DIURNAL BEHAVIOUR IN PREGNANT SOW

COMPORTAMENTUL DIURN AL SCROAFELOR ÎN PERIOADA DE GESTAȚIE

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Abstract: *The experiment was carried out on 80 reproduction sows within a production cycle. Sow lots were constituted 15 days after artificial insemination. Sows were accommodated in boxes of 10 sows each, which means 2.5 m^2 per sow and a foraging front of 40 cm. Between day 15 and day 107 of gestation, sows were weighed weekly to calculate monthly weight gain. Two sow boxes were monitored weekly for 12 hours, in a diurnal regime by video camera recording. We measured and added the times allotted by the sows for resting, moving, feeding, and aggressiveness, and we turned them into recording time shares. Results were correlated with the monthly weight gain in sows and processed to correct technological growth parameters. We could notice that from the first gestation month to the third gestation month resting time increased from 39.82±4.90% to 71.22±3.81% and kept constant until the end of the gestation period. The increase in resting time was compensated by the proportional diminution of the moving time. Sow restricted feeding (2.5 kg mixed feed per day in 2 ratios) resulted in a quasi-constant feeding time during the gestation period. Aggressiveness time diminished from 0.38±0.02% during the first gestation month to 0.06±0.04% in the third gestation month and kept constant until the end of the gestation period. Large individual variations of the time allotted to moving and resting are due to the large differences in weight and age of the sows in the gestation lots. Keeping sows in individual boxes with rigorous control of the amount of feed would allow increased performance of the sows upon farrowing and weaning.*

Rezumat: *Experimentul s-a efectuat pe 80 de scrofe de reproducție într-un ciclu de producție. Loturile de scrofe s-au format la 15 zile de la inseminarea artificială. Scroafele s-au cazat în boxe de câte 10 scroafe, revenind 2,5 m^2/scroafă şi un front de furajare de 40 cm. De la 15 zile la 107 zile de gestație, scroafele s-au cântărit săptămânal pentru calculul sporului lunar de greutate. Două boxe de scroafe au fost monitorizate săptămânal câte 12 ore, în regim diurn prin înregistrări video. S-au măsurat şi însumat timpii folosiți de scroafe în odihnă, mişcare, hrănire şi agresivitate şi s-au raportat în procente din timpul de înregistrare. Rezultatele s-au corelat cu sporul de greutate lunar al scroafelor şi s-au interpretat în vederea corectării parametrilor tehnologici de creştere. S-a constatat că din prima lună de gestație şi până în luna a treia de gestație, timpul de odihnă a crescut de la 39,82±4,90% la 71,22±3,81% şi a rămas constant până la sfârşitul gestației. Creşterea timpului de odihnă s-a compensat prin reducerea proporțională a timpului de mişcare. Hrănirea restricționată a scroafelor (2,5 kg nutreț combinat/ zi administrat în 2 tainuri) a determinat ca timpul de hrănire să rămână cvasiconstant pe toată perioada de gestație. Timpul de agresivitate s-a redus de la 0,38±0,02% în prima lună de gestație la 0,06±0,04% în luna a treia de gestație şi a rămas constant până la sfârşitul gestației. Variațiile largi individuale ale timpului consumat cu mişcarea şi odihna se datorează diferențelor mari de masă corporală şi vârstă a scroafelor din lotul de gestație. Întreținerea scroafelor în boxe individuale cu controlul riguros al cantității de hrană consumată ar permite creşterea performanțelor scroafelor la fătare şi la înțărcare.*

Key words**:** *sows, behaviour, gestation*
Cuvinte cheie: *scroafe, comportament, gestație*

INTRODUCTION

Industrialisation of swine breeding is an ever perfecting process through the

adaptation of mechanisation to animals' natural behaviour. Reproduction sows are a special production category particularly due to their physiological state, individual behaviour, restricted feeding, and shed parameters.

Perfecting feeding systems starts from a better knowledge of the feeding and social behaviour of pregnant sows.

In this paper the authors present the results of a study on pregnant sows' behaviour from a feeding and social point of view in classical exploitation conditions.

MATERIAL AND METHODS

The experiment was carried out on 80 reproduction sows during a production cycle. The sow lots were constituted 15 days after artificial insemination. Sows were accommodated in boxes of 10 sows each, with 2.5 m^2 per sow and an individual feeding front of 40 cm. Sows were weighed upon lot constitution and then weekly until they entered the maternity (107 gestation days) to establish the evolution of their body weight and of the weekly weight gain per gestation week and month.

Feeding was restricted to 2.5 kg of mixed feed per day per sow in two shares.

In two 10-sow boxes we set video cameras connected to a computer to monitor the sows weekly for 12 hours between 8:00 a.m. and 8:00 p.m.

Video recordings were processed from the point of view of resting time, feeding time, moving time, and aggressiveness time. Over diurnal intervals of 12 hours, we calculated in percent points the times allotted to each activity, over gestation weeks and months. Results were correlated with the evolution of the body weight and were interpreted in order to correct technological parameters.

