



# ALTERNATIVE LACTATION HOUSING SYSTEMS FOR AUSTRALIAN PORK PRODUCERS





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# THE AUSTRALIAN PORK INDUSTRY IS COMMITTED TO CONTINUOUS IMPROVEMENT IN ANIMAL WELFARE AND HAS VOLUNTARILY AGREED TO ELIMINATE DRY SOW STALLS

This move has stimulated an increased interest in what options are available to pork producers to reduce sow confinement during lactation. Farrowing crates were developed initially to reduce piglet mortalities, improve piglet welfare, improve access to piglets for routine husbandry, reduce labour inputs and improve work, health and safety conditions for farm staff. However, sow confinement in farrowing crates is perceived by many in the community to have negative impacts on sow welfare.

In more recent years there has been an increasing R&D focus to develop lower confinement farrowing and lactation housing systems. Ideally the sow should be able to farrow and lactate without confinement, so that she can perform her natural behaviours such as nest building.

To assist the Australian pork industry to understand the relative attributes of new farrowing/lactation housing systems, the Pork CRC together with Australian Pork Limited have developed this Fact Sheet to provide the Australian pork industry with a general overview of the farrowing/lactation housing systems available, the attributes of each system from a sow, piglet and producer perspective, and where to seek further information on the various systems.

## LOWER CONFINEMENT LACTATION HOUSING SYSTEMS

The farrowing crate was first introduced in the 1960s to reduce the risk of crushing for piglets. The vast majority of sows in commercial piggeries are housed in farrowing crates from approximately five days before they are due to give birth until their piglets are weaned between 3 and 4 weeks of age. Farrowing crates are now considered to be economical, efficient and safe for both pigs and stockpeople. However, they raise some welfare concerns, particularly for the sow. Confinement of the sow immediately prior to farrowing results in frustration of highly motivated behaviours such as seeking a sheltered nesting site and nest building behaviour. The restriction of the sow's movement within the crate may lead to difficulty standing up and lying down and increases the risk of limb and body injuries.

In more recent years, there has been considerable R&D being conducted in developing lower confinement lactation systems that facilitate sow maternal behaviour, both by overseas research institutes and in Australia with considerable support from Australian Pork Limited and more recently, the Pork CRC. These systems often include a range of modified furnished pen designs in which the traditional farrowing crate is absent. Examples of individual farrowing/lactation pens that have been developed include PigSAFE from UK, Free Farrower from Denmark, UMB pen from Norway, FAT pen from Switzerland and the Werribee pen from Australia.

In addition, temporary crating systems have also been developed. These include systems to temporarily crate the sow, such as the 360° Farrower, the SWAP (adapted from the Danish Free Farrower) and various swing-sided crates. Temporary crating options have been designed to allow the sow to be unrestrained, but generally these systems often confine the sow prior to farrowing and for the first 3-7 days of lactation to ensure that piglets are protected during this critical time. Many of these alternative systems also allow for the provision of nest building material.

# THE MAIN MINIMAL CONFINEMENT LACTATION HOUSING SYSTEMS THAT MAY BE AVAILABLE TO AUSTRALIAN PRODUCERS ARE OUTLINED IN THE TABLE BELOW.

## COMBI-FLEX PEN

See: [www.vissingagro.dk/en/equipment/farrowing-units/combi-farrowing-pen](http://www.vissingagro.dk/en/equipment/farrowing-units/combi-farrowing-pen)

The Combi-Flex pen was designed by Vissing Agro, Denmark. It is built on a similar footprint as a farrowing crate. This is a swing-sided lactation system in which the sow can be contained as she would be in a farrowing crate. One of the crate sides can be moved against the side of the pen to allow the sow to move around freely. The Combi-Flex turn around farrowing pen has been installed in a couple of piggeries in Australia and New Zealand.

The Vissing Agro Combi-Flex Pen has been supplied to piggeries in Australia and New Zealand, but Vissing Agro should be contacted for availability in Australia and any further information.

