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Crying Over Spilt Milk: Controlling H5N1 in California Dairies

A Policy Practicum Report Written Through *Building a Sustainable, Transparent, and Humane Food System*

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Spring 2025

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Written Through:
Building A Sustainable, Transparent, and Humane Food System Policy Practicum
Environmental and Natural Resources Law & Policy Program at Stanford Law School
Climate and Energy Policy Program at Stanford Woods Institute for the Environment
Spring, 2025

Executive Summary

In response to the rise in zoonotic disease threats, animal welfare concerns, and California Central Valley community member alarm around Highly Pathogenic Avian Influenza Type A (H5N1), this report explains the scientific and regulatory landscape for zoonotic disease management and how these systems were - and were not - effective with regards to managing H5N1 in California dairies.

The report organizes several zoonotic disease interventions via the Hierarchy of Controls, a framework often used to manage industrial risk. Discussing each level of the hierarchy, the student team identifies several potential zoonotic disease controls. The report then lays out the federal, state, and local government agencies involved in managing an animal disease outbreak. Stemming from this section, the report highlights three complex yet persistent regulatory challenges that the student team argues must be addressed before any long-term high-impact improvements will materialize regarding zoonotic disease risk reduction.

Key among these challenges is that while many government agencies have authority to mandate risk-reduction protocols, this authority is largely discretionary, and thus often under-used. And, when there are mandates, there is little enforcement. It appears that the reasons behind these challenges largely stem from unclear agency priorities and responsibilities, underfunding, and subsequently, under staffing. Thus, the report concludes with three more pragmatic, yet potentially high-impact recommendations that are not dependent on under-staffed-and under-funded governments.

The students' recommendations are outlined below. They are H5N1 specific, but largely adaptable to other animal-outbreaks. Discussed in different sections throughout the report, the student team organizes them here by potential implementor:

<u>For Policy Makers or Community-Organizers: Pragmatic Recommendations</u>

- Provide training and information on reporting violations through anonymous tip lines
- Thoroughly translate all public health information, education, and guidance
- Require (or publicly pressure) dairy farms to submit biosecurity plans to California Department of Public Health (CDPH) or another relevant agency.

<u>For Policy Makers: Idealistic Policy Recommendations</u>

- Comprehensive adoption of the One Health framework
    - Require more transparent and comprehensive PPE dissemination data
    - Require more transparent and comprehensive H5N1 testing and data sharing
- Prioritize agency goals and remove conflicting mandates
- Identify and mandate low-lift, high-impact outbreak mitigation approaches
- Increase biosecurity inspection and enforcement staff

<u>For Policy Makers or Farm Owners: On-Farm Biosecurity Recommendations</u>

- Regarding workers and PPE:

    - Include a safe place for workers to apply and remove PPE
    - Identify most-necessary PPE for high transmission-risk activities
    - Provide cooling infrastructure or rooms
    - Provide multilingual employee education about a facility's public health protocols
- Regarding animal waste:
    - Identify and incentivize low cost H5N1 neutralization in milk, such as acidification
    - Clarify and mandate specific low-cost livestock carcass management protocols
- Regarding farm operations:
    - Identify and publicize high and low risk areas on farms
    - Provide boot-washing stations at the entrances of designated high-risk areas
    - Power wash and disinfect vehicle tires and wheel-wells at farm entrances
    - Provide paid sick leave when farm workers demonstrate flu-like symptoms

Part I: Background and Approach

This report emerged from conversations with partner organizations concerned with both the consequences of industrial agriculture and conditions in the Central Valley.[1] Partners were interested in better understanding how zoonotic disease risk is managed in general, and how the H5N1 strain of Highly Pathogenic Avian Influenza Type A (H5N1) has been managed in particular. With this understanding, they hoped the student team could propose a series of policy recommendations ranging from the systemic and aspirational to the pragmatic and incremental.

To achieve this goal, the student team conducted in-depth scientific and legal research and interviewed seven stakeholders, culminating in this report's four overarching sections.[2] First, the report provides a scientific overview of H5N1 in California dairies and explains key transmission vectors. Second, it explains, then applies, the Hierarchy of Controls (the Hierarchy) to discuss several pathogen intervention recommendations. Third, it dives into the many governing agencies and entities responsible for elements of animal-disease management, highlighting several fundamental regulatory challenges to more effective zoonotic disease risk management. Lastly, it identifies three pragmatic, yet high-impact interventions for policy makers or advocacy organizations.

1. *California Dairies and H5N1*

California has over 1.7 million dairy cows and, as the top milk production state, produces twenty percent of the Nation's milk.[3] Most of these cows are raised in close-quarters on large dairies in the state's Central Valley,[4] milked and managed by thousands of farmworkers.[5] Due to the region's large number and density of dairies, it is particularly susceptible to disease spread

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[1] Our primary community partner organizations for this project were Farm Forward and Leadership Counsel for Justice and Accountability.

[2] The student team interviewed: Dr. Annette Jones, State Veterinarian; Dr. Stephen Felt, Stanford Professor and veterinarian; Dr.Abraar Karan, Infections Disease Doctor and Stanford Professor; Dr. Crystal Heath, Veterinarian and Our Honor Co-Founder; Dr. Betsy Noth, Senior Industrial Hygienist at Cal/OSHA and UC Berkeley Professor; John Taylor, Bivalve Dairy Farm Owner; and Dr. Jennifer Spencer, AgriLife Extension Dairy Specialist and Assistant Professor at Texas A&M.

[3] "Milk Production." *National Agricultural Statistics Service*, May 2025, downloads.usda.library.cornell.edu/usda-esmis/files/h989r321c/fq979s25z/n009xz85n/mkpr0525.pdf.

[4] "Quick Stats." *USDA: National Agricultural Statistics Service*, https://quickstats.nass.usda.gov/; Smith, Aaron. "Where are California's Dairy Cows?," *The Dairy News,* 20 Feb. 2024 https://dairynews.today/global/news/where-are-california-s-dairy-cows.html (90% of California's cows are in the San Joaquin Valley on farms well over 500 head); "New USDA Data Shows California Mega-Dairy Herds Grew an Average of 72% In 20 Years," *Food & Water Watch,* 21, Feb. 2024, https://www.foodandwaterwatch.org/2024/02/21/new-usda-data-shows-california-mega-dairy-herds-grew-an-average-of-72-in-20-years/ (indeed, California has the most dairy cows on factory farms in the Nation, over double what the next highest state, Wisconsin, has); "California Dairy & Livestock Database (CADD)," *California Air Resource Board,* 2022, https://ww2.arb.ca.gov/resources/documents/california-dairy-livestock-database-cadd.

[5] "Dairy Cattle and Milk Production," *California Employment Development Department,* 2023, https://labormarketinfo.edd.ca.gov.

and mutation from cow to human.

Thus, in March 2024, when the first cases of H5N1 were detected in dairy cattle in Texas and Kansas, California dairies were distinctly vulnerable.[6] Over the next fourteen months, at least 766 dairies—more than 70 percent of California's herds—were infected.[7] By October 2024, the first human case of H5N1 in a California farmworker was confirmed.[8] Generally, human infections are mild and only occur when someone is in close, direct contact with an infected animal.[9] However, the virus's continued spread in cattle dramatically increases its evolutionary opportunity, increasing the likelihood of a mutation enabling human-to-human transmission.[10]

2. *How H5N1 Spreads in Dairies*

Since the initial March 2024 outbreak, H5N1 viral RNA has been identified in dairy cow nasal swabs, urine, and milk.[11] Contaminated milking apparatuses appear to be the primary route of transmission, with milk showing higher rates of viral shedding than nasal swabs or respiratory tissues.[12] Indeed, dairy cow mammary glands are a preferred H5N1 binding site.[13]

Infected cows are typically ill and symptomatic for 14 days, and with care, take 24 days to fully recover.[14] Two to 14 days post inoculation (DPI), cows typically develop necrotizing

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[6] Ly, Hinh. "Highly pathogenic avian influenza H5N1 virus infections of dairy cattle and livestock handlers in the United States of America." *Virulence,* vol. 15, no. 1, 17 April 2024, doi: 10.1080/21505594.2024.2343931.

[7] "Highly Pathogenic Avian Influenza (HPAI) H5N1 Virus in Livestock." *CDFA: AHFSS*, 21 May 2025, www.cdfa.ca.gov/AHFSS/Animal_Health/HPAI.html; early estimates indicate that at its Central Valley peak, on average 15-20% of a cows in infected herds tested positive for H5N1, *see* Rust, Susanne. "Bird Flu Deaths Increasing among California Dairy Cows." *Los Angeles Times*, 4 Oct. 2024.

[8] "CDC Confirms New Human Cases of H5 Bird Flu in California." *CDC Newsroom*, 3 Oct. 2024, www.cdc.gov/media/releases/2024/s1003-birdflu-case-california.html.

[9] "Signs and Symptoms of Bird Flu in People." *CDC*, 20 Dec. 2024, https://www.cdc.gov/bird-flu/signs-symptoms/index.html.

[10] *See, e.g.*, Mike Davis, *The Monster at Our Door: The Global Threat of Avian Flu*, The New Press, 2005; Marie, Veronna, and Michelle L Gordon. "The (Re-)Emergence and Spread of Viral Zoonotic Disease: A Perfect Storm of Human Ingenuity and Stupidity." *Viruses* vol. 15, no. 8 ,1638, 27 Jul. 2023, doi:10.3390/v15081638.

[11] Campbell, A. J., et al. "MGem: Transmission and Exposure Risks of Dairy Cow H5N1 Influenza Virus." *American Society of Microbiology Journals*, vol. 16, no. 3, Feb. 2025, https://doi.org/10.1128/mbio.02944-24.

[12] Anderer, Samantha. "Bird Flu Is Primarily Transmitted among Dairy Cattle through Milking, Study Suggests." Journal of American Medical Association, vol. 332, no. 17, Oct. 2024, https://doi.org/10.1001/jama.2024.21042.; Le Sage V, et al. "Persistence of Influenza H5N1 and H1N1 Viruses in Unpasteurized Milk on Milking Unit Surfaces." Emerging Infectious Disease, vol. 30, no. 8, Aug. 2024, doi: 10.3201/eid3008.240775; Nico Joel Halwe, et al. "H5N1 Clade 2.3.4.4b Dynamics in Experimentally Infected Calves and Cows." *Nature*, vol. 637, Sept. 2024, https://doi.org/10.1038/s41586-024-08063-y; Caserta, L.C., et al. "Spillover of highly pathogenic avian influenza H5N1 virus to dairy cattle." *Nature*, vol. 634, 25 July 2024, https://doi.org/10.1038/s41586-024-07849-4; "Highly Pathogenic Avian Influenza H5N1 Genotype B3.13 in Dairy Cattle: National Epidemiologic Brief." *USDA: APHIS,* 8 June 2024, https://www.aphis.usda.gov/Sites/Default/Files/Hpai-Dairy-National-Epi-Brief.pdf.

[13] Halwe, Nico Joel, et al. "H5N1 Clade 2.3.4.4b Dynamics in Experimentally Infected Calves and Cows." *Nature*, vol. 637, Sept. 2024, https://doi.org/10.1038/s41586-024-08063-y.

[14] Baker, Amy L., et al. "Dairy Cows Inoculated with Highly Pathogenic Avian Influenza Virus H5N1." *Nature*, vol. 637, Oct. 2024, pp. 1–3, https://doi.org/10.1038/s41586-024-08166-6.

mastitis.[15] Cows will also become more lethargic; eat less; have nasal discharge; produce less milk; and have thicker, flakier, more clotted, and yellow milk.[16]

Milk production begins to decline during the first four DPI. It remains low 10-12 DPI, and continues to be at 71-77 percent of pre-inoculation production a month after inoculation.[17] Ultimately, an infected cow's milk production can fall by upwards of 70 percent after two weeks of H5N1 detection, and takes several months to fully recover.[18] Experts estimate that across California, milk production declined by as much as 10.3 percent during the outbreak's peak.[19] In Tulare County, some farms reported a 25 percent decrease in milk production, as well as a 20 percent death rate.[20]

The H5N1 virus in cattle binds to two types of receptors, both of which are found on the surface of a human's eye, in the thin membrane called the conjunctiva.[21] Thus, if a worker's eye is exposed to infected milk droplets, infection risk is high. The conjunctiva-based receptors are also why conjunctivitis is commonly associated with H5N1 in humans.[22]

3. *The Hierarchy of Controls*

To assess pathogen management approaches, this report employs the Hierarchy of Controls (the Hierarchy). The Hierarchy is a widely-used risk-management framework in industrial hygiene.[23] The controls are organized hierarchically according to how effective they

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[15] Halwe, Nico Joel, et al. "H5N1 Clade 2.3.4.4b Dynamics in Experimentally Infected Calves and Cows." *Nature*, vol. 637, Sept. 2024 (severely infected and inflamed mammary gland often due to a blocked milk duct).
[16] *Id.*; Baker, Amy L., et al. "Dairy Cows Inoculated with Highly Pathogenic Avian Influenza Virus H5N1." *Nature*, vol. 637, Oct. 2024.
[17] Halwe, Nico Joel, et al. "H5N1 Clade 2.3.4.4b Dynamics in Experimentally Infected Calves and Cows." *Nature*, vol. 637, Sept. 2024.
[18] Peña-Mosca, Felipe, et al. "The Impact of Highly Pathogenic Avian Influenza H5N1 Virus Infection on Dairy Cows." *Nature Coms*, vol. 16, no. 1, July 2025, https://doi.org/10.1038/s41467-025-61553-z (this is in notable contrast to earlier estimates suggesting production declined around 20-30%, *see* DeBiase, Ria, and Daniel Sumner. "Bird Flu's Varied Impacts on Egg and Milk Markets." *UC Davis College of Agricultural and Environmental Sciences*, 12 Mar. 2025, caes.ucdavis.edu/news/bird-flus-varied-impacts-egg-and-milk-markets).
[19] DeBiase, Ria, and Daniel Sumner. "Bird Flu's Varied Impacts on Egg and Milk Markets." *UC Davis College of Agricultural and Environmental Sciences*, 12 Mar. 2025.
[20] Wilbur, Blake. "From the Fields: Blake Wilbur, Tulare County Dairy and Tree Nut Farmer." *AgAlert*, 16 July 2025, www.agalert.com/california-ag-news/archives/july-16-2025/from-the-fields-blake-wilbur-tulare-county-dairy-and-tree-nut-farmer/; Rust, Susanne. "Bird Flu Deaths Increasing among California Dairy Cows." *Los Angeles Times*, 4 Oct. 2024, www.latimes.com/environment/story/2024-10-04/bird-flu-deaths-increasing-among-california-dairy-cows.
[21] Belser, Jessica, et al., "Ocular infectivity and replication of a clade 2.3.4.4b A(H5N1) influenza virus associated with human conjunctivitis in a dairy farm worker in the USA: an in-vitro and ferret study," *The Lancet Microbe,* vol. 6, no. 7, 17 July 2025, https://doi.org/10.1016/j.lanmic.2024.101070.
[22] *Id.*
[23] "About Hierarchy of Controls." *CDC: National Institute for Occupational Safety and Health*, 10 Apr. 2024, https://www.cdc.gov/niosh/hierarchy-of-controls/about/index.html [herinafter: "About Hierarchy," CDC (2024).]. While the Hierarchy has typically been applied toward managing industrial risk, we argue that it offers a useful framework for (1) understanding the nature and challenge of zoonotic disease, and (2) organizing the range of possible responses to it. For instance, while much public discussion and government activity in response to H5N1 has focused on the distribution and use of PPE, the Hierarchy suggests that such a response is unlikely to succeed,

are at minimizing or eliminating hazard exposure.[24] The most favored controls are those that eliminate exposure with minimal dependence on human activity. From most to least favored, the controls are:

- elimination (physical removal of the hazard);
- substitution (replacement of the target hazardous material, process, or equipment with a safer alternative);
- engineering controls (physical modifications to work environments or processes to reduce hazard exposure);
- administrative controls (changes to workplace procedures, policies, or practices to reduce hazard exposure); and
- using personal protective equipment (PPE) (such as masks, respirators, eyewear, boots, and gowns).[25]

This report does not seek to propose a single "solution" to the H5N1 outbreak, but provides a range of interventions that vary in efficacy and feasibility. To provide stakeholders with a menu of possible mitigation measures, this report now discusses H5N1 examples within each hierarchy level.