RESULTS AND DISCUSSIONS

Tables 1 and 2 and figures 1 and 2 represent, in percent points, per gestation weeks and months, the way sows used their time.

Table 1.

Weekly diurnal behaviour of pregnant sows (%)

Gestation week	3	4	5	6	7	8	9	10	11	12	13	14
Resting time (%)	34.52 ±0.15	44.73 ±0.43	56.56 ±14.48	52.91 ±16.11	48.83 ±5.08	42.41 ±17.13	75.38 ±9.10	69.81 ±6.93	68.75 ±11.07	70.95 ±5.33	75.04 ±6.13	67.42 ±4.82
Feeding time (%)	10.42 ±0.04	11.60 ±0.07	11.87 ±2.57	10.97 ±1.53	9.70 ±0.84	11.11 ±0.42	9.66 ±2.00	12.10 ±0.40	10.90 ±0.21	10.07 ±0.90	10.28 ±0.30	10.83 ±0.54
Moving time (%)	54.30 ±6.13	43.26 ±0.21	31.18 ±1.74	35.90 ±14.37	41.00 ±4.42	46.25 ±17.50	14.87 ±7.2	18.05 ±6.52	20.28 ±11.25	18.73 ±4.59	14.58 ±2.73	21.67 ±5.12
Aggressiveness time (%)	0.36 ±0.16	0.41 ±0.15	0.38 ±0.17	0.22 ±0.20	0.46 ±0.18	0.22 ±0.05	0.08 ±0.03	0.03 ±0.01	0.06 ±0.03	0.09 ±0.01	0.1 ±0.01	0.03 ±0.01

Table 2.

Monthly diurnal behaviour of pregnant sows (%)

Gestation month	I	II	III	IV
Resting time (%)	39.82±4.90	50.18±13.2	71.22±8.10	71.23±3.81
Feeding time (%)	11.01±0.59	10.91±1.34	10.68±0.87	10.55±0.27
Moving time (%)	48.78±5.52	38.58±12.00	17.98±7,39	18.12±3.54
Aggressiveness time (%)	0.38±0.02	0.32±0.15	0.06±0.02	0.06±0.04

We could notice that the older the gestation, the higher the resting time from 39.82±4.90% to 71.23±3.81% from the first to the last gestation month.

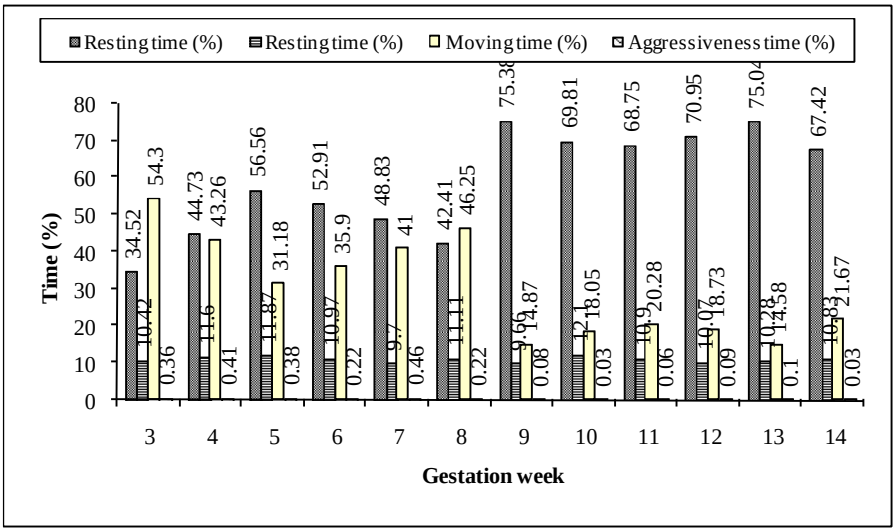

Figure 1. Diagrams monthly diurnal behaviour of pregnant sows (%)

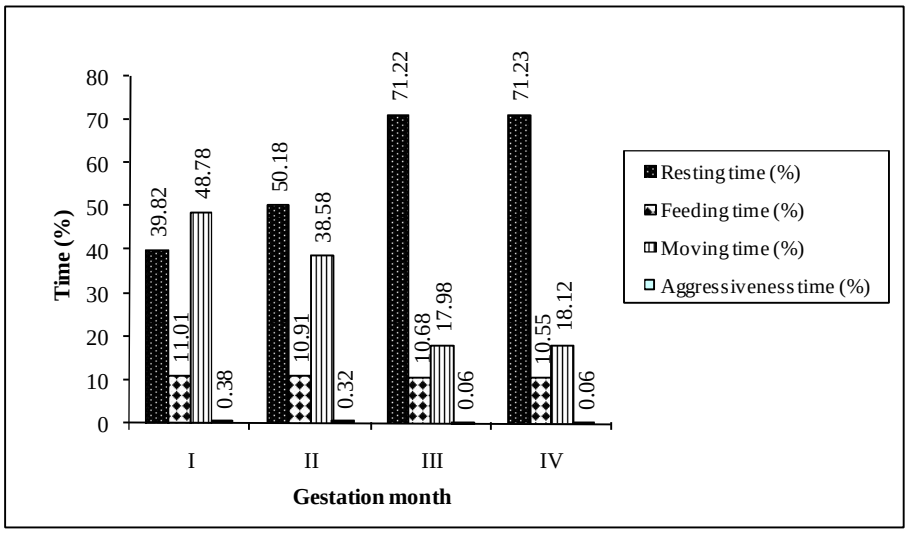

Figure 2. Diagrams weekly diurnal behaviour of pregnant sows (%)

