



## Case study

# Group housing of sows: a Brazilian view on the use of electronic feeding systems



**Authors:** RIBAS, J.C.R.; NEVES, J.E.G.; MAURO, P.A.; LEMME, C.F; RUEDA, P.; CIOCCA, J.R.P.

## Global context

Brazil is one of the global leaders in pork production and export, annually slaughtering 46 million animals<sup>1</sup>. Most production takes place in industrial livestock systems where the animals are reared in close confinement. Most growers, whether they are small, medium or large-scale are directly connected to agribusiness. During the last 20 years, the welfare of farm animals has become one of the most important topics of discussion for the global meat industry. The transition away from individual sow stalls has been recognized as a global trend since the European Union market established a policy to progressively phase out this system. In Brazil, and around the world, several producers, retailers and food manufacturers have committed to phasing out sow stalls, motivated by market pressure, customer demand, and new ethical values in animal production. In this context, Brazil should take a proactive position in the transition of sow housing systems, reasserting its prominent position in the global market and amplifying its market reach.

## Defining animal welfare and productivity

High productivity does not necessarily mean poor welfare conditions<sup>2</sup>, but when management does not meet good animal welfare criteria, this may result in a decrease in egg, milk or meat production; reproduction and development, and in an

increase in disease incidence. Moreover, animals that have a poor relationship with their handlers may also have decreased productivity due to fear, stress and higher cortisol levels.

Animal housing is a factor that directly affects welfare. Animals housed in close confinement perform redirected exploratory behaviors that might result in severe problems, for example cannibalism in pigs. Sows in stalls perform stereotypical behavior as a result of boredom. Stereotypes are repetitive behaviors with no apparent purpose, such as curling the tongue, sham chewing, swallowing air and bar biting. The frustration represented by these behaviors alters the animals' hormonal balance due to chronic stress. Therefore, associated to the deprivation of natural activities and movements, animals are more prone to diseases, reproductive problems and sudden death.



**Image:** Sow accommodation in individual stalls

Identifying alternatives to the housing of sows, which enables them to express their natural and social behaviors is very important to ensure production is ethical and respects good animal welfare. There are economically viable alternatives available for housing sows in groups. According to scientific studies, group housing of sows results in improved reproduction and longevity.<sup>26</sup> This shows that animals reared in balance with their environment, i.e., in conditions that provide for good welfare, may be more productive than animals reared in extreme confinement.

Data and evaluations of systems that represent the reality of Brazilian production are needed to validate this hypothesis. Therefore, the current case study, developed at the ECO-BEA farm, in Brasília, has been developed with the purpose of evaluating the productivity of electronic feeding systems in group housing of sows.

## Contextualizing the case study

The ECO-BEA Farm which belongs to Rubens Valentini, has been the focus of Julia Eumira Gomes Neves' doctoral thesis (Universidade Federal de Brasília) and Paulo Arthur's masters' thesis (Universidade Federal do Rio de Janeiro). Rubens Valentini is one of the pioneers of group housing of sows with electronic feeding systems in Brazil. The farm has 3,450 sows, of which 1,350 are housed in groups with Electronic Sow Feeding. The farm is among the 30 best in terms of productivity indexes in Brazil, according to Agriness, a Brazilian consultancy company on pig farming.

In the group housing system at ECO-BEA Farm, sows are housed in dynamic groups of 80-160 animals. Animals enter and leave the group at any time and at different stages in gestation. Sows have access to electronic sow feeding which individually control the amount of food each sow receives through a microchip that identifies each animal and its stage of gestation. Moreover, the pens have a dynamic layout, with separate areas for defecating and resting, as well as escape areas, allowing the formation of social subgroups and protection in case of aggression. The space allowance follows what has been proposed by the European Commission in the Council Directive 120 / 2008 on sow housing. Handling meets the behavioral needs of the animals and is in line with best industry practice.

## Productivity evaluation

Productivity data from 17,265 litters between 2012 and 2014 was evaluated and compared for three different housing systems:

- 608 litters from the 'group housing' system in which female sows are inseminated and placed in groups immediately afterwards (CS).
- 6,155 litters from the '42-days group housing' system where sows spend 42 days after insemination in stalls and are then moved to groups (GC).
- 10,502 litters from the 'sow stalls' system where sows spend the entire gestation period in stalls (GG).

