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State Policies for Farm Animal Welfare in Production Practices of U.S. Livestock and Poultry Industries: An Overview

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Abstract

Since 2002, 14 U.S States have passed and implemented policies addressing practices that can impact farm animal welfare. The most common policies directly ban confinement practices within a State's pork, egg, and veal industries or prohibit the sale of products from noncompliant operations. Proposals for future changes are also beginning to target beef and dairy industries. As these policies become increasingly common across States, their influence on animal product industries, markets, and international trade opportunities grows. This report describes the current state of these policies, the extent of their implementation and geographic coverage, and the legal environment and challenges these policies have faced. State policies directly cover a relatively small share of operations and production, but retail sales restrictions can reach beyond State borders to affect U.S. animal product industries more broadly and create market implications for U.S. imports and exports.

Keywords:

animal welfare, cage-free, gestation crates, gestation stalls, veal crates, U.S. State farm policy, confinement restrictions, crate bans, battery cage bans, laying hens, hogs, cattle, eggs, pork, tail docking, retail sales restrictions, livestock, trade barriers, animal products, housing, ballot measures, legislation, operations, breeding animals

About the Authors

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A report summary from the Economic Research Service *December 2022*

State Policies for Farm Animal Welfare in Production Practices of U.S. Livestock and Poultry Industries: An Overview

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What Is the Issue?

Since 2002, 14 States have enacted laws governing their animal agricultural industries' production practices prior to slaughter. These policies have focused on confinement practices in the pork, veal, and egg industries, often restricting production practices or sales of noncompliant animal products. This report examines State farm animal welfare laws enacted since 2002 to better understand the timing, scope, and geographic distribution of market impacts on livestock industries, as well as the legal and legislative environment surrounding these policies.

What Did the Study Find?

Most national production in animal agricultural industries occurs outside of the States enacting animal welfare legislation. However, retail sales restriction policies apply to all products sold within a State, including those imported from States without similar production laws. A few examples:

- Eleven States have passed bans on the use of veal crates or gestation crates for sows. By 2026, gestation crate bans will directly cover over 7 percent of the U.S. breeding sow herd but nearly 18 percent of breeding operations. Veal crate bans will cover over 13 percent of U.S. operations by the end of 2022.
- Ten States have enacted policies that prohibit the confinement of hens beyond a minimum space requirement or the use of cages in poultry and egg production. By 2026, 17 percent of U.S. egg-laying operations will be covered by these restrictions, an increase from approximately 3 percent of operations in 2021. Sales bans on eggs produced in noncompliant operations will reach nearly 25 percent of the U.S. population by 2026. Cage-free egg production increased in recent years, along with more legislation and retailer and food-service pledges, with 24 percent of U.S. laying hens kept in cage-free operations in 2021.

International trade can also be affected by animal welfare standards, as in the following examples:

- States with bans on confined or caged egg production on average account for over 41 percent of U.S. shell egg exports.

- State policies do not impact shell egg imports, and all pork imports to States with impending retail sales restrictions originate in the European Union or Canada, where production policies or voluntary commitments are driving a trend toward gestation-crate-free production. Animal welfare issues are also becoming provisions of interest in some trade agreements.

Legal challenges and legislative efforts in response to State animal welfare policies have been largely unsuccessful. Policies similar to those already in place were proposed in other States. The historical success of the passage of current policies through legislative channels indicates future policies may be expected, expanding the coverage of these policies in their respective industries.

How Was the Study Conducted?

State farm animal welfare policies enacted since 2002 were compiled and mapped from several sources, including State legislative libraries and repositories; American Veterinary Medical Association reports; and local, national, and stakeholder news sources. Policies were sorted based on similar provisions, excluding laws focused on slaughter practices, laws that established oversight or regulatory bodies, and laws unrelated to the direct regulation of farm animal production practices. ERS also collected case documents and proposed legislation to describe the legal and legislative response to State policies. The extent of State policy coverage was examined, using average State operation and inventory data from 2002 to 2021 from USDA, National Agricultural Statistics Service to construct descriptive statistics and visual representations. Additional market impacts were assessed using U.S. Department of Commerce, Bureau of the Census data on State exports, imports, and population, as well as USDA, Agricultural Marketing Service data on cage-free egg production.

Introduction

Among the many challenges facing animal production is the issue of animal welfare (see box, "Farm Animal Welfare Defined"). Farm animal welfare concerns have been traditionally framed primarily as moral or ethical issues. Discussions surrounding animal welfare, however, have grown to include the sustainability of animal agriculture as well as the potential threats poor animal welfare might pose to public health and product quality (Tonsor et al., 2009; Broom, 2010; Cardoso et al., 2016). These arguments, as with farm animal welfare standards themselves, continue to be controversial, with a variety of perspectives and opinions on what constitutes optimal conditions and treatment for food animals while meeting consumers' demand for animal-sourced products.

Some governments and organizations, such as the National Farm Animal Care Council (NFACC) in Canada and the World Organisation for Animal Health (WOAH) in France, aimed to establish functional definitions for the most basic levels of animal treatment expected in livestock production (WOAH, 2019; NFACC, 2021). The United States, however, has issued relatively few Federal standards for animal welfare that apply to farm animals, allowing each industry to largely define such standards in conjunction with guidance provided by organizations like the American Veterinary Medical Association (AVMA). Some industry stakeholders have called attention to the nature of conventional animal agricultural production methods. Market-based solutions may not fully address disutility for what some people may consider unsatisfactory animal welfare standards in the industry. This is especially true for those stakeholders—such as vegans, vegetarians, and people associated with animal rights organizations—who may value the treatment of animals apart from the implications for products they may or may not consume. Diverse values like this have driven some stakeholders to turn to policy tools to alter industry standards and uniformly change the level of animal welfare achieved through conventional animal agricultural production.

Policy-based approaches impose a consistent set of rules on production that consequently standardize the level of animal welfare provided across an industry. These policies may arise from ballot initiatives in which citizens directly vote on a policy or by legislative processes handled by governmental representatives. These approaches may especially appeal to those stakeholders who do not participate in animal product markets but still hold strong preferences over the standards of conventional livestock production (Lusk, 2011). In recent years, policy-based approaches have been implemented at the State level with increasing frequency and potentially far-reaching implications for animal product industries.

Farm Animal Welfare Defined

Farm animal welfare has defied scientific definition, in large part due to the inherent variation in values across individuals (Fraser et al., 1997). Despite the difficulties in identifying a universal definition of animal welfare, several common themes arose among different stakeholder groups and were used to form functional definitions widely accepted in many governing bodies. The 2008 World Organisation for Animal Health description of good animal welfare required that an animal be healthy, comfortable, well-nourished, safe, able to express innate behaviors, and not suffering from unpleasant states like fear, pain, and distress (FAWC, 2009). One of the most common sets of guidelines for defining animal welfare is the Five Freedoms, which originated in the 1965 Brambell Report to the British parliament on farm animal welfare and was further refined by the United Kingdom's (UK) Farm Animal Welfare Council (FAWC) in the late 1970s (FAWC, 2009).[1]

continued on next page ►

[1] The Five Freedoms are: (1) freedom from hunger and thirst; (2) freedom from discomfort; (3) freedom from pain, injury, and disease; (4) freedom to express normal behavior; and (5) freedom from fear and distress.

◄ continued from previous page

These guidelines are often subject to interpretation depending on a stakeholder's priorities. In addition, for some stakeholders' values relating to animal welfare, the Five Freedoms are insufficient. Most notably, several studies found naturalness, including access to the outdoors and natural light, to be a high priority for consumers and other stakeholders in defining animal welfare (Sato et al., 2017; Prickett et al., 2010; Clark et al., 2016). The persistent variation in defining animal welfare, as well as how to achieve a satisfactory level of animal welfare, has contributed to the current disagreements over optimal production practices. Despite the varying stakeholder interpretations of whether farm animal welfare is effectively improved or not, several of the State policies currently addressing farm animal production practices specifically allude to animal welfare. These policies either directly include "cruelty" or "humane" treatment in their text or incorporate aspects of the Five Freedoms into their provisions, making animal welfare a stated goal of the policies themselves.

Policy-Based Approaches: Animal Welfare Regulations and Ballot Initiatives

Animal welfare legislation has more commonly focused on companion animals or other animals exclusive of livestock in animal agriculture industries. Relatively few pieces of Federal legislation address any aspects of livestock treatment, with the most notable being the Humane Slaughter Act of 1978 (7 U.S.C., sections 1901–1907) and the Twenty-Eight Hour Law of 1873 (49 U.S.C., section 80502; amended in 1994). However, these laws mainly cover the transportation and slaughter of livestock rather than on-farm production practices. Other major Federal legislation that protects animal welfare—the Animal Welfare Act (7 U.S.C., sections 2131–2160; passed in 1966), and the Horse Protection Act (15 U.S.C., sections 1821–1831)—exclude food animals from coverage.

The absence of Federal regulatory oversight of farm animal welfare has generally allowed industries and individual producers to determine their own standards and practices for addressing the welfare of their livestock (see box, "Market Solutions for Animal Welfare Demands"). Livestock producers and some animal scientists argue that optimal animal welfare is a core element of profit maximization, and hence, the profit incentive suffices to protect the welfare of farm animals (Curtis, 2007). Gibson and Jackson (2017), for example, noted that attention to animal welfare and improvements in productivity or product quality are positively correlated, such as in transportation and slaughter practices. Lusk and Norwood (2011), however, demonstrated that in the case of an issue like stocking density, profit maximization and cost minimization are actually achieved without maximizing the level of animal welfare, creating a tradeoff between animal welfare and the most efficient or productive use of resources. While Federal regulation does not currently address such issues,[2] State legislation is increasingly restricting practices that produce what many stakeholders view to be the suboptimal level of animal welfare produced in conventional operations.

Current trends in farm animal welfare policy indicate that the greatest concerns reside in confinement practices and the restriction of animal movement in the pork and egg industries. The breeding stage of pork production has historically employed confined housing for breeding sows during the entire length of gestation, referred to as gestation crates or gestation stalls. Proponents of gestation crate systems contend that crates protect sows from fighting and injury (Rhodes et al., 2005). Opponents argue that aggression can be man-

[2] The first Congressional bill (H.R. 7004) to address on-farm production practices relevant to animal welfare, the Pigs in Gestation Stalls (PIGS) Act of 2022, was introduced March 9, 2022.

aged in group housing settings that allow sows greater freedom of movement and natural behavior expression (Marchant-Forde, 2010). Similarly, conventional egg production has historically occurred in facilities that use battery cage systems, which generally confine multiple laying hens in a small space and are stacked multiple layers deep within a barn. Arguments both for and against battery cage systems are similar to those of gestation crate systems, including the reduction of aggressive behaviors like feather pecking and cannibalism as a tradeoff for natural behavior expression and freedom of movement (Blokhuis et al., 2007). The most widely instituted State policies in recent years have addressed these confinement practices or facility types. While some States have introduced policies that only address confinement in a single industry, several States have instituted policies that simultaneously address confinement practices in multiple industries, such as policies that outlaw both gestation crates and veal crates.

