

**VOCAL AND TACTILE COMMUNICATIONS BETWEEN SOWS
AND PIGLETS ON DAY 20 AFTER FARROWING****B. Krsnik, Ž. Pavičić, R. Yammine, T. Balenović, A. Pleli,
Angelina Nemet****Summary**

The research was performed by videorecording of the chosen sows and piglets, which differed in breed, age and parity and were placed in two objects with different flooring, during day 20 after farrowing. The purpose was to investigate the vocal-tactile communication between the sow and the piglets. The sows with their piglets were divided in two groups, each consisting of 5 sows. Each sow was videotaped continuously during 6 hours. During the recording, bioclimatic parameters were also controlled. The results obtained were statistically analysed and compared applying the t-test. The analysis revealed a significant difference ($P < 0.05$) between suckling initiated by vocal and tactile communication in Object A. The suckling frequency and duration changed with the aging of piglets. Most of the suckling during day 20 after farrowing was initiated by the piglets, by tactile communication with the sow.

Introduction

The behavioural interactions between sows and piglets have a complex nature (Algers and Jensen, 1985) and consist of a large number of signals (Algers et al., 1989), among which the most important are the vocal and tactile ones (Fraser, 1984; Algers et al. 1989).

On the first day after farrowing the sow is the one that initiates most of the suckling (Algers, 1989), but that proportion changes with the aging of piglets. During day 10 after farrowing the frequency and duration of suckling initiated by the tactile communication of piglets with the sow increase, which is a process also influenced by the housing conditions and flooring differences (Krsnik et al. 1996b).

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During nursing the sow grunts in a typical way (Fraser, 1980) which is a vocalisation of characteristic frequency and duration (Algers, 1983). In the beginning, lasting approximately two minutes the grunting frequency is stable and well-balanced, followed by a swift increase, and after reaching its peak the grunting frequency drops back to zero (Whittemore and Fraser, 1974).

The grunts of the sow clearly reach their peak about 3-4 hours after farrowing, and then after approximately 8 hours they are heard again in regular intervals (Algers, 1989).

In their interaction with the sow during suckling, the piglets also use vocal signals (Algers, 1989).

Jansen and Algers (1984) showed that piglet vocalisation while suckling can be divided into five different, structurally separate classes, yet their function remains unknown, as well as the function of the repeated grunting of the sow (Algers and Jensen, 1985).

Housing and keeping the animals are factors which cannot be ignored either in the present context, because it is known that sows kept in farrowing crates are less active than sows kept in farrowing pens, while on the other hand the suckling duration is longer in crates than in pens (Blackshaw et al., 1994).

The aim of this study was to determine the duration and frequency of suckling based on vocal and tactile communication between the sows and their litters of day 20 after farrowing, and to compare the results with those obtained on day 1 (Krsnik et al., 1996a) and day 10 (Krsnik et al. 1996b).

Material and Methods

Ten sows of different strain, age and parity were kept in separate crates, in two objects (5 sows each) with different flooring (Object A, wire floor; Object B full floor), and number of animals; Object A 168 crates (1.50 m x 2.00 m), Object B 96 crates (1.75 m x 2.50 m). All crates had a separate space for sows, and were equipped with feeders, drinking devices, and heaters.

The cameras were placed on stands in front of the crates, connected to video-recorders, and on day 20 after farrowing each sow and litter were videotaped for 6 hours (from 08:00 to 14:00 h).

The bioclimatic factors in farrowing facilities (air temperature - $^{\circ}\text{C}$, draught - W ms^{-1} and relative air humidity - Ah%) were also controlled using a SOLOMAT 2000 device.

The results obtained were statistically analysed, and compared applying the t-test.

Results and Discussion

The results are presented in Tables 1 and 2.

Table 1 - SUCKLING FREQUENCIES AND DURATIONS, BASED ON TACTILE AND VOCAL COMMUNICATION BETWEEN SOWS AND PIGLETS IN OBJECTS A AND B, ON DAY 20 AFTER FARROWING

Sow litter	Suckling frequency			Suckling duration		
	vocal	tactile	total	vocal	tactile	total
A1	0	0	0	0	0	0
A2	0	6	6	0	980	980
A3	1	7	8	187	1240	1427
A4	0	7	7	0	940	940
A6	0	6	6	0	1456	1456
B1	0	6	6	0	905	905
B2	0	7	7	0	1609	1609
B3	0	7	7	0	600	600
B4	0	9	9	0	1760	1760
B6	0	8	8	0	1552	1552

Table 2 - THE T-TEST RESULTS FOR SUCKLING FREQUENCY AND DURATION TOTAL VALUES, BASED ON THE VOCAL AND TACTILE COMMUNICATION COMPARING OBJECTS A AND B, AND THE VOCAL AND TACTILE COMMUNICATION INSIDE EACH OBJECT, OF DAY 20 AFTER FARROWING

	Frequency			Duration		
	t-test	Df*	P=	t-test	Df*	P=
Total A:B	-1.34231	8	P>0.05	0.936646	8	P>0.05
Vocal A:B	-			-		
Tactile A:B	-1.55563	8	P>0.05	-1.07794	8	P>0.05
A voc.:tact.	-3.74766	8	P<0.05	-3.51793	8	P<0.05
B voc.: tact.	-			-		

* Degrees of freedom

Average bioclimatic values were, in Object A: (at°C - 20.95; W ms⁻¹ - 0.3 and Ah% - 70.92) and in Object B: (at°C - 19.8 W ms⁻¹ - 0.3 and Ah% - 53.4).

Piglets have an inborn need for contact, which is particularly expressed through their behaviour during the first days after birth, while their body temperature is still unstable (Van Putten, 1978).

