

TEETH WEAR OF PIGLETS IN LACTATION PHASE: PERFORMANCE AND INJURIES

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Abstract

Piglets are born with a total of eight teeth and on the second day of life, teeth wear management is carried out to avoid lesions on the sows' ceilings and on the faces of the piglets. For this, an electric wearer is used that only wears the apex of the teeth. In this experiment, a comparison of twelve litters divided into: a control group (CG) was performed, which the intact teeth were kept ; with the management of tooth wear and treatment group (TG),. The animals were followed from the first day of life until weaning. The weighing was carried out on the respective days of life: second, seventh, fourteenth and twenty-first. It was observed that the fights between piglets and for the ceilings did not present significant difference, on the other hand the injuries caused by the teeth and the dirt injuries had significant difference with greater presence in the group without wear. In the comparison of the piglets' daily weight gain, there was noted that no significant difference between two groups was observed, which can state that the non-wear of the teeth does not interfere in the daily weight gain, however it was concluded that the animals without wear (CG) had a higher incidence of dirt lesions.

Keywords

animal welfare, teething, weight gain, piglets, swine.

DESGASTE DENTÁRIO DE LEITÕES EM FASE DE LACTAÇÃO: ASPECTOS DE DESEMPENHO E LESÕES

Resumo

Os leitões nascem com total de oito dentes e no segundo dia de vida é realizado o manejo de desgaste de dentes para evitar lesões nos tetos das matrizes e nas faces dos leitões. Para isso, usa-se desgastador elétrico, que faz o desgaste somente do ápice dos dentes. Neste experimento, realizou-se a comparação de doze leitegadas divididas em: grupo controle (GC), cujos animais se mantiveram com os dentes íntegros; e grupo tratamento (GT), cujos leitões tiveram o desgaste de dentes. Os animais foram acompanhados do primeiro dia de vida até a desmame, quando ocorreu a pesagem nos seguintes dias de vida: segundo, sétimo, décimo quarto e vigésimo primeiro. Observou-se que as brigas entre leitões e pelos tetos não apresentaram diferença significativa, por outro lado, as lesões causadas pelos dentes e as lesões de sujeira tiveram diferença significativa, com maior presença no GC. A comparação do ganho de peso diário (GPD) dos leitões dos dois grupos revelou que não houve diferença significativa, por isso se pode afirmar que o não desgaste dos dentes não interferiu no GPD, entretanto, foi possível concluir que os animais sem desgaste (GC) apresentaram maior ocorrência de lesões de sujeira.

Palavras-chave

bem-estar animal, dentição, ganho de peso, lesões de teto, suinocultura.

INTRODUCTION

According to the Brazilian Association of Animal Protein (ABPA, 2019), Brazil has about 2 million hog breeding housings, resulting in 3.97 million tons of pork meat produced, moreover it has been classified as the fourth country with the largest exportation. The production of pork meat played an important role in the economy of the Santa Catarina State being the largest national producer, with 27.90% of slaughter and also as the main exporter of pork, with more than 50% of Brazilian exports (GIEHL and MONDARDO, 2019).

The pig production system is constantly expanding, and is motivated by the growing demand from consumers and organizations to adopt more ethical practices, aiming improvements in management and welfare (SILVA et al., 2015). Good management practices, which aim to prioritize animal welfare, have been increasingly implemented in all production cycles. A committee was developed to report an objective way of assessing animal welfare called as Welfare Quality®, which addressed the principles to ensure animal welfare: good food, good housing, good health and appropriate behavior (VELARDE and DALMAU, 2019). When these principles are met, there is consequently an improvement in the quality of the final product (SILVA et al., 2015).

Piglets are born with a total of eight teeth, four incisors and four canines, which is used to apprehension of teats during feeding. However, they can generate lesions on mothers and on the faces of other piglets, as a result of disputes, which occur during feedings. Often these injuries are due to greater litter in proportion to the number of ceilings of the mother or by the hierarchy. Therefore, one of the management practices to avoid the appearance of these lesions is the teeth wear at piglets age (DIAS et al., 2018; GODÝN et al., 2019).

