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Short communication

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ABSTRACT

Nine Mora Romagnola and 10 Large White x Mora Romagnola growing pigs were reared outdoors. In both groups *ad libitum* feed was provided. Conventional pigs received it twice a day, distributed in two long troughs. Inside the corral of the second group, an automatic station was set up for: feed distribution, pigs weighing, and control by an analog camera. Thus the self-feeders received feed *ad libitum* individually by the automatic system, divided into small quantities at meal times. During the experiment the analog camera was used over 24 hours each day, to collect pictures of pigs in order to investigate their behaviours. For each picture the day and hour, the number of visible pigs and their behaviours were recorded and a statistical analysis of data, which was expressed as hourly frequencies of behavioural elements, was performed. Moreover to highlight "active" and "passive" behaviours between the groups, two categories "*Move*" and "*Rest*" were created grouping some behavioural elements.

With regard to performance, conventional pigs reached a higher total weight gain (56.1±2.42 kg *vs* 46.7±2.42 kg; P=0.0117). But the feed conversion index (FCI) of both groups was similar. The self-feeders had consumed less feed than conventional animals.

The feeding system seems to influence behaviours. The percentage of time spent in Eating activity differs (P<0.0001) between the self-fed (median 24.6%) and conventional pigs (median 10.9%). The resulting more regular eating trend of self-feeders influenced the daily activities distribution. The behavioural category *Rest* (median: self-feeders 55.0% *vs* 71.4% conventional pigs) was dominant, with conventional pigs becoming more restless, particularly at meal times. This type of feeding competition and aggressive behaviour did not happen in the self-feeders due to the feed distribution system.

The self-feeder results showed that pigs eat at the automatic station both day and night. The animals perform on average 3 visits per hour at night and 10 during the day, with an average duration of some minutes (from 3 to 5 approximately).

Key words: Pig, Outdoor, Self-feeder, Performance, Feeding behaviour.

RIASSUNTO

PERFORMANCE ZOOTECNICHE E COMPORTAMENTO ALIMENTARE DI SUINI ALLEVATI ALL'APERTO ED ALIMENTATI CON AUTOALIMENTATORE

Nove soggetti di razza Mora Romagnola e 10 incroci Large White x Mora Romagnola sono stati allevati all'aperto in due recinti. I due gruppi hanno ricevuto alimentazione ad libitum. Il gruppo di controllo riceveva l'alimento due volte al giorno, distribuito in due trogoli. All'interno del recinto del secondo gruppo è stata installata una postazione automatica per la distribuzione dell'alimento, la pesatura degli animali e il monitoraggio visivo attraverso una videocamera. In questo modo i soggetti del gruppo sperimentale (autoalimentati) hanno ricevuto alimento ad libitum individualmente, distribuito dal sistema automatico. Durante la prova sperimentale la videocamera è stata utilizzata per monitorare costantemente il comportamento dei suini attraverso numerose immagini. Per ciascun'immagine sono stati registrati i numeri di soggetti visibili e il loro comportamento; è seguita l'analisi statistica dei dati, espressi come frequenza oraria, per ogni elemento comportamentale. Per rimarcare, inoltre, le differenze tra comportamenti attivi (animali che si muovono, grufolano, ecc) e passivi (animali a riposo), sono state create due categorie ("Move" e "Rest") raggruppando alcune delle classi comportamentali rilevate. Le valutazioni delle performance hanno evidenziato maggior accrescimenti per i soggetti del gruppo di controllo (56,1±2,42 kg vs 46,7±2,42 kg; P=0,0117). L'indice di conversione alimentare (FCI) è tuttavia risultato similare in entrambi i gruppi; gli autoalimentati hanno perciò consumato meno alimento degli animali alimentati in modo tradizionale. Il sistema di alimentazione sembra aver influenzato il comportamento. Il tempo medio speso per l'alimentazione è risultato significativamente diverso (P<0,0001) tra autoalimentati (mediana: 24,6%) e il gruppo di controllo (mediana: 10,9%). Inoltre il più regolare comportamento alimentare nel giorno ha influenzato la distribuzione dei comportamenti durante la giornata. La categoria "Rest" (animali a riposo) è risultata dominante (mediana: 55,0% autoalimentati vs 71,4% controllo). Il gruppo alimentato in modo tradizionale s'è dimostrato molto più irrequieto, specialmente prima e durante i pasti. Tali comportamenti aggressivi e di competizione alimentare non si sono verificati negli autoalimentati grazie al sistema di distribuzione continuo dell'alimento.
I soggetti autoalimentati hanno visitato la stazione automatica sia di giorno che di notte. Il numero medio di visite per ora varia da circa 3 nelle ore notturne a 10 durante il giorno, con tempi di permanenza compresi fra 3 e 5 minuti.

