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An HSUS Report: Welfare Issues with Gestation Crates for Pregnant Sows

Abstract

Throughout nearly the entirety of their 112-115 day pregnancies, most breeding sows in the United States are confined in gestation crates (also known as sow stalls)—individual metal enclosures so restrictive that the pigs cannot turn around. Crated sows suffer a number of significant welfare problems, including elevated risk of urinary tract infections, weakened bones, overgrown hooves, lameness, behavioral restriction, and stereotypies. Due to concerns for the welfare of intensively confined sows, legislative, industry, and corporate policies are increasingly phasing out the use of gestation crates.

Introduction

More than 5.8 million pigs are used for breeding in the U.S. pork industry.¹ In 1969, gestation crates were introduced into production facilities, and became the most widely used system for housing pregnant pigs in the 1980s and 90s.² Gestation crates are individual, concrete-floored metal stalls measuring 0.6-0.7 m (2.0-2.3 ft) by 2.0-2.1 m (6.6-6.9 ft), only slightly larger than the animals themselves and so severely restrictive that the sows are unable to turn around.³ The majority of breeding sows are now confined in these crates for nearly the entirety of their approximately four-month (112-115 day)⁴ successive pregnancies. In typical pig production facilities, the crates are placed side by side in rows, often with more than 20 sows per row and 100 or more sows per shed.^{5,6} The crate floors are customarily constructed with slats to allow manure to fall into a lower pit to separate the sow from her excrement.⁷



Economic pressure, rather than science or animal welfare, is the driving force behind the use of gestation crate housing in the U.S. pork industry according to John J. McGlone, professor of Animal and Food Science and Cell Biology and Anatomy at Texas Tech University and a director of the Pork Industry Institute: “[I]t is the economic forces that drive pork producers to do things that hurt or stress their pigs.”⁸

Fortunately, public policy changes are beginning to occur around the globe. Gestation crates were first banned in Sweden and the United Kingdom,⁹ but as of January 1, 2013 they are now illegal throughout the entire European Union, although some countries are not yet compliant.¹⁰ In 2010, gestation crates were banned in Tasmania,¹¹ and New Zealand.¹² The pork industry has initiated a voluntary ban in the whole of Australia,^{13,14} and South Africa is discussing a phase-out by 2020.^{15,16}

Despite the clear international trend, gestation crates remain at present a common animal agribusiness practice in the United States. In 2001, animal scientists estimated that 60-70% of breeding sows are confined to gestation crates,¹⁷ but a 2012 survey conducted by a University of Missouri economist reportedly found that for pig production operations with 1,000 or more sows, 82.7% are kept in gestation crates.¹⁸

Recent policy changes in the United States have indicated a clear move away from gestation crate practices, however, and nine U.S. states have now enacted legislative bans. In 2002, Florida voters legislated against the use of gestation crates, with the ban going into effect in November 2008.¹⁹ In 2006, Arizonans passed the Humane Treatment of Farm Animals Act, a voter proposition that disallows both gestation crates for pregnant sows and crates for calves raised for veal beginning January 1, 2013.²⁰ In 2007, Oregon became the first state to ban the use of gestation crates through the state legislature, a ban effective on January 1, 2012.²¹ Colorado followed suit in 2008, banning crates for both calves raised for veal and pregnant pigs with a ten year phase-out period.^{22,23} A November 2008 ballot measure in California, which passed with 63.5% of the vote, bans gestation crates, veal crates, and battery cages for egg-laying hens, effective January 1, 2015.^{24,25,26} In May 2009, the Maine legislature passed a law banning gestation stalls for sows and veal crates for calves throughout the state, effective January 1, 2011.²⁷ Michigan followed in October 2009, with passage of state legislation that will phase out veal crates and gestation crates within ten years.²⁸ In 2010, an agreement in Ohio led to a comprehensive set of rules banning the use of gestation crates for pregnant sows after 2025, among other animal welfare improvements.^{29,30} In 2012, the state of Rhode Island enacted a legislative ban against gestation crates³¹ with a one year phase-out.

