

THE DATE OF THE PARTURITION INDUCTION AND ITS INFLUENCE ON LITTER PERFORMANCE¹

Karin Bößenrodt, Kathleen Fischer²

Abstract: The objective of this study was to examine the influence of the time of parturition induction on the birth weight of piglets. Because of the correlation between birth weight on the one hand and the increase of body weight during the suckling and even during the fattening period on the other hand it is important to produce piglets of an optimal weight at farrowing time. A great number of different factors do have influence on the weight. Two experiments were carried out. In the first trial the exact time of the induction of parturition was in the focus of interest as well as the effect on the birth weight of piglets. Altogether 115 gilts and multiparous sows were randomly selected into two groups. In the first group (G1) the induction of parturition took place in the morning of the 113th day of gestation, in the second group (G2) on the 114th day of gestation. The genotypes as well as the environmental conditions of both groups were the same. In order to induce the parturition each sow got a single injection of 175 µg of "Cloprostenol". In the second experiment (G3) the induction of parturition took place in the morning of the 114th day of gestation. 71 sows were used. The objective of this trial was to show, that factors as genotype and environmental conditions may also have an impact on birth weight.

Along with the weight at birth the weights of the piglets at the time of weaning were determined. The piglets had a weight at birth of 1388 ± 350 g (G1), 1496 ± 344 g (G2) and 1521 ± 329 g (G3). The results at the time of weaning were 7.85 ± 1.77 kg (G1), 7.96 ± 1.90 kg (G2) and 7.76 ± 1.32 kg (G3). Supplementary further information about the farrowing and the litter performance has been taken.

Key words: farrowing management, induction of parturition, litter performance, birth weight, weaning weight, late gestation

Introduction

The aim of piglet producers is to wean as much piglets per sow and year as possible. The number of weaned piglets is mainly affected by the weaning-mating-period, the number of live born piglets per litter and losses during the suckling period. Besides the number the qualitatively characteristics of weaned piglets are important too. To provide the feedlot with large uniform batches of piglets, a great number of piglet producers use a management programme, based on the cycle of sows. Especially in great herds a periodic farrowing system offers a lot of hygienically and organisationally advantages (*SPERBER and HILGERS, 2002*). All sows got divided into groups. Within these groups the single management steps take place temporally concentrated. The stimulation of heat and the synchronisation of ovulation are the requirements of timed artificial insemination. With the use of the synchronisation of parturition it is possible to concentrate the farrowing period within single groups.

The objective of this study was to examine the influence of the time of parturition induction on litter performance, especially the birth weight of piglets. Because of the correlation between birth weight and the increase of the weight during the suckling period and even during the fattening period it is important to produce piglets of an optimal weight at farrowing. A great number of different factors have an influence on this weight (*HÖRÜGEL et al., 1986*). Some of them, like the date of the induction of parturition, are easy to regulate by the piglet producer.

Material and Methods

Two experiments were carried out. In the first trial it should be investigated, how the time of the induction of parturition affects the litter performance, like the birth weight of the piglets. Altogether 115 gilts and multiparous sows were used. The genotypes as well as the environmental conditions of both groups were the same. Each sow was inseminated two times. The day of the second insemination was seen as the first day

¹ Original scientific paper – Originalni naučni rad

² Karin Bößenrodt, Kathleen Fischer, Anhalt University of Applied Sciences, Bernburg, Germany

of gestation. After the sows were kept into farrowing crates, they were divided into two groups randomly. In the first group (G1) the induction of parturition took place in the morning of the 113th day of gestation and in the second group (G2) 24 hours later on the 114th day of gestation. To induce the parturition each sow got a single injection of 175 µg of the PGF_{2α} analogue Cloprostenol.

In the second experiment (G3) the induction of parturition took place in the morning of the 114th day of gestation. 71 sows were used. The objective of this trial was to show that factors like the genotype and the environmental conditions may also have an influence on the litter performance. Cloprostenol was used to induce the parturition but in different, lower doses.