Part II: Applying the Hierarchy to H5N1

The following sections assess H5N1 management approaches using the Hierarchy. There are, of course, countless ways of addressing zoonotic disease risk. Thus, this section aims to highlight under-used suggestions commonly surfaced in their research and interviews. The controls are organized from most difficult to implement, but likely most effective; to most feasible, but likely least effective.

1. Elimination

Eliminating a hazard is the most effective way of controlling it. Here, if the "hazard" is H5N1, elimination requires stopping transmission. However, if the "hazard" is any zoonotic disease, elimination would involve addressing the food system structures that have allowed zoonosis risk to grow.[26] From a regulatory perspective, elimination of either sort requires deeper

given a) its failure to eliminate the hazard at its source (namely, the frequent, close contact between vulnerable industrially-concentrated animals and humans) and its reliance on humans wearing uncomfortable protective gear.

[24] *Id.*

[25] *Id.* ("Substitution" typically follows Elimination in the hierarchy. We exclude it from this analysis given the impracticability of "substituting" a viral hazard like H5N1).

[26] Linder, Ann, et al., *Animal Markets and Zoonotic Disease Risk a Global Synthesis of a 15 Country Study*. Harvard Law School and New York University, 2024, pp. 98–106, animal.law.harvard.edu/wp-content/uploads/Animal-Markets-and-Zoonotic-Disease-Risk-high-resolution.pdf. (such as addressing the increased demand for animal protein, rise in concentrated livestock production, and high-frequency unprotected contact between animals and farm workers).

coordination between relevant government agencies. This idea is not new.

The congressionally mandated National One Health Framework (NOHF) is the current avenue for increased inter-agency coordination.[27] The NOHF, written by the Centers for Disease Control and Prevention (CDC), in coordination with several other federal agencies, is effective from January 2025 through 2029.[28] The NOHF has many goals including reducing cross-species spillover, supporting pathogen-detection technologies, and improving data sharing.[29] It recognizes the need for communication across 23 agencies across eight federal departments.[30] And, it calls for "partnership at all levels," including Tribal governments, non-governmental organizations, universities, and the private sector.[31] However, how the NOHF is enacted on the ground, is left unspecified.

The NOHF was released during the final weeks of the Biden presidency.[32] While the Trump administration has not formally repudiated the NOHF, the administration's current actions have curbed implementation success due to funding cuts and executive orders dictating other agency priorities.[33] It's too soon to tell whether the NOHF might eventually improve agency coordination, but so far, the student team's interviews suggest that it has not.

For instance, the California State Veterinarian, Annette Jones, admitted that, "we probably haven't had a real intentional implementation of that framework. We've looked at it, but we haven't made a lot of progress —mostly due to resource constraints."[34] However, Jones did claim that "California has long lived 'One Health'...for decades," meaning that the state has aimed for collaborative, interagency responses to zoonotic disease long before any federal directive.[35]

Texas A&M's dairy specialist Dr. Jennifer Spencer shared a similar view. "I don't really think it's changed the processes, and if it did, it's probably not very substantial," she said, "I

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[27] H.R. 2617 Consolidated Appropriations Act 2023, Chapter 4 § 2235, 117th Cong. (mandating CDC develop the NOHF and incorporating language from the proposed Advancing Emergency Preparedness Through One Health Act of 2021, S. 861, 117th Cong.). The framework emerged from calls by academics and advocates that the US recognize the interconnectedness of human and animal health).

[28] "National One Health Framework to Address Zoonotic Diseases and Advance Public Health Preparedness in the United States." *CDC,* 10 January 2025, https://www.cdc.gov/one-health/media/pdfs/2025/01/354391-A-NOHF-ZOONOSES-508_FINAL.pdf.

[29] *Id.* at 9-12.

[30] *Id.* at 3, 15 (including Health and Human Services (HHS), USDA, Department of the Interior (DOI), Department of Commerce, Department of Defense, Department of Energy, Department of Homeland Security, and the Department of State).

[31] *Id.* at 7 (NOHF's guiding document institutes a "federal level coordinating structure with shared leadership between the CDC, DOI, and USDA, representing an equal balance across public health, animal health, response agencies, and environmental sectors.").

[32] Linder, Ann, et al., *Animal Markets and Zoonotic Disease Risk a Global Synthesis of a 15 Country Study*. Harvard Law School and New York University, 2024, pp. 124.

[33] *See e.g.,* Shao, Elena, and Ashley Wu. "What We Know about the Trump Administration's Cuts to the Federal Work Force." *The New York Times*, 29 Mar. 2025, www.nytimes.com/interactive/2025/03/28/us/politics/trump-doge-federal-job-cuts.html; "2025 Executive Orders." *Federal Register*, 2025, www.federalregister.gov/presidential-documents/executive-orders/donald-trump/2025.

[34] Dr. Annette Jones, State Veterinarian, interview by Jordan Stock, Zoom, May 8, 2025.

[35] *Id.*

haven't really heard much of dairy producers talking about it."[36] Dr. Spencer did qualify her comments by noting that, unlike her, trade and advocacy organizations may have been exposed to the rollout. Unfortunately, the student team did not have time to follow up with such groups and Rubia Branco Lopes, a Tulare County Cooperative Extension Dairy Advisor, declined the team's interview request.

The lack of change however, does not imply a wholesale lack of NOHF interest. Veterinarian Stephen Felt advocates for the NOHF structure.[37] "There's always been a little bit of disconnect between the human and animal side," Felt said, "experts that come from the animal, the human, and the environmental side of things…really do need to work together, and I'm optimistic that they are, that they've created this new framework. It does remind people of the importance of having all those different experts."[38]

A comprehensive NOHF adoption–from federal to local government agencies–is arguably one of the most effective ways of preventing zoonosis.[39] In the H5N1 context two high-impact, non-structural recommendations include **a) weekly bulk milk testing with county-level reporting** [40] and **b) mandatory compliance with the USDA's National Milk Testing Strategy.**[41]

2. Engineering Controls

Engineering controls are physical changes to a workplace that can reduce or mitigate a worker's hazard exposure.[42] Engineering Controls can be less feasible than other interventions given associated costs, political pushback, lack of knowledge, and enforcement agency understaffing.[43] Here, the student team discusses several commonly-identified, under-used "engineering" level interventions. Each is discussed in the following subsections.

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[36] Dr. Jennifer Spencer, AgriLife Extension Dairy Specialist and Assistant Professor at Texas A&M's Department of Animal Science, interview by Jordan Stock, Zoom, May 6, 2025.
[37] Dr. Stephen Felt, Veterinarian and Stanford Professor of Comparative Medicine, interview by Jordan Stock, Zoom, May 5, 2025.
[38] *Id.*
[39] While NOHF compliments the systemic food system changes needed to eliminate zoonotic disease more generally, given its implementation complexities it is outside the H5N1 scope of this paper.
[40] CDC only maps state-level dairy-infection data, county-level would go far in helping local administrators better assess their risk and subsequently, what area-specific mandates to enact. There was a county-level map for poultry infections, though this was archived July 7, 2025. *See,"*Archived: USDA Reported H5N1 Bird Flu Detections in Poultry." *CDC*, 7 July 2025, archive.cdc.gov/#/details?url=www.cdc.gov/bird-flu/situation-summary/data-map-commercial.html; "H5 Bird Flu: Current Situation." *Avian Influenza (Bird Flu)*, CDC, 7 July 2025, www.cdc.gov/bird-flu/situation-summary/index.html.
[41] Dhillon, R.S., et al. "Steps to prevent and respond to an H5N1 epidemic in the USA." *Nature Medicine,* 24 Feb. 2025, https://doi.org/10.1038/s41591-025-03527-8.
[42] "About Hierarchy," CDC (2024).
[43] Notably, this section does not touch on *how* these controls would best be implemented (a policy change, farmer education, formal guidelines, enforcement actions, or otherwise) because this varies considerably for each recommendation and this paper's goal is to provide an overview of options.

1. Require biosecure spaces where workers can remove, store, and clean their protective equipment.
2. Provide cooling-off areas or technologies so PPE use is more consistent, particularly during high-risk activities such as milking infected cows.
3. Encourage affordable and simple H5N1 neutralization methods in infected milk, such as acidification.
4. Require updated, efficient, well explained, and affordable carcass disposal options.

i) Regarding Proper PPE Use Feasibility

A 2025 UC Merced study emphasized the lack of physical mechanisms to protect workers from H5N1 exposure.[44] Interviews with dairy workers from four Central Valley counties found that workers lacked designated secure spaces in which to take work breaks,[45] eat meals, store PPE, or access sanitation materials.[46] Meanwhile, CDFA's Dairy Farm Enhanced Biosecurity Plan Manual recommends that complete plans will ensure good quality, undamaged PPE that is either properly stored and laundered and once irreparably contaminated, properly disposed of.[47] Thus, **requiring biosecure spaces where workers can remove, store, and clean their protective equipment** is a key engineering control.

Secondly, given the hot summer temperatures in the Central Valley, heat can undermine worker compliance with PPE guidance.[48] After discussions with smaller dairy farmers and reading other accounts of minimal PPE use,[49] the student team suggests **dedicated cooling-off areas or technologies so PPE use is more consistent, particularly during high-risk activities such as milking infected cows**.

ii) Regarding Waste Management

[44] Cossyleon, Jennifer E., et al. *Producing Risks: Dairy Workers' Experiences and the Need for Worker-Centered Bird Flu Mitigation*. UC Merced Community and Labor Center, Feb. 2025, pp. 3-4, https://clc.ucmerced.edu/sites/g/files/ufvvjh626/f/page/documents/dairy_worker_brief_final_5.pdf [herinafter Cossyleon et al., "Producing Risks."].
[45] California OSH Standards Board. *OSHSB Board Meeting: Valley Voices Presentation*. 20 Mar. 2025, videobookcase.org/oshsb/2025-03-20/.
[46] Cossyleon et al., "Producing Risks." at 3.
[47] *California Dairy Farm Enhanced Biosecurity Plan Manual*. CDFA, Oct. 2023, pp. 16-17, www.cdfa.ca.gov/AHFSS/pdfs/ca_dairy_farm_enhanced_biosecurity_plan_manual.pdf.
[48] *See e.g.,* John Taylor, Founder and owner of Bivalve Dairy, interview by Jordan Stock, Zoom, May 1, 2025.
[49] Kenny, Emily, and Justin Velazquez. "How Dairy Farms Manage Heat for Their Workers and Cows." *Spectrum News*, 20 July 2024, spectrumlocalnews.com/nys/central-ny/news/2024/06/20/how-dairy-farms-manage-heat-for-their-workers-and-cows ; Owermohle, Sarah. "Farmers Resist Push for Workers to Wear Protective Gear against Bird Flu Virus." *STAT*, 10 May 2024, www.statnews.com/2024/05/10/bird-flu-virus-dairy-farmers-resist-ppe-recommendation/.

Managing H5N1-infected dairy waste is another area where engineering controls could play a major role.[50] Proper waste management refers to both deceased-animal and contaminated-milk management.[51] USDA's Animal and Plant Health Inspection Services (APHIS) recommends having an H5N1 neutralization plan before disposing of or feeding exposed milk to animals.[52] Pasteurization is the most commonly recommended neutralization method for H5N1 in California dairy milk.[53] However, pasteurization can be expensive, especially when balanced against lower-than average milk quantity and quality - and thus sales.[54] Fortunately, a recent UC Davis study suggests that acidification may be a more cost effective alternative for neutralizing H5N1 milk**,** though its use does not appear to be widespread.[55] Thus, the student team recommends **encouraging affordable and simple H5N1 neutralization methods in infected milk, such as acidification.**

While the average H5N1 dairy cow mortality rate is unknown, observers suggest it reached over 15% in infected Central Valley herds,[56] likely resulting in well over 50,000 deceased cows.[57] Yet government guidance or regulation regarding deceased cattle management is minimal.[58] At the federal level, EPA, CDC, and APHIS offer guidance,[59] but defer to state and

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[50] *See* APPENDIX 2 regarding Wastewater Testing and Surveillance as a means of tracking H5N1 spread and suggesting infected remains are not well contained.

[51] "Dairy Farm Biosecurity: Preventing the Spread of H5N1." *USDA: APHIS*, Dec. 2024, pp. 2, https://www.aphis.usda.gov/sites/default/files/dairy-cattle-biosecurity-measures.pdf (Dairy waste includes "raw (unpasteurized) waste milk, processed wastewater used to clean equipment or floors, and any waste material containing raw milk (such as manure, slurry, bedding, urine or feed)); Linder, Ann, et al., *Animal Markets and Zoonotic Disease Risk a Global Synthesis of a 15 Country Study*. Harvard Law School and New York University, 2024, pp. 98–106 (discussing approaches to zoonosis management generally).

[52] "Dairy Farm Biosecurity: Preventing the Spread of H5N1," *USDA: APHIS*, Dec. 2024, https://www.aphis.usda.gov/sites/default/files/dairy-cattle-biosecurity-measures.pdf.

[53] "Bird Flu." *CDPH*, 30 June 2025, www.cdph.ca.gov/Programs/CID/DCDC/pages/Bird-Flu.aspx.

[54] Peña-Mosca, Felipe, et al. "The Impact of Highly Pathogenic Avian Influenza H5N1 Virus Infection on Dairy Cows." *Nature Communications*, vol. 16, no. 1, July 2025; "Investigation of Avian Influenza a (H5N1) Virus in Dairy Cattle." *U.S. Food and Drug Administration*, 14 Mar. 2025, www.fda.gov/food/alerts-advisories-safety-information/investigation-avian-influenza-h5n1-virus-dairy-cattle (since H5N1 affects milk quality (often making it thicker, clumpier, and more yellow) even after pasteurization it does not pass commercial sale inspections).

[55] Quinton, Amy M. "Killing H5N1 in Waste Milk — an Alternative to Pasteurization." *UC Davis*, 13 Feb. 2025, www.ucdavis.edu/news/killing-h5n1-waste-milk-alternative-pasteurization; "Highly Pathogenic Avian Influenza (HPAI) H5N1 Virus in Livestock." *CDFA: AHFSS*, 21 May 2025, www.cdfa.ca.gov/AHFSS/Animal_Health/HPAI.html.

[56] Rust, Susanne. "Bird Flu Deaths Increasing among California Dairy Cows." *Los Angeles Times*, 4 Oct. 2024; "Highly Pathogenic Avian Influenza (HPAI) H5N1 Virus in Livestock." *CDFA: AHFSS*, 21 May 2025 (as of May 21, 2025, at least 766 California dairies have had H5N1 cases.).

[57] At a 15% mortality rate across 766 dairies with, at minimum, 500 head, roughly 57,450 dead cows have needed managing during the recent H5N1 outbreak. *See,* Smith, Aaron."Where Are California's Dairy Cows?" *The Dairy News,* 20 Feb. 2024 (explaining that over 90% of California dairy cows are on farms with over 500 head).

[58] See APPENDIX 3: Key Waste Management Guidance Documents; Douglas, Leah. "Cows Dead from Bird Flu Rot in California as Heat Bakes Dairy Farms." *Reuters*, 17 Oct. 2024 (generally, it appears that leaving animals for pickup by a rendering facility is the preferred method, but the dramatic increase of dead cattle and high temperatures caused a delay); "Home." *Agricultural Commissioner/Sealer*, 2022, agcomm.co.tulare.ca.us/ (lacking information regarding dead animal management).