Parole chiave: *Suini, Allevamento estensivo, Autoalimentatore, Performance zootecniche, Comportamento alimentare.*

Introduction

The widespread attention concerning animal welfare pushes the animal production sector to develop systems able to increase the possibility for animals to behave more naturally (Petersen *et al.*, 1995; De Jonge *et al.*, 1996). Grunert *et al.* (2004) posed the question whether pigs reared under indoor conditions could meet the consumer's requirements with regards to organic farming and animal welfare. In addition building costs for confined pig production are very expensive, making it economically interesting to search for simpler, and less capital-intensive systems (Stern and Andresen, 2003).

Consequently, the most industrialized zones of the world are rediscovering outdoor production systems for pigs. In most cases, sows are kept outdoors, while the production of weaners and slaughter pigs takes place indoors.

However, growing pigs may also be reared outdoors. The related literature indicates that growth rates obtained in an outdoor system can be comparable to growth rates obtained in an indoor system, even if the feed conversion index is variable (Lee *et al.*, 1995; Andresen *et al.*, 2001; Gustafson and Stern, 2003). Other authors showed that the effects of indoor or outdoor housing on a growing pig's performance and carcass traits seem to be significant (Mayoral *et al.*, 1999; Acciaioli *et al.*, 2002; Pugliese *et al.*, 2003; Strudsholm and Hermansen, 2005).

Several studies on the behaviour of domesticated pigs under intensive conditions are available in the literature. In contrast, only few researches considered non-intensive conditions. Stolba and Wood-Gush (1989) studied the behaviour of pigs under semi-natural conditions, where their behaviour was not affected by the constraints of husbandry. The pigs showed a rich repertoire of behaviours; one notable feature was a high level of activity. In 31% of observations they were grazing, in a further 21% rooting, and in another 23% working over the enclosure (walking and nosing the ground). Pigs in natural conditions spend most of their active time in oral activities such as rooting, grazing and chewing nutritional elements found in their surroundings. By nature, exploratory behaviour is a very essential part of life for pigs: they forage in social groups for seven or more hours per day and during foraging expeditions they can trot up to 50 kilometers in one night (Van Putten, 2000). Generally, outdoor pigs are more active than pigs kept in housing systems, as they have a larger space allowance, and are more affected by weather conditions (Stern and Andersen, 2003).

In these non-intensive systems, which aim at satisfying all physiological and behavioural needs of the animals, competition for feed remains one of the biggest problems.

Within a specific feeding system, differences exist in individual feed intake behaviour, depending on genetic background (de Haer and de Vries, 1993a) or social status in the group (Botermans *et al.*, 1997). Some investigations showed that competition and aggression for feed weakened the well being of pigs (Botermans and Svendensen, 2000). Competition and aggression create stressful conditions and influence pig performance. Neverthless, their impact is unclear (Webb, 1989). Competition for feed resulted in meals with a higher feed intake rate (Nielsen and Lawrence, 1993) but did not affect the daily feed intake, daily weight gain, and feed conversion ratio. In some cases, competition for feed may even stimulate feed intake by social facilitation (Hsia and Wood-Gush, 1983). Botermans and Svendesen (2000) indicated that competition for feed does not affect the average performance in a pen, but increases the within-pen variation in daily weight gain when feeding is rationed, and increases the within-pen variation in carcass meat percentage. These results show that it is fundamental to choose the most suitable feeding pattern.

