

COMPARATIVE STUDIES OF FEED SAMPLES ON SALINOMYCIN CONTAMINATION
USING SCREENING AND CONFIRMATORY METHODS

*D.V. YANOVYCH, Z.S. ZASADNA, M.V. RYDCHUK, S.I. PLOTYTSIA, S.M. KISLOVA,
O.M. PAZDERSKA, S.M. MELIKYAN, H.L. MYSKO*

References:

1. Clarke L., Fodey T.L., Crooks S.R.H., et al. A review of coccidiostats and the analysis of their residues in meat and other food. *J. Meat Sci.* 2014 97 (3), 358–374.
2. Jones J.E., Solis J., Hughes B.L., Castaldo D.J., et al. Production and egg-quality responses of White Leghorn layers to anticoccidial agents. *J. Poult Sci.* 1990 69 (3), 378–387.
3. Kabell G., Saini R.K., Somani P., et al. Effects of the carboxylic ionophore monensin on regional blood flow in normal and ischemic myocardium in anesthetized dogs. *J. Pharmacol. Exp. Ther.* 1979 2119 (1), 231–237.
4. Levy J.V., Inesi G. Positive inotropic effect on isolated human atrial muscle produced by the ionophore X 537A: preliminary report. *J. Clin. Pharmacol.* 1974 14 (1), 32–34.
5. Esben B., Svenningsen J., Thyrsed J.-C., et al. Ionophore antibiotic X-206 is a potent inhibitor of SARS-CoV-2 infection in vitro. *Antivir. Res.* 2021 185, 104988.
6. European Food Safety Authority. Cross-contamination of non-target feedingstuffs by maduramicin authorised for use as a feed additive. Scientific opinion of the Panel on Contaminants in the Food Chain. Question N° EFSA-Q-2005-220F. *The EFSA Journal* 2008 594, 1-30.
7. Ashrafihelan J., Eisapour H., Erfani A.M., et al. High mortality due to accidental salinomycin intoxication in sheep. *Interdiscip. J. Toxicol.* 2014 7(3), 173-6.
8. Matabudul D.K., Crosby N.T., Lumley I., et al. The optimisation of a rapid method for the determination of lasalocid in poultry feed using supercritical fluid extraction and high performance liquid chromatography. *J. Food Chem.* 2001 75 (4), 465–471.
9. Focht C., Campbell H., Dalgleish J., et al. Determination of lasalocid sodium in animal feeds and premixes by reversed-phase liquid chromatography: collaborative study. *J. AOAC Int.* 2008 91 (3), 479–488.
10. Dusi G., Gamba V., Liquid chromatography with ultraviolet detection of lasalocid, monensin, salinomycin and narasin in poultry feeds using pre-column derivatization. *J. Chromatogr. A.* 1999 835 (1-2), 243–246.
11. Thalmann A., Wagner K., Tomassen M., et al. Liquid chromatographic method to determine narasin in feedingstuffs and premixtures: development, validation, and interlaboratory study. *J. AOAC Int.* 2004 87 (6), 1278–1286.
12. de Jong J., Stoisser B., Wagner K., et al. Determination of maduramicin in feedingstuffs and premixtures by liquid chromatography: development, validation, and interlaboratory study. *J. AOAC Int.* 2004 87 (5), 1033–1041.
13. Campbell H., Nayeri G., Costa J.M., et al. Determination of monensin, narasin, and salinomycin in mineral premixes, supplements, and animal feeds by liquid chromatography and post-column derivatization: collaborative study. *J. AOAC Int.* 2006 89 (5), 1229–1242.
14. Tavcar-Kalcher G., Pavsic-Vrtac K., Vengust A. Validation of the procedure for the determination of maduramicin in concentrates, premixes, and feeds by liquid chromatography. *Food Addit. Contam.* 2008. 22, 1–5.
15. Wang J., Sporns P., MALDI-TOF MS quantification of coccidiostats in poultry feeds. *J. Agric. Food Chem.* 2000 48 (7), 2807–2811.
16. Hormazabal V., Østensvik Ø., Kaldhusdal M. An improved LC-MS method for the determination of lasalocid, monensin, narasin, and salinomycin in feed. *J. Liq. Chromatogr. Relat. Technol.* 2005 28 (17), 2769–2776.
17. Ebel J.G., Wachs T., Henion J.D. Rapid forensic selected reaction monitoring liquid chromatography/mass spectrometry determination of ionophore antibiotics found at toxic levels in animal feeds. *J. AOAC Int.* 2004 879 (1), 25–30.
18. Vincent U., Chedin M., Yasar S., et al. Determination of ionophore coccidiostats in feedingstuffs by liquid chromatography-tandem mass spectrometry. Part I. Application to targeted feed. *J. Pharm. Biomed. Anal.* 2008 47 (4-5), 750–757.
19. Turnipseed S.B., Roybal J.E., Pfenning A.P., et al. LC/MS confirmation of ionophores in animal feeds. *J. AOAC Int.* 2001 84 (3), 640–647.
20. Huang M., Rumbeih W.K., Emmett W., et al. Rapid and reliable identification of ionophore antibiotics in feeds by liquid chromatography-tandem mass spectrometry. *J. Vet. Diagn. Invest.* 2011 23 (2), 358–363.
21. Delahaut P., Pierret G., Ralet N., et al. Multi-residue method for detecting coccidiostats at carryover level in feed by HPLC-MS/MS. *Food Addit. Contam. - Chem. A.* 2010 27 (6), 801–809.
22. Kennedy D.G., Hughes P.J., Blanchflower W.J. Ionophore residues in eggs in Northern Ireland: incidence and cause. *Food Addit. Contam.* 1998 159 (5), 535–541.

23. Rokka M., Eerola S., Perttilä U., et al. The residue levels of narasin in eggs of laying hens fed with unmedicated and medicated feed. *Mol. Nutr. Food Res.* 2005 49 (1), 38–42.
24. Commission Directive 2009/8/EC amending Annex I to Directive 2002/32/EC of the European Parliament and of the Council as regards maximum levels of unavoidable carry-over of coccidiostats or histomonostats in non-target feed. *OJEU.* 2009 40, 19–25.
25. Order of the Ministry of Agrarian Policy and Food of Ukraine № 131 of March 19, 2012. «On approval of the List of maximum permissible levels of undesirable substances in feed and feed materials for animals» (in Ukr.).
26. Commission Decision 2002/657/EC, 2002. Implementing Council Directive 96/23/EC concerning the performance of analytical methods and the interpretation of results. *Off. J. Europ. Comm.*, No. L 221/8.
27. ISO 13528:2015 Statistical methods for use in proficiency testing by interlaboratory comparison, 2015.