts present greater sensitivity to high temperatures, due to them still being in the growth phase, which increases their metabolic rate (1).



Chi-Square Test: P = 0.0267

Figure 1. Number of pregnant or non-pregnant gilts in the control (inseminated without HW) and hot (inseminated during HW) groups.

The number of abortions was not influenced by HW on gilts insemination days (Figure 2).



Chi-Square Test: P = 0.1065

Figure 2. Number of gilts that aborted or did not abortion in the control (inseminated without HW) and hot (inseminated during HW) groups.

In a tropical environment, particularly in the Brazilian *Cerrado* biome, HW on insemination days impair the number of gilts pregnancies. Thus, the use of air-conditioning systems and adequate installations are needed to reduce the detrimental effects of heat stress in gilts.

Acknowledgments

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Increasing detection of *porcine parvovirus* as cause of reproductive failure

Agnes Jardin[1], Sophie Brilland[1], Philippe Leneveu[1], Preben Mortensen[2*]

[1]*Ceva Santé Animale, France,* [2]*Ceva Corporate Swine, France.*

agnes.jardin@ceva.com

Introduction

The porcine parvovirus (PPV), more correctly named Ungulate protoparvovirus 1 species, is a single-stranded DNA virus potentially causing great losses due to reproductive failure characterised by: stillbirths, mummification, embryonic death, and infertility (SMEDI). PPV viruses are prone to constant mutations and are classified into several strains of variable pathogenicity, some of them with very high virulence. As needs are to achieve clinical protection against all relevant field strains, this poses a challenge on the protective capacity of PPV vaccines. In several countries, an increase of PPV occurrence in the field has been reported within recent years. Also in France, a tremendous increase of PPV detection frequency has been noticed in 2021 compared to 2009-2017 period (1). Here we report several recent clinical cases of PPV-induced SMEDI in properly vaccinated animals.

Materials and Methods

As a part of our routine investigational service to farms experiencing reproductive failure, four SMEDI cases have been collected in which suspicion of PPV vaccine misused could be rejected following thorough investigation. These cases occurred in France in 2021 and in early 2022 in farms free of ADV/PRV, CSFV, and ASFV. All the four farrow-to-finish farms counting from 250 to 800 sows reported a severe increase in mummified foetuses. For example, in one farm, all the 1st parity sows (n=16) belonging to two consecutive batches gave birth to only mummified piglets and two 2nd parity sows gave birth to 5 mummified piglets each. For repro-prophylaxis in these farms, the gilts were vaccinated twice pre-mating and boosted every three to six months either by a commercial PPV-NADL2 plus Erysipelas rhusiopathiae (Ery) combo-vaccine or by a commercial NADL2-like PPV plus Ery plus hexa-valent Leptospira spp. combo-vaccine.
In all farms, mummies from several selected gilts and/or sows, were submitted for laboratory investigations.

Picture 1: mummified foetuses from one of the farms (14.5 to 17.5 cm long) – photo credit: Labocea

Results

All farms demonstrated strongly and only PPV-PCR positive findings in the submitted foetal material. No PCV2 was detected by PCR when investigated in the same foetal material.

Discussion and Conclusion

Vaccination against PPV and Ery is one of the most basic protocols for breeding stock worldwide. As mentioned previously, PPV strains can have different levels of pathogenicity, genetic clusters, and variable antigenicity. When vaccinating against PPV there are indications that the PPV-Kresse-like strain K22 as an antigen confers a wider and more efficient clinical PPV protection compared to other PPV vaccine strains, particularly against more virulent strains. This has been demonstrated in controlled challenge studies (2), as well as in field investigations of farms with a reliable vaccination procedure in accordance with recommendations in other countries (3,4). In conclusion, all these data confirm that a vaccine based on the PPV-K22 is a more reliable alternative in preventing PPV clinical signs and losses against all relevant field strains including the most recent ones.

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Interaction between the administration of mefepronic acid to gilts at farrow, the back fat thickness and the wean-to-estrus period

Guillermo Ramis[1,2*], Anselmo Martínez-Moreno[3], Eva Romera-Recio[1], Elisa Rodríguez-Hernández[1], Raquel Fernández[3], José L. Íñiguez[3], Clara de Pascual[1], Laura Martínez Alarcón[2,4], Ignacio Fernández-Usón[5], Paula Sánchez-Giménez[3]

[1]Departamento de Producción Animal, Facultad de Veterinaria, Universidad de Murcia, Spain,[2]Instituto de Investigación en Biomedicina (IMIB), Murcia, Spain [3] Agropor S.L. Las Torres de Cotillas, Murcia, Spain,, [4] Servicio de Cirugía, Hospital Clínico Universitario Virgen de la Arrixaca, Murcia, Spain, 5 Fatro Ibérica, Spain guiramis@um.es

Introduction

The body composition of gilts and sows has a deep influence on performances during lactation. The back fat thickness is a common measure to define the body condition. One of the major factors influencing on unproductive days in farms is the weaning-to-estrus period. The shortening of this period could result up to in 2.65 € per sow per day. There are a lot of factors that could improve this measure, and one of them is the body condition of the sow, and how the body resources have been used during lactation. We have investigated the influence of an administration of mefepronic acid (MA) 24 hours after farrow. Thus, fibrate can influence on the lipidic and proteic metabolism of the sows and gilts.

Materials and Methods

Two hundred gilts were involved in this trial, being 100 treated into 24 hours after farrow with a 15 ml IM injection of Liverfine® (Fatro Ibérica, Spain), but only data from 192 were recovered. This dose corresponds to 1,500 mg of total MA. The gilts were randomly allotted, and were used all the gilts farrowing into two consecutive weeks to avoid environmental factors. Two different genetic lines were evaluated; being 68 gilts from genetic A and 124 from genetic B. The fat back thickness (FBT) and the deep of loin (LD) was measured at farrow and weekly up to weaning, using a wireless ultrasonography device (Tecnoscan, USA). The wean-to-estrus (WTE) period was recorded for every animal, and a gilt was considered as in anoestrus 7 days after weaning without showing heat signs.

The comparison of data was performed using Student 's t test, considering significant a p-value<0.05. The frequencies were analyzed by Squared Chi test with adjusted residues analysis.

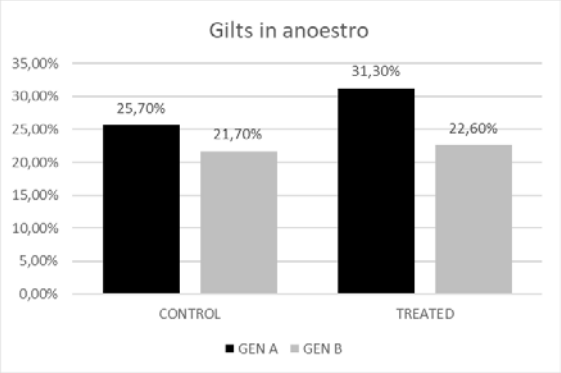
Results

The results for WTE period appear un table 1.

Table 1. Performance for WTE

GEN	GROUP	Mean	SEM
A	CONTROL	5,5769	0,33362
	TREATED	4,9524	0,25332
	p-value	NS	
B	CONTROL	5,0213	0,33935
	TREATED	4,8958	0,16642
	p-value	NS	

There was not significant difference even when the WTE was smaller in the treated group for both genotypes.



There was no difference between expected and observed frequency for anoestrum in none of the groups, even when in genotype B there was an 8.7% more of gilts not going in heat into the first week after weaning.