Additional policies have addressed or intend to address cattle industries, though these policies have received much less attention. The most common are policies that restrict confined housing for veal calves. Other policies or proposed policies address common or routine practices in the dairy industry, such as tail docking and artificial insemination. While some stakeholders have expressed concern over practices and facilities used in the beef industry, the relatively less-confined nature of beef production along most parts of the supply chain has so far placed the beef industry at a lower priority than other livestock industries for animal welfare policies (Norwood and Lusk, 2011).

Since 2002, over 20 State regulations have passed as laws, with several already being fully implemented and others scheduled to go into effect as late as 2026 (table 1). Several States have passed multiple laws that cover animals in different industries, with a total of 14 States passing at least 1 law covering farm animal welfare in production practices prior to slaughter.[3] These laws generally serve two directives: They usually effectively prohibit specific livestock-rearing practices on in-State operations, and they sometimes prohibit the sale of products coming from any operation that employed such practices, even if the products originate out of State. The most widespread State legislation addresses confinement practices in the pork, egg, and veal industries, though additional legislation attempted to address a variety of other practices in these and other industries. For each of the covered practices, these laws tend to be similar across States.

State policies addressing animal welfare passed by a popular vote as a ballot initiative or by State legislative bodies. Twenty-three States allow initiatives that could feasibly pass farm animal welfare legislation (Smithson et al., 2014).[4] Of these, 12 States passed laws by ballot or by other means that cover farm animal welfare before slaughter.[5] This leaves 11 States with no such policies that could potentially be enacted via ballot initiative. According to Smithson et al. (2014), based on the demographic profiles of States that allow initiatives but do not currently have similar farm animal welfare policies, most remaining States were predicted to have less than 50-percent voter support for such initiatives. Even in those States that allow initiatives, however, the majority of State policies were implemented under legislative processes instead of ballot votes, with only 4 of the 14 States with policies passing any of those policies by ballot initiative (table 1).[6]

Every farm animal welfare initiative that has appeared on ballots in the last 20 years has passed (HSUS, 2019). A review of earlier years shows little indication of ballot initiatives presenting relevant questions, with the no-

[3] The 14 States with relevant legislation are Arizona, California, Colorado, Florida, Kentucky, Maine, Massachusetts, Michigan, Nevada, Ohio, Oregon, Rhode Island, Utah, and Washington.

[4] Illinois, Kentucky, Maryland, and New Mexico allow ballot votes but only in limited circumstances not relevant to farm animal welfare policies.

[5] These 12 States are Arizona, California, Colorado, Florida, Maine, Massachusetts, Michigan, Nevada, Ohio, Oregon, Utah, and Washington.

[6] These four States are Arizona, California, Florida, and Massachusetts.

table exception of the 1988 version of Massachusetts' Question 3, (coincidentally also presented as Question 3), which sought similar provisions for farm animal housing and treatment standards to several of today's laws but failed at the time (Lumsden, 1988). The success of ballot measures during the past two decades is consistent with the predictions of Bovay and Sumner (2019) and Smithson et al. (2014). Several States that could have presented ballot initiatives but instead opted to pass legislation through Senate or House bills—including Colorado, Oregon, and Washington—did so following negotiations with stakeholder groups who otherwise proposed to bring these policies to a statewide vote (Garber, 2011; Brown, 2020). As was the case in California, multiple initiatives addressing these issues may be brought in a State, including a measure proposed in Arizona in 2022 that was similar in nature to California's Proposition 12, where a ballot measure on gestation and veal crates passed in 2006.

Table 1
Farm animal welfare legislation by practice, State, date of ban, and implementation deadline

Practice banned[1]	State	Ban enacted	Full implementation deadline	Passage/ enactment type
Gestation and veal crates	Arizona	2006	2013	B
	California[2]	2008 2018	2015 2020 (veal calves) 2022 (sows)	B B
	Colorado	2008	2012 (veal calves) 2018 (sows)	L
	Maine	2009	2011	L
	Massachusetts	2016	2022	B
	Michigan	2009	2020[3]	L
	Ohio	2010	2018 (veal calves) 2026 (sows)	R
	Rhode Island	2012	2013	L
Sale of pork or veal from crated animals or their offspring	California	2018	2020 (veal meat) 2022[4] (pork)	B
	Massachusetts	2016	2022[5]	B
Gestation crates	Florida	2002	2008	B
	Oregon	2007	2012	L
Veal crates	Kentucky	2014	2018	R
Confined hen or battery-caged egg production[6]	California[2]	2008 2018	2015 (confinement) 2020 (confinement) 2022 (cages)	B B
	Colorado	2020	2023 (confinement) 2025 (cages)	L
	Massachusetts	2016	2022	B
	Michigan	2009	2025[3]	L
	Nevada	2021	2022 (confinement) 2024 (cages)	L
	Ohio[7]	2010	2011	R
	Oregon	2019	2024	L
	Rhode Island	2018	2026	L
	Utah	2021	2025	L
	Washington[8]	2011	2026	L
Sale of confined[6] hen or battery-caged products	California	2010 2018	2015 2022	L B
	Colorado	2020	2023	L
	Massachusetts	2016	2022[5]	B/L[9]
	Michigan	2009	2025	L
	Nevada	2021	2022	L
	Oregon	2019	2024	L
	Washington	2019	2024	L

Notes: B = passed by ballot measure/referendum; R = enacted as regulations by a regulatory body apart from the State legislature; L = passed by the State legislative bodies.

[1] Bans apply to commercial production, generally with limited exclusions for medical research, veterinary procedures, transportation, rodeo or youth exhibitions, and limited short-term windows such as breeding, farrowing, or slaughter.

[2] California initially passed Proposition 2 in 2008 with confinement restrictions based on animal movement and behavior (e.g., sufficient space for an animal to stretch its limbs). The passage of Proposition 12 in 2018 further refined these restrictions to explicitly define space requirements for each covered species. Beginning in January 2020, producers were required to have at least 144 square inches

of space per hen. Additionally, Proposition 12 expanded the definition of products covered by sales restrictions.

[3] Michigan gestation/veal crate and battery cage rules originally stipulated a deadline for implementation of 2019; however, these dates were amended to the new dates of 2020 and 2024 in a 2019 amendment.

[4] In January 2021, a California Superior Court ruling delayed enforcement of the Proposition 12 pork sales rules for grocers, retailers, and restaurants until 6 months after regulations are finalized, though 2022 remains the originally intended date of full implementation.

[5] Massachusetts lawmakers in October 2021 began discussing the postponement of implementation of sales bans until 2023. In December 2021, a State senate bill (S 2603) was passed that delayed the sales ban implementation from January 2022 to August 2022.

[6] "Confined" means animals raised in spaces smaller than the required minimum of a State's legislation.

[7] Ohio rules imposed a moratorium on permits for new battery cage operations after the implementation date; however, they allowed existing farms with battery cage systems established prior to 2010 to continue operating with those systems.

[8] Washington rules imposed a moratorium on new confinement operations beginning in 2012. Beginning in 2017, all operations constructed after August 1, 2012, were required to have a minimum 116.3 square inches of space per bird. Beginning in 2026, all operations in the State must meet that minimum space requirement.

[9] Massachusetts initially passed its ban on the sale of whole eggs from hens confined in a prohibited manner as a ballot measure, Question 3. This law was later amended by the State legislature (S 2603) to establish uniform cage-free standards and add egg products as covered products.

Source: USDA, Economic Research Service using information from State legislation repositories.

Gestation and Veal Crate Bans

Florida enacted the first State policy to address farm animal welfare in production practices in 2002 as a State constitutional amendment outlawing the use of gestation crates or stalls in pork production. The amendment made provisions for crate use immediately prior to birth but generally outlawed routine confinement of pregnant sows. Since 2002, another nine States have also outlawed the use of gestation crates in pork production, with eight of those States simultaneously banning the use of crates in veal production (figure 1).[7] In addition, Kentucky enacted a ban on veal crates. The passage of these bans spans from 2002 to 2016, with Massachusetts being the most recent to pass crate bans. In total, all of these laws went into force in or before 2022 with the exception of Ohio, where gestation crate rules are scheduled to begin in 2026. Most States banning gestation crates have relatively small pork industries, with each of these States producing less than 1 percent of the national industry volume each year (figure 2). The two notable exceptions are Michigan and Ohio, which together have comprised an average of 4.5 percent of U.S. pork production since 2002. Conventional gestation crates typically provide approximately 14 square feet of space per sow (Marchant-Forde, 2010). Many States' initial policies on confinement addressed behaviors, requiring that pregnant sows only be confined in ways that allow the animal to lie down, stand up, fully extend its limbs, and turn around freely. However, more recent policies explicitly define a minimum space requirement to accommodate such behaviors. In the case of California's 2018 Proposition 12, this requirement was set at a minimum of 24 square feet of usable floorspace per breeding pig.[8]

