

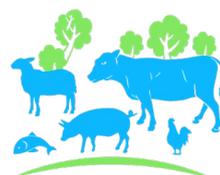


# Banning Farrowing Crates in the UK:

Transitioning to free farrowing to meet the welfare needs of pigs

---

Author: Dr. Steven McCulloch



**Conservative  
Animal Welfare  
Foundation**

## Dedication

This report is dedicated to the memory of Sir David Amess MP (1952-2021), patron of the Conservative Animal Welfare Foundation. David was a Parliamentary champion for animal welfare and introduced the Pig (Husbandry) Farrowing Bill in 2021 to ban the use of farrowing crates in England.



## Executive summary

Farrowing crates cause the greatest degree of confinement of farmed animals of any system in the UK and European Union. The crate measures approximately 198cm x 60cm x 60cm with a footfall (area) of 1.23m<sup>2</sup>.<sup>1</sup> This means that the sow is able to stand up and lie down, but is unable to turn around or move freely to explore her environment. In the UK, 60% of breeding sows are kept in crates, meaning over 200,000 sows are confined in this way.<sup>2</sup> Sows are crated one week prior to farrowing up until weaning, meaning they are typically crated for a five-week period. Given that sows produce 2.3 litters per year,<sup>3</sup> this means that the typical sow spends 80 days each year, or 22% of her adult breeding life, confined in farrowing crates.

Farrowing crates are banned in Sweden (1988), Norway (2000), and Switzerland (2007).<sup>4</sup> Germany has a partial ban on farrowing crates, effective from 2035, with confinement permitted for five days around farrowing. Austria has a similar ban, effective from 2033, with confinement permitted until the end of the critical phase of the suckling pigs life. A court in New Zealand has found farrowing crates to be unlawful and the Government has subsequently announced it will phase out crates by 2025.<sup>5</sup>

---

<sup>1</sup> [Compassion in World Farming](#), "Scientific Briefing on Caged Farming: Overview of Scientific Research on Caged Farming of Laying Hens, Sows, Rabbits, Ducks, Geese, Calves and Quail," (Godalming, Surrey: Compassion in World Farming, 2021).

<sup>2</sup> Davis et al (2020) reported the breeding herd size was 245,000 in 2019. [Carol Davis, Bethan Wilkins, and Claire Barber](#), "Evidence Report: Comparing the Potential Implications of Widespread Use of Different Farrowing Systems in the British Pig Sector" (Stoneleigh: Agriculture and Horticulture Development Board, 2020).

<sup>3</sup> Agriculture and Horticulture Development Board, "Pig Performance Trends and COP Sensitivity for Feed and Performance," <https://ahdb.org.uk/pig-performance-trends-and-cop-sensitivity-for-feed-and-performance>.

<sup>4</sup> [EM Baxter](#), "'Free' Farrowing," (Aberdeen: Rural Policy Centre, Scotland's Rural College, 2022).

<sup>5</sup> Anon., "New Zealand: Farrowing Crates for Pigs Are Unlawful," [Pig Progress, https://www.pigprogress.net/pigs/new-zealand-farrowing-crates-for-pigs-are-unlawful/](https://www.pigprogress.net/pigs/new-zealand-farrowing-crates-for-pigs-are-unlawful/).



The farrowing crate (1.23m<sup>2</sup>) is situated in a pen with a typical area of 4.3m<sup>2</sup>.<sup>6</sup> Within this larger space, there is a “creep” area for piglets, and space for piglets to suckle the confined sow. Sow stalls<sup>7</sup> are similar to farrowing crates, but do not have the outer pen area with a creep for the piglets. Sow stalls are often used throughout the sow’s pregnancy, for example in the US. The sow stall was banned on welfare grounds in the UK in 1999 and the EU implemented a partial ban in 2013.<sup>8</sup> Following a European Citizen’s Initiative (ECI) “End the Cage Age”, the EU Commission has announced its intention to phase out cages, including farrowing crates, and sow stalls by 2027.

The restriction caused by farrowing crates means that sows are not able to perform natural and normal behaviours.<sup>9</sup> Pigs are sentient and intelligent animals and would normally explore their natural environment by rooting and digging.<sup>10</sup> They are social animals that interact with their piglets or other sows, depending on the stage of their reproductive cycle.<sup>11</sup> Sows are highly motivated to build a nest prior to farrowing.<sup>12</sup> Severe confinement caused by the farrowing crate means she is unable to perform innate and highly motivated behaviours.<sup>13</sup> Behavioural and physiological studies demonstrate that sows experience stress and suffering due to the close confinement of farrowing crates.<sup>14</sup> Sows engage in abnormal stereotypic behaviour such as bar chewing.<sup>15</sup> They suffer from physical injuries such as pressure sores of their feet, limbs and shoulders due to being kept on hard surfaces without bedding for prolonged periods of time.<sup>16</sup>

---

<sup>6</sup> Emma M Baxter, AB Lawrence, and Sandra A Edwards, “Alternative Farrowing Accommodation: Welfare and Economic Aspects of Existing Farrowing and Lactation Systems for Pigs,” *Animal* 6, no. 1 (2012).

<sup>7</sup> Also known as gestation crates.

<sup>8</sup> The EU permits the use of sow stalls for a four-week period after service (i.e., mating). S. P. McCulloch, “Brexit and Animal Welfare Impact Assessment: Analysis of the Threats Brexit Poses to Animal Protection in the UK, EU and Internationally,” *Animals* 9, no. 3 (2019).

<sup>9</sup> European Food Safety Authority, “Animal Health and Welfare Aspects of Different Housing and Husbandry Systems for Adult Breeding Boars, Pregnant, Farrowing Sows and Unweaned Piglets Scientific Opinion of the Panel on Animal Health and Welfare,” *EFSA Journal* 5, no. 10 (2007); Emma M Baxter, Inger Lise Andersen, and Sandra A Edwards, “Sow Welfare in the Farrowing Crate and Alternatives,” in *Advances in Pig Welfare* (Elsevier, 2018).

<sup>10</sup> Alex Stolba and David Granger Marcus Wood-Gush, “The Behaviour of Pigs in a Semi-Natural Environment,” *Animal Science* 48, no. 2 (1989).

<sup>11</sup> Per Jensen, “Maternal Behaviour and Mother—Young Interactions During Lactation in Free-Ranging Domestic Pigs,” *Applied animal behaviour science* 20, no. 3-4 (1988).

<sup>12</sup> Baxter, Andersen, and Edwards.

<sup>13</sup> European Food Safety Authority.

<sup>14</sup> European Food Safety Authority.

<sup>15</sup> European Food Safety Authority.

<sup>16</sup> LA Boyle et al., “Effect of Gestation Housing on Behaviour and Skin Lesions of Sows in Farrowing Crates,” *Applied Animal Behaviour Science* 76, no. 2 (2002).



The Animal Welfare Act 2006 is the main piece of legislation in England and Wales to protect the welfare of kept animals.<sup>17</sup> Section 9 of the Animal Welfare Act lists the five welfare needs of animals as (a) its need for a suitable environment, (b), its need for a suitable diet, (c) its need to exhibit normal behaviour patterns, (d) its need to be housed with, or apart from, other animals, and (e) its need to be protected from pain, suffering, injury and disease. The farrowing crate environment violates all five welfare needs, so crates are not compatible with the principles of the Animal Welfare Act. Crates do not provide space appropriate for the physiological and behavioural needs of sows, and pigs are not able to freely turn around in crates. Hence, farrowing crates are not compatible with the principles of the Welfare of Farmed Animals (England) Regulations 2007.<sup>18</sup> In effect, farrowing crates are arguably not compliant with the Animal Welfare Act 2006 and the Welfare of Farmed Animals (England) Regulations 2007.

Well designed and managed free farrowing systems deliver comparable and in some cases lower piglet mortality compared to farrowing crates. Alternatives to the farrowing crate include outdoor systems, zero confinement designed pens, temporary crating, group systems, and kennel and run systems.<sup>19</sup> In the UK, 40% of sows farrow outdoors, which has been described by leading experts as “the gold standard” for a farrowing system.<sup>20</sup> DEFRA data between 2006 and 2021 reveals that total piglet mortality is lower for outdoor farrowing (11.9%) compared to indoor farrowing (13.2%) using the farrowing crate.<sup>21</sup> PigSAFE (Piglet and Sow Alternative Farrowing Environment) is a DEFRA-funded zero confinement system designed by researchers at Scotland’s Rural College (SRUC) and Newcastle University. The PigSAFE system is designed to meet the biological needs and welfare of sows and achieves comparable piglet mortality levels to the farrowing crate.<sup>22</sup> Data from Switzerland reveals that there has been no significant change in piglet mortality levels since the ban was brought into effect in 2007.<sup>23</sup> Baxter (2022) has reported recent commercial live-born mortality figures for Switzerland (11.1%), and Norway (12.0%) compared to 12.2% for the UK.<sup>24</sup>

---

<sup>17</sup> Animal Welfare Act.

<sup>18</sup> The Welfare of Farmed Animals (England) Regulations 2007.

<sup>19</sup> Emma Baxter and Sandra Edwards, “Free Farrowing,” <https://www.freefarrowing.org/>.

<sup>20</sup> Baxter, Lawrence, and Edwards, 97.

<sup>21</sup> Agriculture and Horticulture Development Board. The data compared outdoor with indoor farrowing. Given that farrowing crates are almost universally used indoors, the data effectively compares free farrowing outdoors with the farrowing crate.

<sup>22</sup> Sandra Edwards and Emma Baxter, “The PigSAFE Project: Developing an Alternative to the Farrowing Crate Final Summary Report – October 2012,” (2012).

<sup>23</sup> R Weber et al., “Piglet Mortality on Farms Using Farrowing Systems with or without Crates,” *Animal Welfare-Potters Bar Then Wheathampstead*- 16, no. 2 (2007).

<sup>24</sup> See Table 9 and Figures 15 and 17 of this report. EM Baxter.



The Farm Animal Welfare Council (FAWC) has stated that the minimum legislative requirement in Britain should be that all farmed animals have a life worth living.<sup>25</sup> The farrowing crate clearly does not and cannot meet the welfare needs of sows, because of the degree of physical and behavioural restriction it causes. Therefore, sows cannot have a life worth living whilst confined in a farrowing crate. The farrowing crate continues to be legally permitted because of claims it is necessary to reduce piglet mortality.<sup>26</sup> There are three problems with this claim. First, the farrowing crate should be prohibited on the basis that it cannot meet the welfare needs of the sow during her time spent in the crate. Put simply, no farming system should continue that does not meet the welfare needs of sentient animals and ensure a life worth living.<sup>27</sup> Secondly, the data from UK outdoor pig farms,<sup>28</sup> the PigSAFE designed pen,<sup>29</sup> and the post-ban experience in Switzerland<sup>30</sup> all demonstrate comparable and, in some cases, lower piglet mortality figures. Finally, the critical period for piglet mortality is within 72 hours of farrowing.<sup>31</sup> Despite this, pigs are kept in farrowing crates until the piglets are weaned at 4 weeks of age.

The Government has indicated its intention to ban farrowing crates.<sup>32</sup> This should be a complete ban on farrowing crates, including their temporary use. The ban can be introduced through a variety of legislative vehicles, for instance the Kept Animals Bill,<sup>33</sup> or under secondary legislation under the Animal Welfare Act. The Animal Health and Welfare Pathway of the Agricultural Transition Plan<sup>34</sup> should be used to provide subsidies under the public money for public goods principle to support the British pig industry to transition to free farrowing.

---

<sup>25</sup> Farm Animal Welfare Council, "Farm Animal Welfare in Great Britain: Past, Present and Future," (London: Farm Animal Welfare Council, 2009).

<sup>26</sup> National Pig Association, "NPA Briefing on Farrowing Crates," (Warwickshire: National Pig Association, 2021).

<sup>27</sup> Farm Animal Welfare Council.

<sup>28</sup> Agriculture and Horticulture Development Board.

<sup>29</sup> Edwards and Baxter.

<sup>30</sup> Weber et al.

<sup>31</sup> Emma M Baxter and Sandra A Edwards, "Piglet Mortality and Morbidity: Inevitable or Unacceptable?," in *Advances in Pig Welfare* (Elsevier, 2018); J. N. Marchant et al., "Timing and Causes of Piglet Mortality in Alternative and Conventional Farrowing Systems," *Veterinary Record* 147, no. 8 (2000).

<sup>32</sup> Department for Environment Food and Rural Affairs, "Code of Practice for the Welfare of Pigs," (London 2020); UK Parliament, "Pigs: Animal Welfare," <https://questions-statements.parliament.uk/written-questions/detail/2020-02-03/11510>; *HC Deb*, "Animal Welfare (Kept Animals) Bill (Fifth Sitting)," *Hansard*, no. col 178 (2021).

<sup>33</sup> *Animal Welfare (Kept Animals) Bill 2022-23*. The bill has been carried over to the next Parliamentary session.

<sup>34</sup> Department for Environment Food and Rural Affairs, "The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024," (London: Department for Environment Food and Rural Affairs, 2020).



The Government should supply half of the capital costs to replace farrowing crates with free farrowing systems, such as designed pens, which can meet the welfare needs of sows. There are approximately 75,000 farrowing crate units in use in the UK. Funding 50% of the replacement will cost the Government around £187.5-£281 million in total, and £37.5-56 million annually over a five-year transition period.

Temporary crates cannot meet the welfare needs of sows and do not provide the benefits of designed pens for piglet welfare and mortality. There is no reliable way for Government and enforcement agencies to monitor compliance with temporary crates, for instance if a maximum crating period of five days were permitted. Temporary crates are preferable to conventional farrowing crates, but they have not been designed to accommodate the biological needs of the sow and are likely to be associated with higher piglet mortality compared to designed pens.<sup>35</sup> Furthermore, the British public has demonstrated its opposition to the use of cages in farming, and it would be a poor use of public money to support the continued use of cages simply for a shorter period of time.<sup>36</sup> Given that the farrowing crate cannot meet the welfare needs of sows, the ban should be introduced as soon as practicably possible, given Parliamentary time. A ban should be implemented in 2022/2023, to fully come into force by 2027/28.

---

<sup>35</sup> Sébastien Goumon et al., "Review of Temporary Crating of Farrowing and Lactating Sows," *Frontiers in Veterinary Science* (2022). Baxter, Andersen, and Edwards.

<sup>36</sup> UK Government and Parliament, "End the Cage Age for All Farmed Animals" HMG, <https://petition.parliament.uk/petitions/593775>; Baxter, Andersen, and Edwards.



In summary, the report recommends the following:

1. Ban farrowing crates as soon as Parliamentary time permits, and within the 2022/23 session.
2. Permit a five year period for the British pig industry to transition to free farrowing, so the legislation is fully in force by 2027/28.
3. Fund the transition under the Animal Health and Welfare Pathway based on the public money for public goods principle.
4. The policy must be to transition to zero-confinement free farrowing and not permit the temporary crating of sows.
5. The Government must ensure equivalence of core standards for the import of pigmeat. I.e., import of pigmeat produced in farrowing crates must be prohibited. This will also drive welfare reforms abroad.



 **Contents**

Executive Summary	3
List of Tables	13
List of Figures	14
Introduction	17
Legislation on farrowing crates in the UK	21
The Brambell Report and the Five Freedoms	21
The Animal Welfare Act and Section 9 welfare needs	22
The Welfare of Farmed Animals Regulations	24
Farrowing crates are not compliant with the Animal Welfare Act 2006 and Welfare of Farmed Animals (England) Regulations 2007	25
Government position on farrowing crates	27
The Prime Minister, Brexit and farrowing crates	27
The DEFRA Code of practice for the welfare of pigs	27
Government commitments to prohibit farrowing crates	27
The Government's 2021 Action Plan for Animal Welfare	28
Sir David Amess MP's Husbandry (Farrowing) Bill	29
End the Cage Age petition and Parliamentary debate	29
Kept Animals Bill amendment to ban farrowing crates	30
Policy on farrowing crates in other countries	31
Sweden, Norway, and Switzerland	31
Germany and Austria	31
The EU	31
New Zealand	32



Pigs: sentience and natural behaviour	34
Pig sentience, intelligence, and natural behaviour	34
Farrowing in the natural environment	35
Farrowing Crates and sow welfare	37
Extent and duration of confinement	37
Restriction of physical activity and social behaviours	38
Prevention of nest building	38
Physical and thermal discomfort	38
European Food Safety Authority judgement on farrowing crates	39
Public opinion on farrowing crates and cages	41
Public opinion in the UK	41
The “End the Cage Age” European Citizens’ Initiative and the European Commission pledge to phase out cages by 2027	42
Alternatives to the farrowing crate	43
Outdoor farrowing	46
Case study 1: PigSAFE (zero confinement pen)	48
Case study 2: The Midland 360 Farrower™ (temporary crating)	51
Piglet mortality	55
Causes of piglet mortality	55
The link between sow and piglet welfare	56
Piglet mortality and farm productivity	58
Comparison of piglet mortality in UK indoor and outdoor units	59
Comparison of piglet mortality, sow welfare, and cost of pig farrowing systems	61
Comparison of UK indoor piglet mortality with Swiss, Norwegian, and Swedish free farrowing mortality figures	63
Spotlight on piglet mortality in Switzerland	64



UK welfare assurance schemes and farrowing	65
RSPCA Assured	65
Soil Association	66
Economics of transitioning to free farrowing	67
The farrowing crate as the budget indoor pig producing pen	67
Economic costs in transitioning to free farrowing	68
Economic modelling of alternative farrowing systems	69
Agriculture and Horticulture Development Board analysis	70
The ethics of farrowing crates in pig farming	71
Does the farrowing crate meet the welfare needs of the sow?	71
Do crated pregnant and lactating sows have a life worth living?	71
FAWC's prescription that the legislative minimum must be that all animals have a life worth living	71
Do crated sows have a life worth living?	72
Do breeding sows kept in systems using farrowing crates have a life worth living, over the course of their life?	73
Application of the precautionary principle to sow welfare in farrowing crates	74
Does piglet mortality justify the use of farrowing crates?	74
Do farrowing crates have significantly lower mortality rates?	75
Would a higher piglet mortality in alternative farrowing systems justify the continued use of crates?	76
FAWC accepts Banner's principle: Harms of a certain degree and kind ought under no circumstances to be inflicted on an animal	77
Does an increase in cost of production justify farrowing crates for pigs?	78



Recommendations for reform	79
1. Ban on farrowing crates in the 2022/23 Parliamentary session	79
2. Five-year transition to genuine zero-confinement free farrowing	81
3. Animal Health and Welfare Pathway to fund transition under public goods principle	81
4. Policy must be zero-confinement free farrowing and not permit temporary crating of sows	83
5. Ensure equivalence of core welfare standards for trade imports to ensure level playing field for British farmers and drive welfare improvements abroad	84
References	86



## List of tables

Table 1: Welfare impacts of the farrowing crate on pregnant and lactating sows in terms of meeting animal welfare needs of Section 9 of the Animal Welfare Act.	23
Table 2: Countries with bans or regulation in place restricting the use of farrowing crates.	32
Table 3: Summary of alternatives to the farrowing crate, based on Baxter et al (2018).	45
Table 4: Benefits of outdoor farrowing for the sow, piglets, and stockperson. Adapted from <a href="http://www.freefarrowing.org">www.freefarrowing.org</a> (Baxter and Edwards, 2021).	47
Table 5: Benefits of the PigSAFE farrowing and lactation pen for the sow, piglets, and stockperson. Adapted from <a href="http://www.freefarrowing.org">www.freefarrowing.org</a> (Baxter and Edwards, 2021).	50
Table 6: Benefits of the 360 Freedom Farrower™ for the sow, piglets, and stockperson. Adapted from Baxter and Edwards (2021).	52
Table 7: Summary of farrowing systems and welfare impacts on sow and piglets.	53
Table 8: Mean performance figures for UK indoor and outdoor breeding herds 2006-2021. Data calculated from AHDB (2021).	60
Table 9: Sow welfare, piglet mortality, and cost of farrowing crates, outdoor farrowing, indoor group/multi-suckling systems, and designed pens. Data from Baxter et al (2012).	62
Table 10: Pig rearing systems and pork labels (RSPCA, 2022).	66
Table 11: Price premium needed for farmers to break even using PigSAFE farrowing pen compared to crate. Based on Guy et al (2012).	70
Table 12: Capital costs for conventional farrowing crate and alternative indoor farrowing systems. Data from AHDB (2020)	71



## List of figures

- Figure 1: Piglets suckling from a sow confined in a farrowing crate. 16
- Figure 2: A sow in a farrowing crate on a UK farm. Farrowing crates cause the most severe degree of confinement of any system in the UK and Europe. Copyright Compassion in World Farming. 20
- Figure 3: New farrowing crate at a modern indoor pig farm. Almost all breeding sows on UK indoor pig farms are kept in crates for 5 weeks, 2-3 times each year. Sows are able to stand and lie down but are unable to turn around or walk. Bedding is generally not provided as it blocks the drainage system. 26
- Figure 4: Pigs in the Swiss Alps. Outdoor sows dig and root the earth, explore the physical environment, and interact with other pigs. Farrowing crates are banned in Switzerland. 33
- Figure 5: Piglets suckling on an outdoor pig farm. Sows farrowing outdoors have space to perform natural behaviours and outdoor farrowing has been described as the “gold standard” by leading experts. 36
- Figure 6: A sow closely confined in a farrowing crate. The crate causes severe physical and behavioural restriction. Sows are unable to explore their environment, nest build, and interact with their piglets. 40
- Figure 7: The triangle of needs for the sow, piglets, and stockperson. Adapted from [www.freefarrowing.org](http://www.freefarrowing.org). 43
- Figure 8: Outdoor pig farm in Devon, UK. Farrowing arcs in background. Pigs rooting and exploring their environment in foreground. 46
- Figure 9: The PigSAFE farrower system. Provided courtesy of Emma Baxter, copyright SRUC. 48

## List of figures

Figure 10: The PigSAFE farrower system, developed by the University of Newcastle and Scotland's Rural College (SRUC). Image used with permission from Emma Baxter.	49
Figure 11: The Midland 360 Freedom Farrower in the closed (left) and open (right) position. Photographs provided courtesy of Emma Baxter, copyright SRUC.	51
Figure 12: Piglets suckling on a UK indoor farm in a farrowing crate system. Copyright Compassion in World Farming.	57
Figure 13: Stillborn, live-born, and total mortality in piglets.	58
Figure 14: Pigs weaned per sow per year.	58
Figure 15: Comparison of piglet mortality data from commercial systems. Data from Baxter et al (2012).	62
Figure 16: Comparison of sow welfare expressed as welfare design index (WDI) in different commercial systems. Scores from Baxter et al (2012).	63
Figure 17: Comparison of live-born piglet mortality in the UK and EU with Switzerland, Norway, and Sweden. Data summarised from Baxter (2022).	64
Figure 18: The concept of quality of a life for a farm animal. Copied from FAWC (2009).	72
Figure 19: Sows in a UK indoor farm using farrowing crates. Copyright Compassion in World Farming.	85





Figure 1: Piglets suckling from a sow confined in a farrowing crate.



