

Position note:

The concerning rise of multi-storey pig farms in China

Introduction

Multi-storey pig farms have been built in China over recent years; the Chinese government released a policy in 2019 allowing the construction of high-rise breeding facilities¹. The country's high demand for pork is stimulating the construction of multi-storey pig farms in China⁴, in addition to huge losses in production (an estimated 10 million pigs) as a consequence of the African swine fever (ASF) outbreak in 2018-2020^{3,5}. Since 2021, the pork market and domestic supply have been volatile which puts pressure on small producers who are particularly sensitive to market fluctuations⁶. This may further contribute to mega-producers investing in multi-storey farms to maintain supply of the country's most popular animal protein^{4,7}.

In those highly industrialised, intensive systems, very large numbers of breeding sows and meat pigs are kept on one site in a number of multi-storey buildings, each typically consisting of 6 to 10 floors. At present, the tallest building in China consists of 26 floors (measuring 400,000m²). A second building is now under construction². When fully running, the two buildings will have a combined area of 800,000m², hold tens of thousands of sows and have the capacity to slaughter 1.2 million pigs per year^{2,3}. The first two floors of the buildings have functional purposes, such as feed supply², while from the third floor upwards, each floor will essentially act as a farm, with around 1000 sows and the capacity to slaughter 25,000 pigs per year². The upfront cost of multi-storey farms is huge; the estimated cost of this two-building complex was RMB 4 billion (~€570 million), along with large investments in equipment and labour^{2,3}.

Reports indicate that there may now be as many as 170 multi-storey farms built in Guangdong province, and 64 farms are planned or underway in Sichuan province⁷ which already had 126 multi-storey farms operational between 2021-2022^{4,8}. Multi-storey farms are being subsidized by the government and are becoming the new trend⁸, and with new farms having the capacity for over 1 million pigs per year³, tens of millions of pigs could be reared in these farms.

In multi-storey systems, animals are typically reared in barren and overcrowded conditions. In addition to the obvious welfare concerns that they pose, there are also significant environmental as well as human and animal health hazards associated with the emergence of those systems.



Figure 1. A multi-storey farm in Yaji mountain. The farm is owned by Yangxiang, one of the biggest producers of pork in China. This site is Yangxiang's largest and most advanced multi-storey farm⁴⁹. Photograph: Reuters

Animal welfare

Pigs in multi-storey systems are kept in similar conditions to other intensive production systems, where pigs live in barren environments with limited space. Key welfare concerns associated with intensive pig farming are:

- **Severe confinement** of breeding sows for the majority of their production cycle in individual sow stalls (dry sows) and farrowing crates (lactating sows) where they cannot turn around and struggle to stand up and lie down⁹. This results in sores¹⁰, weak muscles and bones¹¹, frustration¹², boredom (e.g. stereotypic bar biting¹³), aggression with neighbours¹⁴, inability to interact properly with piglets^{15,16} or express nest building behaviours¹⁷.
- **Barren and crowded environments**, typically with high stocking densities and fully slatted floors without bedding. This results in poor comfort¹⁸, heat stress¹⁹, lameness²⁰, inability to express important behaviours (e.g. creating functional areas, nest building and foraging²¹, boredom, frustration, aggression, fighting²², and tail biting^{23,24,25}).
- **Routine mutilations**, including teeth clipping, tail docking and castration, which cause acute pain and stress^{26,27,28}.

Animal health

Poor welfare is often associated with poor health: the welfare of a diseased animal is often compromised, and negative welfare can result in increased susceptibility to disease²⁹.

Animal health can be compromised in multi-storey systems due to a number of risk factors specific to those mega-farms:

- High stocking densities in intensive systems increase the spread of infectious diseases and can lead to an increased risk of mutation and amplification of pathogens, making treatment and prevention more difficult and resulting in culls^{30,31}. If a disease entered a multi-storey farm, with each floor potentially housing 1000 pigs, a high-risk environment is created for a severe disease outbreak^{3,7}.
- Pigs are moved through multi-storey systems using elevators and corridors which may be shared between floors, potentially creating a risk for contamination^{2,32}.
- Any disease outbreak in those multistorey buildings would lead to extremely large numbers of pigs being culled at once, as well as leading to significant economic losses.
- Any breakdown of technology e.g., power outages, would be detrimental to the health and welfare of the pigs due to the tightly controlled, automated conditions (temperature, humidity, toxic gas concentration and supply of feed and water) in these buildings^{2,7}.

Social impact

Increased disease risk leads to the use of antimicrobials to prevent disease and control outbreaks in herds, which is a primary driver of antimicrobial resistance (AMR)³⁴. Intensive farming is a principal cause of livestock-related antibiotic resistance (including in pig farming)³⁵.

AMR is one of the greatest threats facing the human population. Overuse of antimicrobials in farming exposes bacterial populations in the environment to antimicrobial drugs, driving the development of resistant microbial populations³⁶. Manure from farm animals is a potential source of both antibiotics and antibiotic resistant bacteria which can enter soil and groundwater³⁷. This contributes to the transfer of antimicrobial resistant bacteria to humans, thereby undermining the treatment of serious human disease³⁸. Public health researchers from Fudan University found antibiotic residues in 58.3% of school children's urine samples collected in east China, including 14 veterinary antibiotics, likely due to contamination of animal-derived food and groundwater⁴⁵.