See: [www.vissingagro.dk/en](http://www.vissingagro.dk/en)

## 360° FREEDOM FARROWER

See: [www.360farrower.com](http://www.360farrower.com)

The 360° Freedom Farrower was designed by Midland Pig Producers, which is one of the largest pork producing companies in the UK. It is built on the same footprint as a farrowing crate with a fully slatted floor. It has a flexible design with moveable restraining bars which can give the sow space to turn around in the pen but also enables containment when necessary.

The 360° Freedom Farrower lactation system is available from Stockyard Industries.

See: [www.stockyardindustries.com/pigs-farrowingoptions-360freedom](http://www.stockyardindustries.com/pigs-farrowingoptions-360freedom)

## SWAP PEN

Information on the SWAP (Sow Welfare and Piglet Protection) pen is available at: [www.jydenirect.com/jlf10-swap-sow-welfare-and-piglet-protection\\_gb](http://www.jydenirect.com/jlf10-swap-sow-welfare-and-piglet-protection_gb)

The SWAP pen system was developed as part of a collaborative project between Vivi Moustsen from the Danish Pig Research Centre and Christian Hansen from the University of Copenhagen and has been commercialised by Jyden Bur A/S. The SWAP pen is larger than a farrowing crate footprint. It is based upon the Danish Free Farrower pen, where the front of the creep serves as a customised swing side gate. The swing side and the sloping wall of the SWAP system make it possible to contain the sow when needed.

The SWAP lactation system is available from Stockyard Industries.

See: [www.stockyardindustries.com/pigs-farrowingoptions-jyden](http://www.stockyardindustries.com/pigs-farrowingoptions-jyden)

## PIGSAFE PEN

Information on the PigSAFE (Piglet and Sow Alternative Farrowing Environment) pen is available at: [www.freefarrowing.org/downloads/file/5/pigsafe\\_project\\_final\\_report](http://www.freefarrowing.org/downloads/file/5/pigsafe_project_final_report).

The PigSAFE pen was developed by researchers Emma Baxter at Scotland's Rural College, Edinburgh and Sandra Edwards at Newcastle University with support of industry and Non-Government Organisations. The PigSAFE pen has been evaluated in the Pork CRC project 1A-105: Developing commercially-viable, confinement-free farrowing and lactation systems led by Rebecca Morrison, Rivalea Australia.

See: <http://porkcrc.com.au/wp-content/uploads/2015/05/1A-105-Part-2-Final-Report.pdf>.

The PigSAFE pen is not yet commercially available to the Australian pork industry, but has been installed in several piggeries in the UK.

## LACTATION HOUSING INDEX

The relevant attributes of these low confinement lactation housing systems have been listed in a “Lactation Housing Index” which aims to qualitatively and quantitatively, compare various lactation housing systems. This comparison takes into account sow, piglet and producer attributes, for each lactation housing system. Within each of these parameters, further subdivisions have resulted in scores for twelve attributes for each of the lactation housing systems. The twelve attributes scored are:

➤ Sow attributes:

- welfare from a behavioural aspect,
- welfare from a physiological (cortisol/injuries) aspect,
- body condition,
- feed intake, and
- reproductive performance.

➤ Piglet attributes:

- welfare from a behavioural aspect,
- welfare from a physiological (cortisol/injuries) aspect,
- growth performance, and
- mortality.

➤ Producer attributes:

- investment cost,
- labour requirement, and
- OH&S issues.



Four minimal confinement lactation housing systems were compared to the farrowing crate. Two of the alternate systems (PigSAFE and SWAP) were compared where there was NO confinement of the sow at all, between entry to the farrowing house and weaning. The other two systems (360° Freedom Farrower and the Combi-Flex pen) were compared where the sow was confined from entry to the farrowing house up to a week prior to farrowing until 3-7 days after farrowing. In developing the Lactation Housing Index, quantitative information was obtained from published papers or reports where there was a direct comparison between the farrowing crate and the alternate system. This was supplemented with published information on generic pen systems and the experiences of prominent researchers in this field.

In scoring the various systems, a score of 100 was assumed for the farrowing crate and each of the alternatives was scored as a percentage difference, depending upon whether the alternate system was better or poorer. For example, the pre-weaning growth rate in the Combi-Flex pens and the PigSAFE pens was considered 5% FASTER than piglets in the farrowing crate, so PigSAFE and Combi-Flex pens scored 105 for this attribute. Similarly the pre-weaning mortality for the Combi-Flex, PigSAFE and SWAP pens was 15%, 10% and 15% GREATER, respectively, than in the farrowing crate.