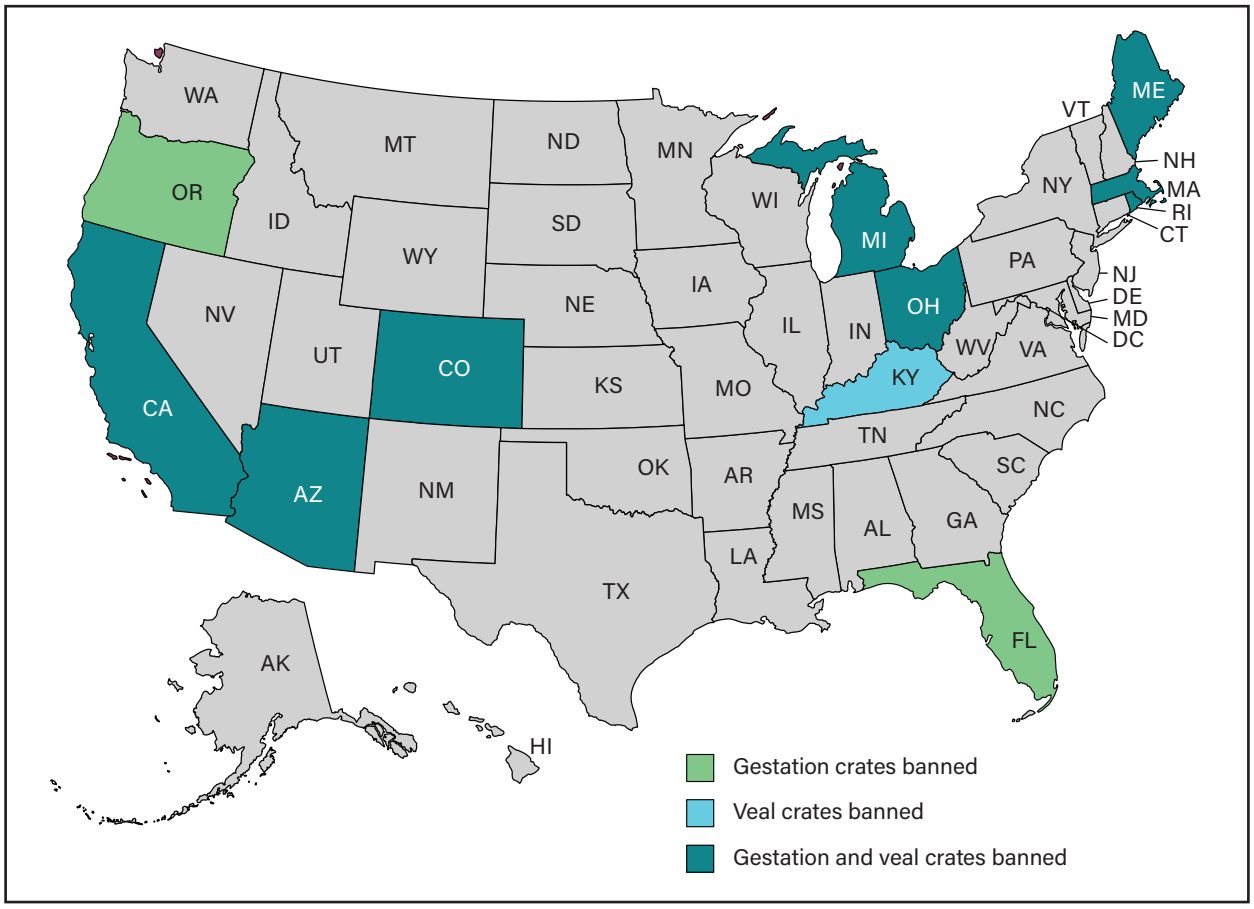
Other States attempted to enact similar legislation, including New Jersey, where gestation crate bills were twice vetoed by the governor in 2013 (S1921/A3250) and 2014 (S998/A2500). These New Jersey bills have since been reintroduced (S3401/A5236). Across the border in New York, State legislators have proposed several bills for bans related to animal confinement since 2011. In addition, the first piece of Federal legislation to address on-farm production practices relevant to animal welfare, the Pigs in Gestation Stalls (PIGS) Act of 2022 (H.R. 7004), was introduced in March 2022. Similar to the provisions of several State policies, the bill aims to prohibit the confinement of pregnant pigs in a manner that does not permit lying down, standing up, or turning around. The proposed prohibition would extend to confinement in a space with less than 24 square feet of floorspace per pig beginning December 31, 2022. While each State with enacted bans imposed a varying timeline for full implementation, none of the bans took immediate effect but rather allowed for a transition period ranging from 1 to 16 years. All passed bans are planned to be fully implemented by 2026. The dates of full implementation,

[7] In addition to Florida, these nine States include Arizona, California, Colorado, Maine, Massachusetts, Michigan, Ohio, Oregon, and Rhode Island. With the exception of Florida and Oregon, these States also banned veal crates.

[8] While this minimum requirement automatically precludes standard gestation crates, it is not automatically met by all group housing facilities, which generally range from 16–24 square feet per sow (Seibert and Norwood, 2011).

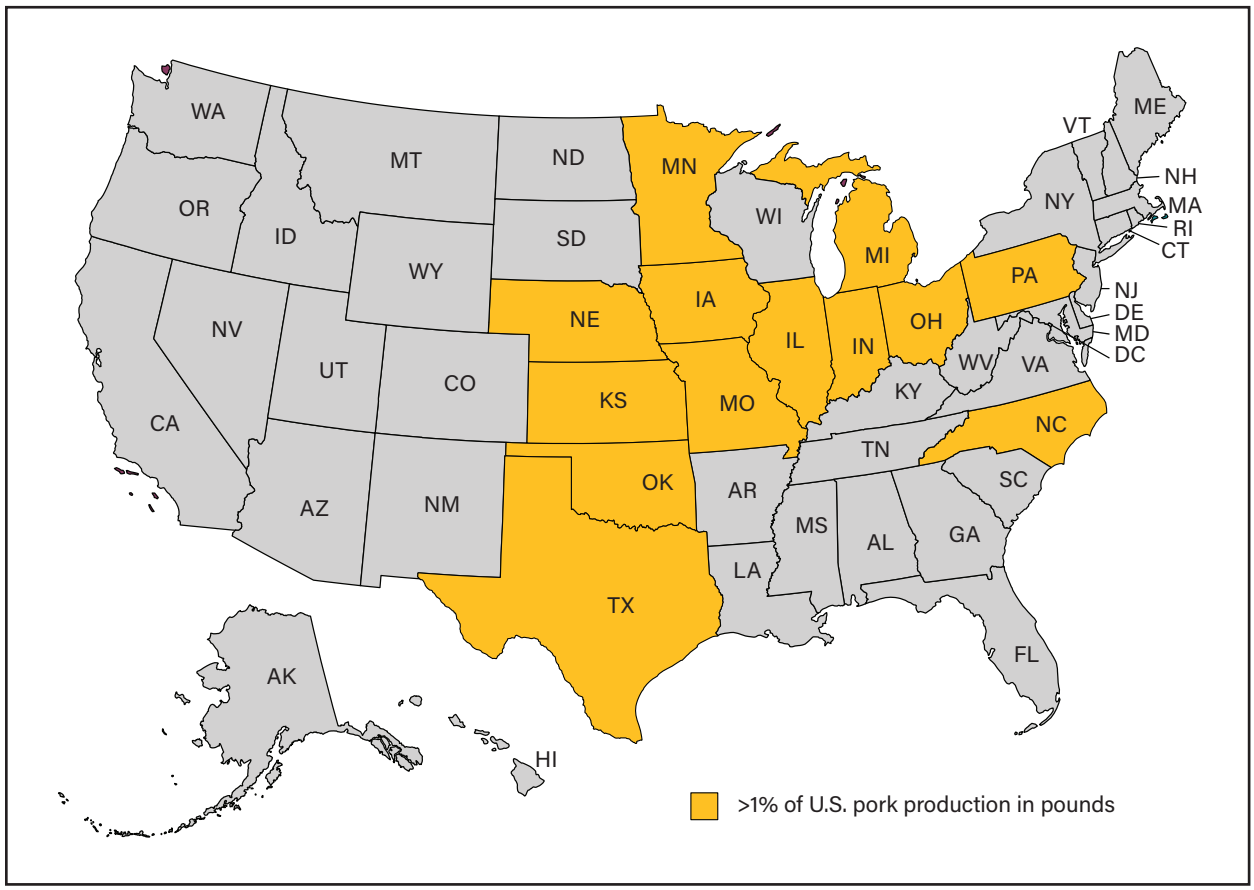
however, are subject to change, with Michigan pushing back the deadline for conversion by 1 year (SB-174) and Massachusetts lawmakers delaying the sales restrictions from the State's Question 3 ballot measure by 7-1/2 months (S 2603).

Figure 1
Gestation and veal crate bans



Source: USDA, Economic Research Service using information from State legislative repositories.

Figure 2
Concentration of U.S. hog and pork production by volume



Note: Percentages are based on 3-year average hog production from 2018 to 2020.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

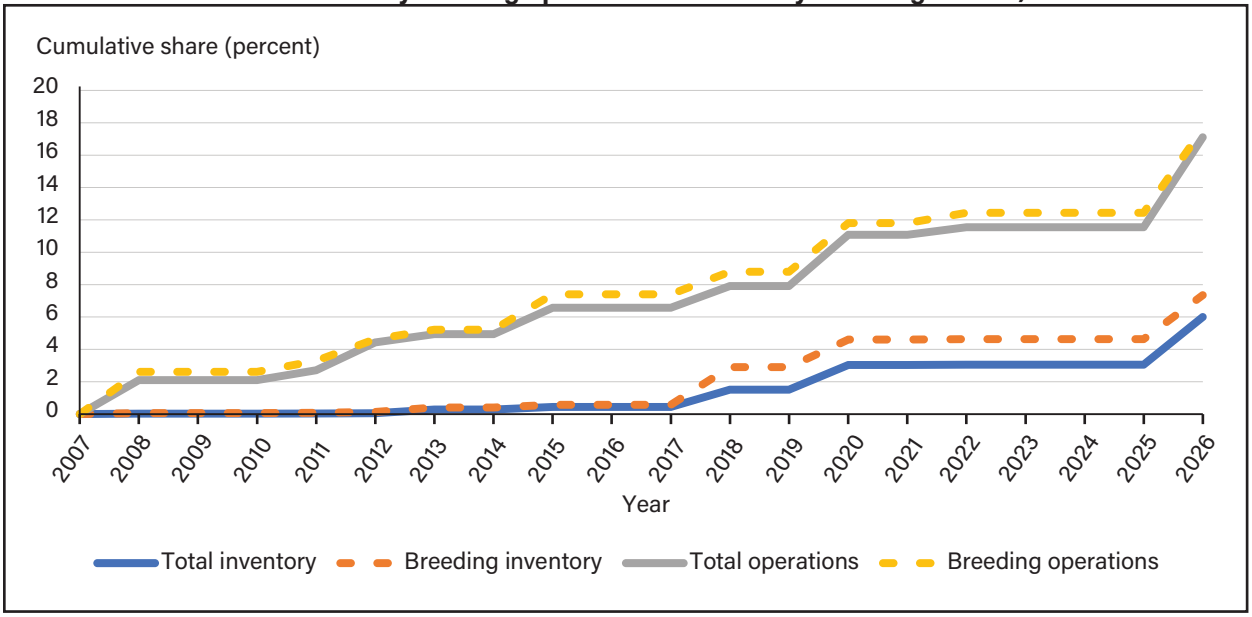
With a few exceptions such as Michigan and Ohio, most States that enacted gestation crate bans do not have substantial in-State pork production (figure 2). Until 2017, these bans covered less than 1 percent of U.S. hogs—both total inventory as well as breeding hogs (figure 3). By 2018, Colorado's ban (SB08-201) had gone into full effect, increasing coverage to as high as 3 percent of the national breeding herd. Michigan's ban (SB-174) went into full effect in 2020, raising coverage to approximately 3 percent of the total herd and nearly 5 percent of the breeding herd. Once Ohio's ban (Rule 901:12-8-02) goes into effect in 2026, coverage of the national herd will further increase by 2 to 3 percent. Overall, however, the bans in these 10 States still represent less than 10 percent of either the total or breeding hog population in the United States. The operations in the States with bans tend to be smaller. USDA, National Agricultural Statistics Service reported an average of fewer than 250 hogs per operation in these 10 States in 2017, the most recent census year, compared with the national average of over 1,100 hogs per operation.[9] With the increasing implementation of bans in Colorado and Michigan since 2018 and the projected ban in Ohio, by 2026, more than 17 percent of all hog producers and nearly 18 percent of producers with breeding operations will be subject to a gestation crate ban.[10]

[9] While less than 1 percent of pork production came from producers in States with fully implemented bans by 2017, these bans affected approximately 7 percent of both total operations and breeding operations.

