HEN
TURKEY
SEABASS
SOW
CHICKEN
SHEEP
RABBIT

NO [ANIMAL] LEFT BEHIND

COW
TROUT
QUAIL
DUCK
PIGLET
GOOSE
GOAT
SALMON
CALF
BEAR

PHASING OUT CAGES IN THE EU: THE ROAD TO A SMOOTH TRANSITION

EUROGROUP FOR ANIMALS

Phasing out cages in the EU: the road to a smooth transition

Executive summary

"Have no fear"

This quote from one of the farmers interviewed for a survey on sow farmer satisfaction[12] highlights the overwhelming sentiment of producers who have transitioned to cage-free farming. **It is simply worth it.**

Many producers, retailers and food manufacturers across the EU have already embraced society's call to 'End the Cage Age'. This report summarises numerous interviews with stakeholders involved in all different stages of the supply chain, and elements of three of the most farmed terrestrial species in the EU: **sows, rabbits, and laying hens**, along with scientific evidence to support and sometimes contrast the many different perspectives and opinions gathered.

The interviewed stakeholders highlighted the impacts of transitioning for them and the European Union. They also discussed important challenges and bottlenecks that must be addressed and mitigated to avoid stalling the EU transition from caged farming, and provide a smooth and efficient process leading to a cage-free future.

Each section is concluded with recommendations for the species-specific transition timeline. These recommendations are based on the numerous interviews and data sought during this study, as well as evidence from the scientific literature on this subject. The analysed scientific evidence and practical experiences of producers point to the conclusion that **the majority of systems can undergo a sustainable transition within three to five years.**

The financial impact of transitioning to cage-free farming is very much a reality for producers. New buildings or the refurbishing of old ones bring new investments. Moreover, the requirement for more space leads to higher production costs, as fewer animals are kept in pre-existing buildings, which in turn may reduce production levels overall. On an individual level, most producers are happy to downsize the number of animals farmed, but they need to be guaranteed a fair price for their product. This leads to the conclusion that **fair prices for these products are indispensable to ensure a smooth transition to cage-free farming.**

The impacts on the individual animals being farmed were also discussed, including health, mortalities, and productivity. **Many producers reported successful solutions to obtain lower or equal mortality rates in the new systems, and the numerous welfare benefits were evident.**

The lack of financial support for transitioning was highlighted as a major issue, with multiple calls for increasing financing on EU level. Obtaining the environmental permits to build or renovate facilities were also reported as the main bottleneck for a swift transition. These impacts are more significant for sows, as it is advisable for farm owners to build purpose-built premises for free-farrowing. Stakeholders reported that permits take around two to three years on average. **This can be mitigated by the Commission and Member States, as streamlining this process can significantly and positively impact the transition.**

Producers and science both point to the need for sufficient financial support to ensure a smooth transition. The welfare benefits of cage-free farming are extensively documented, and farmer satisfaction is immensely improved when using cage-free systems. European consumers support the transition both in polls (EU Barometer 2016) and when choosing higher welfare products at the supermarket. It is clear that the transition must happen in a sustainable way, and that European producers are ready. This report explains how to address this crucial change.

Species 1

SOWS

1. Current national status

Sows	
The EU	In 2001, the EU agreed to the Pigs Directive (2008/120/EC)[1] , which gave Member States until January 1 2013 to transition to group housing for gestating sows (other than four weeks post-insemination and one week before the expected time of farrowing). All newly built, rebuilt or newly commissioned buildings have had to comply with partial group housing since 2003.[1]
Sweden	Between 1988 and 1994, the prolonged use of sow stalls and farrowing crates was only acceptable for up to one week (CIWF, 2000). Sweden then banned sow stalls and farrowing crates entirely in 1994, and reinforced the ban recently in the Animal Welfare Act 2018 1192 and its Ordinance 2018:66.[2] Under SJVFS 2010:15 (L 100), sows who are aggressive towards young can be placed in temporary cages, but only if there is a risk to the piglets. There are no time constraints in place, but it states that before farrowing that a sow must have space within farrowing crates to perform nest-building behaviours (Baxter et al., 2022).
The Netherlands	Since 1998, producers have gradually moved towards group housing systems.[3] From January 2013, the Netherlands restricted the use of sow stalls to four days after insemination.

[1] Council Directive 2008/120/EC of 18 December 2008 laying down minimum standards for the protection of pigs
[2] Sweden Animal Welfare Act (2018:1192)
[3] Pig Progress: Mixing sows into groups only days after AI

The United Kingdom	Sow stalls were completely banned in 1999. Group housing is also mandatory in the UK[4]. Approximately 40% of sows farrow outdoors[5], and many more pigs are reared and finished outdoors[6]. However, the remaining 60% are kept in farrowing crates[7] for about five days before farrowing and then up to 28 days afterwards. There have been attempts to ban the use of farrowing crates in 2020 through the Agriculture Bill[8] (rejected). In 2021, there was another attempt to do so through the Pig Husbandry (Farrowing) Bill[9].
Germany	Germany has committed to phasing out sow stalls by 2029, and limiting the use of farrowing crates to five days from 2036. The regulation that set out the deadlines for banning sow stalls was passed on July 3 2020.[10] Tierschutz-Nutztierhaltungsverordnung, August 22 2006 (BGBI i.s. 2043), which was last amended by Article 1a of the Ordinance of January 29 2021 (BGBI, I.S.146) states that temporary crates may be used for up to a maximum of five days; however, this includes the time a sow farrows. The regulations also state that the pens must be hazard-free when designed so that no harm comes to a sow when an operator retrieves piglets (Baxter et al., 2002). According to Tierschutz Akademie, few producers are currently transitioning, as there is considerable insecurity with the German government changing the requirements too frequently. Most farmers do not want to transition too soon, only for the requirements to change.

[4] Defra: Caring for pigs
[5] RSPCA: Farming pigs
[6] AHDB: Outdoor pig production
[7] CAWF: Banning farrowing crates in the UK
[8] NPA: Bid to ban farrowing crates through Agriculture Bill rejected
[9] GOV. UK: Pig Husbandry (Farrowing) Bill
[10] CIWF: Germany bans sow stalls

Austria	In 2013, a partial ban on sow stalls came into effect, which meant that stalls were only permitted for the first ten days after insemination.[11] Farrowing crates will be prohibited by 2033, but under Tierhaltungsverordnung verlautbart (ThVO), Federal Law Gazette II No. 485/2004, amended by Federal Law Gazette II, sows may still be placed in temporary crates, but only during "critical periods of the piglet's life". There is no time constraint for this (Baxter et al., 2022).
Denmark	A ban was put in place preventing sow stalls from being built in new housing from January 1 2015. By 2035, the use of sow stalls will be banned in all housing (CIWF, 2022). According to an interview with the SEGES Danish Pig Research Centre and Danish Agriculture & Food Council, Denmark is one of the front-running countries on free farrowing systems, as back in 2014, there was an industry goal for 10% of sows to be free farrowing by 2020.[13] Unfortunately, the financial crisis hit, and the farmers could not access the money to invest in the transition. In 2023, 4% of sows are in free farrowing systems. It is important to note that Denmark's definition of free farrowing includes temporary confinement, as many of the farmers confine the sows for the first four days following farrowing, and most also confine sows after insemination. The industry scheme resulted in a state-controlled animal welfare label called 'Better Animal Welfare'. It is a tiered system of one - three hearts depicting increasing levels of animal welfare. The one and two-heart tiers permit temporary confinement of the sow for farrowing, and three hearts are for extensive systems. Denmark has also had a series of new development programmes where farmers can get 40% of their investment into free farrowing systems financed. According to the interview with the SEGES, the last award was so popular it was over-subscribed, and the SEGES are approaching the Government for more funding.

[11] Pig Progress: Only 13 countries sow stall ban compliant

[12] Focus Tierwohl: Focus on farrowing systems – exercise pens or free farrowing?!

[13] Landbrug & Foedevarer: Vision 2050

	Lastly, Denmark released another industry initiative that means that from 2023, all sows in new-build facilities will be loose-housed.
Switzerland	In Switzerland, the use of farrowing crates is prohibited. However, under the Animal Protection Ordinance 455.1 and the Ordinance on Keeping of Livestock and Pets 455.110.1, sows may be placed in temporary crates if there is a risk to the piglets. The maximum length of time a sow may be confined is from the moment they start nesting to three days after giving birth (Baxter et al., 2022).

1.1 Timelines for producers who have transitioned, or are undergoing a transition

Producer	Start date/ Date of pledge	Actual/ Forecasted completion date (by)	Transition time	Additional information
Producer 1	2011/2013	2011-2013 two experimental, then transitioned fully to alternative systems	2 years experimental 1 year transition for further 80 sows	Producer one trialled two experimental pens for two years before transitioning a further 80 sows into free farrowing. They then continued to transition the rest of the farm over the following years.
Producer 2	2008 (planning)	Jan 2013 (ready to move into)	5 years including planning	Building work began in 2012, and the whole system was ready for the 1315 sows to move into in January 2013.
Bodman's Farm	2010	2013	3 years	Using the PigSAFE system, the Bodman Farm installed 20 pens into his new shed, which was ready for production in 2013.[14]

[14] World Animal Protection: Leading the way. Global pig producers say no to sow stalls

Les Viandes DuBreton	2015	2018	3 years	In 2015 DuBreton committed to raising 300,000 pigs to a high welfare standard by 2018 and exceeded their target by 40,000.
Fumagalli Salumi	2012	Ongoing		They began around 2012, converting existing farms, and now have 50% free farrowing systems. They want to transition the remaining ones but are waiting to see what the legislation is to feel secure in their investments/ direction.

For detailed descriptions of the transition process of different producers, see producer case studies in Annex I.

2. Impacts of transitioning

This section describes several factors that can be impacted (positively or negatively) or not by the transition to cage-free systems (free farrowing and group housing during gestation). Factors featured range from financial, to worker and animal satisfaction as well as the impact on number of animals and product quality.

2.1. Financial

2.1.1. Investment costs

The initial investment of a free farrowing facility is higher than the conventional crate system. This increase is mainly connected with an increase in the need for space as well as greater robustness of the material.

As with any investment in facilities for animal rearing, it has to consider not only the installation costs but also the space requirements, running costs, performance, and efficiency (Baxter et al., 2022; Guy et al., 2012). For example, in one estimate based on data collected from equipment manufacturers and producer group technicians in 2017, the purchase and installation of free farrowing pens cost on average €1,330 more per pen (based on a maternity block for 40 sows), compared with conventional crates (Ramonet et al., 2018). In addition, Ramonet et al. estimated that the intangible costs of electricity, ventilation and labour would increase by €70-€90 per pen. In total, the investment was estimated to be 33% higher for a free farrowing pen, compared to a conventional crate, due to the requirement of more space and the need for equipment to be more robust (Ramonet et al., 2018). According to The National Association of Pig Producers in Spain (ANPROGAPOR), a new farrowing pen costs between €5,000 to €7,000. These figures are based on the free farrowing pen size only being 6.25m^2, which is now considered by EFSA, and other scientists, to be insufficient (EFSA, 2022). In France, according to the Institut du Porc (IFIP), using 2022 prices, it would cost €5,193 per sow to create a 6.5m^2 farrowing pen, €5,424 for a 7m^2 one, €5,701 for 7.5m^2, and €5,975 for an 8m^2 pen (IFIP, 2022). For boars, it would cost €1,138 per boar for a 2.25m^2 pen and €1,422 for a 3.5m^2 pen (IFIP, 2022). These can be partially offset by premiums, discussed in detail in chapter 2.1.3. of this report.

2.1.2. Production costs

The impact of transition on production costs varies in terms of whether the producer has transitioned an existing building or built a new one designed for free farrowing and whether they have maintained, decreased, or increased their herd size.

In one modelling exercise, Guy et al. compared the production costs of a conventional crate (4.3m^2) with two free farrowing systems of 6m^2 and 8.9m^2. They found that if there were equitable production across the systems, **the free farrowing systems would only increase costs by 1.7% and 3.5%, respectively** (Guy et al., 2012). Most of the stakeholders interviewed commented **that the additional space per sow had the greatest impact on production costs**, as there is more space to heat and clean. Producer one, for example, said that the cost of iron provision and feed had not changed, but as they had a larger space to heat and fewer bodies in it, they had to spend more on heating costs. Similarly, SEGES also said that energy costs are higher for free farrowing systems because it costs more to heat the larger building, mainly because there are fewer sows. **This can be mitigated at the point of sale, providing the farmer is paid a fair price. The SEGES said that in Denmark, the increases in labour, energy, and the additional investment for free farrowing systems work out as an extra €2 per pig.** Fumagalli Salumi also commented on the increased production costs of free farrowing systems and said that their increased costs were partly because of their reduced herd size (20-25%), as the building is no longer able to house as many pigs.

2.1.3. Profits, premiums, and covering costs

The overarching conclusion drawn from the interviews is that producers would like to see more governmental support for higher welfare products - a clear labelling scheme enabling consumers to make informed decisions and financial support to offset the costs of transitioning. Overall the testimonies provided highlight the need for financial assistance at EU level for the transition.

A clear scenario arose from the interviews: several factors are at the moment affecting the pork industry, which is taking the value paid for pork to a very low level. At the same time, interviewees also reported the importance of having a buyer that

provides and commits to a long term premium for the investment, and how they struggle to obtain that type of commercial partnership.

Poor prices for pork was a significant theme in the interviews. According to Tierschutz Akadamie, prices are currently extremely low, following the effects of the African Swine Fever which crashed pork prices several years ago. The rising production costs also exacerbate the low pork prices in terms of feed, energy and substrates.

Regarding producers who have already transitioned, many report needing more certainty that their investments will be offset by market premiums or through other ways.

For example producer two only benefitted short-term from a Danish certification scheme until the supermarket no longer wanted that line of products (due to only two lines being available). Producer two benefitted from a 10% additional premium from this programme, which did cover the additional costs of producing pork in this way. They now get some premiums for exporting to the UK and California, but it does not cover the cost difference.

The SEGES also commented that producers would not get their investment into transitioning back from the market. Fumagalli Salumi said that they have some market for their higher welfare product but that consumers need to understand the real costs of animal welfare, which is hard to communicate (e.g. the need for better feed, increased management etc.).

2.2. Health and productivity

2.2.1. Free farrowing

A well-designed free farrowing system managed by skilled staff has been proven, both in research and commercial conditions, to provide the same performance levels as conventional farrowing crate systems (Baxter et al., 2022).

Sow behaviour

Overall the producers interviewed reported calmer and more content sows, which matches the current research that demonstrates lower levels of stress and frustration for non-confined sows.

The behaviour of the sow can change in free farrowing systems, and many comment that **they are calmer when not in the crates and more careful when lying down** (Grimberg-Henrici, 2018). For example, producer one from the Netherlands feels that the sows in their free farrowing system are much quieter and more relaxed than in the conventional crate system. **They commented that the sows were more alert and less relaxed in the farrowing crates.** Others report similar observations. For example, Baxter quotes a Danish producer, who said that the "sows are calm and quiet; staff can perform their routines efficiently and move on to the next batch… There is no disturbance, it is a comfortable place to work for staff and for pigs" (Baxter et al., 2022). Fumagalli Salumi also said that providing the sow is given nesting material to fulfil her need to nest build; she is generally calm and content. **They said that a sow takes nest building very seriously and won't eat for 24 hours when doing so, so enabling her to nest build is important for keeping her calm.** A pig producer from Sweden supported this in her presentation at the Free Farrowing Congress and said that now that she uses straw bedding, the sows are much calmer as they can make nests from the straw.[15]

The genetic traits of the sow may also influence this positive effect. For example, studies have found that the traits; of calmness, less aggressiveness, and better mothering are associated with more successful litters (Rydhmer, 2021) (see also section 4.2). **A German pig producer also commented in his presentation at the Freedom Farrowing Congress that because the farrowing pens are arranged in a way that enables the sows to maintain social contact even in the farrowing barn, they see a positive effect on levels of fighting when they are group-housed.**[16] In particular, he reported having very little fighting amongst the sows.

FInally, Fumagalli Salumi commented on how allowing the sow to be free with her piglets also allows her to behave more naturally. For example, **they said the sow will**

[15] FFL21: Change experiences by a Swedish farmer
[16] FFL21: Change experience by a German farmer

call her piglets to feed when in the free farrowing system, whereas she doesn't do that in the conventional stalls.

Assisting the sow during birth

Highly prolific breeds are still a common place in pork production. These lead to a greater need for assistance during birth. Free farrowing systems have demonstrated less need for assistance during birth . Nevertheless, when using breeds that may need more birth assistance, this can be a greater challenge in free farrowing systems.

One of the key factors in terms of the farrowing experience when sows are not confined, is that it is harder for the producer to go in and assist their sows. This can affect mortality rates, which is a concern for producers, and often why some producers wish to maintain confinement for the first few days following farrowing. **However, the need to assist the sow is the result of the selection pressure for higher birth weights in piglets and larger litter sizes and is not necessarily from the farrowing system in itself.** Producer one reported in their interview that they tend to breed for lighter birth weights from their non-confined sows to ease farrowing.

Studies show, however, that free farrowing sows may require fewer interventions than conventionally housed sows. This is because they have reduced inter-birth intervals (EFSA, 2022), show fewer pain-related behaviours during farrowing (Nowland et al., 2019), and have fewer postpartum health disorders (Egli et al., 2022).

Sow health

Farrowing systems provide a greater opportunity for sows to develop a healthier musculoskeletal system.

Producer two observed positive changes in their sows compared with farrowing crates. **In particular, the sows are in better condition (muscles and health) at weaning and achieve good breeding results that are higher than the average for traditional Danish systems.** Producer two also said that as his sows can exercise, they are in better shape when they go back into the farrowing house." He also reports

fewer shoulder and back ulcers in the free farrowing sows, as they are not lying down all the time.

Piglet weaning weights

Science and producers agree, free farrowing systems lead to higher piglet weaning weight.

According to the **Danish Agriculture and Food Council, the weaning weight of piglets in free farrowing systems is higher than in conventional systems**, as the piglets have better access to the teats, and so there is a positive impact of increased weight. Scientific studies have supported this observation (Pedersen et al., 2011), and it is thought to be because the sow can select her lying location and position herself more naturally for optimum suckling (Kinane et al., 2021). In their study, Kinane et al. observed that the piglets visited the teats more often and had fewer teat fights in the free farrowing pens compared with the conventional crates. Furthermore, milk letdown lasts, on average, 1.8 seconds longer in sows who are free to move, and as a result, fewer piglets miss it when in free farrowing systems than in conventional crates (Pedersen et al., 2011).

Consequently, this all results in improved pre-weaning growth rates and heavier weaning weights (Kinane et al., 2021). This can positively impact the later stages, as weaning weight is an important predictor of performance in pigs, and heavier weaning weights are associated with improved growth rates and, thereby, reduced days to slaughter (Rooney et al., 2019; Wolter & Ellis, 2001). It is still unclear whether these improved pre-weaning rates continue beyond weaning, but if they do, this would be an important advantage for overall productivity (Kinane et al., 2021).

Piglet mortality rates

With the right management, it is entirely possible to keep mortality rates low at a comparable rate then conventional systems.

As mentioned previously, there are multiple factors involved in piglet mortality rates. **Studies have shown that mortality rates are often the same in pens as in conventional crates** and that the causes of death tend to differ (Kinane et al., 2021; Melišová et al., 2014; Weber et al., 2007). Kinane et al. (2021) found that fewer piglets died from hunger in free farrowing systems than in conventional crates. And Weber et al. (2007) also concluded that mortality rates were similar across conventional and loose farrowing systems, but piglets in conventional systems were more likely to die from other causes.

Piglet mortality in farms may happen for multiple reasons, including crushing, the loss of less vital piglets, and general poor health in the litter. Crushing is often considered the most common cause of mortality in free farrowing systems. However, research suggests that piglets are often incorrectly thought to have been crushed and actually died for other reasons, such as poor health. In fact, in one study, out of 777 'crushed' piglets, 28% had shown no signs of crushing [17]. Furthermore, 24% of the crushed piglets were very underweight, and 25% were relatively underweight, which means that their viability was already compromised, and they may have died from something else first.

In support, **Fumagalli Salumi said that although at the start of their transition, there was around a 5% increase in mortality rates, over time, they have now managed to close that gap so that the levels are the same.** They have primarily achieved this by increasing the pen size, largening the nest area, increasing the birth weight to 1.4kg per piglet (versus 1.3kg in conventional) and maintaining a higher nest temperature to encourage the piglets back into the nest.

Mortality rates vary according to systems, and producer one reported a lower mortality rate of 15%, an increase of 4-5% from their conventional system. However, the SEGES Danish Pig Research Centre reported even lower mortality rates of 6.5% in free farrowing systems with pens that are 6.5m^2 or 6.8m^2 in size.

There are several key factors that need to be addressed/ taken into account to aid the decrease in piglet mortality rates: using a more robust sow and selecting for smaller litters, good management practices, experience of the sow, size and design of the pen. Annex IV features a collection of experience of the different interviewed producers around this topics.

[17] Detailed analysis of farmers' records of piglet mortality in free farrowing systems in Switzerland

2.2.2. Post-insemination

> The initial fear of not having a confinement after insemination lies on the possibility of losing viable embryos and lowering production. experience and science have demonstrated that is not necessarily the case and in fact, sometimes is even the opposite.

Approaches to managing sows' post-insemination vary considerably, and it is more of a concern for some farmers/regions/countries than others. For many, the motivation for confining the sow is to protect productivity, as there is some evidence that increased stress can affect the success of the embryos and result in larger litter sizes (Chou & Parsons, 2022). **However, in practice, this is often not the case, stall housed, and group-housed sows perform similarly, and on some measures, group-housed sows perform better.** For example, in a comparison between group and stall-housed sows in two Chinese farms, factors such as total live birth, litter weight, birth weight, and live piglets per year were slightly higher in the group-housed sows (Baxter & Edwards, 2021). **The sow culling rate and the number of stillborns were also reduced in the group-housed sows compared with the stall-housed sows.**

The experiences of farmers with organic systems, where there is more room available, prove that confinement is not needed to achieve similar production levels as with conventional methods, provided the animals have enough space. Furthermore, lameness is typically correlated with confinement, so group housing with proper management may reduce lameness (Chou & Parsons, 2022).

The SEGES said that most Danish farmers confine the sows after insemination for one week, some for four days, and some for four weeks. The SEGES stated that the farmers feel the confinement is needed to protect the sows from leg health issues due to persistent mounting and fighting. In the initial weeks following insemination, sows experience a surge of hormones and respond by persistently mounting one another. This can cause leg issues, as the sows are very heavy, which puts pressure on their legs and can cause one another to slip and injure themselves. Similarly, Fumagalli Salumi has also struggled with not confining the sows after insemination and now mostly confines them for 48 hours. If they have a small group who are not showing signs of mounting and aggression, they try to keep them unconfined if they

can. **With their organic farms, they have had more success with this, as there is a lot more space to utilise, and they separate groups of sows.**

Dr Giersberg, Utrecht University, commented that adjustments to management approaches could remove the need for stalls following insemination. For example, Dr Giersberg suggested that providing that sows are kept in stable groups before and after the procedure, are given enough space, and critically have room to move away and hide from conspecifics, the negative impact can be managed, as **there is no ethological need for confinement.**

Many producers have stopped confining sows after insemination and have considerable success in leg health and embryo viability. However, there are more factors at play than the potential stress from mixing with other sows. Overall management is vital to ensure there are enough resources and space for the sows to avoid aggression and leg issues. Issues can also be minimised by training gilts to live in group housing and keeping stable groups.[3]

Husbandry practices following insemination differ widely. For example, producer one said they place the sows into smaller pens on their own for 2-7 days following insemination before they are moved back into group housing. Whereas the Compleat Food Group reported that many of their producers did not confine sows following insemination, only for the 1-2 hours needed for the process. They also mentioned that one of their producers does not even confine them for the procedure. Although they designed their system with movable partitions to allow for temporary confinement for the procedure, they stopped using them and performed the procedure in the group housing. **Overall, the Compleat Food Group's farmers do not report any adverse issues following insemination**. They feel this is managed by genetics, appropriate feed management, environmental enrichment, and space provision. In particular, to supply Compleat Foods, farmers must provide extra environmental enrichment, straw dispensers, and hanging devices for chewing. If there is additional aggression following insemination, the farmers have to mitigate it by providing more enrichment.