Workers in multi-storey systems are believed to adhere to strict rules. For example, to reduce the risk of disease transmission into the building, particularly ASF and Porcine Reproductive and Respiratory Syndrome (PRRS), workers are allegedly required to remain on site for long periods of time, being unable to leave for several months until their next break^{3,32}. For some multi-storey units, staff are required to quarantine for days, supply samples for laboratory testing³³, and wash thoroughly before entering the farm³². Working conditions in these units are largely unknown, however, they are suggested to be strict which raises concerns for the welfare of the workers.

Loss of local livelihoods is another concern with multi-storey production. These mega-farms are appearing near rural villages, where backyard farms are typical⁵. There is a shift from smallholdings to large-scale pig farms as smallholders are struggling to meet the same hygiene and biosecurity standards, particularly following the ASF outbreak³³. Therefore, many go out of business as they are more susceptible to market fluctuations³³. In addition, mega-farms have been driving up feed and vaccine prices, putting even more pressure on small farms⁵.

Environmental impact

Storage and disposal of waste on large-scale farms is a significant challenge. Metals in manure can leach into the environment which may affect water quality for the human population in the area, in addition to damaging the wider ecosystem³⁹. Emissions of nitrogen and phosphorus into soil and ground water, as well as greenhouse gas emissions, are also significant environmental concerns associated with intensive pig farming in China⁴⁰.

The large, multi-storey buildings are resource intensive, requiring large amounts of water and energy to operate. In a life cycle assessment (LCA), the yield-based environmental impact per kg of pork produced was 25% higher for farms with >100,000 pigs compared to backyard farms in China⁴⁰. This shows that large-scale intensive pig production may have greater negative environmental consequences (including water depletion, global warming potential and eutrophication potential) than small backyard farms⁴⁰. Similarly, in the EU, traditional pig farming systems which use slow-growing traditional breeds and outdoor rearing were found to have lower energy demands and CO₂ emissions per hectare of land used compared to conventional systems⁴¹.

Additionally, there are high feed requirements for the large number of pigs kept on site. Intensive animal production uses huge amounts of soy and cereals as feed⁴². Growing animal feed has led to the expansion of arable land which is a significant concern for environmental sustainability and biodiversity loss⁴².

These intensive, high output farms (for example, 108,000 tonnes of pork produced per year in the largest multi-storey farm²) are not coherent with the need to reduce meat consumption globally³. Shifting diets towards more plant-based foods is integral to reducing global CO₂ emissions and fighting climate change⁴³. Plant-based meat alternatives are found to have 10-20% of the environmental impact of animal products⁴⁴. While China announced plans to become carbon neutral by 2026, the European Parliament found it to be responsible for ¼ of global greenhouse gas emissions in 2019, and the government is backing upscaling meat production, which is not conducive with reaching its net zero target⁷.

Alternatives to highly intensive production systems

To provide a higher welfare living environment to meet the needs of pigs, the following criteria should be met:

1. **Enough space and animals free from confinement**, including no sow stalls and farrowing crates, to be replaced by group housing of sows from weaning throughout pregnancy and free farrowing pens from pre-farrowing (typically 1 week before farrowing) throughout lactation⁴⁶, as well as increased space allowance for pigs and sows at all stages⁴⁶ (for further detail about our recommendations on space allowance, please see our resources on [space allowance](#) and our

[corporate cage-free ask](#)).

2. **Enriched environment**, providing bedding and manipulable materials at all stages of life and nesting substrate for farrowing sows, to allow pigs to perform natural behaviours such as foraging and rooting²¹, and nestbuilding¹⁷.
3. **Well-designed space**, including separate functional areas (feeding, activity, dunging, resting) and well-designed free farrowing pens to avoid piglet crushing⁴⁶ (for further details about our recommendations on free farrowing, please see our [infographic](#)).
4. **No routine mutilations**, including no routine tail docking, tooth clipping or grinding and surgical castration^{26,27,28}.
5. **Maintaining good air quality and optimal thermal conditions**, for improved health and comfort^{19,46}.
6. **Good management**, including stable groups and good mixing practices for group housed sows, later weaning of piglets and good handling, to reduce stress, aggression and promote health and positive mental wellbeing⁴⁶.
7. **Adjust breeding goals** to reduce litter size, breed for good maternal behaviour, and promote the use of local traditional breeds.
8. **Monitor welfare outcomes**, such as tail lesions, body lesions, lameness, body condition, mortality, positive behaviours (e.g., rooting, foraging, social interaction, exploration) and negative behaviours (aggression, biting ears/tails, vocalizations), to ensure that the system and its management deliver good welfare (for further details on welfare outcomes, please see our resources for [pigs](#) and [sows](#)).

In conclusion, multi-storey pig farms typically present significant animal welfare and health concerns associated with the confinement of a very high number of animals in a barren and overcrowded environment. There are also concerns around the antimicrobial overuse in those intensive systems contributing to antimicrobial resistance in human population, and around the increased risk of disease outbreaks and the subsequent management of such outbreaks - leading to hundreds of thousands of pigs having to be culled. The impact that those resource intensive, high output systems may have on local livelihoods, as well as on the environment, are also significant concerns.

Compassion calls on producers and companies in China, and anywhere in the world, to not invest in those mega multi-storey systems which go against the urgent need to shift our global food and farming system. We recommend a focus on a reduction in the number of farmed animals, more plant-based foods, and higher welfare, nature-friendly farming systems.

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