

Injection technology use reported by swine veterinarians in the United States.

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Abstract

The objective of this study was to determine injection practices on swine farms as reported by veterinarians. Participants were members of the American Association of Swine Veterinarians. Veterinarians that self-reported as clinicians were contacted for participation. A web-based survey was administered regarding farm demographics, injection technology, needle types and sizes, and injection locations for each stage of production and for pharmaceutical classes. Additionally, descriptions of protocols for handling a broken needle event were recorded.

The response rate was 36.8% (132/359). For breeding animals, the neck was the most common site of injection for except for hormones in sows, where perivulvar injection was the most common (67%). Thirty-eight percent of respondents reported the hip as a location used for injection in sows. For growing pigs, the neck was the most common site of injection (>99%). Twenty-five and 8 percent of respondents reporting using needle-free injection in breeding animals, and growing pigs respectively. Forty-percent reported using highly detectable needles. Eighty-seven percent had a protocol to identify animals that had a physical hazard. Seventy-seven percent inform the packer of potential physical hazards, and 38% had been contacted by packer regarding physical hazards or abscesses associated with injection sites.

This is the first description of injection technologies used in swine in the United States. Injection practices have changed with the advent of new technologies and increasing concerns for occupational safety. Further evaluation of the implications for pork safety and quality associated with these practices are warranted.

Introduction

Great strides have been made in reducing food safety concerns regarding physical hazards associated with injection preharvest. Yet, physical hazards remain important concerns for both food safety and economic impact in the pork chain. Anecdotal reports of alternative injection methodologies and locations have been reported, particularly in sows, but it is unknown what the extent of these is in the industry.

Appropriate methods for injection are well recognized as important for pork quality and safety, and represent a critical component of the Good Production Practices in the US National Pork Board (NPB) Pork Quality Assurance Plus program (PQA Plus). Appropriate injection methods decrease the risk for physical hazards and the potential of residues due to improper administration.

Adoption of alternate technologies (e.g.needle-free injections) hold the promise of decreased physical hazards in pork, and initial research indicates that use of needle-free injection methods for vaccine administration resulted in equivalent immune response as well as no difference in gross or microscopic lesions at the injection site.¹ Little data is available on the efficacy of needle-free injection methods outside of this specific application (e.g. use for antimicrobials) nor is there data on the number of producers that are using needle-free injection methods.

Under PQA Plus guidelines, intramuscular injections are to be given in the neck, regardless of the production phase. Recently, the Canadian Quality Assurance program approved the hip as an acceptable anatomical location for intramuscular injections in sows only. This has potential advantages for occupational health of pork producers, decreasing the risk of injury while giving injections, particularly to sows in crates. Concerns remain regarding the risk of carcass defects associated with this anatomical location in sow carcasses, as it is a muscle tissue of critical value. Another critical issue is the paucity of peer-reviewed data on the frequency and characterization of carcass defects in sow carcasses, as the Pork Quality Audit² addressed finisher pigs only.

Carcass defects represent not only a pork safety concern, but an economical cost to processors. Some of these concerns were outlined in the 1994 Pork Chain Quality Audit. According to this audit major economic losses are due to carcass defects. Almost \$1.5 million was lost the year the audit was conducted due to abscess or injection-site blemishes at the time of slaughter. Abscesses were the second most common cause of condemnation and carcass trimming at slaughter plants².

Despite educational efforts and economic costs, carcass defects and physical hazards remain a major economic and food safety concern for the pork chain. Emergence of new technologies and increasing concerns regarding employee injuries associated with injections have increased the interest in understanding implications of injection methodologies and addressing carcass defects at slaughter. The objective of this study was to describe injection practices on swine farms as reported by veterinarians.

Materials and Methods

Study participants: The target population was members of the American Association of Swine Veterinarians that self identified themselves into any one of 4 practice categories (determined by AASV): 100% swine practice, mixed practice > 50% swine, 50% swine and mixed practice < 50% swine (n=359).

Survey Design: The survey was developed and a draft version was reviewed by faculty and students at the University of Minnesota for clarity. Participants were asked to provide demographic data (responsibility with the farm and farm inventory). Survey questions were divided into sections based on production phase (breeding, farrowing, nursery and grower/finisher). For each phase, questions were focused on anatomical location of injections, technology used for injections, needle types and sizes and what pharmaceuticals classes were administered. Additionally, participants were asked if they used highly detectable needles, if they had a protocol for physical hazards, and whether they had received notification from the packer regarding physical hazards or abscesses.

Survey Administration: The survey was administered via a web-based format. An invitation to participate was sent via email in February 2008, with participants receiving 2 follow-up emails and a final follow-up phone call. The final survey was submitted in April, 2008. Responses were anonymous.

Results

The response rate was 36.8% (132/359). Of respondents, 97% identified themselves as veterinarians, 10.6% as the farm owner, 6.8% as the manager and 2.3% as service personnel. Respondents indicated that the following phases were present on their farms: 80% sows, 70% boars, 77% farrowing, 65% nursery and 66% grower/finisher. Most respondents represented large farms (65% of respondents had sow inventories > 5000 head; 48% had boar inventories >50; 74% had nursery inventories > 5000 and 82% had finisher inventories > 5000). For breeding animals, the neck was the most common site of injection for except for hormones in sows, where perivulvar injection was the most common location for administration (67%). Thirty-eight percent of respondents reported the hip as a location used for injection in sows, predominantly for vaccine administration. For growing pigs, the neck was the most common site of injection (>99%). Seven, 11, 9 and 25% of respondents reported using needle-free injection technologies in suckling, nursery, finishing and sows respectively. Forty-percent reported using needles

that are highly-detectable during processing. Eighty-seven percent had a protocol to identify animals that had a physical hazard. Seventy-seven percent inform the packer of potential physical hazards, and 38% had been contacted by packer regarding physical hazards or abscesses associated with injection sites.

Discussion

This study represents the first description of injection methods used in US swine. There are limitations for extrapolation to the entire US pork population (veterinary representation, predominant large farm representation). Nonetheless, it suggests that there is adaptation of needle-free injection technology in the US swine herd as well as the use of the hip as a location for injection in sows. These data are important not only to assess risk of physical hazards, but also to inform veterinarians and other pork chain members regarding current practices and opportunities for risk mitigation. Future studies targeted at producers regarding injection technologies and practices; as well as evaluation of risk of physical hazard and carcass defects associated with injection technology and practices are recommended.

Conclusion

- US pork producers are adopting needle-free injection technologies.
- The hip is being used as a location for injection in sows.
- Further studies regarding the impact of injection technologies and practices on the risk of physical hazards and carcass defects are warranted.

References

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Funding: National Pork Board