Bird Flu H5N1 Dairy & New World Screwworm Update

September 22, 2025

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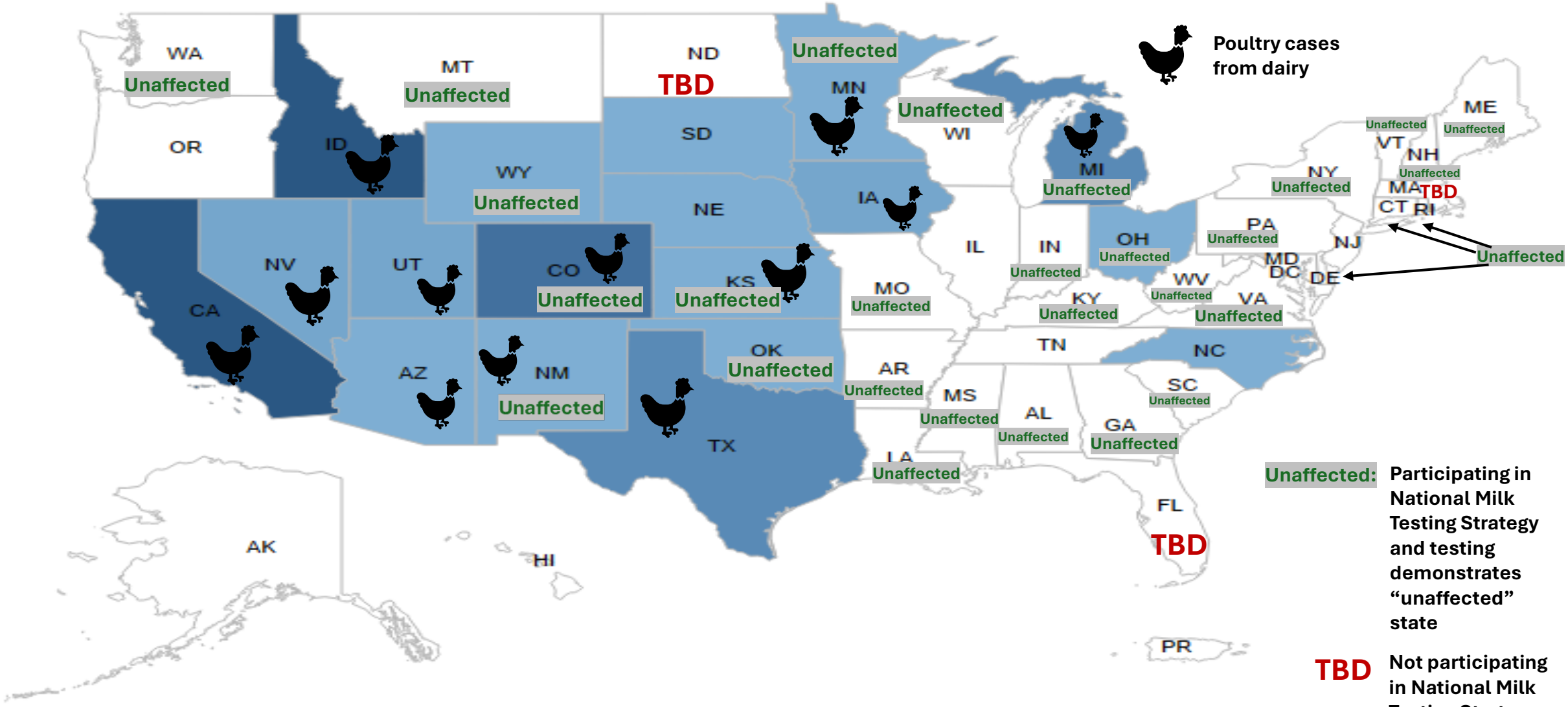
California Department of Food and Agriculture

Number of Confirmed Cases in Cattle by State, Total Outbreak

Legend
- 0
- 1 to 10
- 11 to 25
- 26 to 50
- 51 to 75
- 75+

September 16, 2025 USDA Data



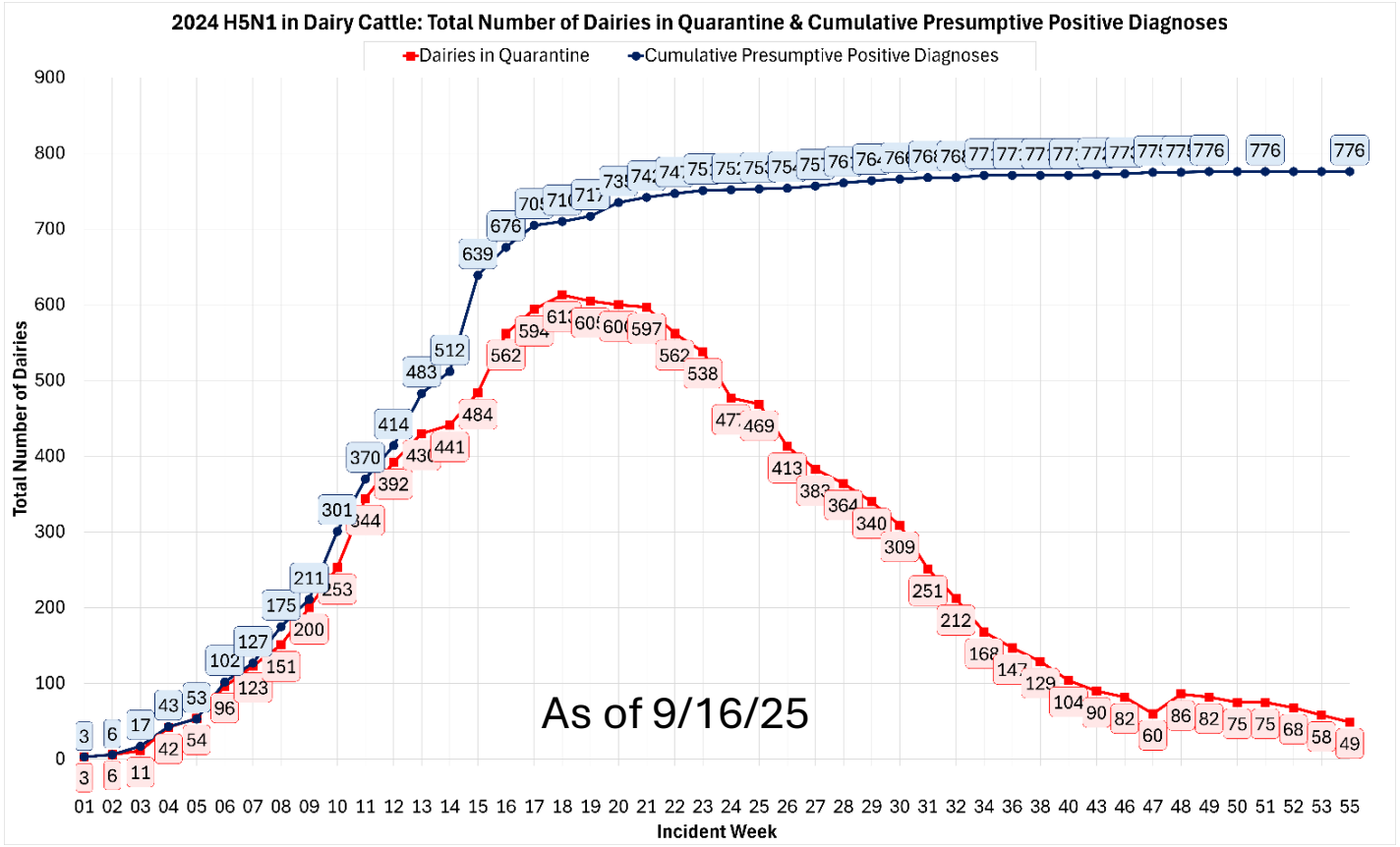
Unaffected: Participating in National Milk Testing Strategy and testing demonstrates "unaffected" state

