



Assessment of the sanitary status of enterprises processing food of animal origin in Poland: Veterinary and public health perspectives

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Abstract

Background: With regard to its' proprieties, the food of animal origin is subject to special supervision of the Polish veterinary inspection. The acquisition of such products requires strict observation of legal norms. This paper focuses on the sanitary state of slaughterhouses and butcheries, with regard to the public health supervision held by the veterinary inspection institutions.

Material and methods: The numerical data subjected to the present research reveal its activity in the years 2005–2016, and divided into two sub-terms, each covering the period of six years (report no. RRW-5). Statistical analysis was performed to compare the statistical trends (number of given administrative decisions, both warning, and forbidding) between the number of supervised and controlled public health establishments.

Results and conclusions: The veterinary and public health inspection applies administrative tools that were adequate to analyze the public health dangers affecting the consumers. As a result of this, the inspection extorted the improvement of sanitary state or it eliminated the incorrect abattoirs from the market. In the light of conducted analysis, the national institutions of sanitation responsible for the assessment of processing foodstuffs of animal origin can be rated positively, with regards to its proper supervision. Results and observations of the sanitary condition of processing food of animal origin were described in the scope of worldwide tendencies in veterinary and public health supervision of food safety. It is advisable to compare the results obtained in this paper with the assessment of the final product offered for consumption to the end consumer.

Key words: public health; sanitation; food safety; veterinary inspection; food animals.

Introduction

Food of animal origin may be contaminated at any stage of production, and therefore must be subjected to a special veterinary supervision [1–14]. Governments policies around the world, along with non-governmental organizations, are constantly striving to minimize the risks to the public health [1–3, 9, 14–17]. Special efforts were made by the European Union member states, as evidenced by the European veterinary legislation concerning food safety. The veterinary food-safety legal rules are a significant part of the European law. [8, 18–22]. The national veterinary authorities

of food inspection play the leading role in enforcing compliance with legal norms in establishments of processing food of animal origin. In Poland, the veterinary inspection is the main responsible authority in charge to conduct the public health and food safety assessments [8, 10–12, 18, 20–22]. This study attempts to assess compliance of enterprises dealing with food of animal origin with the veterinary legislation in Poland and constitutes its first enquiry. This paper is prepared on the basis of the veterinary inspection supervision on food of animal origin in Poland. The subject of the evaluation were based on the selected indicators, illustrating the activities of veterinary inspection during the 2005–2016 (arranged into two sub-periods i.e., six-years length each). The results obtained in Poland are presented in scope of global trends and present a worldwide tendency in the state consumers' public health protection.

Material and methods

The material for the tests were numerical values of the Polish Veterinary Inspection activities, performed in the years 2005–2016 in supervision over the companies processing food of animal origin. Based on the collected data, numerical indicators were calculated to facilitate the analysis. Reports on the activity and sanitary status of enterprises in the field of hygiene of food products of animal origin' for the years 2005–2011, as well as 'Reports on the activity and sanitary status of the structures in which products of animal origin are produced, during the years 2012–2016 (report No. RRW-5). Creating the assessment indicators was guided by consumer safety. The number of supervised and controlled entities, as well as the number of administrative decisions issued by the veterinary inspection followed by the finding of non-compliance with the legal norms, were adopted for the assessment of the safety of food production. The number of decisions requiring corrective or limiting production (warning decisions), and decisions ordering the limitation or suspension of production, and withdrawing approval (prohibitory decisions), were taken for the total number of decisions.

Statistics

The compliance with the legal requirements was analyzed in two periods, related to Poland's entry into the EU structures: the first period covering the years 2005–2006, constituting a transitional period, making it possible to operate on the domestic market of enterprises that do not meet the EU requirements, and the second period between 2007–2016, that meet under the full application of European legislation in Poland. Furthermore, by characterizing the trends for the number of enterprises supervised by the veterinary inspection, together with the number of inspections and the number of decisions issued, the data from the reports were systematized in two six-year sub-periods, covering the years 2005–2010 and 2011–2016. For these sub-periods, a trend line (linear regression), equations and correlation of the linear model fit were determined using StatSoft 2013 (<https://www.statsoft.pl/>).

