



U.S. Department of Agriculture (USDA)
Animal and Plant Health Inspection Service (APHIS)
Veterinary Services (VS)
Strategy and Policy (S&P)
Ruminant Health Center (RHC)
August 2023

Hawaii Tuberculosis Eradication Program Review

May 2023

Review of Hawaii's Tuberculosis Management and Mitigation Activities

2023 Review of Hawaii's Tuberculosis Eradication Program

Dates of the Review: May 23 - May 25, 2023

Executive Summary

Animal Plant Health Inspection Services (APHIS) conducted a virtual review of the Hawaii bovine tuberculosis (TB) program the week of May 23-25, 2023. Review team members completed a preliminary review of program documents and database information requested from HDOA, APHIS Wildlife Services (WS) and Hawaii Veterinary Services (HI VS) staff prior to virtual interviews.

The review members identified areas for improvement and detailed them in this report. Recommendations discussed with HDOA and HI VS included:

- Filling open HDOA staff positions on the island of Moloka'i;
- Complete removal and postmortem examination of remaining TB-exposed trace swine;
- Complete migration of TB program data and management to the Surveillance Collaboration Services (SCS) database and consider developing electronic version of movement permits; and
- APHIS VS should continue supporting validation of the QuantiFERON Gold gamma test.

Background

In response to multiple positive TB herd detections in 2021-2022, Hawaii Department of Agriculture (HDOA) placed a quarantine on the island of Moloka'i starting April 8, 2022. A total of six TB-affected herds were detected between July 2021 and March 2022, including a mixed herd that contained positive detections in both cattle and domestic swine.

TB was first detected in cattle on Moloka'i in 1941 and then again on multiple occasions over the following decades. TB was detected in axis deer for the first time in the 1970's and feral swine in the 1980's. In an effort to eradicate TB, all cattle on the island were depopulated in 1985 followed by a phased restocking. A single positive herd detection in 1997 led to testing of all cattle herds on the island and an extensive wildlife surveillance effort was implemented from 1998-2012. Cattle producers in Eastern Moloka'i are required to conduct annual herd testing and movement testing out of that region of the island since 1997. The 1997 herd detection represented the last TB detection in cattle on Moloka'i prior to July 2021.

As the result of the herd detections in 2021-2022 and detection in an axis deer on Moloka'i in April 2022, HDOA and APHIS entered into a TB Program Memorandum of Understanding (MOU) on November 23, 2022. The MOU is valid for one year.

Review Objectives

Review objectives are derived directly from the articles of the MOU and are listed as a separate numbers and letters under sections I and II. Findings and observations are reported beginning on page 7 and correlate with each objective by number or letter as listed below.

I. Evaluate HDOA compliance with Article 5 of the MOU required for the maintenance of Accredited Free Status.

1. Designate, in writing, an authorized representative who shall be responsible for collaboratively administering the activities conducted under this MOU.
2. Require official electronic identification for any live cattle moved from premises on the island of Moloka'i with the exception of any animals moved direct to slaughter on the Island of Moloka'i and have the ability to retrieve information concerning animal identification and animal movement within 48 hours.
3. Require all cattle on the island of Moloka'i be double tagged at the time of bovine Tuberculosis (bTB) testing with an official electronic identification tag and a secondary HDOA approved identification tag. The goal is complete double-tagging of all Moloka'i herds by July 1, 2023. All identification must be captured and entered into the SCS or other approved database within 60 days of placement by HDOA in cooperation with VS personnel.
4. Maintain and enforce Quarantine Order #158, "Bovine Tuberculosis Quarantine. Island of Moloka'i," restricting movement of live ungulates, except horses, to prevent spread of disease. Modification or lifting of the quarantine order may be performed by HDOA in concurrence with USDA APHIS VS.
5. All live ungulates on the island of Moloka'i are prohibited from moving unless an approved movement permit is obtained. HDOA will maintain and enforce the DC-8 movement permit system to request, approve, and track movement of live ungulates on Moloka'i.
6. Prior to the movement of cattle on Moloka'i:
 - i. The herd of origin shall have completed a negative whole herd test (WHT) for bTB of all animals four months of age or older and all non-natural additions of any age within the past four months, or
 - ii. The cattle for movement shall be tested negative for bTB within 30 days prior to movement.
 - iii. Cattle are exempt from testing requirements in parts a. and b. above when permitted direct to slaughter or into terminal feedlot approved by HDOA in conjunction with APHIS.
7. Shipments of bTB exposed Moloka'i cattle direct to slaughter on O'ahu's Hawaii Meats plant will be allowed under conditions detailed in the joint USDA-HDOA Standard Operating Procedure No: A1_2022-03-10, or as amended. All livestock movement to slaughter will be accompanied by an approved movement permit and in an officially sealed conveyance and moved directly to an approved slaughtering establishment for immediate slaughter. Non-exposed cattle from Molokai herds not

