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Cost of Animal Welfare Regulation, Ballot Initiatives, and the Vote-Buy Gap

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Over the past two decades, 19 agricultural policies involving regulations of farm animal welfare (FAW) have been enacted through legislative bills or majority-vote ballot initiatives in 11 states (see Figure 1). Among the laws enacted, 10 of them involve confinement standards for egg-laying hens or the sale of eggs from hens raised in so-called battery cages, 11 involve confinement standards for gestating sows, and 11 involve confinement of veal calves (Hopkins et al. 2022). Ensuring an animal-friendly environment in animal husbandry practices is part of a larger global trend following the European Union laws that banned battery cages for egg-laying hens in 2012. When it comes to FAW regulation in general and egg-laying hens in particular, California is the indisputable leader. In January 2015, California's Prevention of Farm Animal Cruelty Act and Assembly Bill 1437, together known as "Proposition 2," went into effect. Proposition 2 banned the use of battery cages for all the table eggs produced and sold in California. In November 2018, Californian voters overwhelmingly passed (with 61%) the referendum on "Proposition 12" which completely bans selling eggs produced in any type of cages by the end of 2021.

The new law established standards for the confinement of certain types of farm animals and banned the sale of eggs, veal, and pork products that do not comply with the new confinement standards. Meat producers, farmers, and agricultural associations have repeatedly challenged the constitutionality of Proposition 12, arguing that it violates the Constitution's commerce clause by placing an undue burden on interstate commerce. In March 2022, the U.S. Supreme Court officially put California's Proposition 12 on its docket. A growing list of parties from both sides of the issue are flooding the high court with amicus briefs. Most significantly, the Solicitor General of the United States has come down on the side of the Interstate Commerce Clause and the pork producers. The Supreme Court has until the end of its term to render a decision, hence the final word on this matter might not come until June 2023. Although its final provisions went into effect in January 2022, the fate of Proposition 12 remains uncertain.

According to the Association of California Egg Farmers (CEF),[1] 40 million Californians consume 12 billion eggs annually, or about 300 eggs per person. Based on Nielsen retail scanner data,[2] however, the consumption of cage-free eggs in California accounted for only 14% of the total egg consumption. The comparison of voting to ban the selling of conventional (cage) eggs and purchasing of cage-free eggs illustrates the seemingly incongruous facet of individuals' behavior, known as the vote-buy gap

1 http://californiaeggfarmers.org/
2 https://www.chicagobooth.edu/research/kilts/datasets/nielsen

of about 47 percentage points. The term refers to a situation where citizens vote to ban products that are purchased by most consumers. In the case of new laws concerning animal production practices, this can lead to a type of unfunded mandate on producers to implement the newly required changes in husbandry practices without being provided with any monetary assistance to do so. The discrepancy between consumption and voting outcomes has been explored by scholars at the intersection of economics and political science for quite some time. The rationalization that seems to have gained the most acceptance in the literature is some combination of the public good nature of voting coupled with the expressive benefits of voting. In this framework, a consumer/voter's utility contains the consumption of both private and public goods[3] and could contain an additional expressive effect derived from the voting itself. In a nutshell, these models would predict that for sufficiently large constituencies, when voter's expressive utility (benefit) effect from voting for a policy change (or the preference for public good resulting from that policy) is positive but the effect on utility from the change is negative, it is optimal to vote for the policy change (see Brennan and Lomasky, 1993). In other words, sometimes it makes perfect sense to vote for a policy proposal that you favor even if it can hurt your pocketbook because the chance that you will cast the decisive vote is extremely small.