## Introduction

*“The crates result in the sow being forced to give birth in a tiny space and then nurse their young through bars. The space in the crate is so restricted that all the sows can do is stand up and lie down until their piglets are weaned. Confined in these crates, sows bite and chew the bars, and scrape at the floor in frustration, only to endure painful wounds and sores.”*

– Sir David Amess MP, 2021<sup>37</sup>

Farrowing crates are cages used to confine gilts and sows during the final week of pregnancy, during labour, and through lactation. The crates were developed during the 1960s to prevent the crushing of piglets. They were initially used for three to five days for the period of highest risk to piglets during farrowing. Despite this, the duration to use farrowing crates extended such that the industry norm became one week prior to farrowing through to four weeks after, hence a total of five weeks.<sup>38</sup>

In the UK, over 200,000 sows and gilts are confined in farrowing crates each year. This represents 60% of the national herd. Sows produce 2.3 litters each year, so pregnant and lactating sows spend more than two 35-day periods in severe confinement annually.<sup>39</sup> Some sows are used to nurse foster piglets after their own litter has been weaned. Foster sows can spend a further one to two weeks in the farrowing crate for each lactation, taking their total confinement up to seven weeks.<sup>40</sup>

The typical size of a farrowing crate is 1.23m<sup>2</sup>, within a pen of 3.6m<sup>2</sup>.<sup>41</sup> Compassion in World Farming cite average dimensions of a farrowing crate based on research in Denmark as length 198cm, width 60cm, and depth 60cm. The pregnant or lactating sow is able to stand up and lie down, but is unable to turn around. Farrowing crates include a separate creep area that is inaccessible to the sow where the piglets are provided with a heat source.

---

<sup>37</sup> HC Deb, “Pig Husbandry (Farrowing),” Hansard 690, no. col 896 (2021).

<sup>38</sup> National Pig Association; Farm Animal Welfare Committee, “Opinion on Free Farrowing Systems,” (Farm Animal Welfare Committee, 2015).

<sup>39</sup> Agriculture and Horticulture Development Board.

<sup>40</sup> National Pig Association.

<sup>41</sup> Baxter, Lawrence, and Edwards; Baxter, Andersen, and Edwards.



Farrowing crates are popular with the pig industry because of the low footprint required of 4.3m<sup>2</sup>. The crate provides access to the sow and piglet for the stockperson as well as safety from the sow.<sup>42</sup>

The severe confinement has led to concerns about the welfare of sows kept in farrowing crates. Pigs are sentient and highly intelligent species.<sup>43</sup> The confinement for 5 weeks restricts the performance of natural behaviours such as nest building. Prolonged lying on a hard surface causes shoulder and skin injuries. Sows are unable to interact normally with their piglets and many develop abnormal behaviours and stereotypies such as bar biting.<sup>44</sup>

Farrowing crates are very similar in design to sow stalls<sup>45</sup>, but have separate compartments for the piglets to suckle and a creep area to provide heat. Sow stalls are used throughout pregnancy in some countries, such as the United States. They have been banned in the United Kingdom (UK) since 1999 and there has been a partial ban in the European Union (EU) since 2013.<sup>46</sup> These bans were implemented based on robust scientific evidence that sow stalls cause an unacceptable degree of suffering to pregnant pigs.<sup>47</sup>

In the UK, a high figure at 40% of the national herd farrow outdoors in arcs or pens.<sup>48</sup> Outdoor farrowing has been described as the “gold standard” for pig farming.<sup>49</sup> The economic inputs are minimal and the potential for high welfare for both sow and her piglets is very high. Input from stockpersons is also relatively low. Despite this, there are limitations to the growth of outdoor pig farming due to the soil type and land required, and potentially the market to purchase the premium product.

---

<sup>42</sup> National Pig Association; Baxter, Andersen, and Edwards.

<sup>43</sup> Lori Marino and Christina M Colvin, “Thinking Pigs: A Comparative Review of Cognition, Emotion, and Personality in *Sus Domesticus*,” *International Journal of Comparative Psychology* (2015).

<sup>44</sup> European Food Safety Authority.

<sup>45</sup> Also known as gestation crates.

<sup>46</sup> Sow stalls are permitted in the EU for up to four weeks after service (mating).

<sup>47</sup> D. M. Broom, “Animal Welfare in the European Union,” (Brussels: European Parliament Committee on Petitions, 2017).

<sup>48</sup> Baxter, Andersen, and Edwards; Agriculture and Horticulture Development Board.

<sup>49</sup> Baxter, Lawrence, and Edwards.



A range of indoor free farrowing systems have been developed and are in commercial use as alternatives to the farrowing crate.<sup>50</sup> These include individual farrowing pens, individual temporary crates, and group systems. The Piglet and Sow Alternative Farrowing Environment (PigSAFE) is an individual pen designed by Newcastle University and Scotland's Agricultural College, funded by DEFRA. The 360° Farrower is a temporary crate developed by Midland Pig Producers.<sup>51</sup>

Norway, Sweden, and Switzerland have banned farrowing crates. Austria and Germany have passed legislation for a partial ban on farrowing crates.<sup>52</sup> In the UK, the RSPCA and Soil Association prohibit the use of farrowing crates in their welfare accreditation schemes. The Soil Association permits only outdoor farrowing.<sup>53</sup> The RSPCA Assured scheme permits both outdoor and indoor free farrowing.<sup>54</sup>



---

<sup>50</sup> Baxter, Andersen, and Edwards.

<sup>51</sup> Baxter and Edwards.

<sup>52</sup> Baxter, Andersen, and Edwards; [Compassion in World Farming](#).

<sup>53</sup> Soil Association, "Soil Association Standards Farming and Growing," (Bristol: Soil Association, 2021).

<sup>54</sup> Royal Society for the Prevention of Cruelty to Animals, "RSPCA Welfare Standards for Pigs," (Horsham 2016).



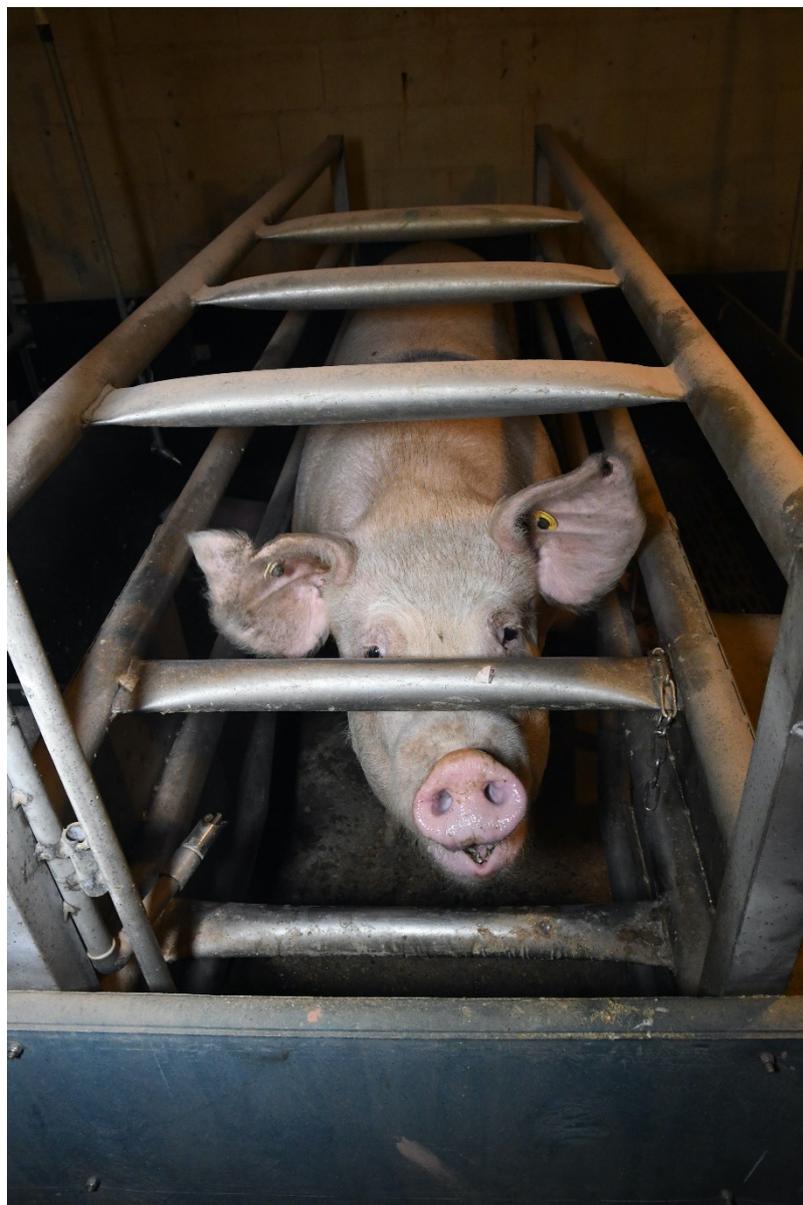


Figure 2: A sow in a farrowing crate on a UK farm. Farrowing crates cause the most severe degree of confinement of any system in the UK and Europe. Copyright Compassion in World Farming.



## Legislation on farrowing crates in the UK

### The Brambell Report and the Five Freedoms

Successive UK Governments have made significant progress in animal welfare since the Brambell Committee produced its report into the Welfare of Animals Kept Under Intensive Livestock Husbandry Systems in 1965.<sup>55</sup> The Brambell report was a groundbreaking document that led to the establishment of the Farm Animal Welfare Advisory Committee (FAWAC), mandated animal welfare science, and much animal welfare legislation around the world.<sup>56</sup>

The animal welfare community considers veal crates for calves, sow stalls for pigs, and battery cages for chickens, three of the most egregious harms to sentient animals. The harms to sentient animals kept in such systems are considered severe in large part due to the degree of confinement that they cause.<sup>57</sup> In this context, the Brambell Committee wrote the following on confinement:<sup>58</sup>

*“In principle we disapprove of a degree of confinement of an animal which necessarily frustrates most of the major activities which make up its natural behaviour and we do not consider such confinement or restraint permissible over a long period unless the other advantages thereby conferred upon the animal are likely to be very substantial. An animal<sup>59</sup> should at least have sufficient freedom of movement to be able without difficulty, to turn round, groom itself, get up, lie down and stretch its limbs.” (Brambell Committee, 1965).*

---

<sup>55</sup> F. W. R. Brambell et al., “Report of the Technical Committee to Enquire into the Welfare of Animals Kept under Intensive Livestock Husbandry Systems,” (London, UK: HM Stationery Office, 1965).

<sup>56</sup> S. P. McCulloch, “A Critique of FAWC’s Five Freedoms as a Framework for the Analysis of Animal Welfare,” *Journal of Agricultural and Environmental Ethics* 26, no. 5 (2013).

<sup>57</sup> Animal welfare impacts are a function of severity, duration, and number of animals impacted. See e.g., S. P. McCulloch and M. J. Reiss, “The Development of an Animal Welfare Impact Assessment (AWIA) Tool and Its Application to Bovine Tuberculosis and Badger Control in England,” *ibid.* (2017); [Farm Animal Welfare Council](#).

<sup>58</sup> Brambell et al., 13.

<sup>59</sup> In the context of farrowing crates, it is important to note that the Brambell Committee provided this recommendation to apply to each individual farmed animal. The farrowing crate is often defended based on the claim that it is necessary to reduce piglet mortality. This empirical claim is problematic, but also the Brambell freedoms, the five freedoms, and the five welfare needs of the Animal Welfare Act relate to individual animals. This significance of this is discussed later in the report.



Being able to “turn around, groom.. get up, lie down and stretch its limbs” have been termed the “Brambell freedoms”.<sup>60</sup> They were later developed by the Farm Animal Welfare Council (FAWC) into the well-known Five Freedoms, which underpin much animal welfare assessment, education, and legislation.<sup>61</sup> The fourth freedom is the ability to express normal behaviour, by “providing sufficient space, proper facilities and appropriate company of the animal’s own kind”.

### The Animal Welfare Act and Section 9 welfare needs

The Five Freedoms are reformulated as “welfare needs” in Section 9 of the Animal Welfare Act 2006.<sup>62</sup> Under Section 9(1), a person commits an offence if he does not take reasonable steps in all circumstances to ensure that the needs of an animal which he is responsible for are met to the extent required by good practice. Section 9(2) then states that for the purposes of the Act, an animal’s needs include:

- (a) its need for a suitable environment,*
- (b) its need for a suitable diet,*
- (c) its need to be able to exhibit normal behaviour patterns,*
- (d) any need it has to be housed with, or apart from, other animals, and*
- (e) its need to be protected from pain, suffering, injury and disease.*

Based on scientific evidence, farrowing crates clearly do not satisfy Section 9 welfare needs. Table 1 summarises some animal welfare impacts of farrowing crates on pigs in terms of the Animal Welfare Act’s five welfare needs.

---

<sup>60</sup> Brambell’s reference to turn around presumably referred to sows kept in sow stalls and farrowing crates, given these were the main system in common use at the time that caused a degree of confinement that meant the animal could not turn around. Battery hens, for instance, though tightly crammed in a cage, could turn around.

<sup>61</sup> McCulloch, “A Critique of FAWC’s Five Freedoms as a Framework for the Analysis of Animal Welfare.”

<sup>62</sup> Animal Welfare Act.



Table 1: Welfare impacts of the farrowing crate on pregnant and lactating sows in terms of meeting animal welfare needs of Section 9 of the Animal Welfare Act.<sup>63</sup>

<b>Animal Welfare Act Section 9 Welfare need</b>	<b>Welfare impacts of farrowing crate</b>	<b>Is welfare need met?</b>
<i>(a) suitable environment</i>	A suitable environment for a sow includes provision to explore and root, without excessive restriction to perform normal behaviours. The farrowing crate is not a suitable environment for health and welfare.	XXX
<i>(b) suitable diet</i>	Crated sows are generally fed diets high in cereal content and low in roughage (i.e., fibre). This leads to hunger (lack of stomach filling) and boredom (lack of chewing). Poor diets are considered to contribute to oral stereotypies such as bar chewing/biting which are common in crates.	X
<i>(c) need to be able to exhibit normal behaviour patterns</i>	Sows are prevented from turning around, walking, nest building, seeking physical and thermal comfort, and more normal behaviour patterns.	XXX
<i>(d) any need it has to be housed with, or apart from, other animals</i>	Sows are prevented from interacting with their piglets (throughout lactation). They are prevented from interacting with other sows (natural behaviour in mid-late gestation).	XX
<i>(e) need to be protected from pain, suffering, injury and disease</i>	Sows suffer pain through disease such as pressure sores due to prolonged lying on hard surfaces and injury caused by the bars. Sows suffer mentally because of prolonged confinement in crates that restrict natural and normal behaviours.	XXX

Hence, farrowing crates violate all five of the welfare needs under Section 9 of the Animal Welfare Act.<sup>64</sup>

<sup>63</sup> See 'Pigs: sentience and natural behaviour' and 'Farrowing crates and sow welfare' sections of this report.

<sup>64</sup> In 2020 New Zealand's high court ruled that the use of farrowing crates was unlawful, and that continued use would require changes to legislation. The Court found that the use of farrowing crates was not compliant with New Zealand's Animal Welfare Act. The New Zealand Government subsequently announced it would prohibit farrowing crates. See 'Policy on farrowing crates in other countries' in this report. [Anon.](#)



## The Welfare of Farmed Animals Regulations

The Welfare of Farmed Animals (England) Regulations 2007<sup>65,66</sup> is secondary legislation under the Animal Welfare Act 2006. The 2007 Regulations were used primarily to implement EU law and provide further guidance related to meeting obligations under the Animal Welfare Act. Within the 2007 Regulations, Schedule 1 outlines general conditions under which farmed animals must be kept. Paragraph (9) states “The freedom of movement of animals, having regard to their species and in accordance with good practice and scientific knowledge, must not be restricted in such a way as to cause them unnecessary suffering or injury”. Schedule 1 paragraph 10 states the following:

*“Where animals are continuously or regularly tethered or confined, they must be given the space appropriate to their physiological and ethological [i.e., behavioural] needs in accordance with good practice and scientific knowledge”. (The Welfare of Farmed Animals (England) Regulations 2007 Schedule 1 paragraph 10)*

Schedule 8 of the 2007 Regulations includes additional conditions that apply to the keeping of pigs. Sub-paragraph 5(1) states:

*“A pig must be free to turn around without difficulty at all times”. (The Welfare of Farmed Animals (England) Regulations 2007 Schedule 8 paragraph 10)*

Sub-paragraph 6(1) states that the internal dimensions of a stall or pen must not be less than the square of the length of a pig, and no internal side less than 75% of the length of the pig. To illustrate, if a pig is 1.5 metres long, then the internal area would need to be 1.5m x1.5m, which equals 2.25 m<sup>2</sup>. The area of the gestation crate is typically around 1.23m<sup>2</sup>, and pigs are not able to turn around due to the dimensions of the crate.

Schedule 8 Sub-paragraph 6(2) then states: “Sub-paragraph (1) does not apply to a female pig for the period beginning with seven days before the predicted day of her farrowing and ending when the weaning of her piglets (including any piglets fostered by her) is complete”.

---

<sup>65</sup> [The Welfare of Farmed Animals \(England\) Regulations 2007](#).

<sup>66</sup> And parallel regulations in the devolved administrations of Scotland, Wales, and Northern Ireland.



## Farrowing crates are not compliant with the Animal Welfare Act 2006 and Welfare of Farmed Animals (England) Regulations 2007

Table 1 illustrates how farrowing crates cannot meet the welfare needs within the 2006 Animal Welfare Act. Farrowing crates are also not compatible with the principles of the 2007 Regulations. Crates do not provide pigs with the “space appropriate to their physiological and behavioural needs” in Schedule 1(10).

Schedule 8 paragraph 6(4) provides an exemption to pigs from sub-paragraph 6(1). Sub-paragraph 6(1) relates to the dimensions and internal area of a crate. However, there is no exemption within the 2007 Regulations to paragraph 5(1), which states that “A pig must be free to turn around without difficulty at all times”. Furthermore, there is no exemption to Schedule 1(10) such that farmed animals, including pigs, are provided with the space appropriate for their physiological and behavioural needs.<sup>67</sup>

The Animal Welfare Act is concerned with preventing unnecessary suffering and promoting welfare. Pigs suffer in the confines of a farrowing crate due to the severe physical and behavioural restrictions caused by it. Despite this, there are two fundamental reasons why suffering experienced by crated pigs is not necessary. First, the critical period of risk for piglets is within the first three days of farrowing.<sup>68</sup> Despite this, pigs are kept in crates from one week prior to farrowing until weaning when the piglets are four weeks old. Secondly, as detailed in this report, free farrowing systems, both indoor and outdoor, achieve comparable, and in some cases lower, piglet mortality rates with farrowing crates.<sup>69</sup>

Arguably, farrowing crates are not compliant with the Animal Welfare Act 2006 and the Welfare of Farmed Animals (England) Regulations 2007.

---

<sup>67</sup> Based on these points alone it is arguable whether farrowing crates are compliant with the 2007 Regulations, as they clearly violate space requirements in Schedules 1(10) and a pig's freedom to be able to turn around at all times in Schedule 8 paragraph 5(1).

<sup>68</sup> [Baxter and Edwards](#); [Marchant et al.](#)

<sup>69</sup> See section ‘Piglet mortality’, e.g., Tables 8 and 9 and Figures 15 and 17.