- under herd quarantines for bTB that have been tested negative within 12 months may be shipped to slaughter at the Oahu Hawaii Meats plant under the HDOA “Permit to Ship” FORM DC-8.
8. Prior to the movement of captive Axis deer on Moloka’i:
 - i. All captive deer are required to test negative for bTB 30 days prior to movement.
 - ii. Captive deer are exempt from pre-movement bTB testing if moved directly to a recognized slaughter establishment on Moloka’i.
 - iii. All live ungulates require a Permit to Ship for DC-8 to move including to slaughter.
 9. HDOA will utilize State authority to conduct unscheduled inspections of livestock shipments on public roads within Moloka’i for compliance with State requirements and this MOU.
 10. Quarantine and procedures for affected herd
 - i. The State of Hawai'i will continue to issue quarantines (refer to section H) for each affected herd identified, and conduct official bTB testing, removal or depopulation of animals as stipulated within individual herd management plans.
 - ii. HDOA will quarantine all premises that contain animals suspicious for the presence of *M. bovis* as outlined in the 2005 Uniform Methods and Rules until determined to be negative for bTB. On a case-by-case basis, HDOA and USDA APHIS VS may approve movement of animals off a quarantined premises where animal welfare or other concerns related to quarantined animals exist. APHIS VS will expedite appraisal and approval of indemnity for cattle as described in Article 6.F.
 - iii. All herds in which Comparative Cervical Tuberculin (CCT) Suspect or Reactor animals are identified shall be quarantined immediately. Exposed animals must remain on the premises where bTB detection is confirmed unless a State or Federal permit for movement has been obtained. Movement of animals for immediate slaughter must be shipped directly to a slaughtering establishment where approved State or Federal inspection is administered. Exposed animals must be identified by official eartags.
 - iv. Herd plans will be developed and implemented for all affected herds in concordance with APHIS. Compliance with and successful completion of the herd plan is necessary for removal of operation/herd quarantine.
 - v. Sale of feeder calves from quarantined herds shall be restricted. Feeder calves under 12 months of age that have passed a Caudal Fold Tuberculin (CFT) test within 60 days may be permitted to move within slaughter channels to an approved feedlot provided the movement is compliant with procedures in Article 5D.
 - vi. When *M. bovis* infection has been confirmed in a herd, an epidemiologic investigation and tracing will be initiated. During the investigation, HDOA will administer the VS epidemiological questionnaire and complete tracing within 30 days of confirmation of infection in cooperation with VS.

