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Assessing the food safety risk associated with federally regulated pork establishments in Canada using the Canadian food inspection agency’s establishment-based risk assessment model

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Introduction

The Canadian Food Inspection Agency (CFIA) has developed a quantitative risk assessment model to help inform inspection resources’ allocation for food establishments. This “Establishment-based risk assessment” (ERA) model takes into consideration risks associated with a specific food commodity, operation or manufacturing process, mitigation strategies implemented by the industry to control their food safety risks, as well as establishment compliance information (Racicot et al., 2018 and 2019; Zanabria et al., 2018). In 2014, a pilot project assessed the model’s performance with 49 meat/poultry establishments resulting in a Spearman correlation coefficient of 0.64 (p< 0.001) between the model outputs (annual number of DALYs) and the assessment done by CFIA senior inspectors.

Materials and Methods

To assess the food safety risk of all federally regulated pork establishments across Canada, 689 meat establishments, including 59 facilities exclusively doing pork slaughtering and/or processing activities, attended WebEx information sessions along with their assigned inspectors. Using an Excel questionnaire, both provided inputs, from April to October 2017, on the inherent/mitigation factors associated with the establishments, which were analysed by the model algorithm along with up to 5 years-compliance data from CFIA’s systems.

Results

Nineteen establishments (out of 689) were not considered in the analysis because they refused participating (0.7%), were not operating (1.6%), or were not processing/storing meat products (0.04%) at the time of data collection. Forty-nine percent (337) of the meat establishments reported processing only pork or pork and other meat species. From those, 111 (33%) establishments distributed products directly to vulnerable population, 204 (61%) applied several additional treatments to further reduce their

risk (e.g., antimicrobials), and 336 (99.7%) applied specific controls for incoming supplies (Figure 1). Intact meat (e.g., raw cuts, carcasses) (60%), ready-to-eat cooked (15%), and offal or meat by-products (9%) were listed as the most common pork sub-products being processed (see Table 1).

The 337 establishments processing only pork or pork and other meat species (representing 33% of the total meat production volume) were responsible for 40% of the total meat risk. Among pork establishments, only 10 contributed to 44% of total risk related to the pork sector. This model helped categorizing pork establishments into 4 groups calculated based on their individual risk contribution to the overall meat risk. Then, considering its individual contribution to the overall food safety risk in the meat sector there were 0, 41, 150, and 146 for category 1 to 4 respectively, where 1 represents the highest risk and 4 the lowest, as of March 2019.

Discussion and Conclusion

By using scientific data and establishment specific information gathered from regulated parties the ERA model evaluates a facility and determines an establishment’s level of risk. How often an inspection occurs will be guided by where a facility falls in the four categories of risk assigned by the ERA model, i.e., higher risk establishments (categories 1 and 2) would require more oversight while lower risk establishments (categories 3 and 4) would require less oversight. These findings will be integrated in the Agency’s work planning for risk-informed oversight, to proportionally allocate inspection resources based on the establishment risk contribution.

References

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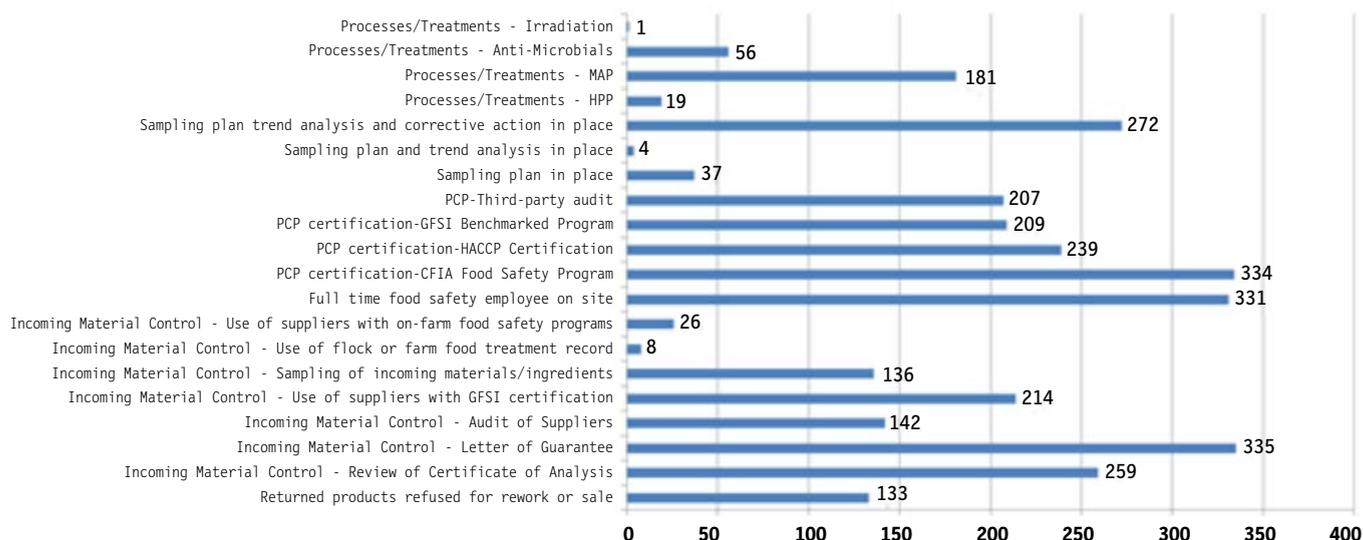


Figure 1: Number of Canadian pork establishments implementing strategies to reduce food safety risks (n=337)

Table 1: Pork Sub-products volume (processing/slaughtering) (includes establishments processing multi species)

Sub-product manufactured by the establishment	Domestic volume (millions of Kg)	% of total (domestic) pork sub-products	Export volume (millions of Kg)
Raw Non-Ready-To-Eat (non-RTE) comminuted meat: ground, finely textured, chopped, mechanically separated, flaked and minced	67.82	4.7	24.87
Raw Non-Ready-To-Eat (non-RTE) meat: Non-intact (tenderized, injected, restructured, etc.)	93.99	6.5	18.63
Raw Non-Ready-To-Eat (non-RTE) meat: Intact and/or commercial raw cuts (including carcasses)	865.13	60.3	971.76
Raw Non- Ready-To-Eat (non-RTE) meat: Offal or Meat By-Products	129.52	9.0	190.16
Ready-To-Eat (RTE) cooked meat	213.96	14.9	16.86
Ready-To-Eat (RTE) dried cured meat	8.60	0.6	0.99
Ready-To-Eat (RTE) dried fermented meat	19.42	1.4	0.44
Ready-To-Eat (RTE) canned (appertized) meat	14.31	1.0	0.34
Other	22.80	1.6	9.28