[10] Projected estimates of coverage of these policies are based on historical averages of available data since 2002. Previous research (Mullally and Lusk, 2018; Carter et al., 2021) indicates that these estimates likely represent an upper bound as the implementation of similar production policies has been shown to result in decreases in the size of in-State industries.

Figure 3

Cumulative total swine inventory and hog operations affected by State legislation, 2007–26



Notes: State inventory shares are based on average shares calculated from USDA's 2002–2020 National Agricultural Statistics Service (NASS) survey data. State operations shares are based on average shares across 2007, 2012, and 2017 Census of Agriculture values for operations with inventory. States include Arizona, California, Colorado, Florida, Maine, Massachusetts, Michigan, Ohio, Oregon, and Rhode Island.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Some States with bans included measures in their legislation that prohibit the sale of pork from any animals or the offspring of animals raised under the prohibited conditions, regardless of the State where the pork was produced. Such measures are, in part, a response to lessons from egg producer reactions to similar bans. Those producers argued that the bans disadvantaged them relative to out-of-State producers who could continue to produce the same products at lower cost without the given restrictions and out-compete in-State producers in markets within the State. These in-State sales restrictions, similar to the production bans, did not take immediate effect but contained later-scheduled implementation dates.

The impending effect of California's sales ban included in Proposition 12, passed in 2018 and begun in 2022 subject to court-imposed limits, has prompted legal actions by industry advocacy groups across the country, as well as proposals for legislation from senators from several major pork-producing States. The North American Meat Institute petitioned the Supreme Court for a writ of certiorari in February 2021 that opposed California's law, though this petition was dismissed.[11] The National Pork Producers Council, in tandem with the American Farm Bureau Federation, similarly filed a suit against several California officials in the U.S. Court of Appeals for the Ninth Circuit, attempting to strike down the Proposition 12 in-State sales ban on pork from gestation crate systems.[12] The case and its appeals were dismissed in July 2021; however, in March 2022, the Supreme Court announced it would review the challenge. Partly in response to the inability of industry groups to nullify these laws through the courts, senators from Kansas, Iowa, Mississippi, and Texas jointly proposed the Exposing Agricultural Trade Suppression Act (EATS Act) in August 2021. The goal of the act is to prevent States from interfering with the production and distribution of agricultural products in interstate commerce. Together, in 2020, these four States accounted for nearly 35 percent of the national hog herd and nearly 20 percent of the national breeding hog herd.

[11] North American Meat Institute v. Bonta, SCOTUS No. 22-1215.

[12] National Pork Producers Council v. Ross, D.C. No. 3:19-cv-02324-W-AHG, (S.D. Cal., Jul. 28, 2021).

Economic Impacts of Gestation Crate Bans and Retail Sales Restrictions

California's Proposition 12 ban on in-State sales of products from noncompliant operations was scheduled to begin in January 2022, but enforcement has been delayed for grocers, retailers, and restaurants until 6 months after regulations are finalized.[13] Costly facility conversion expenses and concerns about post-implementation reduced productivity slowed producer response to the impending impacts of the ban. Using estimates of 18-percent productivity losses in converted systems due to reduced stocking capacity, coupled with a $225 per stall conversion cost, Seibert and Norwood (2011) found that converting a farrow-to-finish system away from gestation stalls resulted in a $1.15 annualized investment cost per finished pig.[14] They estimated a 3- to 4-cent increase, or approximately 8.7 percent, in the per pound cost of producing finished hogs in a gestation stall-free system compared with a gestation stall system. Since relatively little pork production outside of the banning States was converted to compliant housing, the prohibition on noncompliant pork sales would reduce the supply of pork imported into California from out of State. Lee et al. (2021) estimate retail pork prices in California will increase 7.7 percent, reducing demand by 6.3 percent and resulting in an annual loss of $320 million in economic benefits for consumers. Massachusetts was similarly set to impose a retail sales ban on pork from confinement operations not in compliance with State law (Question 3) in 2022, though enforcement was suspended to begin 30 days after the Supreme Court ruling on the suit filed by the National Pork Producers Council and American Farm Bureau Federation against California's Proposition 12. (The Court's hearing was scheduled to start October 11, 2022.)

Veal Crate Bans

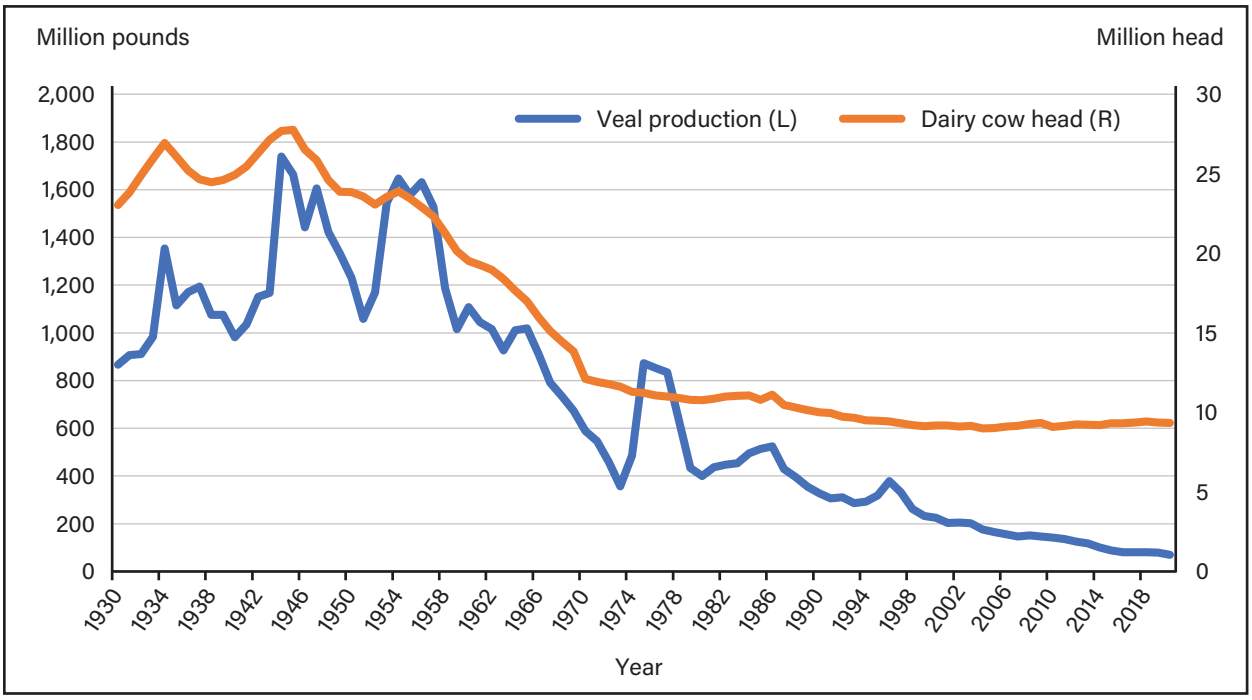
While applied differently than for gestation crates, legislation addressing confinement housing in the veal industry has arisen in tandem with gestation crate bans over the last 20 years. Most States with bans have enacted them as a singular piece of legislation to ban both gestation crates or stalls and veal crates. All State veal crate bans that have been passed are in force as of 2022. While gestation crate bans may be disruptive to the conventional production practices that are standard in the pork industry, veal crate bans have had a less practical impact on the industry. In the U.S. milk-fed veal industry, group housing has already become standard practice (AVA, 2019). Furthermore, the veal industry has generally declined beginning in the 1950s, concurrent with the following changes: (1) the decline in the size of the national dairy herd (until stabilizing around 2004), (2) the widespread availability of sex-sorted semen technology, and (3) the redirection of some dairy bull calves into feedlot operations for dairy-beef (figure 4). Total veal production in the United States in 2020 was 69 million pounds, or 4 percent of the peak production of over 1.7 billion pounds in 1944. The extensive shrinkage of the industry over the past 80 years has resulted in relatively few veal operations in many States, with several States containing fewer than 20 operations. The overall U.S. veal industry consisted of fewer than 8,000 operations in 2017, less than half the number of operations in 2012. Despite the industry standard of already foregoing crate systems, nine States have banned veal crates.[15] Most of these States, as with pork, are relatively small producers. Up until 2017, State bans covered just over 3 percent of operations (figure 5). However, Kentucky's ban (302 KAR 21:030) went into full effect in 2018, raising coverage to include an additional 6 percent of producers. With the remaining bans all fully implemented in 2022, over 13 percent of veal operations in the country are covered.

[13] For California's Proposition 2 and AB 1437, the California Department of Food and Agriculture established a registration process and labeling requirements for compliant products under the Egg Safety and Quality Management (ESQM) Program to enforce sales restrictions on covered eggs. Enforcement of California's Proposition 12 was delayed for these groups since similar guidelines for oversight on pork and pork products had yet to be established.

[14] These estimates assume the conversion occurs on a 10-year-old operation with 800 stalls and incorporates corresponding depreciation. The conversion of newer facilities would result in higher costs, while conversion of older facilities would be less costly.

[15] These States are Arizona, California, Colorado, Kentucky, Maine, Massachusetts, Michigan, Ohio, and Rhode Island.