TBD Not participating in National Milk Testing Strategy

DAIRY: Herd immunity may not last

Aug 26, 2024 – Sept 16, 2025

- 775 cumulative positive dairies (768 confirmed by USDA), 60 currently quarantined, 715 released
- *Few "Redetections" each week - stabilized*
- Ave. time quarantined for those released: 110 days
- Time under Quarantine: 11 to 307 days and counting
- 1,000 under surveillance (all)
- 1,000 samples per week
- 688 biosecurity audits
- 1004 epi interviews



CA Livestock Research List for 2024 HPAI Outbreak

* Research in Progress: June 2025

Study of Disease

Pathology of HPAI in dairy cows & fetuses in California *(CAHFS)*	*Better understand pathogenesis of disease, including all tissue sites of infection and replication and risks to pregnant dairy cattle and their fetuses*
Extended evaluation of H5N1 viral shedding, transmission routes, & clinical presentation in infected dairy calves *(UC Davis)*	*Evaluate H5N1 viral transmission dynamics in dairy calves that can inform management decisions and biosecurity measures to reduce disease spread*

Environment

Evaluation of dairy feed rations as a potential source of HPAI *(UC Davis)*	*Develop and validate a testing procedure for H5N1 in dairy cow feed rations and quantify virus contamination in samples from infected farms and cows*
USDA Wildlife Services sampling on affected premises in California *(USDA Wildlife Services)*	*Conduct enhanced surveillance for H5N1 on or near infected premises to better understand viral transmission*
Sampling house flies on infected farms *(USDA Agricultural Research Service)*	*Evaluate prevalence of H5N1 in house flies as potential indicator of farm infection and as vector for disease transmission*

Intervention

Evaluation & development of an on-farm, ready-to-use protocol for inactivation of H5N1 through milk acidification *(UC Davis)*	*Evaluate acidification of milk as an option for inactivating H5N1 under field conditions and use of treated milk for feeding preweaned dairy calves; develop on-farm guide for milk acidification*
Effect of heat treatment on HPAI virus viability in colostrum from HPAI-infected dairy cows *(UC Davis)*	*Demonstrate the effect of heat treatment on H5N1 virus viability in colostrum from HPAI-infected cows*

* Outlined projects represent research being facilitated through CDFA and/or USDA; completion may be subject to investigator factors, producer participation, and other research components outside CDFA/USDA control. *Updated: June 2025. Organizations leading research projects noted in (parentheses).*

CA Livestock Research List for 2024 HPAI Outbreak

*** Research in Progress: June 2025**

Transmission

Early detection of & extended sampling on infected dairies for holistic characterization & control of H5N1 *(Colorado State University; Private Veterinary Clinic)*	*Collect a battery of samples and other data throughout all phases of disease to help determine routes of intra-herd and inter-herd transmission and impacts on immunity, environment, and wildlife*
HPAI 20: Tulare's modified USDA longitudinal (extended) study *(UC Davis)*	*Comprehensively evaluate animal hosts and environmental factors for infected and uninfected cows on infected dairies*
Evaluation of transmission & infection from routine introduction of naïve cows (springers, dry cows) to H5N1-infected herds *(UC Davis)*	*Better understand the risk of transmission to springers and dry cows at calving and introduction to lactating herds, as well as viral shedding and immune response in these cows*
Post-quarantine survey to characterize epidemiology & impact of HPAI on CA dairy herds *(UC Davis)*	*Better understand HPAI outbreak epidemiology and impact on CA dairy herds, as well as test the hypothesis that heat wave, season, herd management practices, and geographic location are associated with severity*
Spread of HPAI within dairy herds: inferring key parameters using a modeling approach *(UC Davis)*	*Develop robust mathematical models to better predict transmission routes, viral shedding duration, and effectiveness of potential control measures, which can also serve as decision-making tools for industry*
Air sampling of high-risk areas to better understand transmission risks *(Private Researcher)*	*Testing for ambient virus, in areas of new or recent infection, or at other locations thought to potentially be at risk of airborne spread from dairy*

Economics

Supply & milk market impacts of H5N1 in CA: Economic data analysis to improve understanding & project impacts *(UC Davis)*	*Aid in understanding potential impacts of HPAI on milk supplies and market impacts, including prices, quantities, incomes, and expenditures across affected groups*
Poultry & egg market impacts of H5N1 in CA: Economic data analysis to improve understanding & project impacts *(UC Davis)*	*Aid in understanding potential impacts of HPAI on poultry and eggs, including prices, quantities, incomes, and expenditures across affected groups*

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Dairy Economic Impact Study H5N1 in California

UC Davis Agricultural and Resource Economics, Sumner

- Initial infection has significant impacts on individual dairy production ~ 16% reduction in milk from norm
- California milk output began to fall below its no-H5N1 projected quantities with a 1.1% drop in September 2024. Production losses deepened to about **9.1% in November** and 8.4% in December before tapering gradually to 1.8% below the projection in April 2025.
- May numbers show an uptick in year over year losses to 2.75%

