

RESEARCH REGARDING PARTURITION SYNCHRONIZATION IN SOWS BY USING F2ALPHA PROSTAGLANDIN AND OXYTOCIN

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Abstract

651 Camborough hybrid sows at their first to fourth farrowing were administrated intramuscularly 1ml of Proliz (0.2 mg cloprostenol) on day 113 or 114 of gestation. After 24 hours from the inoculation of luteolysin, 1.5 ml of oxytocin (15 UI) were inoculated. The birthing was monitored and compared to a batch of 600 Camborough sows that were not hormonally treated. The F2alpha prostaglandin and oxytocin treatment generated a quick and synchronic farrowing. The farrowing began on an average after 24.5 ± 4.6 minutes from the oxytocin administration, with oscillations between 9 and 162 minutes. This process helped induce births after 114 of gestation for 99.08% of the sows treated on day 113, and after 115 days of gestation for 90.20% of the sows treated on day 114. The sows in the untreated batch gave farrow as follows: (10.4% up to day 114; 20.6% on day 115; 26.8% on day 116; 25.3% on day 117; 13.3% on day 118; 3.5% on day 119, and 2.8% after 119 days of gestation. In both batches the time of the beginning and the duration of the farrowing were monitored.

Key words: synchronization, parturition, sows, F2alpha prostaglandin, oxytocin

INTRODUCTION

Oxytocin is a hormone that stimulates uterine contractions and is involved in the farrowing mechanism. It acts on the background of a high level of estrogens found in the body before parturition [1,2,10].

In sows, by injecting oxytocin after the administration of luteolysin, farrowing may be induced at a pre-established time [3,7]. Grouping births in sows allows a better organization of the technological flow in the farm [1,7,8].

MATERIAL AND METHOD

The study was done on 1,258 inseminated Camborough sows at their first to fourth farrowing, diagnosed as pregnant in September, October and November. They were divided into two batches: the Experimental Batch (EB), made of 658 sows and the Control Batch (CB), made of 600 sows. 7 of the sows of the experimental batch

gave birth up to day 113 of gestation. The remaining sows (651) were submitted to a birth-inducing protocol, as follows: 325 sows were injected intramuscularly on day 113 of gestation and 326 sows on day 114 of gestation (table 1), with 1ml of Proliz (0.2 mg cloprostenol), according to the recommendations in the specialized literature [1,3,4]. After 24 hours, 1.5 ml of oxytocin (15 UI) were administrated intramuscularly. In both batches the time of the beginning and the duration of the farrowing were monitored.

Table 1 The biological material

Category of female	Control Batch	Experimental Batch (PGF2alfa on day:)		Total female treats
		113 of gestation	114 of gestation	
Sows	439	245	244	489
Gilts	161	80	82	162
Total	600	325	326	651

RESULTS AND DISCUSSIONS

In the control batch, the farrow took place between day 111 and day 119. Most of the sows (83.3%) gave birth between 115 and 118 days of gestation (table 2).

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Table 2 Duration of gestation sows in the control group (n=600)

The day of farowing	Nr. sows	% on total
<111	2	0.3
111	6	1.0
112	6	1.0
113	7	1.1
114	44	7.3
115	124	20.6
116	161	26.8
117	152	25.3
118	64	10.6
119	21	3.5
>119	14	2.5

The normal gestation period can vary between 108 and 124 days [1], but most of the sows give farrow between day 115 and day 118 [1,8,10]. The average duration of the gestation was 116.4 days.

Among the 325 sows inoculated on day 113 of gestation, 3 sows (0.92%) gave farrow

before the oxytocin administration. The other 322 sows were inoculated with 1.5 ml of oxytocin. The farrowing began on an average after 26.0 ± 10.2 minutes, with limits between 18 minutes and 162 minutes (table 3).

Table 3 Results regarding to the begining of the farowing after PGF2alpha and oixtocin

The day of treatment	Interval PGF2alpha-parturition (hours)			Interval oxytocin-parturition (minutes)		
	average	min	max	medie	min	max
113	24.7 ± 1.2	4	27	26.0 ± 10.2	18	162
114	24.6 ± 1.4	3	25	24.2 ± 8.6	9	86

In the sows injected on day 113 of gestation, there was a time range of 24.7 ± 1.2 hours from the administration of PGF2alpha and the beginning of the farrowing.

Among the 326 sows inoculated on day 114 of gestation, 32 sows (9.8%) gave birth during the following 24 hours. The other 304 sows were injected oxytocin. The farrowing began on an average after 24.2 ± 8.6 minutes, with limits between 9 minutes and 86 minutes. The sows injected with PGF2alpha on day 114 of gestation gave parturition on an average after 24.6 ± 1.4 ore (table 3).