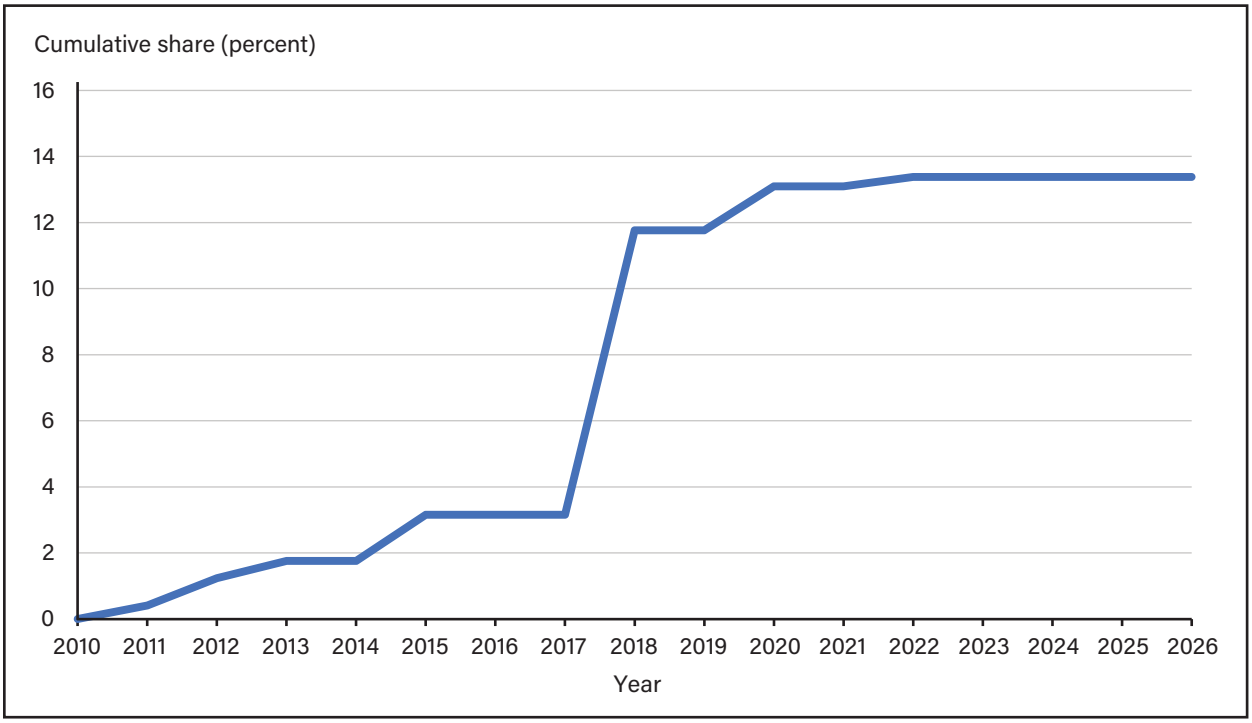
Figure 4
Veal production (million pounds) and dairy cow inventory (million head) since 1930



Note: L = left vertical axis; R = right vertical axis.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Figure 5
Cumulative share of veal operations covered by State legislation, 2010–26



Notes: State shares are based on average shares across 2007, 2012, and 2017 Census of Agriculture values of number of operations with veal calves raised or sold. States include Arizona, California, Colorado, Kentucky, Maine, Massachusetts, Michigan, Ohio, and Rhode Island.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

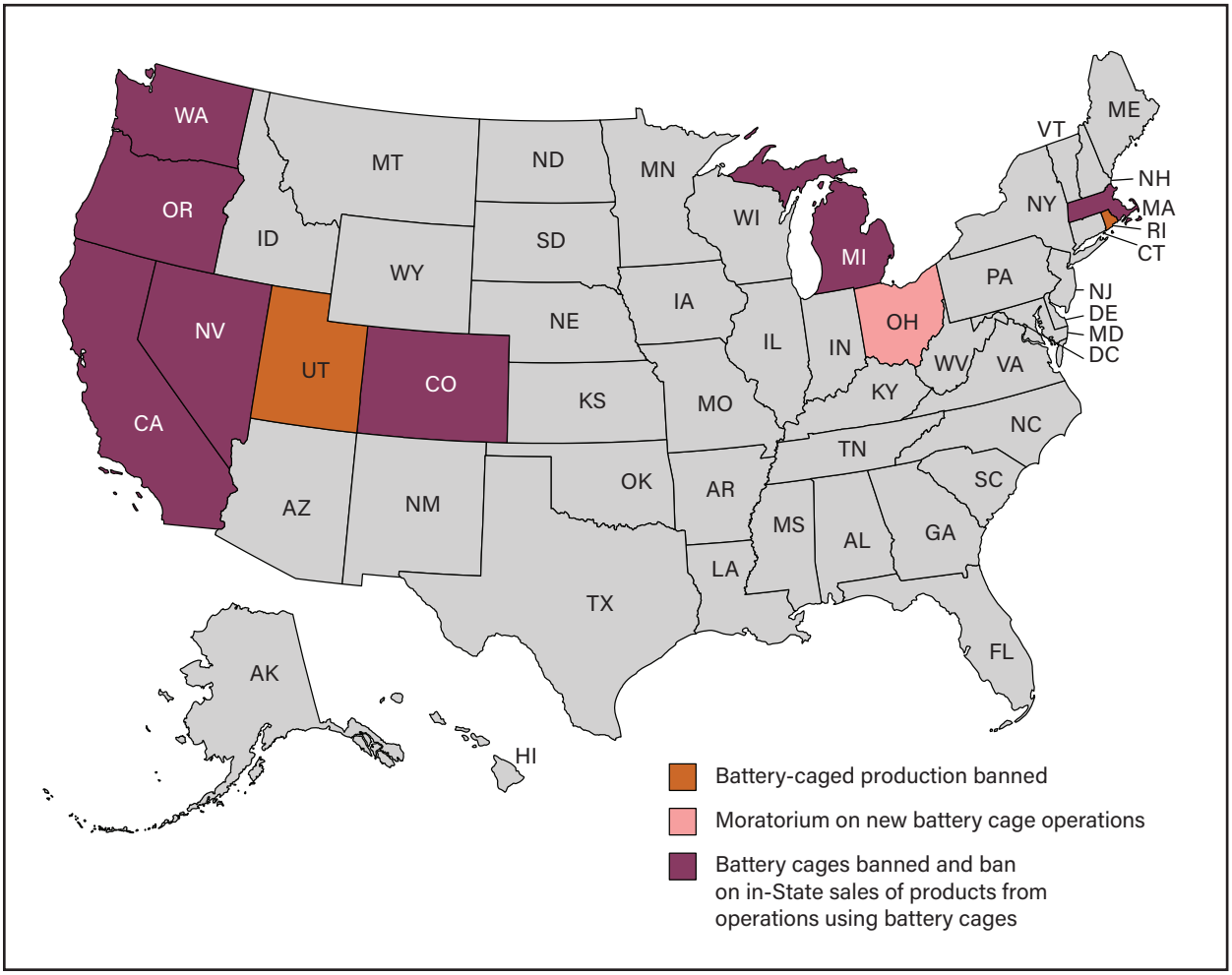
Hen Confinement and Battery Cage Bans

An estimated 76 percent of U.S. eggs came from caged layer systems in 2021. In 2008, the State of California passed Proposition 2, a ballot measure that effectively banned battery-caged egg production (a system of stacked cages multiple layers deep) in the California poultry industry, becoming the first State to do so. In practice, Proposition 2 outlawed the confinement of hens in cases where they were unable to fully extend their limbs or turn around freely. In 2013, State regulators further defined the rule by setting the minimum amount of space allowed per bird to 116 square inches, a 73-percent increase over the 67-square-inch industry standard (Carter and Saitone, 2015; UEP, 2017). In 2018, California voters further refined restrictions by passing Proposition 12, which contained more specific language outlawing the use of battery cages in egg production and requiring a minimum of 1 square foot of usable floorspace per hen. Since California's Proposition 2 passed, another eight States have enacted similar bans on confined or caged production (figure 6).[16] In addition, in 2010, Ohio imposed a moratorium on new permits for caged layer operations, requiring all new laying operations in the State from 2011 onward to be cage-free with a minimum of 1 square foot of space per bird. The Ohio law is not an outright ban, however, because it allows already-established operations to continue operating but requires them to provide a minimum area of 67 square inches per bird for all laying hens in the State by 2016. Approximately half of passed State policies restricting confined or caged egg production went into force in or before 2022.[17] As with gestation and veal crate bans, other States proposed similar legislation, including a stalled house bill in Arizona (HB2724) and a dead house bill in Maine (H.P. 1485) in 2020 (AVMA, 2020).

[16] In addition to California, these States include Colorado, Massachusetts, Michigan, Nevada, Oregon, Rhode Island, Utah, and Washington.

[17] These include confinement and cage laws in California, Massachusetts, and Ohio and confinement laws in Colorado and Nevada. Colorado's and Nevada's cage bans are scheduled to go into effect in 2025 and 2024, respectively.

Figure 6
Battery cage bans and bans on sales of products from animals produced in battery cages



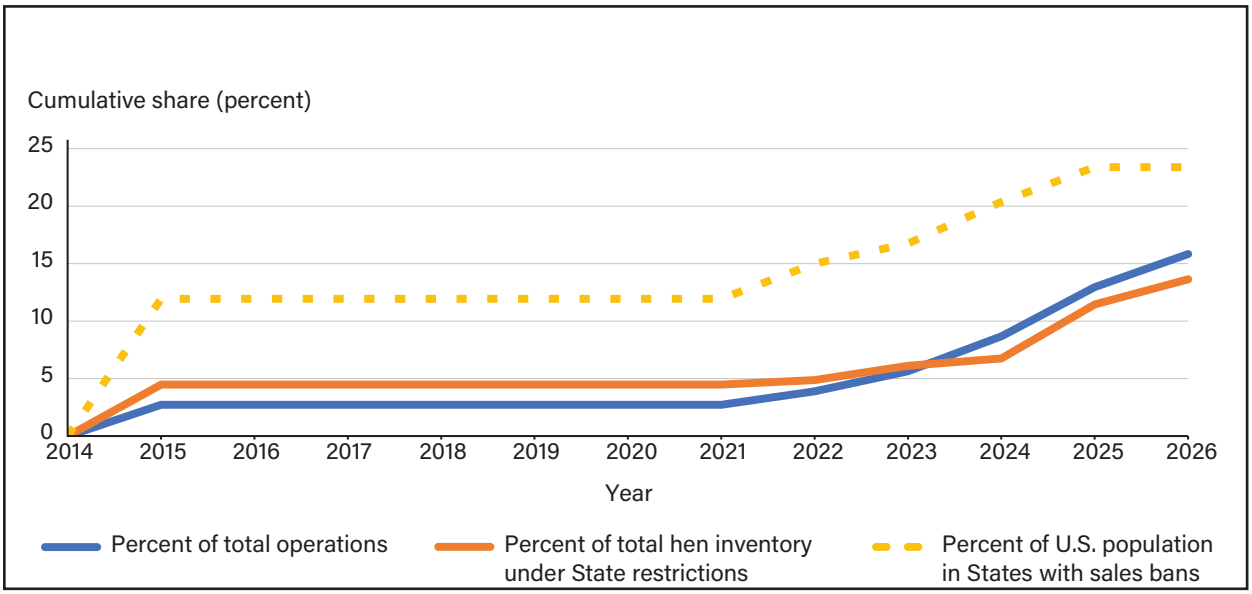
Source: USDA, Economic Research Service using information from State legislation repositories.

Together, the States that have passed these bans represent a relatively small but growing proportion of U.S. egg production. Prior to 2022, only California's bans were in effect, accounting for approximately 3 percent of all U.S. laying operations (figure 7).[18] By 2026, under full implementation of all current bans, 17 percent of operations will be directly regulated by State legislation. Beginning in 2022, the consecutive implementation of multiple States' restrictions will cause a continuous, increasing trend in coverage of laying operations through 2026. Despite the increasing coverage of State bans in the U.S. egg-laying flock, unless other States pass additional legislation, 83 percent of operations in the United States will still legally be allowed to produce using battery cage systems with stocking densities of less than 116 square inches per bird after 2026. This amounts to nearly 87 percent of all egg production in the United States, with only 13 percent of total egg production occurring in States with confinement regulation.