The literature suggests that shorter, frequent feeding events throughout the day are more efficient in the utilization of feed than longer but less frequent feeding events. Increasing the feeding frequency improves nutrient digestibility in pigs (de Haer and de Vries, 1993b), due to a more constant digestive flow in the upper part of the gastrointestinal tract (Laplace *et al.*, 1986; Sissons and Jones, 1991; van Leeuwen *et al.*, 1997), and an increase in digestive enzyme production. Ingestion of a few large meals per day increases body fat deposition, decreases body protein deposition, increases urinary nitrogen excretion (Partridge *et al.*, 1985), and has a higher feed conversion index (FCI) compared with the ingestion of frequent small meals (de Haer and de Vries, 1993b).

On the basis of these ideas we tested the use of an automatic feed distributor (self-feeder) on growing pigs reared outdoors. In particular this study aims at observing the influence of the self-feeder's role on growth performance and feeding behaviours and at evaluating the possibility of effective utilisation as feeding system in farm and in research activities.

Material and methods

Animals and housing

In the experiment 10 subjects (4 castrated males and 6 females) of the Italian Mora Romagnola breed involved in a conservation program, and 10 Large White x Mora Romagnola crossbreeds (4 castrated males and 6 females) were used. The animals were raised at the experimental research station of the Facoltà di Agraria - University of Torino, Italy. All piglets were initially reared indoors. The 20 individuals have been divided into two mixed balanced groups when they were 150 days old, and moved/reared outdoors in springtime. Prior to the start of the observation period, the pigs of the first group were allowed almost 3 months to become accustomed to the self-feeding system. During this period, a female of Mora Romagnola died. First group fed by self-feeder ("self-feeder" group, SG): 229±28.0 days old and 105.1±14.82 kg average weight; second group fed by conventional way ("conventional" group, CG): 230±33.2 days old and 108.5±13.79 kg average weight.

Both corrals were rectangular in shape, with an area of 860 m^2 and 840 m^2. Each corral had a pond in the centre and a hut with straw.

The animals' diet was formulated according to their requirements: the digestible energy (DE) was 14.7 MJ*kg^{-1} DM and crude protein concentration was 15.5% (Table 1). Meals were given adding water (1:3).

Table 1. Components and composition of diet.

		Live Weight >90 kg
Components (%):		
Corn		55
Barley		15.5
Soybean meal 44%		12
Lineseed meal		2.5
Wheat bran		11
Minerals and vitamins		3.5
Bentonite		-
NaCl		0.4
Lesine		0.05
Methionine		0.05
Composition:		
DM	%	87.2
CP	%DM	15.5
DE	MJ/kg	14.7
ME	"	14.1

DM: dry matter; CP:crude protein; DE: digestible energy; ME: metabolizable energy.

