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Pork cutting plant condemnation data: Economic value and potential use as a farm-inoculation surveillance tool

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Introduction

It is known the potential of pig abattoir inspection data as a health and animal welfare surveillance tool. However, the information is scarce regarding the potential of meat condemnation data at the cutting plant as additional information for surveillance purpose.

The objective of this study was to evaluate pork meat condemnation in a cutting plant and analyse its economic value and its potential use as a surveillance tool.

Methods

During a period of 30 labour days (February and March 2018), data from one pork cutting plant was collected, including:

- Daily production volume (units and Kg);
- Number, weigh and cause of condemnation of the condemned parts.

Due to logistic restrictions, the type of lesions or cause of condemnation were classified as abscesses or other lesions. The classification of "abscess" included different stages of abscess formation. The classification of "other lesions" included lesions other than abscesses, for example: bruising, fibrosis, abnormal colour and consistency of the muscle tissue. Also, the samples analysed were restrict to only four parts of the carcass: the neck, the superficial skin and subcutaneous muscle of the neck known as "caluga", the shoulder and the loin.

In order to evaluate with more detail the lesions observed, 13 samples of muscle lesions found during the study period were sent for a histopathological analysis.

Results

In the referred study period, a total of 53 361 deboned carcasses were analysed (corresponding to 504 684 parts of carcass). From those, a total of 2 090 meat units were condemned representing a direct economic loss of 3 343.24 Euros. From those, 421 parts were condemned due to abscess lesions and 1669 parts due to other lesions. The distribution of these condemnation causes per part of carcass and respective cost (Euros) is presented in table 1. Table 1 - Distribution of condemnation causes, in units and kilograms, per part of carcass and respective cost.

Most of the abscesses lesions were found in caluga and most of the "other lesions" were mainly observed in the neck muscle, representing the main economic loss (2 909.82 Euros).

For both cases, the results obtained through histopathological analysis revealed traits that may fit with inoculation compatible lesions. These traits included:

- Cellular necrosis;
- Myositis;
- Abscesses;
- Oedema;
- Calcification;
- Fibrosis;
- Cellular infiltrates.

In the case of abscess lesions, those may be related with older inoculation incidents, in opposite to "other lesions", which some may be related with more recent innoculations.

Also, the neck region it is one of the most common inoculating zones for intramuscular and subcutaneous injections in swines, reinforcing the suspicious that

Table 1: Distribution of condemnation causes, in units and kilograms, per part of carcass and respective cost

	abscess units	abscess weight (Kg)	abscess cost (€)	other lesions units	other lesions weight (Kg)	other lesions cost (€)	total units	total weight (Kg)	total cost (€)
caluga	389	272,3	373.44	0	0	0	389	272.3	373.44
neck	3	8,7	5.22	1639	4753,1	2851.86	1642	4761.8	2857.08
shoulder	27	116,91	50.76	17	73,61	31.96	44	190.52	82.72
loin	2	6,74	4	13	43,81	26	15	50.55	30
total	421	404.65	433.42	1669	4870.52	2909.82	2090	5275.17	3343.24

this could be the major cause of these lesions. In addition, one of the 13 samples sent to the lab for histological analysis, revealed a strange substance (we suspect of pharmacological residue) around which a granulomatous reaction developed. This sample was from a neck muscle that was classified as "other lesions" and macroscopically it was evident the alteration of the normal texture and colour of the muscle tissue.

Conclusion

The quality of pork meat is dependent on every production stage, ranging from the primary producer to the final consumer.

This study demonstrates the potential use of neck lesions observed at pork cutting plant for a farm-inoculation risk-based surveillance system. This system could be extremely helpful for the pork meat industry because it gives the possibility to access if suppliers respect the correct practices of intramuscular and subcutaneous inoculation. However, more studies should be performed to prove as accurately as possible the association between these variables.

In addition, the monitorization of muscle lesions in the neck area of the swine carcasses, may decreases the risk of undetected abscess or other lesions reaching the consumer.