Teeth wear is performed with the help of an electric wearer, which reduces only the apex of the canine and incisor teeth, at the first days of life. This management is commonly carried out on the second day of life, so that on the first day, piglets are able to apprehend the teats and consume colostrum, which is very relevant for the transfer of passive immunity (DIAS et al., 2018).

Some producers have already abolished this practice in their productions, although there is no Brazilian legislation that addresses the issues. Other solutions

have been implemented to reduce fights, and to avoid productive losses, such as piglet transfer management and litter uniformity, together with the access to the sufficient amount of feed for the lactating females (ABCS, 2016).

Due to the new demands of consumers' market, the management of teeth wear on the first or second day of life has been negatively seen, for causing pain, exposure of the dental pulp cavity, teeth fractures, bleeding and other diseases, decreasing the animal welfare. Studies have been carried out to understand the possibility to abolish this practice and/or to only performed in some pig lots.

In July 2018, the first proposal for Brazilian legislation was prepared, which dealt with good management practices in pig farms of commercial breeding. This proposal addressed the tolerance on the teeth wear when there are serious injuries on the ceilings and on the piglets face, and when worming, it should be done only in the final third of the tooth. The cutting of teeth with pliers was prohibited, but it was revoked in 2019. Despite this, it can be taken as a basis for future actions and the prerogatives for animal welfare proposals (BRASIL, 2018).

The European Directive 2008/120/EC, which was considered a benchmark in animal welfare, and more restrictive, also stated that tooth wear should only be carried out if there is evidence of damage to the ceilings of sows. Beyond, if necessary, it must be carried out by a veterinarian or trained person, experienced in the execution of techniques and with adequate hygiene conditions. Therefore, it did not prohibit the teeth wearing practice (UNIÃO EUROPEIA, 2008).

Given the above, and the scarcity of information on the effects of teeth wearing on piglets' performance and dirt, this study aimed to verify the influence of this management on the daily weight gain and fight behavior.

MATERIALS AND METHODS

This research was evaluated and approved by the Ethics Committee on the Use of Animals (CEUA) of the Federal Institute of Santa Catarina, Concórdia Campus, Santa Catarina State, under the protocol no. 16/2019. The study was carried out in a core farm - piglet producing unit (UPL) of an agroindustry in Western Santa Catarina, which were housed a herd of 504 sows. The farm had seven sheds, one for maternity, three for finishing, two for gestation and one for daycare, located in the countryside of Chapecó city, Santa Catarina State. The piglets were monitored from October, 17th to

November, 7th, 2019.

The experiment was carried out in the maternity shed, with twelve litters, which were divided into two groups: the first containing six litters in which the teeth were worn, and the second with six litters that the teeth were not worn. The experiment was carried out from the second day of life until weaning at 21 days. In addition to the evaluation of fights behavior between piglets and dirt lesions were also observed. These injuries observed was the ones caused by the act of the piglet feeding on teats at the time of feeding.

The females were inseminated with fresh semen and remained in cages throughout pregnancy. At about 110 to 112th days of gestation, the sows were transferred to the maternity ward, where they remained until the piglets weaning. As for the thermal control in the installation, curtains and heating were handled via concealers with incandescent lamps.

The parturition and the births of the piglets were constantly monitored, in addition to the observation of colostrum feed intake. When necessary, birth assistance was provided. After colostrum ingestion, the piglets were redistributed to each litter, containing 12 animals on average per sow, in order to standardize the batches and minimize disparity in average weight.

On the first day of life, caudectomy was performed and the piglets were identified with a tattoo. The females received earrings with numbers according to the farm management, as they will remain in the herd. Males, on the other hand, had received simple numbering for individual weighing, and were marketed in the nursery phase.

The animals were distributed in the groups: control (CG) and treated (TG). The TG (n = 77) received teeth wear management, six of which were litter fed: three with 13 piglets, two with 12 and one with 14. The teeth wear management of the piglets in the CG was performed on the second day of life, with electric wearer (DREMEL® 3000), when the first weighing was also carried out. In the CG (n = 72) there was no teeth wear, and were composed by six litters, two with 11, three with 12 and one with 14 animals. In total, 149 piglets were evaluated, 76 males and 73 females.