The correlations obtained per genotype and group between WTE and fat and muscle consumption parameters appear in the following table:

Table 2. Correlations among WTE and BFT and LD parameters

Genotype	Group	Parameter	WTE
A	CONTROL	BFT2-3	**-,443***
		DAYS	**,402***
	TREATED	BFT3-4	**,457***
		LD2-3	**-,467***
B	CONTROL	BFT3-4	**-,290***
		LW1	**-,310***

Interestingly, the 2nd and 3rd week after farrow seems to be key for the WTE, since in the control and treated group of genotype A there was a significant correlation, but whilst the loss of fat in the second week is negatively correlated to WTE, in treated group the loss of fat in the 3rd week is positively correlated to WTE. In genotype B only in control group has been assessed a positive correlation between loss of fat in the 3rd week and WTE, and interestingly negatively between the weight of litter at 24 hours of life.

Discussion and Conclusion

Apparently, the way to use the fat during lactation is related to the WTE length, and thus the use of MA, which influence the fat and muscle mobilization (data not shown in this communication) could help to reduce the WTE. Even when the differences are not significant (due, probably to variability), the reduction of half day in WTE in a 9,600 sows farm (as in this study) means an important economical save over the year, but this term need for a big scale experiment to be corroborated.

INTRAUTERINE GROWTH RESTRICTION (IUGR) ALTERS INTESTINAL MICROBIOTA FROM BIRTH TO THE GROWING-FINISHING PHASE IN SWINE

Saffir D. Fernandes[1]; Thaís G. Santos[2]; Rodrigo D. O. Carvalho[3]; Flavia F. Aburjaile[4]; Vasco A. C. Azevedo[3]; Fernanda R. C. L. de Almeida[1];

[1]*Department of Morphology, ICB- Federal University of Minas Gerais ,*[2]*Fiocruz Minas – René Rachou, Institute,* [3]*Department of Genetics, ICB- Federal University of Minas Gerais,* [4]*Veterinary School- Federal University of Minas Gerais,* safirdf@gmail.com

Introduction

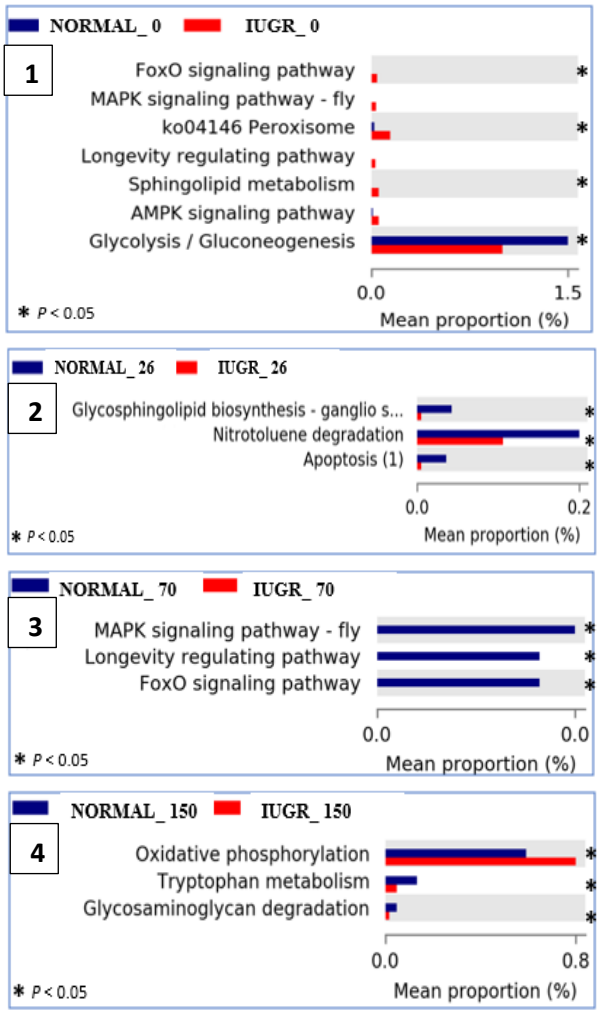
In pigs, IUGR is responsible for high mortality rates in the first weeks of life and reduced body weight gain throughout development, which leads to large economic losses to the industry (1). Homeostasis of the gut microbiota critically influences host health and development. However, recent studies have revealed that IUGR negatively compromises the composition of the microbiota in newborns, but it is still controversial whether these signs remain in the growth and fattening phases, periods in which growth development should be maximum (2,3). In this sense, in the present study, we hypothesized that IUGR alters intestinal microbiota from birth to the growing-finishing phase in swine.

Materials and Methods

One hundred sixty-two littermate male piglets were selected at birth and allocated into two treatment groups: normal weight (NW; birthweight range 1.6 - 1.9 kg) and intrauterine growth restricted (IUGR; birthweight range 0.7 – 1.0 kg). A subgroup of 10 littermate pairs were randomly selected and euthanized at birth, and on days 26 (48 hours after weaning), 70 (grower period) and 150 (finisher period), for duodenum collections. For the characterization of the intestinal microbiota, new generation sequencing was performed using the Ion Torrent 16S Metagenomics kit that amplifies the hypervariable region V4 of the bacterial 16S rRNA gene, according to the manufacturer's instructions. Data were submitted to analysis of variance (ANOVA) and LS means, compared by the Student T test, using the software SAS (Statistical Analysis System Institute Inc., Cary, NC, 2003).

Results

Figures 1, 2, 3 and 4 show the amount of bacterial populations responsible for various metabolic functions in NW and IUGR pigs' small intestine. Interestingly, newborn IUGR pigs show a reduction in the group responsible for gluconeogenesis but a marked increase in many cellular physiological events such as apoptosis, cell-cycle control, glucose metabolism, oxidative stress resistance, and longevity. In contrast, in IUGR pigs up to 70 days, it is observed that groups of bacteria important in signaling pathways that regulate a wide variety of cellular processes such as proliferation, differentiation, apoptosis and stress responses are practically non-existent. At 150 days there is an increase in oxidative phosphorylation pathways, which indicates energy source for metabolic activities.



Discussion and Conclusion

This metabolomic study of the intestinal microbiota in IUGR pigs can support the hypothesis that the effects of IUGR on the microbiota are persistent in pigs at all stages of development. Metabolomic studies in gut microbiota-related research could lead to the development of mechanistic hypotheses potentially applicable to the development of nutritional and personalized therapies.

Acknowledgments

We would like to thank our sponsors, the agencies CAPES, CNPq and FAPEMIG.

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LIVER MORPHOFUNCTIONAL ALTERATIONS THROUGHOUT POSTNATAL DEVELOPMENT IN INTRAUTERINE GROWTH RESTRICTED PIGS

Saffir D Fernandes[1];Thaís G. Santos[2]; Fernanda R. C. L. de Almeida[1];
[1]*Department of Morphology, ICB- Federal University of Minas Gerais* ,[2]*Fiocruz Minas – René Rachou Institute* ,safirdf@gmail.com

Introduction

Intrauterine Growth Restriction (IUGR) is a condition in which the fetus does not express its growth potential relative to gestational age. These individuals present low body weight at birth, higher risk of mortality, predisposition to short and long term impairments and chronic diseases, such as type II diabetes, gastrointestinal inefficiency and metabolic syndrome (1). In most cases this condition is called asymmetric, as the body prioritizes the development of the brain at the expense of the other organs. Thus, the individual presents normal skull circumference but a less developed body. Among the organs which may suffer from IUGR effects, the liver stands out as the most affected one. Although IUGR effects on hepatic function have been investigated, information on liver morphology is limited (2). Thus, the objective of this study was to evaluate hepatic morphofunctional alterations throughout postnatal development in IUGR pigs.