- vii. VS Cattle Health Center staff, HDOA and Hawaii VS will develop Test and Remove (T&R) herd management plans for affected herds based upon review of the epidemiologic investigation and the VS CEAH T&R model.
- viii. All animals moved from a premises prior to being released from quarantine shall be shipped and accompanied by an approved movement permit either:
 - 1. Directly to slaughter;
 - 2. Directly to a bTB approved feedlot in another state providing;
 - a. the State Veterinarian of the receiving state approves the movement; and
 - b. any pre-movement testing or other shipping requirements of the receiving state are met.
- 11. HDOA will include information of activities in the bTb program in the annual and semiannual bTB reports (VS Form 6-38 Form narratives).
- 12. HDOA will conduct surveillance for bTB in cattle on Moloka`i as follows:
 - i. Annual whole herd testing of all herds except Backyard Beef Herds. Conference of the Backyard Beef Herd (BBH) designation is approved by the Chairperson, Board of Agriculture. Backyard Beef Herds must be isolated to not contact other cattle, not be situated adjacent to other non-BBH cattle, undergo annual inspection to verify the herd is comprised of six or fewer head, no breeding of cattle occurs, and no cattle are moved from the BBH to any other premises.
 - ii. Whole herd testing will include all cattle four months of age and older and all non-natural additions of any age.
- 13. Testing high-risk herds:
 - i. In a newly assembled herd on premises where a tuberculosis-affected herd has been depopulated, two negative annual herd tests shall be applied to all cattle, and other livestock. The first test must be applied approximately six months after assembly of the new herd. The exclusion of any species from these herd test requirements or test requirement waiver must be approved by a designated epidemiologist.
 - ii. Animals previously sold from a known affected herd are considered Exposed. If the exposed animal(s) are not depopulated, they shall be tested as determined in conjunction with APHIS.
 - iii. In herds where *M. bovis* infection has been confirmed but the herd has not been depopulated, testing shall be in accordance with requirements outlined in an individual herd plan. Reference Article 5, Item F.4.
- 14. HDOA will collaborate with APHIS Wildlife Services (APHIS WS) and APHIS VS, university and agency-based researchers, and representatives of livestock producers to increase the biosecurity of herds in the highest risk on Moloka`i. This effort is designed to identify and support long-term cattle raising practices that may decrease risk of bTB infecting herds from surrounding wildlife.
- 15. HDOA will collaborate with Hawai'i Department of Land and Natural Resources (DLNR) and USDA WS as necessary for the accurate determination of the prevalence

- of bTB in wildlife species on Moloka'i and evaluate the need for wildlife control activities on livestock premises to reduce bTB transmission risk.
16. HDOA will evaluate effectiveness of deer exclusion fencing and other wildlife mitigation strategies in cooperation with VS and WS partners through a proposed 2023 TB Initiative Project or other available funding.
 17. HDOA will complete herd inventory reconciliation for Backyard Beef Herds and any whole herd test performed on Moloka'i by regulatory or accredited veterinarians within 60 days of a whole herd test or annual inspection. Herd inventory reconciliation means comparing herd inventories between two dates, identifying animals that cannot be accounted for by current databases, contacting owners to gather any additional information, and assigning animals for investigation. Justification for herd reconciliations extending beyond 60 days from WHT or annual inspection will be summarized in the annual TB reports.

II. Evaluate APHIS Responsibilities.

1. Designate, in writing, an authorized representative who shall be responsible for collaboratively administering the activities conducted under this MOU.
2. Provide expertise in epidemiology, diagnostic support, risk assessment, and testing.
3. Assist with maintaining slaughter surveillance at Federal slaughter establishments, including assisting HDOA with obtaining data on cattle movement to and slaughter in other states.
4. Assist with indemnity payments as funding allows for diagnostic suspect (as applicable), reactor, exposed, or depopulation in the following:
 - a. High-risk herds as described in Article 5, Item I.
 - b. Cattle in herds undergoing whole herd surveillance testing, movement testing, or circle testing related to the finding of bTB in wildlife or cattle.
 - c. Cattle that are positive to the caudal fold tuberculin test during the assessment and removal phase, and positive to the comparative cervical testing and/or gamma interferon testing during the verification phase of testing in herds undergoing a test and remove herd management plan.
 - d. Susceptible livestock affected by bTB.
5. Assist with payments for animal and specimen transportation fees, laboratory analysis, data storage, and management support.
6. The USDA APHIS VS will assume responsibility for timely appraisal and payment for animals indemnified with Federal funds.
7. Assist HDOA with cattle movement monitoring and compliance investigations involving movement of cattle intrastate and interstate through the activities of USDA, APHIS Investigative and Enforcement Services (IES) officers.
8. Engage USDA WS to assist with wildlife risk management, enhanced biosecurity verification and other support activities.
9. Provide support for acquisition and development of electronic identification, hardware, and software in accordance with Animal Disease Traceability and USDA regulations.