Industry shifts have also pronounced movement away from the use of gestation crates. In 2007, Smithfield Foods, the world's and United States' largest pig producer,^{32,33} and Maple Leaf, Canada's largest pig producer,³⁴ made corporate commitments to phase-out their use of gestation crates.^{35,36,37} Said Smithfield Foods CEO Larry Pope, "Our own research has demonstrated that group pens are as good as individual gestation stalls in caring for pregnant sows."³⁸ In 2013, Smithfield announced that nearly 40% of sows in its U.S. company-owned farms were group housed, and their international hog-production operations in Poland and Romania are already using group housing, while Granjas Carroll de Mexico and Norson joint ventures in Mexico are expected to complete the transition by 2022.³⁹ Cargill has reached 50% gestation crate-free production,⁴⁰ and in January 2012 Hormel announced that it would require all of its company-owned facilities to be converted to group housing by 2017.⁴¹

Following the continued state legislation and shifts by major pork suppliers, progress in the retail sector has come swiftly in the United States, at an increasing pace. In 2007, celebrity chef Wolfgang Puck committed to purchasing pork from only gestation crate-free sources for all of his restaurants.⁴² Burger King was the first major restaurant chain to announce that it would begin requiring gestation crate-free pork suppliers.^{43,44} Since the beginning of 2012, over 40 companies, including Hormel Foods (maker of SPAM),^{45,46} Denny's Corporation,⁴⁷ McDonalds,⁴⁸ Wendy's,⁴⁹ the Sonic drive-in chain,⁵⁰ Cracker Barrel,⁵¹ CKE Restaurants (owner of the Carl's Jr. and Hardee's chains),⁵² Oscar Mayer (owned by Kraft Foods),^{53,54} Heinz,⁵⁵ Campbell Soup,⁵⁶ Subway,⁵⁷ Wienerschnitzel,^{58,59} Jack in the Box,^{60,61} Hillshire Brands,^{62,63} ConAgra,^{64,65} Dunkin' Donuts,^{66,67} Brinker International (owner of Chili's, Maggiano's Little Italy brand, and Romano's Macaroni Grill),^{68,69} Bruegger's Bagels,^{70,71} The Cheesecake Factory,^{72,73} Arby's,^{74,75} General Mills,^{76,77} and DineEquity Inc. (owner of IHOP and Applebee's restaurants)⁷⁸ have all announced plans for moving away from gestation crates. In 2012, several grocery store giants, including Safeway,⁷⁹ Kroger,^{80,81} Costco,⁸² Supervalu,⁸³ and Harris Teeter supermarkets^{84,85} also announced steps toward the elimination of gestation crates. Further, the largest foodservice company in the world, Compass Group,⁸⁶ the second largest foodservice company, Sodexo,⁸⁷ as well as the foodservice giant, Aramark,^{88,89} have all pledged to move away from gestation crates in their supply chains as well.

Crating Pregnant Sows

Within U.S. animal agriculture, breeding sows produce an average of 2.1-2.5 litters each year⁹⁰ and are typically first impregnated around seven months of age,⁹¹ often through artificial insemination.^{92,93} A week before birthing, sows are customarily moved into farrowing crates to nurse their piglets. The piglets are weaned at 17-21 days old,⁹⁴ and the sows are re-impregnated a few days later.⁹⁵ Breeding sows are typically culled after an average of 3.5 parities.⁹⁶ Although in decreasing percentages given legislative and industry shifts away from individually confining pregnant sows, at present, the majority spend nearly their entire approximately four-month pregnancies in gestation crates, which prevent the animals from satisfying basic psychological needs and

engaging in most of their social and natural behavior,⁹⁷ including rooting, foraging, nest-building, grazing, and wallowing.^{98,99}

As a result of the intensive confinement, crated sows suffer a number of welfare problems, including poor hygiene, risk of urinary infections, weakened bones, overgrown hooves, poor social interaction, lameness, behavioral restriction, and stereotypies. The European Union Scientific Veterinary Committee (SVC) criticized gestation crates in its 1997 report, “The Welfare of Intensively Kept Pigs,” and concluded: “No individual pen should be used which does not allow the sow to turn around easily.”¹⁰⁰