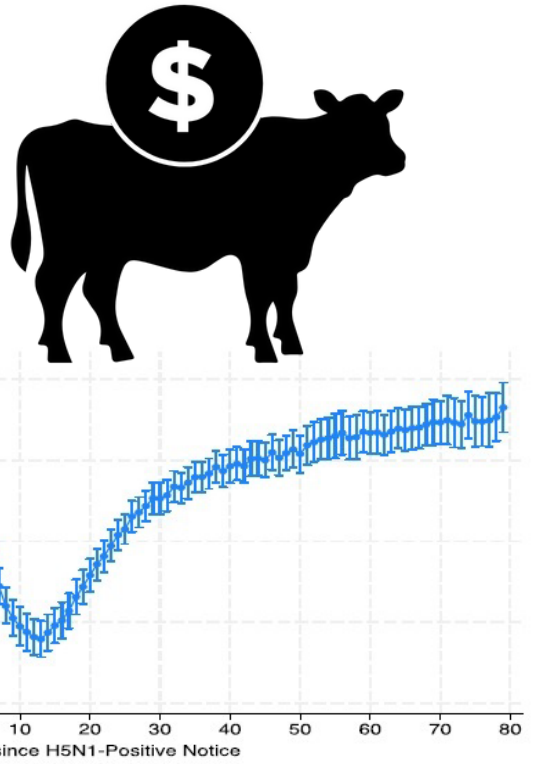


Figure 2: Average difference in daily milk production relative to the H5N1 Notification date

Note: The figure displays the predicted changes in the 7-day moving average of daily milk production are estimated using a linear regression with month dummy variables. Figure 1 includes 95% confidence intervals.

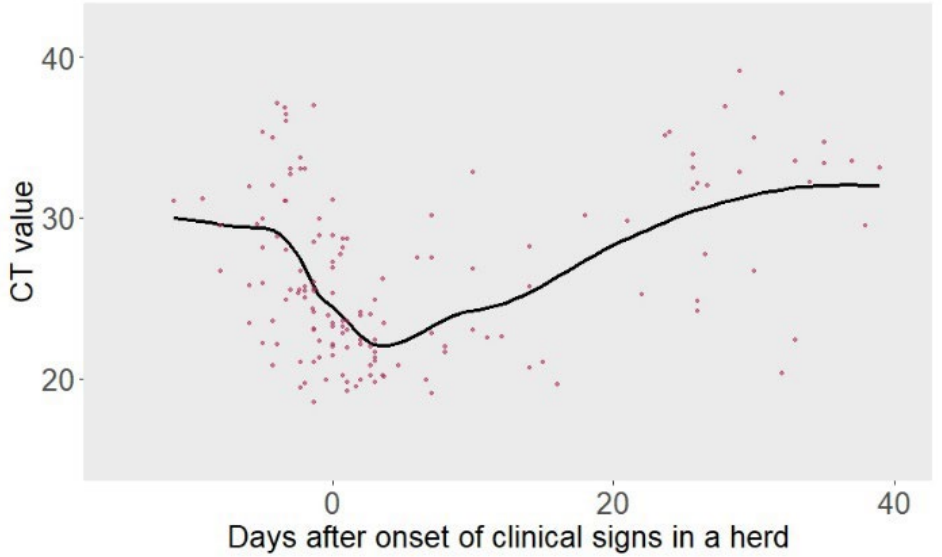
Important Economic Impacts of H5N1 in California Dairy

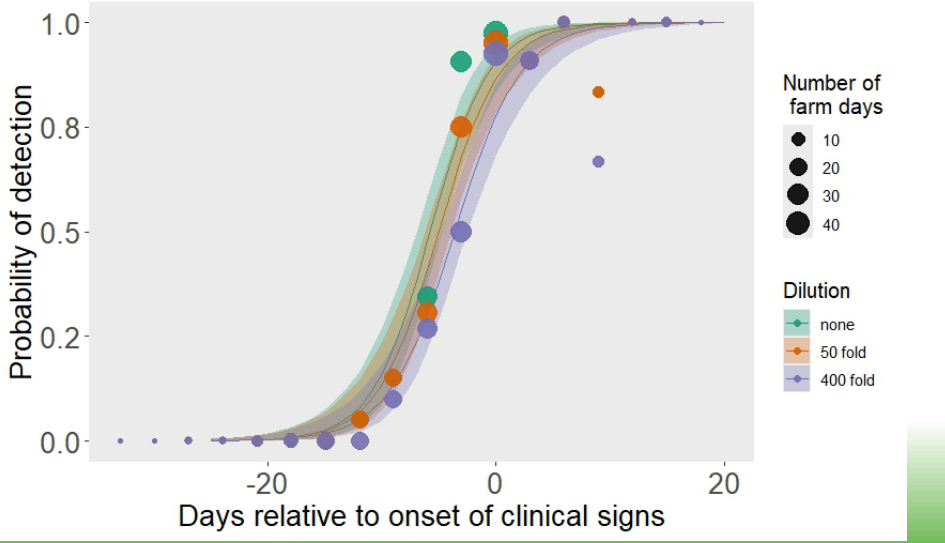
(Sumner et al, continued)

- Total production shortfall is about **1.36 billion pounds (about 4%)** in California (Sept-May).
- **No rise in farm milk prices** caused by H5N1
- Most California milk enters U.S. and global markets as storable dairy products. The drop in California milk production was not enough to move dairy commodity prices.
- With milk prices unaffected, impacts on farm milk revenue follow the effects on farm production. Lost milk revenue was about **$186 million in 2024,** another $119 million (through May), for a total of **$305 million, so far**.
- Farm losses include cows that died or had to be culled early, added cow health care labor and supplies, and management time, among other losses.
- USDA Farm loss recovery payments (ELAP): 585 paid applications totaling **$310 million in 2024,** and 196 paid applications totaling **$46 million in 2025,** for a total of **$356 million, so far.**
- The total net loss calculations are on-going.
- What happens next is unknown. Immunity is a big question. **Dairy impacts continue.**

Bulk Milk Tank and Silo Sensitivity (USDA CEAH)

- Naive herd during early phase →BMT positive about one week before signs
- If wait to test until after clinical signs, BMT slowly becomes less effective over time
- Hospital and milk string equally effective for sampling
- Silo - For INITIAL infection and early testing, silo samples should work well, but less sensitive after recovery. To determine if on-going infections, BMT is more sensitive
  - Regression fit to California BTM for initial detections at three different dilutions
  - 50-fold dilution, an 800-gallon bulk tank into a 40,000-gallon silo, and for a 400-fold dilution, a 2,000-gallon bulk tank into an 800,000-gallon silo





Breed/genetic factors?

