Maternal Behaviour in Sows of Different Social Rank

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Abstract — The maternal behaviour of domestic sows in intensive husbandry has been studied in relation to their social rank during the second half of pregnancy when they were kept in groups. The sows dominant during pregnancy were more active immediately before farrowing but not after it. The low-ranking sows showed much more restlessness from the early days after farrowing and many stereotyped / redirected patterns. Those sows voluntarily interrupted nursing in the early days of lactation more often, while the dominant sows were more likely to allow piglets to suckle freely.

The maternal behaviour of the domestic pig (Sus scrofa) has been widely investigated in recent years. Many studies have been devoted to making an ethogram of maternal behaviour (Hansen and Curtis, 1981; Lammers and De Lange, 1986), to the evaluation of the physiological aspects of farrowing and lactation (Titterington and Fraser, 1975; Fraser, 1978; Fraser and Phillips, 1989), or to the mother-offspring relationships (Whatson and Bertram, 1983; Algers, 1989; Blackshaw and Hagelso, 1990). In addition, the maternal behaviour has been used to study principally the ontogeny of piglets (Fraser and Thompson, 1986; Schouten, 1986). Several other researchers have studied the modifications of behaviour induced by the different types of housing or management techniques used in commercial housing, mainly to find certain parameters of welfare (Baxter, 1982; Vestergaard and Hansen, 1984; Barnett et al., 1987; Edwards and Furinss, 1988; Hutson and Haskell, 1990).

More recently some studies have been carried out on free-ranging sows (Jensen, 1988a as review; Petersen et al., 1990) to find the basis of the maternal behaviour and to detect indirectly whether and how much the behaviour displayed has been changed by intensive husbandry.

While in northern Europe tethering or individual housing is still a common practice for pregnant sows, in Italy they are generally grouped for much of the gestation. This method, which has recently become more common in other European countries, avoids the rise of stereotyped patterns so often observed in sows tethered or kept in individual crates. Nevertheless, group housing leads quickly to the formation of an almost linear social hierarchy and, consequently, to very different behaviours, especially during the feeding times (Csermely and Wood-Gush, 1986, 1990).

Knowing that the maternal behaviour is influenced by several environmental variables, we planned to find out whether the differences in behaviour between sows of high- and low-rank observed during the gestation have any effect on behaviour after entering the farrowing-house and on the maternal behaviour in general, with particular regard to the mother-young relationships.

Methods

The study was carried out in a commercial intensive unit near Parma, between May and November. The 24 animals used belonged to the unit and were all Large White × Landrace
crosses. Most of them were multiparous and only 6 sows were primiparous; 2 of them were high-ranking animals. After mating, the sows were kept in individual stalls for 40–50 days, and were then housed in groups of about 17 sows each in a large indoor pen (7.5 × 3.0 m) where the animals were loose and remained so for the rest of the pregnancy. A detailed description of the characteristics and the feeding system is given elsewhere (Csermely and Wood-Gush, 1986). We studied 6 such groups. All the sows of a particular group were scheduled to farrow within a week. The social rank of each sow was ascertained from the agonistic interactions observed during several meals within the last 15 days of pregnancy and by using the Dominance Index (DI) (Crook and Butterfield, 1970). Further details of the DI calculation are given elsewhere (Csermely & Wood-Gush, 1986).

About 4 days before the farrowing date, the sows were moved to the farrowing-house which consisted of several rooms, each containing 2 rows of 7 crates (2.5 × 1.6 m) with wire floors, the rows separated by a central corridor used for inspection. Each sow was restricted to the central area of the crate (2.0 × 0.6 m) which was equipped with a small feeder, a nipple-drinker for the sow, and a water bowl for the piglets outside the central area. An infrared heater was suspended about 50 cm above an insulated corner of the pen, and switched on only after farrowing.

Four animals per group were then observed as focal animals. They were the 2 highest- and the 2 lowest-ranking sows. These animals were randomly allocated to 4 adjacent crates so that the observer, sitting quietly in the central corridor, was able to record their behaviour without interruptions. The other sows of the group were housed in the remaining crates.

We observed the animals during 5 periods: during the 4 days preceding farrowing (i.e. just after entering the farrowing house, the PRE-period) and after parturition, in days 0–1, 2–4, 5–7, 8–11. Every sow was observed at least once in each period. Each observation for each sow was carried out at random between 7:30 am and 6:30 pm and lasted about 3 h, the animals being observed continuously. The duration and frequency of their behaviour patterns were recorded with an event-recorder, permitting to record the patterns as they occurred in sequence and/or simultaneously.

A total of 27 patterns were considered, most referring to the maternal behaviour: 1) STANDING (ST); 2) LATERAL RECUMBENCY (LR); 3) STERNAL RECUMBENCY (SR); 4) NURSING WHILE LYING ON THE SIDE (NL); 5) NURSING WHILE STANDING (NS); 6) LICKING the piglets (LI); 7) SNIFFING the piglets (SN); 8) PUSHING THE PIGLETS TOWARDS THE TEATS (PU); 9) ACCEPTING THE PIGLETS CLIMBING on herself (CL); 10) NIBBLING the piglets (NI); 11) THREATENING the piglets, i.e. an aggressive bout without physical contact (TH); 12) KNOCKING the piglets with the head or snout, i.e. an aggressive contact (KN); 13) BITING the piglets (BI); 14) BEING SNIFFED by the piglets (BS); 15) BEING LICKED by the piglets (BL); 16) BEING KNOCKED by the piglets (BK); 17) BEING BITTEN by the piglets (BP).

In addition, we considered 10 other patterns involving the maintenance behaviour or redirected or stereotyped activities: 18) FEEDING (FE); 19) DRINKING (DR); 20) EATING the placenta or the umbilical cord (EC); 21) HEAD-SHAKING (HS); 22) Putting or pushing the HEAD ON AGAINST THE PEN BARS (HB); 23) BAR-BITING (BB); 24) ROOTING (RO); 25) VACUUM-CHEWING (VC); 26) BLOWING (BW); 27) PAWING, i.e. the scratching movement typically performed alternatively with the foreleg(s) as when free-ranging sows dig a hole in the ground for building a nest (PA) (Baxter, 1982; Jensen, 1986; Jensen et al., 1987). The patterns referring to the maternal interest were obviously observed only after farrowing, and the pattern EC necessarily only at day 0.

The suckling episodes were studied, particularly to ascertain the causes of termination of nursing (Petherick, 1983). These could be due either to the dam, refusing to nurse more (i.e. sitting or standing up while the piglets were still suckling), or “to the piglets”, finishing to suckle to start another activity when the sow was still in a nursing position. It can be assumed that in