**National Advisory Committee on Meat and Poultry Inspection Public Meeting**
September 16–17, 2024

Subcommittee 2: Input on Ways Technology Could Enhance FSIS' Inspection Activities

**Question 1. Has industry successfully implemented any cameras, imaging, or AI technology to identify defects, trends, potential hazards, or other regulatory concerns (e.g., pre-op, sorting procedures, labeling requirements)?**

- Industry is currently conducting a lot of trials which are ongoing.
- Camera/video applications
    - Security cameras were originally introduced for security purposes, but their use has expanded over time. Industry has been able to utilize these cameras for overseeing/investigating processes (i.e. pre-op, packaging), biosecurity monitoring, etc.
        - The ability to have remote access, especially such that establishments can monitor on their phones, has been very helpful.
        - Some establishments utilize cameras specifically for CCPs where failures can direct auditing of the video footage. It would not be recommended to solely rely on cameras for CCP monitoring, because of potential failures of the camera system, but it has proven to be a good tool for verification purposes.
        - Video footage has proven useful for training purposes, both to demonstrate positive/negative behaviors to employees as well as to verify effectiveness of training.
            - It allows for unbiased monitoring of employees.
    - Industry has long utilized a variety of sensors, though the adoption rate, connectedness, and enhancement of the devices continues to increase.
        - Fairly wide adoption of digital/wireless temperature monitoring for cooking, cooling, storage, transportation, etc. This has proven very helpful.
        - Counting product, pH, ambient conditions (humidity, etc.)
        - Traceability through the process: reading ear tags, tattoos, labels, etc.
        - HACCP monitoring
        - Like cameras, remote access has proven helpful.
            - Some adoption of this for mobile slaughter units.
    - Video technology is being utilized/developed for animal welfare monitoring, for monitoring handlers and animals.
        - Utilized
            - Camera based internal auditing
            - Camera based external auditing
        - Developing, some early adoption, but still in more of a testing phase and not widespread usage
            - AI integrated video monitoring

        - Industry has found value in the ability to
            - send photos/videos to FSIS for remote antemortem inspection or other consultation with PHV, as needed to help expedite decision making in certain circumstances
            - review video footage with FSIS when there are questions
    - Camera footage has additional uses, such as communicating with suppliers/customers: yield, quality, animal welfare, etc.
- Vision systems, such as hyperspectral imaging, have generally focused on foreign material control (as it relates to food safety). Imaging systems can be independent or have an AI integration. Other uses include:
    - Label verification
    - Quality, fat content, etc.
    - Truck seals
- Detection systems (generally referencing foreign material detection, but there are other applications)
    - Rejection devices work WITH a detection system, but are a separate system that has to be integrated.
    - Detection and rejection systems need to be fit for purpose. The product, environment, processing speed, etc. are all factors that need to be considered. It is rare to utilize equipment off the shelf. Most installations are designed specifically for that establishment/process.
- Technology around operational and maintenance integration is being adopted more (downtime, runtime, equipment functionality, etc.)

**Question 2. What suggestions does industry have for FSIS to leverage technology for domestic, import, and export inspection? Is there any automated technology that industry is currently using that they think FSIS should use to enhance or more efficiently inspect?**

- Recommend FSIS evaluate sensors to aid in import/export inspection, e.g., temperature monitoring, GPS locators.
- Recommend FSIS utilized digital paperwork, such as a PHIS app for tablet/phone where inspectors could directly conduct inspections, sign off on certificate in real time.
    - It is important to assess what must be done in real-time and what can be uploaded, noted later, etc.
    - Consider evaluating speech to text or handwriting to digital records technology

**Question 3. What challenges/hurdles (other than internet/hardware) potentially block industry from adopting advanced technology? Does FSIS have any regulations or policies that are creating obstacles to industry innovation and adopting more efficient technology? What changes do you suggest that will maintain an equivalent or better level of food safety?**

