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Welfare of Cattle and Pigs in Terms of Meat Inspection Data

1.

The issues concerning protection of farm animal welfare are governed by a number of legal acts based on the Declaration of Animal Rights adopted under the auspices of UNESCO on 15 October 1978. This document was followed by conventions (6/11/2003,¹ 10/5/1979,² 10/3/1976³), directives of the Council of Europe (98/58/EC,⁴ 2008/119/EC,⁵ 1999/74/EC,⁶ 2007/43⁷), acts on the protection of animals, as well as regulations and implementing regulations, which set out the minimum requirements for the rearing of particular animal species. The basic principles of farm animal wel-

¹ European Convention for the Protection of Animals during International Transport (Revised), 6/11/2003.

² European Convention for the Protection of Animals for Slaughter, 10/5/1979.

³ European Convention for the Protection of Animals Kept for Farming Purposes, 10/3/1976.

⁴ Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes, 8.8.1998.

⁵ Council Directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves (codified version), 15.1.2009.

⁶ Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens, 3.8.1999.

⁷ Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production, 12.7.2007.

fare were developed by the Farm Animal Welfare Council⁸ and are contained in the so-called Code for the Welfare of Livestock. Intensive farming systems have caused serious problems.

The World Organization for Animal Health (OIE) is increasingly playing an important role in ensuring animal welfare standards and, in the face of rapidly growing and modernizing animal production and increasing international trade in animals, is influencing countries that are less committed to the welfare issue. The OIE issued recommendations on personnel training, ethology, animal care, stunning and slaughtering methods to ensure welfare during slaughter of animals for human consumption. The definition of “animal welfare” adopted in May 2008 by the OIE International Committee reads as follows: “Animal welfare means the extent to which an animal copes with the conditions offered by the breeder”. Animal welfare is defined as appropriate if (according to scientific criteria) the animal is healthy, satisfied, well nourished, safe, able to express innate behavior and does not suffer from unpleasant conditions such as pain, fear or dissatisfaction expressed by anxiety.⁹

Existing national legal regulations (laws, regulations of the Minister of Agriculture and Rural Development, guidelines of the Chief Veterinary Officer) relating to welfare concern: keeping animals on the farm, transporting animals and slaughtering animals. The most important legal acts of the Polish legislation in the field of animal welfare include the Animal Protection Act of 21 August 1997¹⁰ (Journal of Laws of 1997, No. 11, pos. 724, as amended), the Act of 15 January 2015 on the Protection of Animals Used for Scientific or Educational Purposes, and a number of executive regulations to this Act. The principles of animal welfare protection are particularly emphasized in the Animal Protection Act, which contains significant, frequently quoted words: “The animal as a living being, capable of suffering, is not a thing, and man owes it respect, protection and care”. Since 2013, receiving direct payments by holdings in the European Union has been linked with the management of holdings in accordance with requirements concerning animal welfare conditions. These requirements were called cross-compliance (1307/2013¹¹). In the literature on the subject, the division of welfare indicators into physiological, behavioral, health and production indicators is now predominant.

⁸ Farm Animal Welfare Council (FAWC). Five Freedoms, <http://www.fawc.org.uk/freedoms.htm> [access: 20.02.2020].

⁹ OIE 76th General Session World Assembly, World Organization for Animal Health, Paris, 25–30 May 2008.

¹⁰ Animal Protection Act of 21 August 1997 (consolidated text, Journal of Laws of 2003, consolidated text 2013, item 856, as amended).

¹¹ Regulation (EU) No. 1307/2013 of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No. 637/2008 and Council Regulation (EC) No. 73/2009.