[59] *See* APPENDIX 3: Waste Management Guidance Documents.

regional governments for regulation and enforcement.[60] Yet at the state level, the most information appears to come from the 2006 Emergency Animal Disposal Guidelines - which are just that - guidelines.[61]

The California Department of Food and Agriculture's (CDFA) Animal Health Branch (AHB) explains that AHB District offices have Regional Carcass Disposal Plans that, "addresses a number of emergency scenarios and animal mortality disposal options," and that "coordination with county officials in the affected areas is a key factor in determining available emergency carcass disposal options."[62] This guidance implies that approved animal disposal methods are largely left to regional decision makers. Unfortunately, aside from office and fax numbers, there is little online AHB regional information for California's top dairy counties.[63]

AHB's July 2021 Newsletter acknowledges that "livestock carcass disposal in California is complex and highly regulated by several state agencies. With very few options available to the producer…" and claims to have been preparing Regional Carcass Disposal Emergency Response Action Plans.[64] But, as of July 2025, such plans do not appear online.

Thus, at H5N1's presumed California dairy peak there were likely several thousand H5N1 infected dead cows in the Central Valley and several guidelines for farmers to consider, but very little clarity on mandated action.[65] According to CalEPA/CDFA 2006 guidelines, the best approach is to temporarily store infected carcasses until a rendering facility can collect them.[66] However, enforcing proper "storage" appears to have fallen short, increasing opportunities for disease spillover into waterways, wild animals, and humans as the carcasses sit for pickup.[67] Overall, the student team recommends **updated livestock carcass management**

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[60] *Id.; see also,* 9 C.F.R. 56.2 "Cooperation with States"; 9 C.F.R 56.10(a)(8) regarding required and APHIS approved disposal plans for *poultry* owners for indemnity eligibility; "Carcass Management during Avian Influenza Outbreaks." *US EPA*, 30 Oct. 2017, www.epa.gov/disaster-debris/carcass-management-during-avian-influenza-outbreaks.

[61] *See* APPENDIX 3: Key Waste Management Guidance Documents.

[62] "Foreign and Domestic Animal Diseases." *CDFA: AHFSS*, 2022, www.cdfa.ca.gov/AHFSS/Animal_Health/eprs/fad/.

[63] "Offices by Location." *CDFA - AHFSS*, 2025, www.cdfa.ca.gov/ahfss/AHFSS_Offices.html#office1.

[64] "Animal Health Branch Newsletter." *CDFA: AHFSS* , July 2021, p. 6, https://www.cdfa.ca.gov/AHFSS/Animal_Health/eprs/fad/.

[65] *See* APPENDIX 3: Key Waste Management Guidance Documents; "ORDER WQ 2020-0004-DWQ GENERAL WASTE DISCHARGE REQUIREMENTS FOR DISASTER-RELATED WASTES." *California Water Resources Control Board,* 18 Feb. 2020, pp. 4, 14 https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2020/wqo2020_0004_dwq.pdf (the Water Board's management requirements for Municipal Solid Waste (MSW) facilities accepting "mass animal mortality wastes" do not regulate what the farmer does before carcasses get to the MWS).

[66] "Emergency Animal Disposal Guidance." *CalEPA*, 2006, calepa.ca.gov/disaster/animals/.

[67] Klein, Kerry. "Photos of Dead Cattle Show Bird Flu Is Overwhelming Tulare County. How Did the Virus Get In?" *KVPR | Valley Public Radio*, 11 Oct. 2024, www.kvpr.org/health/2024-10-11/photos-of-dead-cattle-show-bird-flu-is-overwhelming-tulare-county-how-did-the-virus-get-in; Johnson, Don. *Emergency Animal Disease Regulatory Guidance for Disposal and Decontamination*. CalEPA, 2 Dec. 2004, pp. 7–8, calepa.ca.gov/wp-content/uploads/2016/10/Disaster-Documents-EADisease.pdf (explaining that there are few rendering plants in California and that carcasses *must* be secured and separated while waiting for pickup and during transit).

guidance that include low cost[68] *required* components responsive to high death-rate emergencies.

3. Administrative Controls

Administrative controls are changes to workplace procedures, policies, or practices that reduce hazard exposure.[69] Administrative controls in the dairy-H5N1 context largely focus on on-farm activities and workers' work-time rights.[70]

Examples Include:

- On-Farm Processes
    - Ensuring that milking equipment is not shared between infected and healthy cows
    - Strictly segregating infected milk
    - Monitoring people, equipment, and vehicles that move onto the facility
    - Power washing and disinfecting farm vehicle tires and wheel-wells at farm entrances
    - boot-washing stations at the entrances of designated high-risk areas
    - monitoring potential contacts between dairy herds and wildlife, pets, and pests
- Farmer Work-time
    - Sufficiently long break times to execute sanitation and PPE management protocols
    - Paid sick leave when farm workers demonstrate flu-like symptoms
    - Onsite testing and vaccinations
    - Multi-lingual employee education about a facilities public health protocols[71]

Surveys indicate that these recommendations are not status quo. For instance, some farmworkers report being discouraged to use PPE.[72] And, of the 30 dairy workers interviewed by UC Merced researchers, only one received a "robust" H5N1-related safety briefing from an employer.[73] That is why, among the many suggestions above, a relatively high-impact, low-lift administrative control is prioritizing **designating high- and low-risk areas on farms, and having appointed personnel managing the movement through, and use of, those areas** so

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[68] "Emergency Animal Mortality Preparedness Rendering Service Disruption in the Central Valley Mortality Disposal Options for Dairy." *CDFA,* 2 Sept. 2022, p. 5, https://www.cdfa.ca.gov/AHFSS/pdfs/dairy_emergency_mortality_disposal_preparedness_guidance_final_09012022_cdfa.pdf (indicating that, in state of emergency where select landfill dumping is permitted, using the Visalia landfill for Tuulare count would likely cost a farmer several hundred dollars).

[69] "About Hierarchy," CDC (2024).

[70] Cossyleon et al., "Producing Risks."(The predominant response to H5N1 in California dairies prioritizes animal health and milk production over worker health and safety).

[71] "Dairy Farm Biosecurity: Preventing the Spread of H5N1," *USDA: APHIS*, Dec. 2024, https://www.aphis.usda.gov/sites/default/files/dairy-cattle-biosecurity-measures.pdf.

[72] Cossyleon et al., "Producing Risks."

[73] *Id.*

that farmworkers are clear about what PPE and activities are safe or recommended in any given place**.**[74]

4. Personal Protective Equipment (PPE)

PPE is traditionally viewed as the least effective control because it relies on individual compliance.[75] As a threshold matter, there is little reporting on PPE getting to vulnerable farmworkers. And, for many who do get it, it's a balance between avoiding relatively mild flu symptoms or wearing something uncomfortable, heat trapping, and cumbersome in hot summer temperatures.[76] Overall, the student team analysis focuses not on whether sufficient PPE exists, but rather issues surrounding farmworker access and use.

i) PPE Access

Evidence regarding distributing PPE to dairy farmworkers is conflicting and scarce. Until March 31, 2025, California Department of Public Health (CDPH) provided farms free PPE upon request.[77] As of October, 2024, more than 3.3 million pieces of PPE were reportedly distributed to local health departments and farms in response to avian flu.[78] Yet, there is no additional information discussing how much PPE was distributed throughout specific regions or otherwise disaggregated.[79] Thus, it's difficult to understand where and how much PPE was ultimately disseminated to farm workers. Despite the reportedly high PPE dissemination, a UC Merced study assessing dairy workers' experience with H5N1 reports that dairy farmworkers are being provided minimal PPE.[80] Indeed, some farmworkers report receiving none.[81] Thus, the student team recommendation is simple: **require more transparent PPE dissemination data to help organizations better identify PPE access gaps.**

ii) Using PPE

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[74] *Id.*
[75] "About Hierarchy," CDC (2024).
[76] *See generally,* Demarco, Stasia. "Avian Flu and Workplace Safety." *Occupational Health & Safety*, 11 Feb. 2025, ohsonline.com/articles/2025/02/11/avian-flu-and-workplace-safety_0.aspx?Page=2.
[77] "How to Request Personal Protective Equipment (PPE) for Farmworkers to Protect Against Avian Influenza (HPAI H5N1) – also known as Bird Flu," *CDPH*, 28 February 2025, https://www.google.com/url?q=https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Request-Farmworker-PPE-Avian-Influenza.aspx&sa=D&source=docs&ust=1753296126052884&usg=AOvVaw0YvojvXZ0cGyT4KR3ZBXj-.
[78] Hwang, Kristen. "Bird Flu Jumped from Cows to People. Now Advocates Want More Farmworkers Tested." *CalMatters*, 30 Oct. 2024, calmatters.org/health/2024/10/bird-flu-california/.
[79] *Compare* Owermohle, Sarah. "Farmers Resist Push for Workers to Wear Protective Gear against Bird Flu Virus." *STAT*, 10 May 2024, www.statnews.com/2024/05/10/bird-flu-virus-dairy-farmers-resist-ppe-recommendation/ (While distribution data is lacking across US states, other states have reported minimal PPE distribution and on-farm use).
[80] Cossyleon et al., "Producing Risks."
[81] *Id.*

Since H5N1 is directly transmitted through exposure to contaminated equipment and infected milk particles,[82] PPE use can play a key role in minimizing transmission risk. Recommended PPE includes goggles, N95-level respirators, gowns, boots, and gloves.[83] However, dairy workers report considerable non-adherence.[84] Wearing PPE can be very uncomfortable, particularly for Central Valley dairy farmers frequently working outdoors in over 90 degrees Fahrenheit.[85] Since goggles and masks capture heat, using them during extreme temperatures can make it difficult to see, and significantly increases heat stroke risk.[86]

John Taylor, the founder and owner of a small-scale dairy in Marin County, shared that for his farmworkers, "the glasses are the first things they don't follow."[87] Taylor explained, "they're uncomfortable. If you're not someone who wears glasses every day, it's like 'these things are just in the way.'"[88] However, Taylor emphasized that workers' adoption of gloves, shoe-washing, and masks has been better, likely because of greater familiarity since Covid-19.[89] One approach may be for managers to **emphasize specific PPE use at specific high transmission-risk times.** For instance, goggles are of particular importance when milking cows since H5N1 infected milk particles can potentially splash into workers' eyes.[90]

Part III: The Regulatory Landscape

A close look at the zoonotic disease regulatory landscape helps elucidate how our government may or may not incentivize or require different interventions. Specifically, this section reviews the many government agencies involved in disease prevention and response with a focus on their involvement in H5N1 reduction.

The governmental responses to zoonotic outbreaks in general, and to the H5N1 dairy outbreak in particular, involve a complex patchwork of agencies and authorities. There are three government agency categories necessarily involved, those concerned with a) livestock health, treatment, and transport; b) human public health; and c) workplace hazards. These three categories are reproduced at the federal, state, and local levels. With three sets of agencies

[82] Anderer, Samantha. "Bird Flu Is Primarily Transmitted among Dairy Cattle through Milking, Study Suggests." Journal of American Medical Association, vol. 332, no. 17, Oct. 2024, https://doi.org/10.1001/jama.2024.21042.
[83] "Information for Workers Exposed to H5N1 Bird Flu." *CDC*, 6 Jan. 2025, www.cdc.gov/bird-flu/worker-safety/farm-workers.html.
[84] Cossyleon et al., "Producing Risks." (among others, one factor farmworkers report is that supervisors actively discourage PPE use).
[85] "Tulare Weather (California, United States)." *WeatherSpark*, 2025, weatherspark.com/h/y/1509/2024/Historical-Weather-during-2024-in-Tulare-California-United-States#Figures-Temperature (data from the Fresno Air Terminal Airport air station).
[86] *See generally,* Demarco, Stasia. "Avian Flu and Workplace Safety." *Occupational Health & Safety*, 11 Feb. 2025, ohsonline.com/articles/2025/02/11/avian-flu-and-workplace-safety_0.aspx?Page=2; Cossyleon et al., "Producing Risks," at 3, (Dairy farm workers also report inadequate PPE sizes, sanitization, and on-site storage leading to farmworkers taking soiled PPE home, further increasing transmission risk).
[87] John Taylor, Founder and owner of Bivalve Dairy, interview by Jordan Stock, Zoom, May 1, 2025.
[88] *Id.*
[89] *Id.*
[90] "Information for Workers Exposed to H5N1 Bird Flu." *CDC*, 6 Jan. 2025, www.cdc.gov/bird-flu/worker-safety/farm-workers.html.

involved at three levels of government, an effective zoonotic response requires alignment and coordination between hundreds of agencies.

1. *Federal Regulatory Landscape*

Three key acts provide the backbone of federal action regarding a zoonotic crisis: the Public Health Service Act,[91] the Animal Health Protection Act,[92] and the Occupational Safety and Health Act.[93] Through these acts various officials may block interstate movement of livestock, draw on emergency Treasury funds, impose herd quarantines, require slaughter, test animal products pre-sale, or require employer-provided PPE.[94]

The critically involved federal agencies are USDA for livestock health (which houses APHIS and the National Veterinary Services Laboratories, among other sub-agencies), Health and Human Services (HHS) for animal health (overseeing both the CDC and the Food and Drug Administration (FDA)), and the Occupational Safety and Health Administration (OSHA) for worker protection. APHIS, in particular, has expansive authority to prevent and mitigate animal pandemics.[95]

However, given limited federal operational capacity, staffing, and police powers, close state coordination is often required to implement on-farm mandates. For instance, state animal health agencies typically implement their own on-farm quarantines and depopulation orders under cooperative agreements between federal, state, industry, and other stakeholder groups *guided* by APHIS's National Animal Health Emergency Management System.[96] Another example is PPE use. OSHA may recommend farmworkers use PPE, may facilitate free PPE for farms, but can not visit and enforce on-farm PPE use.[97] This theoretically leaves state and regional governments to enforce regulations; but in practice, largely leaves compliance up to community members and farmworkers.[98]

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[91] 42 U.S.C. § 201 et seq.
[92] 7 U.S.C. § 8301 et seq.
[93] 29 U.S.C. § 651 et seq.
[94] For an in-depth statute review, *see* APPENDIX 1.
[95] 7 U.S.C §8301; "Foreign Animal Disease Framework Roles and Communication FAD PReP Manual 1-0." *USDA: APHIS*, 5 Sept. 2022; "Livestock and Poultry Diseases." *USDA: APHIS*, July 2025, www.aphis.usda.gov/livestock-poultry-disease.
[96] "NVAP Reference Guide: National Animal Health Emergency Management System." *USDA: APHIS*, 20 March 2024, https://www.aphis.usda.gov/nvap/reference-guide/emergency-management/nahems.
[97] "Avian Influenza." *US Department of Labor, Occupational Safety and Health Administration,* 2025, https://www.osha.gov/avian-flu; Kenny, Emily, and Justin Velazquez. "How Dairy Farms Manage Heat for Their Workers and Cows." *Spectrum News*, 20 July 2024, spectrumlocalnews.com/nys/central-ny/news/2024/06/20/how-dairy-farms-manage-heat-for-their-workers-and-cows ; Owermohle, Sarah. "Farmers Resist Push for Workers to Wear Protective Gear Against Bird Flu Virus." *STAT*, 10 May 2024, www.statnews.com/2024/05/10/bird-flu-virus-dairy-farmers-resist-ppe-recommendation/.
[98] *See* below section on anonymous tip lines; "Avian Influenza: Standards." *OSHA,* 2025, https://www.osha.gov/avian-flu/standards (acknowledging no Avian Flu specific standards, but listing several general duty clauses a *worker* could cite when reporting an unsanitary work environment such as the Clause 29 USC 654(a)(1)).