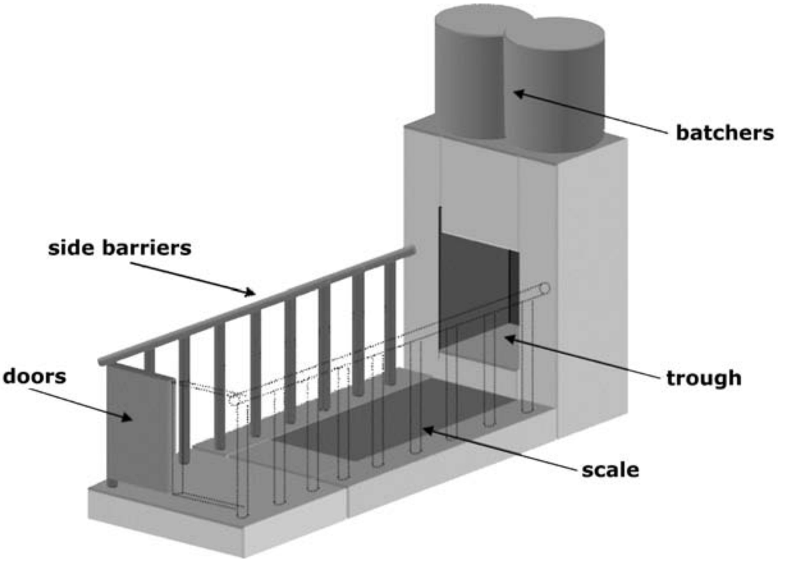
Feeding system

The two balanced groups differed in the way they received their feed. In the conventional group animals received feed *ad libitum* twice a day, distributed in two long troughs with a space allowance of 0.33 m*$head^{-1}$ while the pigs in the second group received feed *ad libitum* individually by a self-feeder. In this case, the feed was divided into small quantities at meal times. This self-feeder is part of a structured feeding station (Figure 1), specifically developed for this experiment.

The components of this system are:

- a modified self-feeder "wet&dry" for gestating sows;
- an industrial scale with weighing bars at load cells of 300 kg load and a digital weight indicator;

Figure 1. Scheme of the automatic station.



- an analog B/W camera with 12 infrared LEDs for improved low light vision.

The chosen automatic feeder is usually utilised for the breeding of sows. In this experiment, it has been modified to work with pigs from 40 to 200 kg in weight. It was equipped with:

- 8 blades (instead of 4) in the feed's batcher, to increase the accuracy in distribution;
- a feeding platform, with scales incorporated under it, to easy the access to the trough;
- two side barriers to allow access one at a time and to reduce feeding and social competition around the feeder.

SG animals received the ration using the individual electronic feeding system. Each pig was equipped with a transponder to allow its automatic identification. Two different types of transponder were used in the experiment: one placed underneath the skin behind the ear, and the other one in the auricle like an eartag. The transponder is actived by signal, sent by a two-way radio, placed in the automatic feeding system and sends back an identifier of the animal. The pig's presence in the feeding station activated the transponder's reading and in turns the meal's unloading, individually programmed by the operator for each pig. The transmission utilised the TI-RFid^{TM} (*Texas Instruments Radio Frequency Identification*) System with HDX 32.5x3.8 mm bio-glass encapsulated transponders at low frequency (134.2 kHz). These transponders are in accordance with current ISO Standards (ISO 11784 and ISO 11785).

The weighing system (bars at load cells and the digital weight indicator) was placed in front of the trough, at the same height as the ramp. When a pig went into the feeding station it was therefore weighed on four legs.

The analog black-and-white camera had twelve LEDs, enabling optimal viewing in a variety of lighted conditions. Initially it was placed over the feeder to check the animals while eating. It was used to collect pictures of both groups of pigs to investigate behaviours.

The described station was situated in the SG pigs corral and was controlled by a personal computer (Pc) placed 150 meters away. The communication between the weighing system, the analog camera and the feeding station with the Pc was not based on cable broadcasting but using radio with transmitter and receiver devices: one audio/video transmitter and two radiomodems. The use of these modules inside the UE is free, according to the CEPT-ERC/REC 70-03 recommendation, because these are classified Short Range Devices (SRD).

Operating procedure

Feeding. In order to identify the SG animals, whenever a pig went into the feeding station the magnetic field emitted by the antenna near the trough started up its transponder. The feeding station software checked that a lag of 5 minutes had occurred since the last time the same animal was fed. In this instance, the pig received a new portion of feed according to its individual diet. Each portion was about 5-10% of its daily feed ration to allow the pig to finish feeding before being eventually disturbed by its mates. By dividing up the daily ration, natural conditions were simulated. Moreover, a reduced difference between the discharged quantity and the consumed quantity was obtained.