Appears to be breed immune system response differences with Holstein springers, even those housed with Jerseys, seroconverting (evidence of infection and immune response) more often than Jerseys

Other Findings

- Rapid transmission through dairy (CSU, UCD)
- Systemic infection, not just milk; milk highest viral load; manure neg /urine sometimes positive / adult respiratory samples usually neg *but* significant respiratory impacts on naive herds (CSU, UCD, others)
- Air sampling most frequently picks up in parlor +/- where wash water enters lagoon, but continuing to look for evidence of wind transmission (Various)
- Peri-domestic wildlife cases (doves, pigeons, sparrows, mice, rats, etc.). Cases more common around poultry than dairies.
- Flies seem to be implicated, significant study is on-going (USDA ARS)
- Milk tanker surfaces negative, but more testing in newly infected region needed

- Calves:
  - Calves and heifers/dairy feeders have tested positive (CFFA, UCD, CDFA). Immune status and viral shedding are big questions.
  - Current assumption: seroconvert (immune response) by 19-34 days of age if from an infected dairy (incubation 12-24 days plus seroconvert 7-10 days); little evidence of lateral spread on a calf ranch but additional research pending (Calf Raiser Data, UCD, USDA)
  - Fetuses / Abortion can detect virus, looking at pathology (UCD)

Other Findings - Products

- Stability of virus: Viable longer when cold; time depends on how much virus. For typical high virus titer in lactating cow: refrigerated raw milk – 45 days. For 10 log reduction (more than typically needed): cold milk 69 days, rm temp 24 days; Steel/Polypropylene cold 40 days, rm temp 4 days; wastewater room temp 16 days (NIAID, UCLA)

- Pasteurized Products are safe, regardless of herd status. Pasteurization effectively inactivates (kills) virus at standard legal temperatures and times (FDA/USDA Studies)
- Aging of raw milk cheese a concern (FDA); Viable virus still found at 120 days of aging (Two FDA-funded studies at Cornell). Effective aging period still unknown.
- HPAI Recommended Best Practices for Raw Milk Cheese Makers developed by National Association of Dairy Regulatory Officials in cooperation with NASDA, FDA and USDA. CDFA participated on working group. Opportunities for USDA funds to support processor testing of milk for use in raw cheese making. Information available online at nadro.org

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New World Screwworm Executive Briefing

Outline

(Note – There are graphic pictures)

- Reemerging Threat
- What is New World Screwworm (NWS)
- How Introduced to New Areas
- Potential Impacts to CA
- Response Basics
- Disposal

History of NWS Distribution and Eradication

GUSANO BARRENADOR DEL GANADO
Mida-USDA
COPEG

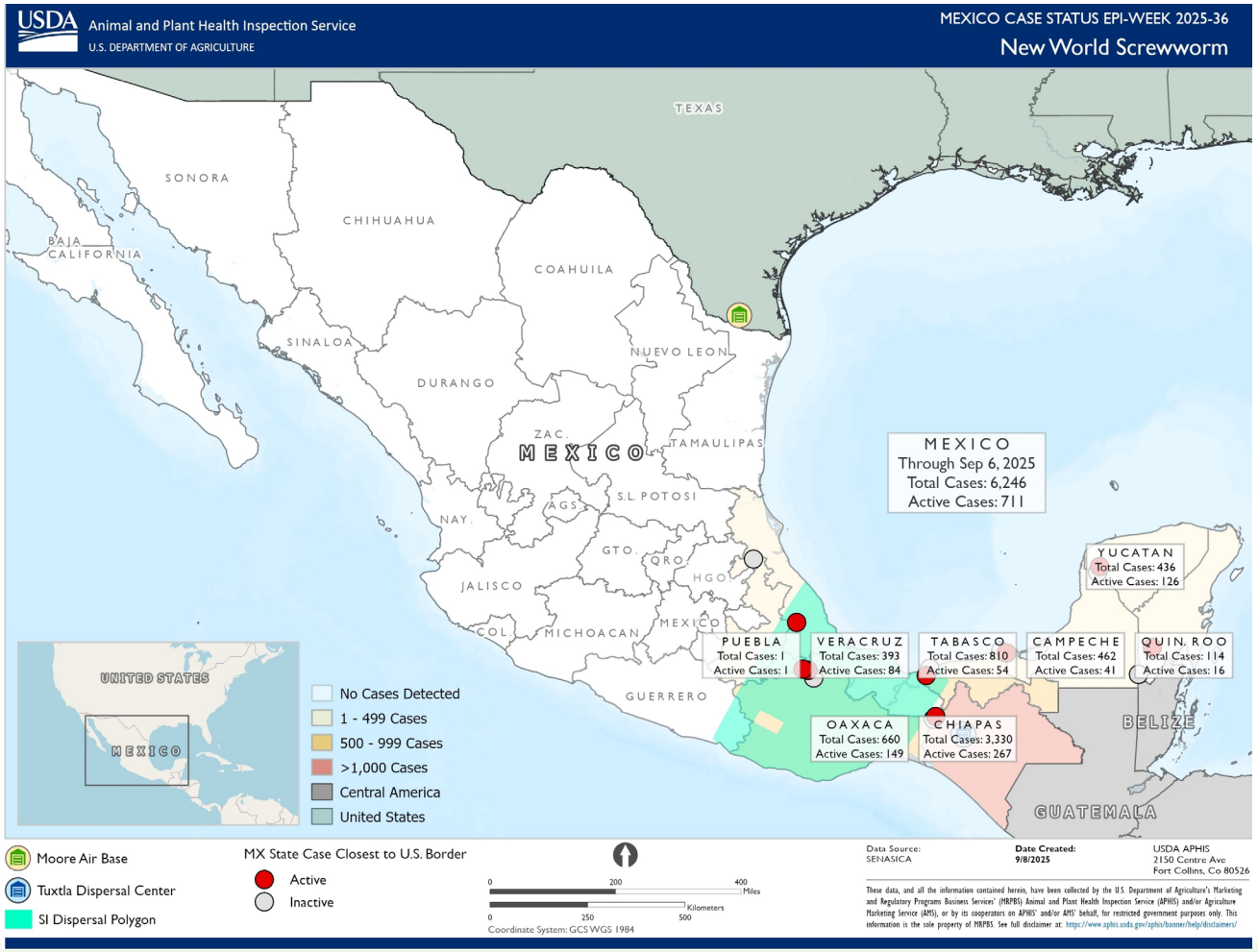
A reemerging threat to California

New World Screwworm (NWS), previously contained at the Darien Gap of Panama; has been moving north since 2022, detected in MX in Nov 2024.