10. Provide data entry assistance necessary to monitor tuberculosis testing and animal movements and assist with fulfilling reporting requirements of this MOU.
11. Review the progress of the bTB eradication activities covered under this MOU and reporting recommendations to HDOA.
12. Support implementation of wildlife risk mitigation strategies including completing herd assessments and wildlife risk assessment with wildlife biosecurity recommendations.
13. USDA APHIS VS will conduct annual reviews of the bTB eradication program on Moloka'i to determine compliance with this MOU and all other applicable regulations.

Findings, Observations, and Recommendations

The Hawaii TB program review was conducted prior to the conclusion of the first full year of the Hawaii MOU that became effective on November 23, 2022, with the expectation that some activities and responsibilities may be incomplete at the time of the review. All findings listed in this section should be viewed in context of the timeframe between November 23, 2022, and May 25, 2023, unless otherwise noted.

I. HDOA compliance with Article 5 of the MOU required for the maintenance of Accredited Free Status.

Findings and Observations

1. The HDOA Authorized Representative responsible for administering the activities of the MOU# 23-9715-D076-MU was designated on November 16, 2022.
2. Verification of official electronic identification for the movement of live cattle is the responsibility of the HDOA livestock inspector on Moloka'i who is also responsible for receiving and processing permit requests between premises on the island. Program staff indicated that HDOA is in the process of migrating movement information to the SCS database and that they have the ability to retrieve this information within 48 hours of identification and/or approval of permitted movement.
3. Field staff apply or verify double tags in cattle with every herd test but only 4 of 8 herds completed annual herd testing as of May 24, 2023. Annual herd testing is progressing but will not be completed by the July 1, 2023, goal listed in the MOU. HDOA program staff indicated that all identification is being entered into the SCS database within 60 days of herd testing.
4. Quarantine Order #158, "Bovine Tuberculosis Quarantine. Island of Molokai," is still in effect and HDOA program staff stated that no infractions have been documented to date.
5. HDOA approved 24 permitted movement requests between April 2022 and May 2023 and denied none. HDOA program staff stated that the majority of permits have been issued with the paper version of the HDOA DC-44 form (certificate of livestock ownership) rather than the DC-8 permit and that all are forwarded to HDOA for entry into SCS. Each permitted movement in SCS is distinguished with a unique