Crated gestating sows have difficulty moving due to the spatial restriction, lack of exercise, and flooring type,¹⁰¹ whereas group-housed sows have a greater range of movement and show fewer abnormalities of bone and muscle development.¹⁰² As well, several factors relating to the construction of gestation crates and the unsanitary conditions prevalent in pig production facilities may predispose crated sows to disease and/or injury, including: confinement, slatted floors with sharp corners, rough concrete flooring, lack of bedding, and endemic infections.^{103,104}

Physical Health Concerns

Virtually immobilized in barren, restrictive gestation crates, the welfare of breeding sows is severely compromised. Jeremy Marchant-Forde, now a research animal scientist with the U.S. Department of Agriculture (USDA), and Donald Broom, professor of Animal Welfare at the University of Cambridge, have posited that difficulty performing the simple movements of standing and lying is indicative of poor sow welfare.¹⁰⁵ They describe that commercial stalls were not designed with the understanding of these movements and note: “With these dynamic space requirements taken into account, the vast majority of gestation stalls and farrowing crates are too small in width and length, to allow standing and lying to be carried out without spatial restriction.”¹⁰⁶ Other animal scientists have made similar determinations and also suggest that crated sows experience increasingly severe discomfort as pregnancy advances.¹⁰⁷

Indeed, welfare concerns were not the primary consideration in the design of many current housing systems.¹⁰⁸ A survey of manufacturers revealed that engineers never used sow measurements during the design of the first gestation crates.¹⁰⁹

Discomfort can be compounded by problems associated with barren crates. Without any bedding materials, sows have no thermal protection, which can cause systemic and local cold stress, and may contribute to or exacerbate injuries to skin and limbs.¹¹⁰ Since gestation crates are barely larger than the sow’s body, the animals must urinate and defecate where they stand. As such, the concrete floors of the crates are often partially or fully slatted to allow waste to fall into a pit below. Housing the sows directly above their own excrement has been shown to expose the animals to aversively high levels of ammonia,¹¹¹ and respiratory disease has been found to be a significant health issue for pigs kept in confinement.¹¹² Foot and leg disorders, urinary tract infections, and cardiovascular problems are also of concern for crated sows, who additionally suffer traumatic injuries and body sores often caused by being forced to stand and lie on unnatural flooring or in residual feces and urine. Research led by Broom found 33% of crated sows required removal from production as a result of health problems, compared with less than 4% of group-housed sows.¹¹³

Injury Due to Gestation Crate Design

Space restriction in gestation crates is a significant cause of injuries to pregnant sows. Intensively confined, crated sows experience soreness and injuries from rubbing against the bars of their enclosures and from standing or lying on barren flooring.¹¹⁴ As gestation crates are narrow and typically placed side by side within pig production facilities, when lying down, sows must extend their limbs into adjacent stalls where they may be stepped on.¹¹⁵ The slatted floors often have sharp corners that can injure exposed limbs and sows who slip in the crates.¹¹⁶ Food-deprived sows can also suffer head and snout injuries from attempting to access an adjacent stall’s feeder.¹¹⁷ Research has shown that rates of injury increase with time spent in the gestation stall.¹¹⁸ Despite

concerns regarding injuries and research showing that providing extra stall space can considerably reduce injuries and improve breeding sow welfare,¹¹⁹ industry observers believe the trend may be towards even narrower stalls.¹²⁰ Though stalls have not yet become physically smaller, over time, they have become effectively smaller compared to the size of the sow. Industry journal *National Hog Farmer* reported that in 1989, the sow stall was of adequate size to hold the average gestating sow,¹²¹ but research from 2004 found that more than 60% of sows could not fit in conventional stalls without being compressed against the crate's sides.¹²²

Foot and Leg Problems

In their natural habitat, pigs evolved to walk in woodlands and scrub. Putting sows in gestation crates with unnatural flooring changes the stresses on sows' feet¹²³ and is considered to significantly contribute to toe lesions,¹²⁴ with some reports finding up to 80% of stall-housed sows suffering from this condition.¹²⁵ Gestation-crate confinement has also been found to excessively¹²⁶ cause damage to joints¹²⁷ and lameness.^{128,129} Erosion of the cement floor from water and feed may leave rocks and sharp edges that can contribute to foot, leg, and shoulder sores,¹³⁰ and bolts which fix the crates in place can also contribute to similar injuries.¹³¹