In the European Union, all animals that are slaughtered for meat are subjected to a meat inspection (MI) process, with the primary aim of ensuring that meat is fit for human consumption. The frequency of disease conditions and lesions, as well as quality deviations found during the sanitary and veterinary examination of slaughter animals before and after slaughter is a measurable indicator of the health and hygienic condition of slaughter animals.¹² Meat inspection plays an important role in detection of certain welfare condition. The quality of carcasses and meat depends on the technology of rearing and on the conditions of transport and pre-slaughter handling of animals. Animal transport, even under the best conditions, may lead to significant weight loss, injuries or even death of animals.¹³ The transportation of animals to the slaughterhouse must be carried out by drivers that hold a certificate of competence in vehicles previously approved by the national veterinary authority for animal transportation.¹⁴ Similar reservations may be made in respect of live-storage facilities, where animals are kept before slaughter and are often subjected to additional stress.¹⁵ Qualitative deviations in the form of emaciation, watery muscles or incomplete loss of blood, which have been observed for years, may be symptoms of certain diseases or inappropriate treatment during breeding or on the way from the farm to the slaughterhouse.

Changes or symptoms observed before and after the slaughter of animals shall provide information on the health status and welfare of the animals.¹⁶ Slaughterhouse animal examination and meat testing are tools to reduce or even exclude risks to consumer safety and health.¹⁷ In recent years, a number of reports have been published

¹² A. Cleveland-Nielsen, G. Christensen, A.K. Ersbøll, *Prevalence of Welfare-Related Lesions at Post-Mortem Meat Inspection in Danish Sows*, "Preventive Veterinary Medicine" 2004, No. 64, pp. 123–131; P. Sánchez, F.J. Pallarés, M.A. Gómez, A. Bernabé, S. Gómez, J. Seva, *Importance of the Knowledge of Pathological Processes For Risk-Based Inspection in Pig Slaughterhouses (Study of 2002 to 2016)*, "Asian-Australasian Journal of Animal Sciences" 2018, No. 31, pp. 1818–1827.

¹³ K. Górski, *Transport zwierząt gospodarskich a ich dobrostan*, „Przegląd Hodowlany” 2000, Nr 2, pp. 24–26.

¹⁴ Regulation (EC) No. 1/2005 of 22 December 2004 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and Regulation (EC) No. 1255/97.

¹⁵ S. Wajda, E. Burczyk, *Zasady postępowania z bydłem w czasie obrotu przedubojowego*, „Gospodarka Mięsna” 2017, Nr 68, pp. 12–14.

¹⁶ S. Harley, L.A. Boyle, N.E. O’Connell, S.J. More, D.L. Teixeira, A. Hanlon, *Docking the Value of Pigeat? Prevalence and Financial Implications of Welfare Lesions in Irish Slaughter Pigs*, "Animal Welfare" 2014, No. 23, pp. 275–285; N. Staaveren, B. Doyle, E.G. Manzanilla, J.A.C. Diaz, A. Hanlon, L.A. Boyle, *Validation of Carcass Lesions as Indicators for On-Farm Health and Welfare Pigs*, "Journal of Animal Science" 2017, No. 95, pp. 1528–1536.

¹⁷ A. Dalmau, E. Fabrega, X. Manteca, A. Velarde, *Health and Welfare Management of Pigs Based on Slaughter Line Records*, "Journal of Dairy, Veterinary & Animal Research" 2014, No. 1, pp. 73–78.

concerning the evaluation of slaughter and free-living animals in Poland.¹⁸ The results of these tests show a significant number of animals for slaughter, especially cattle and pigs with symptoms or lesions.

The aim of this study is to analyze the frequency of pathological conditions and lesions in slaughter animals in Poland in 2018 in the context of animal welfare. Data relating to the evaluation of the results of the health and veterinary examination were derived from the official documentation of the Veterinary Inspection from all places where animals were slaughtered under veterinary supervision.

2.