Figure 3: New farrowing crate at a modern indoor pig farm. Almost all breeding sows on UK indoor pig farms are kept in crates for 5 weeks, 2-3 times each year. Sows are able to stand and lie down but are unable to turn around or walk. Bedding is generally not provided as it blocks the drainage system.



## Government position on farrowing crates

### The Prime Minister, Brexit, and farrowing crates

Boris Johnson, as Prime Minister and leader of the Conservative Party, made the following statement on farrowing crates in a 2019 Parliamentary debate:<sup>70</sup>

*"I would just point out that, on animal welfare, it may interest him to know that there are measures we will be able to implement as a result of Brexit—such as banning sow farrowing crates, for instance, which I think is of great concern to our constituents, and banning the live export of animals—that we would not otherwise be able to do." (Johnson, 2019)<sup>71</sup>*

### The DEFRA Code of practice for the welfare of pigs

DEFRA's recently updated *Code of practice for the welfare of pigs* (2020) states that "The aim is for farrowing crates to no longer be necessary and for any new system to protect the welfare of the sow, as well as her piglets".<sup>72</sup> Following on from the section above, this sentence is further evidence that Government is fully aware that farrowing crates are problematic and do not meet the welfare needs of sows.

### Government commitments to prohibit farrowing crates

In February 2020, Kerry McCarthy MP (Labour) tabled the following Parliamentary question: "how many and what proportion of sows are kept in (a)(i) outdoor and (ii) indoor farrowing systems and (b) farrowing crates; and if she will make a statement".<sup>73</sup> In reply, George Eustice, Secretary of State for DEFRA, replied with the following response on behalf of Government:<sup>74</sup>

---

<sup>70</sup> [HC Deb](#), "Engagements," Hansard 667, no. col 365 (2019).

<sup>71</sup> The EU sets minimum standards for farmed animal welfare. Therefore, as a member state the UK was able to legislate for higher standards of animal welfare. Indeed, the UK has done so, for instance by implementing a full ban on sow stalls in 1999, when the EU implemented a partial ban that came into force in 2013. Despite this, as a member of the EU, the UK could not prevent the import of meat raised in lower welfare standards. This is because of the principle of free movement of goods within the single market. Brexit therefore presents the opportunity for the UK to raise animal welfare standards and prevent the import of meat raised in lower animal welfare standards. Indeed, the UK Government has repeatedly stated that it will not permit the import of lower welfare food. See [S. P. McCulloch](#), "Brexit and Animal Welfare Impact Assessment: Analysis of the Opportunities Brexit Presents for Animal Protection in the UK, EU, and Internationally," *Animals* 9, no. 11 (2019).

<sup>72</sup> [Department for Environment Food and Rural Affairs](#), "Code of Practice for the Welfare of Pigs," 40.

<sup>73</sup> [UK Parliament](#).

<sup>74</sup> [Ibid.](#)



*“I believe the aim should be for farrowing crates not to be necessary. It is important that we make progress towards a system which both safeguards the welfare of the sow as well as the piglets and also works commercially, and that we do so as quickly as possible so that crates can be consigned to history.” (Eustice, 2020)*

In a 2020 debate on caged animals, DEFRA minister Victoria Prentice stated that the Government had made it clear that it remained “completely committed to the ambition that farrowing crates should no longer be used for sows”.<sup>75</sup> Prentice went on to state the following:

*“It is important that we make progress towards a system that both works commercially and safeguards the welfare of the sow and her piglets, and that we do so as quickly as possible. The UK is already ahead of most pig-producing countries on this issue, with about 40% of our pigs living and farrowing outside. Good progress has been made, but there is more to do.” (Prentice, 2020)*

And that:

*“The commercial development of farrowing systems and practices is not sufficiently advanced to recommend the compulsory replacement of all farrowing crates, but I am keen to work with the industry on this—using both carrots and sticks—because it is important to not simply move production abroad.” (Prentice, 2020)<sup>76</sup>*

## The Government’s 2021 Action Plan for Animal Welfare

In its 2021 Action plan for animal welfare, the government has stated that it will introduce further reforms to improve animal welfare, including “examining the use of cages for laying hens and farrowing crates for pigs”.<sup>77</sup>

---

<sup>75</sup> HC Deb, “Caging of Farm Animals,” Hansard 673, no. col 253WH (2020).

<sup>76</sup> Ibid.

<sup>77</sup> Department for Environment Food and Rural Affairs, “Action Plan for Animal Welfare,” (London: Department for Environment, Food and Rural Affairs, 2021).



## Sir David Amess MP's Pig Husbandry (Farrowing) Bill

Also in 2021, Conservative MP Sir David Amess introduced the Pig Husbandry (Farrowing) Bill to Parliament.<sup>78</sup> Introducing the Bill, Amess stated:<sup>79</sup>

*"The crates result in the sow being forced to give birth in a tiny space and then nurse their young through bars. The space in the crate is so restricted that all the sows can do is stand up and lie down until their piglets are weaned. Confined in these crates, sows bite and chew the bars, and scrape at the floor in frustration, only to endure painful wounds and sores." (Amess, 2021)*

## End the Cage Age petition and Parliamentary debate

A 2021 UK Government and Parliament petition "End the Cage Age for all farmed animals" received 109,824 signatures from the public.<sup>80, 81</sup> The petition called for the UK Government to secure, by 2027, a ban on the use of cages for laying hens, farrowing crates for sows, and individual calf pens. The UK Government responded by stating that it is committed to improving farm animal welfare standards and is exploring options for further reforms, including "phasing out the use of cages in farming".<sup>82</sup>

The Government response refers to the above stated aim in the DEFRA code of practice for the welfare of pigs for farrowing crates to no longer be necessary. It reiterates the Government's commitment to maintain the UK's position as a world leader in farm animal welfare, and its desire to improve on its record. The Government further references the Animal Health and Welfare Pathway to use public funds for public goods in its response to the End the Cage Age for all farmed animals petition.

---

<sup>78</sup> UK Parliament, "Pig Husbandry (Farrowing) Bill," <https://bills.parliament.uk/bills/2844>

<sup>79</sup> HC Deb, "Pig Husbandry (Farrowing)."

<sup>80</sup> UK Government and Parliament.

<sup>81</sup> The Compassion in World Farming website reports 465,229 signatures received on its website for a petition calling for the same i.e., the end of cage farming. Compassion in World Farming, "End the Cage Age for All the UK's Farm Animals," <https://action.ciwf.org.uk/page/73106/petition/1?locale=en-GB>.

<sup>82</sup> UK Government and Parliament.



## Kept Animals Bill amendment to ban farrowing crates

During Committee Stage of the passage of the Kept Animals Bill through the House of Commons in 2021, Labour MP Daniel Zeichner tabled New Clause 7 as an amendment to end the use of farrowing crates.<sup>83</sup> Zeichner stated the following:<sup>84</sup>

*“Alternatives to farrowing crates, many of them designed by British farmers and engineers, are already commercially available in the UK. We should support British ingenuity and pig welfare by requiring the use of these higher-welfare systems. Labour has long been committed to ending the cage age and banning sow farrowing crates, and many others from across the political spectrum are committed to the cause—including, it would seem, the Prime Minister, who claimed in the Chamber that as a result of Brexit, we would be now able to introduce such a ban.”*  
(Zeichner, 2021)

Zeichner’s amendment was to simply omit sub-paragraph 6(2) in Schedule 8 of the Welfare of Farmed Animals (England) Regulations 2007. Sub-paragraph 6(2) is discussed in the section above ‘Legislation on farrowing crates in the UK’ and provides an exemption for pigs to sub-paragraph (1). Sub-paragraph 6(1) relates to the minimum dimensions and area of a stall or pen to keep pigs. The dimensions and area, stipulated in 6(1) related to the length of the pig, are greater than that provided by farrowing crates.

Responding on behalf of the Government, Victoria Prentice recognised this when she stated that “My difficulty is that the new clause would cause an immediate ban [on farrowing crates]”.<sup>85,86</sup> Prentice went on to explain that based on a conversation with the National Pig Association (NPA), an immediate ban would not be commercially feasible. For the Government, Prentice further commented that “I am keen to ensure we have a realistic phasing-out period that is sustainable for the industry, so that we can achieve the welfare goals shared by Members from across the House”.

Prentice’s statement, including a “realistic phasing-out period”, demonstrates the Government’s intent to ban farrowing crates. Zeichner’s New Clause 7 was voted against by 10 votes to five.

---

<sup>83</sup> HC Deb, “Animal Welfare (Kept Animals) Bill (Fifth Sitting).”

<sup>84</sup> Ibid.

<sup>85</sup> Ibid.

<sup>86</sup> During the debate the Committee appeared to be unaware that sub-paragraph 6(2) refers only to sub-paragraph 6(1) on the dimensions and area of crates. Schedule 8 sub-paragraph 5(1) states that “A pig must be free to turn around without difficulty at all times”. There is no exemption to this stipulation and therefore farrowing crates are arguably not compliant with Schedule 8 of the 2007 Regulations, regardless of whether sub-paragraph 6(1) is omitted or not.



## Policy on farrowing crates in other countries

### Sweden, Norway, and Switzerland

Sweden (1988), Norway (2000), and Switzerland have bans on the use of farrowing crates for pigs. Switzerland's ban was passed in 1997 and came into force in 2007. In Sweden, Norway and Switzerland, sows must be free during farrowing and lactation. The confinement of sows is permitted only in exceptional circumstances, which in practice is when sows are savaging piglets.<sup>87</sup>

### Germany and Austria

Germany is the largest pigmeat producer in the EU, producing 5.2 million tonnes in 2019.<sup>88</sup> Germany has passed a partial ban on farrowing crates, coming into effect in 2035. Farms will be able to confine sows in farrowing crates for up to five days around farrowing. Austria has enacted a similar partial ban on farrowing crates that will come into force in 2033. The Austrian law states that confinement is permitted "until the end of the critical phase of the suckling pig's life".

### The EU

Following a European Citizen's Initiative "End the Cage Age", in June 2021 the European Commission agreed to phase out cages for farmed animals across the EU, including sow stalls and farrowing crates, by 2027. The phase out will follow scientific impact assessments conducted by the European Food Safety Authority (EFSA). The Commission also committed to providing financial support to transition to cage free farming. Following the EU Commission announcement, governments and industry in many member states are awaiting further developments on confinement policy from the EU.<sup>90</sup>

---

<sup>87</sup> Baxter; *Compassion in World Farming*, "Scientific Briefing on Caged Farming: Overview of Scientific Research on Caged Farming of Laying Hens, Sows, Rabbits, Ducks, Geese, Calves and Quail."

<sup>88</sup> European Parliament, "Briefing: The EU Pig Meat Sector," (Brussels: European Parliament, 2020).

<sup>89</sup> European Commission, "Questions and Answers: Commission's Response to the European Citizens' Initiative on "End the Cage Age"," [https://ec.europa.eu/commission/presscorner/detail/en/QANDA\\_21\\_3298](https://ec.europa.eu/commission/presscorner/detail/en/QANDA_21_3298).

<sup>90</sup> Free Farrowing, "Country Roundup," [https://www.openagrar.de/receive/openagrar\\_mods\\_00073456?lang=en](https://www.openagrar.de/receive/openagrar_mods_00073456?lang=en).



## New Zealand

In 2020 New Zealand's high court ruled that the use of farrowing crates was unlawful, and that continued use would require changes to legislation. The case was bought by SAFE for Animals (Save Animals from Exploitation) and New Zealand's Animal Welfare Law Association. It followed the publication of a report *Uncaging New Zealand's Sows: Scrutinising Farrowing Crates* by SAFE (Knight, 2018).<sup>91</sup> The Court found that the use of farrowing crates was not compliant with New Zealand's Animal Welfare Act, which itself based on the five freedoms.<sup>92</sup>

Table 2: Countries with bans or regulation in place restricting the use of farrowing crates.

Country	Policy
<i>EU</i>	Policy to phase out cages by 2027.
<i>UK</i>	Crates permitted but stated aim of DEFRA Pig welfare Code to transition to free farrowing. <sup>93</sup>  40% of pig herd farrows outdoors, many under RSPCA Assured and Soil Association schemes.
<i>Sweden</i>	Full ban since 1988.
<i>Norway</i>	Full ban since 2000.
<i>Switzerland</i>	Full ban since 1997 with ten-year transition that came into force in 2007
<i>Germany</i>	Ban with confinement permitted for five days from 2035.
<i>Austria</i>	Ban with confinement permitted "until the end of the critical phase of the suckling pig's life" from 2033.
<i>New Zealand</i>	Legal challenge resulted in government announcement to phase out by 2025.
<i>Denmark</i>	Crates permitted. Industry initiative for 10% loose-lactating by 2022. Government animal welfare label requires free farrowing.
<i>Finland</i>	Farrowing crates permitted. Government subsidy has supported transition of significant proportion of farmers to free farrowing in recent years. Finnish Ministry of Agriculture no longer provides subsidies for temporary crates under term "free farrowing".

<sup>91</sup> Andrew Knight, "Uncaging New Zealand's Sows: Scrutinizing Farrowing Crates," (Wellington, New Zealand: SAFE for Animals, 2018).

<sup>92</sup> Anon.

<sup>93</sup> Department for Environment Food and Rural Affairs, "Code of Practice for the Welfare of Pigs."





Figure 4: Pigs in the Swiss Alps. Outdoor sows dig and root the earth, explore the physical environment, and interact with other pigs. Farrowing crates are banned in Switzerland.

## Pigs: sentience and natural behaviour

### Pig sentience, intelligence, and natural behaviour

Sentience is the capacity to feel pleasure and pain and have conscious awareness of one's surroundings.<sup>94</sup> Sentient animals have positive and negative subjective mental experiences, meaning they can have a good life or a life not worth living. FAWC has stated that British law should ensure that all farmed animals have a life worth living, and an increasing number have a good life.<sup>95</sup> It is the mental experiences of animals, substantially influenced by their immediate physical environment, which leads to a duty for the UK Government to ensure that they have a life worth living.

Pigs are a highly sentient species, meaning they feel pleasure and pain, together with a range of other emotions, such as frustration and boredom. Pigs are also highly intelligent animals and are often compared to companion dogs in terms of their rational capacities. Recent research, widely reported and documented by the BBC, demonstrated that pigs were able to play computer games with the aid of joysticks.<sup>97</sup>

Pigs have been artificially selected to be farmed as food animals since around 9000 years ago in the Near East.<sup>98</sup> Despite this, they retain many biological and behavioural traits that are fundamental to their welfare. In an early experiment, Stolba and Wood-Gush, pioneers in animal welfare science, released domesticated pigs into a semi-natural environment.<sup>99</sup> The authors found that the pigs' behaviour considerably reverted to that of the wild pig, for instance rooting the earth and nest building to farrow.

---

<sup>94</sup> Jonathan Birch, Alexandra K Schnell, and Nicola S Clayton, "Dimensions of Animal Consciousness," *Trends in cognitive sciences* 24, no. 10 (2020); Jonathan Birch et al., "Review of the Evidence of Sentience in Cephalopod Molluscs and Decapod Crustaceans," (London: LSE, 2021).

<sup>95</sup> Farm Animal Welfare Council.

<sup>96</sup> Marino and Colvin.

<sup>97</sup> Candace C. Croney and Sarah T. Boysen, "Acquisition of a Joystick-Operated Video Task by Pigs (*Sus Scrofa*)," *Frontiers in Psychology* 12 (2021); BBC News, "Pigs Can Play Video Games with Their Snouts, Scientists Find," BBC News, <https://www.bbc.co.uk/news/technology-56023720>.

<sup>98</sup> Anna K Johnson and Jeremy N Marchant-Forde, "Welfare of Pigs in the Farrowing Environment," in *The Welfare of Pigs* (Springer, 2009).

<sup>99</sup> Stolba and Wood-Gush.



## Farrowing in the natural environment

Jensen (1988a) reports several stages in the farrowing process. These are social isolation, nest planning and construction, farrowing, nest occupation, suckling, social integration, and weaning.<sup>100</sup> Baxter et al (2018) have summarised the process as follows:<sup>101</sup> During the two to three days prior to farrowing, sows in the wild can travel several kilometres to find a nest site. The purpose is to find a site that is secluded and relatively safe from predators. The sow then digs and roots in the ground to make a concave depression. Following this, she gathers sticks, branches, grass, and leaves to line the nest. These behavioural patterns are associated with underlying hormonal changes, which are disrupted in the restricted farrowing crate environment.

During farrowing, the sow lies down on her side and delivers piglets around every 20 minutes, in a process that takes two to three hours. Within the first few days, sows spend most time in the nest, with brief excursions away from the nest to forage and toilet. With time, the sow spends more time away from the nest, until the nest is abandoned two weeks after the piglets are born. The sow and litter then re-join the original group of pigs. This permits the sow to increase her foraging and thus feed intake. The piglets benefit from socialisation and a more varied environment. There is a gradual increasing independence of the piglets with reduced suckling, until all piglets are weaned at around 3-4 months.<sup>102</sup>

---

<sup>100</sup> P Jensen, "Maternal Behaviour of Free-Ranging Pigs. I. Results of a Three-Year Study," Swedish University of Agricultural Sciences, Faculty of Veterinary Medicine, Department of Animal Hygiene, Skara, Report 22 (1988); Jensen; "Nest Site Choice and Nest Building of Free-Ranging Domestic Pigs Due to Farrow," Applied Animal Behaviour Science 22, no. 1 (1989); Knight.

<sup>101</sup> Baxter, Andersen, and Edwards.

<sup>102</sup> Ibid.





Figure 5: Piglets suckling on an outdoor pig farm. Sows farrowing outdoors have space to perform natural behaviours and outdoor farrowing has been described as the “gold standard” by leading experts.



## Farrowing crates and sow welfare

### Extent and duration of confinement

The farrowing crate causes severe physical restriction of the sow. Indeed, the farrowing crate is the most severe form of confinement for farmed animals in UK and Europe. Compassion in World Farming document this reality in its 2021 End the Cage Age report focused on the European Union:<sup>103</sup>

*“The degree of restriction of movement in a farrowing crate, and sow stall, is more severe than any other form of confinement in European livestock farming today.”*  
(Compassion in World Farming, 2021)

Sows are highly sentient and intelligent, and farrowing crates constitute the most severe form of confinement in UK farming today. Therefore, it should come as no surprise that crates cause significant suffering. There is a wealth of scientific evidence that sows and gilts suffer greatly when confined in farrowing crates.<sup>104</sup>

Sows are crated around five days prior to farrowing and remain there until weaning when the piglets are around four weeks. Sows that are used as foster or nurse sows can spend a further two weeks in the crates.<sup>105</sup> Thus, most sows are kept in crates for five weeks, but some are kept in crates for up to seven weeks. Since the sow produces two to three litters per year—the mean number of litters per year in 2021 for indoor sows was 2.3<sup>106</sup>—she is kept crated for around 80 days in each 365-day year. This constitutes 22%, i.e., nearly a quarter of the year, for the duration of a sow’s adult breeding life.

---

<sup>103</sup> [Compassion in World Farming](#), “End the Cage Age: Why the EU Must Stop Caging Farm Animals,” (Godalming, Surrey: Compassion in World Farming, 2020), 28.

<sup>104</sup> For reviews of the evidence see [European Food Safety Authority](#); [Baxter, Lawrence, and Edwards](#).

<sup>105</sup> [National Pig Association](#).

<sup>106</sup> [Agriculture and Horticulture Development Board](#).



## Restriction of physical activity and social behaviours

The most obvious cause of poor welfare relates to the restriction the crate places on basic physical activity. Sows can stand up and lie down in a crate, but they cannot turn around. Sows would ordinarily move around and explore their environment.<sup>107</sup> Pigs explore their environment by rooting with their highly sensory snouts. They are social animals that interact with other pigs. Farrowing crate severely limits these basic but important behavioural activities.<sup>108</sup>

## Prevention of nest building

Sows are highly motivated to build a nest prior to farrowing. Farrowing pigs are motivated to travel long distances to find a suitable nest site.<sup>109</sup> The farrowing crate precludes nest building first because of the severe physical restriction. Secondly, the crate is a barren environment and straw or nesting material is generally not provided. Nest building is an internally motivated and innate behaviour pattern in sows and the inability to build a nest leads to stress and suffering.<sup>110</sup>

## Physical and thermal discomfort

Sows suffer from physical and thermal discomfort in farrowing crates. Farrowing crates are located in small pens with slatted or semi-slatted flooring. The slatted flooring is hard, and the sow is generally not provided with any bedding material, such as straw, because it would clog up the underground wastage system.<sup>111</sup> Since the sow is unable to move around normally, she spends most of her time lying down. This leads to pressure sores on parts of her body most in contact with the flooring, including her hooves, legs, and shoulders.<sup>112</sup>

---

<sup>107</sup> Jensen, "Maternal Behaviour and Mother—Young Interactions During Lactation in Free-Ranging Domestic Pigs."; Baxter, Andersen, and Edwards.

<sup>108</sup> European Food Safety Authority.

<sup>109</sup> Baxter, Andersen, and Edwards.

<sup>110</sup> European Food Safety Authority; Baxter, Andersen, and Edwards; Compassion in World Farming, "Scientific Briefing on Caged Farming: Overview of Scientific Research on Caged Farming of Laying Hens, Sows, Rabbits, Ducks, Geese, Calves and Quail."