Furthermore, since Donald Trump took office in January 2025, federal capacity to coordinate, monitor, and contain the virus has declined.[99] National Animal Health Laboratory Network staff have accepted employment buyouts;[100] USDA and FDA employees involved in the H5N1 response have been terminated;[101] FDA has suspended its proficiency testing program for Grade "A" milk;[102] and halted implementing the FDA-USDA Interlaboratory Comparison Exercise for Detecting Highly Pathogenic Avian Influenza.[103] Furthermore, the rise in farmworker ICE raids and deportation fears keeps many farmworkers from getting tested–further masking public health officials' ability to track its spread.[104]

Upon taking office, the Trump administration dramatically ratcheted-up federal immigration enforcement actions in the Central Valley, leading to widespread reports of workplace raids, arrests, and deportations.[105] An estimated 75 percent of California's more than 500,000 farmworkers are undocumented, so the threat of deportation looms over interactions

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[99] The Trump administration took a number of highly-publicized early actions in response to the H5N1 outbreak, but these actions were targeted toward poultry flocks, not dairy cattle herds, and displayed a single-minded focus on reducing the retail cost of eggs, not controlling viral transmission. *See, e.g.,* Rollins, Brooke. "Agriculture Secretary Brooke Rollins: My Plan to Lower Egg Prices." *Wall Street Journal*, 26 February 2025, https://www.wsj.com/opinion/agriculture-secretary-brooke-rollins-my-plan-to-lower-egg-prices-6be0f88; "Release: USDA Invests Up To $1 Billion to Combat Avian Flu and Reduce Egg Prices." *USDA*, 26 February 2025, https://www.usda.gov/about-usda/news/press-releases/2025/02/26/usda-invests-1-billion-combat-avian-flu-and-reduce-egg-prices; "Release: USDA Update on Progress of Five-Pronged Strategy to Combat Avian Flu and Lower Egg Prices." *USDA*, 20 March 2025, https://www.usda.gov/about-usda/news/press-releases/2025/03/20/usda-update-progress-five-pronged-strategy-combat-avian-flu-and-lower-egg-prices.

[100] Douglas, Leah. "Workers key to bird flu response taking USDA buyouts, may strain agency's efforts." *Des Moines Register*, 10 April 2025, https://www.desmoinesregister.com/story/money/agriculture/2025/04/10/buyouts-accepted-by-usda-workers-key-to-bird-flu-response-source-says/83030017007/.

[101] Treisman, Rachel. "The USDA fired staffers working on bird flu. Now it's trying to reverse course." *NPR*, 19 February 2025, https://www.npr.org/2025/02/19/nx-s1-5302019/bird-flu-usda-firings-reversed; Leah Douglas and Tom Polansek. "Exclusive: Trump health layoffs include staff overseeing bird flu response, source says." *Reuters*, 1 April 2025, https://www.reuters.com/business/healthcare-pharmaceuticals/trump-health-layoffs-include-staff-overseeing-bird-flu-response-source-says-2025-04-01/#:~:text=April%201%20(Reuters)%20%2D%20The,source%20familiar%20with%20the%20situation.

[102] Douglas, Leah. "US FDA suspends milk quality tests amid workforce cuts," *Reuters*, 22 April 2025, https://www.reuters.com/business/healthcare-pharmaceuticals/us-fda-suspends-milk-quality-tests-amid-workforce-cuts-2025-04-21/.

[103] Douglas, Leah. "FDA suspends program to improve bird flu testing due to staff cuts," *Reuters,* 3 April 2025, https://www.reuters.com/business/healthcare-pharmaceuticals/fda-suspends-program-improve-bird-flu-testing-due-staff-cuts-2025-04-03/; Notably, through the National Milk Testing Strategy, APHS continues to get milk test results from all 48 contiguous states through a series of programs - which are predominantly voluntary for farmers unless shipping their milk interstate, *see* "Testing." *APHS,* 25 July 20205, https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-livestock/testing.

[104] Maxmen, Amy. "Trump's Immigration Tactics Obstruct Efforts to Avert Bird Flu Pandemic, Researchers Say - KFF Health News." *KFF Health News*, 10 Apr. 2025, kffhealthnews.org/news/article/bird-flu-trump-immigration-raids-farmworkers-threats-california-michigan/.

[105] Duara, Nigel. "Raid or rumor? Reports of immigration sweeps are warping life in California's Central Valley." *Cal Matters*, 31 March 2025, https://calmatters.org/justice/2025/03/immigration-raids-rumors/; Ferris, Gabe. "A look at the immigration raids, protests in Central Valley as 'immigration crackdown' continues." *ABC30*, 12 February 2025, https://abc30.com/post/look-immigration-raids-protests-central-valley-crackdown-continues/15899494/.

between farmworkers and state institutions.[106] Indeed, in a 2022 survey of over 1,000 California farmworkers, under half reported a doctor's visit in the past year, and over a third said they would not report employer workplace non-compliance.[107]

Despite inadequate testing and federal agency downsizing, the federal government remains empowered to take comprehensive action in response to zoonotic outbreaks. Specifically, the federal government is uniquely positioned to a) control interstate commercial herd movement,[108] b) bulk-test milk and dairy products,[109] and c) provide emergency supplies or financing during spikes.[110] Meanwhile, states can use their police powers to enforce on-farm biosecurity and worker safety measures. Using each level's strengths the student team are, in short, advocating for the National One Health Framework discussed prior.

2. *California Regulatory Landscape*

California law empowers several state agencies to mount robust state-level responses to outbreaks like H5N1. The predominant state agencies are California Department of Food and Agriculture (CDFA) for livestock health, the California Department of Public Health (CDPH) for human health, and the California Division of Occupational Safety and Health (Cal/OSHA) for worker protection. Much like their federal counterparts, these agencies have the legal authority to mount a robust and effective response. However such action is predominantly discretionary.[111]

Notably, Governor Newsom declared a state of emergency in December 2024 for H5N1.[112] In doing so, Newsom was authorized to, "suspend any regulatory statute," or "orders, rules or regulations of any state agency."[113] Accordingly, Newsom suspended Government Code

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[106] "31 California Farmworker Facts You Should Know." *La Cooperativa Campesina de California*, 28 March 2023, https://lacooperativa.org/31-california-farmworker-facts-you-should-know/.
[107] Brown, Paul, et al. "Farmworker Health in California." *Community and Labor Center: UC Merced*, 2022, pp. 7–10, clc.ucmerced.edu/sites/g/files/ufvvjh626/f/page/documents/fwhs_report_2.2.2383.pdf (surveying 1,242 agricultural workers across five California regions from August 2021-June 2022).
[108] *Federal Order Requiring Testing for and Reporting of Highly Pathogenic Avian Influenza (HPAI) in Livestock*. APHIS, 24 Apr. 2024 (building off of the Interstate Commerce Act, the Federal government is uniquely empowered to regulate the interstate movement of commercial goods).
[109] Having a federally run testing program ensures cross state constancy and a uniform National dairy-safety standard. *See e.g.,* Polzin, Leonard. "Suspension of FDA's Grade "A" Milk Proficiency Testing Program – a Comprehensive Analysis." *University of Wisconsin-Madison*, 2025, farms.extension.wisc.edu/articles/suspension-of-fdas-grade-a-milk-proficiency-testing-program-a-comprehensive-analysis/ (regarding gaps left by ending the Grade "A" Milk Proficiency Test Program).
[110] *See e.g.,* "ASPR's Response to H5N1 Bird Flu." *Administration for Strategic Preparedness & Response„* aspr.hhs.gov/H5N1/Pages/default.aspx (discussing how the federal government agency is uniquely positioned to provide support during public health outbreaks generally, and H5N1 specifically).
[111] *See* APPENDIX 1.
[112] "Governor Newsom takes proactive action to strengthen robust state response to Bird Flu." *Governor of California*, 18 December 2024, https://www.cdfa.ca.gov/AHFSS/Animal_Health/docs/governors_proclamation_of_a_state_of_emergency_bird_flu_2024.pdf; CA Govt Code § 8858(b) (2024) (granting Newsom authority to declare a state of emergency); CA Govt Code § 8625(c) (2024), (granting Newsom authority to declare a state of emergency in a particular affected location when the Governor, "finds that *local authority is inadequate to cope with the emergency*" (emphasis added)).
[113] CA Govt Code § 8571 (2024).

and Public Contract Code provisions.[114] However, this merely gave agencies additional, discretionary powers.[115] For instance, it allowed agencies to procure PPE more quickly by skipping the competitive bidding process.[116]

While most disease-prevention laws are discretionary, two mandatory Cal/OSHA regulations are worth highlighting:[117]

1. Section 3203 Injury and Illness Prevention Program: provides the general requirement that employers *must* ensure that "employees comply with safe and healthy work practices," in part by establishing, implementing, and maintaining an effective, written workplace injury and illness prevention program.[118]
2. Section 5199.1 Aerosol Transmissible Diseases – Zoonotic: lays out additional mandatory workplace requirements necessary for § 3203 compliance.

Under § 5199.1, employers, including farms, *must* "establish, implement, and maintain effective procedures for preventing employee exposure to zoonotic aerosol transmissible pathogens." Listed procedures include sanitation, PPE, biosecurity measures, and employee training.[119] Together, these two provisions empower Cal/OSHA to enforce on-farm biosecurity measures in response to the H5N1 outbreak.

Indeed, through the Labor Code, a range of sanctions are available when regulations are violated; 1) Cal/OSHA can issue stop-work orders or civil penalties that escalate for repetition;[120] 2) prosecutors can bring criminal charges for willful violation of regulations or for failure to comply with an abatement order under the California Labor Code;[121] or 3) injured employees could pursue civil action against their employers under the Private Attorneys General Act if caused by a regulatory violation.[122] Unfortunately, within the H5N1 context, pursuit of such remedies appears minimal.[123] This may be for a number of reasons, discussed in the following sections, but appears predominantly centered around lacking agency capacity and farmworker retaliation fears.[124]

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[114] "Governor Newsom takes proactive action to strengthen robust state response to Bird Flu." *Governor of California*, 18 December 2024, at 4.
[115] *Id.*
[116] *Id*. Unfortunately, this rapid agency PPE procurement did not, per se, lead to rapid and proper dairy farmworker PPE use (*see,* "Using PPE" section).
[117] *See* APPENDIX 1.
[118] Cal. Code Regs. tit. 8, § 3203.
[119] Cal. Code Regs. tit. 8, § 5199.1.
[120] Cal. Code Regs. tit. 8, § 336.
[121] Cal. Lab. Code § 6429; Cal. Lab. Code § 6425.
[122] Cal. Lab. Code § 2699 et seq.
[123] Schurmann, Peter. "Farmworker Advocates Push for Greater Protection Against Bird Flu." *American Community Media,* 20 Mar. 2025, https://americancommunitymedia.org/health-care/farmworker-advocates-push-for-greater-protection-against-bird-flu/; "California FAME Reports: 2023." *Occupational Safety and Health Administration*, 2023, https://www.osha.gov/stateplans/famereport/CA.
[124] *Id.*

3. *County Regulatory Landscape*

Local entities are on the front lines of the response to a zoonotic outbreak and are often responsible for, at least in part, implementing and enforcing state and federal mandates.[125] County-level administrative structures are similar across California's top five dairy counties: Tulare, Merced, Stanislaus, Kings, and Kern.[126]

The County Board of Supervisors holds the authority to establish county-wide policies and declare local emergencies when necessary to address significant threats to public health or safety.[127] Beneath the Board, the county-level Agricultural Commissioner enforces state and local laws and regulations related to agriculture's intersection with environmental and consumer health.[128] However, the County Environmental Health Department also holds relevant authorities, including, in some instances, routine inspections of dairy facilities, and ensuring compliance with sanitation requirements.[129] A County Health and Human Services Administrator, typically led by County Health Officers, is responsible for issuing local public health guidance, and monitoring the human health-components of a disease outbreak.[130] Finally, Animal Services departments are responsible for animal welfare, and may play a supportive role in any response (though the scope of these agencies is better suited for pets than livestock).[131]

Since county governing structures vary, and Tulare is the top dairy-production county,[132] its structure is discussed in more detail here. Firstly, their Agricultural Commissioner/Sealer of Weights and Measures does not appear to have any online information around H5N1.[133] Rather, their Environmental Health Division's Dairy Program appears to have the most H5N1 related

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[125] *See e.g.,* "Avian Influenza (H5N1 Bird Flu)." *Tulare County Health and Human Services Agency,* 2024, tchhsa.org/eng/public-health/avian-influenza-h5n1-bird-flu/ (referring people to CDFA, Fish and Wildlife, Department of Public Health, and U.S. CDC); "Tulare County Dairy Program." *HHSA: Environmental Health Division,* 2024, https://tularecountyeh.org/eh/our-services/dairy/ (Tulare County administers one of the CDFA's Milk Inspection Services); "Approved Milk Inspection Services." *CDFA*, 2025, https://www.cdfa.ca.gov/ahfss/milk_and_dairy_food_safety/Approved_Insp_Services.html.

[126] "Quick Stats," *USDA: National Agricultural Statistics Service* (using the most recent, 2022 census data for dairy milk sales by county); "County Structure." *California State Association of Counties*, 2025, www.counties.org/counties/county-structure/ (these five counties are all General Law Counties).

[127] "Proclamation Process." *California Governor's Office of Emergency Services*, 1 Jan. 2021, https://www.caloes.ca.gov/office-of-the-director/operations/recovery-directorate/proclamation-process/.

[128] "Role of Counties." *California State Association of Counties,* 2025, https://www.counties.org/counties/role-of-counties/.

[129] *See e.g.,* "Tulare County Dairy Program." *HHSA: Environmental Health Division*, 2025.

[130] "Role of Counties." *California State Association of Counties,* 2025; "Public Health." *Tulare County Health and Human Services Agency,* 2025, https://tchhsa.org/eng/public-health/; "Avian Influenza (H5N1 Bird Flu)." *Tulare County Health and Human Services Agency,* 2024, https://tchhsa.org/eng/public-health/avian-influenza-h5n1-bird-flu/.

[131] *See e.g.* "Animal Services." *Tulare County Health and Human Services Agency,* July 2025, https://tcanimalservices.org/animalservices/.

[132] Smith, Aaron. "Where Are California's Dairy Cows?" *The Dairy News*, 20 Feb. 2024 (explaining that as of 2022, Tulare has the most dairy farms over 500 head in the State).

[133] *See generally,* "Home: Agricultural Commissioner/Sealer." *Tulare County,* 2025 (in searching, and reviewing the websites reports, programs, disaster relief, and pesticide pages there is no mention of H5N1 as of July 14, 2025).

powers.[134] Among others, Tulare County Registered Dairy Inspectors, "routinely inspect and officially score dairy facilities" in both Tulare and Kern county in accordance with California Food and Agriculture Code and Code of Regulations.[135] The agency's 2019 Dairy Inspection Form–complete with milk-quality questions–is presumably used by inspection officials to keep infected milk out of commerce.[136] Notably, for "abnormal milk," the form only requires sick cows to be milked, "as a separate group" *or* "with separate equipment," but not both.[137]

For residents, the Tulare Public Health Department appears to be the primary agency providing public health information.[138] Online, they provide an English-only weekly count of confirmed human cases, which was last updated June 15, 2025.[139] Their website includes links for reporting dead wild animals, but nothing for reporting dead livestock, and includes downloadable English and Spanish information brochures, though brochure information differs.[140] Lastly, Tulare County's Animal Service Division has no information on avian flu.[141] Ultimately, it appears that while local governments are the primary actors overseeing, enforcing, and implementing animal disease risk reduction measures, at least for Tulare county in the H5N1 context, accessible information is sparse.

Part IV: Idealistic Policy Recommendations

After researching federal, state, and local government agency animal disease responsibilities, understanding authorizing language, and assessing on-the-ground (in)action, the student team identified three persistent policy barriers: 1) inadequate mandatory government action 2) inadequate regulation enforcement, and 3) conflicting agency mandates. These recommendations admittedly face significant barriers. They are not, in other words, the most pragmatic nor feasible. However, if left unaddressed, our Nation's inadequate response to zoonotic disease will invariably persist. The following subsections discuss these three barriers in more detail.