As mentioned above, the CG pigs were fed traditionally. A worker distributed feed *ad libitum* twice a day (10 and 16 o'clock) in two long troughs.

Weighing. Every time a pig ate in the feeding station, it went up the platform and activated the weighing system. The platform on the scales was protected by two sidewalls attached to the trough to prevent another pig entering the feeding station and thereby disturbing the weighing system. The system measured the weight and the associate transmission device sent it to the Pc. An MS Visual Basic software was in charge of recording the information into a text file with the date (day and hour), the pig's identification number, its weight, and the name of the associated animal image.

Contrary to self-fed pigs, the CG animals were weighed by hand fortnightly in order to determine their weights increase. Since pigs were free in the corral, the operators needed to direct the pigs in a forced course ending with a balance where he could weigh each individual one at a time.

Visual monitoring.The Pc operator directly monitored the pig's activity at the feeding station. Furthermore the camera took a photo 20s after the pig's entry and automatically saved the image with its identifier. In fact, the software recognized the subject's presence in the feeding station once a defined threshold weight value had been exceeded.

Behavioural data

After monitoring the pigs' activity in the feeding station for one month, the camera was repositioned to observe the pigs' activities in the corrals. On alternate days the video camera was repositioned to monitor night and day CG or SG animals. The behaviour of the two groups was studied performing three observation periods (repetitions) of ten consecutive days. Hundreds of frames were collected every day by the automatic system. For each picture the day and hour, the number of visible pigs and their behaviours were recorded by the same operator and were classified on the basis of a prefixed ethogram (Table 2). All behavioural elements were mutually exclusive. Non specifiable activities, refreshing, rooting and social

Table 2. List of behaviours recorded in the experiment and respective description.

Behaviour	Description of activity
Lying	Lying on the ground without performing any other activity
Mounting	Placing the front part of the body on the back of the standing pen mate and vice versa
Nosing	Sniffing and touching part of structures (eg, fencing)
Refreshing	Bathing in the pond
Rooting	Thrusting the snout into the soil
Social interaction	Touching or sniffing any part of the body of a pen mate (eg, grooming)
Standing	Standing on all four legs
Non specifiable activity	An active behaviour but which is impossible to identify exactly because only part of the pig is visible in the picture

interaction were grouped together and also analysed as a single behavioural activity ("*Move*"). In the same way, lying and standing were grouped and also analysed as a single activity ("*Rest*"). The aim was to simplify the statistical analysis and highlight "active" and "passive" behaviours between the two experimental groups.

Statistical analysis

Data analysis was performed by SAS/STAT in SAS 9.1 using general linear model (GLM) or a nonparametric test (NPAIR1WAY) procedures (SAS, 2004).

Least square means (Lsmeans) of production variables (live weights, feed consumption, etc.) were compared using a one-way analysis of variance. Results were expressed as LSmeans ± Standard Error of Mean (SEM.).

To perform behaviour analyses each frame was observed. Activities have been assigned to each visible animal to obtain the frequency for each hour of each day. Finally, the percentage of each specific activity on each total daily activity was computed. The "0" value was established for non-visible activities. The results were the hourly percentage for each day and activity. The corral was considered the experimental unit for analysis of behavioural data. It was assumed that each pig in a corral contributed equally to behavioural activities. A Shapiro-Wilk test was used to examine normal distributions in the data set and, when tests yielded a significant result a Kruskal-Wallis one-way ANOVA was used. Behavioural data are presented as median and interquartile ranges.

Results

Performance

Table 3 presents the performance results. The two groups were correctly balanced for initial age and body weight, therefore statistical analysis is not significant. After 90 days it is observed that the final live weight (LW) of CG animals was higher compared with SG animals (164.6 *vs* 151.8 kg) but not significantly. A significantly differences was observed for total weight gain (CG 56.1 kg *vs* 46.7 SG; P=0.0117). Moreover, the conventional group's average daily gain (ADG) was higher (624 g/d) in comparison to the self-feeder group (519 g/d; P=0.0117), and the SG

Table 3. Average age, live weight and weight gain of animals (LSMeans ± SEM).