Materials and Methods

One hundred sixty-two littermate male piglets were selected at birth and allocated into two treatment groups: normal birth weight (NBW; birthweight range 1.6 - 1.9 kg) and intrauterine growth restricted (IUGR; birthweight range 0.7 – 1.0 kg). A subgroup of 10 littermate pairs were randomly selected and euthanized at birth, and on days 26 (48 hours after weaning), 65 (grower period) and 150 (finisher period), for blood and tissues collections. Blood samples were harvested for biochemical analysis of cholesterol (total LDL and HDL), glucose, and hepatic enzymes aspartate aminotransferase (AST/GOT) and alanine aminotransferase (ALT/GPT) levels via photocolorimetric method. Livers were weighted and fragments were processed for histomorphometrical analysis (hepatocyte and nucleus area in newborns, cord width and nuclei diameter at other ages) and density (nuclei number/mm²)..

Data were submitted to analysis of variance (ANOVA) and LS means, compared by the Student T test, using the software SAS (Statistical Analysis System Institute Inc., Cary, NC, 2003).

Results

IUGR pigs presented lower body weights at all ages($P<0.05$). Livers were also lighter at birth, 26 and 65 days old ($P<0.05$), but were similar at 150 days of age. Growth restriction in uterus did not affect the histomorphometrical parameters assessed regardless of age. The enzyme AST levels were higher in NBW newborns ($P<0.05$), but similar at other ages, and ALT levels were similar between the two experimental groups at all four ages, as shown in Table 1. Biochemical analysis also showed that total cholesterol and LDL levels were higher in IUGR pigs at 65 days ($P<0.05$), but HDL and glucose levels remained similar between IUGR and NBW pigs at all ages. Additionally, body weight was negatively correlated with total cholesterol at 65 days ($r = -0.56$, $P<0.05$) and glucose at 150 days ($r = -0.59$, $P<0.05$).

Table 1. ALT and AST levels (U/L)

Age/ mate	Birth		26 days		65 days		150 days	
	N	I	N	I	N	I	N	I
ALT	44.5 [a]	35.1 [a]	50[a]	48[a]	40.6 [a]	39.7 [a]	39.5 [a]	40.7 [a]
AST	139[a]	95.4 [b]	69.8 [a]	66.3 [a]	44.2 [a]	49.3 [a]	43[a].	42.5 [a]

[ab]At the same age on the same line, means statically different ($P<0.05$). N: NBW/I: IUGR

Discussion and Conclusion

Even though IUGR affected liver weight it did not alter histomorphometrical parameters, suggesting a commitment in cell proliferation, since IUGR liver presents the same cellular density but less weight. Biochemical data indicate that growth restiction in uterus severely compromises metabolic function, which may predispose to long-term metabolic disorders.

Aknowledgments

We would like to thank our sponsors, the agencies CAPES, CNPq and FAPEMIG.

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Monitoring status of bacterial contamination on boar stud: a case report

Janaína C. Rocha[1]; Letícia Cantele[1]; Flávia C. Silva[1]; Lucas Bevilaqua[1]; Larissa L. do Carmo[1]; Kérlin Calderan[1]; Pedro Ivo de Quadros [1]; Jorgea Pradieé[1*]
[1]*Bretanha Importação e Exportação LTDA, *Departamento de Pesquisa e Desenvolvimento Bretanha Suínos*
jorgea@bretanhasuínos.com.br

Introduction

Bacterial contamination is one of the most important issues within a swine semen processing center, which must be constantly monitored. Mainly because the quality of the insemination dose is related to individual factors of the males and inherent to the semen technology, such as collection, handling, and storage of the dose, it becomes increasingly necessary **for** production process improvement (1).

Materials and Methods

The case report happened at a multi-genetic boar stud **in** Chapecó, south-west region of Santa Catarina State. However, we will present a case of only one specific genetic (39 animals). There was a routine of once a month **sending of** samples of fresh, extended, and stored semen, besides water (inlet water, osmosis, animal drinking water, stored and extender), to the laboratory to evaluate the contamination status of each sample. The goal for bacterial status for fresh semen is <2000 cfu/mL, for diluted and stored semen < 500 cfu/mL and for water is 0 cfu/mL. Because of this type of monitoring, inlet and stored water samples were detected last June with values higher than the established, but this **did not reflect** on microbiological quality of the dose that month. After that some actions were performed to suppress the contamination **and** procedures were carried out to identify problems. Identifying perforated tank bags, osmosis with low water production capacity (and immediately request for new equipment). Cleaning of the water tanks was carried out, and alignment of processes with the team. Even so, in July **it** was detected **that** 55% of stored semen sample was contaminated. **However,** the samples of water were good. In August, the identification of males with higher contamination and application of antibiotics in the foreskin to reduce local contamination were **included in** the procedure, as well as cleaning of the boar housing and cleaning animals. The doses were normally produced with long term extender (Vitasem, Magapor®), and to reduce the fresh semen contamination an extender during the collection phase **was used** (Dicol, Magapor®). Monitoring first packaging dose, **mainly** because **of** the filling hose quality. After that, in September, plating was carried out at several points in the laboratory, and all collection points showed controlled contamination. October was the end of use Dicol on fresh semen because the contamination was controlled. And in this period we **started to send** more samples that we used for bacteriological control. In August we sent 54, in September 39, in October 34 and November 30 stored semen samples.

Results

Table 1 shows the percentage of samples in compliance based on the established target of 95%. In July **it** was 45%, in August 45,6% and in September 43,6% of stored samples in compliance. Of the 39 animals, 15 showed contamination. After that, with the effectiveness of the actions, the months of September and October have already returned to normality with 100% compliance of the stored samples.

Discussion and Conclusion

In our case, after **cleaning** the boar housing and boars, the contaminantion on fresh semen **was** controled. **It is** effective to monitor the status contamination once a month, but to discover the source of the contamination **it** was necessary to investigate all phases involved in the semen collection system. It is possible to adopt action plans, providing support to design better strategies, adjusting the procedures (2).

So some questions that **remain** here **are**, how important is the bacterial monitoring status of dose? How many times **is it necessary** to proceed monitoring (once a month, every week)? How many samples **should be sent** to the lab, and how to decide?

This case s**howed** us that monitoring every week could be a good strategy. Monitoring the main critical points is extremely important to ensure the quality of the dose. And **doing** this kind of periodic monitoring of samples could save time if you consider that the diagnostic of the problem can be faster and more effective **for** decision making, saving time and money.