Producer two manages leg health and stress in the sows by ensuring the sows are mixed in static groups before insemination. They are then kept in their group for insemination, with no isolation or confinement (other than to perform the procedure in the feeding/resting stall). They keep the straw in the pen topped up by an automatic straw dispenser, which tops it up five times a day to ensure at least 5-10cm of straw in the bedding area. This helps to cushion the floor and prevents

slipping, reducing the risk of leg issues. Producer two said that as a result, he sees no negative effects from mounting and aggression on leg health.

2.3. Long-term impacts on piglets

As the Danish Agriculture and Food Council said (section 2.2.1) because the piglets have better access to the sow's teats, they find that they have a better weaning weight than conventionally reared piglets, and this may have positive effects in terms of production later on (Kinane et al., 2021). There are also other long-term positive effects of free farrowing systems for piglets. For example, studies have found that piglets reared by loose-housed sows perform less damaging behaviour, and more play behaviour post-weaning, compared with piglets reared by confined sows (Sutherland & Marchand, 2021). This is thought to be because the positive effect of increased interactions with the sows improves the piglets' social behaviours and makes them better able to cope with the stress of weaning (Winkel et al., 2020).

2.4. Changes to the number of animals being farmed

Downsizing may be necessary, but also opportunities to expand may arrive from a conversion to cage-free systems. There is also a potential to overcome the need for space in the farrowing area, with a reduced need for space in the gestation group housing area (after the removal of the sow stalls).

Transitioning to free farrowing systems may lead to farms 'down-sizing' their production for one or more reasons. Firstly, unless the producer builds a new, larger building that allows them to expand, transitioning an existing building will mean that the farmer can house fewer sows, as free farrowing systems require more space. In addition, the current difficulties in securing environmental permits across the EU would mean that many producers will have to transition existing buildings. For example, Fumagalli Salumi said that with their farms, they have focussed on transitioning existing buildings in order to avoid delays with environmental permits in Italy. Producer two also commented that it would be hard to transition an existing building into free farrowing, so it is likely that a new building is needed, which brings an opportunity to expand with it.

In terms of the reduction in capacity that results from the transition, it appears to vary, particularly in regards to the pen size. For example, Fumagalli Salumi had to reduce each farm's capacity by 20-25% sows when transitioning. **Although, ceasing the confinement of sows in early gestation will result in the removal of sow stalls, which could increase the amount of space available in the maternity buildings.**

When producer two was asked whether he felt the EU transitioning to free farrowing systems would result in fewer pigs being produced, he said it would, but it would not be because of the system; it would be to do with the economy, as farmers are feeling insecure about investing. A strong proposal from the European Commission, supported by Member States, could mitigate that.

The Compleat Foods Group felt that most of their farmers are happy to decrease the number of pigs they produce, providing that they get the same money. They also commented that this fits with the EU's Farm to Fork strategy and goal to reduce meat consumption.

If farmers are compensated for the reduction in their production, it is likely that most will be happy to reduce their herd size. And providing that consumption is not supplemented by third-country imports, this move would help to ensure that the EU works towards reducing meat consumption, as encouraged in the EU's Farm to Fork Strategy.[18] [19]

2.5. Product quality

All of the producers interviewed felt that transitioning had had no effect on their product quality, as they kept with the same breed, and the impact of farrowing systems had little impact on the later stages. However, as mentioned in sections 2.2 and 2.3, there was some evidence of better weaning and growth rates of the piglets, and improved social behaviours, **which may have a beneficial effect down the production chain**.

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[18] EU Commission: Farm to Fork Strategy

[19] The EU campaigns to promote meat, eggs and dairy

2.6. Staffing and labour

Testimonies regarding this factor varied. Nevertheless, overall there isn't a clear increase in labour force needs. Some producers even reported a reduction. Furthermore, a potential increase in the need of staff was also indicated as a potential benefit to stimulate the socioeconomic value of the rural communities.

In the stakeholder interviews, producers said they had to increase their labour costs and potentially the number of staff needed since they transitioned to free farrowing systems. For example, producer one said they now have one worker in the farrowing unit full-time, who is responsible for cleaning the floor and caring for the 80 sows and their piglets. Before transitioning to free farrowing, they still had one worker, but they were not solely in the farrowing unit. Producer two also said they felt they have more staff than in conventional systems, as they have six staff for their 1315 sows, compared with peers who manage with less.

Fumagalli Salumi said that although the free farrowing systems require extra management, it is difficult to quantify. They estimate that around 10-15% more time is needed compared with the crates. However, they did say that this is partly due to the piglets' slightly later weaning age of 28 days, as opposed to 25, as they still operate on a five-week all-in all-out system and so have to clean and set up the pens faster. **They also commented that they reduced workload by stopping tail docking and teeth grinding/ clipping.**

T**he ProSAU project, which involved temporary confinement pens, calculated additional labour costs of around €10 per sow per year for a temporary confinement pen of 5.5m^2, compared with a farrowing crate of 4m^2.** However, according to an interview with the Institute for European Environmental Policy (IEEP), **in the long term, the labour costs and time requirements for alternative indoor systems are not estimated to vary significantly from farrowing crate systems. And any increased employment and wage bills will contribute greater added socioeconomic value to the wider rural community (IEEP, 2020).**

In a survey of 214 sow farmers across Europe, there were conflicting responses in regard to workload, with opposite statements being made. For example, some said their workload had decreased, as the sows had fewer difficulties with farrowing now that they had more space, whereas some reported an increased workload due to higher crushing rates.[12] However, this was most probably due to not being familiar

with management of these systems, thus is easy to mitigate as demonstrated in the above mentioned points.

2.6.1 Staff safety and working conditions

Free farrowing systems have the potential to improve staff safety and working conditions. A good relationship between farmer and sow is key for these factors to be improved. Design of the system and a good training of staff also have an important role to play.

Staff safety in a free farrowing system can be directly improved by the specific features of the system, as well as good management and training. For example, pen layout and room design can significantly impact how well the sows move in and out of the pens and facilitate more positive interactions with the sow (Baxter et al., 2022). **A well-designed system will also reduce the need for staff to enter the pen.** The main reasons staff need to enter the pen are to clean, assist the farrowing sow, or treat the piglets. As mentioned in section 2.2.1, free farrowing sows tend to need less intervention during farrowing compared with conventionally housed sows. So providing the system is well designed, this need is minimised. In terms of the piglets, the pen layout can ensure that the creep areas are easily accessible and are designed to minimise disruption to the sow and her piglets (Baxter et al., 2022; Olsson et al., 2009).

Furthermore, **research has shown that improving the human-animal relationship can significantly impact worker safety,** and this can be done by both genetic selection and good husbandry (Baxter et al., 2022; Rydhmer, 2021). Developing and maintaining a positive human-animal relationship is important for animal welfare, productivity, and efficiency. For example, fearful sows tend to change their posture more frequently (Lensink et al., 2009), which can lead to more piglet crushing. In addition, a negative human-animal relationship is also associated with reduced numbers of piglets from sows per year (Coleman & Hemsworth, 2014), whereas **a positive relationship results in improved growth, fewer stillbirths, and improved numbers of born and weaned piglets (Coleman & Hemsworth, 2014; Lensink et al., 2009; Pol et al., 2021).**[20] Therefore, prioritising the development of a good

[20] Pig333: Sow responsiveness to humans reveals info on performance and living conditions

human-animal relationship before farrowing could help reduce staff safety issues and improve productivity.

When producers interact with and visit the pens more frequently, they generally have no issues. Indeed, in the survey of 214 European sow farmers, those who saw no difference in their occupational safety following transitioning had a better understanding of their sows, could recognise dangerous situations and sows, and developed a very good relationship with the herd with regular physical contact.[12] This also has a positive impact on the sow.

> "Very good relationship with the herd and regular physical contact (e.g. scratching the head) makes work much easier, especially during farrowing. If I am not perceived as a danger, the stress level of the sow is lower. If my touches are perceived as pleasant, this makes it much easier (e.g. to do a mammary examination)."[12]
>
> - *Study participant*

2.6.2. Staff training

> Transitioning to free farrowing requires new skills and a different approach and attitude. A completely different mindset.

Some producers advocate for the importance of having "strict procedures in place from the simplest of tasks to the more complex" for free farrowing systems (World Animal Protection, 2021). In addition, predictable, well-managed and specific routines are important around the time of farrowing and can improve mortality rates (Rosvold et al., 2017). Fumagalli Salumi also felt that ensuring management practices follow a regular routine helps to keep sows quiet and calm.

Training and openness to shared knowledge and best practice are also vital in transitioning, and there is now a growing body of experienced stock people in the EU to draw upon (FFL21, 2022). A small-scale study of stockpeople using temporary confinement systems in Finland reported that "free farrowing requires a better understanding of pig behaviour and patience in work tasks from stock people" (Pussinen, 2021). Tierschutz Akademie also suggested that as a result of this, not only

are the farmers more skilled at their job, but they also see the sows as the individuals that they are, rather than just rows of crated animals. Indeed, in the stakeholder interviews, **there was an overwhelming opinion that the process was not always unilateral in direction and that sometimes the plans had to be redesigned or reworked, but this was all part of the process.** It is a journey for farmers to transition, but this can also be more rewarding in terms of farming in a more connected way.

2.7. Farmer satisfaction: the biggest win for the farmer

In fact, in the European survey of farmers' experiences with transitioning, one of the participants responded by saying, **"Have no fear!"**.[12] Others said, **"Have the courage and try it!"** and "You have to commit to it and not take every setback as confirmation that the system is bad. **Persevere and gain experience. Once you get the hang of it, this system offers many opportunities and benefits.** A calm handling of the herd is important!" Finally, one participant said, "You have to give it some time because then the handling becomes easier, and you will notice that the sows feel very comfortable there. This is also reflected in the weight of the piglets."

In the interview study of the motivations of Danish producers to make positive animal welfare changes, Anneberg et al. found that producers enjoyed seeing their animals in a new way once they had transitioned (Anneberg & Sorensen, 2020). Furthermore, t**he producers and their employees also reported improving their relationship with their animals** as a result.

One quote from a farm owner expressed the difference it made to their work enjoyment: "Yes, well, I think it's fantastic to be able to see the sow from the front. So - it was quite scary somehow, when I look back, that you just went and looked at their bottoms all the time (...). If I pass a sow today and she comes to the gate to say hello, I can't help it - for me, it's a natural thing to lower your hand and say hello. I guess it's just petting, I think, or respect for the animal, or what do I know, I like the sow when she's not fixed, and I enjoy watching how the employees also walk around quietly and take their time to get contact. After all, I say to our students and to whoever it is: If you spend 10 minutes in one place standing and scratching a sow behind the ear, you will never, ever get scolded for that. So, it is so important that we accept them, and they accept us. So, if she comes up to you when you're emptying a manger, and rubs herself a little up off your leg and wants to scratch a little, so do it. Just spend some time on it" (Anneberg & Sorensen, 2020, p.61).

Similarly, the DeBreton Farm company in Canada said that "**the majority [of their staff] see a better way of raising pigs as a very good improvement for their job… Our people are using more time to observe the animal's behaviour to prevent problems**" (World Animal Protection, 2021, p.18).

In the European survey, one of the themes that arose from their responses was that farmers found they had a "better relation to the animal (more 'animal understanding')" and more fun at work than before they transitioned.[12] And a German farmer commented in his presentation at the Free Farrowing Congress that "It is really nice to watch, when sow and piglets are able to move freely."[10]

2.8. Imports from third countries

Several of the interviewees expressed a concern that the transition would result in the EU importing more from third countries. However, this concern would be entirely mitigated by applying the same standards to imports as to products produced within the EU - a measure that not only farmers, but Member States as well are very keen to see in the upcoming legislation. More on the issue of imports from third countries can be accessed here.

3. Transition timelines

This section provides insights into the duration of the actual farm transition, as well as bottlenecks and any other information that can aid to complement the knowledge for better decision making on cage-free transition of current systems.

3.1. Key factors to consider for transition timelines

3.1.1. Time for depreciation

There is a clear need from farmers to be able to offset these costs before investing, but likewise also a willingness to then reinvest. The average time of depreciation reported was between eight to 15 years. This means that the majority of the farmers will be ready to invest in the coming years, making the present time an important moment to guide investment decisions. Furthermore, yet again the need for the next investments to be fit for purpose is clear, so no more investments on caged systems within the EU and beyond should be done.

The time taken for a farmer's investment to depreciate was a key factor mentioned by most of the stakeholders who were interviewed. Depreciation refers to the reduction of the value of a tangible asset over time, in this case, the housing systems put into place for the sows. Investments are based upon the typical depreciation rate of the equipment, as after this period, farmers will typically need to reinvest in new equipment and need to have paid off the investment they previously made. This is an important consideration in the timeline, as, without financial support from the EU, farmers with investments still owing will not be able to transition.

Depreciation rates vary, both across the EU and also in terms of the type of equipment and materials used. In terms of loan structures for the initial investment, the average period reported was 15 years. Although, many farrowing buildings are thought to be older than 15 years, as farmers have been relying on repairs and not making major investments (AHDB, 2020).

In particular, producer one said their investment was based on 15 years of depreciation. However, because they had several years of poor production and various challenges, they will need longer to see a return on their investment. Overall,

though, they felt that 15 years was an appropriate lifespan for their equipment. When interviewed, they had used their equipment for ten years and had not had to make any repairs yet. Producer two said that they would pay off the investment within 15 years.

ANPROGAPOR also said that 15 years for depreciation in Spain is typical for their equipment and that most farmers invested in 2011-2012 due to the change in legislation and will be ready to reinvest in equipment around 2026-2027.

In contrast, the Compleat Foods Group said that they tend to work for a 10-year period with their farmers. Although, they explained that this was partly based on the willingness of farmers to transition within ten years, after the installing of the previous systems, rather than economics. This example is also influenced by the Compleat Foods Group offering a guaranteed market for the transitioned products and better prices. Fumagalli Salumi said that their investments were based on a loan period of eight to 10 years, which was standard in Italy. They felt that their equipment would not last 15 years before needing replacing. This is the same for free farrowing and conventional infrastructure.

3.2. Timeline of implementation

There are many factors involved when a producer transitions, and the following sections illustrate the process of transition that has been described by the stakeholders interviewed. This process description is followed by a summary of the examples of time frames mentioned during the interviews. For detailed information on planning the transition and managing the new system, see Annex IV.

3.2.1. Decision to transition

Farm owners may decide to transition for a number of reasons. However, commonly cited reasons include the recognition that society and the market are changing regarding ethical demands, the need to upgrade existing systems, and the desire to be early adopters.

The citizens of the EU are clearly concerned with the restrictive confinement of farmed animals, as the recent success of the European Citizen Initiative "End the Cage Age" showed, with over a million signatures spanning 18 EU member states. Studies and surveys have also shown that society no longer supports farrowing crates

(Boogaard et al., 2011; Vandresen & Hötzel, 2021). For example, in **one study where citizens visited both conventional and organic pig farms in the Netherlands and Denmark, the citizens showed strong concern about the overexploitation of animals in conventional systems. They wanted to see "unfixed sows in spacious farrowing pens"** (Boogaard et al., 2011).

Concern for this issue is not limited to the EU, as in a research of Brazilian citizen's attitudes towards farrowing crates and other systems, researchers found low support for farrowing crates based on concerns over freedom of movement, ability to perform natural behaviours, and the naturalness of the system (Vandresen & Hötzel, 2021). Moreover, these concerns persisted even when citizens were told of the associated risk of piglet mortality.

According to SEGES Danish Pig Research Centre, Danish "farmers are queuing up to be a part of the animal welfare labels, and are knocking at the door, asking when they can join?" The SEGES feel that this drive comes **from ethical concerns and also because farmers are developing solutions in Denmark, and other farmers can see how it is viable and how they will not lose too much productivity.** Similarly, in a questionnaire study of German farmers, farmers showed strong motivations to design and construct improved sow systems influenced by several factors (Winkel et al., 2020).

Although farmers are motivated by market demand, **studies have found that farm owners are much more motivated to make positive changes if they can find others doing the same and can share experiences along the way** (Anneberg & Sorensen, 2020). Furthermore, many old designs of farrowing crates are no longer suitable for hyperprolific sows, who are larger than they were and have larger litters (Baxter et al., 2022). **Farmers also like the idea of being early adopters who are innovative and can influence decisions** (Anneberg & Sorensen, 2020).

The following decision tree is taken from Baxter et al. (2022) and shows a farmer's decision-making process when deciding to transition their farrowing system.

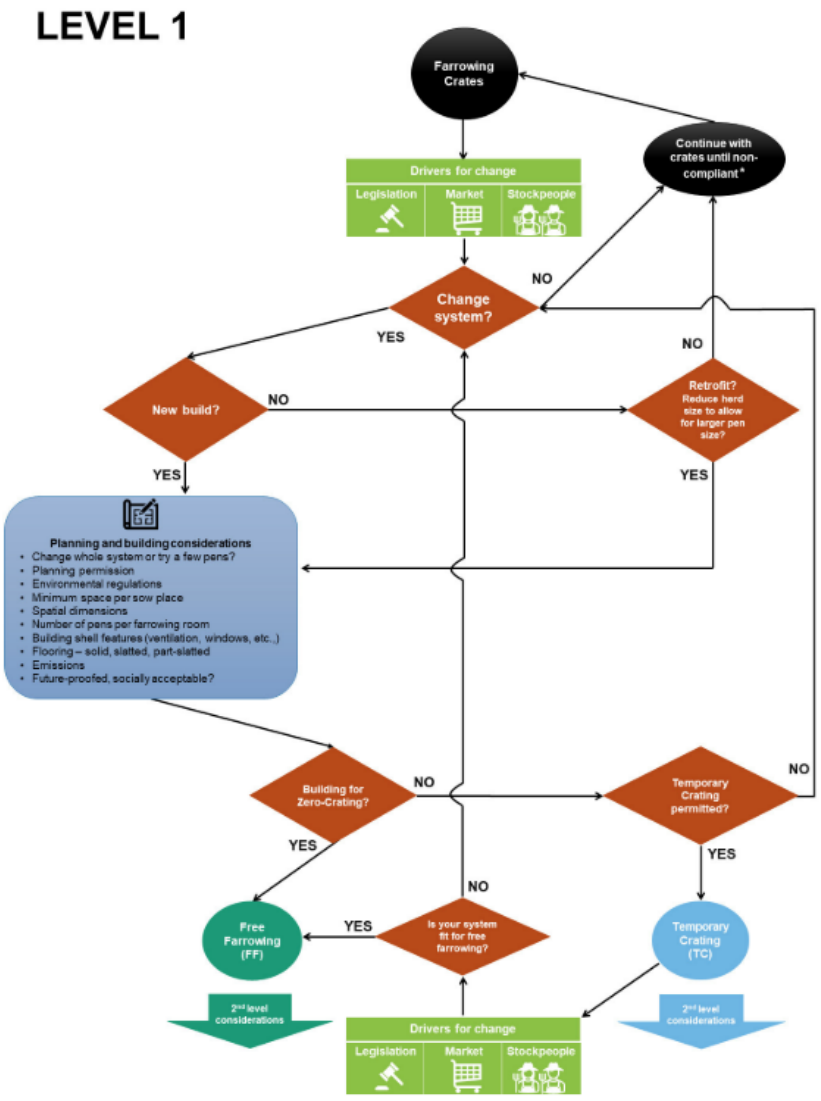

Figure 1. *Source:* (Baxter et al., 2022, p.6)

A first-level decision tree for transitioning from farrowing crates to alternative accommodation.
*Assumes a transition period will be in place before farrowing crates are no longer permitted.
An additional driver for change would be because of the current genotypes for hyperprolific sows, which may outgrow the conventional farrowing crates. For example, this was one of the drivers for producer two to transition, as the farrowing crates were too small for the larger sow and her larger litters.

3.2.2. Total time taken to implement

Producers approach transitioning their systems differently. For instance, producer one (Netherlands) experimented for two years with just two farrowing pens before transitioning the whole farm. **They said that once they had decided to transition fully,**

the implementation of the system took around two to three years as they built a new barn for the system. Producer two began planning for the transition in 2008, built the new barn in 2012, and then it was ready to move into in January 2013, **taking a total of five years from planning to completion**.

The Compleat Foods Group mentioned that one of their producers kept production while converting to freedom farrowing. The farm only bred piglets and then sold the weaners off, so the transition did not affect other parts of the farm. **The process took four years**, with a substantial investment, and the Compleat Foods Group felt that this was one of their quicker turnarounds and commented that they do not come across farms that do it that quickly very often.

The Danish Pig Research Centre, SEGES, said that in Denmark, building new facilities **takes around three to four years.** Securing the environmental permit is the stage that takes the longest, potentially up to two years for that stage. And so, it **can take between three to four years until production can begin again**.

Fumagalli Salumi said that because they transitioned their existing buildings, they were able to **implement the new system within 18 months without stopping production**.

For detailed information on planning the transition and managing the new system, see Annex IV.

3.3. Bottlenecks that slow down the transition

3.3.1. Insufficient funds to invest

Insufficient funds are a significant and critical bottleneck for the individual farmer's willingness and ability to transition. As discussed in section 3.1.1, the fact that farmers still have investments to pay off on their existing systems before they can reinvest is a significant consideration. The EU must support the transition financially in order not to hinder the process, as otherwise, many **farmers would have to wait to pay off their existing investment before they could access loans for a new one**. The time left on their investment will vary depending on when they last invested and the length of the loan. As mentioned above, detailed suggestions on how to finance the transition are available here.

3.3.2. Awaiting the legislative standards

The overwhelming reporting from stakeholders interviewed was that there is a need to set out a clear protocol for what is to be expected in regards to cage-free systems for sows (e.g. detailed characteristics like space and system features) to allow producers to maintain security and plan effectively, aiding a quicker and smoother transition.

According to Tierschutz Akademie, producers in Germany are hesitant to begin transitioning, despite this being a legal requirement by 2036 and there being financial support available. The farmers are concerned that the government may change the requirements again. They are also reticent to change due to the current poor market and prices and the impacts of African Swine Fever. The survey study of German pig farmers also supported this comment, and 74.4% of the farmers who were not transitioning their systems to higher welfare ones, said it was because of a lack of political planning security (Winkel et al., 2020).

Fumagalli Salumi also shared concerns regarding the future legislative standards and said that this has delayed them in their continuing transition. They have transitioned 50% of their farms but are reticent to continue at the moment because they do not know what the legislation will require in terms of size and system. They do not want to risk investing in something that will have to be changed.

3.3.3. Insufficient knowledge sharing

In order to mitigate the potential setbacks of transitioning and in order to get a new cage-free system running smoothly and at the same productive levels as a caged system, rapid knowledge growth needs to be provided to producers and on-farm staff. Currently, it was felt by the interviewed farmers that there is an existent big enough pool of knowledge to facilitate this knowledge exchange to potentiate a better transition.

Some of the early adopters said that the lack of available best practice to learn from slowed down their transitions, and consequently, they had to start from scratch, which involved a lot of trial and error. For example, one producer commented that when they transitioned back in 2012, there were no other farms as big as theirs that had transitioned, and the experiences of the smaller farms were less relevant to them.

3.3.4. Need for new buildings

The general conclusion was that for free farrowing there is a higher need to invest in new buildings whereas for the gestation period, existing buildings can generally be used.

Constructing new buildings is a longer process than transitioning an existing building, but for the farrowing unit, it is often the only way to continue efficiently. Otherwise, there is a risk that the new system will not work for the sows or the workers. According to the SEGES Danish Pig Research Centre and several of the producers interviewed, for free farrowing, the only good solution is to start from scratch. In fact, the SEGES advise their producers to build a new farrowing unit and use the existing one for weaners, a service unit, or some other purpose. This is because free farrowing requires dimensions that do not work with existing facilities, along with new walls and flooring and slurry systems.

In regard to removing the gestation stalls, most producers can continue to use the same buildings as they did with the previous legislative transition. For example, in 2009, Flemish pig farmers were surveyed to track progress in regard to the EU Pig Directive requirement for partial group housing of sows from 2013 (Flemish Government, 2011). Only 42% of the farms with concrete plans for transitioning required partial or complete new construction (Flemish Government, 2011).