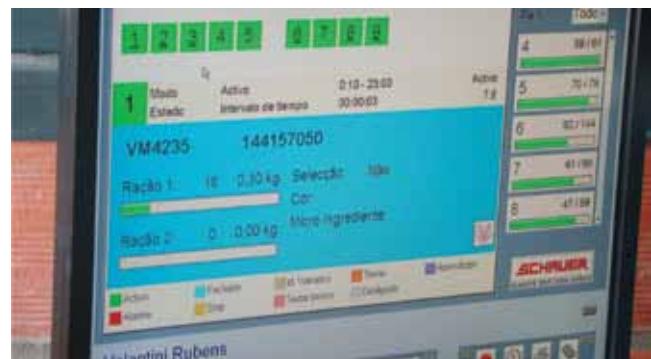
The results show a statistically significant improvement ( $P<0,01$ ) in the reproductive indexes of animals housed in the 'group housing' (CS) system as demonstrated in the Table.

In the 'group housing' (CS) system, sows are moved into groups immediately after insemination and before the embryo implantation period, which in pigs occurs between the 7th and the 24th day after fertilization.<sup>5</sup> This method avoids embryo losses by reabsorption or mummification which results from aggressive behavior between sows that can occur when a new hierarchy is forming during the first 48 hours after introducing the new sow into the group.

In addition to the increase in litter size achieved through the 'group housing' (CS) system, the use of electronic sow feeding systems allows each sow to receive the precise amount of food she needs for the stage in gestation and prolificacy. For example, a sow with a history of farrowing large litters might



**Image:** Sows housed in groups with electronic sow feeding at the Miunça farm.



**Image:** Computerized individual control of feeding, enabling better nutritional control.



**Image:** Employee being advised on the correct use of animal handling tools.

**Table – Productivity indexes for the three housing systems compared at Miunça farm\***

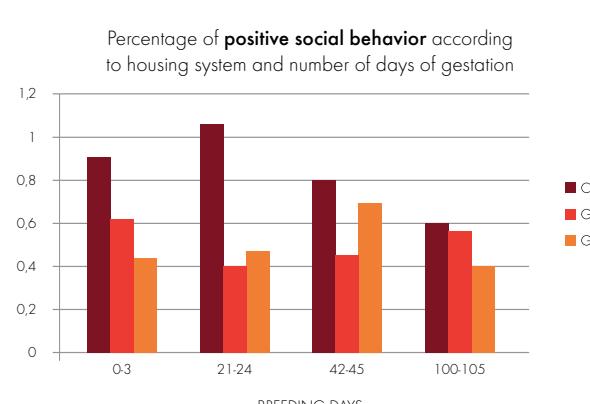
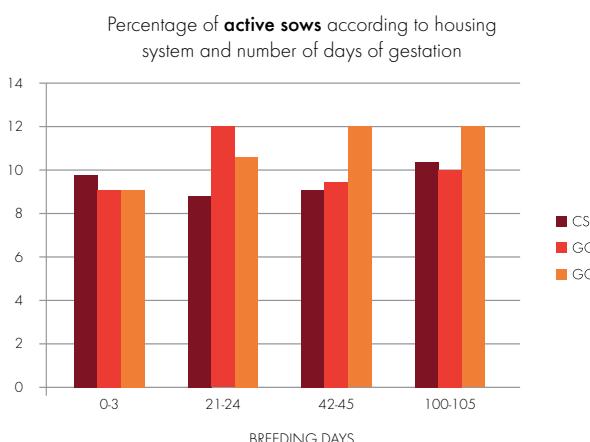
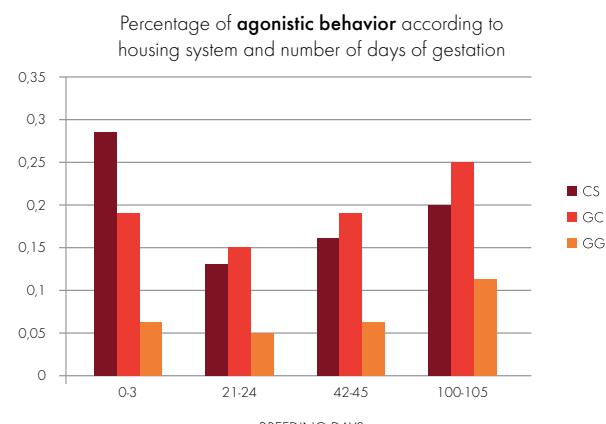
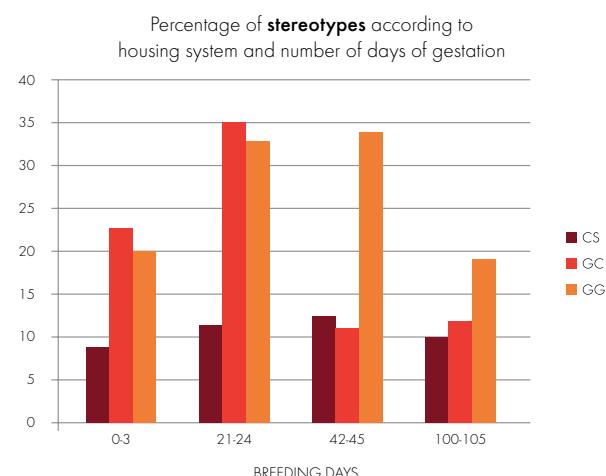
Groups / Rates	Group housing (CS)	42-days group housing (GC)	Sow stalls (GG)
Gestation days	116.68 a	116.78 a	116.96 b
Total born	16.01 a	15.8 ab	15.51 b
Total live-born	14.44 a	14.15 a	13.76 b
Mummified	0.39 a	0.42 a	0.47 a
Litter weight	19.51 a	19.49 a	19.38 a
Average piglet weight at birth	1.36 c	1.40 b	1.43 a
Heat repetition	3.78% a	3.50% a	4.30% b
Abortions	1.34% a	1.63% a	1.30% a
Farrowing rate	92.94 ab	93.23 b	91.12 a