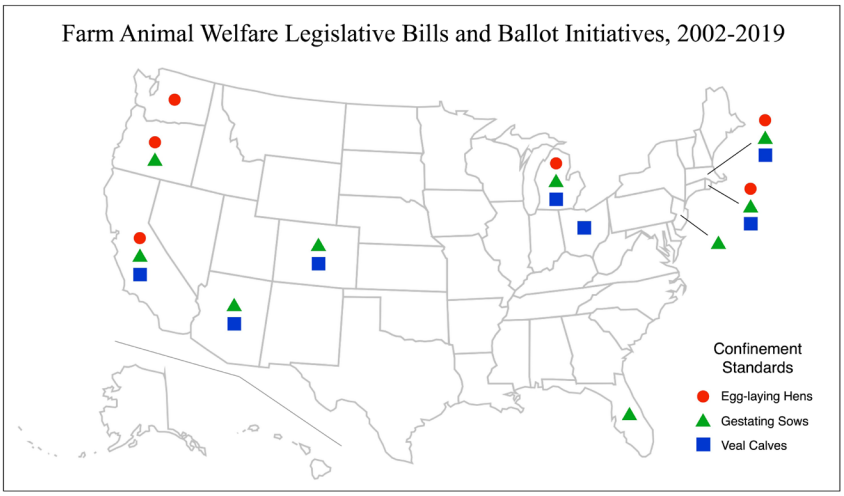

Figure 1: Map of Animal Welfare Legislative Bills and Ballot Initiatives

Since Proposition 12 is one of the strongest animal welfare laws in the U.S., it became the center of attention and concern from interest groups around the country. To address a shortcoming of the existing literature to deal with market equilibrium effects of animal welfare regulations, Oh and Vukina (2021) showed that any public policy intervention targeting consumer products must take firms' optimal price responses and their effect on consumer welfare into account. Using the combination of the 2015-2017 Nielsen consumer panel and retail scanner data, they investigated consumer preferences for cage-free eggs with the objective to evaluate the ex-ante welfare effect of Proposition 12. To assess the effects of the laying-hen cage ban on the market, they estimated a structural model of the demand and supply of table eggs. They modeled egg supply as an oligopoly[4] pricing game where retailers compete in the regional markets for fresh egg products. On the demand side, they assumed that households make decisions on whether to buy a carton of eggs among the choices they face during a trip to a grocery store. Table eggs are differentiated by their characteristics such as size, grade, color, total count per carton, and whether the laying hens are raised in cage-free or cage environments. Retailers set prices for their table eggs by maximizing their total profits in each market.

In modeling egg demand, the authors found that consumers prefer cage-free eggs, but the magnitude

3 A private good is a product which is purchased, and consumed (or used), by an individual; the consumption of the product by one person prevents others from consuming it (e.g. food). Public goods are those for which it is not possible to exclude someone from using them, and supply of that good is not affected by people's consumption of it; public education, public infrastructure, national defense are common examples. In this case, the positive and collective benefit of improvements to animal welfare could be considered a public good.

4 In this example, an oligopoly is a market structure where food retailing is dominated by a small number of sellers.

of the effect is, on average, very small. Together with the supply side model for heterogeneous products, the combined model predicts the new market prices of all egg products under Proposition 12 where conventional eggs are banned. The results showed that the new marginal production costs of what used to be conventional eggs would increase, on average, by 56%. The prices of originally conventional eggs would increase by 65% and the prices of cage- free eggs would decrease by 3.4%. The total net benefits to consumers and producers would decrease. The state-level expected annual welfare loss to households would amount to $72 million, and the industry welfare loss at the retail level would amount to 17.6% of their original profits before deducting fixed costs.

Whereas the egg industry's opposition to Proposition 12 is easily explainable by the loss in profits, the consumers' support for it, as revealed at the ballot box, is harder to fathom. Indeed, observed gaps between purchasing and voting behavior are often taken as prima facie evidence of unwarranted actions that, by mandating restrictive production practices, lead to welfare losses for both farmers and consumers. Insofar as the discrepancies between voting and purchasing behavior are caused by the lack of information about what exactly is bought or voted for, knowledge gaps about the relevant tradeoffs, or other behavioral mores, concerns about animal welfare initiatives would be justified. However, as it turns out, orthodox economics can provide a plain explanation for observed vote-buy gaps by pointing out that, in addition to consumptive benefits to all people who them, eggs can also provide non-consumptive benefits to some people when they are produced in a humane way. The purchasing choices of an individual consumer account mostly for the private (consumptive) good aspect of the product, and the public good (non-consumptive) attributes of the purchased good are likely ignored. Voting for a ballot initiative, on the other hand, reflects the public and private good aspects in question.

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To formalize this reasoning, in recently completed research, Moschini, Oh, and Vukina (2022) proposed a model that juxtaposes the private good aspect of buying decisions with the public good aspect of voting. The model, based on stylized facts reflective of an animal welfare referendum, predicts that the vote-buy gap would increase with the size of the market and the price premium for a regulated product over an unregulated product, and would decrease with a population's aversion to cruelty to animals, consumers' heterogeneity with respect to their aversion to caged hens, and the fraction of consumers who do not care about animal welfare at all. These implications are then tested with a unique precinct-level dataset that combines voting outcomes on the proposal to ban the sales of conventional eggs and the actual purchases of egg products.