- individual number and can be queried or searched if needed. The use of the paper DC-44 form for movement permitting is probably not as efficient as an electronic permitting request system but has sufficed in this function to date. The HDOA livestock inspector on Moloka'i is responsible for receiving and processing permit requests and also has authority to approve them. Approved permits are sent to HDOA offices via a text message with hard copies following in the mail. There are two HDOA personnel that function in a backup role to receive and process permit requests when the local HDOA inspector is unavailable. In addition to the multiple other tasks the HDOA inspector is responsible for, this appears to be an overly burdensome workload for a single individual and there is limited local backup in his absence.
6. Of the 24 total permitted movements that were approved, 21 were for movement direct to slaughter and three were permitted movements between premises. All pre-movement TB testing requirements were completed and verified.
 7. Shipment of TB exposed cattle for slaughter at Hawaii Meats was completed as outlined under USDA-HDOA Standard Operating Procedure No: A1_2022-03-10 with no additional positive cattle detected under FSIS inspection. HDOA stated that the last shipment was completed on October 17, 2022, and no further shipments of exposed cattle to Hawaii Meats are expected.
 8. HDOA reported that no permitted movement requests for captive axis deer have been received to date.
 9. HDOA reported that there were no documented unscheduled inspections of livestock shipments on Moloka'i to date. The HDOA livestock inspector relies primarily on local knowledge and communication with public to maintain awareness of all cattle movements on the island and will report any unpermitted movements to HDOA superiors and follow-up directly with producers if they occur.
 10. All six TB affected herds from 2021-2022 have signed herd plans and these were provided to the review team for review. Hawaii VS and HDOA reported that all six herds completed depopulation as stipulated within each individual herd plan but final inventory reconciliation was still in process for two of the six herds to confirm all animal identification for indemnity purposes. HDOA identified trace exposed swine from the HI 21-C herd in the spring of 2022 but only 16/21 animals have been removed and indemnified as of the review in May 2023. HDOA released quarantines on three of the six affected premises between December 2021 and November 2022, one of which restocked and is subject to annual herd testing and the other two indicated no intent to restock in the immediate future. One affected herd was allowed to maintain young stock to feed for slaughter under isolation, testing, and management restrictions outlined in the associated herd plan as they were not eligible for indemnity during depopulation. They will remain under quarantine and are not allowed to restock until all feeder animals have been slaughtered.
 11. The FY2022 HI annual TB report was signed and submitted to VS Cattle Health Center (CHC) for review on 5/16/2023 and later approved on 6/7/2023. No separate

- semi-annual report was submitted and CHC has yet to define specific information to be included on a semi-annual report.
12. Hawaii VS and HDOA have identified nine production herds on Moloka'i and approximately five Backyard Beef Herds (BBH) as part of surveillance. There is currently only one HDOA Livestock Inspector and no VMO stationed on Moloka'i so personnel must fly to the island to conduct surveillance and testing activities. For the production herds, a WHT schedule has been created that aligns with previous test cycles on the island. Hawai'i VS and HDOA will attempt to perform tests on two or more herds per visit to the island to maximize efficient use of equipment and personnel on Moloka'i. This schedule is adversely affected by unreliable travel to the island, lack of sufficient safe cattle handling equipment, and limited personnel availability. In addition, due to movement and the terrain on Moloka'i, cattle may be inaccessible for the WHT on a scheduled date. HDOA projected 2023 herd testing to be completed by September 2023.
 13. Three herds exist on Moloka'i that correspond to each of the three provisions outlined in the "high risk herd testing" section of Article 5. HI 21B was restocked with cattle in early January 2022 after depopulation and received WHT's on 1/11/2022 and 7/8/2022. The herd plan will be completed upon the first annual WHT that was scheduled, but not yet completed, at the time of the review. There were 21 trace exposed swine from HI 21C identified in the spring of 2022 but only 16 have been removed for post-mortem examination. The herd containing the remaining five trace exposed swine is under quarantine and the exposed animals are anticipated to be slaughtered under FSIS inspection at the local slaughter facility or receive postmortem examination from HDOA or VS regulatory personnel at the time of home slaughter. TB testing was completed as outlined in the herd plan for HI 22D for young stock that were allowed to be kept for feeding and slaughter purposes. HI VS is assisting HDOA with inventory reconciliation
 14. Hawaii submitted a project proposal through the USDA TB initiative in the fall of 2022 designed to be a collaborative effort between HDOA, HI VS (including CEAH) and HI WS to evaluate wildlife populations, movement dynamics and possible disease mitigation strategies. The project was approved with partial funding and is currently in the planning phase with plans to begin in November 2023. The data obtained from trail cameras will help inform wildlife populations and possible contact events with domestic livestock to better inform risk of disease transmission. Proposed disease transmission mitigation strategies will not be studied as part of this phase of the project in favor of prioritizing available funding toward surveillance activities. If funding allows, participants plan to continue project into subsequent fiscal years.
 15. HDOA has submitted two field collected samples to NVSL from feral swine with no *M. bovis* isolations. HDOA collected 168 field samples from axis deer and submitted 70 samples to NVSL with isolation of *M. bovis* from one axis deer. In addition, slaughter samples were submitted from three axis deer with isolation of *M. bovis* from one. Resources are limited for carcass evaluation and sample collection/submission.