Nat'l Biosurveillance Integration Center Monitoring List 20250701

A reemerging threat to California

- MX cases continue to increase
- Northern most case **Veracruz, Mexico.*
- *COPEG releasing 100 million flies/wk (max production)*
- *USDA providing $21 Million to renovate Metapa, Mexico production facility*



What is New World Screwworm (NWS)

1. *Cochliomyia hominivorax* fly
2. Myiasis: Infestation and feeding by a larval fly (maggot)
3. NWS only feeds on LIVING tissue of warm-blooded animals

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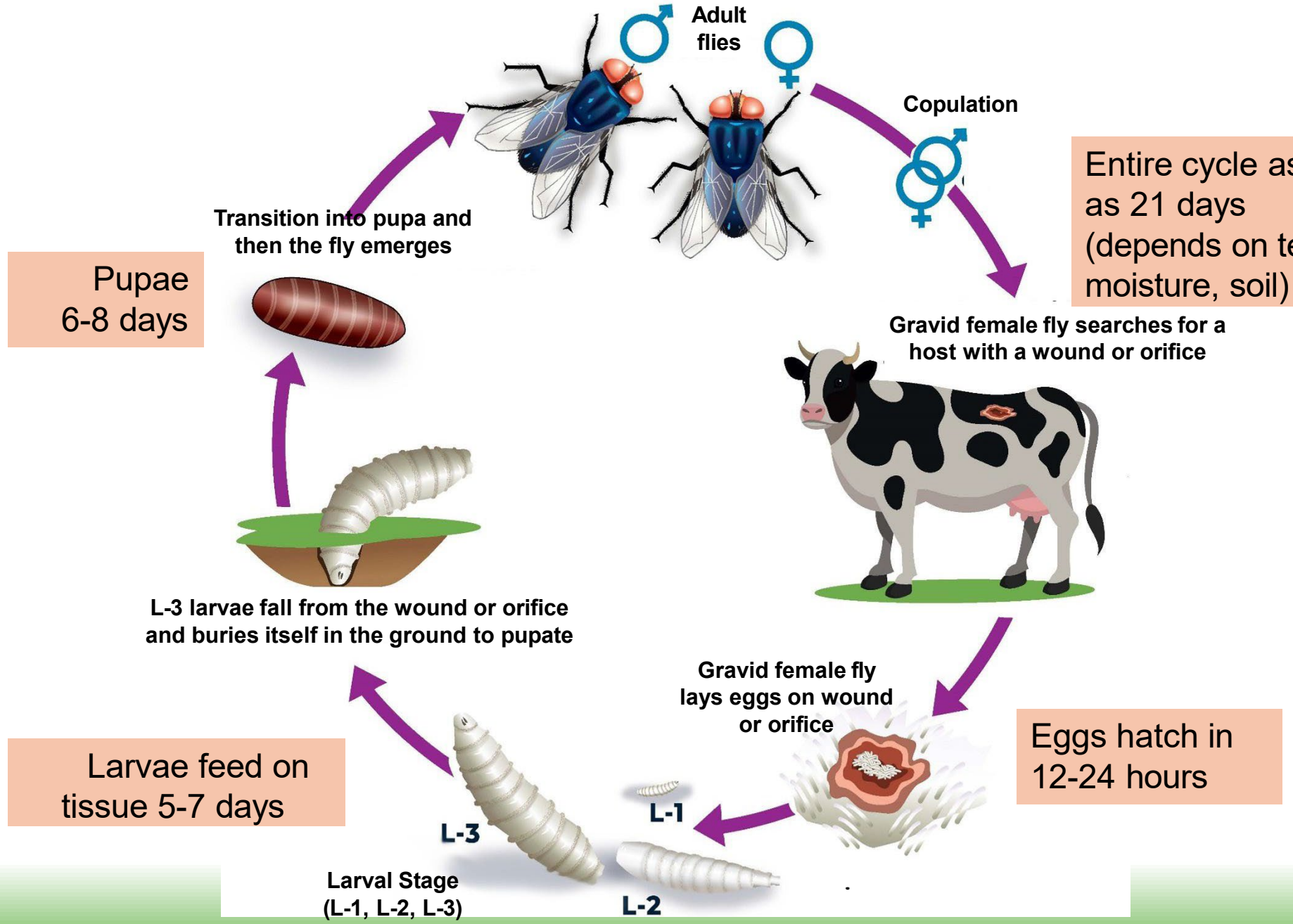
NWS Life Cycle



NWS In Animals

- Female fly deposits eggs around wounds:
  - tick bite or mucous membrane openings (nose, eyes, ears, anus, genitalia, or in umbilicus)
- Larvae enter wound to feed on ***living tissue*** *(vs Blowfly and Botfly)*
- Multiple infestations in one wound are common
  - Can attract other species of blowflies to the wound
- Not direct animal to animal spread (Life Cyle)

Clinical Signs

- Larvae visible in wound by day 3; may be hundreds present
- Up to 17mm (7/10 inch) long
- Bloody discharge
- Foul odor
- May only have small wound but deep, infested pockets under skin
- Animal depressed, off feed, separate from herd/self-isolate, head shaking

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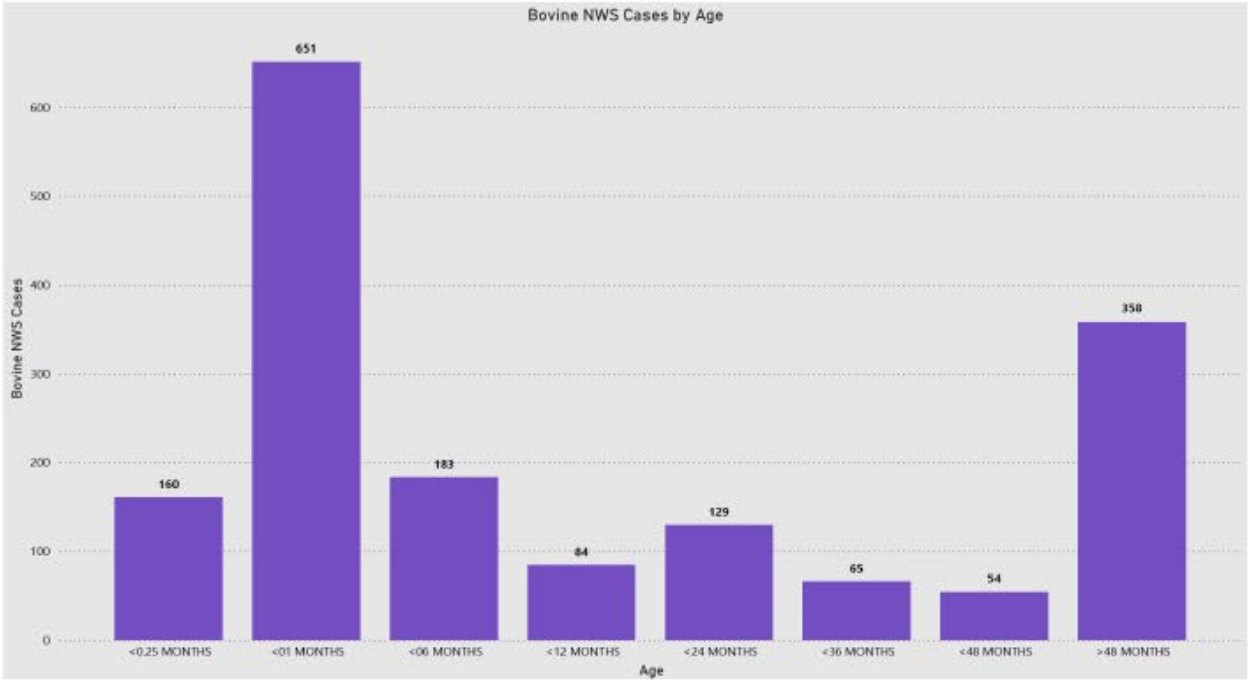
Morbidity