Table 1. Number of samples: compliance/total and percent (%) fresh, extended and stored semen

Months	Samples		
	Fresh	Extended	Stored
July	4/5 (80)	5/5 (100)	9/20 (45)
August	4/5 (80)	5/5 (100)	4/54 (44,4)
September	15/20 (75)	6/20 (30)	17/39 (43,6)
October	26/26 (100)	10/10 (100)	34/34 (100)
November	9/11 (82)	5/5 (100)	30/30 (100)

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Ovarian morphometrical evaluation in silent estrus and anestrus gilts

Lucas C. Cardoso[1]; Gefferson A. Silva[2]; Amanda P. Siqueira[2]; Marcelo Gorlin[2]; Neimar B. Gueler[2]; Cícero Ari Tecchio[3]; Neimar Cristiano Cavazini[3]; Anne Caroline de Lara[3]; Hélio Chiarini-Garcia[1]; Fernanda R. C. L. Almeida[1]
[1]Department of Morphology, Institute of Biological Sciences, Federal University of Minas Gerais, Av. Antônio Carlos, 6627, 31.270-901, Belo Horizonte, Brazil; [2]Agroceres PIC, Rio Claro, SP, Brazil; [3]Seara Alimentos Ltda, Itajai, SC, Brazil. clucasbio@gmail.com

Introduction

The domestic pig is a polyestrous species, which was developed along its domestication process. However, females may experience pathological periods of anestrus or silent estrus throughout their productive lives. Both pathologies increase the number of non-productive days, with the need of hormonal interventions or culling from the breeding herd, which leads to economic losses (1,2). Despite being relatively common in swine farming, there are few studies that have evaluated ovarian histomorphometry in those pathologies. Therefore, the objective of this study was to investigate through morphometrical analysis the ovarian alterations in silent estrus and anestrus gilts.

Materials and Methods

Thirty gilts (Landrace x Large White) were selected and allocated to the following experimental groups: control (CT; n = 10), anestrus (AN; n = 10), and silent heat (SH; n = 10). At 23 weeks of age, females were exposed to boar stimulation. Animals were weighed, backfat thickness was measured, and were sent to slaughter, where the ovaries and uterus were collected and weighed. Macroscopically visible follicles, corpus luteum and albicans were measured and follicles were classified into three classes (F1: < 3mm, F2: 3-5mm, F3: > 5mm). Subsequently, the ovaries were processed for histomorphometrical evaluation. Follicles were divided into different classes, according to the morphological characteristics established by Ross & Pawlina (3). Areas of follicles, oocyte, antrum and granulosa layer of secondary and mature follicles were measured using the ImageJ® software.

Results

Although AN animals had similar body weights to the other groups, they showed the smallest backfat thickness, as well as the smallest and lightest ovaries (Table 1) and uterus (P≤0.05). The classification of macroscopically visible follicles showed that females in anestrus have a greater number of follicles in the F1 and F2 (P.≤0.05), and absence of corpora lutea and albicans. The analysis of the follicular population revealed that the animals in anestrus had not only the highest number of secondary and tertiary follicles, but also the highest number of follicles in both early and late atresia (P≤0.05- Table 2). On the other hand, SH females showed similar behavior as the CT, except for the number of corpora lutea, which was higher (P≤0.05- Table 2). No differences in the areas of follicular components were observed among experimental groups.

Table 1 Ovarian biometrical data in Control (CT), Silent Heat (SH) and Anestrus (AN) gilts

Parameter	CT	SH	AN	SEM	p-value
Length, cm	35^{b}	34.0^{ab}	29.2^{a}	1.5	0.002
Width, cm	27^{b}	24.4^{ab}	21.6^{a}	1.1	0.008
Thickness, cm	19.3^{a}	19.0^{a}	13.4^{b}	1.2	0.003
Weight, cm	8.9^{ab}	9.6^{b}	5.3^{a}	1.2	0.04

[a,b] Within a row, different superscripts differ (P≤0.05)

Table 2 Number of ovarian follicles at different stages of development in Control (CT), Silent Heat (SH) and Anestrus (AN) gilts

Parameter	CT	SH	AN	SEM	p-value
Preantral	26.0	25.5	10.5	11.0	NS
Antral	5^{ab}	3^{ab}	9^{a}	2	0.05
Tertiary	5^{b}	5^{b}	17^{a}	2	< 0.01
Early atretic	4^{b}	3^{b}	16^{a}	4	< 0.05
Late atretic	7.0^{b}	5.0^{b}	20.0^{a}	2.5	< 0.01
Corpura lutea	2.0^{b}	5.0^{a}	0.0^{c}	0.4	< 0.01
Corpura albicantia	2.5^{a}	2.3^{a}	0.0^{b}	0.6	< 0.05

[a,b] Within a row, different superscripts differ (P≤0.05)

Discussion and Conclusions

It is clear that animals in anestrus present reproductive failure due to lack of ovulation, which is evidenced by the high number of atretic follicles and the absence of corpora lutea and albicantia. However, silent estrus females have normal ovaries, which indicates that the lack of estrus behavior may have other origins or is a consequence of estrus detection failure.

Acknowledgments

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Ovarian stimulation with FSH improves ovarian follicular response, oocyte quality and meiotic maturation in 140 and 160 days old prepubertal gilts

Vivian A. P. Alfradique[1*]; Saullo V. P. Alves[1]; Domingos L. Souza Netto[1]; Andréia F. Machado[2]; Jurandy M. Penitente Filho[1]; José D. Ribeiro Filho[1]; José D. Guimarães[1]; Marcos S. Lopes[3]; Simone E. F. Guimarães[2]
[1]*Department of Veterinary,* [2]*Department of Animal Science, Federal University of Viçosa, MG, Brazil,* [3]*Topigs Norsvin, Curitiba, PR, Brazil,* vivianangelico@gmail.com

Introduction

Oocyte competence is refer as the ability of the oocyte to resume meiosis, cleave following fertilization and develop into a viable embryo (1). *In vitro* study showed that oocytes obtained from porcine prepubertal females has a lower embryo development capacity compared to adult females (2). Strategies have been adopted in an attempt to increase developmental competence of prepubertal oocytes, such as FSH treatment in the oocyte donor prior follicular aspiration (3). However, it is unknown if FSH treatment and increasing of age could improve oocyte numbers and quality in prepubertal gilts. Thus, the purpose of this study was to examine the effects of age (140 vs 160 days) and FSH treatment on: i) density of preantral follicles; ii) biochemical composition of follicular fluid (FF), and iii) oocyte quality and nuclear maturation rate in cumulus-oocyte complexes (COCs) collected from prepubertal gilts.

Materials and Methods

Thirty-five prepubertal gilts were separated according to the age (140 ± 4 days and 160 ± 4 days) and within each age, gilts were allotted to received six injections given every 8 h of FSH [treated; 100 mg of FSH; G140+FSH (n = 10) and G160+FSH (n = 7)] or saline solution [control; 0.9% sterile saline solution; G140+control (n = 10) and G160+control (n = 8)]. After 24 h of the last FSH injection, ovaries were recovered and the number of small (1-3 mm), medium (3-6.49 mm) and large (≥6.5 mm) follicles were counted and COCs were aspirated from medium follicles. Then, the COCs recovered were morphologically classified (grade I-IV) and COCs grades I-II were used to brilliant cresyl blue (BCB) staining and *in vitro* oocyte maturation (IVM). After IVM, the oocyte meiotic maturation was evaluated by orcein staining. In addition, FF was used for analysis of biochemical parameters in an automatic biochemistry analyzer. Data were analyzed by the GLM procedure of SAS 9.4® ($p < 0.05$).

Results

Results of COC morphological classification and oocyte nuclear maturation are shown in Table 1. The results showed a significant effect ($p < 0.05$) of FSH and donor age in the ovarian follicle population. The percentage of medium follicles increased ($p < 0.0001$) as the same proportion that the percentage of small follicles reduced ($p < 0.0001$) in FSH-treated and younger gilts. In addition, the concentration of glucose in FF increased ($p < 0.05$) in FSH-treated and older gilts; in contrast, the concentration of triglycerides decreased ($p < 0.05$) in these same groups of animals.