[18] While Ohio's moratorium went into effect in 2011, it did not require preexisting operations to alter their practices and thus does not automatically imply coverage of all in-State operations.

Figure 7

Cumulative share of total egg-laying operations and U.S. laying hen inventory directly covered by State legislation compared with cumulative share of U.S. population in States with retail sales bans on confinement egg products, 2014–26



Notes: State operations shares are based on average shares across 2002, 2007, 2012, and 2017 Census of Agriculture values of operations with sales. State inventory shares are based on average shares calculated from available 2008–20 USDA, National Agricultural Statistics Service (NASS) survey data. States with legislation covering egg-laying operations include California, Colorado, Massachusetts, Michigan, Nevada, Oregon, Rhode Island, Utah, and Washington. States with retail sales bans include California, Colorado, Massachusetts, Michigan, Nevada, Oregon, and Washington. Since Ohio legislation prohibits permits for new battery cage operations but allows established farms to continue operation, Ohio is excluded from the calculations as operations in the State are not automatically covered.

Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census 2020 Population Estimates and USDA, National Agricultural Statistics Service.

When the first layer confinement ban was passed in California (Proposition 2), it initially contained no provisions for the sale of eggs from confined hens produced in other States. Estimates of the increased costs imposed by the ban on producers indicated at least a 20-percent rise in production costs (Sumner et al., 2008). Under the original Proposition 2 structure, these increased costs would only accrue to California egg producers, while out-of-State producers could continue to produce using battery cage systems and still sell their products in the California market. Arguing the protection of in-State producers from this unequal burden, California lawmakers amended the ban (AB 1437) in 2010 to prohibit sales of shelled eggs from a confined poultry system not in compliance with Proposition 2 rules, including out-of-State products. In 2018, the passage of Proposition 12 further refined this sales ban to prohibit sales of shelled and liquid eggs from any caged laying system, beginning in 2022. California's example has been followed by six of the eight States that have banned battery cage systems (figure 6).

While the share of egg-producing operations is relatively low in States implementing restrictions on confinement production, the share of the U.S. population residing in States implementing sales bans on noncompliant eggs is much greater (figure 7). Just under a quarter of the U.S. population lives in States that, by 2026, will prohibit the sale of products produced in confined or caged laying systems, though less than 15 percent of laying hens will reside in States with compliant legislation. While population share is not necessarily equivalent to consumption share, the discrepancy still represents a substantial deficit in production that would need to be filled by out-of-State imports, thereby exporting the impacts of these States' policies to other States without their own restrictions.

As with opposition to the sales bans associated with gestation crates in the pork industry, several industry and State representatives have pushed back against the bans on sales of eggs from confined layers. In 2014,

the attorneys general of Missouri, Nebraska, Oklahoma, Alabama, and Kentucky and the Governor of Iowa sought to block California's law in California District Court. Their case was dismissed on the grounds that egg producers could file the complaint themselves, that alleged economic damages from the law were necessarily speculative, and that allegations of discrimination based on State of origin were deemed to be misplaced.[19] Another lawsuit challenging California was filed with the Supreme Court in 2017 by 13 States.[20] A similar motion to file a complaint against Massachusetts' law was also made by 13 States that same year. Both motions were denied. State caged egg sales bans also inspired proposed amendments to both the 2014 (section 11312) and 2018 (HR 4879—the Protect Interstate Commerce Act) farm bills that would have prevented States from imposing animal welfare standards on other States' industries through sales restrictions. Neither amendment was passed in the final farm bills (Hamilton, 2014; Carter et. al., 2020). Without a successful legal challenge, the California confined egg sales ban took effect in 2015. The next scheduled bans in Massachusetts (Question 3) and Nevada (AB 399), and in California (Proposition 12) for shelled and liquid eggs from cage systems, are scheduled to take effect in 2022.

Economic Impacts of Hen Confinement or Battery Cage Bans and Retail Sales Restrictions

Shifting production toward less-confined or cage-free production results in increased costs that are often transmitted to the retail level. Sumner et al. (2008) estimated that cage-free production costs are at least 20 percent greater than the cost of production in conventional systems. Mullally and Lusk (2017) found that 20 months after implementation, both egg production and egg-laying hen numbers in California were 35 percent lower than expected in the absence of the regulation. In addition to the potential impacts of increased costs, Sumner (2018) suggested this decline in California's egg industry could also be attributed to the increased legal and regulatory uncertainty these policies impose. Several studies examined the effect of the Proposition 2 California sales ban (AB 1437) on retail prices both in and outside the State. Prices for eggs in California increased between $0.48 and $1.08, or approximately 33 to 70 percent, per dozen from January 2014 to July 2015, with an estimated cost to consumers of between $400 million and $850 million in economic benefits per year (Malone and Lusk, 2016). Outside of California, long-run wholesale egg prices increased by approximately 7–10 cents, or 4–6 percent, from 2016 to 2017, following the January 2015 implementation of the policy (Carter et al., 2020).[21] While California's regulations did not force out-of-State egg producers to alter their production to remain in operation, the regulations did constrain those producers' marketing opportunities within the State. As a result, the ban shut smaller producers out of the California market, restricting California's supply to eggs with higher production costs and reorganizing overall interstate trade dynamics (Carter et al., 2020). Oh and Vukina (2021) estimated the expected annual economic loss to California households of Proposition 12 to be $72 million, with a concurrent industry-level loss amounting to 18 percent of original quasi-profits.

Cage-Free Eggs and Organic Eggs

State retail sales regulations, in conjunction with pledges from large national retailers such as McDonald's, Walmart, and Kroger to only sell cage-free eggs (Dewey, 2018; Kelso, 2019), have exerted increasing pressure on how eggs are produced nationally (see box, "Private Commitments to Farm Animal Welfare Standards"). As a result, the U.S. egg industry has increasingly shifted toward cage-free production, nearly doubling it in the 5-year span of 2017 to 2021. The cage-free laying hen inventory increased from an estimated 12.9 percent of the national flock in 2017 to an estimated 24 percent at the end of 2021 (figure 8). These estimates include

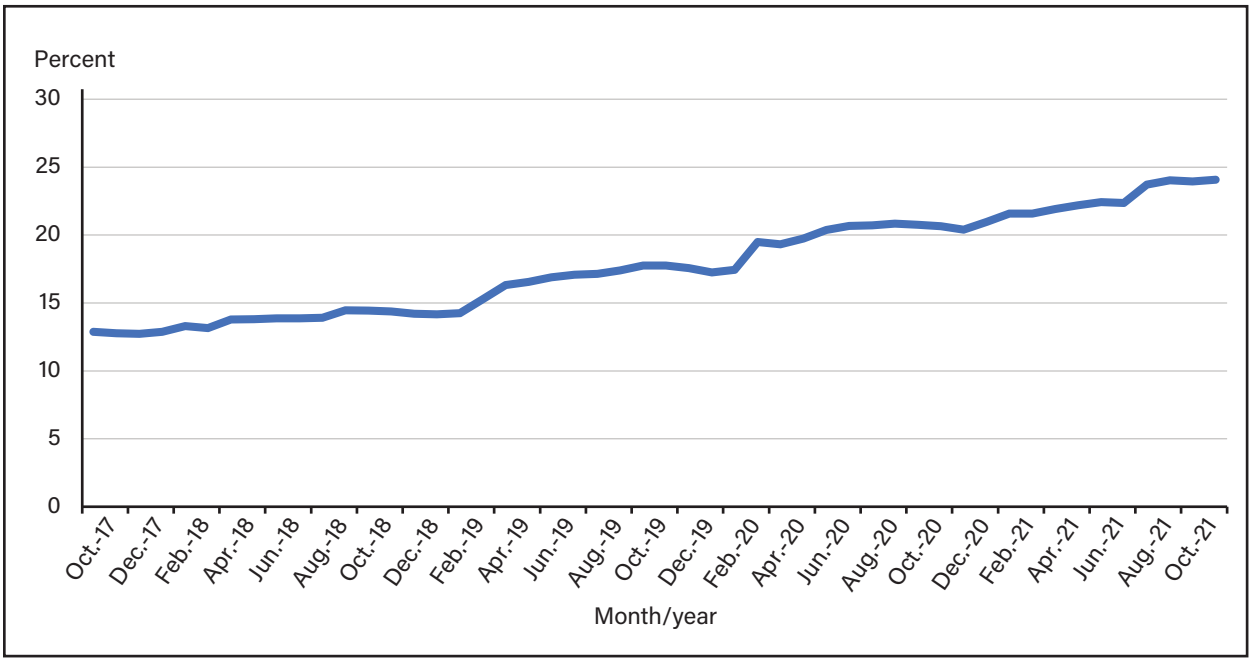
[19] *Missouri v. Harris*, No. 2:14-cv-00341-KJM-KJN, 2014 WL 4961473 (E.D. Cal. Oct. 2, 2014).

[20] *State of Missouri et al. v. State of California*, SCOTUS No. 22O148.

[21] Despite using modeling approaches designed to account for egg price inflation from other variables, these studies do note that estimates could be influenced by the effects of the concurrent highly pathogenic avian influenza outbreak in 2014–2015.

both certified organic operations and conventional cage-free operations. When excluding certified organic production, the cage-free laying hen inventory increased from an estimated 9.4 percent in 2017 to an estimate of just over 20 percent of the total nonorganic national flock in 2021.

Figure 8
Monthly estimated share of U.S. laying hen inventory produced in cage-free operations, October 2017 to October 2021

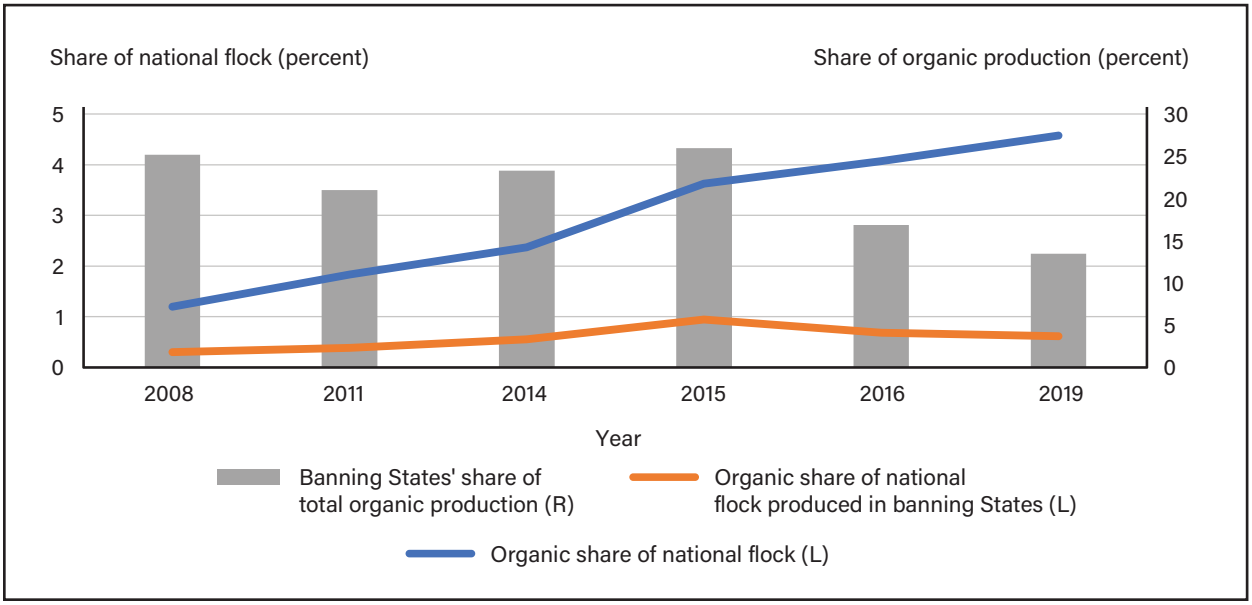


Source: USDA, Economic Research Service using data from USDA, Agricultural Marketing Service Monthly USDA Cage-Free Shell Egg Report and USDA, National Agricultural Statistics Service.