Locations of field collected axis deer are being documented. At this time, mitigation activities primarily involve maintaining existing fencing and added mitigations have not been pursued.

16. Comments for this section combined with #14.
17. HDOA is still developing their BBH program. They have performed no annual inspections or herd reconciliations to date. HDOA has identified approximately five herds and confirms that these premises are not adjacent to production cattle. Cattle from BBHs do move out of the premises for grazing and may not be assembled in a timely manner for inspections. When HDOA completes double tagging of BBH animals, HDOA will account for permitted movement of cattle to expedite the inspection process.

Recommendations

1. Increase HDOA staff positions on the island of Moloka'i to improve work efficiency and provide functional redundancy for the HDOA Livestock Inspector when not available.
2. Complete removal and postmortem examination of remaining five HI 22C exposed trace swine and submit all related indemnity documentation to HI VS by September 1, 2023.
3. Establish a Standard Operating Procedure (SOP) that prioritizes work activities for field personnel.
4. Work with VS and WS to develop a written SOP for wildlife surveillance testing.
5. Complete migration of TB program data and management to SCS.
6. Consider developing electronic version of movement permits to improve efficiency and reduce work burden on staff.
7. Establish a BBH program SOP that incorporates the MOU requirements for double tagging with official ID, annual inspections, herd reconciliations, and movement data.

II. APHIS Responsibilities.

Findings and Observations

1. The APHIS VS Authorized Representative responsible for administering the activities of the MOU# 23-9715-D076-MU was designated by VSDA on November 22, 2022.
2. HI VS, CEAH and Ruminant Health Center personnel provided support on multiple occasions since the MOU became effective on 11/23/2022.
3. HI VS and HDOA continue to work with FSIS and local plant management to improve record keeping. HI VS has been able to obtain necessary records for slaughter salvage. FSIS personnel have been competent at detecting tuberculosis lesions: November 2021 detected 4 of 4 adult pigs from West End farm. Also identified 1 additional cow with gross lesions when slaughter salvage was pursued. A neighboring herd also had 2 suspect cows identified on testing and FSIS submitted samples to NVSL which confirmed bTB on PCR.

4. No indemnity requests have been submitted for diagnostic purchase of cattle as defined in provision d. of Article 6 to date.
5. HI VS has coordinated or assisted with submission, shipment and testing of samples from both domestic livestock investigations and wildlife surveillance.
6. Indemnity processing has been completed for four of the six affected herds. Indemnity has been partially processed for HI 22A and HI 22B and will be completed upon final reconciliation of herd records and slaughter data from herd depopulations. Indemnity has been paid or is in process for 16 trace exposed swine from HI 21C and approved but not yet submitted for processing on the remaining five trace animals. HI VS projects final total indemnity payments for HI 21D, HI 22A and HI 22B to be less than requested due to higher than anticipated salvage values.
7. HDOA made no requests for assistance from USDA, APHIS Investigative and Enforcement Services.
8. HI WS is working to hire a technician who can share the responsibility of wildlife sample collection and submission. In addition, this resource will be utilized in the TB initiative project to manage trail cameras once deployed. The TB initiative project is still in the planning stages and cameras should be able to be placed in August of 2023. HI WS wildlife control efforts are focused on safety (airports/roads) and any programs initiated on the island would be management focused as opposed to eradication focused. HI WS efforts have been focused on axis deer population and they have not been actively engaged in feral swine control.
9. HI VS coordinated acquisition of radio-frequency identification (RFID) tags for use in Moloka'i cattle and handheld PDA and wand hardware and Mobile Information Management System (MIMS) software to capture individual cattle RFID information at the time of TB testing and permitted movement. A HI VS VMO has begun training other VS and HDOA field personnel in the use of the equipment and software.
10. HDOA is transitioning from their Access database to SCS database. At this time, all information from WHT test charts is entered into SCS. Cattle movements are also tracked in SCS as individual movements with the DC44 form attached for reference.
11. HI VS, HDOA and HI WS formed a Moloka'i TB taskforce in 2022 that holds regularly scheduled meetings to discuss and coordinate TB program activities outlined in the MOU.
12. See comments in #8.
13. VS CHC conducted a HI TB program review from May 23-25, 2023. A formal report with recommendations will be provided to HDOA for comment in July 2023.