In a similar study, Robertson and collab. (1978) [9] obtained an average time range of 27.3 ± 4.7 hours between the administration of PGF2alpha on day 112 and 113 of gestation and farrowing. Guthrie HD (1985) [5] quotes

a range between 24 and 28 hours between treatment and parturition. The same study proved that oxytocin administrated 20 hours after the PGF2alpha increased the frequency of births within the 20-24-hour range after the PGF2alpha administration [6]. Wilson MR identified a range of 25.7 hours between the administration of PGF2alpha on day 112 and farrowing [11].

The comparative analysis between the two female categories (primiparae and multiparae) did not highlight any significant differences as regards the time of the beginning of the farrowing after the PGF2alpha treatment, as it took place after 24.4 ± 2.3 hours (in primiparae) and 24.6 ± 1.9 hours (in multiparae), respectively (table 4).

Table 4 The results obtained at primiparous and multiparous

The day of treatment	Category of female	Interval PGF2alpha-parturition (hours)			Interval oxytocin-parturition (minutes)		
		average	min	max	average	min	max
113	primiparous	24.5±2.1	2.0	27	26.3±10.4	10	78
	multiparous	25.2±1.8	1.5	25	23.4±9.7	11	59
114	primiparous	25.1±2.6	3.0	25	24.2±8.1	9	112
	multiparous	24.2±1.7	3.0	26	25.6±7.8	21	162
Total	primiparous	24.4±2.3	2.0	27	25.8±10.2	16	118
	multiparous	24.6±1.9	1.5	25	24.9±9.1	14	88

Related to the time of the oxytocin administration, the parturition began after 25.8±10.2 minutes in primipare and after 24.9±9.1 minutes in multiparae.

Regarding the duration of the fetal expulsion, most of the untreated females (57.5%) had a birthing duration between 2 hours and 3 hours and in 36.2% of the females the parturition took over 3 hours (table 5).

Table 5 The farrowing duration at treated and untreated females

Protocol	The category of female	Nr sows	The duration of parturition (minutes)										
			60-90		91-120		121-150		151-180		More than 180		
			nr	%	nr	%	nr	%	nr	%	nr	%	
Untreated	Primiparous	161	1	0.6	18	11.2	103	63.9	32	19.8	7	4.5	
	Multiparous	439	2	0.4	17	3.8	48	10.9	162	36.9	210	47.8	
Total untreated		600	3	0.5	35	5.8	151	25.2	194	32.3	217	36.2	
Treated	day 113 Primiparous	80	17	21.2	47	58.7	13	16.3	2	2.5	1	1.3	
	day 113 Multiparous	245	22	8.9	49	20.0	137	55.9	24	9.8	13	5.4	
	Total day 113		325	39	12.0	96	29.5	150	46.1	26	8.0	14	4.4
	day 114 Primiparous	82	16	19.5	52	63.4	11	13.4	3	3.7	-	-	
	day 114 Multiparous	244	17	6.9	51	20.9	131	53.6	31	12.7	14	5.9	
Total day 114		326	33	10.1	103	31.6	142	43.5	34	10.4	14	4.4	
Primiparous treated		162	33	20.4	99	61.1	24	14.8	5	3.1	1	0.6	
Multiparous treated		489	39	7.9	98	20.1	268	54.8	55	11.2	27	6.0	
Total treated		651	72	11.0	199	30.5	292	44.8	60	9.2	28	4.5	

A shorter parturition duration was ascertained both in sows and in gilts after the administration of PGF2alpha and oxytocin. Therefore, for most untreated gilts (75.1%) the farrowing lasted between 1.5 hours and 2.5 hours, while for 81.5% of the treated gilts the farrowing lasted between 1 and 2 hours (table 5).

The day when the PGF2alpha was administrated did not influence the birth duration. In the sows treated on day 113, the parturition took between one hour and 1.5 hours for 12% of them, and between 1.5 hours and 2 hours for 29.5%, and between 2 and 2.5 hours for 46.1%.

10.1% of the sows treated on day 114 of gestation gave parturition in 1-1.5 hours. For 31.6% the parturition took between 1.5 hours and 2 hours, and for 43.5% the parturition took between 2 and 2.5 hours.

CONCLUSIONS

The use of PGF2alpha and oxytocin in days 113 and 114 of gestation determined the grouped farrowing after approximately 25 hours from the PGF2alpha administration and after 20-30 minutes from the oxytocin inoculation. This treatment variant is useful for inducing farrowing at a pre-established time, avoiding nighttime or certain week days. This method enables a better organization of the animal flow in the reproduction sector.

The PGF2alpha and especially the oxytocin administration facilitates births, which took place faster, both in primiparae and multiparae.

The parturitions in untreated sows took place in a time range between 110 and 119 days, the gestation period of 114 days and 115 days respectively (as in the case of hormonal treatment) being only in 20.6% and 26.8 of the sows respectively.

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