The need for suckling is, besides the need for contact, the most obvious behavioural pattern in newborn piglets, which is expressed through a number of phases described by Fraser (1980) and Algers (1989). The readiness for milk ejection, as a presumption for the respective suckling act, is created by the sow itself more often by the piglets (Zerboni and Grauvogl, 1984).

Until the fifth day of life, the suckling occurs each hour, and later each hour and a half. Each piglet drinks 20 - 30 g. of milk per suckling (Van Putten, 1978), while the average milk production of a sow is about 5.3 kg of milk per day (Signoret, 1969), which makes about 300 kg in an 8 week lactation (Van Putten, 1978).

The milk is available to the piglets for a very brief period, about 20 seconds, because the duration of an increased intramammary pressure in the sow is very short (Ellendorff et al., 1982) and the provisions of milk in the udder are rather small (Fraser, 1980).

In our research, on day 20 after farrowing, suckling initiated by vocal communication of the sow did not occur (with one exception in Object A). Besides, the frequency of suckling initiated by piglet tactile communication was higher in Object B, which differs from the results obtained on day 1 (Krsnik et al. 1996a) and day 10 (Krsnik et al. 1996b) after farrowing. On the first and the tenth day of research (Krsnik et al., 1996a; b) the frequency of suckling initiated by the sow vocal communication in Object A was a little higher than in Object B, while the frequency of suckling initiated by the piglet tactile communication was higher in Object B.

The duration of suckling initiated by the piglet tactile communication ranged from 0 - 31.54% (on average 20%) in Object A and from 9.34 - 27.39% (on average 20%) in Object B. The average values are almost identical with the ones obtained on day 10 of the research (Krsnik et al. 1996b) but significantly higher than those obtained on day 1 (Krsnik et al. 1996a).

The statistical analysis of data obtained by the recording of vocal and tactile communication between piglets and sows on day 20 (Table 2.) revealed in Object A, a significant difference ($P < 0.05$) between the suckling initiated by vocal and tactile communication.

On day 1 (Krsnik et al. 1996a), a significant difference ($P < 0.05$) was found between the sows in Objects A and B, regarding vocal communication, as well as between the suckling initiated by vocal and tactile communication in Object A.

Regarding day 10 of the research (Krsnik et al. 1996b) the analysis did not reveal any significant difference.

The behaviour of sows and piglets can be influenced by environmental factors (Krsnik, 1977; Fraser, 1984), the type of incarceration and flooring (Fraser and Thompson, 1986; Algers, 1989), resulting in different within-litter body weights or a disturbed tactile communication and udder massage by the piglets.

As the thermoregulation in newly born piglets is not yet fully developed, supplementary heating in their biozone is necessary (the temperature of 33°C). That temperature decreases with the age of piglets (Krsnik et al. 1996a;b).

A hastened of excessive temperature decrease provokes diarrhea in newly born piglets (Krsnik et al., 1993) and also causes an insufficient suckling rate.

In our research, the average air temperature in Object A was (20.95°C) and in Object B (19.8°C). Draught speed values, in both Objects were (0.3 ms⁻¹), which is higher than recommended for this category of piglets.

Regarding flooring, the animals in Object A were kept on a wire floor, and those in Object B on a full concrete floor, which in a way, also resulted in differences in the frequency and duration of vocal-tactile communications (Krsnik, 1996a). Moreover, beside different floorings the total number of animals placed in farrowing units also differed, Object A (168 sows) and Object B (96 sows), which may also have influenced the activities in question, as confirmed by a paper (Algers, 1989) saying that in large farrowing units signal covering may occur resulting in irregularities or even the omission of suckling bouts.

The incarcerations in the farrowing units were of a horizontal type, which contrary to the vertical ones, influence in a way the behaviour of piglets near the udder and while suckling, as well as the tactile communication.

Conclusions

The results of the research on vocal-tactile communications between the sow and the piglets on the first day of age (Krsnik, et al. 1996a), the tenth day (Krsnik et al., 1996b) and the twentieth day, enable us to conclude that the number of sucklings initiated by the sow vocal communication decreases with the advanced age of piglets, while the number of sucklings initiated by tactile communication of the piglets increases. Besides, with time the piglets need a shorter period for suckling.

It needs to be mentioned that the incarcerations in the farrowing units were of a horizontal type, which contrary to the vertical ones, in a certain way influence the behaviour of piglets near the udder and while suckling, as well as their tactile communication with the sow (Krsnik et al., 1996b).

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**GLASOVNE I TAKTILNE KOMUNIKACIJE IZMEĐU KRMAČA I PRASADI NA DAN
DVADESETI NAKON PRASENJA**

Sažetak

Istraživanje je obavljeno videosnimanjem odabranih krmača i prasadi različitog pasminskog sastava, starosne dobi i broja prasenja u dva različita objekta s obzirom na vrst poda tijekom dvadesetog dana nakon prasenja, a cilj je bio istražiti glasovno-taktilnu komunikaciju između krmača i prasadi. Krmače s prasadi podijeljene su u dvije grupe po 5 životinja. Svaka je krmača snimana neprekidno 6 sati. Za vrijeme video snimanja kontrolirani su i mikroklimatski uvjeti. Dobiveni rezultati statistički su obrađeni i uspoređeni pomoću t-testa. Značajna statistička razlika ($P < 0.05$) zabilježena je između isanjanja na osnovi glasovne i taktilne komunikacije u objektu A. Učestalost i trajanje isanjanja sa starenjem prasadi se mijenja. Najveći broj isanjanja u tijeku dvadesetog dana starosti prasadi biva potaknut od same prasadi, taktilnom komunikacijom prasadi s krmačom.

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