Along with the weight at birth the weight of the piglets at the time of weaning were determined. The results of the different groups were compared with one another. Supplementary further information about the farrowing and the litter performance was captured.

To carry out the calculations different computer programs of Windows like EXCEL and the statistic programme SPSS_{version10} were used.

Results and discussion

In group1 and group 2 it was possible to induce the parturition in more than 98 % of all sows. Only in group 3 the result was lower with 94 %. These results correspond to reports of other experiments (HÜHN and LEIDING, 2001). The reason can be found in the lower dose of Cloprostenol, which was used, the genotype of the sows and other environmental conditions.

The length of the parturition does not differ between group 1 and 2, but between these two groups and the third group. The reason for this difference is the number of born piglets per sow. In G1 and G2 11.7 piglets per sow were born and in G3 12.1 piglets per sow (table 1).

Table 1. Piglets per litter

	1 st litter sows			2 nd litter sows			> 2 nd litter sows		
	G1	G2	G3	G1	G2	G3	G1	G2	G3
PI	113.DG	114.DG	114.DG	113.DG	114.DG	114.DG	113.DG	114.DG	114.DG
\bar{x}	11.2	11.1	11.1	11.9	11.6	11.8	12.3	12.3	13.0
s	2.5	2.7	3.2	2.4	3.3	2.9	2.4	2.6	3.3
n	27	19	22	14	14	16	20	21	33

\bar{x} : mean s : standard deviation DG : day of gestation n : number of litters

In general first litter sows got the smallest piglets in weight. The weight of the piglets increased in the second litter in all groups. Piglets of the groups 2 and 3 were significantly heavier than the piglets of group 1 (table 2).

Table 2. Birth weight of piglets

	1 st litter sows			2 nd litter sows			> 2 nd litter sows		
	G1	G2	G3	G1	G2	G3	G1	G2	G3
PI	113.DG	114.DG	114.DG	113.DG	114.DG	114.DG	113.DG	114.DG	114.DG
	weight at birth (Kilogram)								
\bar{x}	1.29	1.38	1.42	1.50	1.57	1.56	1.45	1.53	1.56
s	0.29	0.27	0.31	0.38	0.36	0.33	0.37	0.36	0.33
n	286	157	224	137	148	180	193	199	406

\bar{x} : mean s : standard deviation DG : day of gestation n : number of piglets

The piglets of the Groups 1 and 2 were weaned at the same day of the week and the weights of the single piglets were determined. The results are shown in table 3. There are no significant differences between

the piglets of the the group 1 and 2. The suckling period of the 1st group lasts about one day longer than in the 2nd group. So it was possible for the piglets of group 1 to equalize the disadvantage of the lower birth weight.

Table 3. Weight of the piglets at the time of weaning

	1 st litter sows			2 nd litter sows			> 2 nd litter sows		
	G1	G2	G3	G1	G2	G3	G1	G2	G3
PI	113.DG	114.DG	114.DG	113.DG	114.DG	114.DG	113.DG	114.DG	114.DG
	weight at weaning (Kilogram)								
\bar{x}	7.26	7.32	7.26	8.67	8.17	7.96	8.02	8.26	7.29
s	1.42	1.57	1.28	1.82	1.83	1.25	1.88	2.05	1.29
n	203	101	167	113	110	155	160	144	495

\bar{x} : mean s : standard deviation DG : day of gestation n : number of piglets

Conclusion

The study has shown that it is possible to induce the parturition in sows on the 113th day of gestation. But it has also shown, that the weight of the piglets born in group 1 (induction of parturition on the 113th day of gestation) is lower than the weight in the other two groups, when the piglets were born one day later. These results correspond with the results of other experiments (*BEDDIES and HÜHN, 2002*).

Because of the longer suckling period the piglets of group 1 were able to get a comparable weight at the time of weaning compared to piglets of group 2, which lived under the same environmental conditions.