The analyzed data included those taken from the sanitary and veterinary examination in the reports prepared by the Veterinary Inspection.¹⁹ The analysis of changes in the frequency of pathological conditions and pathological changes in slaughter animals was carried out for 2018. Post-slaughter examination involved visual examination of carcasses and organs including palpation and incision of tissues or organs. Tuberculosis, erysipeloid, septicemia and abscess, emaciation and watery muscles, icterus, salmonellosis, neoplasm, leukemia, putrefaction, immaturity, incomplete loss of blood, parasites, foci of pus, contamination, organoleptic anomalies and other changes were included in the assessment of the causes of disease changes and unfitness for consumption. The analysis of the results included the number of animals tested, the number of carcasses found to be diseased and the number of carcasses declared unfit for consumption. Post-mortem examination of slaughtered healthy animals was made according to the Regulation (EC) No. 854/2004.²⁰

¹⁸ M. Radkowski, J. Siemionek, B. Zdrodowska, *Neoplastic Lesions in Slaughter Animals in Warmińsko-Mazurskie Voivodeship (Poland) Area during the Years 2001–2007*, "Polish Journal of Veterinary Science" 2010, No. 13, pp. 669–672; K. Szkucik, Z. Bełkot, M. Gondek, *Występowanie zmian chorobowych i odchyłeń jakościowych w tuszach zwierząt łownych w Polsce w latach 2000–2011*, „Medycyna Weterynaryjna” 2012, Nr 68, pp. 755–761; H. Lis, K. Górski, *Ocena wyników badania sanitarno-weterynaryjnego bydła rzeźnego w Polsce w 2016 r.*, „Życie Weterynaryjne” 2017, Nr 92, pp. 831–833; K. Górski, S. Kondracki, *Analysis and Comparison of the Frequency of Pathological Conditions and Lesions in Slaughtered Animals in Poland in 2009 and 2017*, "Folia Pomeranae Universitatis Technologiae Stetinensis Agricultura, Alimentaria, Piscaria et Zootechnica" 2019, No. 350, pp. 15–24.

¹⁹ RRW-6. *Sprawozdania z wyników urzędowego badania zwierząt rzeźnych i mięsa za 2018 rok*, Główny Inspektorat Weterynarii, Warszawa 2018.

²⁰ Regulation (EC) No. 854/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific rules for the organization of official controls on products of animal origin intended for human consumption.

3.

Table 1 shows that in 2018, more than 24.7 million slaughtered animals, including more than 1.98 million cattle and more than 22.7 million pigs, were under veterinary supervision.

Table 1. Pathological condition and lesion frequency in animals slaughtered in Poland in 2018

Species	Number of examined animals	Number and percentage of animals with lesions or pathological symptoms	Number and percentage of carcasses unfit for consumption
Cattle	1,988,338	429,183 (21.59)	4,893 (0.25)
Pigs	22,724,461	7,409,394 (32.61)	34,627 (0.16)
Total	24,712,799	7,838,577 (31.72)	39,520 (0.16)

Source: *RRW-6. Sprawozdania z wyników urzędowego badania zwierząt rzeźnych i mięsa za 2018 rok*, Główny Inspektorat Weterynarii, Warszawa 2018.

As can be seen in Table 1, in 2018, 31.72% of examined animals were diagnosed with a pre-slaughter and post-slaughter disease in the form of symptoms or lesions. Among cattle, there were 21.59% of animals with symptoms or lesions. In case of pigs, the percentage of individuals showing lesions exceeded 32.6%. In 2017, there was 20.68% of cattle and 35.45% of pigs with symptoms or lesions.²¹ In 2018, 39,520 carcasses were declared unfit. The percentage of carcasses unfit for consumption in cattle was 0.25%, while in pigs it was 0.16%, and in 2018, it was slightly higher than in 2017.

Table 2 presents data showing the frequency of disease-related changes in particular species of animals for slaughter in 2018, according to the type of changes.