Recommendations

1. CHC should consider re-evaluating carcass disposal reimbursement procedures and policies.
2. CHC needs to evaluate and define information to be included on annual and semi-annual TB reports for Hawaii.

3. Coordinate timely and adequate VS sponsored TB training for newly onboarded HDOA and HI VS field personnel.

III. Other findings and observations

Findings and Observations

1. Field staff report that producers generally have a pessimistic outlook about the sustainability of cattle production on Moloka'i and they question whether it is realistic to even pursue TB eradication based on the long history of the disease on the island.
2. Field staff reported that cattle producers are willing to cooperate with the new regulatory requirements but have a general lack of enthusiasm for the TB program due to logistical obstacles and poor marketability of cattle on the island. This makes it difficult for field staff to schedule and conduct timely TB herd testing.
3. Interferon Gamma Release Assay (IGRA) is an approved TB test that can potentially shorten the length of time required for TB herd testing but it is not feasible for use in cattle on the island of Moloka'i due to time sensitive logistical requirements for sampling and testing under existing testing protocols.
4. Producers are sometimes forced to move cattle away from critical grazing areas and confine them for several days in order to present the animals for TB herd testing. During this time, producers also often have to obtain and pay for additional feed to maintain the herd while confined.

Recommendations

1. APHIS VS should continue to support expansion of national gamma testing capabilities.
2. Opportunities to subsidize or reimburse feed costs or provide feed for producers that are required to maintain cattle in confinement for TB herd testing with limited resources should be explored.

Conclusion

The Hawaii Department of Agriculture administers the cooperative Bovine TB Eradication Program in a state where, alongside livestock producers, they face the challenges of a wildlife disease reservoir, drought, and multiple logistical challenges associated with island cattle production. The lack of existing infrastructure and livestock handling equipment hamper safe, efficient herd testing and the limited availability and high cost of feed is a major burden for producers assembling and holding cattle for TB herd tests. Many Moloka'i livestock producers have an unfavorable outlook about the viability of cattle production on Moloka'i

This review focused on the responsibilities identified within the 2022 MOU with the intent of identifying issues and program gaps. These issues should be addressed in the next MOU projected to take effect in late November 2023. The review was conducted to meet the

requirement for an annual program review as outlined in 9 CFR 77.4. Overall, signatory agencies were fully compliant with responsibilities outlined in the November 2022 MOU. Variable progress and incomplete implementation of some responsibilities and activities is reasonable and justifiable based on the abbreviated 6-month timeline since the MOU was established.

The overarching findings and recommendations discussed with participants during the exit interview included:

- Significant staffing improvements have been made since the MOU was signed in 2022 but HDOA should continue prioritizing the hiring of personnel to adequately manage TB program activities on Moloka'i. APHIS/VS should continue to support validation of the QuantiFERON Gold gamma test to improve testing flexibility and reduce the logistical burdens of TB herd testing for producers and field staff.
- HDOA should continue transitioning data management to the SCS database and adopt electronic forms of data capture and management.

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