Results

Numbers of food processing enterprises of animal origin: The number of entities subject to the veterinary inspection supervision were varied in the analyzed period. In the years 2005–2006, this number was by several dozen percent higher than to compare with the following years, amounting to a total of 2561 and 2617, respectively. The smallest number was recorded in 2010 (1785), followed by an increase in the following years (Figure 1). Veterinary supervision over food of animal origin led in the initial period to eliminate from the food market all the entities were not met the safety and health requirements. It is confirmed by the number of decisions issued by the veterinary inspection in 2008 (1285), compared to 2005 (4509) – the percentage decrease in the value of this parameter reaches 71.51% (Figure 2a). During the years 2005–2006 as a transition period, in which measures restrictively eliminating weak entities from the market dominated, and in the later

years can be considered stable in terms of meeting the requirements of the food-safety law. It should be noted that in the second sub-period (2011–2016), a clear upward trend in the number of plants were observed, associated with a good reaction of market in Poland to the global economic crisis.

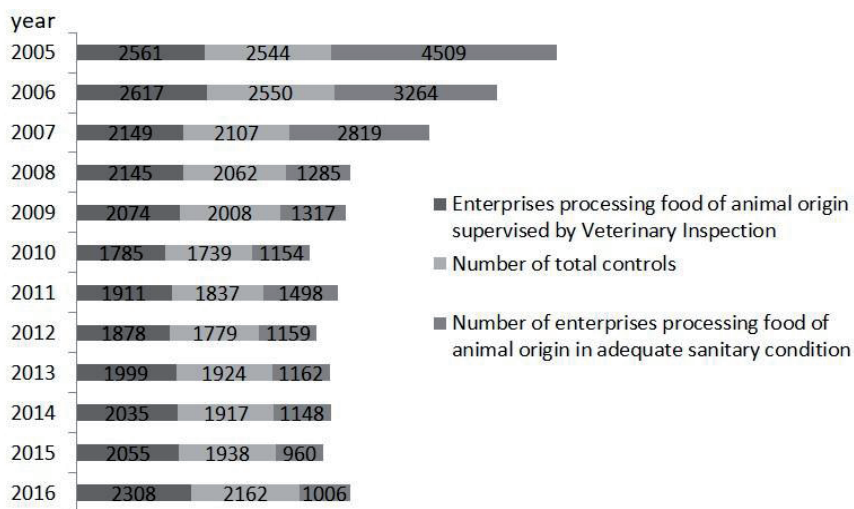


Figure 1. Enterprises processing foodstuffs of animal origin and inspections carried out in them by the Veterinary Inspection, and enterprises assessed as not meeting the requirements of food-safety law (in inadequate sanitary condition)

Number of decisions: The total number of administrative decisions issued in the sub-periods 2005–2010 and 2011–2016 was characterized by a downward trend with a strong correlation, the fit of the linear model comprised respectively 89.22 and 75.70% of decisions (Figure 2a, 2b). It was found that statistical correlations of the number of entities, the number of inspections and the number of decisions did not always overlap. The comparison of the number of irregularities found with the number of decisions issued, in particular prohibitory decisions, indicates non-schematic veterinary inspection's actions. The

highest number of decisions in the second sub-period of the present analysis was issued in 2011 (1498, with 3174 identified deficiencies), while the most of irregularities were recorded in 2009 (3805, with 1317 deficiencies). For comparison, the smallest number of decisions was issued in 2015 (960, with 3645 irregularities). In the control reports of food law requirements, the veterinary inspection authorities reported in 2005–2007 the number of objects in poor sanitary condition based on just four parameters. However, starting from 2008, reporting in this area has been detailed to thirteen parameters. This change is reflected in the significant increase in the number of negative assessments (Figure 1). It should be noted that this increase does not mean a significant deterioration of the sanitary condition of the supervised facilities.