1. *Increase Mandatory Federal, State, and Local Agency Disease-management Actions*

As discussed, officials at all levels of government are empowered to take bold—even quite radical—measures in response to zoonotic outbreaks.[142] However, these powers are also

[134] "Tulare County Dairy Program." *HHSA: Environmental Health Division,* 2024, https://tularecountyeh.org/eh/our-services/dairy/.
[135] *Id.*
[136] "Dairy Inspection Checklist." *Tulare County Health and Human Services,* 2019, https://tularecountyeh.org/eh/guidance-library/dairy/dairy-inspection-checklist/.
[137] *Id.*
[138] "Avian Influenza (H5N1 Bird Flu)." *Tulare County Health and Human Services Agency,* 2024.
[139] *Id.*
[140] *Id. See* "Translate and Expand Public Health Guidance Dissemination" section regarding incongruent English and Spanish information packets.
[141] "Animal Services." *Tulare County Health and Human Services Agency,* July 2025.
[142] *See* APPENDIX 1.

predominantly discretionary.[143] For instance, even after an emergency declaration, there are very few mandatory testing, quarantining, reporting, or dairy cow intrastate movement restrictions.[144]

This discretion allows agency response to potentially follow political, rather than public health, interests. Certainly, some degree of discretion is necessary given an agency's regional expertise, funding and staffing limitations, and the potential for mandatory action to chill an emergency declaration (and thus preclude other emergency-only actions). However, this near-wholesale "discretion" has allowed agencies to, the student team believes, do too little. **A detailed review and revision across authorizing statutes to increase low-lift, high-impact *mandatory* action across government agencies** would significantly help ensure an adequate government response to zoonotic threats.

2. *Increase Agency Enforcement Staffing*

Enforcing regulations appears wholly inadequate. For instance, as mentioned, § 5199.1 outlines protective measures employers must take to protect their workers from zoonotic disease outbreaks.[145] Yet despite numerous reports of inadequate H5N1 prevention, Cal/OSHA had issued only one § 5199.1 violation as of March 20, 2025.[146]

At the March 2025 Cal/OSHA board meeting, a Board member acknowledged the wide gulf between state-level regulatory activity, and meaningful on-the-ground enforcement:

> *[H5N1] is another case—we've had several over the last several years—where it feels like Cal/OSHA is putting in a great deal of effort. There is existing regulation on the books. Employers should have the knowledge, tools, and resources to manage this. And then we hear from employee representative groups saying, "None of the employers are doing anything." ... There's a huge gap here, and we have to figure out someday how to manage this.*[147]

[143] *Id. See also,* email exchange with Weld County Department of Public Health and Environment in Colorado, indicating that 12 of 26 attempts to monitor dairies were unsuccessful, and, lacking authority to do more, left un-studied. Maxmen, Amy. "Exclusive: Emails Reveal How Health Departments Struggle To Track Human Cases of Bird Flu." 25 Oct. 2024, *KFF Health News,* https://kffhealthnews.org/news/article/bird-flu-farmworkers-emails-tracking-human-cases-obstacles-california/.

[144] *See* APPENDIX 1 (for instance, under the Animal Health Protection Act (7 U.S.C. ch. 109) the Federal agency APHIS *may* prohibit or restrict importation, interstate movement, or use of animals/articles to prevent disease dissemination (§ 8303–8305); under California's Agricultural Code division 5.2 § 9562, if the State Veterinarian believes that food products or domestic animals may carry a transmissible pathogen, then he or she *may* order for segregation, isolation, or destruction of animals; and, under California's Health and Safety code (§ 120175.5) local health officials, only during declared outbreak emergencies, are *mandated* to promptly notify governmental entities within their jurisdiction about communicable diseases that may affect them. But this notification is only mandatory if the local health officer *believes* that the actions or inactions of these governmental entities could impact mitigation efforts).

[145] Aerosol Transmissible Diseases - Zoonotic, Cal. Code Regs. tit. 8, § 5199.1 (2025).

[146] California OSH Standards Board. *OSHSB Board Meeting,* 20 Mar. 2025.

[147] Speech by Dr. Nola Kennedy, Professor at California State University Northridge and the Board's occupational health representative, California OSH Standards Board. *OSHSB Board Meeting,* 20 Mar. 2025.

This enforcement deficit may be the result of longstanding staff shortages in the Department of Industrial Relations (DIR), which houses Cal/OSHA. Cal/OSHA's most recent report noted that the department has a 36 percent vacancy rate, and that, "a large portion of the unfilled positions were in enforcement staff."[148] Further, these "staffing shortages affected [DIR's] ability to respond timely to complaints and schedule programmed inspections of high-hazard workplaces," a category that includes dairy operations.[149] The report also noted that "the number of serious citations issued remains a longstanding concern," and significantly trailed national targets.[150]

Community organizations including Valley Voices and the UC Merced Farm Labor Center have petitioned the board to reform §5199.1, introducing new requirements for widespread employer-provided testing, and fully-paid work exclusion of the kind introduced during Covid-19.[151] These recommendations are well reasoned, but without an **increase in inspection and enforcement staff,** they are unlikely to deliver meaningful relief.

3. Prioritize Agency Goals to Remove Competing Mandates

Given the interdisciplinary nature of zoonotic disease, and the wide range of agencies and governments necessarily involved, effective interagency and intergovernmental coordination will underpin any effective outbreak response. While external evaluation of interagency coordination is challenging, reporting indicates that many agency responses are undermined by the conflicting mandates of their own, or other involved agencies.[152]

Indeed, one agency often has several priorities that can at times appear contradictory. For instance, CDFA is called to promote and protect our food supply, enhance local and global agricultural trade, and foster environmental stewardship.[153] In the H5N1 context, efforts to slow the spread (and protect our food supply and the environment) included mandatory quarantines, pasteurizing unsellable milk, and undergoing widespread cattle and milk testing.[154] But such efforts also decrease milk supply, increase farmer costs, and hurt California's milk trade.[155]

[148] "California FAME Reports: 2023." Occupational Safety and Health Administration, 2023.
[149] *Id.*
[150] *Id.*
[151] Little, Bryan. "Avian Flu Petition Filed with Cal/OSHA Standards Board." *Farm Employers Labor Service*, 4 April 2025, https://www.fels.net/avian-flu-petition-filed-with-cal-osha-standards-board/.
[152] *See e.g.,* Eban, Katherine. "Inside the Bungled Bird Flu Response, Where Profits Collide With Public Health." *Vanity Fair*, 21 October 2024, https://www.vanityfair.com/news/story/inside-the-bungled-bird-flu-response.
[153] "Mission Statement." *California Department of Food and Agriculture,* June 2025, https://www.cdfa.ca.gov/CDFA-Mission.html.
[154] "Highly Pathogenic Avian Influenza (HPAI) H5N1 Virus in Livestock." *CDFA: AHFSS,* 2025.
[155] Peña-Mosca, Felipe, et al. "The Impact of Highly Pathogenic Avian Influenza H5N1 Virus Infection on Dairy Cows." *Nature Communications*, vol. 16, no. 1, 15 July 2025.

As H5N1 cases spiked in the Central Valley,[156] dead cows were left along the road,[157] farmworkers remained largely uninformed,[158] and opportunities for mutation and spread grew.[159] Several agencies were authorized to improve conditions before H5N1 jumped to humans but, for many reasons discussed, did not.[160] Removing competing agency mandates would go far in clarifying what an agency should prioritize in the face of zoonosis, and ideally, foster quicker, more robust action. While having multiple mandates fosters well-rounded agencies, **clarifying agency priorities, and removing *conflicting* mandates** would minimize inaction, and ultimately, reduce outbreak risk.

Part V: Pragmatic Recommendations for Policy Makers and/or Community Organizers

There are countless ways of minimizing zoonosis risk. However, given the complex regulatory landscape, there are several barriers to structural change or the widespread adoption of the student team's identified recommendations across the prior sections. Thus, this final section highlights three more pragmatic, but nonetheless high impact, recommendations. The student team views these recommendations as most effective if implemented by local or state governments, but in their absence, could be fulfilled by community organizations.

1. Pressure (or Require) All Farms to Submit Biosecurity Plans to CDFA

Biosecurity Plans are a comprehensive set of practices designed to prevent the introduction and spread of a virus within and between livestock and farmworkers.[161] Specific on-farm Biosecurity Plans are commonly cited as a key defense to animal disease outbreaks and have played a critical role in the response to the poultry H5N1 outbreak.[162] However, simply having a plan is insufficient. Farms must have *effective* plans, and must *implement* these plans.

California dairies are not required to have biosecurity plans. However, they are encouraged when participating in the California Secure Food Supply program (SFS)[163] and when

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[156] "HPAI Confirmed Cases in Livestock." *USDA: APHIS*, June 2025, www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/hpai-confirmed-cases-livestock (see spike in California cattle cases from mid October through December 2024).
[157] Howarth, T. "'Shocking': Bird-Flu Infected Cattle Dumped at California Roadside." *Newsweek*, 11 Oct. 2024, https://www.newsweek.com/disturbing-footage-reveals-bird-flu-infected-cattle-dumped-roadside-1967813.
[158] Cossyleon et al., "Producing Risks."
[159] "Single Mutation in H5N1 Influenza Surface Protein Could Enable Easier Human Infection." *National Institutes of Health*, 6 Dec. 2024, www.nih.gov/news-events/news-releases/single-mutation-h5n1-influenza-surface-protein-could-enable-easier-human-infection.
[160] *See* APPENDIX 1.
[161] *California Dairy Farm Enhanced Biosecurity Plan Manual*. CDFA, Oct. 2023, p. 4.
[162] For poultry producers, Biosecurity Plans help qualify them for USDA indemnification programs. Claimants must submit biosecurity plans that comply with listed requirements, and pass audits to demonstrate adherence. There is no equivalent for cattle. *See* APPENDIX 4 discussing indemnity.
[163] "Helping Producers Maintain Continuity of Business During an Animal Disease Outbreak." *CDFA*, 2025, https://www.cdfa.ca.gov/AHFSS/SecureFoodSupply.html.

obtaining movement permits.[164] During animal disease outbreaks, those participating in the SFS must have a biosecurity plan.[165] Notably, biosecurity plans are produced, managed, stored, and supervised internally by a "biosecurity manager."[166] Only during an animal disease outbreak may CDFA request SFS participating dairies to submit their plans for review or visit participating dairies.[167] Ultimately, this largely optional process poses several challenges. Among others, it makes preemptive risk management difficult, obfuscates a plan's contents, prevents farmworkers or the community members from knowing whether a farm is violating their plan, and makes confirming a plan meets SFS's requirements difficult.[168]

Furthermore, while auditing is allowed at SFS participating dairies during a disease emergency, it is unclear whether agencies have the capacity to do so. Indeed, only Fresno, Sonoma, Tulare, Kings, Imperial, San Joaquin and Stanislaus counties have local dairy inspectors.[169] And, with a 36% vacancy rate (much of which is concentrated in its enforcement division), Cal/OSHA is unlikely to thoroughly conduct inspections itself.[170] Thus, the student team recommends a policy revision **requiring dairy biosecurity plan submission to CDFA**, or another relevant agency. Submission to CDFA or another government agency is a low time and cost commitment for agencies (they need only store the plans) and SFS participating dairies (who ostensibly already have plans). Given limited agency capacity to review and enforce plans, agency submission would make them publically accessible, thus enhancing community oversight, information sharing, and accountability.

2. *Provide Anonymous Tip Line Training*

Despite having biosecurity plans,[171] many dairy workers report having minimal on-farm safety measures. Policy violation persistence appears largely linked to a) employee fear of retaliation if they speak up and b) lack of Cal/OSHA enforcement staff visiting farms to directly check compliance.[172] One way to assist limited enforcement staff in identifying noncompliant

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[164] *California Dairy Farm Enhanced Biosecurity Plan Manual*. CDFA, Oct. 2023, p. 4.
[165] "Helping Producers Maintain Continuity of Business During an Animal Disease Outbreak." *CDFA*, 205.
[166] *California Dairy Farm Enhanced Biosecurity Plan Manual*. CDFA, Oct. 2023.
[167] *Id.* (many of the specific decisions, tests, and oversight are made by an Incident Management Team made of CDFA and USDA staff).
[168] Notably, a farm may elect to submit their plan prior to an outbreak and have it SFS approved, this allows them to resume activities more quickly during an outbreak. However, there doesn't appear to be any regular plan review, biosecurity-implementation review, or other non-emergency audit authority.
[169] "Approved Milk Inspection Services." *CDFA: AHFSS*, 2025, www.cdfa.ca.gov/ahfss/milk_and_dairy_food_safety/Approved_Insp_Services.html.
[170] "California FAME Reports: 2023." Occupational Safety and Health Administration, 2023.
As discussed in "Recommendation 2: Enforcement" workers or concerned third-party groups, like the veterinarian animal rights non-profit Our Honor, may be able to play an increased role in monitoring and enforcement through expanded use of anonymous agency tiplines, especially those provided by Cal/OSHA.
[171] "Helping Producers Maintain Continuity of Business During an Animal Disease Outbreak." *CDFA* (During a state of emergency, dairy facilities participating in the SFS program are required to have biosecurity plans to reduce disease outbreaks).
[172] Cossyleon et al., "Producing Risks."; "California FAME Reports: 2023." Occupational Safety and Health Administration, 2023.

farms and address employee retaliation fears, is to increase multilingual anonymous tip line education.[173]

Currently, Cal/OSHA operates tiplines and receives both "Safety and Health Complaints" and "Whistleblower Complaints."[174] These tips can be made over the phone, online, in person, in any language, by a third party, on a worker's behalf, and often anonymously.[175] Yet, Cal/OSHA reported that as of March 31, 2025 they had not received *any* H5N1-related tips.[176]A Cal/OSHA official explained that tips stating the specific violated regulation are more likely to lead to official inspection and enforcement.[177] In the H5N1 context, educating farmworker communities about Section 5199.1 would likely increase agency oversight on - and hopefully farm compliance with - biosecurity plans. Overall, the student team recommends community groups, if not local governments, **provide more information about the existence of, and how to optimally use, anonymous tip lines** to help focus limited Cal/OSHA resources.[178]

3. Translate and Expand Public Health Guidance Dissemination

An effective response to a zoonotic outbreak like H5N1 requires considerable community outreach and education about risks, precautions, and one's rights. Accordingly, CDPH launched several public health campaigns regarding H5N1. CDPH provides information about transmission and mitigating spread, how to protect yourself, and how to get tested.[179] However, the majority of these campaigns and resources are disseminated online.[180] This approach presumes that users (1) are aware that such information exists online, (2) have reliable internet access and can navigate CDPH websites, and (3) can understand and interpret the materials. Unfortunately, these presumptions do not seem to be universally true. Central Valley dairy workers report that most of their H5N1 information has come through family members with first hand experiences, farmer WhatsApp groups, social media accounts, and the radio.[181] Additionally, there have been discrepancies between CDPH's English and Spanish H5N1 fliers.[182] Specifically, some Spanish fliers lack information about workers' workplace rights and resources for understanding one's paid sick-leave and workers' compensation programs.[183]

To ensure that official materials and public health guidance is disseminated effectively to relevant populations, the student team would recommend that a) **CDPH expand where and how**

[173] Crystal Heath,Veterinarian and Our Honor Co-Founder, interview May 5, 2025; validated by interview with Dr. Elizabeth Noth, Senior Industrial Hygienist, Cal/OSHA, May 14, 2025.
[174] "File a Complaint." *Occupational Safety and Health Administration*, 2025, https://www.osha.gov/workers/file-complaint (only Safety and Health Complaints can be made anonymously).
[175] *Id.*
[176] California OSH Standards Board. *OSHSB Board Meeting: Valley Voices Presentation* . 20 Mar. 2025.
[177] Dr. Elizabeth Noth, Senior Industrial Hygienist, Cal/OSHA, interview 14 May 2025.
[178] Crystal Heath,Veterinarian and Our Honor Co-Founder, interview May 5, 2025; validated by interview with Dr. Elizabeth Noth, Senior Industrial Hygienist, Cal/OSHA, May 14, 2025.
[179] *See generally*, "Bird Flu." *CDPH*, 30 June 2025.
[180] *Id.*
[181] Cossyleon et al., "Producing Risks" at 8.
[182] *See* APPENDIX 5 for an attached example.
[183] *Id.*

they disseminate their H5N1 information to include the most common information avenues for high-risk communities and b) **ensure that the same information is shared and translated across all relevant languages.**

Part VI: Conclusion

The purpose of this project has been to (1) overview the management of zoonotic disease in the United States and California, with particular attention to H5N1, and (2) propose a series of possible interventions that range from the systemic and aspirational, to the feasible and incremental. After reviewing the relevant regulatory landscape, and conducting a series of stakeholder interviews, the student team landed on the Hierarchy of Hazard Controls as a framework for understanding zoonotic disease risk, and organizing the wide range of possible biosecurity interventions.