3.3.5. Shortages on equipment

Shortages in production were another common theme across interviews, as the impact of COVID on manufacturing has led to logistical issues. Furthermore, the war in Ukraine also affects building and manufacturing, as according to some stakeholders, some parts and products are currently unavailable. One lesson that

should be learned from the transition from conventional layer hen cages to enriched cages is that the requirement for manufacturers and systems in one period can be a significant bottleneck. One that is likely to be exacerbated in the current situation, but on the other hand, can stimulate the economy. **Incentives to stagger transitions are, therefore, key for mitigating this.**

3.3.6. Environmental permits

When a new building is to be built, this requires a new environmental permit, which is considered a significant challenge and bottleneck for the transition. The impact varies according to the country, region and farm set-up.

An environmental permit is an administrative licence / official permission or authorisation / approval from a government organisation (at federal or local level) that authorises the carrying out of certain activities that might be harmful for the environment, health or safety. It imposes measures on self-employed individuals, sole traders, small-scale craft companies or industrial companies to have prior approval to ensure its activities are not harmful to the environment. Without a permit, the activities cannot go ahead.

In this sense, EU law could intervene to circumvent the problem linked to environmental permits. The EU could ask Member States to:

- Put in place simpler administrative procedures (e.g. call for a single contact point or have a special authority dealing with this) and/or;
- Make sure the administrative procedure to obtain the permit is kept to the shortest time possible; etc. (e.g. provide for specific deadlines or maximum deadlines).

For example, the Compleat Foods Group commented that one of their producers was delayed for years by hold-ups with building regulations and environmental permits. And the ANPROGAPOR also commented that it can take two years to get the necessary building permits for building new premises. In contrast, producers only need to update their manure permit when they transition existing buildings. In some countries, such as the Netherlands, it is virtually impossible for farmers to build a new building, so they can only transition what they already have. However, even when transitioning an existing building, the SEGES said many producers have significant

delays with their environmental permits. Even if a producer just needs to break into the floor to change the layout of the building, it triggers the need for an environmental permit, which can delay things by two to three years and even stop transitions. According to the survey study of German pig farmers, the complications in securing permits may also deter farmers from transitioning their systems to higher welfare ones, as 43.9% of farmers who were not transitioning said their inaction was to do with difficulties in securing permits.[12]

The environmental permit is, therefore, considered by most to be a significant bottleneck for transition. It is not only the need for more space that is an issue; the SEGES reported that free farrowing results in 20% more ammonia than conventional systems, which creates further issues with securing environmental permits. In addition, one producer commented that in Denmark, because they calculate the emissions impact from the square metre rather than the number of animals, this disadvantages free farrowing systems as they require more space per sow. The producer has gotten around this by using a cooling system for the flooring to mitigate some of the issues but is also continuously trialling and researching new slurry systems.

Tierschutz Akademie commented that there needs to be some room for flexibility on environmental permits. In addition, the complexity of the environmental permit situation adds significant deterrents to those transitioning and significantly slows down the process.

3.4. Factors that hasten and assist the transition

> Knowledge exchange, public pressure and financial aid were and can potentially still be the most relevant propellers of the cage-free transition.

ANPROGAPOR felt that the transition could be sped up if farmers had the financial help to incentivise them. As financial investment was a key theme in the interviews, particularly regarding the difficulty for farmers to invest at this time, this is an important consideration for the European Commission.

As mentioned, there are now numerous examples of producers who have transitioned and various brands and systems on the market. Farmers can now utilise the wealth of knowledge, research, and practical experiences when transitioning their farms, which will significantly aid the transition and speed up the design and

research process. The Free Farrowing website provides reams of resources for farmers, including best practices, a checklist of things to consider, an interactive model for farmers to work out the cost and productivity of a new system compared with their existing system, and numerous examples of pen layouts and designs.

The SEGES expressed a real need for animal welfare organisations to help facilitate the transition for the farmers by raising the profile and demand of these higher welfare products whilst supporting the farmers in their transitions and rewarding and recognising those front runners. They felt that farmers need recognition for what they are being asked to do. SEGES stated that, although there is a lot of adjustment required from the farmers, the willingness is there. ANPROGAPOR, for example, suggested that a tiered animal welfare labelling system is required to improve the transparency of costs. The label would show the consumer why they need to pay more and can be based on different levels, as seen with eggs.

4. Other comments

4.1. Temporary confinement

There is an imperative need for exposing farmers to information on the lack of need for temporary confinement. This is key to guide producers to invest in a cage-free system that is fit for purpose and for the future, otherwise there is a big risk that their investments become obsolete in a shorter term than the depreciation periods of the systems.

There appears to be a division between countries and producers regarding using temporary confinement for farrowing. **There is sufficient research and experience to show that temporary confinement is not needed,** and so this is a case of ensuring this information is communicated effectively. For example, in the survey of European pig farmers, one participant said, **"We initially restrained the sow from birth because we were afraid of high crushing losses. In hindsight, that was counterproductive. In the meantime, we always have free farrowing now, and it works very well."**[12]

Similarly, Fumagalli Salumi pens were designed to allow for temporary confinement, but they stopped using this function as the sows couldn't nest build and became stressed and agitated; the sows would lie against the gate, making it harder for the piglets to feed, and the sows were more agitated when released from confinement, which increased crushing. **Once they stopped confining the sows, they found they were less stressed, the piglets could feed better, and they had better weaning rates.**

Furthermore, given the increasing societal concerns over farrowing crates, some suggest that this may also apply to any moves towards using temporary confinement systems, as society will still consider these unacceptable (Baxter et al., 2022; Vandresen & Hötzel, 2021). This was seen in response to the move from conventional layer hen cages to enriched cages in the EU, where NGOs and consumers widely responded by saying, "A cage is still a cage" (Weary et al., 2016). There are also concerns that, as with the partial gestation stall ban, auditing the temporary confinement period to ensure compliance may be challenging (Baxter et al., 2022).

A similar effect is seen regarding the gestation stalls. Stakeholders such as the Compleat Foods Group commented that although farmers may oppose it initially, once they do it, they find it completely workable. Many farmers have stopped using

gestation stalls entirely, and as described in section 2.2.2, they have found workable solutions that maintain production and welfare. Again, the difference appears primarily in the approach and attitude.

5. Recommendations

Staggered timeline for a transition with full or significant financial support from the EU

These recommendations are based on the actual practical timeline to transition, regardless of current investments and depreciation times. As there are many steps involved in transitioning, this timeframe must take into consideration the amount of time a farmer needs to plan for the transition, including deciding which of the many systems would work in their farm, and trialling the system. According to the stakeholders interviewed, this is key to minimising the negative welfare impacts of inexperience and choosing the wrong system for the farm. Allowing farmers the time to transition a portion of their farm, or to work with another system for a period, can ensure that they can reduce both the financial impacts of poor production when they fully transition, but also more importantly, minimise the welfare impacts of poor health and mortality rates in the pigs. Furthermore, there is also the concern that from a genetics perspective, ensuring that sows with the right traits are available on a commercial level is another important consideration, and one that takes time.

It is advised that in order to minimise the impact of equipment and construction shortages, the EU should take a staggered approach, requiring farms to transition in order of age of building and investment. Doing so offers a fair way of ensuring that

producers stagger their investments and transitions, putting less pressure on the construction and equipment manufacturers. The staggered approach can also allow for farmers to decide between transitioning existing buildings, for which they will have less time to do so, or building new facilities, where they will be granted longer. This two-phase approach, will enable production to continue steadily and allow farmers the time to comply with the legislation.

Lastly the following recommendations could be significantly improved upon if there were significant improvements to the process for farmers securing environmental permits for rebuilding to install cage-free systems. For example, the recommendations allow for two to three years to secure a permit, but producers could transition approximately one year sooner (for both transitioning existing systems and rebuilding) if these processes did not restrict them, as in some areas, permits are a major bottleneck.

For free-farrowing systems

Based on the timelines provided by the producers interviewed:

- For systems built before 2010, it is possible to transition existing systems **within three years**[21];
- If rebuilding their building, it is possible to transition **within five years**;
- For systems built since 2010, it is possible to transition existing systems **within five years**.

For post-insemination confinement

The ban on post-insemination confinement should apply **immediately** with the launch of the new legislation.[22]

[21] Based on five years of implementation from the announcement of the timeline (2023).
[22] Producers will in effect, have four years' notice to implement this transition.

Species 2

FATTENING RABBITS

6. Current national status

Rabbits	
The EU	Across Europe, only 1% of rabbit farms did not use cages in 2017; barren cages made up roughly 85% of production and enriched cages around 9% (European Commission, 2017). Typically, the 1% of alternative systems were Label Rouge or organic farms (Lapin & Bien, 2019). According to a report by Lapin & Bien (n.d.), the General Assembly on Food wishes to increase the production of Label Rouge standard rabbit meat from 1% to 20% (Lapin & Bien, 2019).
Austria	Austria has already banned barren cages for meat rabbits (CIWF, 2020a). This happened in 2012.
Germany	Germany has already banned barren cages for meat rabbits (CIWF, 2020a). This will come into effect from 2024, and they have stated that rabbits must have a platform, gnawing material, and roughage.[23]
The Netherlands	The Netherlands has already banned barren cages for meat rabbits (CIWF, 2020a). This happened in 2016. Rabbits are required to be housed in pairs and given a platform and gnawing material (CIWF, 2020). In 2017, roughly 60% of fatteners were kept in pen housing systems as opposed to conventional barren cages, due to market demand in countries that demand higher welfare standards (European Commission, 2017).
	As a net exporter of rabbits, Hungary is more influenced by its export markets in terms of the production systems they use. They

[23] Rabbit meat production in the EU

Hungary	have conventional cages, furnished cages, and parks. For example, German and Swiss distributors audit their suppliers' slaughterhouses and farms (ITAVI, 2017).
Italy	Italy still relies a lot on conventional cages, and the uptake of financial support for transitioning has historically been poor.
Spain	The issue of welfare for rabbits is seen as a North EU issue, although it has the potential to drive legislative change (ITAVI, 2017).
France	France still keeps the majority of rabbits in cages. However, the increasing reach of brands such as Lapin et Bien and Label Rouge and other producers, such as Bauer Kaninchen Spezialitäten, means that alternative systems are increasing (ITAVI, 2017; Lapin & Bien, 2019).
Belgium	Breeders may use 'combiparcs' or 'multipurpose' pens, as these allow for kindling and fattening to take place in the same pen (ITAVI, 2017). With these systems, the females have to be separated from one another before kindling, before returning to group housing until the kits are weaned. In Belgium, the Royal Decree of June 29 2013 set out the conditions for animal welfare in rabbit farming. By 2025, all does and fattening rabbits must be kept in alternative systems (ITAVI, 2017). In addition, Belgium banned cages for fattening rabbits from January 1 2016, with some exceptions allowing furnished cages to be used until 2024 (to protect recent investments). From January 1 2021, it has not been permitted to keep does in cages, with exceptions allowing recent investments in furnished cages to be protected until the end of 2024. From 2021, male rabbits must be kept in furnished cages or enriched pens.

6.1. Timelines for producers who have transitioned, or are undergoing a transition

Lapin et Bien	Lapin et Bien started researching and developing their system back in 2010, and was then fully in operation for fatteners from 2017.
Bauer	Bauer Kaninchen Spezialitaten began transitioning their fattening systems in 2008 to their alternative group-housed system and was farming around 18,000 rabbits in this way by 2020.
Kani-Swiss	Kani-Swiss is one of the biggest players in Switzerland. Felix Näef pioneered a rabbit-friendly husbandry system with the animal welfare industry in Switzerland, the BVL and the Coop. Kani-Swiss won CIWF's Good Rabbit Award in 2016 for its current policies.
BreFood	BreFood began transitioning to alternative systems in 2009, and since 2012 they have been working with organisations such as CIWF and Four Paws to provide ground-reared systems for rabbit meat production. BreFood won CIWF's Rabbit Innovation award in 2014 and 2022 and its Good Rabbit Award in 2015.
Paille de Oree Label Rouge	Label Rouge is a unique label that guarantees quality and welfare. The fattening rabbits are raised in small groups in fenced areas on straw bedding, and the animals can eat freely. The label prohibits cages.
Lonki Food Group	In accordance with the legislation in Belgium and the Netherlands, the Lonki Food Group systematically evolved to use park-housing systems from 2009. In addition, they ensure the rabbits have roughage, enrichment, plastic flooring, and shelters and have enough space to stand, stretch out and jump.
WISIUM: LAPETY WELLAP	WISIUM developed a new concept for rabbit breeding: LAPETY WELLAP. They trialled the system in 2018 and then developed their first production building in 2020-2021. They produced the first fatteners from the system at the end of 2021.[24]

[24] WISIUSM LEPATY WELLAP Press Release 2021

Colruyt	Colruyt has only used animal-friendly park systems since 2014, which allows rabbits to exhibit natural behaviours. They won CIWF's Good Rabbit Commendation in 2015.
Schiever Distribution	Schiever Distribution works to improve the breeding, housing, transport, and slaughter welfare of all animals they use. They won CIWF's Good Rabbit Commendation in 2017.
Danone	Danone only sources rabbit meat from suppliers who do not use cages.[25]
Danone Specialised Nutrition	Danone Specialised Nutrition works with suppliers and CIWF to improve welfare standards on their farms. They won CIWF's Good Rabbit Commendation in 2018.

See Annex II for more detailed case studies on different companies and producers.

[25] Danone 2020 Animal Welfare Report

7. Research and development - the case of the German Animal Welfare legislation

Because of the developments in German legislation for the keeping of rabbits, German rabbit farmers have to transition their systems to comply with higher welfare requirements. As a result, several research studies have been conducted comparing conventional cage systems with a series of new higher-welfare housing systems. One of the main challenges was the flooring, which was leading to a higher number of injuries. The timeline of studies below illustrates the evolution and how the problem was resolved, as well as other positive outcomes for production were demonstrated due to higher space and outdoors access.

2026-2020: Rabbit Welfare Comfort Housing (RAWECOH) – New Housing Concept for Fattening Rabbits

The RAWECOH project aimed to explore and develop improved husbandry systems for breeding and fattening rabbits under the specifications for rabbit husbandry in Germany (Animal Welfare Livestock Husbandry Ordinance).[26] The husbandry system was designed and tested under practical conditions, and animal behaviour was recorded continuously to assess the rabbits and their usage of the system.

The housing facility had some positive effects; it met the new legal requirements, resulted in lower injuries than the wire mesh cages, and achieved higher daily weight gains in the kits. The extra space and environmental enrichment also positively impacted the rabbit's behaviour. However, there were issues with hygiene as the floor was soiled quickly and to a significant amount, and the project concluded with a need for further research into floor design being required before it could be implemented into practice. The issue was primarily with meeting the requirements of the German Regulation, as they made positive changes to the flooring that resolved the hygiene issue but no longer met the Regulation's requirements. The barn climate and emissions were in accordance with the German Animal Welfare Regulation (TierSchNutztV) (RAWECOH, 2016).

[26] EIP Rabbit welfare comfort housing (RAWECOH)

2019-2021: Study 2 - Conventional cages versus alternative housing with plastic flooring

This study compared conventional wire mesh cages to new alternative housing that complied with the German Regulation (Rauterberg et al., 2021). In the new systems, the rabbits had elevated pens with an open top, slatted plastic flooring, a nest box and manipulable materials. There were hygiene problems with the alternative system, which resulted in health and economic consequences, as the hind feet of the rabbits were particularly affected. This was due to the floor design of the new housing system, as it led to a high degree of soiling compared with the wire mesh floors of the traditional cages (Rauterberg et al., 2021). Other studies have found similar effects, with the requirements for flooring being a significant constraint in maintaining hygiene, resulting in increased mortality and soiling (Rauterberg et al., 2019b).

2019-2021: Study 3 - Conventional cages versus large group housing

In another study exploring the impacts of housing systems that comply with the German Animal Welfare Regulation, the researchers used a new housing system, which was characterised by large groups (58 rabbits, max. 12 rabbits/m^2), slatted plastic floor (11mm slats and 11mm gaps), elevated platforms with a partly solid floor, boxes and different enrichment materials (Rauterberg et al., 2019a) Compared with the conventional cage system, they recorded higher daily weight gains and fewer injuries in the new system, compared with the conventional one. The finding of reduced injuries was particularly notable, considering the rabbits were housed in larger groups, and was thought to be because the rabbits had more space than in the conventional cages.

2018-now: Has im Gras

Has im Gras is a research project by KAGfreiland that has explored methods of farming rabbits outdoors using a mobile free-range husbandry system.[27] Since 2018, seven fattening groups of 34 rabbits have been raised in the Has im Gras facility under organic and KAGfrieland standards. The system produced good results in terms of productivity, especially as the rabbits could be used to graze pasture.

[27] KAGfreiland: Has im the gras

8. Impacts of transitioning

This section describes several factors that can be impacted (positively or negatively) or not by the transition to cage-free fattening systems. Factors featured range from financial, to labour impact as well as the impact on number of animals and product quality.

8.1. Financial

8.1.1. Investment costs

Although some research has pointed towards an increased cost compared to cages, there are cage-free alternatives that can have competitive or even lower prices.

There are some challenges with cost, and during the interviews some producers such as Lapien et Bien expressed the increased cost due to the external consequences (around 10-15% more expensive). They also reported that, to transition from an existing system it is still necessary to "remove walls, introduce new facilities, change and adapt; it is still time and investment."

According to ITAVI's report on the structure and organisation of the European rabbit sector, in 2017, constructing a conventional cage cost around €550 per female (ITAVI, 2017). Whereas converting to a park system would cost around €688 per female. Prices will also have increased considerably since 2017.

Nevertheless, there are market options that are even less expensive than building a caged system: **WISIUM's Lepaty Wellap model is considered to offer a cost-effective approach to transitioning. WISIUM say that breeders can set their system up at a lower cost than cages and specify an investment of around €400 per doe, compared with €800 - €1000 for a cage system.**

8.1.2. Production costs - retailers as important partners

Cage-free systems can represent an increase in costs, but several farmers have secured ways to mitigate that cost, especially good partnerships with the consumer facing businesses.

In rabbit farming, alternative systems often result in increased production costs, not only in terms of the additional costs of the systems themselves but also the increased labour, space, and the potential loss in reproductivity (Clément et al., 2016). However, **many studies and practical examples from stakeholders show that alternative systems can still be cost-effective,** but the extra costs need to be recouped from the retailers. For example, the Bauer family stated that their product is 20-30% higher in cost than rabbit meat from rabbits reared in conventional cages. The price increase is because their barns house fewer rabbits than before, which has reduced their productivity. Furthermore, they also have to heat the building more now, increasing costs overall, and per rabbit. Bauer Kaninchen Spezialitäten said in their interview that they were open with their retailers about the increased costs, and they get a premium for their product which mostly covers the additional costs. Kani-Swiss also tackled the increased cost of higher welfare production by supplying to a retailer willing to pay the increased cost and then charge their customers accordingly. In addition, their products are labelled to show the consumer what they are paying for in terms of animal welfare, and Kani-Swiss also sell some of their meat as pet food and under their own brand.

Not all producers can secure a fair price. According to ITAVI, the legally required park systems in Belgium resulted in breeders being unable to secure a sufficiently high selling price to make a profit on their products (ITAVI, 2017). Furthermore, Tierschutz Akademie in Germany said that the biggest hurdle for rabbit farming is to do it ethically, whilst being economically rewarding. Because rabbits in alternative systems have more space and can move around more, they take longer to gain weight.

According to the World Rabbit Science Association (WRSA), the likelihood of production costs increasing is partly dependent on the set-up of the transition. **For example, if the farmer can keep the same number of rabbits in their new system as before, or if they farm fewer rabbits but receive a similar price overall, there is no**

relative increase in production cost per kilogram of rabbit meat. They also felt that feed prices were not likely to increase due to changing the housing system. They said that because fattening rabbits are often kept on a feed-restricted diet and spend a lot of time resting when young, there would not be a significant increase in feed costs for fattening rabbits.

Lapin et Bien managed to house almost the same number of rabbits when they transitioned, which positively impacted production costs. They were also not put off by the increase in production costs. Instead, they focused on finding a better way to farm rabbits that was also economically viable and then selling it at the right price so that the end market would accept it. They work hard to communicate to the retailers about how their products can attract the value-added consumer who spends more money on high-value, high-quality products.

Extensive systems - The economically viable future

Transitioning to park or alternative pen systems is one way of rearing higher welfare rabbits, but extensive systems promise the most welfare improvements. Productivity does not have to be significantly impaired either. For example, in their study '**Has im Gras', KAGfrieland found that rabbits reared in free-range systems with access to grass, reached slaughter weight only ten days later than the conventionally reared rabbits, who reach a live weight of 3.1kg at 84 days (ZIKA breed) (Kutzer, 2018).** The longer production time is because conventionally caged rabbits are fed intensive diets and cannot move freely to burn calories. The free-range rabbits also had a better feed conversion rate (1:3.04) compared with the conventionally reared rabbits (1:3.43), although this is partly because they were able to supplement their diet with fresh forage (Kutzer, 2018). In conclusion, KAGfrieland found the free-range system competitive, as the rabbits did not increase feed consumption, which counteracted the longer fattening period. Therefore, if marketed appropriately, farmers can get a higher selling price from their free-range products (Kutzer, 2018).

8.1.3. Health and productivity

Rabbit cage-free systems offer several opportunities when it relates to health and productivity such as lower number of injuries and a decrease in the need of antibiotics. There are also several challenges highlighted that are directly connected with a better and different management of the system.

Injuries from flooring

According to an interview with the World Rabbit Science Association (WRSA), t**he move from wire flooring to the slatted flooring used in alternative systems has led to significant improvements in foot and leg health in rabbits.** With wire cage flooring, between 20-25% of rabbits would have leg issues, whereas now it is around 10% with the plastic slatted flooring that is used, and the rate is still dropping. However, the WRSA reported that there are still concerns with slatted flooring, and the design is critical to ensure that it is not only hygienic, but that it is also safe for young rabbits, as if the gaps are too wide, they can easily trap and break their legs. **The IEEP also confirmed that alternative housing systems have a lower rate of injuries incurred from the flooring, as the plastic flooring offers a more comfortable and less injurious surface than the wire mesh floors in cages (IEEP, 2020)** Kani-Swiss has found a similar positive effect from moving away from wire flooring and finds that the solid flooring in their system is more comfortable for the rabbits, eliminating the occurrence of hock lesions, which are common with wire floors.[12]

Injuries from fighting

Park rabbit systems have the likelihood of creating tension in rabbits due to competitiveness and aggression, which can lead to more injuries in the group (Jekkel et al., 2008; Szendrő et al., 2019). However, **this can often be mitigated by providing enough space for the rabbits to demonstrate submission to others and by providing gnawing sticks** (Dorning & Harris, 2017).

Mortality rates

The mortality rates of rabbits in alternative systems often do not differ from conventional systems unless the stocking density is decreased. For example, in Belgium systems, the mortality rate of fattening rabbits is between 4-5% regardless of whether they are in cages or parks (ITAVI, 2017). Similarly, the WRSA also noticed no change in mortality rates between cage and park systems. However, they commented that the current model of park system in France keeps the rabbits at the same stocking density, just in a pen rather than in a cage. Similarly, a research project in Bavaria also found no difference in mortality or injury rates between caged rabbits and rabbits housed in alternative floor pens with soil. [28] **The rabbits' bone density was also improved in the floor pens.**

When efforts are made to reduce the stocking density and to make other key improvements to the system, alternative housing systems can result in fewer mortality levels of rabbits compared with conventional systems. The Bauer family reported a drop in mortality rates of around 25% in the young rabbits housed in their new system compared with the park system they used before. They put this down to the improved cleanliness. Similarly, BreFood found that once they transitioned to their alternative, higher welfare systems, they benefited from a reduction in mortality rates of 2-3%.

Antibiotics

The need for antibiotics also appears to decrease when higher welfare alternatives are used (Mondin et al., 2021). This has both welfare and economic advantages and helps to mitigate antibiotic resistance. For example, Kani-Swiss states that they only use antibiotics if an individual needs treatment, and have nearly entirely eliminated their need. Otherwise, the only routine medication they give is an anthelmintic coccidiostat for the fatteners to avoid infection from the intestinal parasite coccidiosis.

[28] LFL Study on animal-friendly rabbit farming

8.2. Market demand

The rabbit meat market has very specific characteristics such as a marked decrease of consumption at EU level and a premium attribution to the product in several Member States. These factors increase the importance for this market to adhere to consumers' demands regarding cage-free and utilise this opportunity to increase value and quality.