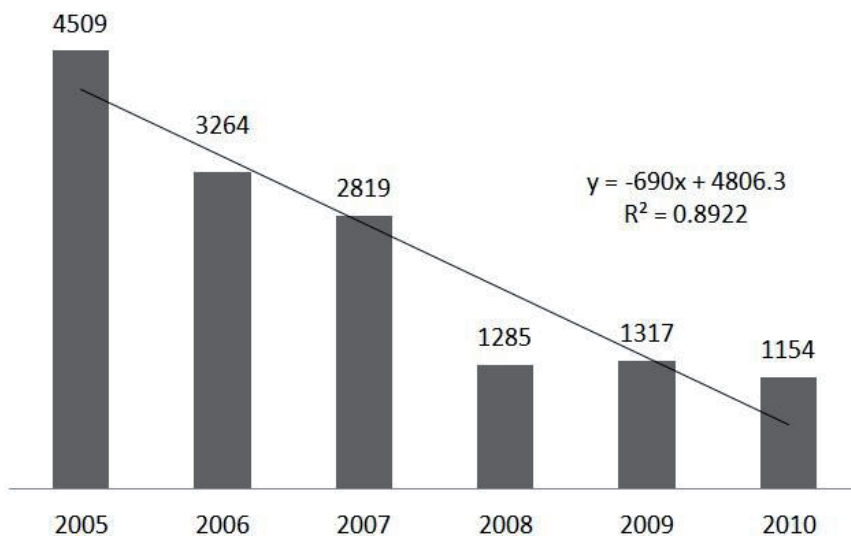


Figure 2a. Trend for the total number of decisions issued in the years 2005–2010 with the line and trend equation, and regression correlation.

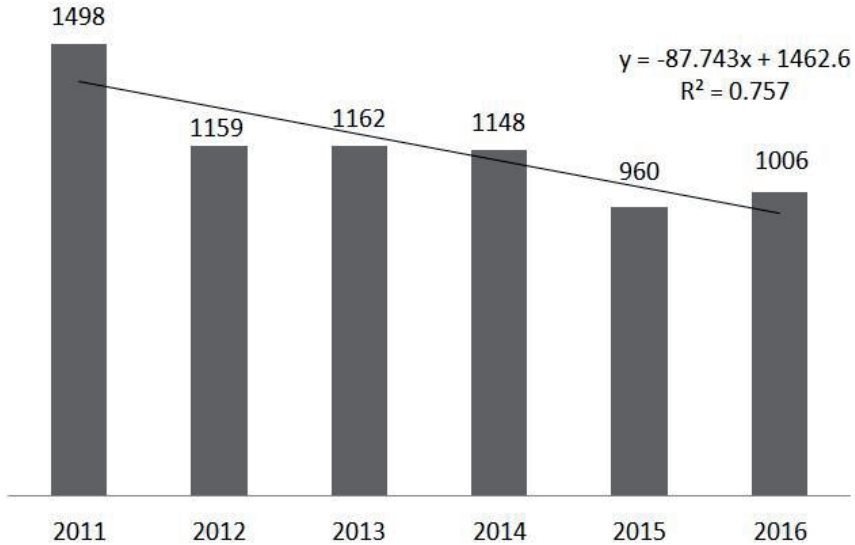


Figure 2b. Trend for the total number of decisions issued in the years 2011–2016 with the line and trend equation, and regression correlation

Number of negatively evaluated bets – warning and prohibitory decisions: In the initial sub-period subject to analysis (i.e. years 2005–2006), a decrease of 32.64% of the number of enterprises assessed by the veterinary inspection negatively was observed (Figure 1). This fact can be considered a phenomenon characteristic of the end of the adaptation period to the new EU requirements in the field of food-safety law, related to Poland’s accession to the EU on May 1, 2004. At the same time, the veterinary inspection issued in 2005 compared with 2006 by 27.62% fewer administrative decisions, 4509 to 3264, respectively, with a comparable number of establishments and controls (Figure 2a). With the passage of time, the veterinary inspection issued fewer and fewer decisions, viz., in 2007 – 37.49% fewer decisions than in 2005 and 13.94% less than in 2006 (Figure 2a). It was found that this is the result of the introduction of EU law in Poland in the scope of maintaining the safety of food products, while the veterinary inspection is applying risk-relevant administrative actions.

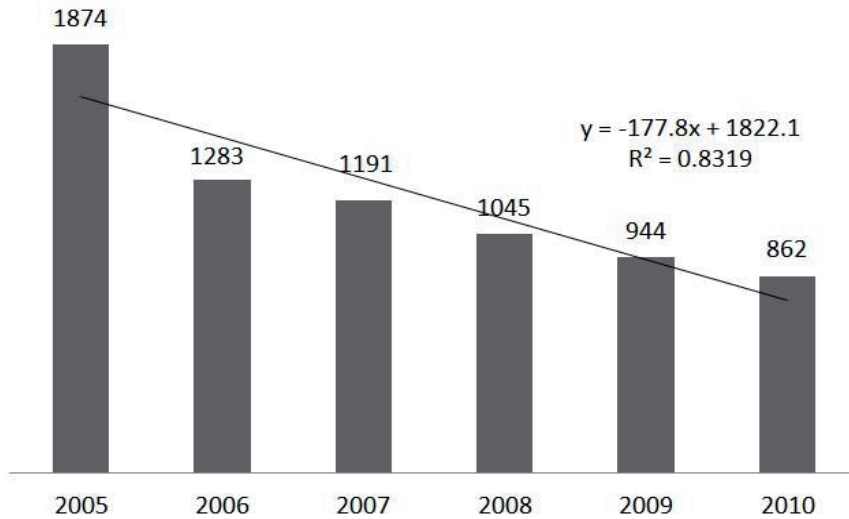


Figure 3a. Trend for warning decisions issued in the years 2005–2010 with the line and trend equation, and regression correlation

