**Awards issued prior to January 20, 2025, were funded under previous Administrations and may not reflect the priorities and policies of the current Administration.**

**United States Department of Agriculture**
**Project Initiation**

# Project Data for Accession Number 1029978

## Project Title

Machine Vision, Artificial Intelligence and Robotics to Increase Capabilities and Efficiencies of Poultry Productions

## Project Details

| | |
|---|---|
| **Sponsoring Institution**<br>National Institute of Food and Agriculture | **Project Status**<br>COMPLETE |
| **Funding Source**<br>NIFA Non Formula | **Grant Year**<br>2023 |
| **Grant No.**<br>2023-70439-39199 | **Cumulative Award Amt.**<br>$999,999.00 |
| **Proposal No.**<br>2023-01073 | **Multistate No.**<br>(N/A) |
| **Project Start Date**<br>Feb 15, 2023 | **Project End Date**<br>Feb 14, 2026 |
| **Program Code**<br>[MPPRI] Meat and Poultry Processing Research and Innovation | |

## Project Director

Cheng, X.

## Recipient Organization

INDUSTRY VISION AUTOMATION, CORP.
14227 REED FARM WAY
NORTH POTOMAC, MARYLAND 208783807

## Performing Department

(N/A)

## Non Technical Summary

The poultry industry is especially concerned about hazardous materials, such as metals, plastics, and bone fragments embedded in boneless meat fillets. Large pieces of chicken bones can be a choking hazard to small children and elderly. Robust and effective automatedinspection solutions that can address this food safety risk in mostcases are still elusive for the poultry industry.The technical solution will feature a combination of multiple sensing and imaging technologies, integration of advanced reliable detection algorithms, fast and effective electronic control and communications, as well as a flexible and friendly user interface. Industry Vision Automation Corp (IVA) is uniquely positioned to build such an advancedsystem that integratingmulti-functional sensing and imaging technologies into one online machine system embedded with the latestartificial intelligent (AI) algorithms to ensure food safety and quality, and to achieve customer satisfactions. The goal of this projectis to develop an upgraded imaging detection system model by adding new sensing hardware and AIalgorithms for enabling accurate poultry deboning quality. It will

also have add-on functions for consistent fillet packaging for improved consumer acceptance. The proposed workcan have significant positive impact to the poultry processingindustry and processingefficiency and productivity.

## Animal Health Component

Animal Health Component: 0%

## Research Effort Categories

| | |
|---|---|
| Basic | 0% |
| Applied | 30% |
| Developmental | 70% |

## Classification

| Knowledge Area (KA) | Subject of Investigation (SOI) | Field of Science (FOS) | Percent |
|---|---|---|---|
| 723 | 3260 | 2020 | 50% |
| 501 | 3260 | 2020 | 50% |

## Knowledge Area

[723] Hazards to Human Health and Safety

[501] New and Improved Food Processing Technologies

## Subject Of Investigation

[3260] Poultry meat

## Field Of Science

[2020] Engineering

## Keywords

AI, Machine Vision, Monitoring, Poultry Processing, Automated Detection&Sorting, Food Safety/Quality

## Goals / Objectives

This projectresponds directly to the USDA Small BusinessFY23 Meat and Poultry Research and Innovation (MPPRI) program by developing innovative technologies to improve poutry processing efficiency and ensure foodquality and safety. We will focus on developing a multi-functional machine vision system andan upgradedLaXser systemby adding new sensing and detection imaging hardware and artificial intelligence (AI) algorithms to aidfor poultry deboningand meat quality and safety monitoring.The new upgraded system will boost itsfunctions to improvethesafety, packaging consistency, and consumer acceptanceof poultry filletproducts. The new system with add-on AI will feed the sorting control mechanisms and provide real-time on-line monitoring data for management. The proposed work should significantly improve food safety,productivity and process efficiencythrough smart food manufacturingfor the U.S. poultry industry.

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## Project Methods

Industry Vision Automation Corp (IVA) is uniquely positioned to build a multi-functional automated on-line detection system that integrates x-rays, laser 3D and color imaging technologies and applies artificial intelligent to ensure food safety and quality of deboned fillets, and to achieve customer satisfactions. IVA has developed a machine that uses the synergism of x-ray and laser imaging for sensitive detection of bone fragments in de-boned poultry meat. This system overcomes the weakness of conventional x-ray technology and eliminates false image patterns by x-ray absorption compensation. We've conducted further R&D, system design, manufacturing, resulted in the full-scale industrial grade LaXserTM machines. In this project, we proposeto upgrade the system technology by adding the state-of-art sensing capabilities and latest artificial intelligence algorithms to monitoring chicken deboning lines and sure the food safety and quality with greater efficiency.