Wide individual variations of the times used for resting and moving denote behavioural features related, most presumably, to sow age. This suggests that in making up pregnant sow lots we should also take into account both individual weight and age. Unevenness of sows from this point of view leads to disturbing quieter sows; therefore, both body weight and age should be as close as possible.

Feeding time over gestation is much evener, the variation between the first and the fourth gestation month being 0.5%. This is due to sow restricted feeding. Though we supplied a

feeding front of 40 cm per sow according to the exploitation technology and a daily feed amount of 2.5 kg, we could see that older sows and weighing more that the average of the sow lot have a dominant behaviour, their mixed feed consumption being higher than that of younger sows and weighing less. There are body weight gain differences, aggressiveness and excitement manifestations, and negative effects on body weight in both sows and piglets upon farrowing. This exploitation system shows differences in average body weight in piglets upon birth and in the future milk production and health state of the sow at the end of lactation.

The ideal solution would be to keep sows individually and to control their daily feed intake rigorously. From the beginning to the end of gestation period, moving time is gradually reduced with 21% in the second gestation month and with 53% in the third gestation month, after which resting time is constant until the end of the gestation period. Time difference is practically added to the resting time.

Aggressiveness time diminishes in the first gestation month, upon lot constitution and group hierarchy development until the third gestation month from 0.38% to 0.06%, after which they remain constant during the last month of gestation.

Diminishing aggressiveness time in sows kept in common boxes could be done by diminishing sow numbers per box with the same 2.5 m^2 per sow; this could allow levelling body weight and age in gestation boxes since there is no control of sow heat in these conditions.

Monitoring the evolution of the body weight and of the body weight gain during gestation, we could see that the highest body weight gain was almost even in the second and third months of gestation, when sows gained 67.5% of the weight gain during gestation (Table 3).

Table 3.

Average body weight and weight gain per gestation month in pregnant sows

Gestation month	I (15-30 gestation days)	II	III	IV (90-107 gestation days)
Average weight (kg)	174.75±3.85 182.65±5.75	203.5±5.7	222.65±1.15	234.55±0.85
Average gain (kg)	7.9	20.85	19.15	11.90

CONCLUSIONS

- Resting time of sows increases with 80.0% in the first gestation month to the third gestation month, remaining constant until the end of gestation;
- Supplementary time allotted to resting was obtained by proportionally diminishing moving time;
- Wide individual variations of the time used for resting is due to the differences of individual body weight and age of the sows in each gestation box; these differences have a negative impact on the feed ingested by each sow;
- The time allotted to feeding remains practically constant during gestation due to sow restricted feeding;
- Sow aggressiveness diminishes from 0.38% from the first gestation month to 0.06% in the third and fourth gestation months.

BIBLIOGRAPHY

1. BERGERON, R., BOLDUC J., RAMONET, Y., MEUNIER-SALAUN M.C., ROBERT, S., Feeding motivation and stereotypes in pregnant sows fed increasing levels of fibre and per or food, Application of Animal Behaviour Sciences, 70: 27-40, 2000.
2. DINU, I., HĂLMĂGEAN, P., TĂRĂBOANŢĂ, GH., FARKAŞ, N., SIMIONESCU, D., FELICIA POPOVICI, Tehnologia creşterii suinelor, Editura Didactică şi Pedagogică, Bucureşti, 1990.
3. MC GLONE, J.J., FULLWOOD, S.D., Behavior, reproduction and immunity of crated pregnant gilts:

Effects of high dietary fiber and rearing environment, Journal of Animal Sciences, 79: 1466-1474, 2001.

4. PALICICA, R., COMAN, I., Etologie, comportamentul animalelor domestice, Editura Orizonturi Universitare, Timişoara, 1998.
5. RAMONET, Y., MEUNIER, S., DOURMAD, J., High-Fiber diets in pregnant sows: Digestive utilization and effects on the behaviour of the animals, Application of Animal Behaviour Sciences, France, 77: 591-599, 1999.
6. RAMONET, Y., BOLDUC, J., BERGERON, R., ROBERT, S., MEUNIER-SALAUN M.C., Feeding motivation in pregnant sows: Effects of fibrous diets in an operant conditioning procedure, Application of Animal Behavior Sciences, 66: 21-29, 2000.
5. ALBRO HOUPT, KATHERINE, Domestic Animal Behaviour for Veterinarias and Animal Scientist, third edition, Iowa State Press, Blackwell Publishing Company, 1990.