- Industry obstacles
    - Cost prohibitive for small plants

    - Lack of time/skillsets to implement, monitor, and maintain technology
    - Physical space restraints
    - Processing conditions are not necessarily conducive to technology: wet, cold, hot, sanitation, etc.
    - Cybersecurity risks – every connection, operational technology, etc. is another vector for risk that has to be managed.
    - Specific to AI
        - Lack of trust in AI – still very new in some areas and dependent on how the system integrates with company data, data ownership, etc.
        - AI only knows what it can be taught, must have sufficient data and understanding for inputs
    - Internet accessibility is still a very important aspect, especially remote locations, even if not small facilities.
- There is not a specific regulation or policy that is currently inhibiting innovation, but rather the real or perceived fear of misunderstanding by FSIS.
    - There is a fear of innovation being used against the establishment, whether because it is used out of context or because it encourages more scrutiny. Industry has to weigh the benefit with the risk of additional scrutiny.
        - Recommend FSIS consider the following and development training materials, guidance, etc. to address with FSIS employees at all levels.
            - Lack of clarity and consistency on what level of access can/should be provided to FSIS
            - Inconsistent interpretations of technological results/data
                - FSIS should provide IPP with a centralized resource to address questions, not just askFSIS, ideally dedicated staff that are well-versed in technology and the results/data.
            - Integrating into HACCP System opens up enhanced scrutiny
            - Security concerns with patented tech, confidential information, etc.
            - Need better cooperation/flexibility (especially locally) when testing new technology
            - Need to foster a culture of adapting to change and innovation.
- HACCP Rule and existing regulations allow for innovation.

**Question 4. What current inefficiencies or issues can be addressed by leveraging technology (e.g., remote veterinary dispositions, remote export certificates, digital pen cards)?**

- Recommend FSIS provide access to phones/tablets for local inspection staff. Suggest allowing options for different preferences, comfortability.
    - Must have a secure connection. Suggest an app for PHIS or similar to allow for secure file sending.
    - Would allow IPP to review and complete PHIS tasks, write NRs, etc. on the spot vs. taking notes and typing things up later when they get back to a computer.
        - Consider ability to add photos to a task/NR

- FSIS has a seemingly high expectation for communication in formal writing (email). Recommend allowing for more efficient communication, like phones calls, video chat, could move situations along more quickly.
- Develop push notifications for PHIS for IPP so that inspectors are alerted when away from their computer.
    - PHIS Tasks
    - Export sign offs
- Recommend FSIS allow remote inspections for certain circumstances.
    - Slaughter inspector could use secure video connection, pictures, etc. to make remote dispositions – ante and postmortem
    - Secure video connection for export/import verification, reviewing labels, etc.
    - To review corrective actions to release product/area when inspector is offsite.
- Recommend FSIS meet with AMS to see if there are learnings from AMS activities
    - Camera grading system, is there an application for food safety?
    - Remote grading pilot, are there lessons learned that could be applied for remote inspections?
- Recommend looking into technology to converting handwriting into digital records, i.e., digital notepads. Could be something to consider for industry and FSIS.
- Recommend evaluating better options for controlled documents, stamps, and inspection materials that must be kept secure to allow access for relief inspectors.

**Question 5. What would industry need to go paperless (labels, product tracking, imports, exports, HACCP, Sanitation)?**

- Seeing a greater adoption industry wide, including smaller companies, though obstacles remain.
- Administrative challenge of adopting – need dedicated time, resources, skills to do it
    - Cost, resources (human and capital), skillset, connectivity
    - Learning hurdle
    - Backing up data and data security
    - Cybersecurity protections
    - Pulling data for FSIS – ongoing administrative time, effort, cost
    - Providing access to FSIS to oversee while maintaining confidentiality
- Even if companies go "paperless" a backup system (most likely paper based) is needed for extenuating circumstances, such as:
    - Hardware and/or software failures
    - Cybersecurity incidents
- Cooperation from local FSIS, better understanding of expectations with digital recordkeeping
    - If things go digital, FSIS needs to adapt and not request paper records

    - Recommend FSIS provide training and guidelines to industry and IPP for digital recordkeeping so there are consistent and clear expectations.
- Digital recordkeeping is one aspect, companies also need a tool to trend and look at the data or it will go unutilized, the same as paper records in a file cabinet.
- There is some utilization in industry of scanning paper records for storage and reference.