<sup>111</sup> Baxter, Andersen, and Edwards.

<sup>112</sup> Boyle et al; Emma M Baxter and Sandra Edwards, "Optimising Sow and Piglet Welfare During Farrowing and Lactation," in Understanding the Behaviour and Improving the Welfare of Pigs (Burleigh Dodds Science Publishing, 2021).



In the farrowing crate, the lactating sow and her piglets have very different requirements for the environmental temperature. The thermoneutral zone of farrowing sows is 18-20 degrees Celsius. Piglets, in contrast, have a lower critical temperature of 25-30 degrees Celsius, and higher in the immediate postnatal period.<sup>113</sup> The architecture of the sow's nest facilitates these differential requirements, and sows would ordinarily be able to move to a preferred temperature zone. Of course, the farrowing crate precludes significant movement, meaning the sow has no control over her thermal comfort. This leads to a risk of overheating, which is an additional stress for the lactating sow.<sup>114</sup>

### European Food Safety Authority judgement on farrowing crates

In its 2007 Opinion, EFSA summarised the major welfare concerns for farrowing crates:<sup>115</sup>

*"Housing of sows in farrowing crates severely restricts their freedom of movement which increases the risk of frustration. It does not allow them, for instance, to select a nest site, to show normal nest-building behaviour, to leave the nest site for eliminative behaviour or to select pen areas with a cool floor to thermoregulate." (European Food Safety Authority, 2007)*

The next section moves on to discuss public opinion related to cages used for farming and the farrowing crate.

---

<sup>113</sup> R Muns et al., "High Environmental Temperature around Farrowing Induced Heat Stress in Crated Sows," *Journal of Animal Science* 94, no. 1 (2016).

<sup>114</sup> *Ibid.*; Baxter and Edwards.

<sup>115</sup> European Food Safety Authority, no page.





Figure 6: A sow closely confined in a farrowing crate. The crate causes severe physical and behavioural restriction. Sows are unable to explore their environment, nest build, and interact with their piglets.



## Public opinion on farrowing crates and cages

### Public opinion in the UK

It is well known in Westminster that MPs and government ministers often receive more letters on animal welfare compared to any other policy areas.<sup>116</sup> The British public demonstrates consistent moral concern about cages for farmed animals. A 2021 UK Government and Parliament petition “End the Cage Age” called for a ban on the use of cages for laying hens, farrowing crates for sows, and individual calf pens.<sup>117</sup> The petition rapidly received 109,824 signatories, surpassing the 100 thousand required to be considered for debate in Parliament.

Barren battery cages were banned in the UK and across the EU in 2012, although enriched and colony cages continued to be permitted.<sup>118</sup> Despite the law permitting the use of enriched and colony cages, the British public has demonstrated its preference for non-caged eggs at the supermarket. Based on DEFRA figures, free range eggs accounted for nearly two thirds (62%) of all production between July and September 2021.<sup>119</sup> Furthermore, UK supermarkets are listening to British consumers. All major supermarkets, including ASDA, Lidl, Tesco, Morrisons and Iceland have committed to selling only cage-free eggs by 2025. Waitrose, Marks and Spencer, and Sainsburys already sell only non-caged eggs.<sup>120</sup>

For the AHDB, Davis et al (2020) report a 2019 survey that found 56% of British consumers were not aware about the use of farrowing crates in pigs.<sup>121</sup> Of the sample, 25% were aware and concerned about farrowing crates, and 18% were aware and not concerned. The same survey found that 73% of respondents believed “all farm animals should have access to the outdoors”.

---

<sup>116</sup> S. P. McCulloch, “The British Animal Health and Welfare Policy Process: Accounting for the Interests of Sentient Species” (University of London, 2015).

<sup>117</sup> UK Government and Parliament.

<sup>118</sup> Enriched cages have a nest box, scratching surface, and dust-bathing material. Colony cages are larger and hold more birds with more space compared to barren battery cages.

<sup>119</sup> FarmingUK, “Free Range Now Accounts for Two Thirds of UK Egg Production,” Farming UK, [https://www.farminguk.com/news/free-range-now-accounts-for-two-thirds-of-uk-egg-production\\_59376.html](https://www.farminguk.com/news/free-range-now-accounts-for-two-thirds-of-uk-egg-production_59376.html).

<sup>120</sup> “All Major Retailers to Go Cage-Free by 2025,” Farming UK, [https://www.farminguk.com/news/all-major-retailers-to-go-cage-free-by-2025\\_42707.html](https://www.farminguk.com/news/all-major-retailers-to-go-cage-free-by-2025_42707.html).

<sup>121</sup> Davis, Wilkins, and Barber.



Davis et al (2020) conclude that based on the survey, British consumers appear to be more concerned about access to the outdoors rather than the farrowing crate per se. Related to this, there are concerns within the pig industry that consumers may not pay a significant premium for alternative farrowing systems indoors, as they do for outdoor bred pork.

Indeed, it is reasonable to assume that a substantial proportion of the British public will be opposed to the close confinement of farrowing and lactating pigs. The farrowing crate is the most severe form of confinement used in UK farming. Survey based studies consistently find that the public tend to empathise with mammals, such as pigs, more than birds, for instance chickens.<sup>122</sup> Hence, if the UK public is opposed to the less restrictive confinement of chickens in battery cages, it follows that it should be more concerned about pigs kept in conditions of far more restrictive confinement.

### **The “End the Cage Age” European Citizens’ Initiative and the European Commission pledge to phase out cages by 2027**

Compassion in World Farming with over 170 other organisations spearheaded the “End the Cage Age” European Citizens’ (ECI) initiative, which ran for one year. It received 1.4 million signatures representing all EU member states. The petition was the sixth most successful ECI in history and the first successful ECI for farmed animals.<sup>123</sup> In June 2021 the European Commission agreed to phase out cages for farmed animals across the EU by 2027. This includes cages for hens, pigs, calves, rabbits, ducks, geese, and other farmed animals. The European Commission further committed to ensuring that imported products met EU standards. Finally, the Commission committed to providing financial support to transition to cage free farming.<sup>124</sup>

---

<sup>122</sup> E.g., C. J. C. Phillips and S. McCulloch, “Student Attitudes on Animal Sentience and Use of Animals in Society,” *Journal of Biological Education* 40, no. 1 (2005).

<sup>123</sup> Compassion in World Farming, “End the Cage Age: Our Campaign to Stop Caged Farming,” <https://www.endthecageage.eu/>.

<sup>124</sup> European Commission.



## Alternatives to the farrowing crate

Given the major and widely recognised welfare problems caused by the farrowing crate, what system should replace it? Researchers at Scotland's Rural College (SRUC) and the University of Newcastle have conducted extensive research and commercial trials on a number of systems. Baxter et al (2012) have proposed that any system must be based on a "triangle of needs" for the sow, piglets, and stockperson.<sup>125</sup>

The sow requires space, good nutrition, nest building material, veterinary care, a hygienic pen, and environmental enrichment. The piglets require a safe and hygienic environment, veterinary care, and nutrition (provided largely by the sow). The stockperson requires a safe and practical environment to work in.

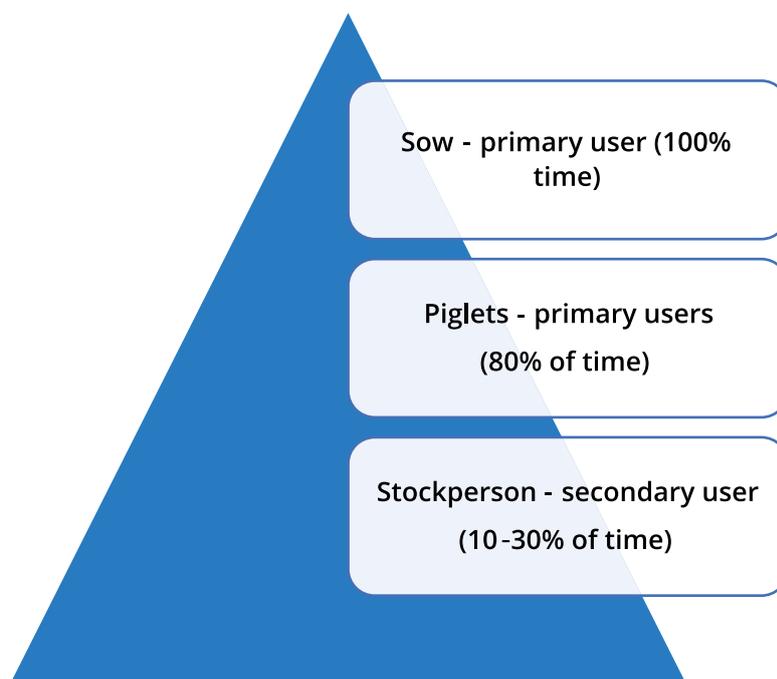


Figure 7: The triangle of needs for the sow, piglets, and stockperson. Adapted from [www.freefarrowing.org](http://www.freefarrowing.org).<sup>126</sup>

<sup>125</sup> Baxter, Lawrence, and Edwards.

<sup>126</sup> Baxter and Edwards.



Based on their research at SRUC and the University of Newcastle, Emma Baxter and Sandra Edwards have developed [www.freefarrowing.org](http://www.freefarrowing.org).<sup>127</sup> The website includes a wealth of information on free farrowing and lists the following as categories for free farming systems.

1. Zero confinement pens
2. Temporary crating
3. Group systems
4. Outdoor systems
5. Kennel and run systems

Table 3 summarises the design principles, design features, and examples of alternatives to the farrowing crate. The information in the table is summarised from Baxter, Andersen, and Edwards (2018).<sup>128</sup>

Following Table 3, the report provides an outline of outdoor farrowing. It then describes two indoor alternatives to the traditional farrowing crate. Case study 1 describes the PigSAFE as an example of a designed (or zero confinement) pen. Case study 2 describes the Midland 360 Farrower as an example of a temporary crate system.

Readers should also refer to a 2021 World Animal Protection report Farming pigs and future proofing for a crate-free era.<sup>129</sup> The report provides several illustrative case studies including the following:

- The Bodman's Farm in the UK (PigSAFE)
- Ten Have Farm in the Netherlands (Pro Dromi II)
- Søndergaard Farm Denmark (farm's personal design)
- Viggby Äs Lantbruk in Sweden (farm's personal design measuring 7m<sup>2</sup>)

---

<sup>127</sup> Ibid.

<sup>128</sup> Baxter, Andersen, and Edwards.

<sup>129</sup> World Animal Protection, "Farming Pigs and Future Proofing for a Crate-Free Era: The Global Business Case for Loose Sows for Indoor Farrowing and Lactation," (London: World Animal Protection, 2021).



Table 3: Summary of alternatives to the farrowing crate, based on Baxter et al (2018).<sup>130</sup>

System (Category)	Design principle	Design features	Example(s)	Notes
<i>Temporary crates</i>	Starting point is footprint of farrowing crate (4.3m <sup>2</sup> ).	Widening of farrowing crate to permit sow to turn around during farrowing/lactation.	Ellipsoid.	
		Restrain sow for 5-7 days during farrowing/early lactation, then open crate.	Open crate, Combi-flex, Midland 360 Farrower.	
	Starting point is larger pen (6m <sup>2</sup> ) to include some design features for the biological needs of the sow.		SWAP (Sow Welfare and Piglet Protection).	Used in Denmark (superprolific breeds). The SWAP system is exception within the temporary crate category.
<i>Simple pens</i>	Crate is absent, based on same footprint as farrowing crate (4.3m <sup>2</sup> ).	Simple pen with design to encourage piglet movement to creep area.	Hillside pens.	Use of additional design features e.g., mushroom protrusions to prevent crushing.
<i>Designed pens</i>	Starting point is biological needs of sow and piglets. Also designed to accommodate farmer needs.	Defined regions include separate lying and dunging areas, pen "furniture" (rails/sloped walls), and piglet creep.	PigSAFE (Piglet and Sow Alternative Farrowing Environment), Schmid pen, FATs, Werrabee farrowing pen, Danish Free Farrower, SowComfort Farrowing Pen.	Footprint ranges from 5-8.5m <sup>2</sup> . Areas calculated to permit sow space to turn, group piglets, lie, and suckle.
<i>Group systems</i>	Permit sows and litters to mix prior to weaning.	Sows initially housed (or crated) for farrowing. Mixed with group 10-21 days post-farrowing.	Ljungström.	Permit sows and piglets much more space. Use deep straw bedding.
		Sows group housed before farrowing with access to individual nest boxes to farrow.	Thorstensson, Get away pens, Freedom farrowing, crated then grouped, Family pen system.	
<i>Outdoor systems</i>	Sow and piglets have outdoor access.	Full outdoor: sows and piglets housed outdoors in arks or huts. Access to individual or group paddocks.	Various arks and huts available.	Low capital requirement and running costs.
		Outdoor runs plus kennel or Solari pen.	Solari pen.	More access for stockperson. Use smaller footprint than full outdoor.

<sup>130</sup> Baxter, Andersen, and Edwards.

## Outdoor farrowing

Around 40% of the UK pig herd farrows outdoors. Most outdoor systems consist of huts or arks within an enclosed farrowing paddock. Outdoor farrowing systems require land with good drainage that is not prone to soil erosion.<sup>131</sup> Outdoor systems generally use breeds like the Duroc, which has good mothering abilities, to reduce piglet mortality. Outdoor farrowing systems require little capital input and are designed to have minimal input from stockpersons to manage the piglets.

Baxter et al (2011) have described outdoor farrowing as the “gold standard” for promoting high welfare pig farming:

*“Given that well-managed outdoor production has the potential to satisfy the biological needs of both mother and offspring, particularly by providing an appropriate environment in which to perform species-specific behavioural patterns, it could be labelled as the gold standard for facilitating high welfare, while being economically efficient.” (Baxter et al, 2011)*



Figure 8: Outdoor pig farm in Devon, UK. Farrowing arcs in background. Pigs rooting and exploring their environment in foreground.

<sup>131</sup> Ibid.; Baxter and Edwards.



Table 4: Benefits of outdoor farrowing for the sow, piglets, and stockperson. Adapted from [www.freefarrowing.org](http://www.freefarrowing.org) (Baxter and Edwards, 2021).<sup>132</sup>

Scotland's Rural College (SRUC) has published *Outdoor Pig Husbandry: A stockperson's guide to farrowing* (SRUC, 2019) for further information on outdoor farrowing.<sup>133</sup>

<b>Sow</b>	<b>Piglets</b>	<b>Stockperson</b>
Freedom of movement at all times.	Deep straw bed for thermal and physical comfort.	Capacity for safety provisions e.g., lock in and out mechanisms.
Opportunity to withdraw from herd to farrow in secluded hut or arc.	Opportunity to forage in more complex outdoor environment.	Greater job satisfaction of working with pigs kept in more natural environment.
Undisturbed nest-site and opportunity to nest-build.	Opportunity to mix with litters pre-weaning to promote socialisation.	Reduced labour cleaning dunging as separate dunging area.
Deep straw bed for farrowing and physical comfort.		
Opportunity to forage in more complex outdoor environment.		
Separate dunging, nesting and feeding areas.		
Opportunity to interact with other sows.		
Opportunity to withdraw from piglets akin with natural behaviour.		

<sup>132</sup> Emma Baxter and Sandra Edwards, "Outdoor Systems," <https://www.freefarrowing.org/farrowing-systems/outdoor-systems/>.

<sup>133</sup> For further information see [Scotland's Rural College](#), "Outdoor Pig Husbandry: A Stockperson's Guide to Farrowing," (Aberdeen: Scotland's Rural College, 2019).



### Case study 1: PigSAFE (zero confinement pen)

The Piglet and Sow Alternative Farrowing Environment (PigSAFE) was designed by researchers at SRUC and the University of Newcastle. The project was funded by DEFRA and involved input from key stakeholders including British Pig Executive (BPEX), Quality Meat Scotland (QMS), and the RSPCA.<sup>134</sup>

PigSAFE was designed to optimise the welfare of sows and piglets as well as economics.<sup>135</sup> The farrowing system has been designed to promote good maternal behaviour by providing functional spaces for the sow whilst ensuring the protection of piglets and the safety of the stockperson.



Figure 9: The PigSAFE farrower system. Provided courtesy of Emma Baxter, copyright SRUC.

<sup>134</sup> Edwards and Baxter; Baxter, Lawrence, and Edwards.

<sup>135</sup> Edwards and Baxter.



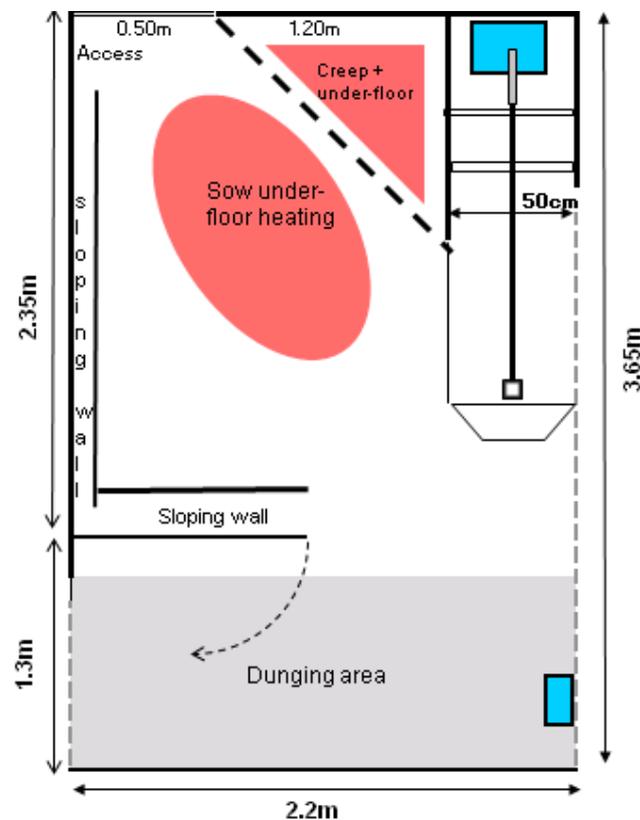


Figure 10: The PigSAFE farrower system, developed by the University of Newcastle and Scotland's Rural College (SRUC).<sup>136</sup> Image used with permission from Emma Baxter.

<sup>136</sup> Emma Baxter and Sandra Edwards, "PigSAFE," <https://www.freefarrowing.org/farrowing-systems/individual-farrowing-pens/pigsafe/>.



Table 5: Benefits of the PigSAFE farrowing and lactation pen for the sow, piglets, and stockperson. Adapted from [www.freefarrowing.org](http://www.freefarrowing.org) (Baxter and Edwards, 2021).<sup>137</sup>

<b>Sow</b>	<b>Piglets</b>	<b>Stockperson</b>
Freedom of movement at all times.	Improved udder access.	Fast and safe inspection of piglets.
Opportunity to nest-build and enclosed nest-site.	Sloped walls for protection during sow lying events.	Easy maintenance of good hygiene in the pens (separate dunging area).
Sloped walls for support in lying-down situations.	Appropriate creep environment.	Easy provision of nest building materials.
Opportunity to contact neighbouring sows.	Reduced spread of infection between pens.	Ability to separate sow from piglets and staff for husbandry procedures.
Opportunity to dung away from nest-site.	Opportunity to live in an enriched environment.	Multiple access points for easy inspection and movement of animals.
Opportunity to feed away from dunging and resting areas.	Opportunity to dung away from resting areas.	

<sup>137</sup> Ibid.



### Case study 2: The Midland 360 Farrower™ (temporary crating)

The 360° Freedom Farrower™ is a temporary crating system designed by Midland Pig Producers. The system is based on a traditional farrowing crate but has movable restraint bars. The moveable bars provide space for the sow to turn around in her pen. The bars can be used to confine the sow more closely when required by stockpersons.<sup>138</sup>



Figure 11: The Midland 360 Freedom Farrower™ in the closed (left) and open (right) position. Photographs provided courtesy of Emma Baxter, copyright SRUC.

<sup>138</sup> "360° Freedom Farrower™," <https://www.freefarrowing.org/farrowing-systems/temporary-crating/360-farrower/>.



Table 6: Benefits of the 360 Freedom Farrower™ for the sow, piglets, and stockperson.  
Adapted from Baxter and Edwards (2021).<sup>139</sup>

Sow	Piglets	Stockperson
Freedom to turn around when the restraining bars are in the open position.	Safe access to the sow's udder, especially when the farrower is in the closed position.	Fast and safe inspection of piglets.
	Reduced infection rates due to the slatted flooring in the farrower.	Ability to cross-foster easily when in closed position.
		Ability to restrain aggressive sows.
		Ability to treat sows safely.
		A fully slatted floor allows easy maintenance of good hygiene.



<sup>139</sup> Ibid.



Table 7: Summary of farrowing systems and welfare impacts on sow and piglets.