Table 2. Frequency of disease lesions and qualitative changes in 2018 according to the type of changes

Type of lesions	Cattle	Pigs
	Number and percentage	
Tuberculosis	27 (0.0010)	321 (0.0020)
Erysipeloid	-	1,778 (0.0080)
Actinomycosis and sepsis	1,260 (0.0600)	9,205 (0.0400)
Salmonellosis	0 (0.0000)	9 (0.0001)
Neoplasms	6 (0.0003)	4 (0.0001)
Leukemia	0 (0.0000)	3 (0.0001)
Emaciation and watery muscles	242 (0.0120)	1,939 (0.0090)
Icterus	126 (0.0060)	1,728 (0.0080)
Putrefaction	33 (0.0020)	7 (0.0001)
Immature	6 (0.0003)	1 (0.0000)

²¹ K. Górski, S. Kondracki, *op. cit.*, pp. 15–24.

Type of lesions	Cattle	Pigs
	Number and percentage	
Organoleptic anomalies	1,036 (0.0500)	2,558 (0.0100)
Incomplete loss of blood, natural death, the slaughtering in agony	393 (0.0200)	2,506 (0.0100)
Chemical poisonings	20 (0.0010)	0 (0.0000)
Foci of pus, contaminations and congestions	252,531 (12.7000)	5,488,413 (24.1500)
Cysticercosis	569 (0.0300)	1 (0.0000)
Echinococcosis	0 (0.0000)	19,709 (0.0900)
Fasciolosis	133,103 (6.6900)	-
Trichinellosis	-	40 (0.0002)
Sarcocystosis	-	31 (0.0002)
Other parasites	6,362 (0.3200)	448,908 (1.9800)
Other contagious diseases	3 (0.0002)	1 (0.0000)
Other changes	33,466 (1.6800)	1,432,232 (6.3000)
Total	429,183 (21.6000)	7,409,394 (32.6100)

(-) absent

Source: See Table 1.

The data shows that among both cattle and pigs there were cases of tuberculosis, septicemia and abscesses, as well as icterus, neoplasms, emaciation or watery muscles, putrefaction, immaturity, as well as incomplete loss of blood, natural death and slaughtering in agony found by sanitary and veterinary examination. In the carcasses of all these species there were foci of pus and contaminations or congestion, cysticercosis and other parasites. Cases of erysipeloid, salmonellosis, trichinellosis, echinococcosis and sarcocystosis have been reported in pigs, and cases of fasciolosis have been reported in cattle. According to data from Table 2, the most numerous group included animals with foci of pus, contaminations and congestions – 12.7% in cattle and 24.15% in pigs, respectively. Changes as such may be due to inappropriate handling of slaughter animals during transport and before slaughter.²² A large number of contaminations and congestions may indicate poor hygienic quality during cutting and processing of carcasses. When comparing the frequency of disease lesions defined as foci of pus, contamination and congestion with data from 2017, it can be concluded that there has been an increase in the percentage of cattle with these lesions from 10.2% to 12.7%. In case of pigs, there was a decrease in the percentage of animals with changes recorded as foci of pus, contamination and congestion (from 28.07% to 24.15%). Liver fluke infections in cattle (6.69%) and other changes in pigs (6.30%) were the second most frequent. A large percentage of lesions was also caused by the presence of other parasites. This is particularly true for pigs in which parasites were found in more than

²² V. Vecerek, M. Malena, M. Malena Jr., E. Voslarova, P. Chloupek, *The Impact of the Transport Distance and Season on Losses of Fattened Pigs During Transport to the Slaughterhouse in the Czech Republic in the Period from 1997 to 2004*, "Veterinární Medicina" 2006, No. 51, pp. 21–28.

2% of the examined carcasses. For comparison, it can be said that the incidence of fasciolosis in cattle in Poland in 2017 was about 8.6%,²³ i.e. at a level by 2% higher than in 2018. In Western Europe, the prevalence of liver fluke in cattle estimates of 25%, 50% and 61% are reported in Northern Ireland, Germany, and Spain, respectively.²⁴ Other pathological lesions occurred at a much lower frequency. Tuberculosis-related changes occurred in 0.001% of the examined cattle and in 0.002% of the examined pigs, emaciation or watery muscles were present in 0.01% of cattle and 0.009% of pigs, incomplete loss of blood, natural death or slaughter in agony occurred in 0.02% of cattle and 0.01% of pigs. Other diseases or quality deviations of cattle and pig carcasses ranged from 0.0001 to 0.0003%. The increasing number of cases of trichinellosis in pig meat – 40 cases in 2018 – is alarming. In 2017, only 5 cases of trichinellosis²⁵ were identified nationwide. The decreasing percentage of pigs with echinococcosis is to be considered as satisfactory. In 2018, the disease was found in 0.09% of pigs. This result differs significantly from the national average of 2017, when the extensiveness of echinococcosis in pigs was 0.16%.²⁶ However, our findings are different compared to Slovakia (0.13–0.29%)²⁷ and Romania (4%).²⁸