Ultimately, the student team identified three incremental policy changes that might meaningfully improve the response over the short-to-medium term:

1. Require that farms submit site-specific biosecurity plans to CDFA or other relevant agency;
2. Expand the use of anonymous tip lines to effectively target limited enforcement resources; and
3. Improve outreach and educational activities to farming communities, particularly regarding full Spanish translation of all health guidance.

Furthermore, consistent with the student team's emphasis on the importance of effective multilingual communication to any adequate response, the student team has created a series of infographics that highlight risks and protective measures across the relevant hierarchies. These might be useful to distribute to key partners, or for relevant state agencies. For these graphics, see *APPENDIX 6*.

There are several avenues to pursue following this report. **First**, while attempted, hearing from dairy farm workers directly was difficult. The student team recommends continuing to develop long-term trust-based ties with grassroots organizations and workers to fully understand the nuances of on the ground challenges and solutions. **Second**, future legal analysis should proceed beyond the federal and state levels and focus more deeply on county-level administrative practices. The student team's interviews suggest that extended qualitative interviews with local officials would help reveal key pressure points and constraints. **Finally**, in a world of discretionary state authority and insufficient enforcement resources, mechanisms for improving local conditions *without* an active regulatory state are essential. The student team recommends exploring tools like tiplines, community surveillance, and activist litigation.

The student team hopes this report has improved current understanding of the zoonotic disease challenge in California and beyond, and can serve as a sturdy foundation for the work of future advocates and researchers.

APPENDIX 1: Statutory Background

Relevant federal agencies include:

- United States Department of Agriculture (USDA)
    - Animal and Plant Health Inspection Service (APHIS)
    - Food Safety and Inspection Service (FSIS)
    - Farm Service Agency (FSA)
    - National Veterinary Services Laboratories (NVSL)
- Centers for Disease Control and Prevention (CDC)
- Food and Drug Administration (FDA)
- Occupational Safety and Health Administration (OSHA)

These agencies and offices are empowered by a number of federal statutes and regulations. These include:

- **Public Health Service Act** (42 U.S.C. ch. 6A); select notable sections:
    - 42 U.S.C. § 264-272 ("Quarantine and Inspection"), esp.: § 264(a): regulations to control communicable diseases
        - Surgeon General (with HHS Secretary's approval) authorized to make and enforce regulations in his judgment necessary to prevent the introduction, transmission, or spread of communicable diseases from foreign countries into the States or possessions, or from one State or possession into any other State or possession.
        - May include: inspection, fumigation, disinfection, sanitation, pest extermination, destruction of animals or articles found to be so infected or contaminated as to be sources of dangerous infection to human beings, and other measures, as in his judgment may be necessary.
    - 42 U.S.C. § 247d: public health emergencies
        - If the HHS Secretary determines that a disease presents a public health emergency, the Secretary may "may take such action as may be appropriate to respond to the public health emergency, including making grants, providing awards for expenses, and entering into contracts and conducting and supporting investigations into the cause, treatment, or prevention of a disease."
        - Public Health Emergency Fund: established in the Treasury without fiscal year limitation to support rapid response.
- **Animal Health Protection Act** (7 U.S.C. ch. 109); select notable sections:

    - AHPA empowers the USDA Secretary (acting through the Animal and Plant Health Inspection Service (APHIS) with permanent and general regulatory authority over pests and diseases of animals, including livestock. These powers are expansive. For instance, APHIS may:
        - Prohibit or restrict importation, interstate movement, or use of animals/articles to prevent disease dissemination (§ 8303–8305).
        - Quarantine, seize, treat, disinfect, or destroy any animal or conveyance suspected of carrying disease (§ 8306).
        - Declare an "extraordinary emergency" and compel removal or preventive slaughter, with compensation at (generally) fair-market-value (§ 8306(c)–(d))
        - Transfer emergency funds across USDA accounts for disease control (§ 8316).
        - Impose civil and criminal penalties for non-compliance (§ 8313).
- **Food Safety Modernization Act** (21 U.S.C.)
    - Food safety legislation empowers the Food and Drug Administration to test and monitor salable agricultural products, and restrict their distribution. FDA is responsible for the safety of the US milk (and beef) supply, and can impose within-facility measures to mitigate disease risk.
- **Occupational Safety and Health Act** (29 U.S.C. ch. 15 §651 et seq)
    - The "General Duty" clause of the OSHA (§5(a)(1)) requires employers to provide workplaces free from recognized hazards capable of causing serious physical harm or death to their employees. Under the General Duty clause, OSHA can cite employers failing to institute reasonable protections for their workers. Of course, as applied to an H5N1 outbreak, legal disputes would focus on whether H5N1 constitutes a "recognized hazard."
    - Under the Act's general authorization, and while there is not a single OSHA standard that comprehensively responds to farmworker safety during a zoonotic outbreak, several existing standards and regulations are relevant to farmworkers.
    - These include:
        - PPE and the required provision of respiratory protection (29 CFR § 1910.134).
        - Sanitation requirements generally (29 CFR § 1910.141) and in agriculture in particular (§1928.110).

Relevant California agencies include:

- Office of the Governor
- California Department of Public Health (CDPH)

    - California Medical Health Coordination Center (MHCC)
- California Department of Food and Agriculture (CDFA)
    - California State Veterinarian (Director of the Animal Health and Food Safety Services (AHFSS) Division)
    - California Animal Health and Food Safety Laboratory System (CAHFS)
- California Department of Industrial Relations (CDIR)
    - California Division of Occupational Safety and Health (Cal/OSHA)
- California Environmental Protection Agency (CalEPA)
    - State Water Resources Control Board
        - Regional Water Boards

Major authorizing statutes, and relevant regulations, include:

- **Food and Agricultural Code**
    - Division 5 ("Animal and Poultry Quarantine and Pest Control")
        - Provides the foundational legal authority for state action against animal diseases.
        - Div. 5 Pt. 2: Bovine Animals
    - § 9562
        - § Grants the State Veterinarian significant power to impose quarantines. The authority can be invoked if the State Veterinarian believes, based on sound epidemiological practices or credible scientific research, that a population of domestic animals or food products derived from animals has contracted or may carry an illness, infection, pathogen, contagion, toxin, or condition that, without intervention, could transmit an illness capable of causing serious harm or death to other animals or humans.
        - The State Veterinarian's powers under this section expressly include the authority to order the movement, segregation, isolation, or destruction of animals or food products, as well as the power to hold animals or food products in place to minimize the risk of disease spread.
            - In January 2025, the State Veterinarian invoked this authority to ban all California poultry and dairy cattle exhibitions at fairs and shows.[184]
- **Health and Safety Code**
    - § 120175.5

[184] "State Veterinarian Bans All California Poultry and Dairy Cattle Exhibitions at Fairs and Shows," *California Department of Food & Agriculture*, 7 Jan. 2025, Link.

        - Outlines the powers and duties of local health officers during outbreaks and emergencies.
        - Mandates that local health officers promptly notify and update governmental entities within their jurisdiction about communicable diseases that may affect them. Notification is required (mandatory) if the local health officer believes (discretionary) that the actions or inactions of these governmental entities could impact the outbreak response efforts.
        - In addition to these mandatory duties, local health officers have the discretionary power to issue orders to other governmental entities within their jurisdiction to take any action deemed necessary to control the spread of the communicable disease. CA Health & Safety Code § 120175.5(b) (2024).
- **Department of Industrial Relations General Industry Safety Orders (Cal/OSHA Regulations)**
    - DIR and Cal/OSHA have announced employer requirements in response to the outbreak. They have also made voluntary programs available for employer participation.

    - **Title 8, Subchapter 7, § 5199.1. Aerosol Transmissible Diseases – Zoonotic**
        - Zoonotic Aerosol Transmissible Diseases are animal diseases that can infect persons through splashes, or through tiny invisible particles and droplets that float in the air.
        - When a workplace is subject to quarantine measures or infection control orders (even if there are no infected animals present), additional worker exposure control measures, PPE, training, and written safety procedures are required.
    - § 3203. Injury and Illness Prevention Program
        - Requires employers to establish, implement, and maintain an effective, written workplace injury and illness prevention program (IIPP).
    - § 5144. Respiratory Protection
        - Requires employers to develop effective respiratory protection programs with worksite-specific procedures for required use of respirators.
    - Art. 10. Personal Safety Devices and Safeguards
        - PPE-specific regulations: §§ 3380-3387, in combination with § 5199.1 (above), set requirements for PPE, depending on the hazards to which workers are exposed.

        - §§ 3395-96 provide for heat illness prevention in outdoor (3395) and indoor (3396) employment settings.
    - § 5192. Hazardous Waste Operations and Emergency Response
        - Governs training and exposure control measures for workers required to handle or dispose of dead livestock.
    - Article 111. Fumigation
        - §§5221-5223
            - Requires training and exposure control measures for workers involved in fumigation (likely more relevant for poultry than cattle operations).

APPENDIX 2: Wastewater Testing and Surveillance

Many scientific studies laud wastewater testing as "a powerful tool for tracking trends in disease incidence in communities."[185] It can be leveraged as a preventative policy offering "low cost, real time, population level data…particularly in locations with limited clinical testing."[186] In the case of H5N1, linking H5N1 RNA in milk products combined with tracking wastewater load, can let public health officials know about nearby infected herds.[187] In fact, the majority of H5N1 RNA that has been detected in US wastewater streams has been linked to discharge from milk processing facilities.[188]

While wastewater surveillance does offer a "creative workaround" in cases where direct testing is not possible,[189] this testing strategy often involves the challenge of identifying exactly the source of the H5N1.[190] Since it is estimated that 12 percent of milk available for sale is thrown out by retailers and 20 percent is thrown out by consumers, dairies are not the only source of milk containing H5N1 in sewers.[191] Additionally more research is needed to understand how humans shed H5 if they consume a dairy product that contains it.[192] For this reason, source tracking is an essential addition when interpreting wastewater surveillance data.[193]

Through testing alone it is impossible to understand the specific source of the virus, so sewer-shed sampling is needed to isolate the virus "spatially and temporally."[194] This involves an understanding of the sanitary sewer system (i.e. is it a closed separate sanitary system or combined system that receives runoff) and close collaboration between wastewater treatment plants and public health departments.[195] It also involves collaboration with independent or publicly funded labs to do the testing.[196] The spatial and temporal calculation itself for source pinpointing might involve (1) computing (2) the number of infected humans in the sewershed, (3) the liters of milk input into the sewer, (4) number of poultry contributing feces to the sewer,

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[185] Paulos, Abigail, et al., "Detection of Hemagglutinin H5 influenza A virus RNA and model of potential inputs in an urban California sewershed." (preprint), *MedRxiv,* 1 Jan 2025, Link.
[186] Wolfe, et al., "Detection of hemagglutinin H5 influenza A virus sequence in municipal wastewater solids at wastewater treatment plants with increases in influenza A in spring, 2024." *Environmental Science & Technology Letters*, 20 May 2024, 11, 6, 526-532, Link.
[187] Zulli, et al. "Infectivity and persistence of influenza A virus in raw milk." *Environmental Science & Technology Letters*, 12 Dec. 2024, 12(1), 31-36, Link.
[188] *Id.*
[189] Dhillon, R.S., et al. "Steps to prevent and respond to an H5N1 epidemic in the USA." *Nat Med,* 24 Feb. 2025, Link.
[190] Wolfe, et al. "Detection of hemagglutinin H5 influenza A virus sequence in municipal wastewater solids at wastewater treatment plants with increases in influenza A in spring, 2024." *Environmental Science & Technology Letters*, 20 May 2024, 11, 6, 526-532, Link.
[191] Paulos, Abigail, et al. "Detection of Hemagglutinin H5 influenza A virus RNA and model of potential inputs in an urban California sewershed." (preprint), *MedRxiv,* 1 Jan 2025, Link.
[192] *Id.*
[193] A. Zulli, et al. "Infectivity and persistence of influenza A virus in raw milk." *Environmental Science & Technology Letters*, 12 Dec. 2024, 12(1), 31-36, Link.
[194] Boehm, Alexandria, et al., "Frequently Asked Questions on WWSCAN Measurements of H5 Marker in Wastewater Solids." *WWSCAN Public Health and Utility*, updated 17 March 2025, Link.
[195] *Id.*
[196] "Centers of Excellence." *CDC National Wastewater Surveillance System,* 2025, Link.

and (5) the number of waterfowl contributing feces to the sewer that would be required to result in the measured H5 concentration."[197]

While wastewater testing may provide essential population level information on hotspots of H5N1 or other zoonotic disease, a successful path forward will require "multisectoral collaboration and data informed guidance."[198] This will require collaboration and coordination between and among public health, academic, municipal water treatment and community partners.[199] A workflow for what this collaboration might look like includes weekly CDC monitoring of wastewater and notification to jurisdictions where levels of the virus are high.[200] After notification, the CDC would provide a checklist[201] for following up which includes reviewing human flu surveillance thru sewer inputs in collaboration with utilities, departments of agriculture and farms and dairies themselves.[202] Without this collaboration "public health investigations into potential sources of H5 viruses in wastewater can be complex...and might support or refute likely sources of H5 without providing definitive conclusions."[203]

Wastewater testing could also function to increase general public risk awareness if information gathered is shared with the public, the media, healthcare providers and dairies and dairy workers themselves[204]. This information could be shared through data dashboards but should be "be accompanied by clear public health interpretations focusing on potential human risk and public health actions."[205] This could include "alerts to health care providers or increasing availability of testing or vaccines." [206]

Another reason wastewater testing is attractive is because, unlike direct blood tests of people, this is not a direct point-source of individuals which, because of fear of deportation/lack of job etc) people are hesitant to participate. This has pros and cons however, while it allows for humans to remain anonymous and can function as an early detection mechanism for infected herds, it is difficult to isolate the specific farm and the infected cows.[207] Used optimally, it should encourage increased specific testing of animals, if wastewater testing identified H5N1 in a region.

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[197] Paulos, Abigail, et al., "Detection of Hemagglutinin H5 influenza A virus RNA and model of potential inputs in an urban California sewershed." (preprint), *MedRxiv,* 1 Jan 2025, Link.
[198] Louis, Souci, et al., "Wastewater Surveillance for Influenza A Virus and H5 Subtype Concurrent with the Highly Pathogenic Avian Influenza A(H5N1) Virus Outbreak in Cattle and Poultry and Associated Human Cases — United States, May 12–July 13, 2024," *Morbidity and Mortality Weekly Report*, 19 Sept. 2024, 804–809, Link.
[199] *Id.*
[200] *Id.*
[201] "Supplementary Material: Checklist for jurisdictional response to elevated levels of influenza virus and H5 detections in wastewater," *Morbidity and Mortality Weekly Report*, 12 Sept. 2024, Link.
[202] Louis et al., "Wastewater Surveillance for Influenza A Virus," Link.
[203] *Id.*
[204] *Id.*
[205] *Id.*
[206] *Id.*
[207] Dr. Jennifer Spencer, interview by Jordan Stock, Zoom, May 6, 2025.