Reduced Muscle Mass and Bone Strength

The health and welfare of breeding sows housed in gestation crates has been determined to be negatively affected by their inability to turn around or exercise.¹³² The restriction of movement can lead to a "reduction of muscle weight and considerable reduction of bone strength,"¹³³ making the most basic movements difficult¹³⁴ and leading to a "greater chance of the sow slipping during lying and standing and incurring physical damage."¹³⁵ Successive pregnancies exacerbate the problems of diminished muscle mass and bone strength.¹³⁶

Urinary Tract Infections

Gestation-crated sows suffer from a higher rate of urinary tract infections (UTIs) than uncaged sows,¹³⁷ due to their inactivity, decreased water consumption, infrequency of urination,¹³⁸ and possible contact with their own waste.¹³⁹ These infections can result in a high mortality rate, with one study estimating that half of breeding sow mortalities were caused by UTIs.¹⁴⁰ In comparison, group-housed sows suffer a lower incidence of UTIs associated with inactivity.¹⁴¹ Increasing water intake at one commercial operation using group pens rather than gestation crates nearly eliminated UTIs.¹⁴²

Mortality

Sows confined in gestation crates have been found to suffer from dramatic weight loss after successive pregnancies and a high incidence of health problems requiring the animals to be "removed from the [production] system."¹⁴³ Research on crate-free production has found that both outdoor,¹⁴⁴ and loose-housing¹⁴⁵ systems offer benefits to sow health and longevity. Compared with typical U.S. crate production methods, deep-bedded, loose housing systems studied in Sweden result in lower cull rates and greater sow longevity.¹⁴⁶ Commercial operations have also recorded better reproductive performance and lower mortality rates for sows housed in pens rather than confined in crates.¹⁴⁷

Compared to group-housed sows, gestation-crated sows show increased resting heart rates, likely due to decreased muscle fitness from chronic lack of exercise,¹⁴⁸ and are more likely to suffer decreased cardiovascular fitness.¹⁴⁹ The deaths of many pigs during transport can be traced to cardiovascular problems.¹⁵⁰

Mental Health and Behavioral Concerns

Pigs are intelligent, social, inquisitive, and capable of learning complex tasks,^{151,152,153} perceiving time, and anticipating future events.¹⁵⁴ They are active and curious animals. Near-immobilization in gestation crates without environmental enrichment or mental stimulation takes a psychological toll and impairs their welfare.

Inability to Express Natural Behavior

In natural environments, sows spend approximately 31% of their time grazing, 21% rooting, 14% walking, and 6% lying down.¹⁵⁵ Pigs also perform thermoregulatory behavior such as wallowing and shade-seeking.¹⁵⁶ When given space, sows elect separate areas for nesting, feeding, and eliminating.^{157,158}

Highly social animals, pigs learn to perform simple tasks for the reward of contact with familiar individuals.^{159,160} They develop behavioral and acoustic signals important to the organization of their social structure. Researchers have described more than 20 different sounds emitted by pigs while performing various social activities including feeding, play, maternal behavior, and sexual interactions.¹⁶¹ For wild boars and feral pigs, their home range, for which they show a high degree of site fidelity, can vary from less than 1 km² (0.39 mi²) to more than 25 km² (9.65 mi²).¹⁶² When released from confinement to semi-natural enclosures, sows quickly revert to natural behavior including rooting, nest-building, and traveling long distances, and spend considerable time performing such behavior when given the opportunity.¹⁶³

Intensive confinement, however, thwarts nearly all this behavior, reducing daily activity to approximately ten minutes—the time it takes sows to eat their concentrated diet. According to one veterinarian, confinement in gestation crates is “so foreign to what I perceive to be the natural habits of swine that it is unjustified by the economic benefits perceived to result.”¹⁶⁴ Compared to group-housed sows, crated sows have been found to be more often frustrated, indicated by the amount of time spent performing stereotypic behavior,¹⁶⁵ likely due to their inability to express natural behavior such as foraging. Confinement in gestation crates, according to Marchant-Forde and Broom, “has resulted in alteration or prevention of many of the sow’s normal behaviours, increases in abnormal behaviour and in various other indicators of poor welfare.”¹⁶⁶