The Lapin et Bien project began with consumer research into the ethical concern for humanely rearing rabbits. The innovators did not wait till they were obliged to change. Years ago, they developed a different rearing system, and it has grown from there. Lapin et Bien work hard to partner with retailers who want to switch, and they communicate with them to sell the competitive advantage it offers over other retailers. At the moment, Lapin et Bien feel that the product is more for the value-added consumer, who spends more money on higher-value, high-quality products. For retailers, offering these products is one way of encouraging those value-added consumers in.

Regarding the market appeal of their product, Lapin et Bien said, **"For the consumer, this system is more appealing, and of course, if it were at the same price, then it would be very appealing."** Lapin et Bien also feel that their products provide more options for the consumer, as there is already an organic market and free-range products, but now with the increases in living costs, people have to make a choice, and it is not always the choice they want to make. Lapin et Bien said they now provide another higher welfare choice from free-range and organic.

Lapin et Bien has endeavoured to create a model where they have a collection of suppliers who provide the volume that is needed for supply. In turn, their farmers can then rely on Lapin et Bien to provide them with a buyer so that they can sell every rabbit they produce. According to Lapin et Bien, it is "Not something that is economically interesting, but it holds ethical values high and ensures that there is the supply and demand needed for both retailers and producers".

Lapin et Bien also made the point that because the rabbit meat industry is declining, due to the market shrinking for it in the EU, there is a greater potential to develop more animal-welfare-friendly production systems, and for those to become the norm.

8.3. A minimum EU standard and the inclusion of imported good in the revision of the animal welfare legislation is essential

The Bauer family commented that as the investment for alternative systems was high, they only managed it because they had a guaranteed buyer for their products. They also suggested that the German market is more willing to pay higher costs for rabbits than other parts of the EU, which could pose challenges elsewhere. They argued that **it is vital to apply the same standards to imported products to ensure a level playing field for EU farmers who invested into transitioning their farms**. The Bauer Kaninchen Spezialitäten felt that finding a balance between higher standards for the animals and ensuring a viable economy for the farmers and slaughterhouses is, therefore, vital.

The concern that improving EU standards would result in third countries importing with lower standards, which would undercut EU production, was raised repeatedly. More on the issue of imports from third countries can be accessed here. For example, according to Lapin et Bien, third countries can comply with every standard on paper, but there may still be fundamental differences impacting welfare, which is why it is so important for the EU to ensure the standards are complied with in reality. Although in Germany, the German animal welfare associations play a critical role in ensuring that imports from China meet Germany's high standards.

8.4. Changes to the number of animals being farmed

The transition to cage-free can lead to a lowering in the production capacity, but some farmers managed to utilise the space in order to mitigate this impact.

When transitioning from a cage to a park system, the rabbit house's internal organisation can often be maintained. Although park systems provide a bigger area than caged systems, most transitions will see a reduction in the number of rabbits being housed, depending on the stocking densities (CRPA, 2022). However, it is entirely possible to maintain almost the same number of animals, as it is related to the system adopted. For example, the Centro Ricerche Produzioni Animali (CRPA)

found that when transitioning to systems with 80cm^2 /head, from 53.3cm^2, the number of rabbits for one house dropped by 22%. And when they transitioned to 150cm^2 /head, they saw a reduction of 58% of capacity. Similarly, the Bauer's system lost about 25% of capacity when they moved from the park systems to their new system.

Not all alternative systems result in a drop in numbers, and Lapin et Bien managed to keep almost the same number of animals following the transition. For example, in their interview, they reported that in 1200m^2 there are 5000 fattening rabbits. "It is **almost the same number of animals in the new building, as although you have less density and more space for the rabbits**, you are using more of the building and are more efficient in the building because there is only one corridor. You are improving space efficiency…' walkable efficiency!"' **Their more efficient utilisation of the space benefited them and meant that transitioning an existing building was feasible.**

The scientists interviewed from the WRSA were less certain concerning the impacts on the numbers of rabbits. However, like Lapin et Bien, they said that the **corridors in conventional systems could be better utilised to minimise the loss of space.**

8.5. Product quality

Some meat quality differences were reported, but overall, they were not very significant. Moreover, reports, science and experience have different perspectives regarding this subject.

In their interview, Lapin et Bien said that their rabbits perform natural behaviours, therefore they have more scratches, so naturally, there can be more inconsistency in their products. In terms of nutritional and overall meat quality, Lapin et Bien said they saw no effect, as it's the same breed being used.

The WRSA also commented that **there is no difference in the meat quality of rabbits reared in park systems compared with cages**, as the age of slaughter is the main factor with rabbit meat. Furthermore, they did point out that currently, park systems keep the rabbits at the same stocking density as they did in cages, so the rabbits are not necessarily moving more, which means there is no impact on the meat. They also said that because the rabbits are typically slaughtered at around 10-11 weeks,

they are killed before they are sexually mature. **Therefore, fighting and aggression in park systems are minimal, which is positive in terms of welfare and product quality.**

Although the Bauer family said they did not see a major difference in meat quality or condition of the carcasses, they thought the rabbits were growing faster than before. They speculated that this was because the young rabbits stayed in the same pen/place on the farm from birth until slaughter age, which meant less disruption to their feeding.

Scientific studies tend to support Lapin et Bien's observations about slower weight gain and report reduced growth and fat content in carcasses from alternative systems (Chodová et al., 2014; Pinheiro & Monteiro, 2012). This is because the extra space and lower densities give the rabbits greater freedom of movement, which can lead to lower slaughter weights (IEEP, 2020). In particular, some studies suggest rabbits who are kept in alternative systems may have a 13% lower live weight overall compared with caged rabbits. **Although rabbits from alternative systems tend to have heavier hind parts as the hind leg muscles are more developed** (IEEP, 2020).

8.6. Staffing and labour

On these factors, challenges and opportunities are identified by farmers, ranging from an increase in labour to an easier system to clean and operate.

In alternative systems, the (non-wire cage) flooring must be cleaned regularly to avoid the build-up of faeces and soiling, to minimise health issues (Szendrő et al., 2019). This creates additional work and labour costs for alternative systems. For example, Lapin et Bien said that from a labour perspective, their new flooring is more complicated to clean than the wire cages, which adds additional challenges, especially as it is at ground level. They also mentioned the challenges of catching the rabbits at ground level, as they can move around and hide, which means it takes longer and is harder for the workers. They concluded by saying that, "Overall, although it is ethical for the rabbits, and for the market, it is challenging for the farmer."

According to the World Rabbit Science Association, farming rabbits in alternative systems does increase the amount of labour, and also makes the work harder, as the

staff have to bend down more and often have to search out the rabbits when they need to perform insemination, health checks, or routine weighing.

In comparison, the Bauer family commented that with their new system, **it is actually easier for them to clean it and keep it hygienic, which has had a positive effect on labour requirements.** This is because they just move the doe out, and not the young rabbits, which makes the cleaning easier. **They have not increased or reduced the number of staff since transitioning,** as they said that the majority of the time is spent on cleaning, and they still have the same amount of space to clean but with fewer rabbits.

In terms of extensive systems, in their study of the impacts and costs of rearing rabbits in a free-range system, the Has im Gras researchers found that for a group of 34 rabbits, cleaning the stable took around 15 minutes per week, and feeding and watering took five minutes a day (Kutzer, 2018).

8.6.1. Staff training

Farming rabbits in an alternative system poses new challenges and requires different skills. As a result, farmers need to learn and adapt. The need to share best practices is clearly evident, as there are many farms that have developed successful farming methods.

8.7. Farmer satisfaction

One of the themes that came from interviews with stakeholders was the high degree of satisfaction that came from farming rabbits in this way. For example, Lapin et Bien said "It isn't too complicated, it is more intuitive to farm in this way… To sum up, it is worth it. I think we all agree with that."

Similarly, when the WRSA talks to farmers who have moved their fattening rabbits to park systems, they find that they are **prouder and more positive** about their systems and are happy to invite consumers and other visitors to see their facilities. **They enjoy seeing the rabbits behave more naturally and move about more freely.**

8.8. Ensuring fair prices, demand, and integrating the sector

Many of the stakeholders who were interviewed reported that the rabbit meat industry is declining in large parts of the EU due to overall less demand from consumers for rabbit meat. There is less demand, as they not only disagree with the intensive farming practices, but they also feel more affiliation with rabbits compared with other farmed species. Furthermore, rabbit meat already costs more than most other meats and is not as convenient, which further adds to the decline in consumption (ITAVI, 2017).

According to ITAVI, the industry expert body for poultry, rabbit, and fish farming (2017), the challenge with transitioning housing systems for rabbits is securing the investment capacity, and guaranteeing a fair value for the products, whilst transitioning the sector in a timeframe that is consistent with the market's demand for more ethically produced rabbit meat. **ITAVI suggests that farming systems that do not require much investment are needed to support the transition, along with strong partnerships with retailers and other stakeholders** (ITAVI, 2017).

9. Transition timelines

This section provides insights into the duration of the actual farm transition, as well as bottlenecks and any other information that can aid to complement the knowledge for better decision making on cage-free transition of current systems.

9.1. Key factors to consider for transition timelines

9.1.1. Time for depreciation

Although the average is 15 years, this can really vary amongst farmers. Nevertheless, the sector will need financial incentives/aid, as well as a sense of security to invest provided by strong EU legislation with clear transition periods.

According to Lapin et Bien, the timeline for depreciation of investments is 15 years. Although, it depends on the farmers and how they want to pay themselves, as some will have paid off their investments earlier than others. The Bauer family stated that typically the costs of housing systems for rabbits take 15 years to depreciate.

Rabbit farmers have been regularly investing at different points over the last few decades, so the time for depreciation for their existing investments varies greatly. According to Lapin et Bien, the farmers at the end of their investment may not want to reinvest straight away (unless incentivised), as they may still have some years left of their equipment to benefit from, and they will take advantage of the situation before investing again. However, some will want to adapt to the changing market. This is why it is so important to provide farmers with financial support to transform their farms, as the will is clearly there, and the reasons for stalling the decision to transition are purely financial.

9.2. Timeline of implementation

9.2.1. Decision to transition

Some rabbit farmers have already transitioned, and others will also want to follow suit sooner rather than later, especially as societal concern for intensive farming practices is changing, and with it, the market. This demonstrates that the moment to provide guidelines to the rabbit industry regarding a cage-free system that is fit for the future is now.

Lapin et Bien feel strongly that the market is changing and that producers must keep up with the demands. **They recognised early on that society was beginning to object to the way in which meat rabbits were farmed, and that in order to keep in the market, they needed to change.** This is what led them to develop the Lapin et Bien brand and farming rabbits in a more ethical and rabbit-friendly way.

Similarly, ITAVI also stated in their report on the structure and organisation of Europe's rabbit sector, that the changing societal expectations regarding how rabbits are farmed, are an important driver both for change, and for the decline in consumption (ITAVI, 2017).

9.2.2. Implementation steps

Lapin et Bien

According to Lapin et Blen, there are two approaches to transitioning: starting from scratch by building a new house or transitioning existing facilities. Both approaches start with the same few steps:

- **Feasibility study:** this explores whether it is possible, which approach is best, if there is the space available to build something new, whether there are staff available to run it, and if it is technically possible.
- **Economic study:** this explores whether there is a market for all of the rabbits, whether the rental costs of the facility, the construction, the feed, and the staff costs can be covered, and how long till there is a return on investment on the facilities and the construction costs.

- **This all takes around six to nine months for Option 1 (build a new house), and around three to six months for Option 2 (switching existing house), although nine and six months were considered more realistic.**

Option 1: Building a new house

- For this approach, the farm owner needs construction permits, and this can take around four months, if all goes well.
- Then for construction, it varies but can take around eight to 12 months to construct. Although this is dependent on having the permits in place and there being no objections from the neighbours.
- Then it takes around six months to get the first rabbits out, as you first introduce the first mother and then grow the rabbits to a saleable weight.
- **On average, it takes three years for Option 1, including the feasibility and economic studies described earlier.**

Option 2: Converting existing house

- For this approach, dismantling the existing system and then converting and constructing the new system takes around 12 weeks.
- No permits are required for switching (unless you break into the floor, which is not commonly needed for rabbit farms).
- For this approach, production can usually continue, as the mothers are kept, and can remain in place with their young. The fatteners are then ready to go straight into the new facilities so that the new generation is in place, and six weeks later, the rabbits are available for sale.
- **On average, it takes around ten months to transition an existing building.**

Bauer Kaninchen Spezialitäten

Bauer Kaninchen Spezialitäten began to design and research their system in 2014, and it **took four years to develop.** Most of the time was spent researching and designing the system to ensure that it worked in terms of the legislation in Germany, but also for the rabbits' welfare, productivity and logistics. They transitioned their existing building, which made implementation easier and cheaper, as they could use the existing feeding equipment, and just had to replace the housing system.

World Rabbit Science Association

The WRSA felt that **for the fattening rabbits, the EU could transition as soon as two to four years**, as they felt that most fattening rabbits were already in park systems. They did stipulate, however, that this would be dependent on the producers receiving financial support for the transition and on the ultimate requirements of the transition (e.g., dimensions of pens).

9.3. Bottlenecks that slow down the transition

The uncertainty of what the new EU legal standards for rabbit welfare will look like and the lack of knowledge sharing are the two main issues explored in this section.

9.3.1. Awaiting legislative standards

Most of the stakeholders felt that insecurity around investing and transitioning was a significant bottleneck for producers making progress now, but also when they are legally required to. For example, the World Rabbit Science Association felt that producers were uncertain about what the legislative requirements would be, which was stopping them from investing in new facilities in case they then had to change them. For example, the WRSA queried the definition of a cage in terms of what is likely to be considered acceptable going forwards. Similarly, the Bauer family also said that no producers were voluntarily transitioning at the moment, as it is unclear what the legislative standards will be in the future. Producers know that legislation is coming but are waiting to see what direction it will go in before they invest.

9.3.2. Insufficient knowledge sharing

The lack of sharing of best practices available for higher welfare systems is another major bottleneck. Although there have been some positive developments in terms of brands creating higher welfare systems, these are still the minority, and there are not as many 'ready-made options' to choose from. Park systems for fatteners have been growing in use, and there is a body of research and practice that can now be drawn upon. However, Lapin et Bien did say that the availability of their experience

and expertise could hasten the transition for producers going forwards (see section 9.4.2.).

The World Rabbit Science Association feels that the systems are already in place for the weaned rabbits, as many producers already use park systems for them.

This bottleneck could have significant implications in terms of the welfare of the rabbits being housed, as poorly designed systems can increase mortalities, injuries and stress. As a result, **it is important that rabbit producers are given clear legislative standards to ensure that their new housing systems are large enough, and are designed to optimise welfare.** Although producers need time to find solutions that work, as there is a tendency for producers to wait till the last point, **too long a transition would only perpetuate the issue.**

9.4. Factors that hasten and assist the transition

The rabbit production sector is ready to transition and many have already done so. The time is now to provide clear EU legislation for cage-free rabbit production and to foment knowledge sharing.

9.4.1. Producers are motivated to transition and current progress

According to the WRSA, in general, there is enthusiasm amongst producers to transition, particularly in France, where the interviewees were based. Most want to move towards better housing systems, although they are currently waiting for the specifics of the new legislation. **In fact, they commented that many producers are already using park systems for the fattening rabbits, and so this part of the process should be an easy transition for the EU.**

9.4.2. Sharing best practice

Lapin et Bien stated in their interview that although it took them years to design the system, this was because they had no best practice to learn from, **whereas now, producers can learn from their experiences and models to transition more efficiently.**

Similarly, ITAVI commented in their report that the experiences of farmers who have transitioned, or who operate alternative systems are invaluable in enriching the knowledge and skills of those in the sector who are seeking to transition (ITAVI, 2017).

10. Recommendations

The recommendations below not only take into consideration the financial investment producers need, but also the time that is needed to trial and develop the right system. The following recommendations apply to fattening rabbits.

This is based on the actual practical timeline to transition, regardless of current investments and depreciation times. As there are many steps involved in transitioning, this timeframe must take into consideration the amount of time a farmer needs to plan for the transition, including deciding upon or designing the system that would work on their farm, and then trialling the system. According to the stakeholders interviewed, this is key to minimise the negative welfare impacts of inexperience and choosing the wrong system for the farm. Allowing farmers the time to transition a portion of their farm, or to work with another system for a period, can ensure that they can reduce the financial impact when they fully transition. More importantly, it will minimise the welfare impact due to the time needed by the farmers to learn how to manage these new systems.

It is advised that to minimise the impact of equipment and construction shortages, the EU should take a staggered approach, requiring farms to transition in order of age of building and investment. Doing so offers a fair way of ensuring that producers stagger their investments and transitions, which will put less pressure on the construction and equipment manufacturers. The staggered approach can also allow farmers to decide between transitioning existing buildings, for which they will have less time to do so, or building new facilities, where they will be granted longer. This phased approach will enable production to continue steadily and allow farmers the time to comply with the legislation.

Taking the most extended deadline provided by the interviews, hence the most conservative approach:

- If building new buildings, it is possible to transition within **four to five years**
- If renovating existing buildings, it is possible to transition within **three years**

It is important to take into account that these periods are calculated taking into consideration a full or significant EU financing aid to build/renovate to cage-free systems. Also, these may vary according to the depreciation time of the buildings.

It is also important to note that the timeline for rebuilding the premises **could be shortened by approximately one year,** if there were significant improvements made to the environmental permit process. For more information on environmental permits, see section 3.3.6. For more information on the cage-free brands of systems and breeds being used, see Annex V.

Species 3

LAYING HENS

11. Current national status

Laying hens	
Austria	Enriched cages are already prohibited in Austria. Between 2005 and 2019, Austria transitioned from all cages for laying hens. The Austrian value-added package was gradually implemented and resulted in a complete ban on unenriched cages in 2009, three years earlier than the rest of the EU. By the end of 2019, the transition periods defined in Austrian animal welfare law expired, and laying hens were only being kept in alternative housing systems (FIBL, 2020).
Luxembourg	Enriched cages are already prohibited in Luxembourg.
Belgium	In 2010 the Belgium government granted a phase-out period of 15 years as a minimum; this was due to a former decision by the Belgian government which granted a phase-out period of 15 years.[29] In Wallonia (Belgium), the cage ban will come into effect by 2028.
Sweden	In 1988, battery cages were banned for laying hens under the Animal Welfare Act 1988 (SFS 1988:534). As of July 2022, 5.5% of all laying hens were still in enriched cages.[30]
France	In October 2017, the French President Emmanuel Macron announced that all eggs in supermarkets would be sourced from free-range hens.[31]

[29] Belgium to ban ALL cages for egg production - Poultry World
[30] Shift to cage-free in EU continues – Poultry World
[31] Compassion supports UK retailer cage-free move | Compassion in Food Business

Germany	Germany is the largest egg producer in the EU. Germany's ban on enriched cages will come into force from 2025 and, in exceptional cases, from 2028 (CIWF, 2020b).
Czechia	Czechia voted in September 2020 to ban cages for laying hens from 2027 (CIWF, 2020b).
Slovakia	In Slovakia, the government and industry bodies signed a memorandum on February 7 2020 to end the use of cages for hens by 2030.[32]

[32] The Slovak Republic to End the Cage Age | Compassion in World Farming (ciwf.org.uk)

11.1. Timelines for producers who have transitioned, or are undergoing a transition

Producer	Start date/ Date of pledge	Actual/ Forecasted date of completion	Transition time	Additional information
Balticovo	2021	2026	5 years	In an interview with Balticovo, they stated that although they had pledged to transition by 2026, it is likely that it will be 2027-2028 due to the current financial crisis and the outbreak of avian influenza.[33]
Granja San Miguel	2017	2025	8 years	Granja San Miguel is working with the non-profit organisation Equalia to move entirely away from cages by 2025.[34]
Gruppo Sabbatani	2017	2023	6 years	The Italian egg producer and packer, Gruppo Sabbatani, began transitioning in 2017, and in 2018, 57% of their eggs were caged, dropping to 46% in 2019, 34% in 2020, and then 20% in 2021 and 2022.[35]
Fattoria Roberti	December 2017	2025	8 years	Roberti Farm (Fattoria Roberti) is an Italian egg producer focusing on animal welfare. They planned to phase out all combined systems and cages by 2025.[36]

[33] Baltic region on the way to cage free
[34] Granja San Miguel: Pledge to animal welfare
[35] LAV: Laying Hens in Italy
[36] CIWF Case Study: Farroria Roberti

				In 2020, they were awarded the CIWF Good Egg Award.
Eurovo	April 2021	December 2022 (Italy) And 2027 (everywhere else)	2 and 6 years	Eurovo is one of the largest egg producers in Europe. In 2021, they pledged to use cage-free systems in their Italian farms by the end of 2022 and for the rest of their European farms to be cage-free by 2027.[37] In 2020, they launched the "Project for the Improvement of the Welfare of Laying Hens" alongside CIWF.[20]
Huevos Guillen	2018	2025	7 years	Guillén Eggs is based in Spain and, in 2018, committed to only producing cage-free eggs by 2025.[38] In 2022 they were awarded the CIWF Good Egg Award.

For detailed descriptions of the transition process of different producers, see producer case studies in Annex III.

[37] Eurovo: Cage Free Commitment
[38] Commitment 2025 (huevosguillen.com)

12. Existent research projects to support implementation within the EU

12.1. Best Practice Hens Project

The Best Practice Hens Project is a European Commission DG SANTE pilot project intended to support egg production in non-cage systems. The project started in May 2021 and will finish in May 2023. One of the outcomes so far is a report that describes the current state of play for pullets and hens in the EU. It includes the economic situation and a summary of best practices across the different alternative systems. This information is now being published and disseminated in a series of roadshows around Europe.

12.2. EVOLUTION project

The EVOLUTION project was initiated in 2019 and led by ITAVI (an expert body in the poultry, rabbit, and fish sectors). The project aims to "support the laying sector in its evolution towards aviary systems combining competitiveness and societal expectations". ITAVI says that the project is needed due to the significant changes in recent years that France, and the rest of the EU, have seen in response to regulatory changes and consumer expectations." Also, new systems, like aviaries, have emerged, and there is not enough experience and knowledge about them in France yet. In particular, the EVOLUTION project will describe the technical characteristics of the available aviaries, measure their performance, and propose solutions to adapt future layers to the environment better.

13. Impacts of transitioning

This section describes several factors that can be impacted (positively or negatively) or not by the transition to cage-free systems. Factors featured range from financial, to labour impact as well as the impact on number of animals and product quality.

13.1. Financial

13.1.1. Investment costs

There is plenty of experience in the egg sector on the cost of investment. These costs seem to have become more challenging given the current socioeconomic conditions. Nevertheless, this doesn't seem to have halted the transition to cage-free of the laying egg industry, instead it has further cemented the need for a strong plan for a smooth transition.

The initial transition cost is sizable for commercial laying hen farms, especially as most systems have upwards of 100,000 hens. The manufacturer Vencomatic, made the point in their interview that their equipment costs the same across the EU, regardless of the recipient country. This means that in terms of economic status, the cost of transitioning may be relatively more expensive for some countries than for others. This could be offset by EU financial support, as detailed in this report by IEEP.

Furthermore, equipment costs are increasing significantly in the current financial climate. Granja San Miguel funded their transition without financial support from the Spanish government. They commented in their interview that in 2021/2022, their new aviary buildings cost €6,000,000 each. This year, however, it will cost them €10,000,000 per building. These are for a minimum of 100,000 hens (average of 150,000), which equates to around €66 per hen in 2023, compared with €40 per hen in 2022, an increase of 40%. This points to the need of setting out a clear plan for a smooth transition, without further stalling, as this could raise the final costs.

The quoted prices for investment varied across the stakeholder interviews, and some producers have found cheaper ways to transition their systems. For example, Fattoria Roberti converted their existing combi-cage system into an aviary system, utilising many of the existing internal structures and cages and opening them up to allow freer movement. They also added ramps and platforms to allow easy movement throughout the tiers. All the interventions and adjustments in this shed required an investment of about €1.50 to €2 per hen.

In the middle ground, Eurovo said in their interview that it cost them around €30 per hen to transition existing cage systems to alternative systems, as part of the initial investment. This price includes the cost of removing the existing cages and buying and installing the multi-tier system.

13.1.2. Production costs and profitability

The experienced cage-free egg market has clearly demonstrated that higher welfare systems (free range and organic) have a greater potential for a greater profit. Likewise, the market has also demonstrated the capacity to absorb and compensate for higher costs of cage-free via higher value paid to the farmer. Nevertheless, a clear need of value distribution through the supply chain is needed for this to be materialised.