While much of U.S. egg production has historically not been compliant with cage-free production standards, the organic egg industry has always operated under such systems. Thus, National Organic Program housing standards for laying hens (7 CFR, section 205.239) automatically comply with many States' legislation by expressly prohibiting caged production and the confinement of hens in a way that prevents lying down, standing up, or fully extending limbs. Organic standards also require "access to the outdoors, shade, shelter, exercise areas, fresh air and direct sunlight year round."[22] Organic egg production has been increasing since 2008, from just over 1 percent to over 4.5 percent of the national layer inventory in 2019 (figure 9). This means that nearly 1 in 20 laying hens in the United States in 2019 produced eggs that would be eligible by default for sale in States prohibiting eggs from caged layers, given their organic status. The States with such bans have historically had a much higher contribution to organic egg production than to overall egg production nationally, though their share of the organic market has decreased over the last decade. With the consistent growth of the organic egg industry in States without such legislation, the proportion of national organic egg production occurring in States with bans has declined since 2015. In 2019, less than 14 percent of organic layers resided in these States, compared to more than 25 percent in 2008 (figure 9). Overall, organic shell eggs make up a decreasing share of total cage-free production in the United States. In 2017, certified organic laying hens comprised nearly 30 percent of total cage-free production but had dropped to just under 18.5 percent by the end of 2021.

[22] Organic requirements expressly prohibit the confinement of hens indoors all year, though temporary confinement from the outdoors is allowed under certain circumstances. 7 CFR, section 205.239 does not contain specific space requirements per bird, though a January 2017 final rule attempted to establish them before being withdrawn in March 2018.

Figure 9
Organic flock total share and banning-States' organic share of the national layer flock, 2008–19



Notes: Banning States are those with restrictions on raising laying hens in confinement or cage systems. L = left vertical axis; R = right vertical axis. States include California, Colorado, Massachusetts, Michigan, Nevada, Oregon, Rhode Island, Utah, and Washington. Since Ohio legislation prohibits permits for new battery cage operations but allows established farms to continue operation, Ohio is excluded from the calculations as operations in the State are not automatically covered.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service.

Market Solutions for Animal Welfare Demands

Strategies to address farm animal welfare have historically focused on the market, with premium product offerings catering to those consumers who place a higher value on animals receiving a standard of care that differs from conventional standards (Tonsor et al., 2009; McKendree et al., 2014; Clark et al., 2017). Just as the meaning of animal welfare terminology varies across stakeholders, premium product claims may have differing animal welfare implications among consumers. Common claims include cage-free, pasture-raised, free-range, vegetarian- or grass-fed, third-party humane certifications, organic, and raised without antibiotics (Animal Welfare Institute, 2022). Chang et al. (2010) found a nationwide average premium for cage-free eggs of 57 percent and for organic eggs of 85 percent.[23] One phenomenon that researchers have identified through these offerings is called the "vote-buy gap," where the share of voters who support a policy is greater than those willing to take private action, such as by buying cage-free eggs (Norwood et al., 2019). As a result, while policies can create a uniform standard for production and sales, they can also impose costs exceeding the total willingness to pay of the population for improved animal welfare. Separate premium offerings in markets without such policies can allow consumers to buy products with specified animal welfare provisions while still allowing others who prefer conventional standards or prices to buy generally lower-cost products.

continued on next page ►

[23] While these estimates are influenced by the animal welfare implications of the labels, they do not purely reflect values for animal welfare but also include differentiating characteristics like egg color.

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One growing product category is plant-based animal product alternatives. While these products differ substantially from their animal-sourced counterparts, they provide a functional substitute that effectively eliminates farm animal welfare concerns from production to slaughter. This trait made plant-based meat alternatives especially appealing early in the Coronavirus (COVID-19) pandemic with its meat processing plant disruptions and contributed to an increase in the market share of meat alternatives from 0.1 to 0.4 percent over the 18-month period prior to July 2020 (Zhao et al., 2022).[24] Plant-based dairy alternatives have also undergone tremendous growth, with milk-alternative sales increasing by 36 percent from 2013 to 2017 (Stewart, 2020). This growth is not driven by animal welfare concerns alone but can be influenced by other factors such as dietary restrictions or claims of environmental benefits. Nevertheless, these products offer an alternative for stakeholders who find current production standards unacceptable but still prefer meat- or dairy-like foods.

Animal Welfare Measures in Cattle Industries

In general, policies addressing farm animal welfare in the dairy and beef industries are less widespread than policies in the pork and poultry industries. Fewer confinement practices partially explain the relative lack of policies addressing farm animal welfare in the dairy and beef industries (Norwood and Lusk, 2011). The primary regulations that have been implemented have outlawed the routine practice of tail docking in the dairy industry. (Approximately one-third of dairy cows had docked tails in 2013 (APHIS, 2018)). Proponents of docking argue that the practice improves comfort for workers when they are milking and increases udder and milk hygiene (Sutherland and Tucker, 2011). Veterinarians, researchers, and other stakeholders question these benefits and contend that tail docking may not only be an unnecessary procedure but increases cow discomfort from fly predation (Stull et al., 2002; Sutherland and Tucker, 2011). Three States have implemented legislation relevant to tail docking of food animals: California (SB 135, 2009), Ohio (Rule 901:12-6-02, 2011), and Rhode Island (S2192, 2012). In addition, the New Jersey Supreme Court ruled tail docking of dairy cows to be an inhumane practice in 2008, eliminating its protection under New Jersey law as an agricultural practice.[25] The States that adopted restrictions on dairy cow tail docking largely did so provisionally, allowing for the removal of a cow's tail by a licensed veterinary professional in cases deemed medically necessary. Other States have enacted policies that restrict tail docking procedures for livestock, though not to the same extent or not for cattle (AVMA, 2019). As this issue has received comparatively less attention than animal welfare issues in the pork and poultry industries—and because the majority of producers already refrain from routine tail docking practices—these legislative measures have had a markedly smaller impact on the dairy industry and markets. Additionally, the AVMA and some industry groups, such as the dairy associations that oversee the National Dairy Farmers Assuring Responsible Management (FARM) Program, contend there are few identifiable scientific benefits to routine tail docking. Therefore, the broad prohibition of the practice could have arguably little economic impact on producers (NMPF, 2020). The elimination of tail docking is also an effectively costless change to production practices, thereby neither increasing costs nor reducing revenues significantly.

Other legislation proposed in recent years but yet to pass legislative hurdles could produce far-reaching impacts on cattle industries. Proposed ballot measures in both Oregon (Initiative Proposal 13) and Colorado

[24] Despite growing market share, evidence suggests these products have a complementary relationship with the red meat counterparts they are marketed to replace (Zhao et al., 2022), indicating that consumers may not necessarily be substituting away from animal products but instead purchasing plant-based meat alternatives together with red meat products. This suggests that consumer motivations for purchasing these products are influenced by considerations apart from animal welfare.

[25] *New Jersey Society for the Prevention of Cruelty to Animals v. The New Jersey Department of Agriculture*, 955 A.2d 886 (2008).

(Protect Animals from Unnecessary Suffering and Exploitation Initiative) in 2020 and 2021, respectively, aimed to redefine sexual exploitation of an animal to include acts that are currently defined as "accepted animal husbandry practices," including artificial insemination and pregnancy exams. Nearly 90 percent of dairy farms practiced artificial insemination in 2014, accounting for approximately 74 percent of cow pregnancies on dairy farms (APHIS, 2018). Both Colorado and Oregon contain small but growing dairy industries, accounting for approximately 2 percent of operations and 3.1 percent of national milk production in 2017. Colorado alone experienced 23-percent growth in production from 2017 to 2020.

Another measure, the Farm Systems Reform Acts of 2019 and 2021 introduced in the U.S. Senate, in part proposes to place a moratorium on large, concentrated animal feeding operations.[26] The 2021 proposed act defines this categorically in the cattle industries as dairy operations with more than 700 head of cattle or beef feedlot operations with more than 1,000 head. Though the act does not explicitly address farm animal welfare, opponents of highly concentrated operations often cite animal welfare concerns as a contributing factor to their opposition (Matheny and Leahy, 2007). While this rule would not necessarily impact a large number of producers, it would cause a dramatic impact on the operations that contribute a majority share of production in these industries. For example, in 2017, fewer than 2,000 dairy farms (5 percent of U.S. operations) contained more than 1,000 dairy cows, yet these farms accounted for over 55 percent of the national dairy herd (MacDonald et al., 2020). Thus, measures such as one that would ban large feeding operations—proposing substantial changes to farm structure—would cover a large proportion of national production. A 2021 State bill introduced in the Oregon senate (SB 583) would lead to a similar goal of limiting the size of dairy farms in the State to 2,500 cows or fewer. While these measures may not be enacted, they represent the current types of proposed legislation under consideration beyond the stall, crate, and cage bans in the pork and egg industries.