Stereotypies

Stereotypies are characterized as movement or behavior that is abnormal, repetitive, and seemingly with no function or goal.¹⁶⁷ Researchers attribute this behavior to boredom and frustration resulting from an impoverished environment, confinement, restraint, and unfulfilled needs.^{168,169} Stereotypies are commonly described in animals in zoos and laboratories, indicating the animal has difficulty coping with the conditions or is in an environment deleterious to welfare.¹⁷⁰

Stereotypic behavior is common among gestation-crated sows and includes repetitive bar-biting, head-weaving, pressing their drinkers without drinking, and making chewing motions with an empty mouth, called sham- or vacuum-chewing.^{171,172,173} Stereotypic behavior can lead to physical injury, such as sores from excessive rubbing against the crate’s bars or damage in the mouth from bar-biting and sham-chewing.¹⁷⁴

Confined sows are typically fed half the amount they would eat *ad libitum* to prevent excessive weight gain and fat deposition,¹⁷⁵ which can result in poor reproductive performance. It is believed that this restrictive diet, combined with the inability to forage, contribute to the development of stereotypic behavior and stress.^{176,177}

Crated sows spend considerably more time performing oral stereotypic behavior than those housed in small groups. In one study by Broom *et al.*, sows in crates exhibited abnormal behavior approximately ten times more often than group-housed sows. One crated sow spent more than 40% of her time performing stereotypies. The authors commented: “Using a wide range of welfare indicators, it was clear that stall-housed sows had more problems than group-housed sows and that these problems were worse in the fourth than in the first pregnancy.” The amount of time sows engaged in stereotypies in the study increased with the time spent in crates.¹⁷⁸ By comparison, in situations where sows have greater freedom in more complex environments, the amount of stereotyped behavior is virtually zero.¹⁷⁹

“That stereotypies are an indication of welfare problems was a strong consensus among nearly all authors whose work was reviewed,”¹⁸⁰ concluded the American Veterinary Medical Association’s (AVMA’s) Task Force on

the Housing of Pregnant Sows. The SVC agreed: “The extent of stereotypy gives an indication of how poor the welfare is.”¹⁸¹

Unresponsiveness

Unresponsiveness in sows is another behavioral disorder indicative of poor welfare. Over time, crated sows respond less to external stimuli, including water poured on their backs, sow grunts, an electronic buzzer, and even squeals from piglets.^{182,183} The SVC commented that inactivity and unresponsiveness are abnormal and it is likely that crated sows become clinically depressed.¹⁸⁴

Aggression

Limiting aggression is often given as justification for confining sows in gestation crates, yet antagonistic interactions remain a problem in stall housing systems. Studies have shown that confinement in individual stalls may lead to “unsettled dominance relationships” and “high aggression levels.”¹⁸⁵ These unresolved agonistic interactions are likely to cause stress and worsen with successive pregnancies.^{186,187} Crated sows have been found to experience agonistic interactions up to three times more often than group-housed sows and cannot readily practice avoidance.¹⁸⁸ This same study found that stall-housed sows were more aggressive than group-housed sows by their fourth pregnancy.¹⁸⁹ Although aggression can be a welfare problem in group housing, it can be curtailed with responsible management and good practices.¹⁹⁰

Alternative Housing Systems

Alternatives to gestation-crate production methods include “turn-around” stalls, free-range and pasture-based systems, and, most commonly, indoor group housing. Turn-around stalls can be slightly larger than customary gestation crates or have a moving wall that allows the sow to turn around inside the crate. In free-range systems, sows are afforded access to the outdoors and, optimally, given the freedom and materials to express natural behavior such as nest-building and rooting. Sows are raised outdoors in pasture-based production and typically provided portable housing or shelters to allow for sustainable rotational practice. With the main alternative to gestation-crate systems, groups of up to several dozen sows are housed together in indoor pens, sometimes with deep litter allowing for access to bedding materials, and given freedom to move and the opportunity to socialize.