According to the Institute for European Environmental Policy (IEEP), the running costs of alternative housing systems depend on the system (IEEP, 2022). For example, based on baseline data from 2017, they state that barn systems in France are likely to cost 9.5% more in production costs than enriched cages. Whereas moving from enriched cages to free-range systems would cost 14.4% more in production costs (IEEP, 2022). Similarly, van Asselt et al. (2015) found that production costs and related market prices are the highest for organic farms, followed by free-range systems, barns and enriched cages. This is primarily because organic and free-range hens are not typically bred to produce intensive levels of eggs and because the birds need to consume more feed due to the higher activity levels.

The Best Hens Practice project also commented that, after the initial investment costs, the major change in production costs is the feed, as the hens are more active and consume more. They suggest there is a 20% increase in costs as a result. Similarly,

Dr Giersberg from Utrecht University also listed feed as one of the key production costs that increase in alternative systems.

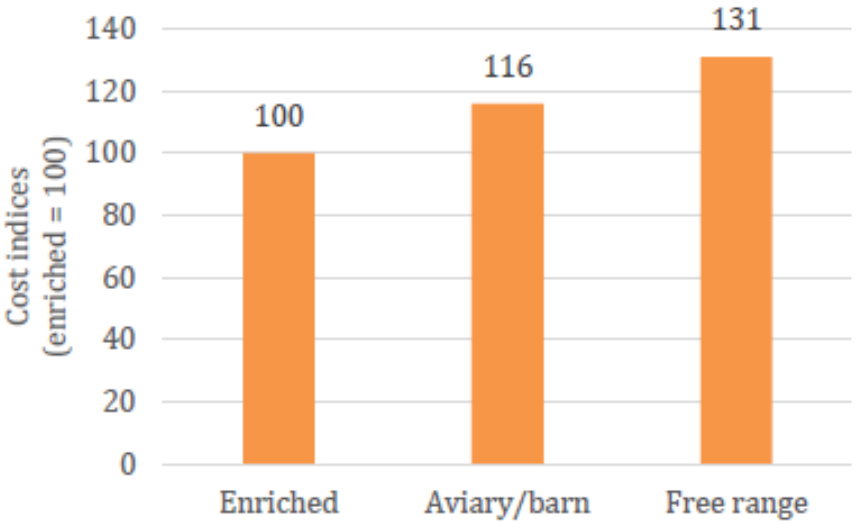

Figure 2. Cost comparison between production systems, based on the situation in Northwest Europe, using prices from Spring 2020.
Source: 'Costs and Benefits of Alternative Systems for Egg Production' by Wageningen Economic Research (2022a).

Profits

The impact of transitioning to alternative systems upon profits varies from country to country and across producers and is influenced by many factors. For example, **some evidence suggests that free-range laying hen systems are the most profitable, followed by organic systems** (Dekker et al., 2011). And that if caged systems were to transition to free-range or organic systems, they would see a profit increase (Dekker et al., 2011). Similarly, the Italian egg packer and producer Gruppo Sabbatani told the NGO LAV that they found that there was no change in profitability when transitioning from cages to barns but that **their profits did increase when they transitioned to free-range systems (LAV, 2022).**

Wageningen Economic Research compared the production costs of eggs produced in enriched cages, aviary systems and free-range systems in Northwest Europe, using spring 2020's prices (Wageningen Economic Research, 2022). They concluded that the aviary system costs less to transition to, compared with free-range (see figure 2), and that producers could get higher prices for barn (aviary) eggs than for cage eggs (see figure 3). Furthermore, they concluded that in

the Netherlands, **the selling price compensates for the extra costs of producing barn eggs** (Wageningen Economic Research, 2022).

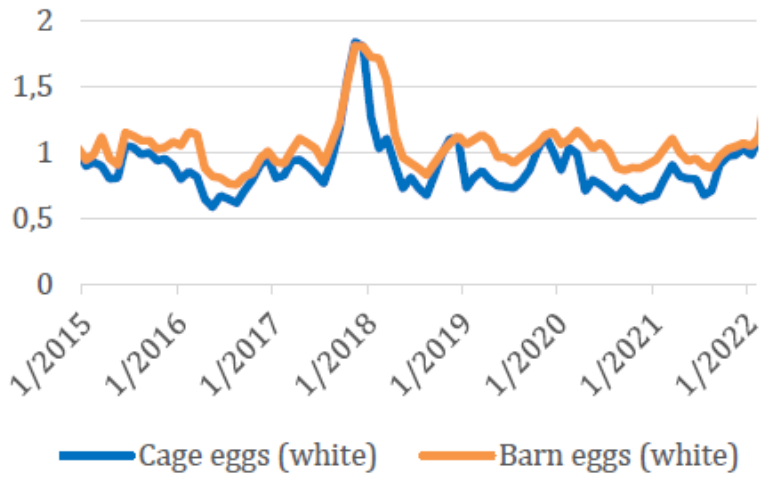

Figure 3. Price comparison between cage and barn eggs (Euro per kg) at farm level in the Netherlands.
Source: 'Costs and Benefits of Alternative Systems for Egg Production' by Wageningen Economic Research (2022a).

The Best Hens Practice project has demonstrated to farmers that there will be no difference in income when they transition from cages, despite having to decrease their flock size, as they will be able to secure a higher price for their eggs. Although, one theme that arose in the interviews was that those producers who are currently providing cage-free eggs, and are getting paid a premium for them, may lose that premium once cage-free is the minimum standard in the EU. Wageningen Economic Research commented that although this is a concern, the market is changing, and from 2026 there will be a strong demand for cage-free eggs, so the market has to adapt. They also commented that **the current financial crisis is temporary, and the market will adapt post-crisis to ensure that the farmer receives enough.**

Similarly, Hendrix Genetics commented on this last point and said that in the Netherlands, the pressure from retailers in 2005 meant that most farmers transitioned to cage-free. But then, those farmers already using barns and aviaries became the standard, bottom end of the market. As a result, many lost their premium from the retailers, as the retailers only accepted non-caged eggs. However, Hendrix Genetics agreed with Wageningen Economic Research and said that if there is protection for the producers, so that they have the timeline to work through the transition, **the**

market will evolve over the years. Hendrix Genetics commented that the producers know these changes are coming and have been waiting for them.

Clear communication to consumers on what the transition means for the animals is also important, particularly about why it amounts to higher costs. For example, Kipster farms argue that **consumers are willing to pay, provided they understand the benefits.** Kipster eggs are priced between free range and organic, and they have been very successful in ensuring a fair price for their products, and they often sell out because they are so popular.

13.2. Health and Productivity

Cage-free egg systems have the potential to quickly demonstrate good results in terms of mortality rates and other production features, even if the initial perception is otherwise. Furthermore, cage free systems have the demonstrated potential to have even better results than caged systems.

Research shows that as the industry becomes more experienced with a system, mortalities gradually decrease (in all indoor systems apart from conventional cages) (Schuck-Paim et al., 2021). **In particular, in a meta-analysis of commercial farms, each year of experience with the aviary systems since 2000 was associated with a drop of 0.35 – 0.65% in cumulative mortality.** Schuck-Paim et al. put this down to improvements in genetics and the natural evolution of knowledge and skills in management. **They also suggest that new producers transitioning to cage-free systems today will likely experience a faster rate of decline in mortality levels.** This is because the genetic strains of the birds will become more adapted, and there is a growing body of knowledge now available (Schuck-Paim et al., 2021). These findings demonstrate that the concern over higher mortality rates in cage-free systems is often an inaccurate perception and that the maturity of a production system plays a significant role (Schuck-Paim et al., 2021).

According to Hendrix Genetics, the mortality rate of the first flocks in a transitioned alternative system will increase compared to the previous system. The rate then decreases gradually, as the producers and staff learn how to manage the system better. Then, eventually, it **can reach below 5%, similar to cage mortality levels, with flocks reaching 100 weeks of age**. Hendrix Genetics say that genetically it is possible,

although, in cage-free systems, there are more disease and health-related problems to consider.

However, following their transition, the Sabbatani group reported no diseases, as they had taken steps to prevent potential issues of verminosis and colisepticaemia that were found in previous pullet rearing cycles[36]. Their actions, which included administering vaccinations, meant that they had an incidence of 0%. Consequently, they also applied no antibiotics, as they only administered antibiotics for treatment and not for preventative measures. They also reported no leg injuries and no lesions to the sternum.

In their aviary system, Fattoria Roberti reports mortality rates of 4.8-5%, and feather coverage of around 60% on average. They also have no problems with feather pecking, even though they have birds with intact beaks, because, according to the farmer, the birds have enough perches to escape more dominant birds.

Feather coverage is an important factor in the health of laying hens, as feathers are the birds' first line of defence from many health issues. Feather coverage can be well managed through breed choice (see section 19.2), and by managing fear and stress sensitivity in hens. For example, research has found that flocks fearful of farm staff as pullets are more likely to have greater feather damage as adults (de Haas et al., 2014, 2021). **This highlights the importance of investing in a good human-animal relationship.** Furthermore, Hendrix Genetics advocates using white hens, as they have better feather coverage than brown birds. In support of this, the Sabbatani Group reported in their progressive reports on animal welfare indicators that 13% of their farms reported feather loss and that this was mainly in the brown Novagen breed of hen.[36]

The Sabbatani Group found similar results following their transition.[39] And they found that mortality rates decreased on average between completed cycles on the same farm (unless there had been an additional change, such as lengthening the production cycle).

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[39] Sabbatani Group – Progressive report on animal welfare indicators 2021 - 2022

13.3. Market demand

Although sometimes it may be hard to directly connect the two, there are clear examples where the demand for eggs has benefited from the cage-free conversions at member state level as well as at individual farmer level.

The impact of transitioning upon market demand varies and is often unclear. For example, Balticovo said that overall demand is high for eggs at the moment, due to the shortage, so they cannot determine the impact of their ongoing transition yet. Similarly, Eurovo said that demand for eggs is high because they are a cheaper protein than meat and are quicker to cook, which means that they are popular in the current economic climate, where most consumers wish to reduce their bills.

However, **without investing anything in marketing, the Kipster farms have reached significant success with their high-welfare eggs**. In particular, their main buyer, Lidl, regularly sells out of their eggs, demonstrating significant demand for their products, despite the eggs being more expensive than free-range (but lower than organic).[31]

Austria saw growth spurts in the Austrian egg market following the industry's communication of their animal welfare-friendly decisions (FIBL, 2020). For example, **since the ban on barren cages in 2009, the number of hens being farmed in Austria has continuously grown,** increasing by over 2 million (35%) between 2009 and 2019 (FIBL, 2020). This growth also meant that Austria increased their self-sufficiency to 87% in 2017, from a low of 74% in 2009 (FIBL, 2020).

"The transformation to alternative systems and diversification of production has made us an attractive company for many clients since we cover all their needs in terms of fresh eggs, product quality and professional service."

- Granja San Miguel

According to the IEEP, France has seen recent increases in organic and free-range production systems and a decline in low-cost cage systems (IEEP, 2022). However, the IEEP states that there is now a challenge to maintain the balance between supply and demand in organic eggs.

13.4. Changes to the quantity of eggs produced

A potential drop in the number of eggs produced in the EU is foreseen. Nevertheless, due to EU's overproduction of eggs and likelihood of expansion to meet the market demand, the interviewed stakeholders reported that this would not be a hard issue to mitigate in the long run.

All of the stakeholders interviewed confirmed that there would be a drop in production following the transition if producers continued to use their existing houses and only transitioned their systems. According to calculations by Wageningen Economic Research, there will initially be a 2% decrease in the production of eggs following the transition. However, they felt that **most farmers would want to either expand or keep the same number of hens that they have, and the use of aviary systems helps to reduce the loss of production.** Wageningen Economic Research also commented that most US farmers have opted to expand, so the same is likely to happen in the EU.

IEEP also agreed that the transition would result in a reduction in the number of eggs being produced in the EU. **However, they viewed this as a positive because it fits with the EU's Farm to Fork Strategy and the need to reduce the consumption of animal products.**

Furthermore, although Hendrix Genetics agreed that transitioning existing houses would mean reducing the flock size, they felt that new farms would always pop up to fulfil demand and that, overall, the total number of eggs would not decline.

Hendrix Genetics also said, regarding individual producers, that if they used white birds, this would help to address the reduction in eggs, as they are more productive and robust than brown hens. Hendrix Genetics also agreed with Wageningen Economic Research that the space could be more effectively used with aviary systems, which will help reduce the impact.

However, it is important to note that environmental restrictions are an important factor in the EU and a significant bottleneck and deterrent for producers transitioning currently (see section 14.3.5). Wageningen Economic Research has also been advising farmers that one way to address the regulatory issues arising from the additional ammonia and fine dust that cage-free hens produce is to reduce the number of hens they farm. If farmers choose to do this, then it is likely that production will decrease more than their forecasted 2% across the EU, although the situation is highly variable and hard to predict. However, Wageningen Economic Research suggested that it would only impact production by around 10% (estimated), which they felt is manageable as the EU has 104% self-sufficiency.

Even when producers build new houses, they do not always expand, and according to the Best Practice Hens project, **many will take the opportunity to earn the same as before whilst keeping fewer hens.** As an example, during their transition, Balticovo built new houses for the alternative systems rather than transitioning their existing ones. However, they downsized their flock from the 300,000 hens they had in a cage system, to only 100,000 in the new house, despite building a similar-sized house.

13.5. Product quality

Feeding, type of selected features of the cage-free system, system management and very importantly pullet rearing all play a role in ensuring that the egg quality in cage-free systems is equal or even better than in caged systems.

In terms of egg quality from alternative systems, different factors are involved, as management plays a considerable role, along with feed quality and the systems themselves. According to the Best Hens Practice project, because the nest quality is better in alternative systems, **there are fewer soiled and cracked eggs**. Although, they do concede that this is dependent on the farmer to some extent, and, most importantly, the rearing. They commented, however, that in cages, eggs tend to accumulate in one place and can often damage each other, and this is less of an issue in well-designed and managed alternative systems.

Granja San Miguel said that the biggest impact on egg quality they see from their transition to aviary systems is the increase in dirty eggs. They find that because the eggs are in contact with the hens more, they collect more dust and dirt. Similarly,

Balticovo has also struggled with the cleanliness of the eggs and found that dust and dirt are an issue in alternative systems. However, they have found that the equipment plays a major role, and they are now trialling different brands and are finding that some result in eggs that are dustier and dirtier than others.

Floor eggs are another consideration in alternative systems, but one that can be mitigated by proper pullet rearing. For example, Fattoria Roberti said they only have an average of 0.1% floor eggs, which is because they rear pullets in similar barn systems.

Egg quality has been assessed in numerous comparisons of housing systems, and many factors play a role, including feed quality. Granja San Miguel said, for example, that because their hens are more active and are spending more energy on activity, the size of their eggs has reduced. Whereas **qualitative aspects, such as yolk colour, are generally better in eggs produced in alternative systems, compared with cage systems (Castellini et al., 2002), and some studies also report improved nutritional value too (Rakonjac et al., 2014).**

13.6. Staffing and labour

There was a consensus that the amount and complexity of work increased with cage-free systems. This was mainly connected to the fact that the animals are now free to move and express their behaviours, which lead to different challenges on daily animal checks, training of the birds to use the system, bigger areas to cover and higher dust levels. On the other hand, this also created an opportunity to be closer to the animals and their natural behaviour and an opportunity to stimulate the rural communities by generating more jobs in these areas.

Transitioning to alternative systems brings with it a change in the way of working, as there are new elements to consider. For example, according to the Best Practice Hens project, alternative systems need a slightly higher ratio of people to hens. In many countries, this is redeemed with family help, which amounts to a few hours a day to collect the eggs and inspect the runs. The main difference, as they view it, is that staff must do things differently, which doesn't necessarily take more time, but it is more complex. In contrast, Hendrix Genetics suggested an increase of 20-25% in labour for alternative systems, as the staff need to walk the extra farm area. Granja

San Miguel said, "Adapting to the new production systems is a daily challenge. The management of animals for these systems differs from the traditional one. It is necessary to control other types of pathologies and also to have a closer control of behaviour." They agreed with others in reporting that there is more work involved in maintaining aviary facilities than cage systems and a greater need for personnel.

There are specific points and elements of alternative systems that result in the need for more labour. For example, Balticovo said that litter removal was a key reason for why they needed more staff in their alternative systems. They also reported that because of employee regulations, the staff could only work for short periods in the alternative systems, compared with caged systems, because of the dust that is created. They said that "The staff have to work less hours and then have an extra day off, which means that overall, we need more people." In summary, they reported needing almost 1.5 additional staff members per hen house because of the safety issues associated with dust.

Other times when more staff are needed include during the unloading and loading of birds in alternative systems, which Balticovo said is more labour-intensive compared with the caged systems. Balticovo now uses professional crews to catch the birds as they are not caged.

The rearing phase is another critical point for labour in alternative systems compared with cages. For example, Hendrix Genetics said that during the rearing phase, staff need to train the chickens to move through the systems, which increases labour costs.

In addition, Hendrix Genetics also commented that alternative systems can produce floor eggs in the production phase, which, although minimised with good pullet rearing, still adds to the labour. For example, with brown birds, floor eggs can be as high as 2-5%, but with white birds, it may only be 0.5%.

Fattoria Roberti also agreed that there was an increase in their workload, **but they also felt that it enabled them to spend more time with the animals, as they now take time to observe the system and to learn what works best for the hens and their needs**.

The increased need for workers can be a much welcome boost to the rural economy.

13.6.1. Staff training

Training is a pivotal part of the smooth transition. Several resources are now available for the different stakeholders involved in the process, with special focus on farmers and any other farm staff.

The need to train staff when transitioning was a key theme in the interviews. For example, Balticovo said that "it takes time to teach, educate, and make proper management tools to train staff".

According to the Best Practice Hens programme, caretakers who only have experience managing hens in cages need additional training to work with cage-free systems to avoid problems arising (Best Practice Hens, 2022b). In particular, the training needs to be tailored to the specific cage-free system in use and adapted to the context of the farmer. Similarly, Vencomatic said that farmers need new skills for managing aviary birds, as it is completely different from managing caged systems. They said that "Staff training is important, as otherwise, they will end up with significant numbers of floor eggs."

According to Hendrix Genetics, the difference in managing a cage farm compared with an alternative system is significant. With cage farms, staff do not need a lot of experience, whereas, in cage-free systems, they need the right management skills; otherwise, mortality levels rise. **Therefore, investment in knowledge transfer and training on these subjects is vital for the sector.** Hendrix Genetics is playing a role in this. For example, they have brought around 30-40 UK producers to the Netherlands to train them in cage-free farming, as the aviary system is not widespread in the UK. Furthermore, the aviary system is more complex to manage, and although the birds can cope well in them, they still need to be trained from rearing.

Granja San Miguel reported that the need for training was not limited only to staff and farm owners, but because alternative systems were not the norm in Spain, compared with other parts of the EU, the veterinarians also had to be trained to understand and control the new challenges that alternative systems pose.

The Best Practice Hens programme said that adequate training is offered by Chambers of Agriculture in some countries, as well as integrations, breeding and equipment companies, farmers' associations, and others (Best Practice Hens, 2022b). They also said there are benefits to ensuring competent handling and management of hens through training. Not only will performance and production

improve, but also animal health and welfare, which will all lead to economic benefits and job satisfaction (Best Practice Hens, 2022b).

The Best Practice Hens project recommends that training should cover; how to comply with legislation, how to recognise normal and abnormal behaviour and signs of good health and disease, how to take corrective measures quickly, and how to seek additional help from experts (Best Practice Hens, 2022b).

13.7. Farmer satisfaction

Another theme arising from the interviews was that, in general, the farmers find it more rewarding to use alternative systems, as they can see the birds behaving more naturally. This is far more interesting and stimulating for the producers. Dr Giersberg, Utrecht University, also raised the point that using alternative systems has a positive impact on their public image, as society no longer wants caged animals anymore. So they must transition, or they will be left with no buyers.

Kipster farm says that their farmers benefit from a rewarding and pleasant place to work, and so they feel their systems are good for the animal, the environment, and for people, and they are proud of what they have created.[40]

However, one survey showed that farmers' satisfaction with cage-free systems is influenced by their previous experiences with systems (Stadig et al., 2016). For example, farmers who had previous experience with conventional cages were generally more negative about alternative systems compared with those who had not had any experience with conventional cages. Furthermore, farmers who had experience with free-range systems were also more positive about them than farmers who had not experienced them. Therefore, experience and knowledge of a system can directly impact a farmer's perception of various factors, including welfare, profitability, consumer demand, and labour requirements (Stadig et al., 2016).

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[40] CIWF case study: Kipster video

13.8. Breeding/rearing houses

If producers breed their own chicks or rear their pullets in-house, they must also transition these systems from cages, not only to comply with the legislation but also because the hens need to be trained from birth. Balticovo, for example, transitioned their rearing houses along with their laying houses so that the transition from pullet to laying system was more efficient for the hens.

Vencomatic commented on the importance of changing the rearing practices of pullets and said that "They have some producers who think they can skip this part to save costs, but then after one cycle, they realise the importance of proper rearing conditions." This observation was supported in a discussion during the 'Freeing the hens' workshop in 2021, where participants commented on the fact that producers are used to raising chicks in cages and that often, the importance of matching the rearing systems with the lay systems is not realised (Rodenburg et al., 2022).

13.9. Breed impacts

One of the spokespeople from Hendrix Genetics commented that when they transition their systems to cage-free, they will benefit from breeding the pure-line birds in an environment that equates to the commercial environment. They felt that for Europe, and in the medium-term for their USA customers, that would give them a competitive advantage, as few of their competitors selling to the US would be doing the same. However, for their South American and Asian customers, this would put them at a disadvantage, as they would be more expensive than their competitors who have not had to transition.

13.10. Beak trimming

In talking with Hendrix Genetics, one of their layer experts said that most of their breeds do not need to be beak-trimmed; only a few of their lines require it to avoid high mortality levels. For those remaining lines, they said, "to remove the need for beak-trimming, they would need six years of selection, and then four years of working with the birds, before the lines could be marketed; ten years in total." However, as there are good breeds available that do not need to be beak trimmed, in reality, this should not be a limiting factor.

Furthermore, research suggests that feather pecking can also be mitigated through good management during the pullet rearing and adult laying phases (Rodenburg et al., 2022). For example, the availability of good quality litter during rearing and laying is crucial in preventing the birds from redirecting their foraging behaviour and pecking at other hens.

13.11. Imports from third countries

Several of the interviewees expressed a concern that the transition would result in the EU importing more from third countries. However, this concern would be entirely mitigated by applying the same standards to imports as to products produced within the EU - a measure that not only farmers, but Member States as well are very keen to see in the upcoming legislation. More on the issue of imports from third countries can be accessed here.

14. Transition timelines

This section provides insights into the duration of the actual farm transition, as well as bottlenecks and any other information that can aid to complement the knowledge for better decision making on cage-free transition of current systems.

14.1. Key factors to consider for transition timelines

14.1.1. Time for depreciation

On average 8 to 15 years was the time reported for depreciation. Most importantly, 2025 was mentioned several times as the most likely year where the majority of the egg producers will be ready to reinvest in new systems.

Wageningen Economic Research

In an interview, Professor van Horne from Wageningen Economic Research explained that he based his calculations on a depreciation rate of 15 years. He said that poultry houses typically last for 25 years, and within that period, the equipment will have to be replaced once. From an economic perspective, it makes sense for the equipment to be replaced after 12.5 years (half the life of the poultry house). He calculated the average depreciation rate at 15 years to allow some leeway for better quality equipment and delays in replacement. The equipment quality is likely to vary across the EU, with some lasting less than 15 years and some being pushed beyond normal usage.

According to Wageningen Economic Research, because the last significant investment was back in 2011/2012 for enriched cages, most cage farmers will need to replace their existing equipment in 2026 (Wageningen Economic Research, 2022). This means that 2026 will be a choice moment for buying new equipment and that mid-2026 will be the time that most farmers will make a decision regarding their new facilities for the next 15 years (Wageningen Economic Research, 2022).

Hendrix Genetics

Hendrix Genetics stated in their interview that the depreciation period can vary from country to country, as some calculate the depreciation time as **15 years**, whereas others base it on 30 years. They said that most banks calculate their loans to producers for a minimum of 15 years and a maximum of 30. **Although they also mentioned that some producers pay back within five years when they remove the egg packer and sell their eggs directly to the retailer, as they benefit directly from price increases.**

Balticovo

Balticovo stated that they had initially hoped for a return on their investment within **seven years**. However, due to a market crisis from March to September 2022, the value of eggs was lower than the cost of production, which meant that they now expect to amortize their investment within ten years.

