Pig inspection: software for the visual inspection system in pigs

Andréia P. Pequeno[1], José A. G. González[1], Ana L. A. Vargas[1], Carlos E. A. Zúñiga[2]

[1]Department of Animal Anatomy, National University, Heredia, Costa Rica; [2]National Animal Health Service, Ministry of Agriculture and Livestock (MAG), Heredia, Costa Rica.
E-mail: andreia.passos.pequeno@una.cr

Introduction

One of the main purposes of meat inspection is to prevent and detect public health hazards, such as foodborne pathogens or chemical contaminants in meat. Furthermore, the information obtained from slaughter animals allows for the planning of animal health management programmes and monitoring the effectiveness of disease treatment and prevention strategies (1, 2). There is a consensus in recognizing that traditional meat inspection is no longer able to address the hazards related to meat consumption. For these reasons, legislations all over the world are changing meat inspection techniques, moving towards visual-only techniques. The visual-only inspection has showed greater efficiency than the traditional inspection in detecting lesions. However, many countries still do not have data on possible applications of a visual inspection system in pigs, moreover consistent data on post-mortem lesions for pigs in the slaughterhouse is missing. There is also great difficulty in the criteria for condemnation of organs or carcass (4, 5). Therefore, the objective of the present study was to develop a software designed to recognize, classify and quantify the main diseases and macroscopic lesions that attack the pigs of age to slaughter in the post-mortem inspection stage.

Materials and Methods

A new protocol of visual-only inspection for pigs was developed based on article 147 of law 29588-MAG-S of Costa Rica, because there were no local visual-only inspection protocols at the time of this study. To give an operative tool to veterinarians, the anatomical structures to be inspected were rearranged into three main groups (head, organs and carcass), which resembles the way organs are found at the end of a slaughtering line.

The scheme was designed to be easily adopted in high production slaughterhouses, shared nationally and comparable with the schemes adopted by the Food Security and Inspection Service in the United States (6). A list of guidelines needed for the univocal interpretation and classification of lesions was developed. The data of each working day is then saved in a file, which can be visible through graphics.

Results

Figure 1 shows the icons for the inclusion of farm data, health inspection data, statistical reports and finally an icon about the software for the user. Figure 2 shows the list of the visual inspection. Figure 3 shows the normal lungs, lungs lesions and the explanation according to the icon selected.
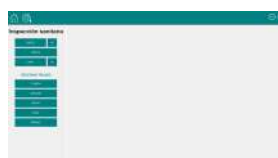

Figure 1. General icons for database.

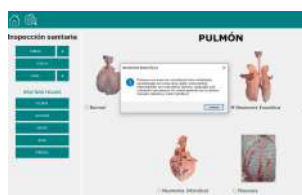Figure 2. Icons for visual inspection.

Figure 3. Normal lungs, lungs lesion list and explanation

Conclusions and Discussion

The data derived from local projects on post-mortem lesions in Costa Rican slaughterhouses are not homogenous and comparable. The subjectivity regarding the criteria for condemnation of organs or carcass is an important problem that can lead to significant economic losses to the food industry and producers in general.

For the first time, a classification of lesions was developed in the Costa Rican swine sector based on local legislation and it is also comparable to the schemes adopted by other countries. Moreover, a relevant dataset of these lesions is being built to to assist producers, veterinarians and local authorities with the interpretation of results and the development of health improvement strategies.

References

1. Huey R. 2014. Vet Rec. 170(3):68–70.
2. Pelliza B et al. 2007. Arq Bras Med Vet Zootec 59 (3): 614-620.
3. EFSA 2011. EFSA J. 9(10):2351-2549
4. Ghidini S et al. 2018. BMC Vet Res 14:6-17.
5. Felin E et al. 2016. Prev Vet Med.127:113–20.
6. Food Safety and Inspection Service 2007. FSIS Directive 6100.2 17/09/2007.