Changes or symptoms of disease found before and after the slaughter of animals are not only the basis for the evaluation of breeding technology, the evaluation of transport conditions or the storage of animals. They also provide information on animal health status and their welfare. Having considered the foregoing, research in this area should be carried out systematically and significantly expanded. In conclusion, from an animal welfare point of view, the high number of animals with symptoms or lesions related to disease is a cause for concern. A large number of purulent foci, contamination and congestions indicates low care for the conditions of pre-slaughter marketing of slaughtered animals, as well as hygiene and conditions of slaughter, carcass cutting and processing. Congestion may also be the result of improper handling

²³ K. Górski, S. Kondracki, *op. cit.*, pp. 15–24.

²⁴ M. Mezo, M. Gonzáles-Warleta, J.A. Castro-Hermida, F.M. Ubeira, *Evaluation of the Flukicide Treatment Policy for Dairy Cattle in Galicia (NW Spain)*, "Veterinary Parasitology" 2008, No. 157, pp. 235–243; B. Kuerpick, T. Schnider, C. Strube, *Seasonal Pattern of Fasciola hepatica Antibodies in Dairy Herds in Northern Germany*, "Parasitology Research" 2012, No. 111, pp. 1085–1092; A.W. Byrne, S. McBride, A. Lahuerta-Marin, M. Guelbenzu, J. McNair, R.A. Skuce, S.W.J. McDowell, *Liver Fluke (Fasciola hepatica) Infection in Cattle in Northern Ireland: A Large-Scale Epidemiological Investigation Utilizing Surveillance Data*, "Parasites & Vectors" 2016, No. 9, pp. 209–223.

²⁵ K. Górski, S. Kondracki, *op. cit.*, pp. 15–24.

²⁶ *Ibidem*.

²⁷ A.H. Kedra, Z. Swiderski, V.V. Tkach, P. Dubinský, Z. Pawlowski, J. Stefaniak, J. Pawlowski, *Genetic Analysis of Echinococcus granulosus from Humans and Pigs in Poland, Slovakia and Ukraine. A Multicenter Study*, "Acta Parasitologica" 1999, No. 44, pp. 248–254.

²⁸ J.M. Bart, S. Morariu, J. Knapp, M.S. Ilie, M. Pitulescu, A. Anghel, I. Cosoroaba, R. Piarroux, *Genetic Typing of Echinococcus granulosus in Romania*, "Parasitology Research" 2006, No. 98, pp. 130–137.

of animals during transport. The presence of quality-related deviations in the form of emaciation, watery muscles or incomplete loss of blood of slaughtered animals also indicate errors made during breeding or transport of animals for slaughter. Parasitic diseases, mainly liver fluke in cattle and echinococcosis in pigs, require greater interest and more effective actions to reduce their incidence.

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Abstract: The article deals with the analysis of the frequency of pathological conditions and lesions in the context of animal welfare. The article shows that from an animal welfare point of view, the high number of animals with pathological conditions and lesions is a cause for concern. It was concluded that a large number of contamination and congestions indicates low care for the conditions of pre-slaughter marketing of slaughtered animals, as well as hygiene and conditions of slaughter, carcass cutting and processing. It has been found that congestion may also be the result of improper handling of slaughter animals during transport.

Keywords: animals for slaughter; post-mortem inspection; lesions; animal welfare