Table 1. Morphological classification, BCB test and meiotic maturation rate of COCs from gilts at 140 and 160 days of age submitted or not (control) to a FSH stimulation (Mean ± SEM).

Parameter	Treatment			
	160 days of age		140 days of age	
	Control	FSH	Control	FSH
Total COCs (n)	36.5 ± 9.3^{Bb}	64.9 ± 16.3^{Ba}	56.2 ± 5.2^{Ab}	88.5 ± 10.1^{Aa}
GI oocytes (n)	4.5 ± 1.7^{b}	17.3 ± 4.8^{a}	7.9 ± 1.3^{b}	19.6 ± 3.4^{a}
GII oocytes (n)	11.7 ± 3.1	17.0 ± 5.2	18.6 ± 3.0	23.9 ± 4.3
GIII oocytes (n)	11.6 ± 3.0	17.8 ± 6.9	16.9 ± 2.5	25.1 ± 3.9
GIV oocytes (n)	8.6 ± 2.5^{B}	12.7 ± 3.7^{B}	12.8 ± 2.4^{A}	19.9 ± 2.4^{A}
BCB + % (n)*	39.1 (43)^{Ab}	87.9 (174)^{Aa}	20.8 (42)^{Bb}	52.2 (165)^{Ba}
Meiotic maturation % (n)*	59.2 (61)^{Ab}	73.4 (138)^{Aa}	42.9 (79)^{Bb}	62.8 (179)^{Bb}

Within a row, mean of values followed by lower-case (FSH vs control) and uppercase (140 days vs 160 days) letters differed ($p < 0.05$) among them by Tukey-Kramer or Chi-square* test.

Discussion and Conclusion

FSH treatment led to an increase in the follicular population available for oocyte aspiration in 140 and 160 days old prepubertal gilts, showing that prepubertal gilts are able to respond to exogenous FSH injections. Also, FSH seems to have an positive impact on oocyte quality and competence since FSH-treated gilts presented greater number of COCs with better quality and meiotic maturation rate. Increased FF concentrations of glucose in FSH-treated gilts indicate that glucose is used as a source of energy metabolism, assisting the oocyte maturation. In conclusion, FSH treatment is effective to improve the oocyte quantity, quality and nuclear maturation in 140 and 160 days old prepubertal gilts. Moreover, oocytes obatined from 140 days prepubertal gilts apperared less meiotically competent than 160 days old prepubertal gilts-derived oocytes.

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Reproductive performance of gilts with reduced age at first breeding and high growth rates

Gefferson Almeida da Silva[1], Fernanda Almeida[2], Vanderlei Zappani[3]; Evandro Cezar Beraldin[3]; Geraldo Camilo Alberton[4]; Daiane Donin[4]; Ray Nascimento[1] and Amanda Pimenta Siqueira[1]

[1]Agroceres PIC, SP, Brazil; [2] UFMG, MG, Brazil; [3]Lar, PR, Brazil; [4] UFPR, PR, Brazil

gefferson.silva@agroceres.com

Introduction

Gilts have an important role on the farm, as they represent the largest category (19-20%) of female pigs in a breeding herd (1). The genetic selection constantly promotes evolution that may change certain traits of these animals (2). However, there is lack of information on management strategies suitable for modern sows. This study, therefore, aimed to evaluate the effect of age and growth rate of gilts at first mating on productive performance and retention rate until third farrowing.

Materials and Methods

The study was performed with 1,962 gilts (Camborough®) at a farm with 10k sow stock *(MHY* and *APP* positive, stabilized in terms of health*)* in the south of Brazil. The groups were retrospectively created according to age at first mating: T1- (190 to 200d – n= 290); T2 (200 to 210d – n= 370); T3 (210 to 220d – n= 591) and T4 – (>220d – n= 620). In all treatments, the following criteria were established for breeding: >135kg body weight, second estrus, 20 days after reproductive vaccines and 15 days of cage adaptation. All females were weighted at birth, weaning, nursery, selection, flushing, breeding, and inbreeding/weaning (Parity 2 and Parity 3) to obtain a growth curve. Additionally, measures of backfat thickness and body condition (caliper) were performed at selection, flushing, breeding, and on weaning/breeding (Parity 2 and Parity 3). Blood samples were collected to evaluate estrogen on day 16 and 18 of the second cycle, and progesterone, tree days after the end of estrus (10 animals per treatment). Retention rate was calculated as follow: Retention rate (%): (Stock after farrowing Parity 3)/ (Stock at the beginning) *100. Data were analyzed using linear or logistic regression models in R, gilt was the experimental unit. Results were considered significant at $P \leq 0.05$.

Results

The growth results from each treatment group are summarized in Table 1. The total number of piglets born, born alive, weaned, stillborn and mummies along three parties were not affected by age at first mating (Table 2). Retention rate until parity three in T1 gilts was slightly higher than T4 females, but it did not reach the level of significance (Figure 1); however, no statistical difference ($P > 0.05$) was detected. No statistic differences were detected on estrogen and progesterone (Table 3).

Table 1. Growth performance of females from birth to breeding of the four experimental groups

Variables	Treatment			
	T1	T2	T3	T4
Birth weight (kg)	1.55±0.32 A	1.49±0.32 B	1.40±0.32 C	1.35±0.32 D
Weaning weight (kg)	6.6±1.09 A	6.48±1.08 A	6.24±1.11 B	6.23±1.18 B
Age at weaning (days)	22±2 AB	22±3 B	22±3 B	23±4 A
ADG at weaning (kg/day)	0.23±0.04 A	0.23±0.04 A	0.22±0.05 C	0.21±0.05 D
Nursery weight (kg)	23.05±4.51 A	22.49±4.84 A	21.32±4.94 B	20.7±5.13 C
Nursery age (days)	60±4 A	61±4 A	61±4 A	62±5 A
ADG nursery (kg/day)	0.6±0.09 A	0.57±0.1 B	0.55±0.1 C	0.53±0.11 D
Selection weight (kg)	108.38±8.25 A	101.44±10.97 B	98.54±9.92 B	95.38±10.49 C
Selection age (day)	146±3 B	145±4 A	146±4 A	147±5 A
ADG selection (kg/day)	0.74±0.05 A	0.7±0.07 B	0.67±0.06 C	0.65±0.07 D
Age at 1st heat (days)	161±11 C	166±14 B	167±16 B	175±21 A
Flushing weight (kg)	134.29±8.84 AB	137.4±10.25 A	134.32±11.5 A	129.75±13.28 B
Flushing age (days)	177±4 D	188±5 C	192±8 B	198±12 A
Backfat thickness at flushing (mm)	13.85±2.23 A	14.07±2.2 A	13.80±2.47 A	13.18±2.76 B
Caliper flushing (points)	11.8±1.65 AB	11.9±1.85 A	11.46±1.91 B	10.69±2.15 C
1st Breeding age (days)	195±3 D	207±3 C	215±3 B	235±15 A
1st Breeding weight (kg)	147.52±8.42 C	150.72±9.79 B	150.97±10.46 B	155.13±12.53 A

*Different letters within a row indicate statistical difference among treatments. Were conducted by Tukey's test based on a linear model ($p<0.05$).

Table 2. Mean and standard deviation of performance of females along the moments before mating for the four treatments.