Granja San Miguel

Similarly, Granja San Miguel said they also hoped to have a return on their investment in a minimum of **15 years**, but they said that production costs and the selling price of the egg could mean it will take them longer. This is why it is crucial for the EU to provide financial support for transitioning farmers.

Eureden Group

According to a member farmer from the Eureden Cooperative and president of an egg producers' group, "I and my fellow chicken farmers went into debt by an average of €2.5 million to bring our farms in line with the new standards in 2012. **We plan to repay our loans by 2025, but it would be impossible for us to do so any sooner.** Eureden Group's approach (transition by 2025) gives us some time, which is important, because aside from the positive effects of this kind of announcement, there are families that need to make a living from their work while updating their

farms". Similarly, another Eureden Group farmer said "There is a trend towards alternative farming. We are prepared to make the change, but first, we need to finish paying off our past investments. I just need the time to repay what we invested". **This proves the point made by Wageningen University - for most farmers, the point of reinvesting is around 2025-2026, so this is the perfect time for legislation to be put in place.**

14.2. Timeline of implementation

For egg producers, the market demand and incentive to change is clear and strong, making the decision to transfer easier. Nevertheless, securing environmental permits[41] and in some cases loans (mainly due to avian influenza outbreaks) remain major challenges. **In total, farmers needed from as quick as three weeks to six years to transition.**

14.2.1. Decision to transition - Cage-free is the right business decision

For those who have already transitioned, the drivers of transitioning are often due to an understanding that the market is changing and a need to keep up with it. For example, Fattoria Roberti decided to transition their system as it saw how the market was ready to move. As a result, they committed to transitioning all of their systems to cage-free by 2025. Likewise, Eurovo said that they had committed to transitioning because they are a market leader, and their partners, who are also market leaders, all recognise the drive from consumers for cage-free eggs and egg products.

[41] For more information on environmental permits, see section 3.3.6.

The Italian egg packer and producer Gruppo Sabbatani told the NGO LAV that they were convinced that they made the right decision in transitioning away from cages, as it was in line with the new ethical values being expressed by today's society (LAV, 2022).

The Eureden Group recognised the changes in society and the time it would take to change. The Sales and Marketing Director for d'aucy Foodservice said that "if we and our farmers want to be able to satisfy our distributors' demand for alternatively farmed eggs, we need to plan ahead. That planning requires sufficient advance commitments from our clients regarding the chosen alternative farming method and the date of the official switch".[31]

14.2.2. Total time taken to implement

Once committed to transitioning, farm owners need to decide whether or not they want to build a new purpose-built shed or whether they will transition their existing buildings. Regardless of what they decide, building work may often still be required. For example, Granja San Miguel said that when transitioning their existing buildings, they still had to undertake building work to the walls and ceilings, as the change from cages to floor systems meant that there were different requirements for the building. For instance, for those transitioning to an aviary system, the height of the building is often inadequate for a fully efficient aviary, which means reducing flock size or investing in restructuring or rebuilding the house.

Wageningen Economic Research suggests that transitioning an existing building is often the quickest and easiest transition approach, as it would only take a few months, providing that the farmer does not need an environmental permit and that they can secure the equipment and construction services.

Stakeholder transition timeframes for transitioning existing systems:

- Fattoria Roberti converted their combination cage system to a Valli Space Aviary. They originally had 20,000 hens in combi-cages and began transitioning in December 2017 to an aviary system for 18,000 hens (although at a higher stocking density than advised by CIWF).
  They transitioned their existing building, and it took about **two to three weeks** to put everything into place in each of their sheds. They worked with the system manufacturer to plan the main adjustments, but most of their improvements were made by the farmers, as they had experience with other multitier systems.
- Balticovo said that when they transition an existing house to an alternative system, it takes **up to a year** to move the old equipment out, reconstruct the building and fit the new equipment. In particular, it takes a minimum of three months to clear out the old equipment, three months for reconstruction, and three months to put all the new equipment into place; a minimum of nine months and an expected one year.
- Eurovo has two approaches to transitioning its systems. The first was to keep the existing caged system and remove the gates to allow more free movement. Although, in general, the equipment was often not good enough to keep, so most of their transitions took a different approach. This second approach was to remove the equipment, buy a new system, and adapt the building. The process is relatively straightforward in terms of construction **(around six months)**. However, Eurovo said they were often held up by the need for authorisation permits, which could easily take two years, but often **two to three years**. Following this, Eurovo says that another two to three years is needed for the farmer to secure investment, find the supplier, negotiate, order the system, get the materials, and install the system. This is particularly exacerbated by the current delay in production seen globally following COVID. Therefore, Eurovo said that in total, their transitions often took **five to six years** in total.
- The Sales and Marketing Director for d'aucy Foodservice said that "It takes 18 months to raise a pullet from chick to laying hen. Transforming a coop with cages into a cage-free coop takes another six months or so, meaning the total transition time can be **around two years**."[31]
- Granja San Miguel said their transition has taken around **four years**, and involved selecting the new system and then gradually emptying the old one, so they could maintain production throughout.

- The manufacturer Vencomatic said they begin once the farmer has the necessary permits and the house is emptied and ready for the new system. They said that installation from this point is relatively easy, as Vencomatic assembles most of it at their location, and then dispatch a supervisor and team to install it on the farm. It takes approximately **three months to install**.
- Balticovo was the only stakeholder who was undergoing the building of new facilities in their transition. They began construction for their first new hen house in early 2018, and by 2021 they had built three new houses, taking a total of **three years** to do so. They kept the old houses open and productive until the new ones were built.

14.3. Bottlenecks that slow down the transition

The EU egg production is well on the way for a cage-free future. Nevertheless, experience has surfaced several bottlenecks that need to be mitigated for a smooth transition to an entirely cage-free production. The securing of environmental permits for new buildings, the lack of financial aid and the "invisible" caged eggs are some of the factors highlighted by the respondents.

14.3.1. Insufficient funds to invest

Balticovo had initially planned to complete its transition by 2026. The transition had been delayed by the current financial situation, and the avian influenza outbreak. In particular, the banks have stopped their loan offers, and the cost of production has increased significantly. According to Balticovo, the cost of building one new house for 130,000 birds is now 40% more than they had planned. So, they have had to reduce their plans from three new houses to two, which is still over their original budget. Similarly, Granja San Miguel commented in their interview that the current economic situation and rising production costs have made it very difficult for them to continue with their transition.

In addition, Eurovo commented that the current difficulties in securing materials and equipment might pose logistical issues for transitioning. The costs are also increasing because it is harder to source materials. Eurovo stated that the cost of transitioning used to be around €20 per hen but is now reaching €32-€35, which is causing some investors to delay transitioning.

The German Association for Controlled Alternative Animal Husbandry (KAT) also felt that the main bottleneck to producers transitioning was the economic situation and the lack of funds for new infrastructure. KAT felt that in terms of the animals and the knowledge of how to use alternative systems, the EU is ready, but the challenge is for producers to find enough money and capital to invest. Again, this emphasises the need for external financial support.

Vencomatic mentioned that many of their producers are not currently investing, and they have seen an increase in the sales of spare parts as a result. In particular, they have seen many producers choose to transition over the past few years, but more recently, this has slowed down considerably. Vencomatic thought this might be a sign of the current economic situation and the effect of avian influenza, as producers are waiting to see what will happen once everything has settled down.

14.3.2. Insufficient knowledge sharing

For the countries where there is already an established section of the industry using alternative systems, there is sufficient best practice and knowledge to share. But according to the Best Hens Practice programme, in those countries where there has been little movement in this direction, **there is a lack of available advice for farmers wishing to transition.** The farmers' advisors, for example, often need to be more familiar with the systems and to "retrain the farmers from being an egg farmer to being a chicken farmer." This observation was supported by comments from Granja San Miguel, who said in their interview that not only did the staff need retraining but so did the veterinarians, as they were also unfamiliar with the system. Granja San Miguel also said that the lack of best practice and examples in Spain was a challenge for them and a significant bottleneck. They said that to get enough information about the alternatives and to see first-hand the production systems, they had to visit farms in Germany and the Netherlands. Fortunately, the Best Practice Hens Project is changing that.

14.3.3. Need for new buildings

One bottleneck for transitioning is the need for many producers to have to build new buildings rather than transition existing ones, which is far quicker to achieve. According to the Best Practice Hens project, the height of the building is a significant factor, as the new aviary systems need higher constructions. So often, conventional buildings can only be transitioned to single-tier systems, as you cannot fit a whole

commercial aviary system into an existing barn. The Best Practice Hens project mostly sees farmers building new two-tier systems next to the existing barn and then demolishing the original barn afterwards. This can be an issue for some areas where there are particular difficulties with securing environmental permits or accessing the space to rebuild. Most farmers will want to keep their existing systems running whilst they rebuild so that they do not lose a year or more of production and lose their contracts. However, many farms will not be able to do this due to the environmental and financial restrictions (see sections 18.3.1 and 18.3.6). **This points to the need of facilitating access to environmental permits.**

14.3.4. Non-staggered transition periods and availability of equipment

A staggered but swift transition needs to be factored in so as to not incur in the same mistakes of the past that led to a shortage of eggs towards the end of the EU deadline to convert to enriched cages.

During the transition from conventional to enriched cages, there was a shortage of eggs towards the end of the transition period. **This was because the majority of the farmers waited until the end to transition and then had to stop production to transition.** A similar effect was seen in Sweden following the earlier transition from conventional cages (Berg et al., 2006; LAV, 2022). This meant that the price of eggs increased as fewer were available. As a result, the transitioning farmers missed out on these higher prices, leading to more dissatisfaction with the legislative transition. **Although the Best Hens Practice project is currently advising farmers not to wait until the last minute, they said that most farmers are still adamant that waiting till the last moment is still the best thing to do, despite being advised of the benefits of transitioning earlier, and the consequences of waiting.** This observation was supported by comments from the Big Dutchman, one of the main players in manufacturing in the EU. They said that in their experience, producers will wait till they absolutely have to transition, and that will cause a significant bottleneck in production. For example, as large numbers of farmers transitioned at once during the last transition, there were insufficient equipment and construction services available for everyone, which drove up costs and caused significant delays.

Therefore, farmers must be incentivised to transition at a staggered rate to avoid these bottlenecks. The Big Dutchman said they are prepared to invest considerably

in expanding their production, but they will not move until they have utmost certainty in the timelines of the transition.

14.3.5. Environmental permits

One significant theme, across all interviews, was the bottleneck of getting an environmental permit for transitioning. Stakeholders commented that this could delay transitioning by several years and often takes around two years to complete the process. For some, this is already a factor in stopping them from transitioning earlier, and for others, it results in considerable delays and costs. To avoid this, many farmers will opt to transition their existing buildings, which means that they cannot increase their flock size and will be unlikely to develop further by creating a free-range system. Doing so, however, does often reduce the impact of seeking an environmental permit, providing that they can maintain the required maximum levels of emissions.

14.3.6. Insufficient market demand

The demand for cage-free eggs exists but it hasn't reached the entire EU population. Likewise, many EU consumers are aware that a lot of products they buy still contain caged eggs (even in member States where production of caged eggs is no longer allowed).

According to Eurovo, many producers are not opting to voluntarily transition because there is sufficient demand for the cheaper caged eggs, so producers do not feel pressured to transition. Eurovo stated that this is particularly the case for exports, as the destination countries (e.g., Japan, Israel) are less concerned with welfare than the EU. Thus, the EU has an opportunity to maintain the position of a leader on animal welfare, leading the way for other countries when exported products are also higher welfare ones.

Similarly, KAT commented in their interview that although they have mostly transitioned from caged systems in Germany, they still import products with caged eggs. T**hey said that most consumers believe they only purchase cage-free eggs and are unaware that other products still contain caged eggs as an ingredient.**

Hence the importance of providing consumers with information about the products they purchase.

In terms of **EU consumers, there is little understanding of the actual differences in laying hen systems, and although consumers are aware of the welfare concerns, studies show that they cannot differentiate between the various systems and how these may impact welfare** (Vecchio & Annunziata, 2012). **Labelling plays a key role here in terms of educating consumers about why they need to pay more, and what exactly the extra cost equates to in terms of welfare** (LAV, 2022). Furthermore, the labelling must be better regulated, as packaging often misleads and hinders the success of products that genuinely offer improved welfare options (Verbeke, 2005).

14.4. Factors that hasten and assist the transition

14.4.1. Training and sharing best practice

According to Dr Giersberg, Utrecht University, for farmers and countries that have already undergone the transition, one key element that helped the transition was appropriate training. Training initiatives from feed companies, breeders, and Chambers of Agriculture, have helped to ensure that the transition has gone more smoothly and allowed best practices to be shared. **The key, however, is to ensure that the source of the knowledge or training is trusted and that it is not a top-down approach but is shared amongst peers.** For example, in a workshop discussing the collaborative opportunities that could facilitate the transition to cage-free systems, one participant mentioned the success of a delegation of Canadian caged egg farmers visiting cage-free systems in Switzerland. The Canadian farmers were happier to adopt recommendations that were shared by colleague farmers than those presented in scientific papers or from scientists (Rodenburg et al., 2022). Although, Rodenburg et al. commented that this is dependent on the pressures and context between the two countries being similar, as collaboration would be more effective when both countries have similar demographics.

Fear from producers over real and important issues, such as feather pecking and cannibalism, can deter producers from transitioning (Rodenburg et al., 2022). However, as these issues are solvable, there is a need for more collaboration between the producers and the many other stakeholders involved, including scientists, NGOs, breeders, and retailers. Although, for many, the best form of knowledge comes directly from fellow producers, which the other key stakeholders

can help to facilitate. For example, NGOs and breeders have been successful at arranging delegations of cage farmers to visit cage-free systems and to facilitate peer-peer knowledge sharing (Rodenburg et al., 2022).

Sharing best practices can also aid in the well-being and productivity of the birds during the transition. For example, research shows that mortality rates in aviary-housed birds decrease with every year of knowledge and familiarity with a system, not just on an individual farm, but in terms of total industry production (Schuck-Paim et al., 2021). See section 17.2. for more details.

14.4.2. Collaboration between retailers and producers

The retail sector is an important collaborator due to the relationship and influence it has on consumers' perceptions and demands (Fernandes et al., 2019; Rodenburg et al., 2022).

One of the suggestions from the 'Freeing the Hens' workshop on collaborative opportunities was that collaboration between retailers and farmers could improve the speed with which consumers adapt to the transition and their willingness to pay more for better welfare conditions (Rodenburg et al., 2022). For instance, in Taiwan, retailers visit farmers and then display video clips of the hens in the higher welfare systems next to the products for sale. A cheaper alternative would be to print QR codes on the egg boxes so that consumers can then visit the website of the farm and learn more about the conditions.

15. Recommendations

The laying hen industry has been preparing for the move from cages since the last transition to enriched cages. It was clearly felt by the stakeholders interviewed that **farmers have not continued to invest in cages in the past years**, following the previous transition, and are waiting for the definitive date for transitioning. Furthermore, there is an overwhelming sense of acceptance from most, as farmers are ready and happy to transition, as they know that there will now be a suitable market for shell eggs at least, due to the commitments of retailers and food manufacturers seen in the past few years. However, farmers still want time to transition, and experience has shown us that most farmers will wait until the last point to transition, despite concerns over the unavailability of equipment. Therefore, it is imperative to avoid a major bottleneck with all producers transitioning at once, which would result in a significant drop in production. Although the following recommendations are staggered in terms of when the producer last invested and installed their system, in all likelihood, **the vast majority of producers invested between 2009-2011 for the transition from conventional to enriched cages, and very few will have invested again since then. This highlights the opportunity to introduce new measures soon, as their announcement would fall around the time of completion of depreciation.** Therefore, there needs to be significant and worthwhile incentives put in place to encourage producers to transition.

Staggered timeline for a transition with full or significant financial support from the EU

These recommendations are based on the actual practical timeline to transition, regardless of current investments and depreciation times. As there are many steps involved in transitioning, this timeframe must consider the amount of time a farmer needs to plan for the transition, including deciding which system would work on their farm.

It is advised that in order to minimise the impact of equipment and construction shortages, the EU should take a staggered approach, requiring farms to transition in order of age of building and investment. Doing so offers a fair way of ensuring that producers stagger their investments and transitions, putting less pressure on the construction and equipment manufacturers. The staggered approach can also allow farmers to decide between transitioning existing buildings, for which they will

have less time to do so, or rebuilding new facilities, where they will be granted longer. This two-phase approach will enable production to continue steadily and allow farmers the time to comply with the legislation.

The following recommendations are based on four years of implementation for transitioning existing systems, and five years if they are rebuilding the building.

It is important to remark that the interviewed producers transitioned at a time when there were less best practices at hand, which could have hindered the time of transition. Currently, the process is simplified in terms of knowledge, as the experience is already available.

The timeline for rebuilding the premises could be shortened by approximately one year, if there were significant improvements made to the process of obtaining environmental permits.

- For systems built more than 10 years ago, it is possible to transition existing systems within **four years**,[42] or if rebuilding buildings, it is possible to transition within **five years**.[43]
- For systems built less than 10 years ago, it is possible to transition existing systems within **five years**, or if rebuilding buildings, it is possible to transition within a maximum of **six years**.[44]

It is also important to keep in mind that the majority of the EU egg producers providing these timelines and committed to cage-free production are due to convert their entire production before 2027.

For more information on environmental permits, see section 3.3.6. For more information on the cage-free brands of systems and breeds being used, see Annex VI.

[42] Based on four years of implementation from the announcement of the timeline (2023).
[43] Based on five years of implementation from the announcement of the timeline (2023).
[44] Staggered according to the date of last implementation, primarily to stagger the pressures on manufacturers and production output, but also to acknowledge the time since the producer last underwent a large change.

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Annex I

Producer case studies - pigs

ten Have farm (producer one, Netherlands)

The ten Have farm, based in the Netherlands, transitioned most of their farm to a free farrowing system, and their meat is now certified with two stars from the Beter Leven star system in the Netherlands. In 2011, producer one built two experimental pens, where she trialled the free farrowing approach. She worked with 14 other farmers, who all took a similar approach, with one or two free farrowing pens each. They all shared experiences and best practices to see what could be improved and how best to set everything up. The farmer ran the experimental pens for around two years.

The experimental process was relatively straightforward and was deemed a success, so after that, they converted the majority of the farm into free farrowing. From 2014, they had 80 free farrowing sows and are now at around 600 sows. The first year of working at this level was more challenging than before. The farmer commented that it was a very different experience to their two experimental pens and a significant shift. It took them over a year to learn how to work with the new free farrowing pens at that level. **However, they felt this was because there was little best practice being shared at the time, as they were transitioning before many others had done so**. So, although they had done a lot of research and talked to people about the design, they still had many problems with the system. **Currently, the transition would be much more simple, as there are more best practices available.**

Issue: The main issue was the design of the pens, as they had issues with air coming in through the feeding rack, over the floor and chilling the floor. The pens were open, with no way of closing them, so the cold air was a real issue when the piglets were born and still warm and wet from birth.

Solution: They resolved this by developing a 'nanny', a box in the farrowing pen. According to the producer, *"Initially, we made the opening to the box too large, and the sow would put her head into it, which was a safety issue for the piglets, so we had to make the opening smaller. We encourage the piglets to go in there, we put the haystack with the sow's smell in there to encourage them to stay there. They go in there typically for the first 15 hours but are free to come and go to feed. Then for the sow, we have created a place for her to lie down next to the nanny so that*

she can be next to the piglets whilst they are safe from crushing." The system is called Pro Dromi II, it was developed collaboratively with Wageningen University and the Pig Innovation Centre Sterksel and is manufactured by Vereijken.

The producers observed that even sows who had not experienced the free farrowing system in the previous cycles of production benefited from being placed in those systems. For example, the producer said *"we had one sow on her second litter who was still in the conventional system, and she didn't want to eat, and we didn't know what was going on. So, we changed the pen and moved her from the farrowing crate to the free farrowing pen, and she started eating and doing OK. Now it is easier, as the sows are born in the free farrowing system, so they know what is going on."*

Producer one also stopped confinement following insemination. Instead, they keep the sows singly in a pen for two to seven days before they return to group housing.

Kannestrup farm (producer two, Denmark)

Producer two, Kannestrup farm, previously used conventional farrowing systems but transitioned when they needed to upgrade their system. The need for an upgrade was due to the sows being too large for the stalls, as they had outgrown them due to developments in sow breeding leading to a larger sow. The litter sizes had also increased, which meant the creep area was too small. To invest in a system fit for the demands of a changing market, they decided to move towards higher welfare solutions.

As there were few best practices available at that time, the planning phase was a substantial part of the transition. They began planning the transition in 2008 and then built a new barn in 2012, ready to move into from January 2013. The Danish Pig Research Centre (DPRC) approached them to be a trial site for their research. With them, producer two developed the Sow Welfare and Piglet Protection Pen (SWAP pen), which allows temporary confinement of the sow for four days in an area that is larger than the conventional crate and allows for the sow to nest build, whilst staff can still enter easily.

According to producer two, they opted for temporary confinement because, during the trials, the researcher from the DPRC found that temporary confinement saved one piglet per litter on average. Although, as discussed in the 'Health and Mortalities' section (2.2), there are many factors at play here, and in fact, producer two has higher mortality rates than some producers who practice fully free

farrowing. Thus, the use of temporary confinement is unnecessary and should be discouraged. The SWAP pen is 3m x 2.1m, with slatted flooring for 120cm.

In terms of insemination, producer two does not confine the sows. In the insemination area, the sows are kept in groups of around 60, with free access stalls. The insemination is performed when the sow voluntarily enters a stall to feed. The sows then stay in this group area for around five days until pregnancy is confirmed. After this period, they are moved as a static group into the group housing pens section which is equipped with Electronic Sow Feeding stations (from Skiold). On average, sows each have around 2.2m^2 in these pens. Kannestrup farm manages the effects of mounting and aggression in these pens by ensuring that half of the pen has a 5-10 cm layer of straw for them to lie in. Although, the producer says that most of the sows opt to lie in the stalls rather than on the straw. The system works, and producer two said he sees no difference in leg health in the sows. The straw is replenished five times a day by a JHminiStrø straw dispenser robot by JH Agro, which moves through the sow house dispensing straw. **Producer two also sees no significant difference between embryo viability with this system and the conventional system, particularly as aggression is limited as the sows are pre-mixed before insemination.** Furthermore, adjacent to each group housing pen is a hospital pen, and each group has its own pen, which means injured sows don't have to be pushed too far and can recover more quickly.

Fumagalli Salumi, Italy

Fumagalli is a family-run pig production business and continental meat manufacturer. They began 50 years ago in Northern Italy. Over the years, they have undertaken many different projects, including genetic selection research and establishing their own breeding network. They have always been at the forefront of the Italian pig sector regarding animal welfare. As a result, they have secured both a Good Sow Commendation (2015) and the full Good Pig Award (2016) from Compassion in World Farming.

They began trialling and transitioning their farms to free farrowing systems around ten years ago and then worked with Compassion in World Farming seven years ago to develop this further. **They were the first farm in Italy to do this, and they designed their first pen themselves.** After developing their pen design, they started converting their farrowing systems to free farrowing in 2015. They trialled the pen in one of their breeding farms with around 300 sows. The farm does not confine the sows after insemination and now has 72 free farrowing pens. They score the sows' body

condition after farrowing and after insemination and monitor other key welfare indicators such as shoulder lesions. The farm also keeps the sows in homogenous groups to minimise competition and stress and groups them according to their body condition score. Each sow has around 2.75m^2 of space during the dry period.

Their second farrowing pen was developed three years ago in conjunction with the University of Milan and the CRPA – an Italian research and consultation institute that works on farmed animal welfare. **As they found the first pen's size to be too small (5.5^{m2}), they developed a pen with a 6.5m^2 space allowance, which meant that every five farrowing crates built according to their previous recommendations were now replaced with four new farrowing pens,** although some pens were larger due to the layout of the existing system and have 7.5m^2 of floor area. The floor of each pen is 50% solid and 50% slatted but can be rearranged if needed to minimise slipping that can lead to crushing. The pens also have farrowing bars to encourage the sow to lie down slowly. The sows go into the pens a few days before farrowing and are given straw for nest building. In the newer pens, the piglets are given a larger nesting area and a substantial heat lamp, which helped to reduce the mortality rate. As a result, the piglets were more likely to return quickly to the warm nest rather than stay in the cooler pen. They also conducted a study in conjunction with the University of Milan to observe which materials the sows used the most and found that straw and paper were the most used.