APPENDIX 3: Key Animal Waste Management Guidance (Federal and State)

Federal:

- "Safety Guidelines: Disposing of Dead Animals after a Disaster." CDC, 20 Feb. 2024, www.cdc.gov/natural-disasters/safety/safety-guidelines-disposing-dead-animals-after-a-disaster.html?CDC_AAref_Val=www.cdc.gov/disasters/animaldisposal.html
- "Carcass Management." *USDA: APHIS*, 2024, www.aphis.usda.gov/animal-emergencies/fadprep/carcass-management
    - APHIS's robust carcass management documents and planning guide
- "HPAI Response New State Checklist." *USDA: APHIS,* 9 Dec. 2024, https://www.aphis.usda.gov/sites/default/files/newstatechecklist.pdf
    - Guidance checklist for farms when infected and managing dead species
- "Highly Pathogenic Avian Influenza Response Plan: The Red Book." *USDA,* May 2017, https://www.aphis.usda.gov/sites/default/files/hpai_response_plan.pdf
    - USDA's overarching management booklet developed after the 2014 avian flu outbreak in poultry
- "Quick Reference for HPAI Disease Management." *USDA: APHIS,* 20 Nov. 2023, https://www.aphis.usda.gov/sites/default/files/emrsquickrefguide-ai-20231120.pdf
    - Notably, these documents focus on poultry infection, depopulation, and carcass management with little to no mention of other species.
- "HPAI in Livestock." *USDA: APHIS*, 2024, www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-livestock
    - APHIS's only H5N1 cattle-specific guidelines focus on biosecurity plans and reporting cases generally.

State:

- "Emergency Animal Disposal Guidance." *CalEPA*, 2006, calepa.ca.gov/disaster/animals/
- "Emergency Animal Disease Regulatory Guidance for Disposal and Decontamination." *CalEPA,* 20 Oct., 2004 https://calepa.ca.gov/wp-content/uploads/2016/10/Disaster-Documents-EADisease.pdf
    - Identifying CDFA as the guiding California agency in this space
- "Emergency Animal Mortality Preparedness Rendering Service Disruption in the Central Valley Mortality Disposal Options for Dairy." *CDFA,* 2 Sept. 2022, https://www.cdfa.ca.gov/AHFSS/pdfs/dairy_emergency_mortality_disposal_preparedness_guidance_final_09012022_cdfa.pdf
    - Guidance for alternative disposal options during declared states of emergency and when extreme heat periods slow rendering facility operations.
- "Preparedness and Response." *CDFA, 2025,* www.cdfa.ca.gov/AHFSS/Animal_Health/eprs/preparedness_response/
    - Providing more updated guidance for farmers that is, nonetheless, vague and defers to the seemingly not-online local requirements.

- “Emergency Response Carcass Management Information and Demonstration Field Day – California.” *CDFA,* 15 Feb. 2022, https://www.cdfa.ca.gov/AHFSS/Animal_Health/pdfs/Emergency_Response_Carcass_Management_Event_Flyer.pf
    - CDFA sponsors occasional carcass management trainings.

APPENDIX 4: Indemnification Reform

The existence of federal indemnification programs—which provide agricultural and livestock producers compensation when they suffer recognized injuries—has inspired scholars[208] and advocates[209] to consider: might these programs serve as a lever policymakers could pull to drive on-premises management changes? This appendix engages that possibility in the context of HPAI H5N1.

Standing and emergency USDA-administered facilities provide indemnification payments to qualifying producers who suffer qualifying harms. These facilities complement the broad array of federal agricultural risk-management tools, including government-reinsured crop and livestock insurance policies. Remedying an initial exclusion, in June 2024 the Biden administration expanded the Emergency Assistance for Livestock, Honeybees, and Farm-raised Fish Program (ELAP) to include dairy producers, allowing qualifying producers to recover losses caused by reduced milk production following confirmed positive H5N1 tests.[210] (7 CFR § 1416.103(j)). It is not clear that this rule has been extended beyond its initial 2024 lifespan.[211] In the House, Reps. David Valadao (R-CA), whose district includes part of the San Joaquin Valley, and Elissa Slotkin (D-MI) introduced legislation[212] to codify this rulemaking by amending the Farm Bill's ELAP provisions to include "dairy cattle" within the definition of covered livestock, and "highly pathogenic avian influenza" among covered diseases.[213] ELAP is funded through the Commodity Credit Corporation, which has a permanent, indefinite borrowing authority from the Treasury. Despite this authority, CCC's borrowing authority has been limited to a $30bn annual congressional cap.[214]

Much like with USDA-reinsured insurance policies, USDA enjoys the power to guide on-farm practices through the attachment of qualifying conditions to indemnity payments.[215] This power may be a powerful incentive for producers to adopt biosecurity or other mitigating measures, but would also likely be the subject of intense opposition, depending on the extent of producer reliance on existing unqualified indemnities. Reform could, for instance, mirror

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[208] Lara Bryant and Claire O'Connor. "Creating Incentives to Improve Soil Health Through the Federal Crop Insurance Program." *Global Soil Security*, 2017, 403-409.
[209] Gillespie, Katie. "Are We Subsidizing the Next Pandemic? How Government Payments to Big Poultry Threaten Public Health." *FarmForward*, March 2025, Link.
[210] "USDA to Begin Accepting Applications for Expanded Emergency Livestock Assistance Program to Help Dairy Producers Offset Milk Loss Due to H5N1." *USDA*, 27 June 2024, Link.
[211] "USDA Reminds Livestock Producers of Disaster Assistance Application Deadline for 2024 Losses." *USDA*, 8 January 2025, Link.
[212] Avian Influenza Research and Response Act, H.R. 9182, 118th Cong. (2024)
[213] 7 U.S.C. 9081(d)(1).
[214] Stubbs, Megan. "The Commodity Credit Corporation (CCC)," *Congressional Research Service*, 14 January 2021, Link.
[215] On the potential of crop insurance qualifying conditions to drive on-farm management changes, *See, e.g.,* "Climate Change: Options to Enhance the Resilience of Agricultural Producers and Reduce Federal Fiscal Exposure (GAO-23-104557)." *GAO*, 16 Feb. 2023, Link; Bryant, Lara and O'Connor, Claire. "Issue Paper: Covering Crops: How Federal Crop Insurance Program Reforms Can Reduce Costs, Empower Farmers, And Protect Natural Resources." *NRDC* Dec. 2017, Link; Ballard, Grand. "A Practitioner's Guide to the Litigation of Federally Reinsured Crop Insurance Claims." *Drake Journal of Agricultural Law,* Iss. 17, no. 3, 2012, 531-64.

existing restrictions on payments for affected poultry and egg producers. Those regulations provide that producers' claims will be denied unless they had in place, and followed, a "poultry biosecurity plan" that met defined requirements, passed a "biosecurity audit" within a defined period, and so on. 9 C.F.R. § 53.10(g)(1).

Public health scholars generally encourage liberal indemnification regimes to encourage testing, monitoring, and rapid reporting to public health authorities.[216] On the other hand, liberal indemnification may create moral hazard within the program, as producers are permitted to externalize the costs of poor on-premises biosecurity to taxpayers. Given these compelling motivations, and notwithstanding the countervailing concerns, a recommendation to attach onerous conditions to indemnification payments should be made cautiously in light of the risk that compliance costs exceed the value of indemnities received.

Currently, federal indemnification programs are administered through a combination of federal and state actors. While the federal government creates programs, sets eligibility criteria, and processes claims, state officials play a number of operational and administrative roles. CDFA and CAHFS conduct herd- and flock-level investigations and testing, critical since a positive test result from a state agricultural lab is typically the first step toward a successful indemnification claim. CDFA could also enforce quarantines and movement restrictions on affected premises, which would demonstrate, for indemnification eligibility purposes, that production losses have been caused by public health measures taken in response to the outbreak.

Given that California agencies take on these important operational responsibilities for the USDA/APHIS indemnification program, could California launch a program of its own, either to heighten requirements, or in response to a federal pull-back? California likely enjoys the legal authority to create a state-level indemnification regime either via legislation or executive action under the governor's emergency powers. CA Govt Code § 8550 et seq. (2024). But there would be several challenges:

First, unlike USDA's ELAP program, California would be unable to draw on mandatory (vs. discretionary) US Treasury funds to finance the emergency indemnification payouts. Instead, California would need to provide funds directly from the state budget. Since California—unlike the federal government—cannot run a multi-year budget deficit, new spending for an indemnification program that would likely run into the tens of millions is unlikely.[217]

Second, California would also be required to deploy the administrative resources today provided by USDA. It is unclear whether California has—or could rapidly develop—the claims infrastructure or actuarial staff necessary to price, process, verify, and pay claims.

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[216] Linder et al. "Animal Markets and Zoonotic Disease Risk: A Global Synthesis of a 15 Country Study." *Harvard Law School*, 21 July 2024, pp. 80, 122, Link.

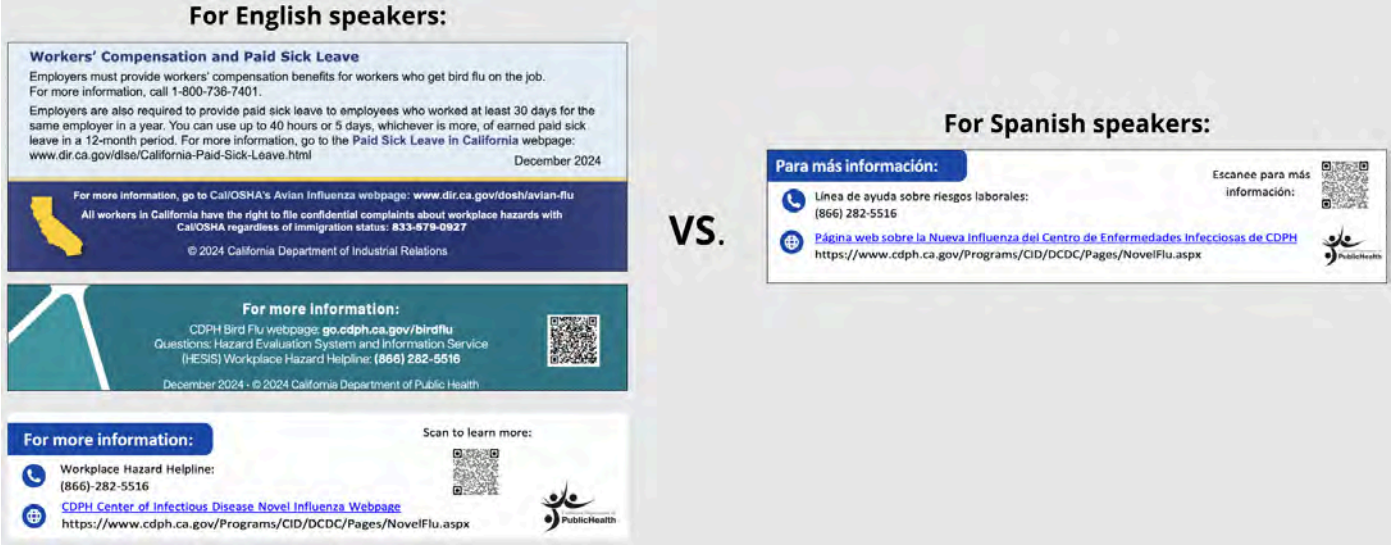
[217] Recent years have been turbulent. In the 2024-25 budget process, the legislature was forced to address a $68bn deficit caused by disappointing revenue and tax deadline extensions. Petek, Gabriel. "The 2024-2025 Budget: California's Fiscal Outlook." *Legislative Analyst's Office*, December 2023, p. 3, Link. The budget outlook for 2025-26 is comparatively rosy, but an effective indemnification program would share features of programs capable of wreaking budget chaos: the potential for uncapped state liability. Petek, Gabriel. "The 2025-2026 Budget: California's Fiscal Outlook." *Legislative Analyst's Office*, November 2024, Link.

Third, a state-level program would also overlap with existing USDA indemnification programs. This might raise concerns about federal preemption of the regulatory field, and invite litigation from California dairy farmers challenging the constitutionality of a state system under the Supremacy Clause. The overlap between state and federal programs would also need to comply with federal cost-sharing rules to avoid future funding "clawbacks," given federal restrictions on using multiple sources of public funds to pay for the same expenses.

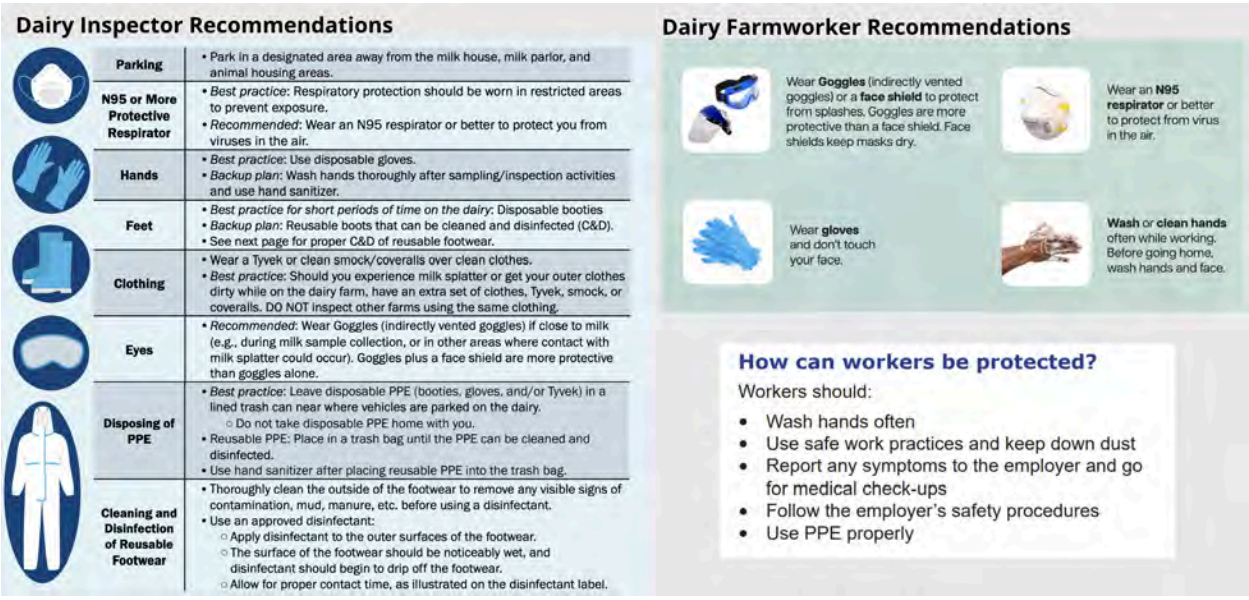
Fourth, concerns (discussed above) about the moral hazard in the indemnification program may frustrate legislative attempts to fund an indemnification program on the state budget. This could, of course, create opportunities for "deals" with legislators interested in reforming dairy operations.

