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Study on the behaviour of Cinta Senese sows and piglets reared outdoors

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Abstract. The aim of this study was to observe the behaviour of Cinta Senese sows and their litters reared in outdoor systems. Data were collected on 4 sows weekly for 24 consecutive hours (1-hour intervals) and submitted to analysis of variance with fixed effects: season (spring and summer) and day slots (morning, afternoon, evening and night). The behavioural models were collected into 5 main activities for sows and 6 for piglets. Considering only the main effects, sows spent the most time at rest, especially in summer (P<0.01), and in the afternoon (77 %) and night (76 %) and therefore the search for food occurred mainly in morning (15 %) and evening (37 %). The activity of rooting (spring > summer; P<0.01) occurred also mainly in morning and evening (30 and 15 %, respectively). In addition, piglets spent much time at rest; in particular, during the first weeks of life they preferred to stay in group (44 %) rather than isolates (13 %). Time spent for feeding was highest in spring and in morning and evening (P<0.01). Rooting activity was influenced by season and day slot (P<0.01).

Keywords. Sow behaviour – Piglets behaviour – Outdoors rearing – Animal welfare.

Observations sur le comportement des truies et des porcelets Cinta Senese en élevage extensif

Résumé. *L'objectif de cette étude était d'observer le comportement des truies Cinta Senese et leurs portées élevées en libre parcours. Les données de 4 truies, recueillies chaque semaine, pendant 24 heures consécutives (intervalles de 1heure) ont été soumises à l'analyse de variance avec des effets fixes : la saison (printemps et été) et le créneau horaire (matin, après-midi, soir et nuit). Les modèles de comportement ont été regroupés en 5 activités principales pour les truies et 6 pour les porcelets. Les truies passent le plus de temps au repos, surtout en été (P<0,01), en favorisant l'après-midi (77%) et la nuit (76%) et donc la recherche de nourriture a eu lieu principalement dans la matinée (15%) et la soirée (37%). L'activité de fouissage, (printemps > été ; P<0,01) s'est produite principalement pendant le matin et le soir (30 et 15 %, respectivement). Les porcelets passent également beaucoup du temps à se reposer, et en particulier pendant les premières semaines de vie ils sont davantage restés en groupe (44%) qu'isolés (13%). Le temps consacré à l'alimentation était le plus élevé au printemps et au cours du matin et du soir (P<0,01). L'activité de fouissage a été influencée par la saison et l'heure de la journée (P<0,01).*

Mots-clés. *Comportement des truies – Comportement des porcelets – Élevage extensif – Bien-être animal.*

I – Introduction

In intensive farming systems, pigs are often kept in unsuitable environments to meet their behavioural needs, that are important indicators of "welfare" (Fraser *et al*., 2001). The complexity of breeding may influence the cognitive ability of pigs (De Jong *et al*., 2000; Sneddon *et al*., 2000) and their ability to cope with stress (De Jonge *et al*., 1996; O'Connell *et al*., 1999). The outdoor system offers more space for pigs, a more stimulating environment and free access to food compared with the intensive system. This may allow the animals to implement a rich repertoire of behaviour and thus develop the skills necessary to cope with stress. The amount of social contact with the sow during the lactation period, which differs between the two systems (Cox and Cooper, 2001) can be determined by the commitment of piglets in beneficial activities for their adaptation to weaning, how to eat solid food, explore the

environment and interact with other broods. The aim of this work was to study the behaviour of sows and piglets of Cinta Senese breed reared outdoors. The results related to feeding, static and dynamic behaviour, observed in two different seasons: spring and summer.

II – Materials and methods

The surveys were carried out on 4 sows and their litters, with a total of 29 piglets in the period from birth to weaning (78 d), two sows gave birth in spring and two in summer. Data were collected weekly noting the behaviour each hour for 24 hours. The day was divided into 4 day slots: morning (6-11 h), afternoon (12-16), evening (17-20) and night (21-5).

The semi-outdoor rearing system consisted of shelters with paddocks and fences for grazing that was round. The grazing rhythms were adapted to the seasonal photoperiod and at the return in the shelters was given supplementation with concentrates.

The different types of observed behaviours have been grouped into five main activities (Table 1).

Table 1. Definition of the specific behaviours that were observed

Main activities	Sow	Piglet
Resting	The sow is laying or sitting or sleeping.	Alone: the piglet is laying alone or with his mother; sitting or sleeping. In group: the piglet are laying in group closed other piglets; sitting or sleeping.
Eating	The sow has its head inside the feeder or the sow is eating straw or grass.	Piglet has its head inside the feeder or piglet is eating straw or grass.
Moving	The sow is standing or walking, or touching another pig in some way or is doing other social behaviours (nursing or grooming).	The piglet is standing or walking, or touching another pig in some way or is doing other social behaviours (grooming).
Rooting	The sow is rooting or trying to root on the floor/in the mud or in the deep straw.	Piglet is rooting or trying to root on the floor/in the mud or in the deep straw.
Suckling	The sow allow the piglets to massage or suck at the udder; the sow is emitting vocalizations.	Piglet massages or sucks at the udder of their mother or of another sow, or piglet researches udder; piglet is emitting vocalizations.

The relative frequencies of the main activities, compared to zero (absent), were subjected to analysis of variance, considering as fixed effects the season and the day slot and their interaction, through the proc. GLM of SAS statistical package (SAS Institute Inc., 2003).

III – Results

Behaviour of the sow: Table 2 reports the average percentages collected for the different sow's activities.

The rest was influenced by season and day slot. Sows spent more time resting in summer and spring, focusing on the afternoon and night in both seasons (data not tabulated), in partial

agreement with De Passillé and Robert (1989) which found that sows in cages remained lying more during the hours of darkness than in the hours of light.