Variable		Treatment			
		T1	T2	T3	T4
Parity 1	Weaned (n)	13±3 a	13±3 a	12±3 b	12±3 b
	Total born (n)	15.68±3.29 a	15.56±3.06 a	15.74±2.83 a	15.4±3.15 a
	Born alive (n)	14.66±3.17 a	14.59±2.94 a	14.64±2.89 a	14.26±3.32 a
	Stillbirths (%)	3.91±5.7 a	3.52±5.23 a	3.93±7.01 a	4.61±8.82 a
	Mummified (%)	2.54±4.83 a	2.53±4.54 a	2.96±5.39 a	2.83±5.61 a
Parity 2	Weaned (n)	12±3 a	12±3 a	12±3 a	12±3 a
	Total born (n)	15.63±4.1 a	15.55±3.85 a	15.89±3.83 a	15.46±3.75 a
	Born alive (n)	14.01±4.31 a	14.07±3.91 a	14.21±4.17 a	14.03±3.83 a
	Stillbirths (%)	5.91±8.34 a	5.24±7.76 a	5.66±9.55 a	5.6±9.2 a
	Mummified (%)	4.41±10.34 a	4.08±7.85 a	4.57±9.01 a	3.76±8.48 a
Parity 3	Weaned (n)	12±4 a	12±3 a	13±3 a	12±3 a
	Total born (n)	16.7±4.48 a	16.8±4.36 a	16.88±3.92 a	16.68±4.04 a
	Born alive (n)	15.23±4.01 a	15.47±3.91 a	15.54±3.6 a	15.38±3.75 a
	Stillbirths (%)	6.27±7.45 a	5.66±7.72 a	5.52±8.17 a	5.25±6.95 a
	Mummified (%)	2.43±4.44 a	2.06±3.69 a	2.39±4.08 a	2.39±4.26 a

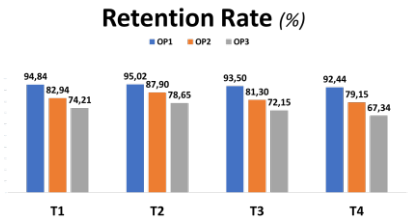
*Different letters indicate difference between treatments. Were conducted by Tukey's test based on a linear model ($p<0.05$).

Table 3. Mean and standard deviation of female progesterone for the four treatments throughout the collections.

Variable		Treatment			
		T1	T2	T3	T4
Progesterone (ng/mL)**	1	6.86±2.43 c	5.74±1.82 c	7.06±2.61 c	8.02±2.54 c
	2	14.04±4.45 b	12.25±3.95 b	14.59±5.86 b	16.16±4.98 b
	3	19.01±2.74 a	20.83±2.21 a	19.91±2.79 a	18.72±3.57 a
Estrogen (pg/mL)*	1	29.15±8.14 b	35.99±6.63 b	26.08±8.01 b	27.61±8.44 b
	2	38.06±3.63 a	34.82±4.78 a	40.27±1.06 a	37.23±7.02 a

*Different letters indicate difference between treatments. Were conducted by Tukey's test based on a linear model ($p<0.05$). ** Estrogen levels were assessed at days 16and 18 of the second cycle. *** Progesterone levels were assessed for three consecutive days after the end of estrus behavior.

Figure 1. Retention rate (%).



*Different letters indicate difference between treatments. Were conducted by Tukey's test based on a linear model ($p<0.05$).

Discussion and Conclusionsn

Gilts having at least one estrus before mating, minimum 135 kg bodyweight are eligible for insemination with a minimum of 195 days of age without commitments in litter size, farrowing and retention rates until the third parity.

Acknowledgments

Lar, UFPR, UFMG and Agroceres PIC.

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Risk factors associated with pelvic organ prolapse incidence in a Brazilian sow farm

[1]João Victor Facchini Rodrigues*, [2]Andre Waltrich, [1]Rosiel M. Cavalcante Filho, [1]Gefferson A. Silva, [1]Marco A. Zandonai, [1]Pedro G. Lisboa, [3]Gilberto Carlos Vaz, [3]Rodrigo Silva and [1]Amanda P. Siqueira
[1] Agroceres PIC Brazil, [2]Federal University of Parana, Brazil, [3]Acadrolli System, Brazil
joao.rodrigues@agroceres.com

Introduction

The pelvic organ prolapses (POP) in sows has shown a considerable increase in the last years, occurring in the vagina, rectum, uterus and bladder (1). In a recent study carried out in the United States, with 104 farms, the incidence on the herd was 2.7%, being the POP responsible for 21% of the total mortality (2). Among the possible factors observed for the occurrence of prolapses are nutritional management, genetic, environment and health (1). Our objective was to evaluate and identify the relationship of different factors with the occurrence of pelvic organ prolapse in sows.

Materials and Methods

Data from 1,028 sows (PIC Landrace and PIC Camborough) was collected at the final third of gestation, pre-farrowing, at farrowing, and post-farrowing, from July to September of 2021 in two production units located in southern Brazil. Whole-herd and individual sow information were collected, including prolapse incidence, body condition score (BC) measured by caliper, perineal score (PS) classified into PS1, PS2 and PS3, tail length, fecal score (FS), oxytocin use, and performance records. For statistical analysis, a logistic regression model using PROC LOGISTIC on SAS® (SAS Institute, Inc., Cary, NC) (4) was used to assess risk factors associated with the incidence rate of POP, with sow as the experimental unit.

Results

Sows with PS3 had higher POP incidence compared with sows with PS2 and PS1 (38.46 vs 9,41 and 0,96%, respectively). Sows with dry feces had higher POP incidence compared to sows with normal feces (9.09 and 1.64%, respectively; $p<0.01$). Sows with tail length < 13cm had higher POP incidence compared to sows with tail length >13 cm (5.18 and 2.25%, respectively; $p<0.01$). There was no association of BCS and POP incidence, although sows with BSC "thin" had higher POP incidence ($p<0.01$) compared with "fat + ideal" sows (Table 2). There was an association among sows with BCS "thin", fecal score "dry" and POP incidence (Table 3). There was also no evidence of an association between use of oxytocin, total born or litter weight and POP incidence.

Discussion and Conclusion

The prolapse incidence was 4 times higher in sows with PS3 than in PS2 sows. Potential causes of the PS occurrence are still not clear. However, injuries of the perineal ligaments, eg tail docking, would correlate with the neuromas and neuroanatomical alterations on the peripheral nervous (1) and POP ocurrence. The prolapse incidence was 5 times higher in sows with dry feces and there was an association among dry feces, BSC thin and POP incidence that would be directly related to low water intake, leading to tenesmus, constipation and an increase on intra-abdominal pressure.

Table 1. Parameters analyzed and prolapse incidence in sows

Item	POP incidence (%) [1]			*p value* [2]
Perineal score (1; 2 and 3)	0.96 [a]	9.41 [b]	38.46 [b]	<0.01
Faecal Score (Normal; Dry)	1.64 [a]	9.09 [b]	-	<0.01
Tail length (> 13cm; < 13cm)	2.25 [a]	5.18 [b]	-	<0.01
Prepartum body score (Fat; Ideal and Thin)	1.79	1.74	3.98	0.13
Use of oxytocin (No; Yes)	3.25	4.84	-	0.38
Total Born (>16; <16)	3.26	4.28	-	0.38
Litter weight (>19; <19 kg)	3.26	1.82	-	0.53

Table 2. Effect of body score on POP incidence

	Ideal + Fat	Thin	*P value*[2]
POP incidence (%) [1]	1.76 [a]	3.98 [b]	< 0.01
Sow (n)	511	503	-

Table 3. Effect of prepartum body score and faecal score on POP incidence[1]

BCS	Faecal score		n	*p value*[2]
	Normal	Dry		
Fat	1.56	3.23	223	0.99
Ideal	1.44	2.53	288	0.99
Thin	1.81 [a]	8.09 [b]	503	0.04

[1]Lsmeans for the incidence or probability of the prolapse occurrence. [2]General model with binomial distribution to measure the probability of the prolapse occurrence ($p< 0.05$).