System	Description	Sow	Piglets
<b>Farrowing Crate</b>	Crate area is around 1.23m <sup>2</sup> (198cm x 60cm x 60cm) within pen of 4.3m <sup>2</sup> .	Welfare needs not met.	Barren environment.
	Sow crated for 35 days, more if nurse sow.	Unable to turn around, root and dig. Not able to interact with other sows.	Sub-optimal access to sow's teats.
	60% of UK breeding herd farrows indoors. Almost all use conventional farrowing crate.	Natural behaviours severely restricted. Unable to nest build.	Higher non-crushing mortality.
		Hard slatted floor and confinement means physical and thermal discomfort.	
<b>Temporary crate (e.g., Midland 360 Farrower, SWAP, Pro Dromi®)</b>	Various designs with variable pen size 4.8-7.2m <sup>2</sup> . Midland 360 Farrower built on same footprint as conventional crate, i.e., 4.3m <sup>2</sup> .	Welfare needs not met during crating. Welfare impacts as above for farrowing crate. Many welfare needs are not met when crate open.	Barren environment.
	Sow crated for around 5 days under German and Austrian partial bans.	Natural behaviours severely restricted during crating and restricted when not crated.	Often sub-optimal access to sow's teats.
	Pen designed to permit temporary crating as well as open crate.	Sow able to interact with piglets but limited space to turn around and group piglets to protect them when not crated.	Potentially higher risk of crushing compared to both conventional crate and designed pen.
	Temporary crate designs are not based on biological needs of sow and piglets but to use similar area as conventional crate and enable periods of crating.	Natural behaviours and nest building can be restricted depending on size of crate, flooring, and design.	



System	Description	Sow	Piglets
<i>Designed pen, or zero-confinement pens (e.g., PigSAFE, Danish Free Farrower, Swiss Free Farrower, Comfort Pen, WelCon System, simple pens)</i>	Pen area depends on design/brand but range 5-8.5m <sup>2</sup> .	Welfare needs generally met.	Improved environment for piglets as less barren e.g., with straw for comfort and manipulation.
	Pen designed based on biological needs of sow and piglets.	Sow can turn around and move freely within pen.	Good access to sow's teats so potential for greater milk intake and growth.
	Includes lying area, creep, feeding area, dunging area.	Able to perform some natural behaviours. Able to nest build.	Mortality comparable and can be lower than farrowing crates.
	Solid/non-slatted flooring for part of pen permits use of straw and other bedding.	Greater physical and thermal comfort.	
<i>Outdoor farrowing</i>	Sow has freedom to move from hut/ arc to paddock.	Sow welfare needs are met and are considered optimal.	Much improved environment for piglets. More space and more complex environment to explore.
	Arcs designed to meet biological needs of sow and piglets.	Able to perform natural behaviours. Able to perform nest building.	Stillborn mortality around half that in farrowing crate. Live-born mortality comparable with conventional farrowing crate.
	40% of UK breeding herd farrows outdoors.	Sow can explore far more complex outdoor environment e.g., perform rooting and digging behaviours.	Social interaction with other litters good for social and cognitive development and reduces stress and fighting post-weaning.
		Social interaction with other pigs permitted and reduces stress and fighting post-weaning.	



## Piglet mortality

Piglet mortality is important for welfare, economic, and environmental reasons. Live born piglets suffer to a greater or lesser extent prior to death, depending on the cause(s). The farmer loses economically through piglet mortality. Piglet mortality is an environmental concern due to wastage of resources used in production that do not entering the food chain. Finally, piglet mortality is a key discussion point as industry justifies the use of farrowing crates based on the claim that they are necessary to reduce piglet mortality.<sup>140</sup>

### Causes of piglet mortality

Globally, piglet mortality has remained relatively high at 16-20% over the last three decades.<sup>141</sup> This is despite advances in knowledge about piglet survival. A key reason is increased litter sizes, which have been genetically selected for, but are associated with higher piglet mortality.

Relatively high mortality levels are not uncommon in species that produce large litters. Mortality is categorised as stillborn, live-born, and total mortality. Piglets can be stillborn or die shortly after being delivered due to congenital diseases.

Baxter and Edwards (2018) describe the welfare problems associated with piglet mortality:<sup>142</sup>

*“Asphyxiation, starvation, hypothermia and physical trauma may be the fate of the newborn and it is highly likely that combinations of these will be experienced, as they are not mutually exclusive.”*  
(Baxter and Edwards, 2018)

Most pre-weaning mortality happens during birth and in the few hours shortly after. Marchant et al (2000) have reported that more than half of piglet deaths occur within three days of birth.<sup>143</sup>

---

<sup>140</sup> National Pig Association.

<sup>141</sup> Baxter and Edwards.

<sup>142</sup> Ibid., 77.

<sup>143</sup> Marchant et al.



Crushing is often reported as the cause of death, but the situation is more complex. Baxter et al (2018) discuss how crushing is predisposed by other causes. Hypothermia is considered the primary cause of most deaths, compared to crushing, starvation, and disease. This relates to piglets being very sensitive to lower temperatures. The cause of death in neonatal piglets is often multifactorial and described as the hypothermia-starvation-crushing complex. See Baxter and Edwards (2018) for a detailed review of piglet mortality and morbidity.<sup>144</sup>

### The link between sow and piglet welfare

Baxter and Edwards (2021) have summarised a growing body of evidence on the link between the poor welfare of the sow in the farrowing crate and the subsequent welfare of her piglets.<sup>145</sup> Recent research is demonstrating welfare problems in piglets related to farrowing crates. The barren environment of the farrowing crate means little environmental enrichment that would have a positive impact on the piglets' social and cognitive development. Further, the farrowing crate environment has an impact on adaption to the weaning process, growth rates, immune response, and the regulation of stress.<sup>146</sup>

Jarvis has demonstrated that sows confined in crates have increased aggression toward piglets. Ocepek and Andersen report a higher degree of restlessness during the farrowing process, which reduces safe udder access for piglets and increases risk of crushing.<sup>148</sup> In contrast, in loose housing environments sows are more careful around piglets,<sup>149</sup> there is improved suckling,<sup>150</sup> and weaning weights are higher.<sup>151</sup>

---

<sup>144</sup> Baxter and Edwards.

<sup>145</sup> Baxter and Edwards.

<sup>146</sup> For a review see Helena Telkänranta and Sandra A Edwards, "Lifetime Consequences of the Early Physical and Social Environment of Piglets," in *Advances in Pig Welfare* (Elsevier, 2018).

<sup>147</sup> Susan Jarvis et al., "The Effect of Confinement During Lactation on the Hypothalamic-Pituitary-Adrenal Axis and Behaviour of Primiparous Sows," *Physiology & behavior* 87, no. 2 (2006).

<sup>148</sup> Marko Ocepek and Inger Lise Andersen, "What Makes a Good Mother? Maternal Behavioural Traits Important for Piglet Survival," *Applied animal behaviour science* 193 (2017).

<sup>149</sup> *Ibid.*

<sup>150</sup> J Yun et al., "Farrowing Environment Has an Impact on Sow Metabolic Status and Piglet Colostrum Intake in Early Lactation," *Livestock Science* 163 (2014).

<sup>151</sup> ML Pedersen et al., "Improved Udder Access Prolongs Duration of Milk Letdown and Increases Piglet Weight Gain," *Livestock science* 140, no. 1-3 (2011); Tanya Louise Nowland, William Hendrik Ernest John van Wettere, and Kate Joanna Plush, "Allowing Sows to Farrow Unconfined Has Positive Implications for Sow and Piglet Welfare," *Applied Animal Behaviour Science* 221 (2019).



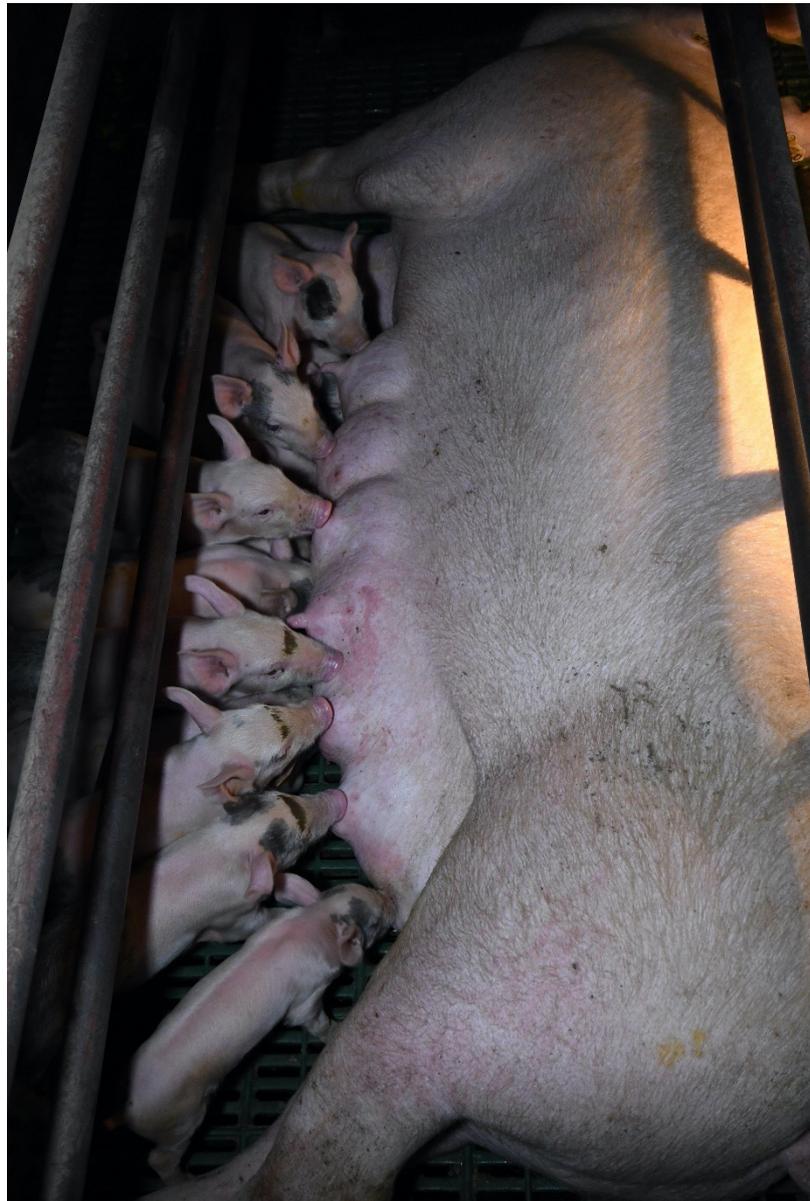


Figure 12: Piglets suckling on a UK indoor farm in a farrowing crate system. Copyright Compassion in World Farming.



## Piglet mortality and farm productivity

From a purely economic perspective, productivity on a pig farm is optimised through minimising inputs (e.g., capital, labour, feed) and maximising outputs (pigmeat). Indeed, the continued existence of the farrowing crate itself, despite the substantial welfare it causes, is explained by these economic factors. Two of the key justifications for the crate are to minimise inputs (in terms of space requirements, capital expenditure, and labour) and maximise outputs (in terms of reducing piglet mortality).

To maximise output of pigmeat, the farmer aims to maximise the number of pigs weaned per sow per year. The number of pigs weaned per sow per year is calculated by multiplying the number of piglets weaned per litter by the number of litters per sow per year. Pigs have a gestation length of 115 days (three months, three weeks, and three days) and assuming successful service (mating), the number of litters per sow per year has remained relatively constant in the UK at 2.3 litters per year.<sup>152</sup>

The number of piglets weaned per litter is a function of the number of piglets born live per litter and the pre-weaning mortality rate. I.e., in theory the productivity would be maximised by increasing the litter size and reducing the mortality rate. The total piglet mortality is the sum of the stillborn mortality and the liveborn mortality.



Figure 13: Stillborn, live-born, and total mortality in piglets.



Figure 14: Pigs weaned per sow per year.

<sup>152</sup> Agriculture and Horticulture Development Board.



## Comparison of piglet mortality in UK indoor and outdoor units

The UK has a high proportion of sows farrowing outdoors at 40% of the herd. The AHDB publish annual data on key performance figures for indoor and outdoor herds.<sup>153</sup> Given that sows farrow freely in huts and pens outdoors, the AHDB data provides a useful comparative data set. The values in Table 8 and summarised below are mean values calculated from 2006-2021 data.

Sow replacement (46.5% versus 49.9%) and mortality (4.0% versus 5.3%) is lower in outdoor herds. Litters per sow per year is slightly higher (2.3 versus 2.2) in indoor herds. Indoor herds have more pigs born per litter alive (12.2 versus 11.3), higher stillborns per litter (0.9 versus 0.5), and total pigs born per litter (13.2 versus 11.9).

Pre-weaning mortality is comparable but slightly higher in outdoor compared to indoor herds (12.2% versus 12.0%). Total mortality is higher in indoor units (13.2%) compared to outdoor units (11.9%). Pigs weaned per litter (10.7 versus 9.9) and pigs weaned per sow per year (24.2 versus 22.0) are higher in indoor units.

The average weight of weaned pigs is comparable but slightly higher (7.4kg versus 7.3kg) in outdoor units. The average weaning age is almost the same (26.6 versus 26.5) in outdoor compared to indoor units. Feed costs are comparable at £176.1 per tonne in indoor farms compared to £174.6 per tonne in outdoor farms.



<sup>153</sup> Agriculture and Horticulture Development Board.



Table 8: Mean performance figures for UK indoor and outdoor breeding herds 2006-2021.  
Data calculated from AHDB (2021).<sup>154</sup>

<b>Performance figure</b>		<b>Indoor</b>	<b>Outdoor</b>
<i><b>Herd structure</b></i>	Average number sows and gilts	523.5	811
	Sow replacement (%)	49.9	46.5
	Sow mortality (%)	5.3	4.0
<i><b>Sow performance</b></i>	Litters/sow/year	2.3	2.2
<i><b>Pigs born per litter</b></i>	Alive	12.2	11.3
	Dead	0.9	0.5
	Total	13.2	11.9
	Pre-weaning mortality (%)	12.0	12.2
	Pigs weaned/litter	10.7	9.9
	Pigs weaned/sow/year	24.2	22.0
	Average weight weaned pig (kg)	7.3	7.4
	Average weaning age (days)	26.6	26.5
<i><b>Feed costs</b></i>	Sow feed cost per tonne (£)	176.1	174.6

<sup>154</sup> Agriculture and Horticulture Development Board.



## Comparison of piglet mortality, sow welfare, and cost of pig farrowing systems

Baxter et al (2012) analysed piglet mortality from a large database within the literature.<sup>155</sup> They compared 12 alternative indoor systems with each other, as well as with conventional crates and outdoor systems. The authors constructed a welfare design index (WDI) for sows based on multiple factors related to welfare, with a higher score indicating higher sow welfare. Baxter et al (2012) also evaluated the costs of the alternative indoor systems to provide a comparison with the farrowing crate. The results are summarised from Baxter et al (2012) in Table 9 and Figures 15 and 16 below. The authors found that designed (free farrowing) pens had the lowest piglet mortality rates at 16.6%. This was followed by outdoor systems (17%) and farrowing crates (18.3%). Indoor group/multi-suckling systems had the highest piglet mortality at 23.7%.

For sow welfare, the indoor group/multi-suckling systems scored highest at 2.20. This was followed by the designed pen (1.64) and outdoor systems (1.10). The farrowing crate received the lowest welfare score at 0.95. In terms of costs, the authors calculated that capital cost for the indoor group/multi-suckling systems was 92% higher than the farrowing crate. In contrast, the additional cost for both capital and labour for designed pens was only 17.5% higher than the farrowing crate. The authors concluded that the designed pen offered the best compromise between sow welfare, piglet mortality, and economic costs.

Arguably, Baxter et al (2012) understate the superior findings related to designed pens in their study. Sow welfare is substantially higher with a score of 1.64, compared to the lowest score of 0.95 for the farrowing crate. Given that the crate prevents the most basic physical and behavioural functions for the sow, the designed pen is clearly superior for welfare. Piglet mortality was not only comparable, but lower (16.6%) in designed pens, compared to the farrowing crate (18.3%). Furthermore, the capital and labour costs for designed pens are comparable to the farrowing crate, with a 17.5% premium being far superior to the 95% premium for capital alone for the indoor group/multi-suckling systems.

---

<sup>155</sup> Baxter, Lawrence, and Edwards.



Table 9: Sow welfare, piglet mortality, and cost of farrowing crates, outdoor farrowing, indoor group/multi-suckling systems, and designed pens. Data from Baxter et al (2012).<sup>156</sup>

System	Sow welfare (WDI)	Piglet mortality (%)	Percentage cost increase relative to farrowing crate
<i>Farrowing crate</i>	0.95	18.3	-
<i>Outdoor</i>	1.10	17.0	-
<i>Indoor group/multi-suckling</i>	2.20	23.7	92% (capital cost)
<i>Designed pen</i>	1.64	16.6	17.5% (capital and labour cost)

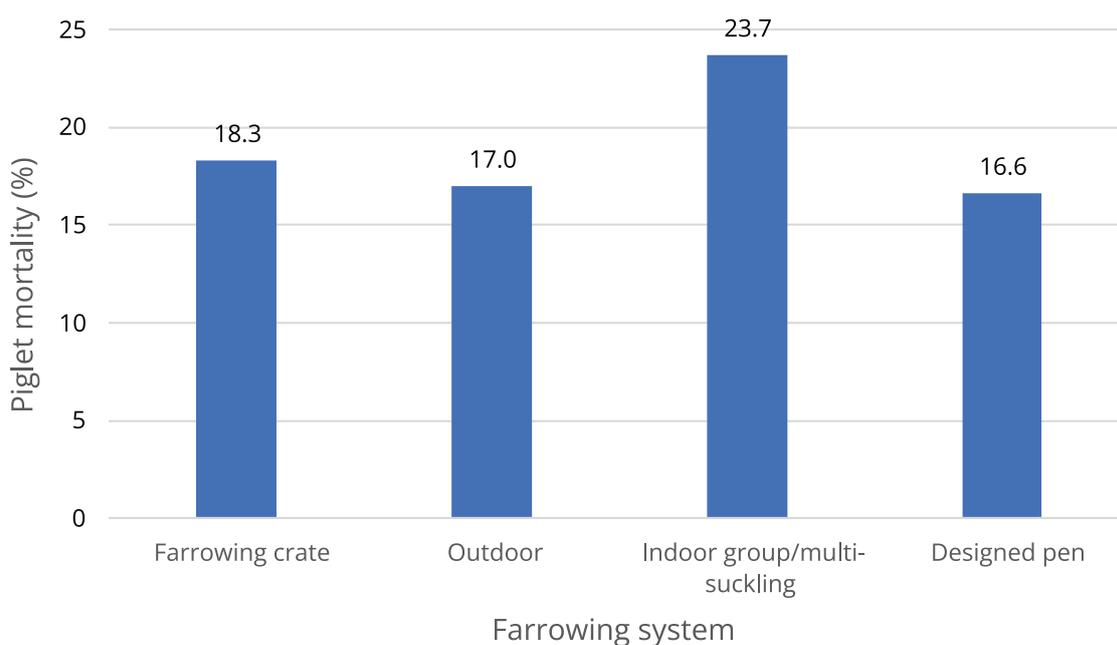


Figure 15: Comparison of piglet mortality data from commercial systems. Data from Baxter et al (2012).<sup>157</sup>

<sup>156</sup> Ibid.

<sup>157</sup> Ibid.



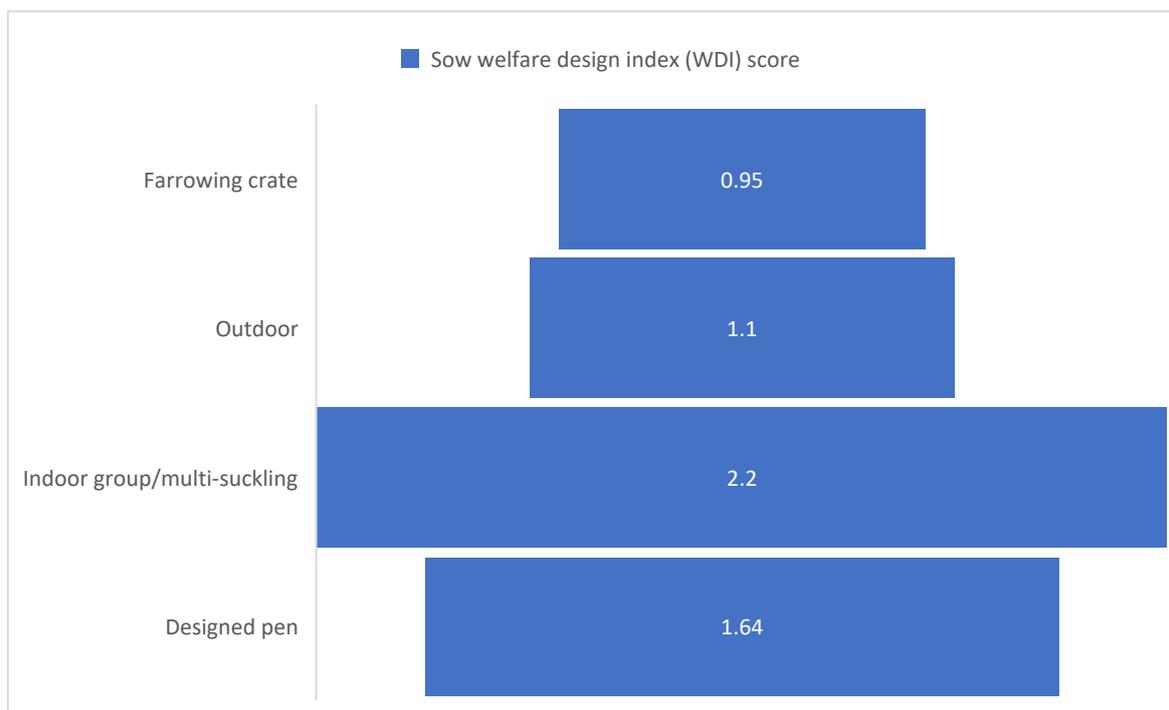


Figure 16: Comparison of sow welfare expressed as welfare design index (WDI) in different commercial systems. Scores from Baxter et al (2012).<sup>158</sup>

### Comparison of UK indoor piglet mortality with Swiss, Norwegian, and Swedish free farrowing mortality figures

Baxter (2022) has reported live born piglet mortality data based on large scale commercial data including nations that have banned farrowing crates.<sup>159</sup> The UK live born mortality rate is reported as 12.2% for indoor farms, and the EU average 13.8%. Switzerland banned farrowing crates in 1997 with a ten-year transition period to 2007. Weber (2020) has reported the live born mortality in Sweden as 11.1%.<sup>160</sup> Baxter cites Ingris (2020) reporting the live born mortality from Norway as 12%.<sup>161</sup> The figure for live born mortality in Sweden is reported as close to 17% over the last ten years. The higher figure is considered to be related to larger litter sized. Baxter (2022) reports that Sweden has less control over pig genetics, and there is more hyperprolific (larger litter size) Danish genetics in the Swedish herd.<sup>162</sup>

<sup>158</sup> Ibid.

