The Comfort farrowing pen is a loose housing farrowing pen designed by Prof. Inger Lise Andersen (professor in ethology, NMBU, Norway), and developed together with Fjøssystemer Sør and cooperating pig farmers.

Originally, Prof. Andersen intended to redesign the farrowing pen in order to enhance the piglets’ creep area. However, multiple studies showed that improvement to the creep area gave no reduction of piglet mortality by crushing. The piglets would if possible, always seek to lie next to their mother. (Vasdal, G, 2010)

This information was the basis for a new farrowing pen design that would stimulate positive maternal behavior, reduce piglet mortality, reduce shoulder sores and increase comfort.

The farrowing pen was first called “UMB Farrowing Pen”, and has recently changed name to “Comfort farrowing pen”.

Succeeding the basic pilot design, Prof. Andersen contacted Fjøssystemer Sør to cooperate on further development of the Pen design. In 2010, 4 pilot versions of the pen were assembled at Faculty of veterinary science in Sydney (Australia) and 2 were placed at the Norwegian University of Life Sciences, UMB, (Now called NMBU, Ås, Norway).

Following 40 litters (28 Australian and 12 Norwegian sows), results showed that the pens production results were higher than the national average in all parameters. Results from the pens in Australia were especially positive since the sows there were not used to loose housing. This indicates that the pen helps stimulate positive maternal instincts. (I.L. Andersen, Praksisnytt, 2012)

Whilst the results of the pilot studies were a success, there was still uncertainty how the pen would function in a full-scale farm. With national state funding (Innovasjon Norge and Skattefunn), two farmers rebuilt their pig farms housing the new pen, and studies has been conducted for documented production results.

One of the two farmers was Olav Glærum, who in 2014 built his new pig farm with 53 Comfort farrowing pens in Hamar. After 40 years as a pig farmer, he has experience with different loose housing pen designs and his input has been vital to the results. He is very happy with the functionality, management and production results of the pen.

His experiences, compared with the traditional farrowing pen used in the old farmhouse, he now uses half the amount of time at daily management. During farrowing, the sows lie along the safe sloped walls in the nest area, increasing the chance of piglet survival. He is also very happy with the warm floor mattress that helps the piglets dry and heat up much faster and giving them a positive start. This also reduces the need of the farmer having to be present at every farrowing. He finds that the level of shoulder sores in sows has
reduced and he recently experienced that for the first time in 40 years, all 53 sows left the farrowing pen without shoulder sores. He believes the reason is a combination of a successful feeding program and the effect of the rubber mattress. He has also experienced a reduction of piglet sores on knees.

A specially built visitor’s hallway was built at Glærum’s farm. This allows people to view the Comfort pen in use without disrupting the daily running of the farm and without subjecting visitors to the normal quarantine restrictions. It has its own entrance distant from the entrance used by the farmer but allows full view of the pens.

The second farm (Langsbakken in Sarpsborg) that had the Comfort pen, also had a long trough installed. This was to function as a farrowing pen where the piglets could remain in the pen until 25kg when the sow moves out. This addition did not work well, as the placement of the trough made the sows defecate in it. During the process of trying to resolve the design problem, the farmer unfortunately decided they wanted to rebuild the pens to traditional loose housing farrowing pens with a piglet creep area. Despite the problems, the results from the production in the comfort pen were positive, especially since there was a significant reduction in the number of dead piglets without stomach milk content compared to the traditional pens in use (1.7%→0.1%). This shows that the Comfort pen improves piglets chance of suckling straight after birth which again improves their chance of survival.

In addition to the two farmers that took part in the trial, 40 Comfort pens were installed at Norwegian University of Life Sciences (NMBU) newly built pig farm. The pens have been used for one year, and the daily manager is very happy with the design and feels they are an improvement compared to the traditional farrowing pen previously used in the following areas;

- Farrowing, pen management, heating piglets, piglet safety and Sow stress levels:
  - Her experience is the same as Glærum’s, the sows prefer to lie the correct way when farrowing.
  - The pens are easy to manage, with a reduced need of maintenance since most sows keep their nests clean after farrowing.
  - She finds the cleaning of the pens to be faster, and it is quick to get an overview in each pen over every piglet.
  - The heated floor keeps the piglets warm, and there is no problem with cold piglets.

On the contrary, in the old pens with a piglet creep area, it was more common to find cold piglets that needed heating.

- According to the daily manager, there is a noticeable reduction in piglets crushed to death. Crushed piglets are mainly found within 48 hours of farrowing, whilst it used to be common to find crushed piglets up to day 5.
- Staff has noticed that both sows and piglets are less stressed in the new pen, changing the way the sow behaves towards staff after farrowing. Incidents with aggressive sows is less common than it used to be in the new pen.