In summary, PS, FS and tail lenght appeared to be contributing factors associated with POP incidence in this system.

Acknowledgments

Acadrolli Farm, RS, Brazil

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The administration of 2-Methyl-2-phenoxypropanoic acid after farrow to gilts improve the use of fat and muscle during lactation

Guillermo Ramis[1,2*], Anselmo Martínez-Moreno[3], Eva Romera-Recio[1], Elisa Rodríguez-Hernández[1], Raquel Fernández[3], José L. Íñiguez[3], Clara de Pascual[1], Laura Martínez Alarcón[2,4], Ignacio Fernández-Usón[5], Paula Sánchez-Giménez[3]

[1]Departamento de Producción Animal, Facultad de Veterinaria, Universidad de Murcia, Spain,[2]Instituto de Investigación en Biomedicina (IMIB), Murcia, Spain [3] Agropor S.A. Las Torres de Cotillas, Murcia, Spain,, [4] Servicio de Cirugía, Hospital Clínico Universitario Virgen de la Arrixaca, Murcia, Spain, [5] Fatro Ibérica, Spain guiramis@um.es

Introduction

The usage of fat during lactation is a main factor to keep the body condition of gilts and sows and achieve an adequate growth rate of litter. Especially in nulliparous whom are still growing themselves. The hepatic metabolism is critical to have a correct lipidic metabolism, meeting then the requirements of breeder and litter. We have investigated the mobilization of fat and muscle in gilts after administration of 2-Methyl-2-phenoxypropanoic acid, also known as mefepronic acid (MA).

Materials and Methods

Two hundred gilts were involved in this trial, being 100 treated into 24 hours after farrow with an IM injection of Liverfine® (Fatro Iberica, Spain), but only data from 192 were recovered. The gilts were randomly allotted, and were used all the gilts farrowing into two consecutive weeks to avoid environmental factors. The fat back thickness (FBT) and the deep of loin (DL) was measured at farrow and weekly up to weaning, using a wireless ultrasonography device (Tecnoscan, USA). Moreover, the piglets were weighted at birth+24h, after fostering and at weaning. Two different genetic lines were evaluated; being 68 gilts from genetic A and 124 from genetic B. The difference between FBT and DL were calculated, among each week of lactation. The comparison of data was performed using Student 's t test, and squared Chi for frequencies.

Results

The values for BFT and LD appears in tables 1 and 2 performance appears in table 1 and 2

Table 1. Average for BFT at each measure

GEN	GROUP	BFT1	BFT2	BFT3	BFT4
A	CONTROL	11.9771	10.5286	9.3443	8.9257
	TREATED	13.5742	11.3955	10.2818	9.4636
	p-value	NS	NS	NS	NS
B	CONTROL	14.218	13.4157	12.0287	11.4787
	TREATED	14.873	13.6651	12.4198	12.0881
	p-value	NS	NS	NS	NS

Table 2. Average for LD at each measure

GEN	GROUP	LD1	LD2	LD3	LD4
A	CONTROL	46.7357	44.4629	41.7129	40.9271
	TREATED	46.9409	46.4061	41.7803	41.4561
	p-value	NS	NS	NS	NS
B	CONTROL	46.2992	44.9492	41.8811	38.1861
	TREATED	47.0675	44.823	40.2548	40.5825
	p-value	NS	NS	NS	0.035

There was no significant difference for BFT at aby measurement, but there was a significant difference for LD at weaning in the genotype B, with higher DL for treated group.

The consumption of fat (as BFT decrease) and muscle (as LD decrease) every week of lactation and the whole period appears in the tables 3 and 4.

Table 1. Fat consumption

GEN.	group	ΔFBT 1st week	ΔFBT 2nd week	ΔFBT 3rd week	ΔFBT whole period
A	CONTROL	1.4486	1.1843	0.4186	3.0514
	TREATED	2.1788	1.1136	0.8182	4.1106
	p-value	NS	NS	NS	NS
B	CONTROL	0.8024	1.387	0.55	2.7393
	TREATED	1.2079	1.2452	0.3317	2.7849
	p-value	NS	NS	NS	NS

Table 2. Muscle consumption

GEN.	group	ΔDL 1st week	ΔDL 2nd week	ΔDL 3rd week	ΔDL whole period
A	CONTROL	2.2729	2.75	0.7857	5.8086
	TREATED	0.5348	4.6258	0.3242	5.4848
	p-value	NS	NS	NS	NS
B	CONTROL	1.35	3.068	3.6951	8.1131
	TREATED	2.2444	4.5683	-0.3278	6.4849
	p-value	NS	NS	NS	0.002

there was no difference in the fat consumption even when in genotype A the BFT loss in treated gilts is higher than in control group. But interestingly, the muscle consumption is higher for treated group in genotype B during the two first weeks but in the third the average animals increased LD, with a significant difference at weaning compared to control group. As regards the gilts that increased muscle thickness, there was lower frequency that expected in the 2nd week (19%, AR=-2.3, p=0.017) for treated group, but much higher in the 3rd week (55.6%, R=2.0, p=0.035) in genotype B. There was no influence of weaned piglets but it was significant the influence of LD at farrow.

Discussion and Conclusion

The usage of fat and muscle during lactation in gilts is critical, since the breeders are still growing and it's preferable to consume fat and not muscle. In this trial we have observed how the treated gilts use more fat and less muscle, in a different way in two different genetic lines.

There is a shot literature of mefepronic acid usage, especially in cows, and commonly focused in lactational ketosis prevention, but there is a lack of information of the effects on sows. Certainly, in former trials we had not found ketosis during lactation since normally in sows and gilts, this condition use to appear in the last third of gestation. But, in this study, the MA seems to produce a differential way to use the fat and the muscle, saving muscle tissue during the last week of the lactation. The effect could not be constant in all genotypes and these terms need for further research.

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The effect of ultraviolet light chamber, used for disinfecting semen blisters, on farrowing rate and number of piglets born alive

Hugo Z. Marques[1*]; Heloiza Irtes[1], Wagner Giacomini[1], Marcos S. Lopes[1]
[1]*Topigs Norsvin, Curitiba, PR, Brazil,* hugo.marques@topigsnorsvin.com.br

Introduction

Keeping a pig farm with a high heath status is essential to achieve satisfactory reproduction performance and profit. In recent years, several diseases have emerged and re-emerged, such as African swine fever and enteric delta coronavirus (1,2,3). To face this challenge, the attention given to biosecurity has increased in pig farms worldwide. Many diseases enter the farms through infected animals, people and/or fomites. Thus, several strategies have been used to prevent the spread of diseases. Among them, we can mention the quarantines, closed herd systems and disinfection tools, such as ultraviolet (UV) chamber (1,3). However, it is still unclear whether the reproduction efficiency of the treated semen dose can decrease due to the disinfection procedure using a UV chamber. Therefore, the aim of this study was to compare the reproduction performance (FR: farrowing rate and NBA: number of piglets born alive) of two treatment groups: 1) sows inseminated with semen doses disinfected using a UV chamber compared to 2) sows inseminated with semen doses without this disinfection procedure (control group).

Material and methods

The semen blisters that were disinfected were placed in a stainless-steel chamber with an ultraviolet light lamp (256 nm ultraviolet wavelength in the C range) and ozone gas spray at the day they arrived at the farm. The blisters were uniformly exposed to UV for 1 minute ($20x10^3 J/cm^2$). Before and after the disinfection, the blisters were stored at a temperature between 15°C and 18°C, in the same way as those that were not disinfected using the UV chamber. The inseminations of both treatment groups were performed by an experienced professional after the detection of estrus, according to the protocol routinely used at the farm. Sows from the same genetic line and parity number were used for both treatment groups. The inseminations were performed in three batches of females, with intervals of 28 days between them. In total, 28 sows (14 for each group) were inseminated for this study. The reproduction performance between the two groups were compared using the *lsmeans* R function (6) with a confidence level of 95%. Each phenotype was evaluated fitting, as a fixed effect in the linear model, the batch of insemination (N=3), treatment group (UV disinfected or control) and service sire (N=12), as the semen of each sire was used to inseminate at least two sows. Significant difference between the treatment groups was declared when a P value ≤0.01 was observed.

Results

All 14 sows inseminated in each of the two treatment groups farrowed successfully and therefore the FR was 100% for both. Regarding the NBA, a significant difference (P=0.009) was observed between groups (Table 1). A decrease of 2.56±0.87 NBA was observed in the group of sows inseminated with the semen doses that were disinfected using the UV chamber compared to the control group.

Table 1: Least-square means (Lsmean) and standard error (SE) for number of piglets born alive of the two treatments group.

Group[1]	Lsmean	SE	Confidence limit	
			lower	upper
UV	12.6	0.62	11.3	13.9
Control	15.2	0.62	13.9	16.5

[1]UV: group of sows inseminated with semen doses disinfected with ultraviolet chamber; Control: group of sows in the control group.

The UV light has the potential of mitigate heath outbreaks caused by viruses and bacteria present on the semen blister's surface due to its disinfection properties. Although this seems to be an important tool for biosecurity, the results of this study show that it may negatively impact NBA and therefore it needs to be considered carefully. On the other hand, it doesn't seem to have any impact on FR in the evaluated dataset. However, this study used a small sample size and the boars used in the treated and control group were different. Therefore, further studies on this subject needs to be performed for more conclusive results.

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The use and sharing of a boar semen lysate

Yufu An[1*]; Xintao Sun[1]; Hao Lv[1];

[1]*PIG PEACE (Hangzhou) Technical Service Co., Ltd., 421655929@qq.com*

Introduction

PRRS virus can be transmitted vertically through boar semen, and the boar semen must remain PRRS negative, otherwise, it will lead to PRRS infection and disease in sow farms. Daily monitoring of PRRS infection status in boar studs is an important means of preventing PRRS. Semen is extracted by different methods, and the extraction method with the highest sensitivity is selected.

Materials and Methods

1. Sample classification: Using 4 bottles of different semen, nucleic acid extraction was performed by four different methods. Method A: Extract with manual nucleic acid extraction kit; Method B: First use RealPCR TL-60 for extraction and then with manual nucleic acid extraction kit; Method C: Extract with automatic nucleic acid extraction kit; Method D: First use RealPCR After TL-60 treatment, use an automatic nucleic acid extraction kit for extraction.

	Boar semen1	Boar semen2	Boar semen3	Boar semen4
A	A1	A2	A3	A4
B	B1	B2	B3	B4
C	C1	C2	C3	C4
D	D1	D2	D3	D4

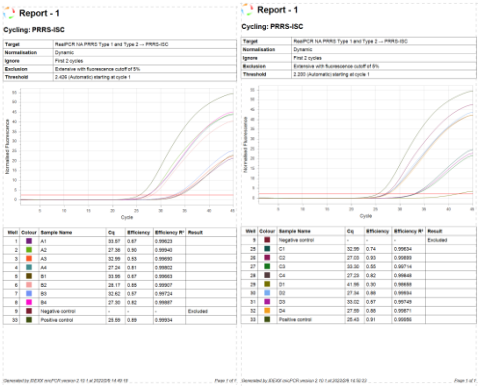
2. Sample processing: 1ml semen samples were taken from the four groups of ABCD and centrifuged at 12000rpm for 4min. In groups B and D, the supernatant was discarded; 400ul RealPCR TL-60 buffer was added, mixed with a pipette tip, and incubated at 70°C for 10min; the lysed samples were centrifuged at 15,000rpm for 1min, and 400ul of the clarified lysate was added to a fresh centrifuge tube.

3. Nucleic acid extraction: In group A, 200uL of supernatant was added to a new 1.5mL centrifuge tube, and then 500uL of lysate from tomorrow's DNA/RNA virus extraction kit was added, shaken, and mixed for the 30S, and allowed to stand at room temperature for 5min. Transfer all the solutions of A and B to the purification column, centrifuged at 12000rpm for 1min, and discard the liquid in the collection tube; add 500uL of rinse solution 1 to the purification column, centrifuged at 12000rpm for 1min, and discard the liquid in the collection tube; add 500uL to the purification column Rinse solution 2, centrifuge at 12000rpm for 1min, discard the liquid in the collection tube; put the purification column back into the collection tube, centrifuge at 12000rpm for 2min; transfer the purification column to a new 1.5ml centrifuge tube; add 50ul of eluent to the purification column, After incubation at room temperature for 2 min, centrifuge at 12,000 rpm for 1 min, and collect the DNA/RNA eluate into a 1.5 mL centrifuge tube. Groups C and D were extracted using an automatic nucleic acid extraction kit. First, the deep-well plate was taken out, and the magnetic beads were resuspended by inverting and mixing several times. Then, the liquid on the wall was tapped on the table to slow down, and then the aluminum sealing film of the kit was carefully removed. ; Take out the proteinase K solution, and after brief centrifugation, use a pipette to add 20uL to the first 4 wells of the first column; take the samples of group C, and use a pipette to add 300uL to the corresponding 4 wells of the first column; take the samples of group D, use a pipette to add the last 4 sample wells in the first column without proteinase K; put the deep-well plate into the automatic extractor for nucleic acid extraction; after the extraction, the eluate in the fifth column is transferred to the EP tube, for the extracted nucleic acid.

4. Configuration of the reaction system: use a 25uL system (20ul reaction solution with 5ul nucleic acid) for configuration.

Results

The semen PRRS in the FAM channel was negative; the Ct value of the endogenous gene in the HEX channel was significantly lower using RealPCR TL-60 buffer.



Conclusions and Discussion

After the semen is first treated with RealPCR TL-60 buffer, the lysis will be more thorough and the sensitivity of pathogen detection will be increased. At the same time, monitoring of PRRS in boar semen will help to better prevent PRRS.

Acknowledgments

PIG PEACE (Hangzhou) Technical Service Co., Ltd.

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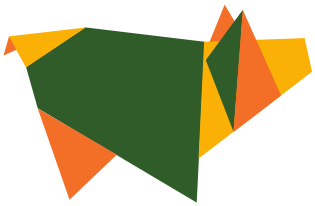

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