<sup>159</sup> Baxter.

<sup>160</sup> Roland Weber et al., "Piglet Losses in Free-Farrowing Pens: Influence of Litter Size," *Agrarforschung Schweiz* (2020).

<sup>161</sup> Baxter.

<sup>162</sup> Ibid.

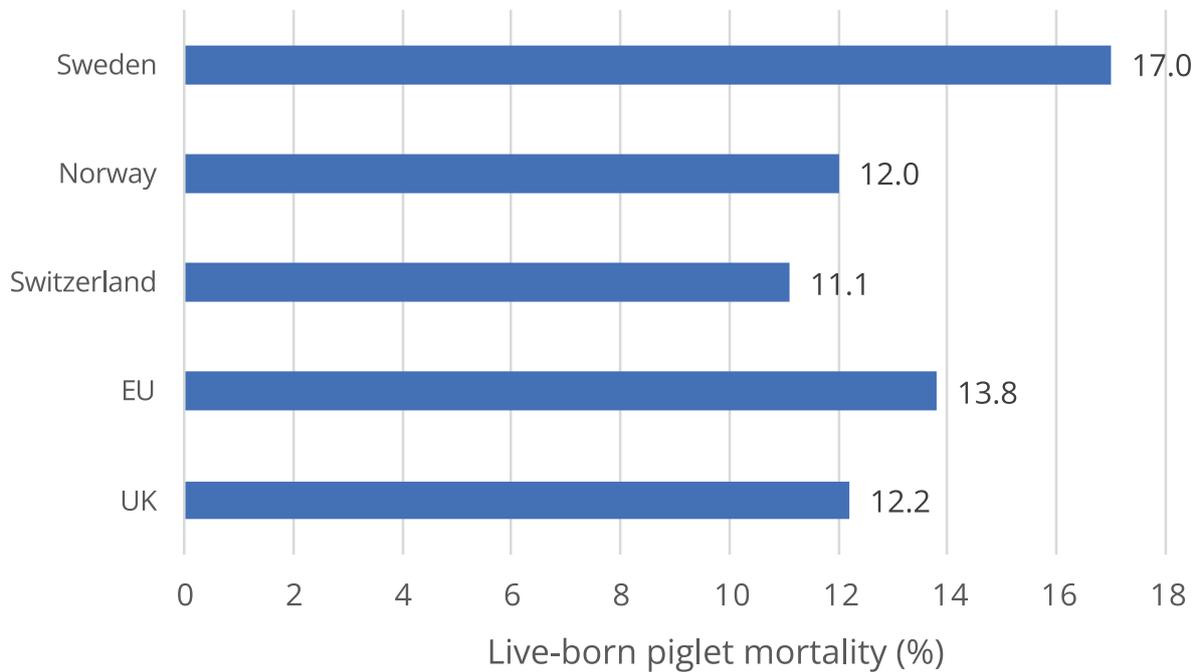


Figure 17: Comparison of live-born piglet mortality in the UK and EU with Switzerland, Norway, and Sweden. Data summarised from Baxter (2022).<sup>163</sup>

### Spotlight on piglet mortality in Switzerland

Weber et al (2007) examined piglet losses in Switzerland and compared loose farrowing pens with farrowing crates during the transition period after the ban was announced in 1997.<sup>164</sup> Based on a large dataset of 655 farms and 63,661 litters, the authors found that piglet mortality in loose farrowing pens (17.2%) was comparable, and indeed less, compared to farrowing crates (17.9%). In later research, Weber (2009) found that the average live-born mortality of piglets born to sows in loose farrowing from 99 farms was 11.8%.<sup>165</sup> The data therefore indicates that the Swiss ban on farrowing crates that was announced in 1997 and fully came into force in 2007 has not adversely affected piglet mortality.

<sup>163</sup> Ibid.

<sup>164</sup> Weber et al.

<sup>165</sup> Roland Weber et al., "Factors Affecting Piglet Mortality in Loose Farrowing Systems on Commercial Farms," *Livestock Science* 124, no. 1-3 (2009).



## UK welfare assurance schemes and farrowing

### RSPCA Assured

RSPCA welfare standards for pigs are based on the Five Freedoms.<sup>166</sup> The standards must be complied with for RSPCA Assured (formerly Freedom Food) accreditation. The standards stipulate that for all farrowing systems, sows must be moved to a clean and comfortable farrowing area at least five days prior to the farrowing date. Clean and appropriate bedding and enrichment material must be provided in sufficient quantity and to allow the expression of natural behaviours such as rooting. Farmers must provide at least 2kg of straw for each sow 48 hours prior to farrowing for nesting behaviour.

RSPCA Assured standards prohibit the use of farrowing crates:

*“The RSPCA standards strictly prohibit the use of farrowing crates. Instead, they require farrowing sows to be provided with a warm, comfortable environment with plenty of straw to help cushion and protect their piglets, whilst also allowing greater freedom of movement and the ability to express natural nesting behaviours.” (RSPCA, 2022)<sup>167</sup>*

The farrowing accommodation must permit the sow to turn around with ease, without restriction from fixtures in the pen. Pens must be designed to offer some protection to piglets from crushing by the sow. Indoor farrowing farms must provide a lying/nest area at least 2.8m<sup>2</sup>, and the minimum size of the pen, including the lying/nest area, must be at least 5m<sup>2</sup>. The minimum 5m<sup>2</sup> area for the pen does not include the feeding stall within the unit. At all times, pigs must have access to environmental enrichment materials for rooting, pawing, and chewing behaviours. Materials include long straw, peat, and silage.

The RSPCA has categorised pig rearing systems and pork labels on its website for the benefit of consumers.<sup>168</sup> The categories are found in Table 10.

---

<sup>166</sup> Royal Society for the Prevention of Cruelty to Animals, 11-14.

<sup>167</sup> RSPCA Assured, “Pigs,” <https://www.rspcaassured.org.uk/farm-animal-welfare/pigs/>.

<sup>168</sup> “Pig Rearing Systems and Pork Labels,” <https://www.rspcaassured.org.uk/farm-animal-welfare/pigs/pig-rearing-systems-and-pork-labels/>.



Table 10: Pig rearing systems and pork labels (RSPCA, 2022).<sup>169</sup>

System	Description
<i>Standard indoor</i>	Farrowing and lactating sows likely kept in farrowing crates
<i>Higher welfare indoor</i>	Pigs kept in individual pens or indoor arcs for farrowing
<i>Outdoor-bred</i>	Pigs born in outdoor systems but reared indoors after weaning
<i>Outdoor-reared</i>	Pigs born outdoors and reared outdoors for half of their lives
<i>Free range</i>	Pigs born and raised outdoors for the entirety of their lives
<i>Organic</i>	Pigs raised to higher welfare standards and must have permanent access to the outdoors

## Soil Association

Farrowing crates are prohibited under the Soil Association organic scheme.<sup>170</sup> Farrowing sows with piglets up to 28 days must have a minimum lying area in outside shelters, which is covered and bedded, of 4m<sup>2</sup> per sow.

*“Organic standards require outdoor access, this includes during farrowing. Farrowing stalls/crates are not permitted.” (Soil Association, 2015)*

When farrowing sows are kept indoors with outdoor access, the space requirements are higher. Farrowing sows with piglets up to 40 days must have a lying area or indoor area of 7.5m<sup>2</sup> and 2.5m<sup>2</sup> outdoor exercise, totalling 10m<sup>2</sup> per sow. The rationale is that sows have sufficient space to lie down and get up, as well as room to perform natural behaviours including exploration and rooting.

The keeping of piglets on flat decks or cages is also not permitted under Soil Association standards.

<sup>169</sup> Ibid.

<sup>170</sup> Soil Association.

## Economics of transitioning to free farrowing

### The farrowing crate as the budget indoor pig producing pen

Prior to discussing the economics of a transition to free farrowing, it is instructive to describe the development and use of the farrowing crate in economic terms and how this relates to sow welfare. The crate was first used in the 1960s to protect piglets during and shortly after farrowing. It also offered benefits for stockperson safety and husbandry procedures. The crate then came to be used for significantly longer periods of time, and today sows are confined in the cages for five weeks. Today, the crate is the predominant indoor system used for indoor farrowing and lactating sows globally.

The crate is a simple design with metal bars enclosing the area where the sow will be kept confined for five weeks. The crate is situated above slatted floor so that her dung falls to a drainage system to help keep the area clean in an economically efficient way. The creep area for the piglets is a simple enclosure at one end of the crate that provides a heat source and protection away from the sow. Generally, the sow does not have straw or other bedding, as this would clog up the underground drainage system. So, she lies or stands for five weeks in the same space on the hard slatted floor.

The farrowing crate is described here to illustrate that once the purpose and nature of it is understood, it should be clear that any development to improve the housing for the sow will incur some economic costs. In effect, the crate can be considered as a simple structure requiring absolute minimum space, leading to absolute minimum costs for indoor farrowing.<sup>171</sup>

Improvements to the crate might be categorised as either increases in space for sows to live, or increases in the complexity of the pen. In the farrowing crate the sow can stand and lie down, but she cannot turn around or move in any other significant way.

---

<sup>171</sup> Indeed, in a report on caged farming in the EU, Compassion in World Farming has documented how the crate can be too small to accommodate the sow so that she often cannot stand or lie down properly. This is because sows have been bred to be larger over the years and farrowing crates have not increased in size to accommodate for this. The animal protection NGO claims that many crates are likely to fall foul of EU law requirements for the sow to have sufficient space even to stand up and lie down. The situation is so extreme in some cases that the sow is effectively bigger than her crate! [Compassion in World Farming](#), "Scientific Briefing on Caged Farming: Overview of Scientific Research on Caged Farming of Laying Hens, Sows, Rabbits, Ducks, Geese, Calves and Quail."



Increasing space allows sows to turn around and walk short distances, to interact with her piglets, and perform behaviours such as nest building. Complexity here means diverging from the slatted flooring and barren environment of the pen. For instance, providing straw for bedding helps provide comfort. Straw is also used for nest building, an innate and strongly motivated behaviour. But the straw requires a solid or semi-solid floor. This then increases costs, first to provide the straw, and second to dispose of the straw. Similarly, a designed pen might have other features to help reduce piglet mortality, such as sloped walls to help the sow lie without crushing her piglets.

Hence, in the language of economists, the costs of the conventional farrowing crate are externalised. Ongoing production costs are minimised, piglet mortality is prioritised by industry as a function of productivity and profit, and purchase price is minimised for the consumer. The costs are substantially externalised to the sow. She is forced to forgo her fundamental welfare needs through incarceration in the most restrictive system of farming in the UK and EU. The cage she is kept in is so restrictive that it clearly does not meet her welfare needs and the principles as laid out in Section 9 of the Animal Welfare Act.<sup>172</sup>

### **Economic costs in transitioning to free farrowing**

Any consideration of the economic costs in the transition to free farrowing must be considered in the context of the farrowing crate as the budget indoor production pen, which substantially sacrifices the welfare of the sow, to the extent that her basic interests are not met. There are significant capital costs (around £3,000 per unit) for the farrowing crate. But the absolute minimal size and simplicity of the crate means that it can be considered as “low cost”, “bare bones”, and “budget”. Any improvements to the crate will increase at least the capital costs.

This is because first, any free farrowing system requires greater footfall/space. If the metal bars, i.e., the “crate” were removed from the pen, the sow would have more freedom of movement, but insufficient space to be able to move freely without harming her piglets. Hence, it has been calculated that sows require around 5m<sup>2</sup> to group their piglets prior to lying down. This grouping of the piglets is the sow’s natural behaviour in order to keep her piglets safe. At this juncture it is noteworthy that the ostensible reason provided to justify the farrowing crate is to prevent the sow from crushing her piglets.

---

<sup>172</sup> See ‘Legislation on farrowing crates in the UK’ earlier in this report.



But the sow risks crushing her piglets first because we humans have kept her in such a small space to begin with, and secondly because we have bred her to be larger, less mobile, and deliver larger litter sizes, often with smaller piglets.<sup>173</sup> Secondly, compared to a more natural environment (or outdoor farrowing), even in a relatively large<sup>174</sup> 9m<sup>2</sup> pen, the sow still has only a small amount of space.<sup>175</sup> For these reasons, designed pens have features, such as restricted sections for piglets and sloped walls, to protect her piglets.

Broadly speaking, the additional costs of designed pens are due to the increased capital costs, the increased space (so less units per given space) on the farm, potentially increased piglet mortality<sup>176</sup> and increased management costs (e.g., around farrowing, and dunging out from solid floors). Potentially offsetting these additional costs are increased piglet weaning weights, lower replacement rates for sows, and premium paid for higher welfare products.

### Economic modelling of alternative farrowing systems

Guy et al (2012) modelled costs for PigSAFE, the Midland 360° Farrower, a Danish pen, outdoor farrowing, and the conventional farrowing crate.<sup>177</sup> Assuming equal performance across systems, including pig mortality, the research found higher costs of production for the 360° Farrower (1.6%), Danish (1.7%), and PigSAFE (3.5%). The outdoor production system had a significantly lower cost.

Comparing PigSAFE with conventional crates, the former would require a premium of 1.6% (2-3p/kg) to break even.<sup>178</sup> Piglets reared in designed pens often have higher weaning weights compared to those raised in conventional crates. In a 2021 meeting between the New Zealand NAWAC and Swedish University of Agricultural Sciences Representatives the following was recorded in the minutes:<sup>179</sup>

*“A notable difference has been the piglets are very large and robust at weaning, with good growth rates, very low post weaning mortality rates, and very minimal use of antibiotics post weaning.”  
(New Zealand National Animal Welfare Advisory Committee, 2021)*

---

<sup>173</sup> European Food Safety Authority.

<sup>174</sup> Relatively large for a farrowing pen.

<sup>175</sup> Less than what an adult human would have in a box room.

<sup>176</sup> Though as this report has documented, well designed and managed free farrowing systems have comparable and, in some cases, lower mortality rates. For example, Switzerland has a mortality rate of 11.1%, compared to the UK mortality rate of 12.2%.

<sup>177</sup> JH Guy et al., “Economic Evaluation of High Welfare Indoor Farrowing Systems for Pigs,” *Animal Welfare-The UFAW Journal* 21, no. 1 (2012).

<sup>178</sup> Ibid.

<sup>179</sup> NAWAC, “Sweden Pig Farrowing Crates Discussion,” (New Zealand: NAWAC, 2021).



Table 11: Price premium needed for farmers to break even using PigSAFE farrowing pen compared to crate. Based on Guy et al (2012).<sup>180</sup>

Factor	Percentage premium required	Percentage premium required in pence per kilo
<i>No increase in piglet weaning weight</i>	+1.6%	+2.3p/kg
<i>Piglet weaning weight increase of 0.3kg using PigSAFE</i>	+0.9%	+1.3p/kg

### Agriculture and Horticulture Development Board analysis

A 2020 AHDB report notes that the UK imports 60% of its pigmeat from the EU.<sup>181</sup> The UK exports around 30% of its production. Margins for the indoor pig sector are low, averaging 1p/kg from 2010-2020. The economics of the pig sector are also volatile, with costs being higher than profits at certain times.

The AHDB team modelled costs under three piglet mortality scenarios: 1. 12.34% mortality (the 2020 British indoor average), 2. 14%, and 3. 18%. The analysis found that mortality levels over 14% posed problems for the long-term viability of the British pig industry. In terms of building costs, the AHDB analysis found that a 6m<sup>2</sup> farrowing pen would add 2p/kg deadweight to the base cost, with a 8m<sup>2</sup> pen adding 4p/kg. The report also discussed concerns about whether British consumers would pay a significant premium for alternative farrowing systems indoors, given that polls found the public valued outdoor access for farmed animals.

<sup>180</sup> Guy et al.

<sup>181</sup> Davis, Wilkins, and Barber.



Table 12: Capital costs for conventional farrowing crate and alternative indoor farrowing systems. Data from AHDB (2020).<sup>182</sup>

System	Area (m <sup>2</sup> )	Approximate cost per unit including building (£)
<i>Farrowing crate</i>	4.3m <sup>2</sup>	3,000-3,500
<i>Alternative indoor farrowing</i>	4.8-7.2m <sup>2</sup>	5,000-5,500 (6m <sup>2</sup> ) 7,000-7,500 (8m <sup>2</sup> )

## The ethics of farrowing crates in pig farming

### Does the farrowing crate meet the welfare needs of the sow?

The farrowing crate is the most severe form of confinement of farmed animals in the UK and throughout the EU. Sows are able to stand up and lie down, but they are unable to turn around. The severe confinement means that the crated sow is unable to move from her immediate environment to seek thermal and physical comfort. She is unable to perform innate and highly motivated natural and normal behaviours such as rooting, exploration, and nest building. The scientific evidence on suffering was briefly reviewed earlier in this report. The degree of confinement caused by the farrowing crate means that the welfare needs of the sow are not and cannot be met. Table 1 of this report illustrates how the farrowing crate fails to meet all five welfare needs in Section 9 of the Animal Welfare Act.

### Do crated pregnant and lactating sows have a life worth living?

*FAWC's prescription that the legislative minimum must be that all animals have a life worth living.*

FAWC, advisory body to the British Government, has stated in its landmark 2009 report that the legislative minimum should be that all farmed animals in Britain should have a life worth living. Further, FAWC states that the policy of the UK Government should be that an increasing number of animals have a good life. A life worth living is one in which the total positive experiences of a sentient being outweigh the total negative experiences of that sentient being.

<sup>182</sup> Ibid.

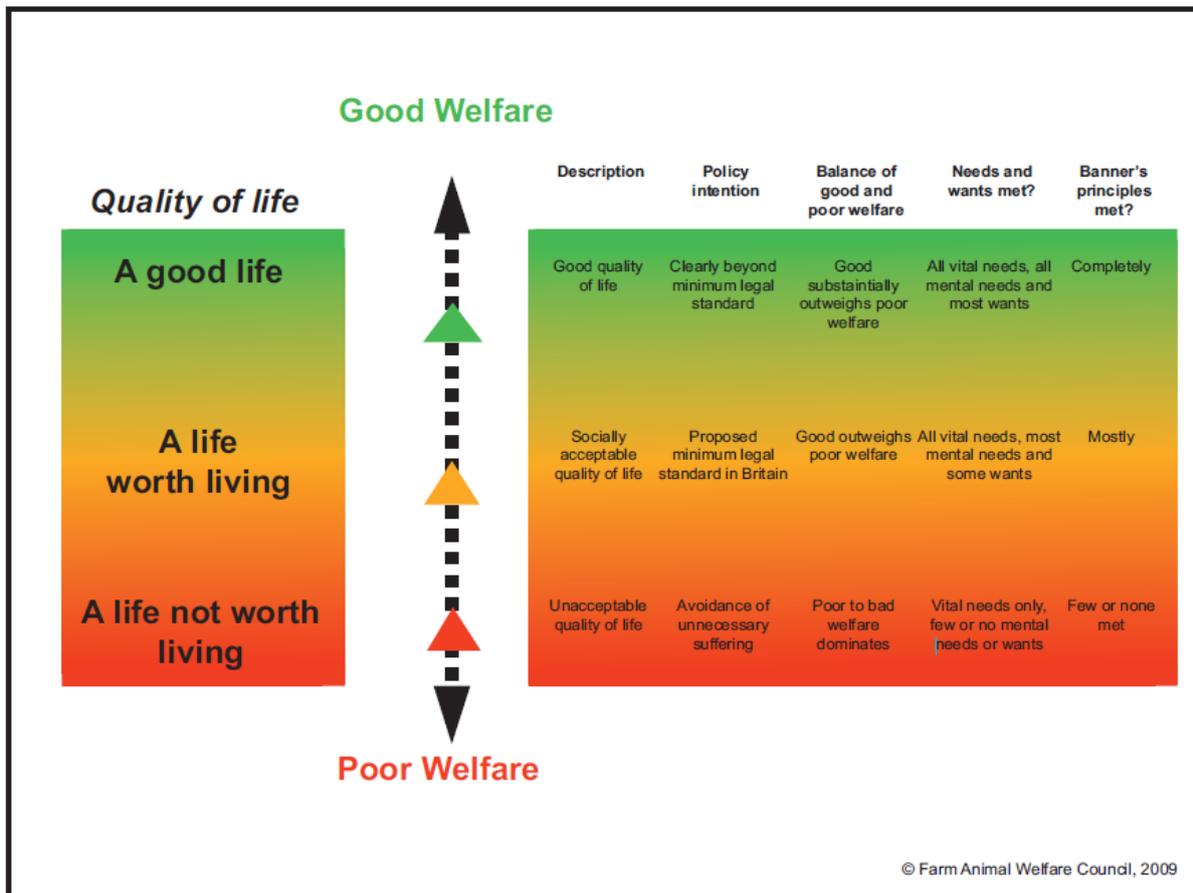


Figure 18: The concept of quality of a life for a farm animal. Copied from FAWC (2009).<sup>183</sup>

### *Do crated sows have a life worth living?*

A question fundamental to the policy issue of farrowing crates is whether pigs can be considered to have a life worth living, i.e., a life of net positive value, within such a system. There are two aspects to consider in this question. First, do sows have a life worth living whilst they are crated, i.e., during the typical one week pre-farrowing and four weeks lactating? The answer to this question should be clear. Given that the farrowing crate fails to meet the welfare needs of sows, pigs kept in crates cannot possibly have a life worth living during the time they are crated within them.