		Self-Feeder group	Conventional group	P value
Animals	n	10	9*	-
Days of test	"	90	90	-
Initial age	d	229 ± 9.7	230 ± 10.2	ns
Final age	"	319 ± 9.7	320 ± 10.2	ns
Initial LW	kg	105.1 ± 4.54	108.5 ± 4.78	ns
Final LW	"	151.8 ± 5.20	164.6 ± 5.48	0.1095
Total weight gain	"	46.7 ± 2.29	56.1 ± 2.42	0.0117
ADG	g/d	519 ± 25.5	624 ± 26.9	0.0117
Means:				
Daily feed consumption	g/d	2809 ± 53.9	3584**	-
FCI		5.45 ± 0.28	5.91 ± 0.29	-

**One pig (female) died during the experiment.*
***Daily feed consumption in CG group was estimated from groups total feed consumption.*
LW=live weight; ADG=average daily gain; FCI=feed conversion index.

daily feed consumption tended to be lower (approximately -22%) than the one observed in the CG animals (2809 g/d *vs* 3584 g/d).

Feeding behaviour and other activities

Table 4 presents the total percentage distribution of the behavioural activities. Each value is the median of each single activity expressed as the percentage on the sum of daily activities. “Nosing” and “Mounting” were not analysed because they were seen very rarely.

A notable difference was in the “Eating” activity: SG animals spent more than twice the time in the feeding activity compared with CG animals (24.6% *vs* 10.9%: P<0.0001). The average time, as hours/day, used in each activity was estimated. SG animals spent nearly 6 hours in the same activity. This is a consequence of dividing the daily ration and giving pigs the opportunity to stimulate the natural behaviour (Stolba and Wood-Gush, 1989).

Data show that pigs spend the majority of the day in “Lying” (SG 51.2% *vs* CG 66.2%: P=0.0003) and generally in “passive” behaviours, as summarized in *Rest* category (SG 55.0% *vs* 71.4% CG: P<0.0001). Self-fed animals rested more than 13 hours a day on average and the control group rested more than 17 hours. There was no difference in the *Move* category instead (SG 18.5% *vs* 15.4% CG).

The time spent in “Rooting” activity was similar in both groups (SG 2.57 h *vs* 1.93 CG: ns). A difference came out in “Non Specifiable Activity” (P=0.0627) and “Standing” activity (P=0.0161). “Social interactions” and “Refreshing” activities had very low incidence in daily behaviours evaluation.

Figure 2 shows the proportional hourly distribution of “Eating” activity, *Move*, and *Rest* categories. Data are presented as average minutes per hours spent for each activity for the two groups. Time axis scales 7 am to 7 pm, the 12 h natural light mean range.

Table 4. Behavioural elements in the self-feeder and conventional feeding groups. Values are median (%/day), with interquartile ranges (25-75%) in brackets.

	Self-Feeder group		Conventional group		
	%	h/day	%	h/day	Kruskal-Wallis Test
Eating	24.6(21.2-31.6)	5.91	10.9(7.6-13.4)	2.60	<0.0001
Lying	51.2(43.6-57.4)	12.30	66.2(56.5-76.0)	15.90	0.0003
Standing	2.6(1.6-4.6)	0.62	4.0(3.0-6.4)	0.96	0.0161
Non specifiable activity	4.8(1.6-7.0)	1.14	5.7(3.9-11.5)	1.38	0.0627
Refreshing	0.0(0.0-2.4)	0.00	0.0(0.0-0.6)	0.00	ns
Rooting	10.7(6.5-15.4)	2.57	8.0(6.7-11.2)	1.93	ns
Social interactions	0.6(0.0-1.3)	0.12	0.0(0.0-1.1)	0.09	ns
"Move"	18.5(14.3-21.4)	4.45	15.4(12.2-26.0)	3.70	ns
"Rest"	55.0(49.1-60.2)	13.20	71.4(65.2-81.0)	17.13	<0.0001

"Move"=non specifiable activity+refreshing+rooting+social interaction.
"Rest"=lying+standing.

