IOWA STATE UNIVERSITY
Agricultural and Biosystems Engineering

Jacek A. Koziel

Associate Professor
Courtesy Appointments in CCEE, FSHN, Toxicology & Environmental Science Graduate Programs
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Laboratory website: Air Quality Laboratory

Education
Ph.D. Civil Engineering, 1998, U. of Texas at Austin
M.S. Environmental Qual. Engineering, 1993, U of Alaska
M.S. Mechanical Eng. 1989, Warsaw U. of Tech., Poland

Honors and Awards
ASABE Superior Paper Award, 2016.
Fulbright U.S. Scholar, 2015-2016.
Distinguished Fellow, Kosciuszko Foundation, USA, 2015.

Selected Recent Journal Publications

Maurer et al. 2017. Farm-scale testing of soybean peroxidase and calcium peroxide for surficial swine manure treatment and mitigation of odorous VOCs, NH3, H2S emissions. *Atmospheric Environment,* 166, 467-478

Orazbayeva et al. 2017. Quantification of BTEX in soil by headspace SPME-GC-MS using combined standard addition and internal standard calibration. *Chromatographia,* 80(8), 1249-1256

Baimatova et al. 2017. Passive sampling and analysis of naphthalene in internal combustion engine exhaust with retracted SPME device & GC-MS. *Atmosphere,* 8(7), 130.

Soso, Koziel. 2017. Characterizing the scent and chemical composition of Panthera leo marking fluid using SPME & multidimensional GC-MS. *Scientific Reports,* 7(1):5137.

Ellis et al. 2017. Use of fecal volatile organic compound analysis to discriminate between non-vaccinated and BCG-vaccinated cattle prior to and after *Mycobacterium bovis* challenge. *PLoS ONE,* 2017, 12(7): e0179914

Cai et al. 2017. Development of an automated method for selected aromas of red wines from cold-hardy grapes using SPME and GC-MS-O. *Separations,* 2017, 4(3), 24

Zhu et al. 2017. Mitigation of livestock odors using a black light and a new titanium dioxide-based catalyst: proof-of-concept. *Atmosphere,* 8(6), 103

Maurer et al. 2017. Pilot-scale testing of non-activated biochar for swine manure treat.& mitigation of NH3, H2S, odorours VOCs &GHGs emissions. *Sustainability,* 9(6), 929

Koziel et al. 2017. Efficacy of NH3 as a secondary barrier treatment for inactivation of *Salmonella T.* and methicillin-resistant *Staph. aureus* in digestate of animal carcasses: Proof-of-concept. *PLoS ONE,* 2017, 12(5): e0176825

Kalus et al., 2017. Odour reducing microbial-mineral additive for poultry manure treatment. *Frontiers of Environmental Science & Engineering,* 2017, 11(3)

Koziel et al. 2017. Method for sampling and analysis of volatile biomarkers in process gas from aerobic digestion of poultry carcass using time-weighted average SPME and GC-MS. *Food Chemistry,* 232, 799-807

Teaching

Dr. Koziel teaches Technology Capstone Project for Seniors and Graduate Seminar. He also organizes Study Abroad trips to Poland focused on livestock production systems, environment, technology and sustainability. He is mentoring undergraduate students in Honors and George Washington Carver programs.

Research

Air quality measurements and mitigation
Air Quality Laboratory specializes is quantifying and mitigate emissions of ammonia (NH_3), hydrogen sulfide (H_2S), particulate matter (PM-10, PM-2.5), volatile organic compounds (VOCs), odor, and greenhouse gases from livestock operations using standard and new analytical methods.

Odor mitigation
Dr. Koziel is currently working on developing and testing mitigation technologies for odor and gaseous emissions control, e.g., manure additives and advanced oxidation. Simultaneous chemical and sensory analyses are used for identification and prioritization of malodors using solid phase microextraction (SPME)—multidimensional gas chromatography—mass spectrometry—olfactometry (MDGC-MS-O).

Environmental and Food Analysis, Animal Health
Expertise in environmental analysis, sampling, monitoring of complex chemical reactions, processes, emissions related to waste treatment, animal mortality composting, plant-insect interactions, volatile biomarkers of animal health, in vivo and non-invasive chemical sampling, wine aroma, biomarkers of aflatoxins, and kairomones.