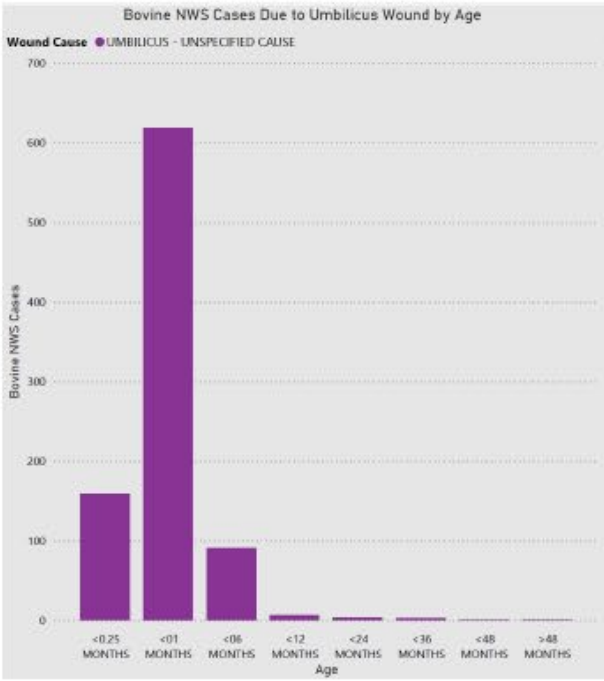
- Varies with conditions (age, organ affected)
- Systemic illness due to secondary bacterial infections
- Treatment with parasiticides can be successful when detected early

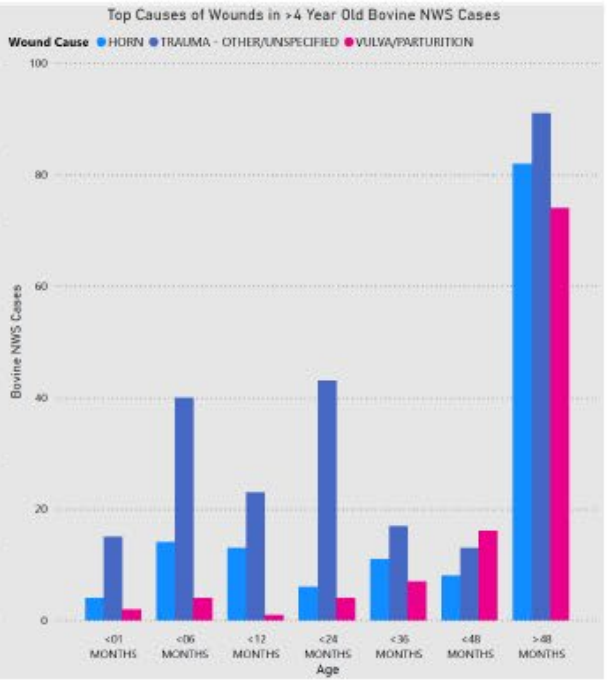
Mortality can occur in 7-14 days without treatment

Newborns highly susceptible due to fresh umbilicus

Mexico Case Data



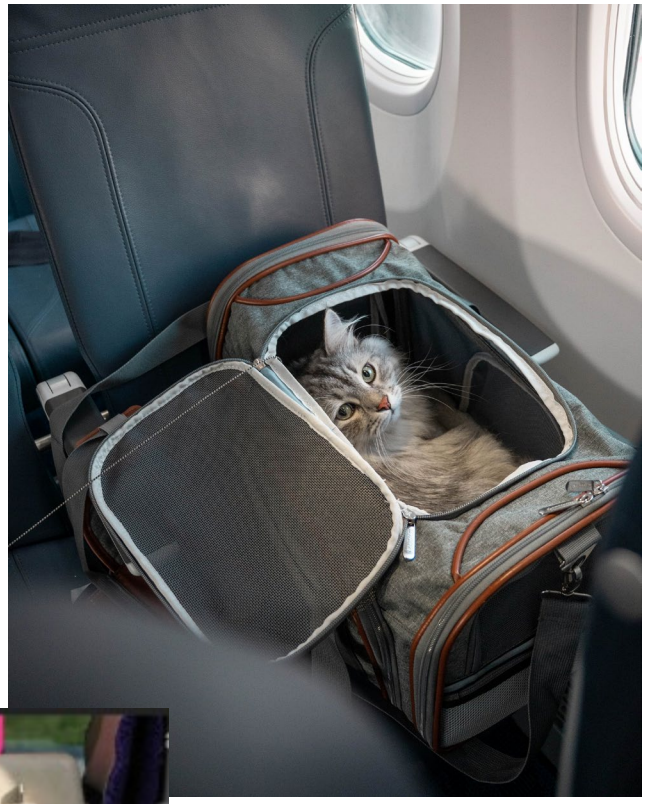




Source Data: Mexico Data Epi Week 22 (June 2) and 23 (June 9)

How Introduced to New Areas

- Illegal Animal Movement
- Undetected larvae on pets (esp. dogs), people, wild animals, livestock, poultry
- Flies tend to stay in area if conditions support but can migrate



Potential Impacts to California

1. **Hundreds of millions in losses to both California livestock producers as well as the general California economy.**