APPENDIX 5: English–Spanish Variation in Public Health and Dairy PPE Guides

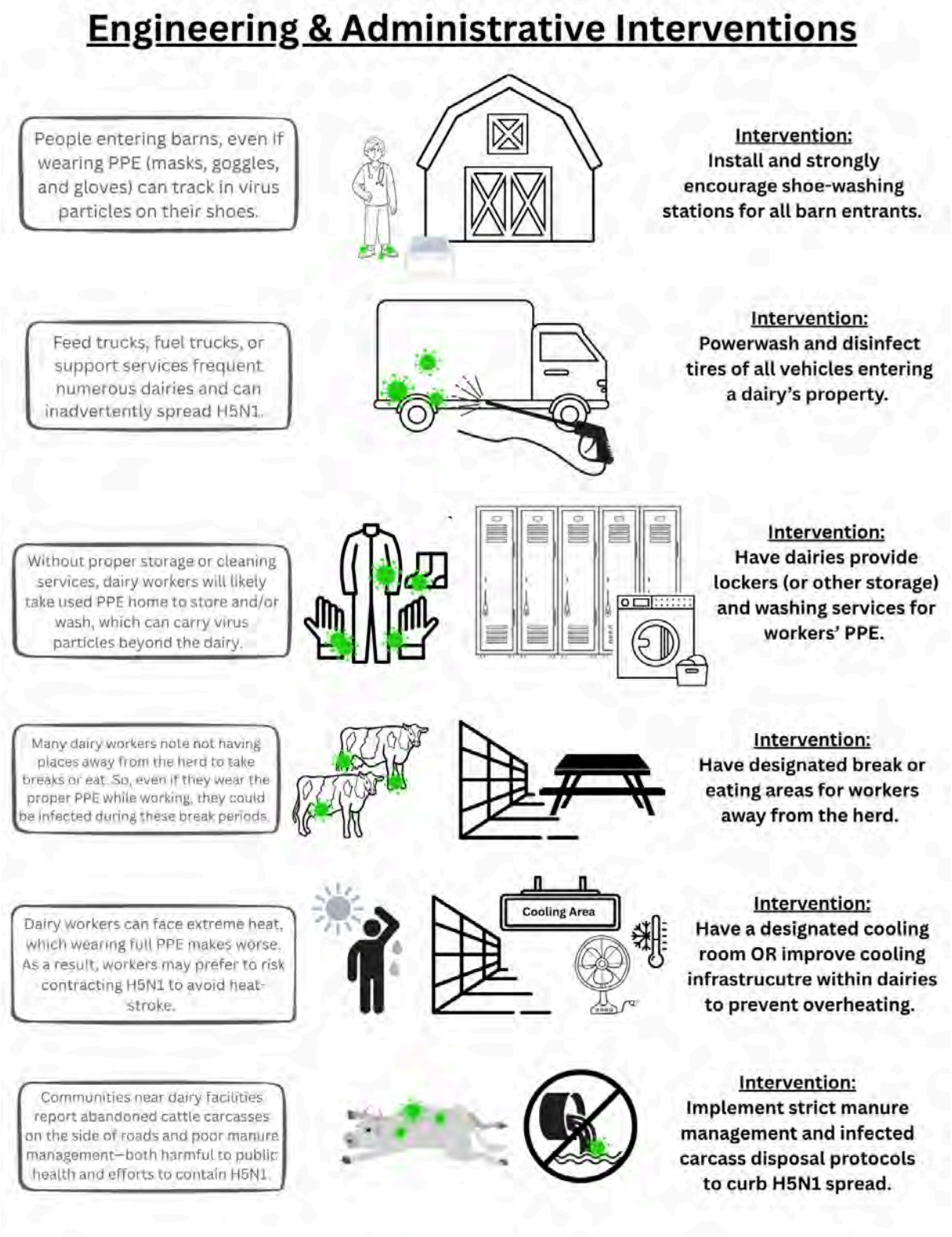
The following comparison highlights differences between CDPH and CDFA public-facing communications by language. While the English-language flyer informs workers of their employment rights, the Spanish-language equivalent provides only a link to general influenza-related information.



The following comparison highlights differences between CDFA PPE guidance targeted at CDFA Dairy Inspectors (left) and dairy farmworkers (right).



APPENDIX 6: Sample Infographics

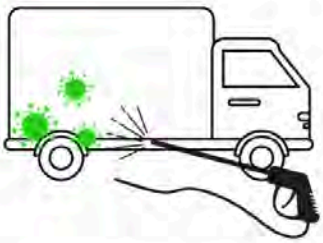


Intervenciones administrativas y de ingeniería

Las personas que entran en los graneros, aun cuando están protegidas con máscaras, gafas protectoras y guantes, pueden transportar las partículas del virus en los zapatos.

Intervención:
Se recomienda instalar una area destinada a la limpieza de zapatos

El virus H5N1 podría expandirse a través de los camiones de comida, los camiones de gasolina u otro vehículo que entre a dar servicio a los animales, por medio de las llantas.

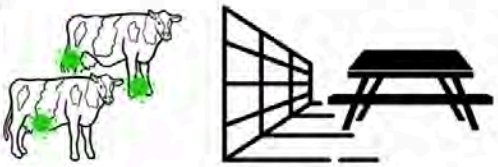


Intervención:
Es recomendable lavar a presión las llantas de los vehículos que entran a las lecherías.

Sin los servicios apropiados de limpieza, los trabajadores de las lecherías se llevan consigo los artículos de protección, en los cuales pueden transportar las partículas del virus H5N1 a sus casas.

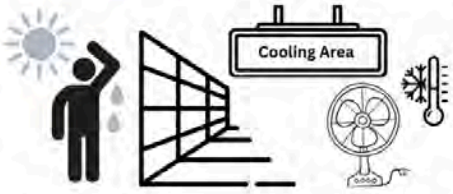
Intervención:
Es recomendable proveer a los trabajadores un área apropiada con lockers y servicios de limpieza.

Muchos trabajadores lecheros notan que no tienen lugares alejados del rebaño para descansar o comer. Por lo tanto, incluso si usan el EPP adecuado mientras trabajan, podrían infectarse durante estos períodos de descanso.



Intervención:
Tenga áreas designadas para descansar o comer para los trabajadores lejos del rebaño.

Los trabajadores lecheros están expuestos a altas temperaturas, lo cual dificulta el uso de mascarillas o gafas de protección. Por lo tanto, muchos se arriesgan al virus H5N1 para evitar un golpe de calor debido al exceso de calor.



Intervención:
Tener una sala de enfriamiento designada O mejorar la infraestructura de enfriamiento dentro de las lecherías para evitar el sobrecalentamiento.

Habido reportes de las comunidades cerca a las lecherías la falta de mantenimiento de salud debido a que vacas muertas abandonadas y acumulacion de estiercol ambos provocan danos a la salud y continenen el virus H5N1.

Intervención:
Implementar protocolos estrictos de manejo del estiércol y eliminación de cadáveres infectados para frenar la propagación del H5N1.

PPE & Enforcement Interventions

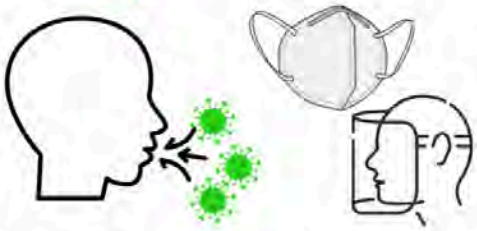
Infected raw milk splashing in workers eyes is a significant mode of transmission.

Intervention:
Provide and strongly encourage all dairy workers to wear protective eyewear (such as googles) while working.

Workers not wearing gloves can spread pathogens, and touching the face (gloved or not) can also transmit H5N1.

Intervention:
Provide and strongly encourage all dairy workers to wear disposable gloves, ban rewearing gloves, and emphasize not touching one's face while working.

H5N1 can spread to dairy workers through inhalation of aerosolized or droplet-borne pathogens.



Intervention:
Provide and strongly encourage all dairy workers to wear N95 masks (and, optionally, face shields) while working in areas of potential transmission.

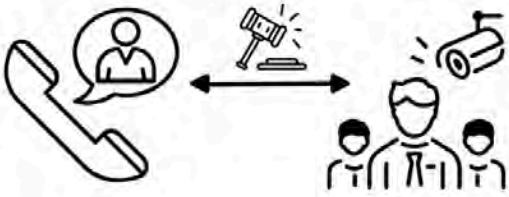
H5N1 particles can linger on clothing, footwear, and hair and spread despite the use of goggles, gloves, and a mask.

Intervention:
Provide and strongly encourage all dairy workers to wear bootcovers, hair/head covers, and either fluid-resistant coveralls or a waterproof apron.

Many dairy workers report not receiving clear or human-focused H5N1 education, leaving them confused and unaware of how to best protect themselves.

Intervention:
Provide and strongly encourage all employees to attend on-site education on proper PPE use, public health protocols, and H5N1 transmission vectors.

Dairy workers report inadequate protections, while owners say workers don't follow proper H5N1 protocols.



Intervention:
Dairy workers can anonymously report unsafe conditions to Cal/OSHA's multilingual tipline. Dairy supervisors should take a more active role in monitoring and enforcing safety protocols.

EPP & ejecución intervención

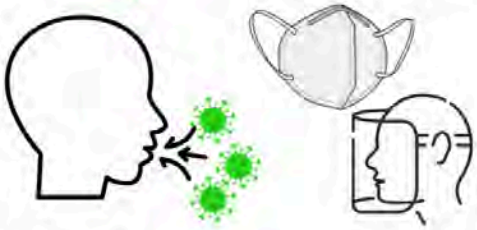
La leche cruda infectada que salpica los ojos de los trabajadores es un modo importante de transmisión.

Intervención:
Proporcionar y alentar encarecidamente a todos los trabajadores lácteos a usar gafas protectoras (como gafas) mientras trabajan.

Los trabajadores que no usan guantes pueden propagar patógenos y tocarse la cara (con o sin guantes) también puede transmitir el H5N1.

Intervención:
Proporcionar y alentar firmemente a todos los trabajadores lecheros a usar guantes desechables, prohibir volver a usarlos y enfatizar no tocarse la cara mientras trabajan.

H5N1 puede transmitirse a los trabajadores lácteos mediante la inhalación de patógenos en aerosol o transmitidos por gotitas.

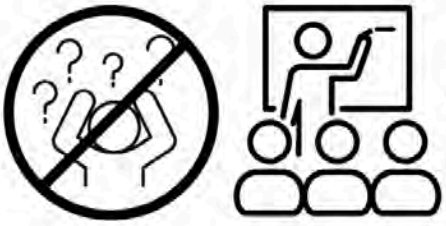


Intervención:
Proporcionar y alentar encarecidamente a todos los trabajadores lácteos a usar máscaras N95 (y, opcionalmente, protectores faciales) mientras trabajan en áreas de posible transmisión.

Las partículas de H5N1 pueden permanecer en la ropa, el calzado y el cabello y propagarse a pesar del uso de gafas, guantes y mascarilla.

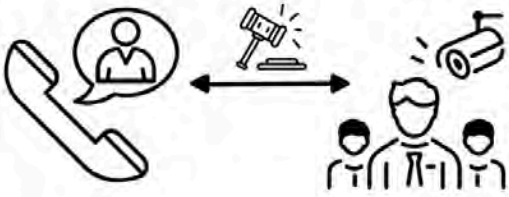
Intervención:
Proporcionar y alentar encarecidamente a todos los trabajadores lecheros a usar cubrebotas, cubiertas para el cabello y la cabeza y monos resistentes a los líquidos o un delantal impermeable.

Muchos trabajadores lecheros informan que no han recibido una educación clara o centrada en las personas sobre H5N1, lo que los deja confundidos y sin saber cuál es la mejor manera de protegerse.



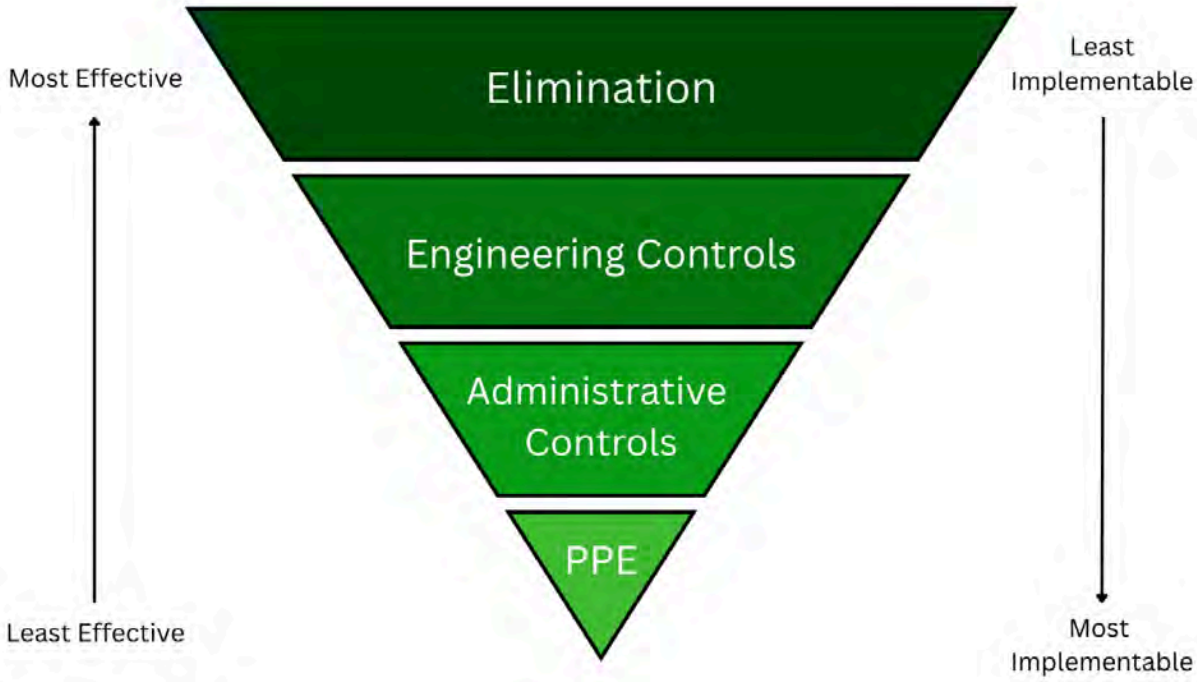
Intervención:
Proporcionar y alentar encarecidamente a todos los empleados a que asistan a educación en el lugar sobre el uso adecuado del EPP, protocolos de salud pública y vectores de transmisión del H5N1.

Los trabajadores lecheros reportan protecciones inadecuadas, mientras que los propietarios dicen que los trabajadores no siguen los protocolos contra el H5N1.



Intervención:
Los trabajadores lecheros pueden denunciar de forma anónima condiciones inseguras a la línea telefónica multilingüe de Cal/OSHA. Los supervisores lecheros deberían asumir un papel más activo en el seguimiento y aplicación de los protocolos de seguridad.

Hierarchy of Controls - H5N1 in California Dairy



Concept Applied to H5N1 Policy Interventions

Physical removal of the hazard: A functional One Health approach to zoonoses management (NOHF) would improve communication between stakeholders and facilitate surveillance and testing.

Isolate people from hazard: PPE storage and washing systems, dairy cooling infrastructure, washing stations, separate break areas for workers, transit policies for trucks entering and exiting facility

Changes to the way people work: Distance from animals during breaks, washing and masking policies, PPE washing services for workers, adequate financial support for infected workers

Personal Protection Equipment: Providing free and adequate PPE, proper and consistent use, storage, and disposal of PPE, comprehensive and multilingual communication of risks and protection strategies to all affected parties of an outbreak

Jerarquía de controles: H5N1 en productos lácteos de California

Concepto aplicado a las intervenciones políticas contra el H5N1

Eliminación física del peligro: Un enfoque funcional de Una Salud para la gestión de zoonosis (NOHF) mejoraría la comunicación entre las partes interesadas y facilitaría la vigilancia y las pruebas.

Aislar a las personas del peligro: Sistemas de almacenamiento y lavado de PPE, infraestructura de enfriamiento de lácteos, estaciones de lavado, áreas de descanso separadas para los trabajadores, políticas de tránsito para camiones que entran y salen de las instalaciones.

Cambios en la forma de trabajar de las personas: Distancia de los animales durante los descansos, políticas de lavado y uso de mascarillas, servicios de lavado de EPP para los trabajadores, apoyo financiero adecuado para los trabajadores infectados

Equipos de protección personal: Proporcionar EPP gratuito y adecuado, uso, almacenamiento y eliminación adecuados y consistentes de EPP, comunicación integral y multilingüe de riesgos y estrategias de protección a todas las partes afectadas de un brote.