The pens at NMBU is, opposite to Glærum’s pen, installed with the activity area towards the hallway. We now have experience with the pen installed both ways and recommend the nesting area towards the hallway due to quicker cleaning of the pen and an immediate overview of all the piglets when you walk down the aisle.
Design of the Comfort Farrowing pen:

Since the pilot in 2007, the design of the pen has changed, but the basic idea is still the same. The pen is divided into two areas; an activity area and a nesting area.

Activity area: Dunging area, feeding, water, contact with neighboring pigs through opening in gates/fences.

Nesting area: Rubber mattress (3cm), heat source in floor, hayrack for nesting material and feeding, sloped walls for sow to comfortably lie against and for piglet safety.

Gates divide the two areas and can be closed to separate the sow from the piglets. This safety feature improves efficiency for farmers and vets.

The pens measurements are set to dictate where the sow choses to lie down. The optimal placement of the sow is in the nesting area with her back towards the sloped walls and the width of the pen is to accommodate this. The length of the pen is to provide the sow enough room to comfortably move in the activity area. The pen measures 2.4m x 3.2m, an area of 7.7 m². In Norway the minimum requirement for a farrowing pen is 6m².
Under the rubber mattress there is heating in the floor divided into two zones, one heating zone for the sow and one for the piglets.

Heating zones for sow and piglets

Heating zone sow: Turned on 24 hours before farrowing. At this moment the sow prefers a raised temperature and will therefore seek to lie against the sloped walls, which is a safe place for the piglets to be born. 24 hours after farrowing, the heating is turned off, since the sow then prefers a cooler area to lie in.

Heating zone piglets: Turned on before farrowing, and stays on until weaning. The piglets search towards this heat zone and are protected by the sloped walls whilst still lying next to the mother. Air temperature and floor temperature is dependent on each other, but with 18⁰ C in the air and 26⁰ C on the floor gives the piglets satisfactory body temperature. One of the major questions by removing the piglet creep area, was if hypothermia in piglets would be a problem. This has not occurred, rather cold piglets are less common due to the heated mattress giving a comfortable temperature all over the nest area.
Experience and results:

The Pen has been in use since 2014, and the results are good. The Comfort Farrowing pen is management efficient, gives low piglet mortality results and improves the welfare of the sow. 40 Comfort farrowing pens have recently been installed at NMBU, with the same positive results.

Advantages:

- Management of the pen is fast an efficient. Walking through the isle, you get an immediate overview in every pen without having to open the creep area. The pen has a design that makes it fast and easy to clean, reducing time spent on daily maintenance. Experience show that farmers reduce maintenance time with up to 50%.
- Eliminating the need of infrared heating lamps is both timesaving but also reduces risk of fire. IR-lamps are a common cause of fires in barns and replacing them with safe floor heating improves fire safety for pigs and farmer. According to “Landbrukets brannvernkomité» (Norwegian committee for fire safety in agriculture), 10% of all farm fires are caused by the use of IR-lamps. Due to the heated floor the piglets stay nice and warm, and the problem with hypothermic piglets in need of heating under a lamp is eliminated.
- Results from 260 litters in the comfort pen showed a pre-weaning death loss of ca.12% (2014). This is without use of nurse sows. The Norwegian national average pre-weaning death loss is 14,2% (Ingris, 2014). The number of weened piglets per litter was 12,4, 1 additional piglet compared to the Norwegian average of 11,3 (Ingris, 2014).
- Number of dead piglets without milk in the stomach went down in the comfort pen compared to the regular loosehousing pen from 1,7% to 0,1%. This indicates that the farrowing pen succeeds with optimising piglets successfully suckling after birth.
- The rubber mattress and the heat underneath gives comfort, but is also causing the piglets to dry faster after birth, reducing the risk of hypothermia. This reduces the need for the farmer to manually dry piglets.
- The gates dividing the nesting area from the activity area allows the farmer to separate the piglets from the sow. Gates increase safety and efficiency for the person handling the piglets (at ex. filing teeth/castration/feeding iron etc.)
- After farrowing, sows tend to keep the nesting area clean, which reduces maintenance.
- The sloped walls are very functional; they are comfortable for the sow and give the piglets a safe tunnel along the walls of the pen. Sows prefer to lie in the nest area towards the sloped walls as intended, creating a safer farrowing and suckeling positioning.
- The hayrack attracts the sow, both for feeding, nest making and stimulating activity. Experience show that the sows are less stressed in the Comfort pens, affecting their behavior to human interaction in a positive way.
- Contact with neighboring pigs seems to be positive for the general welfare.

Disadvantages:

- At a farm south in Norway (Sarpsborg), the pens were installed with a long trough along the activity area. It was meant to function as a “birth to 25kg” pen. Unfortunately, this did not function well, because the design of the pen made the sow defecate in the long trough. A corner trough is the best option for this pen.
- The rubber mattress, hayrack and the gates separating the two areas makes the pen more expensive to buy, compared to other Norwegian loose housing pens.

References:

