ANIMAL SCIENCE

Institute of Agriculture and Natural Resources

UNL POULTRY NEWS

Winter, 2023

Upcoming Activities:

Nebraska Poultry Industries Convention, March 16-17, 2023, Columbus, NE

UNL Chick Days, March 25, Animal Science Building, UNL, Lincoln, NE.

FFA Career Event—Poultry Judging, March 31, 2023, Ani. Sci. Lincoln, NE.

Newsletter Editor:

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2023 UNL Chick Days

An educational event for small and back-yard poultry producers and youth featuring speakers on the following topics: (10:00 to noon)

Housing and Predator Protection—Brett Kreifels, UNL Extension Educator

Humane Slaughter for Backyard Poultry—Drs. Ruth Wiodode and Dr. Gary Sullivan, Dept. of Animal Science, UNL

Egg Grading and Sell of Home Raised Eggs—Workshop—Dr. Sheila Purdum, Dept. of Ani. Sci., UNL

4-H Poultry Showmanship Do's and Don'ts—Josie Foley, Graduate Student, Dept. of Ani. Sci., UNL

Plus Youth and Adult Exhibits and Competitions in Egg Art and Photography

Fun Prizes—Cash and Ribbons

Poultry Quiz Bowl after Lunch

March 26, 2022, 10-2:00

Dept. of Animal Science, University of Nebraska, Student Commons

RSVP to spurdum2@unl.edu

https://animalscience.unl.edu/2023-chick-days

Dr. Yijie Xiong has been a part of a team effort to provide technical analysis to assess the newest EPA's draft laying hen facility emission models. The technical report summary follows. A similar effort is underway for the EPA's broiler emission model.

Evaluating Draft EPA Emissions
Models for Laying Hen Facilities

Executive Summary—The Egg Industry Center

Draft emissions models for laying hen facilities and manure storage were made available by the US Environmental Protection Agency (EPA) in August 2021 for public comments and reviews. This report was commissioned by the American Egg Board to evaluate these draft models and provide suggestions on their suitability for use by the US egg industry. As for the assessment, the draft model equations were coded independently and then subjected to a series of 'stress tests', followed by an evaluation of the impact of using these models to estimate annual emission factors at 12 representative locations.

While an effort was made initially by EPA to develop process-based models, the necessary underlying data were not collected, and as such, the EPA draft report explicitly states that these are not process-based models. Rather, the draft models comprise a series of straightforward regressions of log-transformed emissions data to estimate whole-building emissions of ammonia, hydrogen sulfide, and particulate matter (PM2.5, PM10, and TSP).

Our analysis suggests that the draft models cannot be used to the degree of precision that is suggested in the 2021 EPA report and equations. When an emitted mass of a pollutant per hen, i.e., as an emission factor, was evaluated, the influence of changing bird inventory on model output is substantially outside that reported in previous literature. The EPA dataset had three different bird inventories (38,000, 95,000, and 218,000 hens per barn) for three different high-rise sites from the National Air Emissions Monitoring Studies (NAEMS) in California, Indiana, and North Carolina. High-rise housing is no longer the de facto standard in the US (being replaced by cage-free aviaries and manure belt houses). The EPA dataset had a single manure belt housing site, with about 280,000 hens per barn. The draft model emission factor predictions for ammonia and hydrogen sulfide from manure belt housing deviated substantially for lower and higher inventories. EPA also provided a set of models for emissions from manure storage, based on a single building, using inventory (5-day lag) as an independent variable. These models erroneously predicted increased emission factors with bird inventory, as well as negative emissions for some particulate matter types.

Deploying the draft EPA models to estimate annual effective emission factors and farm emissions from a dozen selected areas of the US demonstrated substantial differences in emission predictions with inventories smaller or greater than that on which they were developed. These predicted emissions were also variable for climate since most EPA draft models include ambient temperature and relative humidity as independent variables to the extent that is not supported in the literature. An assessment of the marginal influence of climate on emissions predictions varied from relatively small amounts that are likely beneath any detection threshold to measure, within the uncertainty of the models' predictions, and in some cases demonstrate surprisingly large marginal changes with temperature and relative humidity that are not supported in the literature. There was little difference in estimated annual emission or emission factor when daily, monthly, or annual climate averages were used at constant bird inventories.

Several recommendations are suggested regarding these draft models; a key problem for the industry is that they do not address cage-free housing, or the advances made in managing both manure belt housing and manure storage since the data underlying these draft models were collected. A much simpler modeling approach is suggested, using NAEMS inventories to determine emission factors and adjusting for climate only within the range possible and appropriate from NAEMS climate data during the field campaign

https://www.eggindustrycenter.org/media/cms/June062022Evaluating_Draft_EPA_Emis_6AEA67822FB51.pdf

Egg Exports during a tight U.S. Market, Sheila Purdum, Extension Poultry Specialist

What happens to egg exports during a tight egg supply. As one would expect, in 2022 exports fell by as much as 66.1 % for shell eggs and 27.4% for egg products this past year. However the $$ value of exports went up due to pricing by 97.4% for shell eggs and 53.2% for Egg products.

Top countries for U.S. egg exports include:

1. Canada
2. Hong Kong
3. Bahamas
4. Mexico

The U.S. egg supply is still suffering shortages due to a near 10% loss of the U.S. Laying hen flock due to Avian Influenza in 2022. It takes nearly 1/2 a year to grow a pullet to produce eggs, so the shortage is going to take time to replenish well into 2023. Avian influenza continues to threaten poultry worldwide .

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