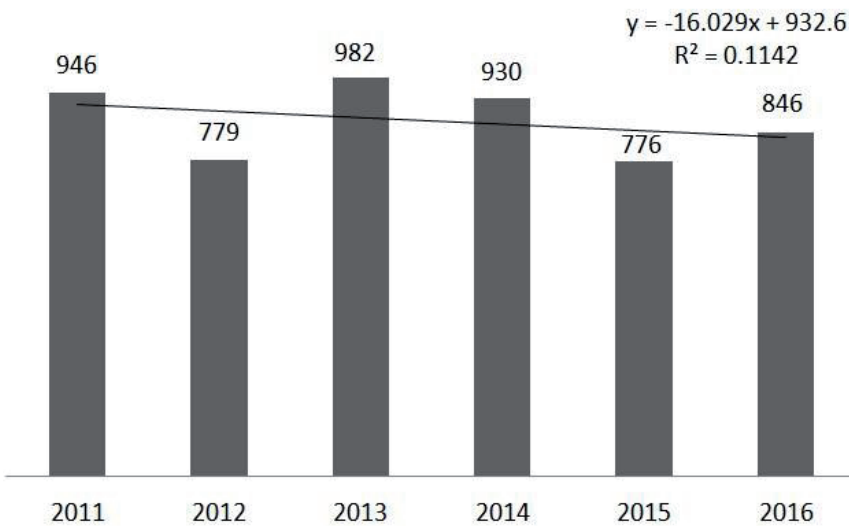


Figure 3b. Trend for warning decisions issued in the years 2011–2016 with the line and trend equation, and regression correlation

A decreasing tendency was observed for warning decisions in the years 2005–2010, with a linear adjustment of 83.19%, while in the subsequent research years, there was a slight decrease trend – 11.42% of the results (Figure 3a, 3b). The number of prohibitory decisions deserves attention. This number was the highest in 2014 – as 56, however, it was only 22.22% of the number of such decisions in relation to the first year of the current analysis. In 2011–2016, the number of prohibitory decisions fluctuated between 24 and 56, an average of 35.3, which is a decrease by one order of magnitude in relation to 2005 and 2006 (Figure 4a, 4b). The volatility of the number of prohibitory decisions in 2011–2016 can be considered as an adequate manifestation of irregularities in the inspection activities.

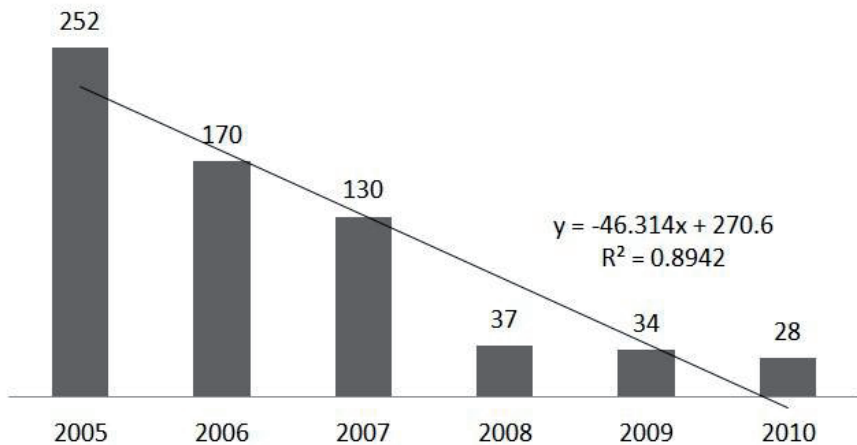


Figure 4a. Trend for prohibitory decisions issued in the years 2005–2010 with the line and trend equation, and regression correlation

