RESEARCH ABSTRACT

PORK SAFETY

Title: The development of on-farm and in-plant methods to eliminate needle hazards – **NPB #18-203**

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Scientific Abstract: A research project was conducted to develop methods for in-plant X-ray machine calibration procedures and on-farm needle detection methods and procedures. The results from this research indicated that X-ray performance differences realized from prior research (NPB Project 13-055) were not the result of improper calibration procedures, as hypothesized, but instead most likely the result of bone-in versus boneless product lines. Laboratory testing from a common X-ray machine used in processing facilities indicated the difficulty in separating X-ray response of bone from needle due to density similarities. Attempts to calibrate the tested X-ray machine for a bone-in product to accommodate needle detection, resulted in significant false positives, rendering this method unacceptable for real-time processing plant use. To accommodate bone-in lines, in lieu of X-ray technology, an advanced magnetic-based technology using dual-phase detection principles was tested in a controlled laboratory and the results revealed 100% detection of all needle fragments, compared with an overall in-plant average of 19.3% (NPB Project 13-055). This advanced technology, compared with the in-plant magnetic-based technology available during prior testing, resulted in 100% needle fragment detection, and was shown to be far less sensitive to detector aperture dimensions relative to product dimensions. On-farm needle detection methods and procedures focused on handheld metal detectors that could be used with vaccination teams. Eight commercially available handheld metal detectors were tested for needle fragment detection and the results revealed detections across all needle fragments that ranged from 0% to 100%. Seven of the eight detectors successfully detected 100% of a needle currently marketed as detectable. Of these seven detectors, two were identified as appropriate for convenient on-farm use due to their size and overall performance. On-farm testing revealed that each of the two identified handheld detectors successfully found both 18g and 16g fully embedded needle fragments. The needles tested were those currently marketed as detectable.