<sup>183</sup> Farm Animal Welfare Council, 18.



*Do breeding sows kept in systems using farrowing crates have a life worth living, over the course of their life?*

The second question is whether breeding sows have a life worth living, when the entirety of their life is considered, if they are kept on units that use farrowing crates. A judgement as to whether breeding sows have a life worth living in this sense is more complex and entails more uncertainty. Indoor sows produce on average 2.3 litters per year, and for each of these litters they are confined in farrowing crates. Breeding sows are therefore typically kept in the extreme confinement of the farrowing crate for 80.5 days each annually, which is 22% of days in each year.

First, over one fifth of any sentient being's breeding life is a very substantial period of time for welfare needs to not be met. Secondly, the psychological impact of enduring severe confinement will not end as soon as the sow is released into group housing at the end of her lactation. Given that the sow's welfare needs are not met for a substantial duration of time whilst she is crated, her crated experience will cause psychological trauma that will not cease once she is released. Crated sows will suffer longer term detrimental welfare impacts due to being crated for periods of 5 weeks two to three times per year.<sup>184</sup>

For these reasons, it is at least questionable whether, all things considered, the sow can reasonably be judged to have a life worth living. It should be remembered that an indoor sow's non-crated experience is far from optimal for welfare. I.e., indoor breeding sows have minimal environmental enrichment (compared to a more complex outdoor environment) and are kept in relatively high stocking densities. Sows will have bonded to some extent with their litters of piglets, despite the limitations of the farrowing crate, and then subsequently had them removed from her.

---

<sup>184</sup> In effect, breeding sows are likely to suffer from what is termed "post-traumatic stress disorder" in humans. Scientific research indicates that stresses and poor welfare caused to animals can have a lasting impact. For instance, stereotypies are abnormal behaviours that are caused by poor welfare, but they continue long after the conditions causing the poor welfare are improved. E.g., see [G. J. Mason](#), "Stereotypies and Suffering," *Behavioural Processes* 25, no. 2 (1991). Similarly, the behaviour and welfare of dogs continues to be affected by how they were kept during earlier periods of their life, and this can have an ongoing impact on welfare. Indeed, if the idea of "post-traumatic stress" in pigs were to be questioned, it is worth noting that we use nonhuman species as models in a research context. E.g., see [Hagit Cohen, Michael A Matar, and Zohar Joseph](#), "Animal Models of Post Traumatic Stress Disorder," *Current Protocols in Neuroscience* 64, no. 1 (2013).



Whether the sow can experience a life worth living within a pig unit that uses farrowing crates is ultimately a question of judgement. The author of this report judges that breeding sows kept in indoor systems using farrowing crates are more likely to have a life not worth living, i.e., a life of net negative value. Given that pigs are highly sentient and intelligent animals, the severe degree of confinement that the farrowing crate causes, and the substantial duration of time the sow spends crated, together with likely ongoing welfare impacts, this is arguably not an unreasonable judgement.

### *Application of the precautionary principle to sow welfare in farrowing crates*

A final point relates to uncertainty and the precautionary principle. If it is not unreasonable to judge that a breeding sow does not have a life worth living within a pig unit that uses farrowing crates, there are very strong grounds to provide the benefit of the doubt to the case that she does not, i.e., ultimately to the breeding sows themselves. If farrowing crates mean that breeding sows do not have a life worth living, then this is a major indictment of much of the indoor pig farming industry itself (not just in the UK, but throughout Europe and globally). The issue raises serious questions about the morality of consuming pigmeat from such systems. The preference for and popularity of pigmeat from outdoor systems, with 40% of the UK herd farrowing outdoors, suggests that a large proportion of British consumers follow a similar line of thinking. This is especially so given that British consumers pay a significant premium to purchase outdoor bred pork at the supermarket checkout.

### **Does piglet mortality justify the use of farrowing crates?**

Essentially, experts and stakeholders agree that farrowing crates are a major problem.<sup>185</sup> Animal welfare scientists have demonstrated major negative welfare impacts of crates and scientific advisory bodies such as EFSA have made recommendations based on these.<sup>186</sup> The sow stall, with the same degree of confinement but used for longer durations, is prohibited in the UK, and partially banned in the EU.

---

<sup>185</sup> For example, BPEX has stated in a strategy report how it will continue to focus on solutions to enable freedom for the sow in farrowing. BPEX, "Pig Health and Welfare: A Vision for 2020," (Stoneleigh: BPEX, 2011).

<sup>186</sup> [European Food Safety Authority](#)



The issue of piglet mortality is commonly used to justify the continued use of farrowing crates. Again, there are two questions in relation to this. First, do farrowing crates have significantly lower mortality rates compared to free farrowing systems, as industry proponents of the crate claim? Secondly, if we assumed that piglet mortality was significantly higher in free farrowing systems, would this legitimise the use of farrowing crates?

*Do farrowing crates have significantly lower mortality rates?*

Arguably, a narrative has developed around the farrowing crate and its moral justification related to piglet mortality that is inconsistent with broader principles of ethics and law in animal health and welfare policy in the UK. These broader principles are to ensure the welfare needs of farmed animals and ethics based on the unnecessary suffering principle.<sup>187</sup> As describe in this report, UK law is fundamentally concerned with protecting the welfare interests of farmed animals. Related to this, any suffering that is caused to farmed animals must be considered to be “necessary”.

As discussed in this report, the welfare needs of pregnant and lactating sows kept in farrowing crates are clearly not met. Hence, the question is whether the suffering caused to sows kept in farrowing crates is in some sense necessary. In the UK, 40% of sows farrow outdoors, which has been called the “gold standard” of welfare for farrowing. DEFRA-funded research has led to free-farrowing systems that have comparable piglet mortality compared to the farrowing crate. Switzerland and Norway, which have banned crates outright, again have comparable levels of piglet mortality to UK indoor producers using farrowing crates. Therefore, the claim that farrowing crates are necessary to manage piglet mortality is problematic at best, and appears without foundations based on the evidence presented in this report.

---

<sup>187</sup> M. Radford, *Animal Welfare Law in Britain: Regulation and Responsibility* (Oxford, UK: Oxford University Press, 2001); Mike Radford, “Unnecessary Suffering”: The Cornerstone of Animal Protection Legislation Considered,” *Criminal law Review* (London, England) (1999).



*Would a higher piglet mortality in alternative farrowing systems justify the continued use of crates?*

Consider if farrowing crates were associated with significantly lower mortality rates. In this case, it might be claimed that the continued use of the crate would be justified on the basis that it was necessary for the welfare of the piglets. In this case, the question relates to the legitimacy of sacrificing the welfare of one farmed animal for the purported benefits of other animals. And this to an extent that the welfare needs of the sacrificed farmed animal are not met, and the crate is not compatible with the principles of the Animal Welfare Act.

Returning to the Brambell freedoms, it is clear from the language that the Brambell Committee were referring to the freedoms of a single animal: "An animal should at least have sufficient freedom of movement to be able without difficulty, to turn round, groom itself, get up, lie down and stretch its limbs." (Brambell Committee, p13)". Here, Brambell refer to "an animal", and "groom itself". Brambell is very much focused on the individual animal. In effect, the purported justification of farrowing crates as necessary for the benefit of piglet mortality, would be morally questionable even if it were the case that alternative systems could not deliver comparable levels of piglet mortality. Given the sacrifices of the sow's welfare involved, the justification for the farrowing crate is based on an ethic that is something more akin to that used in experimental research under the Animals Scientific Procedures Act, compared to the ethic of safeguarding animal welfare that is the fundamental principle of British farmed animal welfare law.



*FAWC accepts Banner's principle: Harms of a certain degree and kind ought under no circumstances to be inflicted on an animal*

Secondly, in FAWC's 2009 report, the Committee borrowed from the policy domain of research animals to propose that Government policy on farmed animals should be in accordance with Banner's principles.<sup>188</sup> In its report, FAWC states that "The most important ethical issue relating to farm animal welfare is the minimum acceptable treatment of farm animals. In addressing this, FAWC has accepted Banner's principles."<sup>189</sup> FAWC then cites Banner's principles in full:

- i) harms of a certain degree and kind ought under no circumstances to be inflicted on an animal;
- ii) any harm to an animal, even if not absolutely impermissible, nonetheless requires justification and must be outweighed by the good which is realistically sought in so treating it; and
- iii) any harm which is justified by the second principle ought, however, to be minimised as far as is reasonably possible.

Banner's principles were developed for the use of animals in research precisely because of the conflict in trading interests. In animal research, it is generally the nonhuman animal that is harmed, for the intended benefit of human society. Banner's first principle is categorically prescribing that there are some harms that should not be committed whatever the benefit that others (humans or animals) may accrue from it. I.e., Banner is setting an absolute moral prohibition on the limits to which we ought to harm animals. Banner's principles are highly relevant to the farrowing crate issue. Given that farrowing crates clearly do not meet the welfare needs of farrowing and lactating sows, they cause a severe harm to sows. Furthermore, given that sows are kept in crates for 35 days, two to three times each year, the harm is being committed for a prolonged duration of time.

---

<sup>188</sup> Farm Animal Welfare Council.

<sup>189</sup> *Ibid.*, ii.



Indeed, it is further evident that farrowing crates may violate Banner's second and third principles. It seems unclear that the harms committed to sows in farrowing crates are outweighed by the benefits accrued to piglets. Even if the farrowing crate were to be associated with higher mortality, the severe confinement and prolonged period of five weeks, would almost certainly cause a degree of suffering in the sow that outweighed that experienced over minutes or even hours by neonatal piglets prior to death. Furthermore, we might ask how the farrowing crate meets Banner's third principle? The farrowing crate is so basic and restrictive that there is no obvious way to reform it without abolishing it altogether and providing a bigger and more complex pen for the sow. Arguably, prohibiting the crate is itself a form of satisfying the third principle. Even in a much larger designed pen, there will remain harms committed to the sow (e.g., restriction of natural behaviours, removal of piglets at weaning). The space and environmental enrichment of a designed pen is in effect satisfying all three of Banner's principles. In contrast, the farrowing crate violates all three of them.

Farrowing crates must therefore be prohibited under Banner's first principle at least. Given the severity and the duration of the negative welfare impacts of farrowing crates on sows, this is a harm of a certain degree and kind to be considered as one which should not be committed under any circumstances. If one were to disagree with this proposition, one could very reasonably ask "what kinds of harms in the British farming industry were FAWC considering, when it proposed Banner's principles?"

### **Does an increase in cost of production justify farrowing crates for pigs?**

The above analysis finds that given the welfare needs of sows are not met, and that there is at best serious doubt as to whether they have a life worth living in a farrowing crate system, there should be an absolute prohibition on the farrowing crate. It therefore follows that any increase in the cost of production of pigmeat, and especially a relatively small one, is very much outweighed by the welfare benefits to the breeding sow, in particular to ensure her welfare needs are met and to give her a reasonable chance of a life worth living.



## Recommendations for reform

The report recommends the following:

1. Ban farrowing crates as soon as Parliamentary time permits, and within the 2022/23 session.
2. Permit a five year period for the British pig industry to transition to free farrowing, so the legislation is fully in force by 2027/28.
3. Fund the transition under the Animal Health and Welfare Pathway based on the public money for public goods principle.
4. The policy must be to transition to zero-confinement free farrowing and not permit the temporary crating of sows.
5. The Government must ensure equivalence of core standards for the import of pigmeat. I.e., import of pigmeat produced in farrowing crates must be prohibited. This will also drive welfare reforms abroad.

### 1. Ban on farrowing crates in the 2022/23 Parliamentary session

Farrowing crates do not and cannot meet the welfare needs of pregnant, farrowing, and lactating pigs. The degree of confinement is too severe to permit sows to turn around or walk. They cannot perform strongly motivated behaviours such as exploring their environment, rooting and digging.<sup>190</sup> Sows are crated for around five weeks and can be crated for seven weeks if they are used as nurse sows.<sup>191</sup> Given that sows are crated for five weeks each litter and deliver 2.3 litters per year, they spend around 22% of their breeding lives in severe confinement. The severity and duration of welfare impacts mean that the sow cannot have a life worth living whilst she is crated, and it is questionable whether she has one over the course of her lifetime.

---

<sup>190</sup> European Food Safety Authority.

<sup>191</sup> National Pig Association.



The fact that farrowing crates cannot provide for the welfare needs of pigs alone means that they must be prohibited as soon as possible. No husbandry system should be permitted if it cannot meet the welfare needs of the animals that are kept in it. This is the fundamental principle of the Animal Welfare Act, i.e., Section 9 confers a duty on keepers of animals to provide for the welfare needs of animals in their care.<sup>192</sup> The design of the farrowing crate, the degree of confinement that it causes, and the extent of the restriction of physiological and behavioural requirements means that farrowing crates simply cannot provide for the welfare needs of pigs. This is the case no matter how ubiquitous the crate has become in indoor pig production in the UK, the EU, and globally. Furthermore, the crate is incompatible with the principles of the Welfare of Farmed Animals (England) Regulations 2007.<sup>193</sup> Farrowing crates do not provide space appropriate for the physiological and behavioural needs of sows (Schedule 1), and pigs are not able to freely turn around in crates (Schedule 8). In effect, arguably farrowing crates are not compliant with the Animal Welfare Act 2006 and the Welfare of Farmed Animals (England) Regulations 2007.

The pig industry claims that the farrowing crate is necessary due to the issue of piglet mortality. But the critical period for piglet mortality is for 72 hours after birth.<sup>194</sup> Pigs are crated until weaning at around four weeks, way beyond the danger period for piglet mortality related to crushing. It is also claimed that alternative farrowing systems have higher levels of mortality. However, this report finds that this is not the case. DEFRA data from 2006-2021 shows that mean total piglet mortality is higher in indoor units (13.2) compared to outdoor units (11.9).<sup>195</sup> Recent live-born piglet mortality figures for the UK are 12.2%. Switzerland and Norway have both banned farrowing crates. Switzerland's live-born mortality rate is 11.1% and Norway's is 12.0%, both lower than the UK figure.<sup>196</sup> These figures are based on large scale commercial data demonstrating that indoor free farrowing systems are perfectly consistent with comparable, and even lower mortality rates, than delivered by the farrowing crate.

---

<sup>192</sup> [Animal Welfare Act](#).

<sup>193</sup> And parallel legislation in Scotland, Wales, and Northern Ireland.

<sup>194</sup> [Baxter and Edwards](#); [Marchant et al.](#)

<sup>195</sup> [Agriculture and Horticulture Development Board](#).

<sup>196</sup> [Baxter](#).



## 2. Five-year transition to genuine zero-confinement free farrowing

The farrowing crate causes significant suffering to around 60% of the UK's breeding sows. This translates to over 200,000 sentient and intelligent animals. There is therefore an urgency to prohibit the practice based on ensuring welfare needs of farmed animals. At the same time, the UK pig industry will require some time to transition to free farrowing. Legislation to prohibit farrowing crates should be implemented as soon as practically possible, and in the 2022-23 Parliamentary session. The ban should be phased in over a five-year period, so that the ban is fully in force in 2027/28. A sunset clause should be added to the Bill such that there are no unnecessary delays to these necessary reforms coming into force. The timing will parallel the EU's announcement to ban cages for farmed animals by 2027.<sup>197</sup> Furthermore, Germany and Austria have recently implemented bans on farrowing crates. In New Zealand, the courts ruled that farrowing crates are illegal under its Animal Welfare Act, and the Government announced a ban.<sup>198</sup> There is therefore significant movement to ban farrowing crates globally. The UK Government claims to be a leader in animal welfare. This report considers that banning farrowing crates is not a mark of leadership, but that it is a minimal requirement for any nation that professes concern about animal welfare. Nevertheless, the UK can hardly continue to consider itself a leader in animal welfare if it continues to permit the most severe form of confinement of farmed animals, when other nations have banned farrowing crates some time ago, or are in the process of doing so.

## 3. Animal Health and Welfare Pathway to fund transition under public money for public goods principle

Leaving the EU has enabled the UK to have its own agricultural policy. The Agriculture Act 2020 permits the minister to provide public funds for public goods, including animal welfare. Animal welfare is a key public good. The British public has demonstrated consistent concern for sentient animals in a range of contexts. A recent "End the cage age" petition received over one hundred thousand signatures and is to be debated in Parliament.<sup>199</sup> The "Piglet mortality" section of this report briefly described the basics of pig farming economics. Farmers aim to minimise inputs (capital, space, labour) and maximise outputs (pigmeat). The continued existence of the farrowing crate, despite it clearly not meeting the welfare needs of pigs, is explained by this simple equation.

---

<sup>197</sup> European Commission.

<sup>198</sup> Anon.

<sup>199</sup> UK Government and Parliament.



The “Economics of transitioning to free farrowing” section of this report described the farrowing crate and critiqued it in more depth. The crate is the absolute minimum in terms of space and resources. The sow, who has grown in recent decades, barely fits in her cage, let alone being able to turn around. She is kept on hard slatted flooring and not provided straw bedding for comfort. The metal bars that form the crate are designed with the minimum cost to simply keep the sow in position and enable piglets access to her teats as she lies confined.

Similarly, piglet mortality is a function of productivity and ultimately profit, which the pig farmer requires to continue trading. The pig industry looks to maximise pigs weaned per sow per year, which has a mean of 24.2 from 2006-2021 in the UK. The pig industry therefore looks to maximise pigs born per litter through genetics (also leading to bigger and heavier sows, and smaller and lighter piglets) and pigs weaned per litter. Hence, the economic costs of farming, in terms of capital and ongoing costs such labour and bedding, are minimised. The economic outputs, in terms of pigmeat, as pigs weaned per litter per year, is maximised. These costs are ultimately monetary and tangible costs that directly affect the farmer and consumer. But the great costs within the farrowing crate system are externalised to the sow. It is the sow who has been genetically selected for higher litter sizes. It is also the sow who is forced to live in a crate for five or more weeks for each litter, two to three times each year. She is without straw to keep her comfortable. She is unable to perform strongly motivated behaviours like nest building. She is even unable to interact with her piglets when they are born.

And this is being explained here because the farrowing crate, and abolishing it, is precisely what public money for public goods is for. The indoor pig industry, in the UK, the EU, and globally, has raced to the bottom in animal welfare. The farrowing crate, despite the obvious reality that it cannot provide for welfare needs of pigs, has become ubiquitous. In response to calls to reform the industry from animal protection NGOs and the British public, the industry replies that replacing crates is too expensive, and it would later be undercut by the import of cheaper pork from abroad, that had been reared in the very crates that the UK had banned.<sup>200</sup>

---

<sup>200</sup> Davis, Wilkins, and Barber.



The biggest opportunity for animal welfare presented by leaving the EU is reforming British farming outside of the Common Agriculture Policy (CAP).<sup>201</sup> Large amounts of money are spent in subsidies; around 50% of the EU total spend went to CAP. After Brexit, the Conservative Government passed the Agriculture Act 2020. Section 1 of the Act gives the DEFRA Secretary of State powers to give financial assistance for “protecting or improving the health and welfare of livestock”.<sup>202</sup> The Animal Health and Welfare Pathway is launching in 2022 and sets out reforms in the Agriculture Transition Plan. The Transition plan includes “the use of cages and crates” as an example of what might be improved through subsidies.

There are around 75,000 farrowing crate units in the UK. The AHDB reports that 4m<sup>2</sup> farrowing crates, including the buildings, cost £3,000-3,500 per place.<sup>203</sup> It states that the alternative pens cost an additional £2,000 for those with a 6m<sup>2</sup> footfall, and an additional £4,000 for those with an 8m<sup>2</sup> footfall. Providing precise economic figures is beyond the remit of this report and the following is intended as illustrative. As outlined above, there are very good economic reasons, related to externalities of costs, for the Government to provide public funds for the pig industry to transition to free-farrowing systems. If the Government were to pay half of the capital costs, then at the lower figures (capital cost £5,000 per crate) this would amount to £187.5 million, which would be £37.5 million spread annually across five years. At the upper end (capital cost £7,500 per crate) the figures would be £281 million, or £56 million annually across five years.