Feeding practices in group-housing systems vary. Often, group-housed sows are fed through automated or manual on-ground distribution of enough food for the entire group. This practice can result in aggression among sows during feeding, due to competition. Various types of feeding stalls have been introduced to reduce this aggression. Free-access stalls allow sows to enter an individual stall to feed, but do not resolve all welfare issues, particularly when sows who eat at different speeds are housed together; those who finish eating quickly may exit their stalls and bite at slower-feeding sows in other stalls. Some free-access stalls are fitted with a back gate or an automated, controlled rate feeder, so faster-eating sows are forced to eat more slowly, to eliminate this aggression. The most effective alternative to date is likely the electronic sow feeder (ESF) system, which allows entry of one sow at a time, identifies her through an electronic tag or collar, and distributes the appropriate ration. When the sow finishes eating, she leaves through a separate exit. In the ESF system, feeding aggression is eliminated because sows do not have to compete for food. In several countries, ESF systems are being widely adopted and their welfare advantages are well-documented in scientific reviews.^{191,192}

Higher sow productivity is possible in group housing than in individual crates, resulting from reduced rates of confinement injuries and urinary tract infections,¹⁹³ earlier first estrus,^{194,195} larger litter size, and lower stillbirth incidence.¹⁹⁶ Commenting on the increased litter size in group versus crated housing systems, Iowa State University animal science professor Mark Honeyman was quoted as saying it is “a large difference....It’s significant from an economic value and productivity value viewpoint.”¹⁹⁷

In its review, the SVC reported that sows in groups “have more exercise, more control over their environment, more opportunity for normal social interactions and better potential for the provision of opportunities to root or

manipulate materials....As a consequence, group-housed sows show less abnormality of bone and muscle development, much less abnormal behaviour, less likelihood of extreme physiological responses, less of the urinary tract infections associated with inactivity, and better cardiovascular fitness.”¹⁹⁸ Currently more than four million sows are raised in group housing in Europe.¹⁹⁹

Conclusion

The prevailing insensitivity of the pork production industry to animal welfare concerns was demonstrated by a spokesman for the National Pork Producer’s Council who stated “So our pigs can’t turn around for the 2.5 years that they are in the stalls producing piglets, I don’t know who asked the sow if she wanted to turn around...”²⁰⁰ In fact, scientists have “asked” the sows if they want to turn around in carefully designed animal behavior research, and found that when penned in a wide enough enclosure, sows will turn around nearly 200 times a day, and continue to try to turn around even when the movement is made more difficult by experimentally narrowing the pen to just 50% of the sow’s body length.²⁰¹ Clearly the behavior is important to the sow.

Although the American Veterinary Medical Association’s Task Force on the Housing of Pregnant Sows concluded that “no one system is clearly better than others under all conditions,” the Task Force did identify a number of problems inherent to gestation crates: “Gestation stalls, particularly when used in conjunction with feed restriction, may adversely affect welfare by restricting behavior, including foraging, movement, and postural changes.”²⁰² Other contributing factors to poor welfare noted were “lack of exercise, lack of environmental complexity, lack of rooting/chewing materials, and an inability for the sow to exert control over her environment.”²⁰³

After a comprehensive two-year study, the independent Pew Commission on Industrial Farm Animal Production, a project of The Pew Charitable Trusts and the Johns Hopkins Bloomberg School of Public Health chaired by former Kansas Governor John Carlin and including former U.S. Agriculture Secretary Dan Glickman, concluded that gestation crates should be phased out:

After reviewing the literature, visiting production facilities, and listening to producers themselves, the Commission believes that the most intensive confinement systems, such as restrictive veal crates, hog gestation pens, restrictive farrowing crates, and battery cages for poultry, all prevent the animal from a normal range of movement and constitute inhumane treatment.²⁰⁴

Scientific evidence supports improved health and welfare for sows not confined in gestation crates. In “The Welfare of Intensively Kept Pigs,” the European Union’s Scientific Veterinary Committee concluded: “Since overall welfare appears to be better when the sows are not confined throughout gestation, sows should preferably be kept in groups.”²⁰⁵

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