The females had different number of deliveries (1st to 6th delivery), with an average of 3.3 deliveries. The body condition scores (BCS) of the females were evaluated and classified from 1 to 5 (WOLOSZYN, 2018), before delivery, and the

mothers' ceilings were also observed.

The presence or absence of fights between piglets, disputes over the ceilings and lesions on the faces were evaluated during a period of three hours during the morning and three hours in the afternoon, three times a week, from the second day of life until the day of leaving the daycare center. Dirt injuries and injuries caused by teeth were classified as: grade 1 - mild injuries, grade 2 - severe injuries, 3 - ulcerated injuries. On the 14th day of life, the piglets were individually evaluated and the lesions were differentiated between dirt lesions and the injuries caused by the piglets' teeth. The piglet's natural behavior of "digging" in the mother's roof during feeding was called and evaluated as dirt lesions.

The daily feed and water supply were *ad libitum*, and the piglets had receipt feed from the 8th day of life and beyond. The individual female feed consumption was observed after their feed in an individual trough. The water was available in a drinking fountain fixed in each stall.

The animals were individually weighed with the aid of a digital scale. These were divided into: weighing the piglets on the second, on the seventh day, on the fourteenth day and on the twenty-first day of life (time of weaning). At this time, the piglets were separated by sex in different rooms. Daily weight gain (GPD) was calculated at the end of the experiment with the aim of analyzing whether wear interfered in weight gain. After data tabulation and normalization, the statistical analysis was performed using the Chi-square test in the SAS software (STATISTICAL ANALYSIS SYSTEM, 2005).

RESULTS AND DISCUSSION

The females were visually observed before delivery and classified according to the BCS in the following scores, as presented in [Table 1](#).

The mean of the BCS of the twelve females was 3.8, which corresponds to that suggested by Woloszyn (2018), who proposed a normality of 3.5 to 4. In relation to the fight behavior, during the cooler days, the piglets had fought less, suckled more, and the females had consumed all the feed provided. In addition, the females showed no lesions on the ceilings. Comparing the results obtained in relation to the behavior of the piglets ([Table 2](#)) of the control group (CG) with the treatment group (GT), it was found that there was no significant statistical difference ($p > 0.05$) between the groups

Table 1. Classification of females in relation to body condition score (BCS) and number of deliveries.

Number	Female	BCS	Number of deliveries
1	2370	2.5 – 3	5
2	2220	4	6
3	2885	2.5 – 3	2
4	2561	3 – 3.5	4
5	2539	3.5	4
6	2544	4	4
7	2692	3 – 3.5	3
8	2875	4	2
9	2716	4	3
10	2891	3.5	2
11	2554	3.5	4
12	3073	4	1
average		3.8	3.3

Table 2. Percentage of animals that presented or not disputes for the ceilings, fights between piglets, injuries caused by the teeth and dirt injuries, among the piglets of the control groups (CG - without teeth wear) and treatment (TG - with teeth wear).

Behavior and lesions	Classification	TG	CG
Ceiling disputes	Presence	35%	35%
	Absence	65%	65%
Fights between piglets	Presence	32%	35%
	Absence	68%	65%
Injuries caused by teeth	Presence	93%	50%
	Absence	7%	50%
Dirt injuries	Presence	77%	55%
	Absence	23%	45%

of disputes over teats and fights between piglets. Ricci et al. (2017) cited that fights between piglets are not necessarily associated with tooth wear, and can be caused by the establishment of hierarchy, for reasons of ambience, lack of environmental enrichment or games between them.

The dirt lesions represented in [Figure 2A](#) and the injuries caused by the teeth in [Figure 2B](#), were classified into three different degrees, however in this study only grade 1 was found, categorized as mild. In this experiment, the majority of piglets had a dirt lesion, but not because of fighting with their teeth. The fights occurred as a game behavior, that they did not result in lesions on their faces.