Reuters

NWS Losses: Texas Data	1976 Results	2016 Results (Adjusted for inflation only)	2024 Results (Adjusted for inflation only)
Cattle Population	7,224,515	-	-
Cattle Infestation Rate	20.60%	-	-
Cattle Cost/Case	$81.51	$346.28	$452.14
Sheep & Goat Population	3,654,945	-	-
Sheep & Goat Infest. Rate	9.10%	-	-
Sheep & Goat Cost/Case	$32.38	$137.56	$179.61
Total Cattle Cost	$121,307,258	$515,351,210	$672,897,355
Total Sheep & Goat Cost	$10,769,588	$45,752,456	$59,738,286
Texas Producers Losses	**$132,076,846**	**$561,103,666**	**$732,635,641**
Texas Economy Loss	**$329,598,005**	**$1,400,235,237**	**$1,828,293,838**

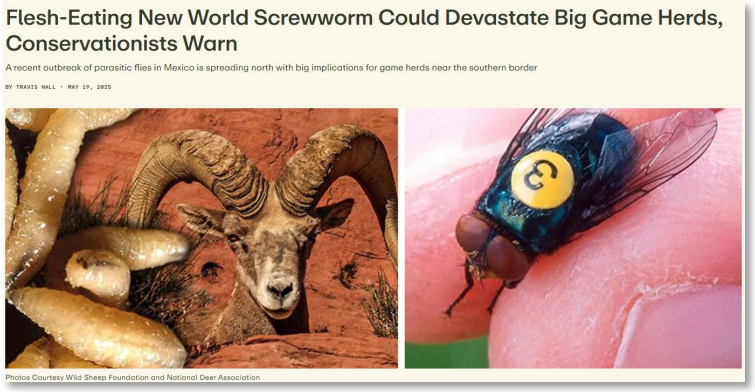
USDA

Potential Impacts to California

2. Negative public reaction to disturbing nature of the parasite and loss of wildlife.

American Veterinary Medical Association

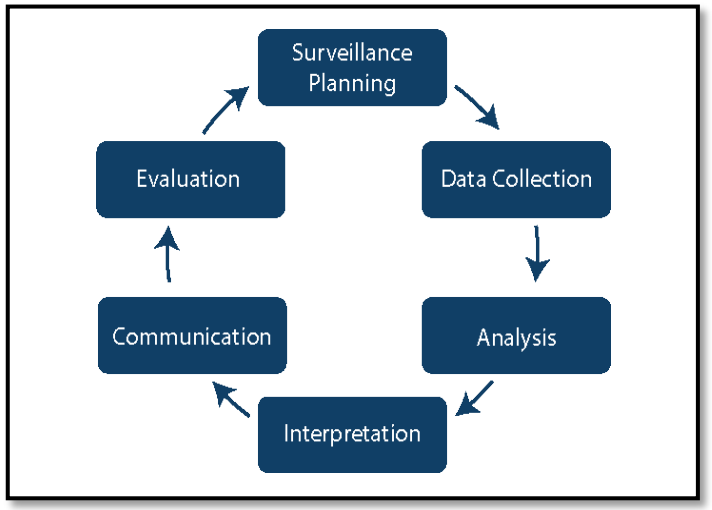
New York Post



Field & Stream / Wild Sheep Foundation

Potential Impacts to California

3. State response costs for carcass disposal, surveillance, movement control, public education, and eradication.



https://depts.washington.edu/edgh/app-ipc/web/surveillance_pt1.html

USDA APHIS

NBC News / Max Cash – AP File

Response Strategy to NWS

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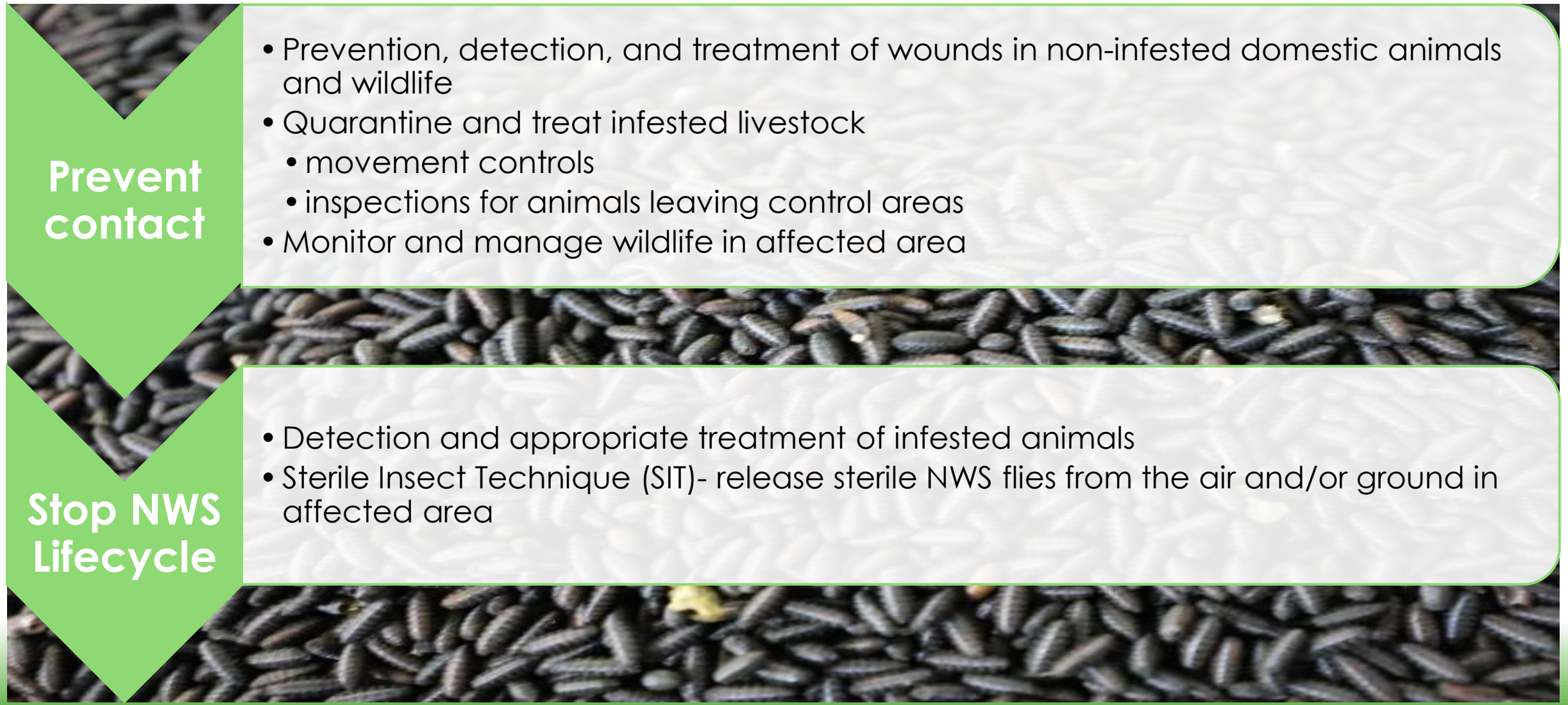