Although the pens were designed to allow for temporary confinement, they currently confine pigs for certain procedures only - for example for piglet tattooing (required for the production of Parma ham in Italy).

They decided against confinement of sows after having witnessed the consequences of confining them for three days in the initial phases of their project. The reason for this was that the sows couldn't nest build and became stressed and agitated. They would lie against the gate, making it harder for the piglets to feed. In addition, the sows were more agitated when they were released from confinement, which increased crushing. **However, once they opted not to confine the sows, they found that these issues improved**, as the sows were less stressed, the piglets could feed better, and they had better weaning rates.

The farmers also do not intervene for the first 24 hours to ensure the piglets consume colostrum, but after that, if the litter is large, they practise fostering, but only with sows belonging to the same batch. **They commented in their interview that, in general, their productivity is comparable now to conventional systems.**

Bodman's Farm, UK

The Bodman's farm always had a remit of higher welfare and used a straw-based system, but as it was common in the UK back in the 90s, they used farrowing crates. In 2010, the Bodmans acquired a new site and decided to install the PigSAFE system. They were motivated by current research at that time and because the UK's outdoor herd was saturated. They installed the system for 20 sows and opened in 2013. Since then, they have developed a further 40 pens.

Søndergaard Farm, Denmark

Søndergaard Farm has around 600 sows on its site. They began rebuilding their farm for the BORNHOLMERGRISEN® label in 2007, and because there was little choice of system back then, they developed their own. Unfortunately, as they designed the farm for temporary confinement but then had to stop any confinement to comply with the BORNHOLMERGRISEN® label, the system is not ideal, and there is a risk of crushing due to the layout. **However, currently there exist many systems that mitigate this risk.**

Viggby Äs Lantbruk, Sweden

This farm produces around 8,000 pigs yearly, just above the Swedish average. They started in 1992 with 40 farrowing places and pens and space to raise piglets to 30kg, then continued to expand every five years or so. Crate confinement is banned in Sweden, and the Elanders have designed their own $7m^2$ pen for farrowing. To reduce the risk of crushing, they place a temporary bar across the pen to aid the sow in changing posture, which is removed when she finishes farrowing. In addition, the outside of the pen has permanent bars to support the sow as she lies down, which also gives the piglets space.

ComplEAT Foods

The Compleat Foods Group is a chilled prepared food company in the UK, but they source their continental meats from Europe. They have three levels of standards: bronze, silver, and gold, with silver and gold requiring free farrowing systems. They commented on the diversity of opinion that they **see from farmers, with some being**

adamant that it wouldn't work, whereas others have transitioned or worked in this way for years and do not have an issue. This shows the importance of farmer attitude and culture in the transition process.

Les Viandes duBreton, Canada

Les Viandes DuBreton farming business consists of a network of 300 family farms in Ontario and Quebec. In 2000, they started their new strategy to include rustic and organic livestock programmes. In 2015, they committed to raising 300,000 pigs to a high welfare standard by 2018 and exceeded their target by 40,000.

Their philosophy is to "allow pigs to be pigs".

DuBreton moved towards a higher welfare remit to access the higher market premiums and the more stable income that higher welfare products attract. They also wanted to be a market leader in this area.

Maple Leaf Foods, Canada

Maple Leaf Foods was the first major company in Canada to commit to converting sows from gestation crates to an open housing system. By the end of 2019, they had moved 77% (around 50,000) of their sows to their Advanced Open Sow Housing system. Also, in 2019, they trialled two different designs for loose lactation and are now continuing the trial to gather more data, increase their understanding, and advance their welfare measures.

Old Fashion Pork, USA

The Old Fashion Pork is a 1,400-sow operation that meets the Global Animal Partnership (Step 1) requirements, which means no crates, cages or crowding. Instead, they have a farrowing pen system that gives the sow substantially more room and allows 360° turning and the ability to lie fully recumbent.

Niman Ranch, USA

Niman Ranch is a network of 650 small family farmers committed to raising livestock humanely and sustainably. Their indoor farrowing pens must be at least $6m^2$, or $4.5m^{2,}$ with access to a larger common area twice a day.

Annex II

Producer case studies - rabbits

Lapin & Bien

The creators of the Lapin et Bien system began to research and design the system back in 2010. However, because there was nothing like their system around then, they had to start developing their system from scratch, addressing and solving the problems and challenges that arose from it.

Since 2017, the ÉLEVEURS ET BIEN Association has set up a new alternative method of rearing rabbits raised on the ground in large enclosures. The project led to the creation of the "Lapin & Bien" brand, allowing products to be marketed accordingly (Lapin & Bien, 2019). The Lapin & Bien brand was developed to produce rabbits more ethically, putting the rabbit's well-being at the heart of their approach.[45] Through the initiative, they have developed a new best-practice breeding programme that is more ethical and sustainable than caged systems. In this system, the fattening rabbits are raised on the ground in large pens with spaces to shelter and rest. As a result, the animals can express their natural behaviours, moving more freely in their environment. As a result, Eleveurs et Bien won CIWF's Rabbit Innovation Award in 2019 on behalf of its commercial brand, Lapin et Bien, and the cage-free system they developed.[46]

More details regarding the experiences of Lapin et Bien can be found throughout this report. But, one thing that Lapin et Bien wanted to stress in their interview was that although it was challenging to develop the system and that it can be more complex to manage the rabbits, they were adamant that "it is worth it". This was a statement that was said with passion.

Bauer Kaninchen Spezialitäten

Bauer Kaninchen Spezialitäten has farmed rabbits for over 30 years in the south of Germany. They began transitioning to group housing in 2008 and, by 2020, were farming around 18,000 rabbits in indoor pens across five different holdings (IEEP,

[45] Lapin et Bien: Our History

[46] Compassion in Food Business Rabbit Innovation Award 2019: Eleveurs et Bien

2020). In 2008, the family worked with the retailer Kaufland to develop a new label for group housing and accompanying criteria for certification. Kaufland now only sources rabbits from suppliers that meet these criteria.[47] Bauer Kaninchen was one of Germany's first rabbit meat producers to offer rabbits from group housing (IEEP, 2020).

In 2016 (ended 2019), the Bauer family founded an EU-funded European Innovation Partnership (EIP-Agri Kaninchen) together with five other partners along the value chain (IEEP, 2020). The objective of the multi-stakeholder group was to develop and test a new rabbit housing system over three years.[48] The new housing system was co-designed in partnership with the supermarket chain Kaufland, the University of Giessen, the Italian equipment producer Meneghin, the feed producer Mifuma and the Farmarts veterinary practice (IEEP, 2020).

In 2013 CIWF awarded the Best Retailer Innovation Award to Kaufland for their work with the Bauer family and the cage-free system they created.[49] As a result, the rabbits in this supply chain are now under the 'Four Paws' higher welfare certification.

In an interview with the Bauer family, they advised me that it took them four years to design and develop the new system, and they started researching and designing it back in 2014. Previously, they used park systems but moved away from them in 2008. They find that their current system is much better in terms of the health and welfare of the rabbits. The system works so that the doe and her young can have their separate area, and then, when the kits are at weaning age, the doe is removed, and the kits remain. They then open up the dividers so that six litters share one large area. The Bauer family feel that their system has many benefits for the welfare of the rabbits, especially the young, as they do not have to be disturbed and moved. They can remain in the pen they know, and then the producers can clean a new enclosure ready for the doe to enter without stressing the young rabbits. Whereas previously, in their caged system, after three days, the young rabbits had to be moved to a new area where they had to learn where everything is and may have had to face changing temperatures. This resulted in stressed young, who began to show health problems 10-14 days afterwards.

[47] Compassion in Food Business: Kaufland Germany
[48] EIP-AGRI: Bauer family research project
[49] Compassion in Food Business: Retailer Innovation Award- Kaufland

WISIUM

In 2018, WISIUM, the animal nutrition company, collaborated with food manufacturers and production groups to develop LAPETY WELLAP, a new concept for rabbit breeding, which they announced in November 2021.[50] The global approach is designed to recognise the changing market regarding consumer expectations, rabbits' welfare, and the need for appropriate feed. The research and development teams at NEOVIA and WISIUM, along with their customers, devised a cage-free system that provides rabbits with an outside feeding path. They spent three years refining the model and trialling it with 4000 rabbits at the ADM's Experimental Station to understand the rabbits' nutritional needs and natural behaviours, and how they use and explore the available space.[51] By November 2021, they had raised 5000 rabbits using the prototype.

The system means that the farmer can gain added value on their rabbit sales, gaining more from their investment, whilst the rabbits can behave more naturally and benefit from improved welfare. Furthermore, the system means that producers can increase their production capacity by reducing the density of existing structures. The working conditions are thought to be improved through increased visibility, shelter and natural light. And the concept will mean that existing sites can be transitioned, allowing for investment in reasonably priced equipment and making it easier for young breeders to get started.

The LAPETY WELLAP system was awarded a Sommet d'Or in 2020 in the Livestock Equipment category and an INNOV SPACE 2 star in 2020.

Kani-Swiss

Kani-Swiss is one of the biggest players in the rabbit meat production industry in Switzerland and has farmed rabbits for over 30 years.[52] [53] Felix Näef is a pioneer in animal-friendly rabbit husbandry and established an animal-friendly rabbit meat production system, together with the animal welfare industry in Switzerland, STS, the BVL and the Coop. The rabbits are kept under the government's animal welfare programme, BTS (Besonders Tierfreundliche Stallhaltungssysteme), and therefore Kani-Swiss receive direct payment.

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[50] https://www.wisium.com/wp-content/uploads/2022/02/PRESS-RELEASE-WORLD-RABBIT-CONGRESS.pdf
[51] WISIUM: Lapety Wellap A new innovative breeding alternative
[52] Kani-Swiss: Animal welfare is part of our philosophy
[53] Kani-Swiss: Case study on group housing for does

Kani-Swiss use park systems for the fattening rabbits, with 25-28 rabbits in each. The rabbits are all provided with enrichment, including multiple platforms, gnawing sticks, straw, hay and silage, natural light and shelters. The founder, Felix Näf, says that because they have daily contact with the rabbits through daily mucking and feeding, they can identify weak and sick individuals faster than in intensive systems. They also have their own slaughtering and processing facilities, producing around 85% of their meat for Coop Switzerland. The rest are marketed under their own brands in local butcheries and as pet food.

BreFood

BreFood was one of the first rabbit meat suppliers on the German market. In 2016, they reported producing 1,400 tons of rabbit meat, equating to 1.2 million animals, with a market share of 70%, through nearly all German retailers.[54] BreFood work with Vier Pfoten, Compassion in World Farming, and the Tierwohl Initiative to develop better farming systems for rabbits.[55] BreFood began in 2009, and now all of their operations are cage-free, and they now have some producers who have free-range and high welfare systems.[56] BreFood worked with animal welfare organisations to be "the driving force that led to a rethink in the German market". As a result, they have won the Rabbit Innovation Award (2014 and 2022) and the Good Rabbit Award (2015) from Compassion in World Farming.[57]

BreFood worked with the University of Vienna, TH Munich, the independent institute NSF Erdmann, and their producers to create the BreFood Rabbit Care Standard. The BreFood standard has also been awarded the Four Paws Controlled Soil Management label. The BreFood label is called Rabbit Care.

BreFood producers keep their rabbits on soft floors made of bamboo or plastic and in groups of up to 80 animals. Their pens are large and airy, with natural light and normal day-night lighting rhythms. Each rabbit has around 1.25m^2 of space, with more space on the platforms and plenty of hiding places, platforms, and tubes to encourage natural resting and exploratory behaviour. The rabbits are fed unlimited feed and water. As a result, the rabbits have space to move, hop, and stand, can have more social interaction, and have plenty of opportunities to express normal behaviours. Images of the system can be seen here and in section 12.1.

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[54] BreFood: Our journey to higher welfare rabbit standards
[55] Initiative Tierwohl
[56] Initiative Tierwohl: BreFood
[57] CIWF Food Business Award: BreFood

BreFood also has a Rabbit Care Premium keeping system (which won the Rabbit Innovation Award 2022). This higher welfare system in China keeps the rabbits in systems that give them permanent access to winter gardens, where rabbits can choose to go into enriched outdoor areas for fresh air and sunlight (see section 12.1 for images).[17]

Annex III

Producer case studies - laying hens

Granja San Miguel

Granja San Miguel is working with the non-profit organisation Equalia to move entirely away from cages. According to the interview with Granja San Miguel, their transition started four years ago. They funded the transition themselves without any financial support from their government.

They outlined a detailed roadmap for their approach:

Granja San Miguel first selected the system to use, and once it was ready, they removed the conventional system ready for installation. They said the process was gradual, so they did not compromise ongoing production and had time to put the appropriate welfare measures in place. Granja San Miguel currently has facilities where the cages have doors that can be closed, and the doors are used as protection systems for hens when they are transferred to new environments. They are then kept open once they have settled into the accommodation, and free circulation is permitted. However, with their 2021-2022 flock, they have tested how to avoid using the doors on transfer days and are working to eliminate the use of the doors from 2025, all under the supervision of the farm veterinarian.

In addition, in the 2021-2022 flock, they also removed the remaining partitions between the multi-level systems, allowing free horizontal and vertical roaming. **They have also stated that they will no longer invest in cages or combined systems that restrict the hens' free movement between levels or cause confinement.** In summary, they are committed to a total conversion to alternative systems by 2025, and they are confident they will manage this before 2025.

Balticovo

Balticovo is the leading egg producer in the Baltics, and it currently owns the largest flock in the region with 3.3 million laying hens and pullets. Its main production is in Latvia, but they also have two farms in Lithuania. Currently, 600,000 of their 3 million layers are in alternative indoor systems, and a further 100,000 are free-range.

In their interview, Balticovo said they began transitioning away from cages in 2021 and planned to be cage-free by 2026. They made this pledge, despite 80% of purchases in Latvia being from cage farming products, as they recognise that the demand for cage-free eggs is growing yearly. They are currently undergoing the transition and although they anticipate a slight delay in the process due to avian influenza outbreaks and economic changes due to the pandemic, they are looking to complete the transition by 2027/2028.

Fattoria Roberti

Fattoria Roberti is a family-owned egg production company founded in Northern Italy. They farm around one million hens per year and mainly focus on selling whole eggs. They have undertaken several initiatives to improve animal welfare. **For example, they were one of the first Italian egg companies to phase out beak trimming and to invest in barn systems when everyone else was still focused on enriched cages.**

Fattoria Roberti converted their existing combi cage system into an aviary system and utilised many of the existing internal structures and cages, opening them up to allow free movement. They then added ramps, platforms, litter and plenty of enrichment throughout the barn.

Kipster

The Kipster farm was founded in 2013, and its revolutionary design benefits chickens and the environment.[58] Not only is it a carbon-neutral system, but the hens also benefit from good welfare, including space, enrichment, and access to outside areas. The birds have both outdoor access and a winter garden area with plenty of daylight. Kipster uses the Dekalb White bird, as the breed has greater feed conversion efficiency and it is easier to avoid beak trimming. Kipster also worked closely with a feed mill to develop feed for the hens made entirely from waste products (e.g. bakery waste, including rusk, waffles, and rice cakes), which avoids competition for resources between laying hens and people. They also rear the male chicks for meat production.

[58] CIWF Case Study: Kipster farm

Eurovo

Eurovo is the European leader in eggs and egg products. Eurovo was one of the first companies at the European level to invest in alternative farm systems for layers. In April 2021, they pledged to eliminate caged systems from their Italian farms by December 2022 and to only use eggs from alternative systems by 2025 at the latest. Then for the other European countries where they manage caged and combi farms (France, Spain, Poland and Romania), they pledged for these to be converted to alternative systems by 2027. In particular, they stated that all new investments were to be for open-ended multi-story aviaries, and existing structures were to be adapted to maximise free movement in the hens, along with appropriate enrichment, ramps, and the removal of partitions and gates. By the end of 2021, they planned to have 25% of the adjustments made on the structures, a further 25% by the end of 2022, and the remaining 50% by 2025. **Furthermore, farms that Eurovo owned before 2020 are to be adapted by 2025, and farms bought between 2021 – 2022 will be adapted by 2027.**

In an interview with Eurovo, they explained that most of their farms are being transitioned from cages or combi systems to barn or aviary systems, as most farms do not have the space or land to transition to free-range. **Eurovo said that they had committed to transitioning because they are a market leader, and their partners, who are also market leaders, all recognise the drive from consumers for cage-free eggs and egg products.**

Gruppo Sabbatani

The Sabbatani Group committed to transitioning its cage systems in 2017. Then in 2018, they began collaborating with CIWF, outlining the path to converting all production and sales of eggs to come from hens reared in alternative systems.[59] The Sabbatani Group committed to transitioning all of its caged and combination systems by 2023 and identifying specific objectives and indicators for assessing the welfare status of their pullets and layers. Between July 2018 – June 2020, the Sabbatani Group set the objective to convert two farms in 2019 and one in 2020 to transition over 72,000 laying hens. They also aimed to convert six chick hatcheries by 2020 to align their pullet-rearing systems with their laying ones. In fact, they

[59] Sabbatani Group: 2020 Progressive Report on Reconversion

exceeded this and converted five of their owned farms into multi-tier systems, which meant that 164,000 laying hens were now in alternative systems. As a result, 66% of the hens from their owned chain were not in cages anymore, and across all of the farms controlled by the group, 70% were not in cages. They also transitioned the chick houses owned by the Sabbatani Group, which meant that by 2020, 78,000 chicks were being kept in alternative systems.

Then, between July 2020 – June 2021, the Sabbatani Group aimed to convert two more farms to free-range systems, impacting around 92,000 laying hens, and to convert two of their combi-systems to aviaries, impacting over 40,000 hens.[60] They achieved this, which meant that in 2021, 80% of their owned chain were now alternative systems, along with 77% of the farms they controlled. They also reduced stocking density from 9 to 8 hens/m^2 and from 21 to 17 hens/m^2 on the floor. In 2021, 5,000 of their hens were moved to a free-range system with a 20,000m^2 outdoor area.

Between July 2021 – June 2022, the Group committed to converting two more systems, positively impacting 104,440 hens.[61] After this, the percentage of owned farms in alternative systems remained at 80% due to restructures, which was below their target of 83%. But the total percentage of controlled farms using alternative systems reached 79%. T**hey still plan to convert the remaining farms in 2023.**

Noble Foods, UK

Noble Foods committed to being cage-free by 2025 back in 2016/2017, when they started seeing the market change.[62] They worked with the British Egg Industry Council, CIWF, and Tesco to develop a new higher welfare barn standard for UK egg production which was launched in 2019. In 2019, they worked hard to convert one of their large, enriched colony caged units, built in 2009, to a new higher welfare aviary barn system and an identical pullet rearing unit.

[60] Sabbatani Group: 2021 Progressive Report on Reconversion
[61] Sabbatani Group: 2022 Progressive Report on Reconversion
[62] CIWF Case Study: Noble Foods

Annex IV

Systems currently being used - pigs

Brands in use

Multiple different brands are being used for free farrowing. Here are some examples:

- PigSAFE Pen: The Piglet and Sow Alternative Farrowing Environment pen, was the product of the UK's Defra-funded research project. The pen was developed by Scotland's Rural College (SRUC) and Newcastle University. The Bodman's Farm is one example of a producer using this system.
- The Danish Free Farrower: This system was developed by Aarhus University, the Danish Animal Welfare Society, housing industry representatives including Skiold, and the Danish Pig Research Centre at SEGES.
- The Swiss Free Farrowing Pen/ FAT II Pen: Designed by the Agroscope Research centre. Floor space of 8.4m^2 (4.5m^2 for the sow, plus a 2.5m^2 dunging area). The creep has a microclimate and can be separated from the sow. Producers find it hard to inspect, though, as they cannot separate the sow.
- The Comfort Pen: Designed by researchers from the Norwegian University of Life Sciences and developed with Fjossystemer.
- The Inauen Elypso-Bucht: This pen provides 8.5m^2 floor space (6.5m^2 for the sow). The creep space is large with its own microclimate, and the rounded shape enables piglets to enter at any time. Producers find that it is good for inspections, and they can safely enter by separating the sow into the dunging area, and the dimensions allow the sow to use the functional areas.
- The WelCon farrowing pen (welfare for animals and convenience for farmers): Designed by researchers at the Institute of Organic Farming and Farm Animal Biodiversity, Agricultural Research and Education Centre Raumberg-Gumpenstein in Wels, Austria and is produced by Schauer Agrotonics. The floor space is 7m^2, but only provides 3.6m^2 for the sow, plus a 1.45m^2 feeding area. The creep provides a microclimate and an option to separate the piglets from the sow, and similarly, the sow can be separated in the feeding area too.
- SWAP pens: Used by Kannestrup farm and provided by Jyden Bur. Please note: these pens allow temporary confinement which is discouraged.

- 360° Freedom Farrower – trialled by the Compleat Foods Group but found to result in poor results, primarily due to the small pen size (it has the same floor area as a conventional stall).

Breeds in use

All of the producers and organisations with indirect experience in transitioning have all said that they did not change the breed when they transitioned. The only times when the breed may be changed is if transitioning to a niche market, such as extensive systems, or a regional breed, for example.

Producer two did comment, however, that he was concerned about the robustness of the sow and was questioning whether to change to another breed. He said there was a balance between larger litter sizes and the robustness of the sow.

Dr Giersberg, Utrecht University, commented on the impact of selecting for certain traits in the sow and that if farmers were to focus on more robust genetics in the sow, with smaller litters, then they would likely see positive results. **She commented that in her experience, farmers would be willing to transition to reduce the litter size and use more robust breeds if they were paid appropriately and, when possible, incentivised for it.**

In the survey of 214 European sow farmers, the survey participants commented on the importance of choice over both genetics and the individual animal.[12] In particular, they stressed the importance of using calm sows with good maternal qualities. They considered the criteria, motherliness, fitness of the piglets, and aggressiveness towards people as the most important to them.[12] One quote from the survey emphasised this point "Choose only sows with good maternal traits for free farrowing!". Another participant said, "The sow is one of the biggest factors here. They must have sufficient motherliness and at the same time have a gentle disposition." Others said that "Genetics is crucial. Breeding companies still have to do much better here." And one participant said that "I pay more attention to the character of the sows. Peaceful sows with good maternal qualities are key to this housing system."

Fumagalli Salumi also felt that selecting certain traits in the sow was vital but also challenging in terms of balancing productive traits with behavioural traits. They put a lot of value on the genetics of the sow, as they believe this is fundamental in ensuring a good free farrowing system.

1. Planning the implementation

Once a farm owner has decided to transition, the next stage is to plan the transition. For some of the early adopters, a significant factor in this was the lack of knowledge and best practice, as few producers were working in this way. **Today, though, there is a wealth of shared best practices and networks for farm owners to connect with to guide and support their transition.** For example, the website www.freefarrowing.org provides detailed support, information, and resources for anyone wanting to know about any aspect of free farrowing and lactation systems. **Thus, the time needed to transition is significantly shorter today, as there is no need to design and trial completely novel systems.**

Once a farmer has decided to transition, they must decide what system they will choose. This decision will be somewhat constrained by whether or not they can build from scratch.

Transitioning an existing building versus building a new one

One of the first decisions will be whether they can afford to build a new barn for the system, add new sections to their existing building, or have to transition their existing building. The timeline for implementing the new system is dependent on what they decide.

Transitioning an existing system is cheaper in the short term and reduces the need for building and environmental permits, which could slow down the process. However, according to the SEGES, in Denmark, even breaking into the floor in an existing system would trigger the need for a new environmental permit. Often, retrofitting a farrowing system is also inefficient, as it cannot fully make use of the space, limits the pen design and system choice, and can render daily work routines less efficient (Baxter et al., 2022). In addition, as sows and their litter sizes have grown since the design and installation of many conventional farrowing crates, they are no longer big enough. Therefore, simply removing them to make room for a pen will not provide enough room for the sow to move safely and avoid crushing her piglets. The SEGES commented in their interview that it is often too complicated to transition existing systems as there are different dimensions to account for.