In the present study, lesions on faces most presented among piglets in the CG



Figure 2. (A) Dirt injuries. (B) Injuries caused by teeth.

were identified, which did not wear, compared to the TG, which did wear ($p < 0.05$). This fact did not corroborate the results found by Ricci et al. (2017), who stated that mild lesions were found both in piglets with tooth wear and in those without wear. On the other hand, this work is in accordance with the literature, which refers that teeth wear is a necessary management to avoid injuries in teats and faces, when there is a dispute over the ceilings (RICCI et al., 2016; RICCI et al., 2017).

The piglet's natural behavior of “digging” in the mother's belly during feeding was called belly nosing in the literature, and may be associated with a lack of environmental enrichment (OLIVEIRA, 2016; SCHMITT et al., 2019). Dirt injuries, in this study, had a significant presence in the TG compared to the CG ($p < 0.05$).

This behavior may be associated with early weaning, weaning weight and sucking behavior in the sow, as the piglets take longer time to ingest the feed and end up developing stereotypes, which is more common in the nursery. Although, in this work, it was observed in the maternity phase. Consequently, piglets, who had spent most of their time experiencing this stereotype, have lower growth rates due to low food intake (GODÝN et al., 2019). The factors that cause the development of this stereotype are still unknown, but they may be related to feeding, as piglets massage the mothers' ceilings (GODÝN et al., 2019; SCHMITT et al., 2019).

The averages of the weights of both groups are shown in [Table 3](#). There was no statistical difference between the male's weight and the females one, hence there was no influence of teeth wearing ($p > 0.05$).

The daily weight gain (DWG), which was calculated on days 7, 14 and 21 ([Table 4](#)), showed a significant statistical difference only in relation to the age of the

Table 3. Piglet weight in the control (CG - without teeth wear) and treatment (TG - with teeth wear) groups.

Age (day)	average \pm standard deviation (Kg)		Variation Coefficient (%)	
	CG	TG	CG	TG
2	1.40 \pm 0.32	1.29 \pm 0.33	23	25
7	2.56 \pm 0.52	2.52 \pm 0.56	20	22
14	4.18 \pm 0.70	4.18 \pm 0.82	16	19
21	5.84 \pm 1.00	5.79 \pm 1.16	17	20

piglets: as higher the age greater is the DWG, which was expected since animals tend to gain more weight. Regarding the treatments, there was a small significant difference between the groups, demonstrating that the teeth wear did not influenced the DWG, so this practice can be abolished from the managements, without harming the animal performance.

Table 4. Daily weight gain (DWG) of piglets in the control (CG - without teeth wear) and treatment (TG - without tooth wear) groups.

Age (day)	average \pm Standard deviation (Kg)		Variation Coefficient (%)	
	CG	TG	CG	TG
7	1.14 \pm 0.38	1.22 \pm 0.30	24	25
14	1.65 \pm 0.32	1.65 \pm 0.37	19	22
21	1.65 \pm 0.44	1.62 \pm 0.54	26	33

At the end of the experiment, on the day of weaning, the piglets were separated between females and males and were transferred to the nursery of the unit itself. The females remained on the farm and the males were marketed after the nursery phase.

Based on the evaluation of the results obtained by comparing the DWG, lesions on the piglets' faces and fights between them, it would be appropriate to stop handling teeth wearing. However, this practice is recommended only in some litters, when necessary. Although the findings were not statistically significant, since the evaluation period was short, based on the animals' time in the maternity hospital, new studies should be carried out, as several factors can interfere in the results. Moreover, some factors may influence the piglets' DWG, such as maternal ability, genetics, feeding, ambience and handling regarding the wear or tear of the teeth, since these aspects can affect the feed intake of the females. This fact leads to less milk production, which can cause a greater dispute between piglets, which in turn can determine the

number of piglet injuries (RICCI et al., 2017).

CONCLUSION

Teeth wear did not influence DWG of piglets, but the occurrence of dirty lesions increased, although it is not related to this management. Therefore, it is suggested that further studies should be carried out to assess the real need for this management, given the current trends in the consumer market for improvements in animal welfare. Therefore, producers that still carry out this management should seek ways to improve ambience, the food supply and uniformity of lots in order to reduce this practice.

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