Animal Welfare Policies, International Markets, and Trade

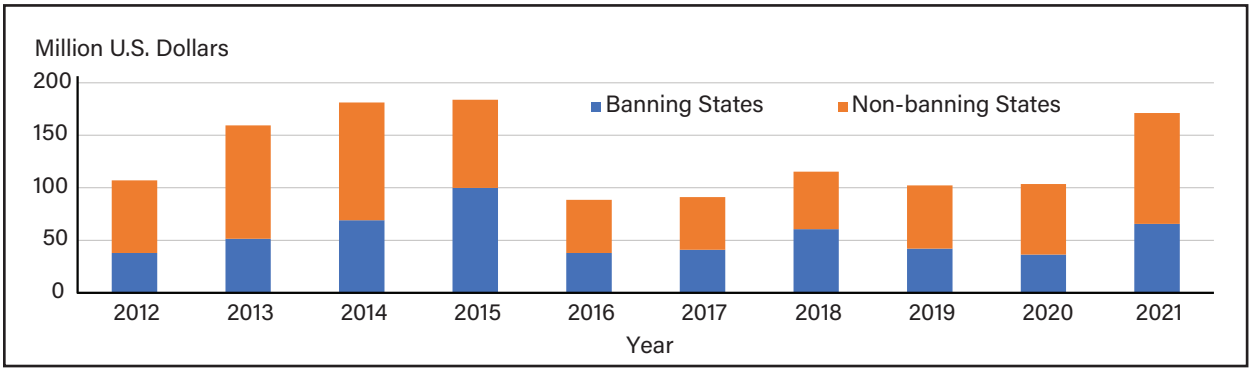
State farm animal welfare policies seem to exert relatively little influence on U.S. animal product exports. While pork is a major U.S. agricultural export, since 2009, fewer than 15 percent of U.S. pork exports, by value, have originated each year in States with gestation crate bans or retail sales restrictions on pork from gestation crate systems.[27] In contrast, States with confinement or cage restrictions in egg production are the origin for a large share of U.S. shell egg exports, though total U.S. shell egg exports are relatively small—approximately $104 million in 2020 and $171 million in 2021.[28] On average, since 2012, these States have provided over 41 percent of U.S. shell egg exports, accounting for 38 percent of exports in 2021 (figure 10). California and Ohio are the two largest State exporters with any confinement restrictions, together exporting over $24 million in 2020 and $53 million in shell eggs in 2021. Fresh shell egg exports are primarily destined for East Asian (Hong Kong, Japan, South Korea) and North American (Canada and Mexico) markets. Though many export destinations do not have policies impacting trade in animal products, several firms in international markets have committed to using only cage-free eggs. For example, in 2016, the Retail Council of Canada, which includes several major grocers, committed to purchasing only cage-free eggs by 2025, though prospects for meeting this deadline are uncertain (RCC, 2016 and 2021).

[26] Animal feeding operations (AFOs) and concentrated animal feeding operations (CAFOs) are defined by the U.S. Environmental Protection Agency (EPA). CAFOs are regulated by the EPA under the National Pollutant Discharge Elimination System permitting program to control point source pollution. While these regulations can constrain operation size and growth, they are unrelated to animal welfare concerns.

[27] Note this is likely an overestimate of the proportion of pork exports produced in a State with a gestation crate policy. State farm animal welfare policies do not necessarily cover processing facilities. Hence, noncompliant hogs and the resulting pork and pork products may pass through a State's borders without being destined for the in-State market. HS codes for pork and pork products: 0203, 020630, 020641, 020649, 021011, 021012, 021019, 160241, 160242, and 160249.

[28] HS code for fresh shell eggs: 040721.

Figure 10
Total U.S. fresh shell egg exports, by value, and fresh shell egg exports from States with confinement or cage restrictions, 2012–2021



Note: Banning States are California, Colorado, Massachusetts, Michigan, Nevada, Ohio, Oregon, Rhode Island, Utah, and Washington.

Sources: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census USATrade data, and State legislative repositories. Harmonized System (HS) code for fresh shell eggs: 040721.

Private Commitments to Farm Animal Welfare Standards

A widespread market trend coinciding with State policies is the voluntary pledging of major agricultural firms, retailers, and foodservice companies to only produce, sell, or use animal products that conform to a specified level of animal care. The most common pledges, as with State policies, focus on the confinement of egg-laying hens or breeding sows, with firms pledging to use only cage-free eggs or gestation crate-free pork products by a target date. These commitments are not limited to the United States; firms in multiple European countries, along with Canada, Mexico, Peru, Vietnam, and several other countries, also make them (RCC, 2016; CIWF, 2021). In the United States, these companies include major firms like Smithfield Foods; grocers like Kroger, Safeway, and Costco; and foodservice retailers like McDonald's and Wendy's. Estimates of the coverage of these pledges indicate that as much as 75 percent of U.S. eggs would need to be cage-free by 2025 to meet the firms' commitments (Lusk, 2019). The proliferation of these pledges indicates an increasing market pressure on industries to alter their production practices regardless of enacted State policies. Similarly, shifting consumer demands—apart from State-by-State policies—may reduce the overall impact of those policies. The decreasing demand for veal, for example, as well as the growing opportunities for alternative production outlets for dairy bull calves, limit the extent to which veal crate policy measures are binding. However, this is subject to these firms' fulfillment of their voluntary commitments and to a shrinking proportion of consumers who demand products produced in systems that do not employ these practices.

In contrast to State exports, States with confinement or cage restrictions in egg production effectively import no shell eggs at all, similar to the rest of the United States, so imports cannot be negatively affected by these policies. The major exception was during the 2015 highly pathogenic avian influenza (HPAI) outbreak, where imports spiked to meet production shortfalls. The bulk of these imports (over 83 percent in 2015 and 2016) originated in the European Union (EU). EU rules prohibited the use of battery cages in egg production in 1999, effective in 2012 (Directive 1999/74/EC), and set a minimum space requirement of 750 cm^2 (116 square inches) per hen. Therefore, the majority of 2015 HPAI-era imports were largely compliant with the only State retail sales policy in effect at the time, California's AB1437. The implementation of California's policy, the only retail sales restriction on eggs in force during the available data period, also did not increase shell egg imports from markets where cage-free eggs are more readily available, such as the EU. Egg product

imports, however, while small relative to total domestic share, are largely destined for these States, with over 50 percent of egg product imports going to a banning State since 2017.[29] These products primarily originate in the EU, Canada, and East or Southeast Asia. As with the United States, several Canadian retailers and major firms are calling for a shift toward cage-free production. While EU rules are already aligned with U.S. State policies that broadly prohibit confinement, European Green Deal Farm to Fork Strategy discussions include proposals to end caged production of all small animal species, including laying hens, by 2027.[30] If these proposals and industry pledges come to fruition, two primary sources of imported eggs and egg products for the United States will comply with State laying hen policies by default. For products coming from markets without policies or industry standards that restrict caged or confined production, it is unclear whether and to what extent imported egg products are covered by State legislation.

U.S. pork imports are substantial, reaching over $2 billion in 2021. Since 2008, an average of over 15 percent of pork imports were destined for California and Massachusetts, the two States that had passed retail sales restrictions on pork and pork products. U.S. pork imports primarily originate from the EU and Canada. Canada accounted for over 57 percent of U.S. pork imports in 2020 and 2021, by value, while the EU accounted for approximately 30 percent of imports in the same years. California's pork imports are similarly structured to the national portfolio in terms of shares originating in the EU and Canada, while nearly 100 percent of Massachusetts imports over the last 7 years originated in Canada. As with egg production, both the EU and Canada have policies or industry trends that address similar concerns underlying State gestation crate policies. The EU has required group housing in pork production since 2013, with minimum space requirements of 1.64 square meters (17.65 square feet) for gilts and 2.25 square meters (24.22 square feet) of space for sows (EU Council Directive 2008/120/EC). Canadian pork producers pledged to phase out gestation crates completely by 2024, though it appears the industry is not fully on track to meet this deadline. Instead, the NFACC's pig Code Technical Panel estimates that 60 percent of Canadian pork production will be gestation crate-free by 2024 (CTP, 2020). This pledge included a commitment to make NFACC group housing recommendations the industry standard, which place minimum per pig space allowances between 15 and 26 square feet, depending on floor type and whether groups are gilts, sows, or mixed (NFACC, 2014). As with eggs, if Canadian and EU pork production conforms to proposed rules and pledges, the top two sources for U.S. imported pork will be positioned to supply policy-compliant pork to States with retail sales restrictions on pork produced in gestation crate systems.[31]

In addition to the ability to import products from foreign markets into States with retail sales restrictions, State policies could also impact how the United States fits within the landscape of global trade and animal welfare-oriented policy. In particular, European trade policy began to address animal welfare by including provisions for it in several bilateral trade agreements. The 2002 Chile EU bilateral free trade agreement (FTA) included animal welfare considerations, the first FTA of its kind to do so. Since then, the EU has tried to include provisions for cooperation on animal welfare standards in all subsequent bilateral or multilateral trade agreements (EU COM, 2018). These policies do not yet substantially impact U.S. trade opportunities. However, the policies represent a trend in global markets of greater attention to livestock production practices, as well as to transportation and slaughter practices, that may increase the salience of similarly oriented State policies. Research indicates the potential for altering standards of production even in markets that do not have policies or widespread industry commitments to animal welfare. For example, Sinclair et al. (2019) found that several Asian markets could demand perceived animal welfare improvements if they coincide with perceived improvements in other traits of interest such as food safety, product quality, and productivity. Proposed changes to European labeling and

[29] HS code for egg product: 0408.

[30] Communication from the Commission on the European Citizens' Initiative (ECI) *End the Cage Age* (2021/C 274/01).

[31] Note that the proposed pledges and policies of both the European Union and Canada leave room for producers to not automatically be compliant with State policies, particularly with space requirements, as the California Proposition 12 law stipulates a minimum of 24 square feet per pig.

production standards in the EU Farm to Fork Strategy discussions—as well as the growing international proliferation of firm and retailer commitments to farm animal production standards—further demonstrate the shifting landscape of global attitudes toward animal welfare and livestock production practices.

Conclusion

This report provides a comprehensive summary of State farm animal welfare legislation and regulations addressing production practices prior to slaughter and their coverage of U.S. livestock industries. The coverage of similar State policies that prohibit the confinement of breeding sows, veal calves, and laying hens are mapped across the country. The current state of policy in cattle industries is also discussed. In addition to current policies, the legal challenges and legislative responses are detailed within the State and Federal regulatory environment.

Farm animal welfare policies covering production practices prior to slaughter are in place in 14 States, with policies largely focused on confinement practices. Despite increasing coverage, these States account for a relatively small share of total U.S. pork, egg, and veal production. However, since the first policy was passed in 2002, State policy strategies have evolved to address the low impacts of in-State coverage on national industries and to protect in-State producers by including all in-State retail. In-State sales bans have the potential to reach further into U.S. livestock industries, as evidenced by past impacts of similar sales bans, recent legal challenges, and counter-legislation efforts. While these State policies will not enforce direct rules on a large proportion of their respective industries, the market repercussions of the sales restrictions may influence industry standards as the laws come into effect.

Increasingly widespread sales bans may create short-run price increases, as California's laws may have demonstrated. The increasing implementation of sales restrictions in other States widens the geographic distribution of those possible price effects. Shifts in international animal welfare policies and production increase the potential availability of compliant products for States with retail sales restrictions, though dependence on imports for eggs remains low. Continuing policy efforts in other States, along with the historical success of ballot initiatives, indicate prospects are strong for additional State regulations similar in nature to those already in place. In addition, recently proposed policies are beginning to target the dairy and beef industries, which thus far received less attention than the pork and poultry industries.

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