Rebuilding an old barn or adding new parts or buildings to an existing system is the more expensive option, but it is also more efficient, as it can be built to the requirements and dimensions of the free farrowing system. Furthermore, this approach often allows farmers to expand their system, although this depends on many factors. **This an approach requiring financial support, nevertheless, it is future proof and provides certainty to farmers that their systems will be viable in the coming years.**

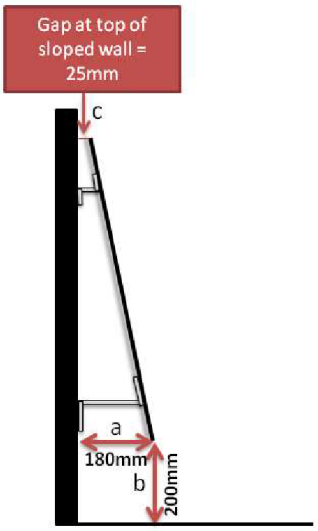
Planning decisions regarding their chosen system

Once the farm owner has decided upon the system they will implement and whether or not they will build from scratch or retrofit their existing house, they then need to make specific decisions regarding the design and management of the system. There are numerous pen designs and brands available now for free farrowing systems, and the following is a list of additional considerations the farmer would need to make (Baxter et al. 2022).

Free farrowing (single) management:

- The pen design must facilitate stockperson interventions (e.g. for farrowing assistance, treatments, piglet checks, dealing with large litters and foster sows)
- The pen must ensure worker safety and also the well-being of the sow (for example, access points should minimise the impact on the sow)
- The pen must be large enough to meet the sow's needs (and the legislative requirements). For example, the sow needs a turning circle of 2m to ensure piglet safety.
- The pen must be designed to optimise piglet safety and sow comfort, for example, by using piglet protection measures.

For example, the following diagram and photo from freefarrowing.org show the optimum dimensions for sloped walls. These dimensions are based on extensive testing and allow the sow to lie comfortably against a wall as preferred, avoiding getting her back or shoulders stuck under a rail while protecting the piglets from crushing.



Source: www.freefarrowing.org

These next photos show an optimum design for a farrowing rail in front of the creep. The rails prevent the sows from trapping piglets in the creep and allow the piglets an escape route.

Source: www.freefarrowing.org

Further detailed information on pen design is available at www.freefarrowing.org

SEGES Innovation has developed criteria[63] for a checklist for designing farrowing pens for loose sows, containing 30 questions to ensure that the farrowing pen functions optimally[64]. These include; whether the sow can move and turn around freely (so that she may nest build, avoid crushing, and get up and down easily), 'gather' piglets before lying down, and lie down with a support, ideally multiple supports.

In regards to the piglets, the checklist asks whether the piglets will be born close to the creep area, whether there is sufficient solid flooring for them to rest on, space for them all to access the udder, space to move when the sow is lying down, and space for rooting and enrichment materials. The checklist also asks whether the pen is easy to keep clean and to work in for the stockpeople and whether it is optimised for reducing emissions (i.e. by minimising dunging on solid floors and reducing the slurry storage surface).

The farm owner must also consider how to manage the sow following weaning when she is reintroduced back into the group, including how she is moved between systems and how reintegration can be optimised.

Group farrowing management:

Group farrowing systems tend to be more niche and often in extensive systems, but the farm owner will still need to make many of the same planning decisions, including:

- Farrowing batch size and familiarity of the group when reintegrated
- Managing possible group farrowings
- Facilitating stockperson interventions
- Managing the movement of pigs, if applicable
- Preventing or facilitating lactational oestrus

Overall considerations:

Regardless of the free farrowing system, farm owners must ensure they have highly skilled stockpeople who understand sow behaviour and are trained with the new system. **Developing a positive human-animal interaction is also key in minimising disruptions and optimising the systems.** In addition, the farmers will need to develop clear and strict protocols for the specific system, including how to positively and

[63] Baxter, E.M., A.B. Lawrence & S.A. Edwards, (2011). Alternative farrowing systems: design criteria for farrowing systems based on the biological needs of sows and piglets. Animal 5:4, pp 580-600.
[64] See Annex VII.

safely handle the piglets and sows, provide supplementary milk or piglet-specific feed, how and when to provide substrate to ensure it is always available and provide permanent access to manipulable materials (Baxter et al., 2022).

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2. Reducing piglet mortality in free farrowing systems

Using a more robust sow and selecting for smaller litters

The unsustainable, high level of litter sizes has been addressed by farmers for a long time. In a survey of 214 European sow farmers, the theme of reducing litter sizes to maintain a more healthy and sustainable system was common[12]. In particular, participants were quoted as saying, "Litters with a low number of piglets are an advantage" and "Max, 15 liveborn piglets". The pressure for larger litter sizes has introduced considerable risks for mortality. Some farmers, such as producer two and Fumagalli Salumi, use foster/nurse sows for the smaller piglets to help them survive the first critical days. High mortality rates can be mitigated by using a more robust sow with smaller and healthier litters and better claw health. For instance, according to Dr Giersberg, Utrecht University, crushing can be largely managed by addressing the robustness and health of the sow and her piglets. In her interview, Dr Giesberg stated that "the literature clearly shows that more often than not, it's the health of the sow and her piglets that is the cause of mortality." For example, claw problems in the sow may result in her flopping down more unsteadily and losing balance (Sala et al., 2019). And the increasing size of piglet litters means that the piglets are often too weak to move fast enough away from the sow (Weber et al., 2007).

Good management practices

Good management and hygiene are other important factors, and some argue that management is possibly even more critical than pen design (Baxter et al., 2022; FFL21, 2022). It was also clear from speaking with stakeholders that significant learning curves are involved in transitioning, both from the perspective of the humans and the sows. For example, in one study, two farms that both ran the same free farrowing and crate systems had markedly different results in mortality levels (Baxter & Edwards, 2021). One farm (site 1) had the same mortality rates in free farrowing and conventional crates, whereas the other (site 2) had higher mortalities in the free farrowing system compared with the crates. The farmer in site 1 had

previous experience with extensive systems, whereas the farmer in site 2 had only ever worked with crates. **Over time though, the differences evened out as the farms became more skilled with the system.**

Experience of the sow

Systems must be well designed in order to work for the specific farm and the sows' welfare. Caretakers need additional training and skills to manage free farrowing sows compared with those in crates. This can greatly impact the health and mortality of the sows and their piglets. Furthermore, research shows that when sows farrow in the same system in their second parity as their first, they have significantly lower mortality rates in piglets than when they change farrowing system (King et al., 2019). King et al. also showed that sows in their second parity in a free farrowing pen have a significantly larger second litter without compromising on mortality. In the survey of European sow farmers, one participant commented on this and said, "The sows knew no other pen. I don't think this caused any major crushing losses. No significant difference between conventional pens and exercise pens in piglet losses."

Fumagalli Salumi found that the sows who had experienced the crates before took time to adjust to the free farrowing pens but were much better the next time. In addition, they commented that with the gilts, it is more of an unknown, as some would be more nervous than others. **Overall, though, they found that the experience of the sow in the farrowing system was visible in terms of the productivity data, as the more sows that were experienced with the system, the better they produced.** Similarly, in a presentation at the Free Farrowing congress, a German farmer said that they found that mortality rates were not higher with their farrowing pens, provided the sow had experience with moving freely around her piglets.

Size and design of the pen

The size and design of the pen are also critical, as this influences the ability of the sow to move around safely, but also impacts the ability of the piglets to find a safe space, as well as being able to access heated areas and the sow for suckling (Baxter et al., 2022). In fact, according to the Tierschutz Akademie, the risk of crushing, and mortality levels in general, are related more to the size and management of the pen and the breed and health of the sow. In Germany,

producers have opted for the smaller pen size of 6.5m^2 to comply with the minimum standards of the legislation there, but this has led to an increase in piglet crushing, as there is insufficient room for the sow and her piglets to move properly. Furthermore, the German Government has published execution notes for the legislation, which states that sows need a 2m turning diameter, which is unrealistic in a pen of 6.5m2. In response, the farmers claim this is unrealistic, and the whole industry is conflicted as the legislation does not work in practice. **Tierschutz Akademie feels that for free farrowing systems to work, they need to provide the sow and her piglets with at least 7.8m2 as recommended by EFSA in their recent scientific opinion on pigs (EFSA, 2022)**. Fumagalli Salumi also found that the layout of the pen was a critical factor in their farms, and they increased the size of their pen from 5.5m2 to 6.5m2 as they found the former pen to be too small for the sow to turn properly. They also commented on the importance of providing barriers or appropriate barriers so that the sow can lie down against a wall as desired whilst the piglets have space to escape.

Concerns over pen size were a common theme in the interviews with stakeholders, with some, such as the SEGES Danish Pig Research Centre, commenting that increasing the pen size would disadvantage those front-runner farmers who have already transitioned and may also lead to an increase in mortalities. For example, producer two was concerned that the size of their SWAP pen was causing difficulties, as the piglets could not always find the creep and then got too cold. **However, simple training can be introduced into husbandry routines to train the piglets to navigate the pen safely.** For example, producer one had designed a pen with a 'nanny system' where the piglets could safely retreat through an opening (large enough for them to pass, too small for the sow's head to fit) and lie on a bed of straw under a heat lamp. Producer one explained how the sow was happy to lie next to the opening to the nanny area as she could still see and smell her piglets. Producer one also explained how they trained the piglets to use the nanny box by placing the sow's hay sack in there so that it had the sow's smell and encouraging them to enter there. The piglets learned quickly, and the nanny box reduced their mortality rates.

Fumagalli also found that increasing the temperature in the creep area and keeping the sow's pen cooler helped to encourage the piglets back to the nest quickly. Other improvements include providing bedding. For example, a producer from Sweden said that since she has used straw bedding throughout the pen, she has reduced piglet mortality as they do not get cold. Furthermore, as pens of less than 7m2 cannot provide the sows with enough space to turn properly, the smaller

pens introduce different causes of mortality, which can be less easily resolved through training. **Examples such as producer one's 'nanny system' highlight the need for better sharing of best practices among producers, especially in the design and planning stage.**

Annex V

Systems currently being used - rabbits

Brands in use

Lapin & Bien

The ÉLEVEURS ET BIEN association set up a new alternative method of rearing rabbits where they are raised on the ground in large enclosures which led to the creation of the Lapin et Bien brand (Lapin & Bien, 2019).

Bauer

The Bauer housing system was co-designed in partnership with Kaufland, the University of Giessen, the Italian equipment producer Meneghin, the feed producer Mifuma and the Farmarts veterinary practice (IEEP, 2020).

BreFood

BreFood have designed housing systems for rearing the rabbits on the ground, with space for them to behave naturally while also training production.

Image: The BreFood Rabbit Care Standard is continually being developed and audited annually by independent German auditors.

BreFood also has a new Rabbit Care Premium keeping system operating in China, where the rabbits are kept in a ground-reared system and have permanent access to outside space in their winter gardens.[65] BreFood say that "A keeping system of this kind and at this scale is one-of-a-kind at the moment. We are proud to be partnering with retailers who are just as passionate about animal welfare as we are, putting it in the centre of our joint business practices."

Image: BreFood (Germany) has producers in China using the new Rabbit Care Premium system, where the rabbits have permanent access to winter gardens and enrichment.
Source: Compassion in World Farming Food Business: Rabbit Innovation Awards 2022

LAPETY WELLAP from WISIUM

The research and development teams at NEOVIA and WISIUM, along with their customers, devised a cage-free system that provides rabbits with an outside feeding path. The LAPETY WELLAP system means that the farmer can gain added value on their rabbit sales, gaining more from their investment, whilst the rabbits can behave more naturally and benefit from improved welfare.

[65] CIWF Food Business: BreFood

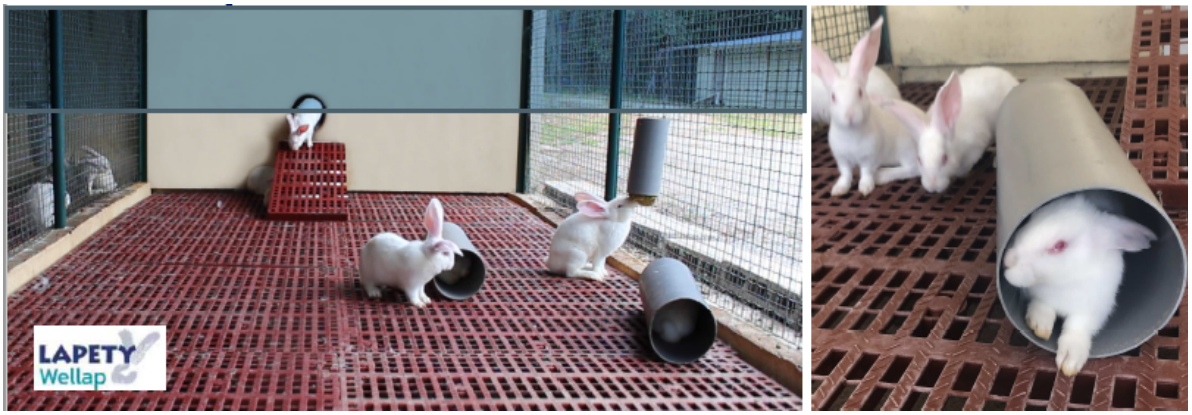

Image: LAPETY WELLAP from WISIUM allows rabbits access to a winter garden.
Source: Guene-Grand et al. (2021)

Breeds in use

The producers all said that they had not changed the breed of the rabbit when they transitioned. The main breeds being used in Europe are the Hypharm and the Hycole. Kani-Swiss use the white French hybrid rabbit Hycole.

Annex VI

Systems currently being used - laying hens

Brands in use

Most of the farms that are transitioning to alternative systems are opting for aviary systems, as not only are they often the cheapest system to install, but they can also maximise production with these. The Big Dutchman and Facco are two of the main players in the EU, and others, such as Vencomatic, only supply non-cage systems.

Breeds in use

According to the Best Practice Hens project, the breed being used depends on the market, as some countries prefer brown eggs and others white eggs (Best Practice Hens, 2022a). Beyond that, most farmers continue to stick with the same breed, provided they produce well. **In their interview, the Best Practice Hens project commented that, in general, there is a lack of consideration for the importance of genetics from farmers and that ideally, they should be collecting more information about the rearing phase as it is so important for successful performance, especially given what they pay for when investing.**

In one of the interviews with Hendrix Genetics, they said that many producers who are moving away from cages are turning to white laying hens, as they can keep the white breeds for an average of 10 weeks longer compared to brown laying hens. For example, in the Netherlands, where they tend to keep layers for longer, they will keep white hens for 100 weeks, whereas brown birds are exhausted by 90 weeks. In addition, Hendrix Genetics reported that white chickens are often more profitable and have better welfare. For example, compared to brown hens, mortality rates are lower for white hens; they have better productivity; better feather coverage; are more social with one another and less aggressive; and are less interested in humans entering the system, which makes management easier.

According to Hendrix Genetics, white chickens are also more favourable from an environmental perspective in terms of sustainability and their carbon footprint. In particular, Hendrix Genetics says that there is over a 5% gap, in favour of the white

chickens, compared with the brown. Hendrix Genetics said that the main reason for this gap is "better liveability, as the brown birds have, on average, around double the mortality levels, compared to white birds. Also, the peak production of white birds is higher, as their egg sizes are somewhat smaller, and so the hen has to spend less energy in egg production, so she has more energy for herself. The white hen tends to take better care of herself compared to the brown hen. Feather cover is also better, and as this is the first line of defence. It all adds up."

All in all, according to Hendrix Genetics, the white hen is a better, more robust, and sustainable choice. There is also no difference between brown and white eggs in terms of taste or nutritional quality. There are, however, cultural preferences at play here, and so there needs to be an element of consumer marketing and education in some markets to communicate that the white egg is acceptable.

These comments from Hendrix Genetics are echoed in the recommendations being made by the Best Practice Hens project, and they state that **white birds are better able to navigate three-dimensional spaces like aviaries compared with brown hens** (Best Practice Hens, 2022a). They also report that white hens tend to disperse more than brown hens, reducing the tendency to pile up. Research has also found that white hens have a lower incidence of keel bone fractures than brown birds when kept in three-dimensional systems (Heerkens et al., 2016). However, brown hens appear to do better in free-range and organic systems because they show improved foraging and ranging behaviour (Bestman et al., 2019).

The Kipster farm uses the Dekalb White bird because of the better feed conversion efficiency and the fact that it is easier to avoid beak trimming. Whereas, Granja San Miguel says they do not commit to a specific breed, as the genetics evolve over time. They decide based on the results they obtained in the previous batches. And Balticovo said that they had not changed their breeds as a result of their transition, as the main thing for them was to focus on "growing them properly".

Annex VII

SEGES Innovation: checklist for designing farrowing pens

SEGES INNOVATION

Farrowing pens for loose sows

There is no shortage of ideas, but it can be difficult to do everything at a competitive price.

SEGES Innovation has drawn up the following check list. It comprises 30 questions about the way in which your farrowing pen functions. The questions relate to the layout, which is important for:

- The sow – in part when loose and in part when/if confined for some days around farrowing time
- Piglets
- Stock people
- Environment

Each question can be answered with a -

- yes – the pen conforms
- no – the pen does not conform

Landbrug & Fødevarer
Sektor for Gris

Recommends that all new farrowing pens are designed for loose sows from 1 January 2023

To help you answer the questions, monitor a sow, 20 approx. 1-3-day-old piglets and 20 approx. three-week-old piglets. All cardboard pigs are to the scale of 1:10.

Once you have answered the questions, you can use the following table to make a summary – the number of 'yeses' and 'nos' there are for each layout. This will enable different pens to be compared more easily and, together with price, etc. form the basis for choosing a pen.

For use when collecting answers to the questions		**Relevant answers:**	
Total number of yes and no	**Number of questions**	**Yes**	**No**
1. The sow is loose	8		
2. The sow is confined	5		
3. Piglets	8		
4. Stock people	7		
5. Environment	2		
Total	**30**		

We hope that this checklist will benefit you, your sows and piglets and that the material will assist you in your decision-making when it comes to selecting farrowing pens for loose sows – e.g prior to applying for a grant.

SEGES Innovation has collected insight and recommendations regarding farrowing pens for loose sows at svineproduktion.dk

Best wishes,

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SEGES Innovation

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SEGES INNOVATION

Check list – function requirements – layout of farrowing pens for loose sows

Below are 30 questions about pen layout *(with supplementary explanations/reasons for the questions*

1. When the sow is loose, can she:	**Yes**	**No**
1.1. Prior to farrowing, can she take some steps in the pen? *Otherwise, the sow cannot nest build and this can increase the number of stillborns*		
1.2. Turn (full standing length)? *Otherwise, the sow may crush her piglets*		
1.3. Move backwards/forwards – beyond her own length – when she wishes to lie down? *Otherwise, the sow cannot get up and lie down easily and this can reduce milk production*		
1.4. 'Gather' piglets before she lies down? *Otherwise, there is a risk that the piglets will be crushed*		
1.5. Lie down with support – i.e is there at least one, and ideally several, pen sides with an inclined lying wall and not a farrowing rail? *Otherwise, there is an increased risk of crushing the piglets*		
1.6. Lie fully on solid and on slatted floor? *Otherwise, the sow cannot thermoregulate*		
1.7. Stand straight at the feeder? *Otherwise, there is a risk that feed and water will be wasted*		
1.8. Stand easily so she avoids dunging on the solid floor? *Otherwise, there is a greater risk of poor hygiene*		
Total: Loose sows		
2. When the sow is confined:	**Yes**	**No**
2.1. Is there at least 20 cm behind the sow? *Otherwise, the piglets can have difficulty being born and it is difficult to provide farrowing assistance*		
2.2. Is there at least 125 cm (ie. the depth of the sow (from back to below the udder + one piglet length) from inside the stall to both sides of the pen so that there is space for the piglets to suckle on both sides. *Otherwise, the piglets will be unable to absorb sufficient colostrum and there is therefore an increased risk of them dying from dehydration, hunger or infection.*		
2.3. Is there only space for the piglets to suckle on one side? *Otherwise, the piglets will be unable to absorb sufficient colostrum and there is therefore an increased risk of them dying from dehydration, hunger or infection.*		
2.4. Can the sow be given nesting material on the solid floor? *Otherwise, the sow cannot nest build, which can increase the number of stillborns*		
2.5. Can the nesting material be retained – either on the floor or within the sow's reach – to enable the sow to have constant access to it – without it lying in the trough? *Otherwise, the sow cannot nest build which can increase the number of stillborns*		
Total: Confined sows		

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3. Piglets	Yes	No
3.1. Will the piglets be born close to the creep area? *Otherwise, there is an increased risk that the piglets will lose energy and subsequently die from cold*		
3.2. Is there 1.4-1.5 m^2 solid/drained floor so that 14-15, three-four week old piglets can rest on a dry, clean solid/drained floor? *There is a legal requirement that all piglets can rest on a solid floor (or equivalent) and not least it is important that the risk of the piglets losing energy and subsequently dying from cold is reduced.*		
3.3. Is there 1.6-1.7 m^2 solid/drained floor so that 16-17, three-four-week-old piglets can rest on a dry, clean and solid floor? *With increasing litter sizes and piglet survival, it makes sense to ensure space for more pigs in the pen. Otherwise, there must be many free pens for nursing sows and a lot of time spent on them.*		
3.4. Is there space for three-four-week piglets at the udder? In other words, is there 125 cm – so that the sow's depth (back to below the udder) and one piglet length and space for a piglet to come past? *It is a prerequisite for a high level of milk production and for the piglets' daily gain that the piglets have easy access to the sow's udder. .*		
3.5. When the sow lies down – is there space for 14-15 pigs in other areas of the pen? *To reduce the risk of crushing to death, it is important that there is space in the pen – in addition to the space that the sow needs.*		
3.6. When the sow lies down – is there space for 16-17 pigs in other areas of the pen? *With increasing litter sizes and piglet survival, it makes sense to ensure space for more pigs in the pen. Otherwise, there must be many free pens for nursing sows and a lot of time spent on them.*		
3.7. Is there an area where the piglets can be given supplementary nutrition – without the sow being able to access it? *With increasing litter sizes and piglet survival, it makes sense to ensure space for more pigs in the pen. Otherwise, there must be many free pens for nursing sows and a lot of time spent on them. A prerequisite for more pigs in the pen is that they can be given supplementary nutrition.*		
3.8. Is there an area with a solid floor where the piglets can be given rooting/enrichment material? *It is a legal requirement that all piglets have access to rooting/enrichment material*		
Total: Piglets		

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4. Stock people	Yes	No
4.1. Is it easy to keep the pen clean? *If there is a partially solid floor – can it be scraped from the passageway for example?*		
4.2. Is it easy to 'catch' a piglet, including moving around the sow to catch it when the sow is confined? *It's important that there is nowhere for the pig to hide or equipment which has to be opened/closed in order to move around the pen when, for example, stock people collect the piglets in the creep area for castration and other procedures.*		
4.3. Is it easy to 'catch' a piglet, including moving around the sow to catch it when the sow is loose? *It's important that there is nowhere for the pig to hide or equipment which have to be opened/closed in order to move around the pen when, for example, stock people collect the piglets in the creep area for castration and other procedures.*		
4.4. Is it easy to check and empty the trough without entering the sow's area? *In order to save time and reduce the risk of the spread of infection, it is an advantage if the trough can be checked from the passageway or at least checked and emptied without entering the sow's area. This avoids wasting time on opening and closing gates, etc.*		
4.5. Can the feed be adjusted from the passageway? *To save time and reduce the risk of the spread of infection, it is advantageous if the feed can be adjusted from the passageway.*		
4.6. How easy is it to confine the sow? *As most/all sows are confined, it is important that this is easy to do (without any heavy lifting and that the equipment required is at hand).*		
4.7. Are the stock people protected/separated from the sow when the sow is confined? *Can the farrowing wing, for example, be used to protect the stock people, i.e so that the wing is between the stock people and the sow when the sow is confined?*		
Total: Stockpeople		

5. Environment	Yes	No
5.1. Is the solid floor in the pen limiting the slurry storage surface? *Farrowing pens for loose sows are larger than farrowing pens with crates and thus have – all other things being equal – a larger slurry surface per sow, which increases ammonia emission unless there is a partially solid floor in the farrowing pen and consequently a reduced cistern and slurry surface.*		
5.2. Is there a risk of dunging on the solid floor? *In pens with a partly solid floor, it is important that the solid floor is clean and dry to ensure a low level of emissions. Therefore, the dimensions and position of the slatted floor area is important.*		
Total: Environment		

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