**Question 6. What programs or records are not possible to be paperless at this time?**

- Outside of the limiting factors outlined in Question 5, the committee recognized that most programs or records could go paperless.
    - However, FSIS and industry holds tags should not be entirely replaced by digital holds. Industry often utilizes multiple controls (i.e., digital and visual). Physical holds, such as tag and tape are still paramount to ensure a visual cue.
- FSIS and industry still must comply with ADA standards for accessibility, when applicable.

**Question 7. How is industry using paperless/digital inventory tracking (i.e., blockchain, barcodes, QR codes) to monitor product distribution (i.e., traceback/forward)?**

- Industry learning has shown that if you cannot do it on paper, you will not be able to do it digitally. Digital systems should not be viewed as an instant fix. Programs must be based on good processes.
    - Paper tracking can be effective, though cumbersome and not easy to manage in a recall scenario.
- Vast majority of meat/poultry industry has adopted barcoding (typically GS1 standards).
    - Traceability within the regulated industry is typically tight, meaning in the packer/processor portion of the supply chain.
    - Traceability tends to break down further downstream at further distribution (i.e., retail, foodservice).
- There is not a wide adoption of blockchain due to data security and confidentiality concerns. Blockchain only works if the entire supply chain is involved.
- QR codes for retail facing mostly at this time for marketing.
- Many companies are held to customer or audit requirements for traceability exercises. Also industry has adopted best practices along similar lines. Example of industry practices, audit/customer requirements:
    - Regular traceability exercises: trace forward, backward, all ingredients/packaging, etc.
    - Effectiveness and time requirements.
- Mature operations are utilizing very sophisticated tracking both entry, exit, and internally throughout processes and internal storage.
- Recommend FSIS meet with FDA on traceability
    - What can FSIS learn from FDA's call to industry on technology?
    - What can FDA learn from FSIS's history of traceability and recall success
    - Recommend collaboration between FSIS and FDA on FSMA traceability rule and implementation to assess the differences and how companies will

manage both pathways.

- Recommend seeking engagement as a collaborative effort with FDA on traceability. Engaging with industry, technology providers, distributors, retailers, etc.

**Question 8. Are there any FSIS forms or recordkeeping activities that industry finds to be repetitive or unnecessary?**

- Talmadge-Aiken (TA) plants (operating under the Federal State Cooperative Act) – establishments are having to provide corrective actions, feedback, etc. to state provided inspectors as well as FSIS oversight (i.e., recall information)
    - Communication breakdown with TA facilities
    - Recommend FSIS define a clear communication pathway and provide clarity to all parties once defined.
- Better coordination between shifts, typically more administrative help on first shift (i.e., reviewing the same HACCP plan on two shifts, reviewing records on second shift that were already reviewed on first, etc.)
    - Recommend streamlining PHIS between multiple shift operations.
- Requesting older records – Recommend clarifying to IPP that establishments have 24 hours to pull older records.
- Recommend a notification within PHIS to notify inspectors when NRs are open to ensure they are closed out in a timely manner.
- 418.2 and 8140 notifications are unnecessary for reporting between federally inspected establishments, supply chain controls are sufficient. Recommend focusing agency resources on incidents that may result in product reaching consumers and defining "in-commerce" as outside of regulated supply chain and potentially accessible to consumers.
- Recommend developing a module in PHIS to update Grant of Inspection information, such as changes in leaderships, ownership, doing business as, etc.

_____End of Subcommittee Report_____