The Lactation Housing Index scores against each of the parameters for the various lactation housing systems are provided in the following table:

**TABLE 1:** Comparison of alternative lactation housing systems, compared to the conventional farrowing crate.

Lactation Housing System	Farrowing crate	Combi-Flex pen	360° Freedom Farrower	PigSAFE pen	SWAP pen
Approximate dimensions (m x m)	2.4 x 1.8	2.2 x 2.8, or 2.4 x 2.4	2.4 x 1.8	2.4 x 3.6	2.1 x 2.8
Confinement	Complete	Up to day 4-7	Up to day 4-7	Nil	Nil
<b>Attributes</b>					
<b>Sow</b>					
Behaviour	100	110	105	130	130
Physiology	100	100	100	100	100
Body Condition	100	100	95	95	95
Feed Intake	100	100	105	110	105
Reproduction	100	100	100	100	100
<b>Piglet</b>					
Behaviour	100	110	100	120	120
Physiology	100	85	85	85	85
Pre-wean GR	100	100	100	105	105
Pre-wean Mortality	100	85	85	90	85
<b>Producer</b>					
Capital cost*	100	80	80	65	75
Labour requirement	100	95	95	85	90
OH&S issues	100	95	95	85	90

\* The relative capital cost is based upon total shed cost and the respective lactation system in a full environmentally controlled shed.

The above scores for the respective indices provide a useful overview of the comparison between the traditional farrowing crate and alternative lower confinement systems. However some caution is required when interpreting the scores as there are many factors that may confound and interact in any comparison of lactation housing systems. Different housing systems and management during gestation may influence the response of the sow to the various lactation housing systems. Genetics, together with any experience of the sow with the alternate housing system, may also influence the performance, welfare and behaviour of sows.

The relative score may also change, depending upon the length of time that the sow may be constrained in the pen system. For example, in the table above, the SWAP pen is scored where there is no confinement of the sow at all, between entry to the farrowing house and weaning. But the SWAP system has the flexibility to restrain the sow for short periods after farrowing. Observations from recent extensive studies on commercial piggeries indicate that piglet survival rate may be improved if the sow is temporarily confined for the first 4 days after farrowing.

Environmental conditions will also have a significant effect on how some of these alternative housing systems perform. Certainly, initial observations from Pork CRC studies in commercial piggeries examining PigSAFE and SWAP systems in Australia identified that summer is a “high risk” time as piglets and sows share the same space within the pen to keep cool. Thus piglets are at risk of being overlain during this time. Further Pork CRC studies are underway to refine the existing pen designs of these systems to attract piglets into safer areas within the pen and to ensure sows are comfortable and cool to ensure commercially-viable levels of piglet survival and growth are achieved over the Australian summer. Finally, any move towards lower confinement housing systems for sows during lactation will require increased skills and knowledge by stockpeople in observing and managing sows and their litters in lactation pen systems. The stockperson may be the most influential factor affecting animal handling, welfare and productivity in alternative lactation housing systems.

## FURTHER INFORMATION

More detailed information on alternative lactation systems may be found on the following website: [www.freefarrowing.org](http://www.freefarrowing.org). This website, which was developed by Dr Emma Baxter and Professor Sandra Edwards from UK, provides extensive information for pork producers who want to know more about any aspect of lactation housing systems. As well as the pen systems that are commercially available to pork producers in Australia, the website also provides some additional information on group lactation systems and outdoor systems.

The Pork CRC has completed several projects on alternative lactation systems and has others that are currently underway. More details on the results of completed projects and the scope of current projects in Subprograms 1A and 1C may be obtained from the Pork CRC website: <http://porkcrc.com.au/research/program-1/program-1-projects>.

The Pig Research Centre in Denmark is establishing a demonstration site in Western Denmark to compare up to 10 different types of farrowing pens. This facility is expected to be open for inspection by visitors in August/September 2016.