Prevent contact

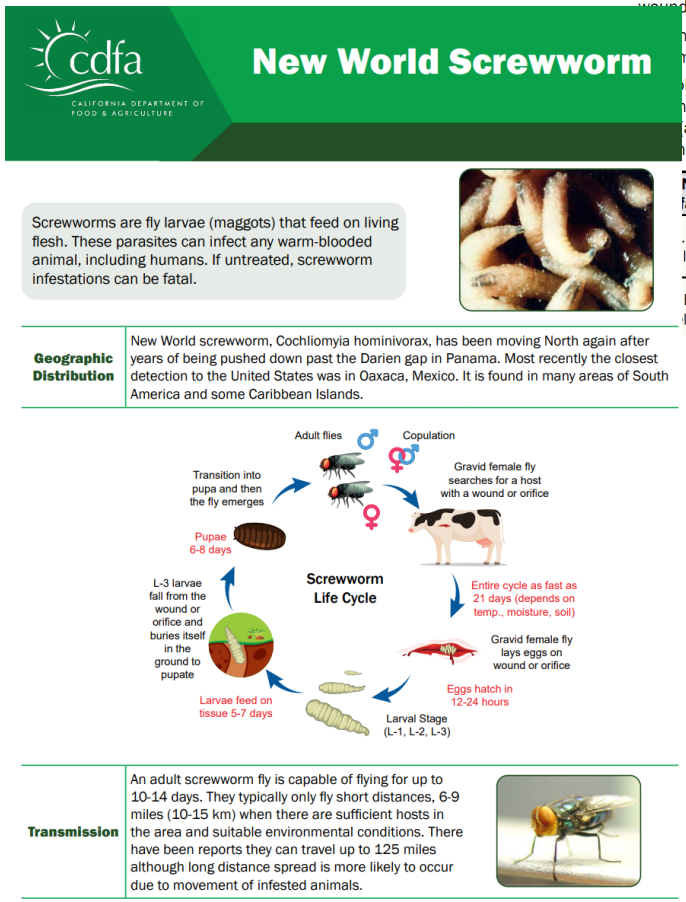
- Prevention, detection, and treatment of wounds in non-infested domestic animals and wildlife
- Quarantine and treat infested livestock
  - movement controls
  - inspections for animals leaving control areas
- Monitor and manage wildlife in affected area

Stop NWS Lifecycle

- Detection and appropriate treatment of infested animals
- Sterile Insect Technique (SIT)- release sterile NWS flies from the air and/or ground in affected area

Current Activities

- Monitoring
- Outreach and Education
- Mitigation
- Surveillance
- Planning
- Coordination
- Preparation



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New World Screwworm

Screwworms are fly larvae (maggots) that feed on living flesh. These parasites can infect any warm-blooded animal, including humans. If untreated, screwworm infestations can be fatal.

Geographic Distribution	New World screwworm, Cochliomyia hominivorax, has been moving North again after years of being pushed down past the Darien gap in Panama. Most recently the closest detection to the United States was in Oaxaca, Mexico. It is found in many areas of South America and some Caribbean Islands.

Transmission	An adult screwworm fly is capable of flying for up to 10-14 days. They typically only fly short distances, 6-9 miles (10-15 km) when there are sufficient hosts in the area and suitable environmental conditions. There have been reports they can travel up to 125 miles although long distance spread is more likely to occur due to movement of infested animals.

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List of Recommended Products for Treatment/Prevention of Screwworm in California

Treatment Management of Infested Small Animals and Origin Premises:

1. All visible eggs and larvae must be removed from in and around the wound. The wound should then be thoroughly cleaned and disinfected.

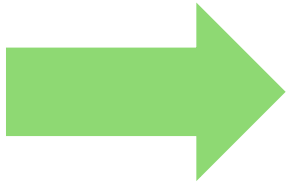
nding on severity, the animal may need extensive wound care, mic antimicrobials, and analgesia.

llowing systemic applications have larvicidal activity and have n to be effective in eliminating screwworm larvae from affected attending veterinarian to implement one treatment that is most appropriate based on overall of the dog and the presence of any comorbidities):

Name and facturer	Active Ingredient	Dosage	Frequency
. Novartis l Health	Nitenpyram	Label recommendations for flea control	Initial Dose with second dose 6 hours after 1st administration
Boehringer lheim	Afoxolaner	Per label recommendations	Single treatment. Provide minimum dosage of 2.5 mg/kg

Interagency Coordination

1. Plant Health & Pest Prevention Services Division
2. CalOES, CalTrans, CHP, and Cal EPA
3. Dept. of Public Health
4. Dept. of Fish & Wildlife



1. Border station inspections, fly dispersal, fly trapping, outreach
2. Quarantine area management, checkpoints, disposal support, risk communication
3. Human health & companion animal response planning
4. Wildlife response

Disposal Issues & Options for New World Screwworm

The gold standard for disposing of NWS suspect or confirmed carcasses is incineration.

A properly designed and operated biological incinerator with an afterburner can effectively destroy pathogens and reduce emissions. However, it's essential to coordinate such disposal with local Air District personnel and ensure compliance with the California Health and Safety Code, which permits open burning for disease abatement and prevention in some circumstances. (CAHFS, NVS, Other?)

Challenges – Regulations, Transport to Offsite, Thermal Tissue Digesters are costly, not readily available, and are not mobile.

Disposal Issues & Options for New World Screwworm

Burial has been shown to be a secondary option for disposal, but the carcass must be at least 4 feet deep.

Challenges - California Regional Water Board has not approve this disposal method. Landfill will/should not accept due to concern of becoming a breeding ground and employee safety. Transportation to an off-site location is a challenge.

Disposal Issues & Options for New World Screwworm

Dehydrator Systems:

- These are used routinely in the United States in the poultry industry. They achieve high temperatures for pathogen elimination using heating elements and an auger system. The finished product is an animal meal product that can be easily sent to a landfill with no restrictions.
- For livestock and larger animals with denser bones we would have to use particle reduction (horizontal grinders and then place the material into the poultry-based dehydrators or buy systems that are designed to take swine carcasses and have stronger auger system for the denser bones.

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Questions?