#### **4. Policy must be zero-confinement free farrowing and not permit temporary crating of sows**

Sweden (1988), Norway (2000), and Switzerland (1997/2007) have full bans on farrowing crates. Live-born piglet mortality in Switzerland is 11.1%, and in Norway is 12.0%.<sup>204</sup> Both nations deliver these performance figures without the use of temporary crating, demonstrating that free farrowing is consistent with comparable, and indeed lower, piglet mortality to the UK indoor average (12.2%). Temporary crating would be perceived by the British public as a continuation of cages for farrowing pigs. After the ban on barren battery cages came into force in the UK in 2012, the British public demonstrated its preference for non-cage eggs, and together with other nations the UK Government is now considering banning caged egg production entirely.

---

<sup>201</sup> McCulloch, “Brexit and Animal Welfare Impact Assessment: Analysis of the Opportunities Brexit Presents for Animal Protection in the UK, EU, and Internationally.”

<sup>202</sup> Agriculture Act 2020.

<sup>203</sup> Davis, Wilkins, and Barber.

<sup>204</sup> Baxter.



There is no good way to enforce the use of temporary crates, for instance if they were permitted for five days around the time of highest risk to piglets. Furthermore, pens with temporary crates have not been built with the biological needs, including welfare, of the pigs in mind.<sup>205</sup> If the Government were to ban conventional crates but permit temporary crating, it would be a poor use of public funds. The welfare benefits for the sow would be suboptimal and there is a good chance the public would continue to oppose the use of temporary crating. For the pig industry, a cage, which is becoming increasingly unpopular with the British and global consumer, would remain at the centre of its enterprise.

## 5. Ensure equivalence of core welfare standards for trade imports to ensure a level playing field for British farmers and drive welfare improvements abroad

The UK government rightly aspires to global leadership in animal welfare. The Government has repeatedly stated that it will ensure that welfare standards of imports are not below British standards in imports.<sup>206</sup> Government must ban farrowing crates to ensure the welfare of pregnant and lactating sows. But it must then prevent the import of pigmeat from abroad produced in crates. There is a global move toward nations and regions prohibiting the import of goods produced in lower welfare standards. Proposition 12 in California prohibits the import of products reared in close confinement.<sup>207</sup> The EU Commission has announced it will phase out cages by 2027 and is looking at policy on preventing the import of goods raised in lower welfare conditions.<sup>208</sup> In summary, the government must legislate for a complete ban on farrowing crates as soon as practicably possible. But it must also support the higher welfare standards of British farmers by preventing the import of pigmeat produced from lower standards abroad. This policy will also drive animal welfare improvements abroad.

---

<sup>205</sup> Baxter, Lawrence, and Edwards.

<sup>206</sup> Department for Environment Food and Rural Affairs, "Protecting Our High Food Standards," <https://deframedia.blog.gov.uk/2020/10/08/protecting-our-high-food-standards/>.

<sup>207</sup> Anon., "The EU and the US Pave the Way for a Ban on Cages Imposed on Imported Food," Eurogroup for Animals, <https://www.eurogroupforanimals.org/news/eu-and-us-pave-way-ban-cages-imposed-imported-food>.

<sup>208</sup> "Animal Welfare and Mirror Measures: Eurogroup for Animals Calls for Revised EU Animal Welfare Rules to Apply to Imports," Eurogroup for Animals, <https://www.eurogroupforanimals.org/news/animal-welfare-and-mirror-measures-eurogroup-animals-calls-revised-eu-animal-welfare-rules>.





Figure 19: Sows in a UK indoor farm using farrowing crates. Copyright Compassion in World Farming.



## References

[Agriculture Act 2020.](#)

Agriculture and Horticulture Development Board. "Pig Performance Trends and COP Sensitivity for Feed and Performance." <https://ahdb.org.uk/pig-performance-trends-and-cop-sensitivity-for-feed-and-performance>.

[Animal Welfare \(Kept Animals\) Bill 2022-23.](#)

[Animal Welfare Act.](#)

Anon. "Animal Welfare and Mirror Measures: Eurogroup for Animals Calls for Revised EU Animal Welfare Rules to Apply to Imports." Eurogroup for Animals, <https://www.eurogroupforanimals.org/news/animal-welfare-and-mirror-measures-eurogroup-animals-calls-revised-eu-animal-welfare-rules>.

Anon. "The EU and the Us Pave the Way for a Ban on Cages Imposed on Imported Food." Eurogroup for Animals, <https://www.eurogroupforanimals.org/news/eu-and-us-pave-way-ban-cages-imposed-imported-food>.

Anon. "New Zealand: Farrowing Crates for Pigs Are Unlawful." Pig Progress, <https://www.pigprogress.net/pigs/new-zealand-farrowing-crates-for-pigs-are-unlawful/>.

[Baxter, EM. "'Free' Farrowing." Aberdeen: Rural Policy Centre, Scotland's Rural College, 2022.](#)

Baxter, Emma, and Sandra Edwards. "360° Freedom Farrower™." <https://www.freefarrowing.org/farrowing-systems/temporary-crating/360-farrower/>.

Baxter, Emma, and Sandra Edwards. "Free Farrowing." <https://www.freefarrowing.org/>.

Baxter, Emma, and Sandra Edwards. "Outdoor Systems." <https://www.freefarrowing.org/farrowing-systems/outdoor-systems/>.

Baxter, Emma, and Sandra Edwards. "PigSAFE." <https://www.freefarrowing.org/farrowing-systems/individual-farrowing-pens/pigsafe/>.



Baxter, Emma M, Inger Lise Andersen, and Sandra A Edwards. "Sow Welfare in the Farrowing Crate and Alternatives." In *Advances in Pig Welfare*, 27-72: Elsevier, 2018.

Baxter, Emma M, and Sandra Edwards. "Optimising Sow and Piglet Welfare During Farrowing and Lactation." In *Understanding the Behaviour and Improving the Welfare of Pigs*, 121-76: Burleigh Dodds Science Publishing, 2021.

Baxter, Emma M, and Sandra A Edwards. "Piglet Mortality and Morbidity: Inevitable or Unacceptable?". In *Advances in Pig Welfare*, 73-100: Elsevier, 2018.

Baxter, Emma M, AB Lawrence, and Sandra A Edwards. "Alternative Farrowing Accommodation: Welfare and Economic Aspects of Existing Farrowing and Lactation Systems for Pigs." *Animal* 6, no. 1 (2012): 96-117.

BBC News. "Pigs Can Play Video Games with Their Snouts, Scientists Find." BBC News, <https://www.bbc.co.uk/news/technology-56023720>.

Birch, Jonathan, Charlotte Burn, Alexandra Schnell, Heather Browning, and Andrew Crump. "Review of the Evidence of Sentience in Cephalopod Molluscs and Decapod Crustaceans." London: LSE, 2021.

Birch, Jonathan, Alexandra K Schnell, and Nicola S Clayton. "Dimensions of Animal Consciousness." *Trends in cognitive sciences* 24, no. 10 (2020): 789-801.

Boyle, LA, FC Leonard, PB Lynch, and P Brophy. "Effect of Gestation Housing on Behaviour and Skin Lesions of Sows in Farrowing Crates." *Applied Animal Behaviour Science* 76, no. 2 (2002): 119-34.

BPEX. "Pig Health and Welfare: A Vision for 2020." Stoneleigh: BPEX, 2011.

Brambell, F. W. R., D. S. Barbour, M. B. Barnett, T. K. Ewer, A. Hobson, H. Pitchforth, W. R. Smith, W. A. Thorpe, and F. J. W. Winship. "Report of the Technical Committee to Enquire into the Welfare of Animals Kept under Intensive Livestock Husbandry Systems." London, UK: HM Stationery Office, 1965.

Broom, D. M. "Animal Welfare in the European Union." Brussels: European Parliament Committee on Petitions, 2017.



Cohen, Hagit, Michael A Matar, and Zohar Joseph. "Animal Models of Post Traumatic Stress Disorder." *Current Protocols in Neuroscience* 64, no. 1 (2013): 9.45. 1-9.45. 18.

Compassion in World Farming. "End the Cage Age for All the UK's Farm Animals." <https://action.ciwf.org.uk/page/73106/petition/1?locale=en-GB>.

Compassion in World Farming. "End the Cage Age: Our Campaign to Stop Caged Farming." <https://www.endthecageage.eu/>.

Compassion in World Farming. "End the Cage Age: Why the EU Must Stop Caging Farm Animals." Godalming, Surrey: Compassion in World Farming, 2020.

Compassion in World Farming. "Scientific Briefing on Caged Farming: Overview of Scientific Research on Caged Farming of Laying Hens, Sows, Rabbits, Ducks, Geese, Calves and Quail." Godalming, Surrey: Compassion in World Farming, 2021.

Croney, Candace C., and Sarah T. Boysen. "Acquisition of a Joystick-Operated Video Task by Pigs (*Sus Scrofa*)." *Frontiers in Psychology* 12 (2021).

Davis, Carol, Bethan Wilkins, and Claire Barber. "Evidence Report: Comparing the Potential Implications of Widespread Use of Different Farrowing Systems in the British Pig Sector ". Stoneleigh: Agriculture and Horticulture Development Board, 2020.

Department for Environment Food and Rural Affairs. "Action Plan for Animal Welfare." London: Department for Environment, Food and Rural Affairs, 2021.

Department for Environment, Food and Rural Affairs. "Code of Practice for the Welfare of Pigs." London, 2020.

Department for Environment, Food and Rural Affairs. "The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024." London: Department for Environment Food and Rural Affairs, 2020.

Department for Environment, Food and Rural Affairs. "Protecting Our High Food Standards." <https://deframedia.blog.gov.uk/2020/10/08/protecting-our-high-food-standards/>.

Edwards, Sandra, and Emma Baxter. "The PigSAFE Project: Developing an Alternative to the Farrowing Crate Final Summary Report – October 2012." 2012.



European Commission. "Questions and Answers: Commission's Response to the European Citizens' Initiative on "End the Cage Age"." [https://ec.europa.eu/commission/presscorner/detail/en/QANDA\\_21\\_3298](https://ec.europa.eu/commission/presscorner/detail/en/QANDA_21_3298).

European Food Safety Authority. "Animal Health and Welfare Aspects of Different Housing and Husbandry Systems for Adult Breeding Boars, Pregnant, Farrowing Sows and Unweaned Piglets Scientific Opinion of the Panel on Animal Health and Welfare." EFSA Journal 5, no. 10 (2007): 572.

European Parliament. "Briefing: The EU Pig Meat Sector." Brussels: European Parliament, 2020.

Farm Animal Welfare Committee. "Opinion on Free Farrowing Systems." Farm Animal Welfare Committee, 2015.

Farm Animal Welfare Council. "Farm Animal Welfare in Great Britain: Past, Present and Future." London: Farm Animal Welfare Council, 2009.

FarmingUK. "All Major Retailers to Go Cage-Free by 2025." Farming UK, [https://www.farminguk.com/news/all-major-retailers-to-go-cage-free-by-2025\\_42707.html](https://www.farminguk.com/news/all-major-retailers-to-go-cage-free-by-2025_42707.html).

FarmingUK. "Free Range Now Accounts for Two Thirds of UK Egg Production." Farming UK, [https://www.farminguk.com/news/free-range-now-accounts-for-two-thirds-of-uk-egg-production\\_59376.html](https://www.farminguk.com/news/free-range-now-accounts-for-two-thirds-of-uk-egg-production_59376.html).

Free Farrowing. "Country Roundup." [https://www.openagrar.de/receive/openagrar\\_mods\\_00073456?lang=en](https://www.openagrar.de/receive/openagrar_mods_00073456?lang=en).

Goumon, Sébastien, Gudrun Illmann, Vivi A Moustsen, Emma M Baxter, and Sandra A Edwards. "Review of Temporary Crating of Farrowing and Lactating Sows." *Frontiers in Veterinary Science* (2022): 169.

Guy, JH, PJ Cain, YM Seddon, EM Baxter, and SA Edwards. "Economic Evaluation of High Welfare Indoor Farrowing Systems for Pigs." *Animal Welfare-The UFAW Journal* 21, no. 1 (2012): 19.

HC Deb. "Animal Welfare (Kept Animals) Bill (Fifth Sitting)." Hansard, no. col 178 (18 November 2021).



HD Deb. "Caging of Farm Animals." Hansard 673, no. col 253WH (16 March 2020).

HC Deb. "Engagements." Hansard 667, no. col 365 (10 March 2019).

HC Deb. "Pig Husbandry (Farrowing)." Hansard 690, no. col 896 (10 March 2021).

Jarvis, Susan, Richard B D'Eath, Sheena K Robson, and Alistair B Lawrence. "The Effect of Confinement During Lactation on the Hypothalamic–Pituitary–Adrenal Axis and Behaviour of Primiparous Sows." *Physiology & behavior* 87, no. 2 (2006): 345-52.

Jensen, P. "Maternal Behaviour of Free-Ranging Pigs. I. Results of a Three-Year Study." Swedish University of Agricultural Sciences, Faculty of Veterinary Medicine, Department of Animal Hygiene, Skara, Report 22 (1988).

Jensen, Per. "Maternal Behaviour and Mother—Young Interactions During Lactation in Free-Ranging Domestic Pigs." *Applied animal behaviour science* 20, no. 3-4 (1988): 297-308.

Jensen, Per. "Nest Site Choice and Nest Building of Free-Ranging Domestic Pigs Due to Farrow." *Applied Animal Behaviour Science* 22, no. 1 (1989): 13-21.

Johnson, Anna K, and Jeremy N Marchant-Forde. "Welfare of Pigs in the Farrowing Environment." In *The Welfare of Pigs*, 141-88: Springer, 2009.

Knight, Andrew. "Uncaging New Zealand's Sows: Scrutinizing Farrowing Crates." Wellington, New Zealand: SAFE for Animals, 2018.

Marchant, J. N., A. R. Rudd, M. T. Mendl, D. M. Broom, M. J. Meredith, S. Corning, and P. H. Simmins. "Timing and Causes of Piglet Mortality in Alternative and Conventional Farrowing Systems." *Veterinary Record* 147, no. 8 (2000): 209-14.

Marino, Lori, and Christina M Colvin. "Thinking Pigs: A Comparative Review of Cognition, Emotion, and Personality in *Sus Domesticus*." *International Journal of Comparative Psychology* (2015).

Mason, G. J. "Stereotypies and Suffering." *Behavioural Processes* 25, no. 2 (1991/12/01/ 1991): 103-15.

McCulloch, S. P. "Brexit and Animal Welfare Impact Assessment: Analysis of the Opportunities Brexit Presents for Animal Protection in the UK, EU, and Internationally." *Animals* 9, no. 11 (2019): 877.

McCulloch, S. P. "Brexit and Animal Welfare Impact Assessment: Analysis of the Threats Brexit Poses to Animal Protection in the UK, EU and Internationally." *Animals* 9, no. 3 (2019): 117.

McCulloch, S. P.. "The British Animal Health and Welfare Policy Process: Accounting for the Interests of Sentient Species." University of London, 2015.

McCulloch, S. P. "A Critique of FAWC's Five Freedoms as a Framework for the Analysis of Animal Welfare." [In English]. *Journal of Agricultural and Environmental Ethics* 26, no. 5 (2013/10/01 2013): 959-75.

McCulloch, S. P., and M. J. Reiss. "The Development of an Animal Welfare Impact Assessment (AWIA) Tool and Its Application to Bovine Tuberculosis and Badger Control in England." *Journal of Agricultural and Environmental Ethics* (August 19 2017).

Muns, R, J Malmkvist, MLV Larsen, D Sørensen, and LJ Pedersen. "High Environmental Temperature around Farrowing Induced Heat Stress in Crated Sows." *Journal of Animal Science* 94, no. 1 (2016): 377-84.

National Pig Association. "NPA Briefing on Farrowing Crates." Warwickshire: National Pig Association, 2021.

NAWAC. "Sweden Pig Farrowing Crates Discussion." New Zealand: NAWAC, 2021.

Nowland, Tanya Louise, William Hendrik Ernest John van Wettere, and Kate Joanna Plush. "Allowing Sows to Farrow Unconfined Has Positive Implications for Sow and Piglet Welfare." *Applied Animal Behaviour Science* 221 (2019): 104872.

Ocepek, Marko, and Inger Lise Andersen. "What Makes a Good Mother? Maternal Behavioural Traits Important for Piglet Survival." *Applied animal behaviour science* 193 (2017): 29-36.

Pedersen, ML, VA Moustsen, MBF Nielsen, and AR Kristensen. "Improved Udder Access Prolongs Duration of Milk Letdown and Increases Piglet Weight Gain." *Livestock science* 140, no. 1-3 (2011): 253-61.



- Phillips, C. J. C., and S. McCulloch. "Student Attitudes on Animal Sentience and Use of Animals in Society." *Journal of Biological Education* 40, no. 1 (2005): 17-24.
- Radford, M. *Animal Welfare Law in Britain: Regulation and Responsibility*. Oxford, UK: Oxford University Press, 2001.
- Radford, Mike. "'Unnecessary Suffering': The Cornerstone of Animal Protection Legislation Considered." *Criminal Law Review* (London, England) (1999): 702-13.
- Royal Society for the Prevention of Cruelty to Animals. "RSPCA Welfare Standards for Pigs." Horsham, 2016.
- RSPCA Assured. "Pig Rearing Systems and Pork Labels." <https://www.rspcaassured.org.uk/farm-animal-welfare/pigs/pig-rearing-systems-and-pork-labels/>.
- . "Pigs." <https://www.rspcaassured.org.uk/farm-animal-welfare/pigs/>.
- Scotland's Rural College. "Outdoor Pig Husbandry: A Stockperson's Guide to Farrowing." Aberdeen: Scotland's Rural College, 2019.
- Soil Association. "Soil Association Standards Farming and Growing." Bristol: Soil Association, 2021.
- Stolba, Alex, and David Granger Marcus Wood-Gush. "The Behaviour of Pigs in a Semi-Natural Environment." *Animal Science* 48, no. 2 (1989): 419-25.
- Telkänranta, Helena, and Sandra A Edwards. "Lifetime Consequences of the Early Physical and Social Environment of Piglets." In *Advances in Pig Welfare*, 101-36: Elsevier, 2018.
- UK Government and Parliament. "End the Cage Age for All Farmed Animals " HMG, <https://petition.parliament.uk/petitions/593775>.
- UK Parliament. "Pig Husbandry (Farrowing) Bill." <https://bills.parliament.uk/bills/2844>.
- UK Parliament. "Pigs: Animal Welfare." <https://questions-statements.parliament.uk/written-questions/detail/2020-02-03/11510>.



Weber, R, NM Keil, M Fehr, and R Horat. "Piglet Mortality on Farms Using Farrowing Systems with or without Crates." *Animal Welfare* 16, no. 2 (2007): 277.

Weber, Roland, Joan-Bryce Burla, Manuel Jossen, and Beat Wechsler. "Piglet Losses in Free-Farrowing Pens: Influence of Litter Size." *Agrarforschung Schweiz* (2020): 53-58.

Weber, Roland, Nina M Keil, Max Fehr, and René Horat. "Factors Affecting Piglet Mortality in Loose Farrowing Systems on Commercial Farms." *Livestock Science* 124, no. 1-3 (2009): 216-22.

[The Welfare of Farmed Animals \(England\) Regulations 2007.](#)

[World Animal Protection.](#) "Farming Pigs and Future Proofing for a Crate-Free Era: The Global Business Case for Loose Sows for Indoor Farrowing and Lactation." London: World Animal Protection, 2021.

Yun, J, KM Swan, Kirsi Vienola, YY Kim, C Oliviero, OAT Peltoniemi, and A Valros. "Farrowing Environment Has an Impact on Sow Metabolic Status and Piglet Colostrum Intake in Early Lactation." *Livestock Science* 163 (2014): 120-25.

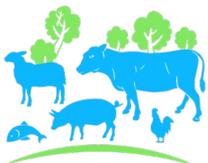


Steven McCulloch  
Senior Lecturer in Human-Animal Studies  
Centre for Animal Welfare,  
University of Winchester,  
UK.  
[Steven.McCulloch@winchester.ac.uk](mailto:Steven.McCulloch@winchester.ac.uk)

Steven McCulloch is Senior Lecturer in Human-Animal Studies at the Centre for Animal Welfare, University of Winchester. Steven qualified as a veterinary surgeon from the University of Bristol and holds a BA Philosophy from Birkbeck College, University of London. He has a PhD from the Royal Veterinary College, University of London, for his thesis "The British animal health and welfare policy process: accounting for the interests of sentient species". He is a diplomat of the European College of Animal Welfare and Behavioural Medicine and a recognised European veterinary specialist in Animal Welfare Science, Ethics and Law. Steven's research is focused on the science, ethics, and policy of animal protection.



Front cover image copyright Compassion in World Farming.



**Conservative  
Animal Welfare  
Foundation**