To get a decision whether the 113th or 114th day of gestation is the right date for the induction of parturition the losses during the suckling period should be investigated in further studies. Because of different information it is likely that the lighter piglets of group 1 have lower chances to survive than the piglets of the other two groups. The correlation between the birth weight and the chance to survive was proved in a number of studies (*RÖHE and KALM, 1997; HOY, 2002; HENNE et al., 2003*).

TERMIN INDUKCIJE POROĐAJA I NJEGOV UTICAJ NA PEROFMANSE LEGLA

Karin Bößenrodt, Kathleen Fischer

Rezime

Cilj ovog rada je bio ispitivanje uticaja vremena indukcije porođaja na masu prasadi na rođenju. Zbog korelacije između mase na rođenju sa jedne strane i povećanja telesne mase tokom perioda sisanja pa čak i tokom tova sa druge strane, veoma je važno proizvesti prasad optimalne težine pri rođenju. Veliki broj različitih faktora utiču na telesnu težinu. Izvedena su dva ogleda. U prvom ogledu tačno vreme indukcije porođaja je bilo u centru pažnju kao i uticaj na telesnu masu prasadi na rođenju. Ukupno 115 nazimica i krmača koje su se ranije prasile su odabrane nasumice i podeljene u dve grupe. U prvoj grupi (G1) indukcija porođaja je bila ujutru 113. dana gestacije, u drugoj grupi (G2) 114. dana gestacije. Genotipovi, kao i uslovi okoline su bili isti kod obe grupe životinja. Da bi se indukovao porođaj svaka krmača je dobila injekciju 175 µg "Cloprostenol"-a. U drugom ogledu (G3), indukcija porođaja se desila ujutru 114. dana gestacije. U ogledu je korišćena 71 krmača. Cilj ovog ogleda je bio da se pokaže da faktori kao što su genotip i uslovi sredine takođe mogu imati uticaj na telesnu masu pri rođenju.

Pored telesne mase prasadi na rođenju registrovana je i njihova masa pri odbijanju. Telesna masa prasadi pri rođenju je bila 1388 ± 350 g (G1), 1496 ± 344 g (G2) i 1521 ± 329 g (G3). Rezultati u periodu odbijanja su bili 7.85 ± 1.77 kg (G1), 7.96 ± 1.90 kg (G2) i 7.76 ± 1.32 kg (G3). Takođe, zabeleženi su i podaci o prašenju i performansama legal.

Ključne reči: upravljanje prašenjem, indukcija porođaja, performance legla, telesna težina pri rođenju, telesna težina pri odbijanju, kasna gestacija

References

1. BEDDIES, M.; HÜHN, U (2002): Zur Bedeutung des Injektionszeitpunktes für die Partusinduktion als geburtssteuernde Maßnahme. Tagungsband 8. Biotechnik-Workshop. Bernburg, p. 61-66
2. HENNE, H.; EDING, H.; SIMIANER, H. (2003):: Genetische Aspekte zur Wurfgröße, zum Geburtsgewicht und zu Saugferkelverlusten. Tagungsband 9. Biotechnik-Workshop. Bernburg, p. 31-35
3. HÖRÜGEL, K.; GÄRTNER, H.; SCHLEGEL, W. (1986):: Untersuchungen zum Einfluß ausgewählter endogener Faktoren auf die Geburtsmasse der Ferkel und ihre Wechselwirkungen. Mh. Vet.-Med. 41, p. 121-126
4. HOY, ST. (2002): Postnatales Verhalten von Ferkeln – Konsequenzen für Wachstum, Gesundheit und Ferkelnestgestaltung. Tagungsband, 8. Biotechnik- Workshop. Bernburg, p. 75-84
5. HÜHN, U.; LEIDING, C. (2001): Gesundere Sauen und mehr Ferkel durch Geburteneinleitung. SUS 49 6, p. 32-35
6. RÖHE, R.; KALM, E. (1997): Effiziente Zucht auf Fruchtbarkeit sollte Geburtsgewichte einbeziehen. SUS 45 4, p. 38-40
7. SPERBER, K.; HILGERS, J. (2002): Gruppenabferkelung im mehrwöchigen Rhythmus. Das gesunde Tier 4, p. 6-11