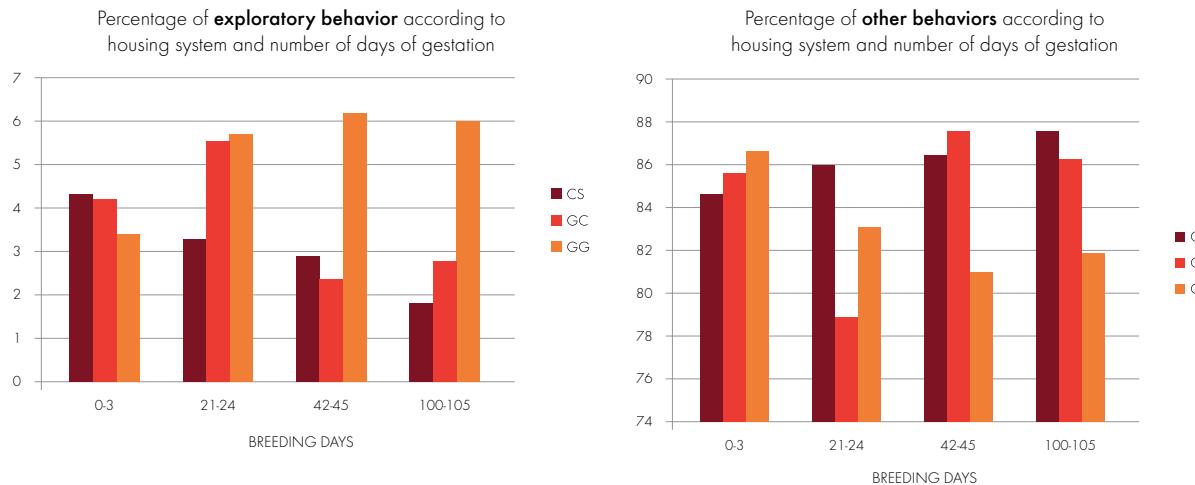
\* Part of Julia Eumira Gomes Neves' Doctoral thesis, unpublished data (2015).

receive a larger amount of feed compared to other sows, enabling litters with piglets of good and uniform weights. However, the maintenance or improvement of reproductive rates on its own does not ensure good welfare. Assessing the behavior of the animals is also fundamental.

Compared to other sow housing systems, 'group housing' (CS) performs better in animal behavior assessments. This is

demonstrated by greater interaction between sows, including both positive and negative interactions and increased levels of activity throughout the breeding period. The significant reduction in stereotypic behavior, which is a symptom of chronic stress, is also an important indicator, because it impacts animal production and health as per the data presented in the Table.





**Charts:** Results of behavioral evaluation during the gestational period in three sow housing systems: 'group housing' (CS), '42-day group housing' (GC) and 'sow stalls' (GG).

## Conclusions

- Group housing of sows with electronic sow feeding is viable and advantageous for productivity.
- Group housing of sows with electronic feeding promotes better animal welfare and allows sows to express natural behavior.
- Group housing of sows, whereby sows are moved into groups immediately after insemination, is the best system to maintain and improve productivity. There is no evidence to support maintaining the sows in stalls beyond the time required for insemination.
- Allowing the expression of natural behavior, good handling, and a good animal-human relationship are fundamental to achieving good productivity in pig production.

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## Contato

T: +44 (0)20 7239 0500  
F: +44 (0)20 7239 0653  
E: [info@worldanimalprotection.org](mailto:info@worldanimalprotection.org)  
[worldanimalprotection.org](http://worldanimalprotection.org)

 **World Animal Protection**  
5th floor, 222 Grays  
Inn Road, London,  
WC1X 8HB, UK

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