Observing the charts it is possible to note remarkable differences in daily activities distributions between the two groups.

The peaks at 10 am and 4 pm (and a third one –but minus– at 1 pm) characterized the "Eating" activity in CG. This trend results from feed distribution of worker. The chart shows that he was not always steady at 10 am and 4 pm. The constant feed distribution by the self-feeder caused a more regular eating trend in SG animals.

From Figure 2 it emerged the prevalence of the *Rest* category on other behavioural activities as well. The *Move* graph was characterized by a certain constant trend of SG animals and by three peaks in the conventional group, just the hours before the Eating peaks that correspond to the distribution of feed.

Use of the self-feeder

Transponders that equipped SG animals allowed recording all the visits to the automatic station. The self-feeder results are presented in Figure 3. The chart shows the average daily number of visits to the self-feeder and the average duration of stay in the station. Each data point represents mean ± standard deviation.

The SG pigs visit constantly the automatic station to get feed. The feeding activity is distributed during the whole day, night included, even if it decreases during the dark both in number and average duration of visits. The average duration of visit is between 2-3 minutes in the night and 5 min during the day. These data are obviously influenced by the fact that the automatic station distributed a small quantity of daily feed ration in each visit.

It is possible to note a great variability on results, in the average number of visits especially. If at night the animals visited the self-feeder 3-4 times per hour, the number of visits increases at dawn and at sunset and it reaches 9-11 during the day.

Figure 2. Proportional distribution of main activities from 7 am to 7 pm.

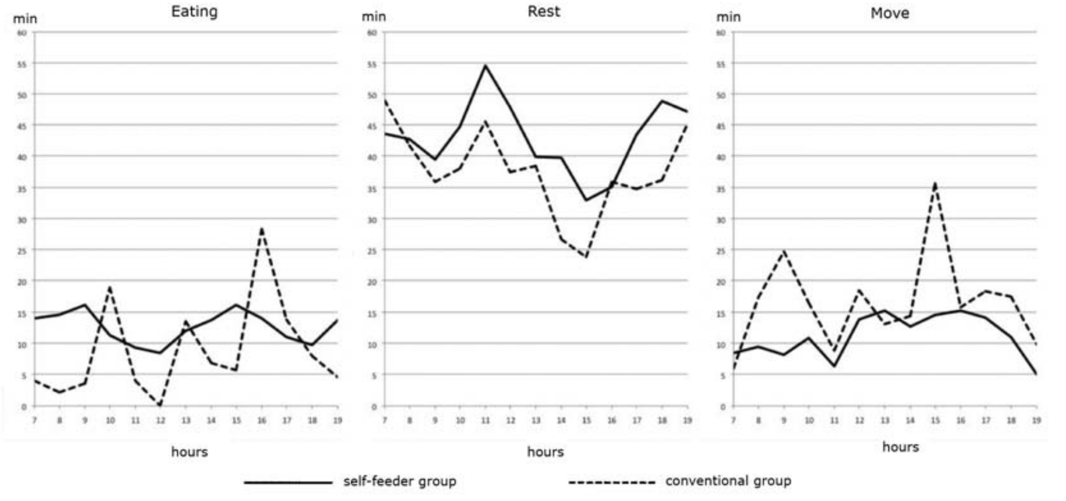
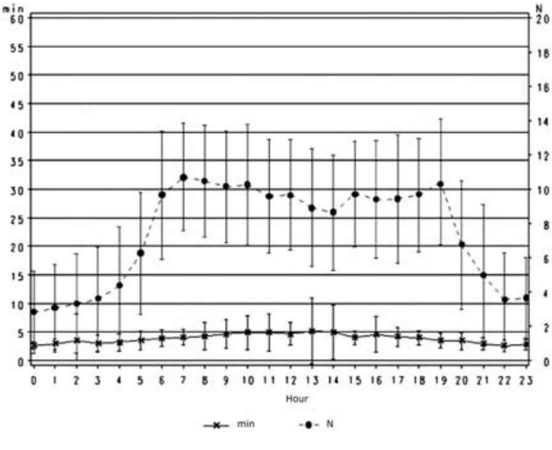