Whereas some of the explanatory variables in the model were directly observable, such as price differentials between cage-free eggs and conventional eggs, other variables had to be approximated based on some plausible assumptions. The population's aversion (disutility) to caged hens was approximated using the percentage of registered voters who turn out to vote on the referendum. The

reasoning was based on the fact that Proposition 12 was on the ballot in the 2018 midterm elections which marked the highest voter turnout seen in midterm elections since 1914, at 49.4%. Democrats made a net gain of 41 seats in the United States House of Representatives with several notable firsts for women, racial minorities, and LGBTQ candidates. As support for animal welfare is one of the progressive causes disproportionately supported by Democrats (see Smithson et al. 2014), the percentage of voters that came out to vote at that time should be correlated with people's aversion towards inhumane animal husbandry practices. Another variable driving the model's predictions is the fraction of consumers who are less animated by animal welfare concerns. It was approximated using the percentage of registered voters affiliated with parties traditionally perceived as positioned on the right of the political spectrum (Republican, American Independent, Libertarian, and Reform parties). The justification for this proxy is related to the link between the progressively leaning voters and the pronounced sensitivity to what is perceived as cruel animal-rearing practices. Specifically, the presumption was that the higher the proportion of registered voters belonging to one of the conservative political parties, the higher the fraction of people in the precinct who do not care about animal welfare. This is consistent with the literature that finds partisan identification a strong predictor of voting on social issues; for example Bovay and Sumner (2019) found that support for the restricted animal housing practices positively correlates with support for the Democratic candidate for president.

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The results strongly supported the predictions of the theoretical model and provides a unique explanation of the heretofore poorly understood social phenomenon. The findings suggest that the magnitude of the vote-buy gap positively depends on the number of registered voters in the precinct and the price differential between cage-free and conventional eggs. This vote-buy gap though is negatively correlated with the voter turnout, the fraction of consumers affiliated with right-of-center political parties, and the heterogeneity of people's preferences regarding animal welfare. Unlike other agricultural economics literature which found no support for explanations rooted in more traditional economics and public choice theory (e.g., Paul et al., 2019), this paper hinges squarely on the core economics of the problem: consumption decisions are influenced mostly by the private good attributes of the choice, whereas voting decisions account for the public good aspects of the choice.

The extent to which one can invoke the public-good explanation for the observed vote-buy gap has remained an open question; indeed, behavioral factors[5] are often offered as alternative explanations. Insofar as the rationalization of the vote-buy gap phenomenon is generally applicable, concerns about mandating restrictive production practices via the ballot box may need to be carefully qualified. Whereas it remains true that misguided initiatives may risk imposing unwarranted inefficiencies in

5 For example, in this context behavioral explanations for an individual's vote-buy gap may be due to social, cultural, emotional, or psychological motivations.

the food supply chain, other controversial proposals may well be consistent with maximizing social welfare. Just because historically observed buyer behavior has not favored certain products with friendly animal-welfare attributes, that is not by itself a sufficient reason to dismiss the desirability of animal welfare regulatory proposals.

The consequences of California's Proposition 12 and the pending Supreme Court decision may have significant implications for the North Carolina table eggs industry. According to NC Egg Association, in terms of commodity eggs (that is, not counting backyard flocks), North Carolina has approximately 9 million laying hens producing between 7.5 and 8 million eggs each day, ranking it 8th among U.S. egg-producing states. Currently in North Carolina, approximately 1.9 million hens (approximately 16% of the NC laying hens) are housed in a cage-free environment.

The conversion of conventional cage production to cage-free production is underway across the entire country. A growing number of states, including Massachusetts, Michigan, Ohio and Washington have already passed laws that will eventually limit the use of battery cages (Mullally and Lusk, 2018). In addition, over 200 hundred companies, among them Walmart and McDonald's, have pledged to eliminate the use of battery cages from their egg U.S. supply chains by 2025.[6] In case of a ruling against the State of California by the Supreme Court, the process of conversion to cage-free eggs could temporarily stall. However, should the ruling be in favor of Proposition 12, the conversion process will gain speed, putting pressure on North Carolina producers to convert their operations even sooner. For those who have not already done so, the conversion to cage-free eggs could become no longer just a competitive advantage but a requirement for survival.

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