

P44

Retrospective study on the occurrence of hypodermic needles and other metallic physical hazards detected by metal detectors in one pork cutting plant

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Introduction

A physical hazard is any extraneous object or foreign matter in a food which may cause illness or injury to a person consuming the product. In addition to biological and chemical hazards, the economic food business operator must determine procedures to control physical hazards. The objective of this study was to evaluate the occurrence of hypodermic needles and other metallic physical hazards in pork meat at the level of a cutting plant.

Methods

For this retrospective study we decided to compare the occurrence of hypodermic needles with the occurrence of other metallic physical hazards, to better understand the real dimension of the problem posed by hypodermic needles.

The data used in this study was collected from the records of quality control team present in the respective cutting plant.

For the needles, data was collected from December 2012 to March 2018 (63 months), and included the following information:

- Needle Gauge;
- Needle length;
- Needle location (carcass part or muscular localization).

Regarding the other metallic physical hazards, data was collected from January 2015 to August 2018, not including the year of 2017 (32 months). The data included the localization and a brief description of the hazard.

Results

For the 63 months period, a total of 26 hypodermic needles were found. From those, the most common localization was the neck muscles (n=15, 57.69%) and the shoulder (n=6, 23.07%). Most (n=22, 84.62%) of the needle fragments were between 2.4 cm and 2.6 cm and had, mainly, a gauge of 16 G (n=15, 57,69%) or 17 G (n=7, 26,92%).

Regarding to the other metallic physical hazards, there were found 23 during the period of 32 months. From those, the majority were just simple metal fragments with no evident shape or origin (n=17, 73.91%). The second most frequent type were both steel filings and washers of steel mesh gloves (n=2, 8.70%). The main localization was the spare ribs (n=13, 52.17%) and the neck (n=3, 13.04%).

Conclusion

The fact that the neck and shoulder were the parts with the highest number of hypodermic needles can be related to the fact that these two anatomical areas are the main preferential areas for inoculation.

As for the other physical hazards, one possible explanation for the fact that the most affect part was the spare rib, is that the spare rib has many bone structures that cause a greater wear upon the cutting blades and machinery.

Although the number of needles per month is practically half of the other metal objects, it still constitutes a large part of all the physical metal hazards identified. If we consider all the objects found, we have a monthly average of more than 1 object / month, which clearly reflects the importance of equipment such as metal detectors and x-ray machines in the food industry and consumer protection.

Additionally, these results, should alert for the importance of good production practices use regarding inoculation procedures in order to mitigate the impact on food safety and consumer confidence arising from the use of hypodermic needles in livestock.

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