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Table 2. Effect of season and day slot on the sow's behaviour (%)

Activities	Season		Day slot				
	Spring	Summer	Morning	Afternoon	Evening	Night	DSR
Resting	43.81 b	53.75 a	26.66 a	77 b	15.63 c	75.83 b	20.32
Alimentation	14.33	16.77	15 a	2 b	36.87 c	8.33 b	17.32
Rooting	19.70 a	5.03 b	29.58 a	3.50 b	15 c	1.39 b	13.67
Moving	6.98 b	11.60 a	16.25 a	5.50 b	13.75 a	1.67 b	12.91
Suckling	15.18	12.83	12.50	12	18.75	12.78	15.11

Within criterion, means with different letters differ ($p<0.05$)

The eating activity occurred differently in the day slots that interacted with the season. Indeed, in respect to spring, in summer sows are more active in seeking food in the morning and vice versa in the evening (Fig. 1). However, the more eating activity during summer is explained by the fact that the animals were given greater permanence to pasture. The rooting also is influenced by both factors that significantly interacted themselves. The sows spend more time rooting in the morning and evening, especially in spring; instead in summer the sows devoted few time to this activity (Fig. 2). This could be due also to different quality of available grazing in the seasons, which has stimulated animals to research food. The suckling activity is not influenced by external factors.

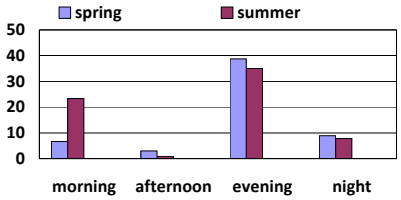

Fig. 1. Eating activities of sows for season and day slot (% of time).

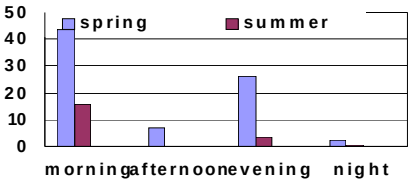

Fig. 2. Rooting activities of sows for season and day slot (% of time).

Behaviour of piglets: Table 3 shows the average percentages reported for the various activities of the piglets. When alone, they rested, more in the summer than in spring and especially during the afternoon (interaction significant at $p<0.01$). In group, on the contrary, they rested more in the afternoon or at night.

Considering together the results for the resting, in spring piglets rested almost always in groups, while in summer the alone resting has increased in each day slot, (Figs 3 and 4).

Eating activity of piglets was influenced by season, day slot and the interaction between the factors and they devoted more time to feeding in spring than in summer and in both seasons in the evening hours (Fig. 5).

Table 3. Effect of season and day slots on the piglet's behaviour (%)

Activities	Season		Day slot				
	Spring	Summer	Morning	Afternoon	Evening	Night	DSR
Resting in group	46.97	40.93	39.04 b	50.50 b	22.36 c	63.91 a	28.38
Resting alone	4.61 a	21.64 b	4.01 b	22.34 a	9.89 b	16.27	22.32
Alimentation	10.93 a	6.85 b	9.74 c	3.58 b	21.09 a	1.14 b	12.09
Rooting	6.71 a	3.48 b	12.26 a	2.37 c	5.75 b	0 c	7.17
Moving	11.19	11.53	20.27 a	6.28 b	16.77 a	2.11 b	11.34
Suckling	18.29	15.50	14.79	14.80	21.69	16.31	15.63

Within criterion, means with different letters differ ($p<0.05$).

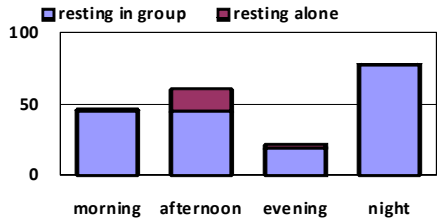

Fig. 3. Resting activities of piglets in spring (% of time).

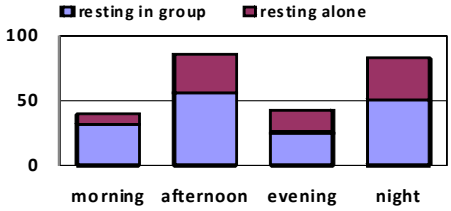

Fig. 4. Resting activities of piglets in summer (% of time).

Also the activity of rooting was influenced by season and day slot, with greater activity in spring (Fig. 6). Be noted that the food management technique adopted favoured rooting in the morning (grazing animals) and eating in the evening (feeding).

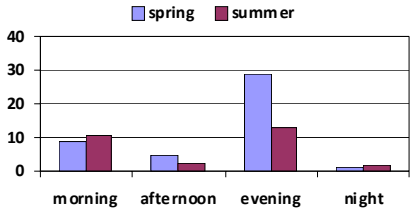

Fig. 5. Eating activity of piglets for season and day slot (% of time).

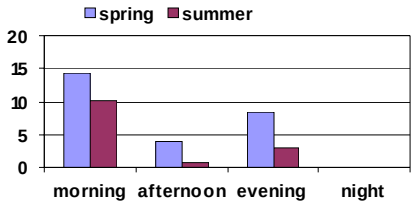

Fig. 6. Rooting activity of piglets for season and day slot (% of time).

IV – Conclusions

The observations show that pigs reared under extensive system have the opportunity to express for many time specific behaviours such as rooting, which is not possible in an intensive

farming. This technique of animal management, with the consequent movements, influenced mainly food-related activities.

Almost all activities are influenced by season and day slot, confirming the strong conditioning of the environment on animals in the extensive system.

The suckling activity finally, was the least affected by environmental factors.

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