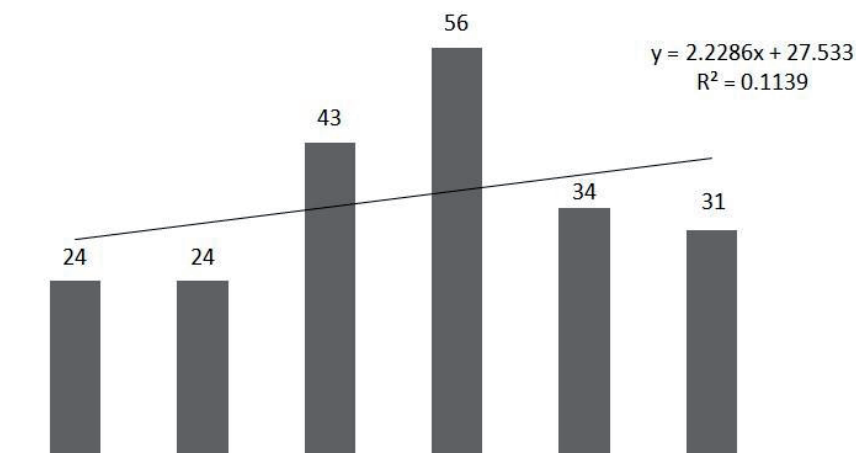


Figure 4b. Trend for prohibitory decisions issued in the years 2011–2016 with the line and trend equation, and regression correlation

The number of prohibitory decisions in each of the analyzed years does not refer to the number of irregularities found (Figure 1, 4a, 4b). Comparison of the analyzed indicators in different years, indicates how flexible and adequate to the threats were reactions of veterinary supervision bodies. Considering the total number of controlled enterprises in this period (2000), the need for radical preventive actions by the veterinary inspection was much smaller than in the previous period. This proves the improvement of the sanitary condition of the monitored area. Statistical analyzes unambiguously indicate a downward trend in the need for restrictive actions. For warning decisions issued in both research sub-periods, the trend was negative, although differentiated ($r^2 = 0.83$ and $r^2 = 0.11$), while for prohibitory administrative decisions in 2005–2010 the trend was negative with a high degree of statistical fit of 89.42%, and in 2011–2016 the trend was positive, with a correlation of 11.39% (Figure 4a, 4b).

Discussion

The results obtained show a decreasing number of serious threats to human health and life found in the enterprises processing food of animal origin. This indicates the efficiency of supervision exercised by the veterinary inspection. Furthermore, the analyzed indicators document veterinary inspection's non-schematic actions, appropriate to threats, and not to the number of deficiencies or non-compliance found. Risk control, which is based on legal standards, integrates all areas of activity of state authorities in the studied area [23]. In addition, the veterinary authorities themselves are subject to control as to the proper performance of their tasks [24]. Food safety is an important issue on a global scale, and its implementation is based on the supervision of food-producing entities [25], their co-operation with official authorities, as well as co-operation between states, international and non-governmental organizations [9]. Food safety obtained in Poland must be comparable with the level of safety in other countries, both EU member states and third states. This means that activities falling within the scope of the official control of foodstuffs, provide a similar level of consumer safety and trust throughout the world [25, 26]. Food safety must be understood on a 0-1-level scale, as the opposite of risk, i.e. the possibility of a consumers' illness after ingestion or contact with food [27], at all stages – from field to table (food supply chain) [17]. The effectiveness of which is strengthened by the introduction of new operating strategies [2]. On a global scale, this is not just about supervisory and restrictive activities, as in Poland. Risk assessments and its prevention at a non-governmental level, but at a hybrid and private level, such as introduction of HCCP, GMP or GHP, is constantly developing [1]. The audit stage may be followed by certification activities [15, 16], which indicate directly to the consumer the fact that the food is safe. In spite of the fact that the increase of consumer awareness in the field of general food safety is observed around the world [28–30] it should be stated that in Poland, consumers are not aware of the existence, role and functioning of veterinary control of animal foodstuffs, regardless of its high efficiency.

Conclusion

The activity of the veterinary inspection in Poland reflects the existence of threats resulting from non-compliance with the requirements of food law in processing of foodstuffs of animal origin. Legal norms, including strict evaluation criteria, allow for a deep analysis of hazards and taking actions adequate to the irregularities found. The veterinary inspection by issuing various administrative decisions, improves the safety of animal foodstuffs on the food market and leads to the elimination of entities posing a threat to food security and public health. There is a constant improvement in the sanitary condition of enterprises processing food of animal origin. This is largely due to the effectiveness of the veterinary inspection. There is a need for additional research, it is advisable to compare the results obtained in this work with the assessment of food safety (final product) offered for consumption to the end consumer.

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