Figure 3. Average daily distribution of number and duration of visits to the self-feeder.



Discussion

The higher final LW of CG animals results in a higher ADG and total weight gain. These are confirmed by the difference in the daily feed consumption. As shown by several authors (e.g., Botermans *et al.*, 2000) diet regulates digestive metabolism (enzyme production and nutrient digestibility) improving the feed utilization efficiency. Providing feed to SG animals throughout the day and dividing it into small quantities seems to produce a similar effect.

By observing the free behaviour of pigs, an initial difference was noted between the two groups. CG animals were not as calm as

SG animals. But this doesn't mean that the SG animals were more inactive compared to the CG individuals. The SG pigs were less scared when an outsider approached the pen. SG pigs were calm around penmates and aggressive behaviours were rare. Restlessness of the CG pigs, in particularly increased at meal times. As mentioned above, the *Move* graph (Figure 2) shows three peaks of activity in the hours before the two corresponding Eating peaks. But it was especially during meals that the CG animals showed a high level of aggression towards penmates. Lower rank pigs were nearly always the worst off. They were repeatedly driven away and allowed to eat only when other animals had finished their own meal. This type of feeding competition did not happen in the SG animals due to the feed distribution system. Clearly the positive effects of the self-feeder system depend on three parameters: a correct animal load (the number of pigs that the self-feeder can feed); the quantity of feed per portion which can be easily and rapidly consumed; the presence of two lateral side barriers allowing access one at a time.

The choice of feed distribution with an automatic system influenced other behaviours. The animals conventionally fed spent proportionally more time in "passive" behaviours (*Rest*: CG 17.13 *vs* 13.20 hours/day SG; $P<0.0001$), while the *Move* category was not different in the two groups. The Eating activity was analyzed separately since the aim was to highlight differences in feeding activity and feed consumption. However, by including the feeding activity (that is "active" behaviour) in the *Move* category, this behavioural category would show a significant difference as well.

Use of the self-feeder

The statistics of the automatic station allowed demonstrating that pigs, whenever possible, seek feed and eat during the day but at night as well. If in the dark the numbers of visits was limited to 3-4 per hour of 3 minutes each, during the day the visits increased to 10 and the average time was 5 minutes. The number of visits per hour has been calculated from 10 subjects with a different social rank and for this reason with a different access to feed. Moreover, the weather conditions were very different during the three observation periods and they have probably led the feeding activity. All of these parameters have contributed to the high variability of the self-feeder results.

Considering an average number of 10 visits per hour of 5 minutes each, the 10 animals had theoretically guaranteed at least a visit per hour and the automatic station was occupied almost all the time during the day. The real capability of the automatic station to monitor the eating activity, record the feed consumption, and the weight gain of each pigs, make it a effective commercial solution for feeding animals but also an important instrument in scientific research to study eating activity and performance of pigs, in outdoor systems as well.

Conclusions

Pig outdoor production meets with the consumers backing and their meat obtains better market prices. The feeding system influences the performance and behaviour of pigs. The pigs fed with the conventional feeding system resulted in a higher ADG. Although FCI is not as good as indoor production, the use of the automatic feeding system seems to reduce feed consumption. The self-feeder further reduces the farmer's work in outdoor production.

Further investigations should improve the knowledge of feeding and social behaviours of pigs in outdoor production systems, especially for native breeds.

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