KANSAS STATE UNIVERSITY | College of Agriculture
Department of Agronomy
Crop, Soil, and Range Sciences

Testimony in support of Senate Bill 405

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Good morning Chairman Kerschen and members of the Agriculture and Natural Resources committee, my name is Peter Tomlinson and I am an Assistant Professor and Extension Specialist for Environmental Quality at Kansas State University. I am here to testify in support of SB 405. The recent interest expressed by the poultry industry to expand broiler chicken production to Kansas has highlighted that our current animal unit designations for poultry do not accurately reflect current production practices.

Broiler chicken production

- During the past 5 years, United States broiler chickens had an average market age of 47 days with a market weight of 6.01 pounds (range from 5.85 to 6.16 pounds). Source: National Chicken Council, http://www.nationalchickencouncil.org/about-the-industry/statistics/u-s-broiler-performance/
- Broiler chicken growth (Fig. 1) is relatively uniform over the production period with an average daily gain of 0.11 to 0.14 pounds per day.

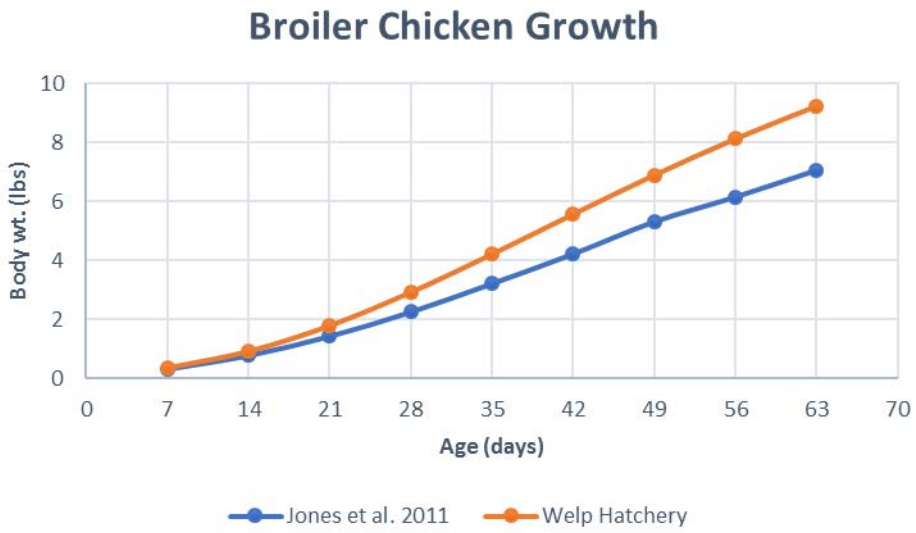

Figure 1. The growth rate of modern broiler chickens adapted from Jacob et al. 2011. How much will my chickens eat? ASC-191, Cooperative Extension Service, University of Kentucky. http://www2.ca.uky.edu/agcomm/pubs/ASC/ASC191/ASC191.pdf), and Welp Hatchery, Bancroft, Iowa (https://www.welphatchery.com/cornish_rock_care).

- Final market weight will not be achieved until the final week of growth and for 50% of the growth period the body weight will be less than half of the final market weight. Thus, supporting the calculation of the animal unit based on the average body weight (50% of market weight) rather than the final market weight.

    - Kellogg, et al. (2000) used the average weight from birth to market for broilers to calculate the number of birds per animal unit, in the development of “Manure nutrients relative to the capacity of cropland and pastureland to assimilate nutrients: Spatial and temporal trend for the United States." Source: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_012133.pdf)
- Justification for an animal unit of 0.003, based on average bird weight:
    - At a weight of 6 pounds, the average weight over the growth period would be approximately 3 pounds.
    - 3 pounds / 1000 pounds per animal unit = 0.003 animal units
- Broiler operations with a capacity greater the 125,000 birds and sufficient covered storage for a full clean out of the litter will have a large confined animal feeding operation (Large CAFO) designation according to federal Environmental Protection Agency guidelines and will be required to obtain all required permits including a nutrient management plan. Source: https://www.epa.gov/sites/production/files/2015-08/documents/cafo_permitmanual_chapter2.pdf
    - If the facility does not have sufficient covered storage it could be designated as having “liquid manure” because the litter would be stored outside exposing it to precipitation resulting in runoff; thus, lowering the threshold to 30,000 birds.
    - The permitting process will also require a nutrient management plan that ensure the appropriate agricultural utilization of nutrients and/or a plan for transferring the litter to a third party.
    - Source: https://www.epa.gov/sites/production/files/2015-08/documents/cafo_implementation_guidance.pdf

Broiler house bedding/manure (litter) management and utilization

- Birds (broilers, broiler breeder pullets) are raised on the floor of the house that has a bedding layer called litter. The litter remains under cover of the house roof and there are no lagoons as litter is a dry material (Fig 2)

Figure 2. Broiler litter with visible bedding material, feces, and waste feed.

- Poultry litter composition:
  - Bedding material (wood shavings, sawdust, rice hulls, etc.), feces, feathers, and waste feed.
  - Moisture content range of 20 to 30%.
  - Nutrient content:

Reference	Nutrient Content as received (lb/ton)		
	N	P_2O_5	K_2O
K-State MF2562[1]	56	45	34
K-State eUpdate[2]	56	53	46
Univ. of George[3]	64	54	48
Clemson[4]	72	69	46

[1] www.bookstore.ksre.k-state.edu/pubs/MF2562.pdf
[2] https://webapp.agron.ksu.edu/agr_social/eu_article.throck?article_id=1635
[3] http://extension.uga.edu/publications/detail.html?number=B1245
[4] www.clemson.edu/extension/camm/manuals/poultry_toc.html

  - Contains additional essential plant nutrients including calcium (Ca), magnesium (Mg), sulfur (S), manganese (Mn), copper (Cu), zinc (Zn), chlorine (Cl), boron (B), iron (Fe), and molybdenum (Mo). Source: https://www.clemson.edu/extension/camm/manuals/poultry/pch3b_00.pdf
- Typically, six or more flocks of birds are raised before either a partial (50% removal) or full (100% removal) cleanout of the litter.
- A 50 ft by 500 ft broiler house (25,000 square feet) with a capacity of 20,000 to 30,000 birds will produce an estimated 150 tons of litter per year (6 flocks) assuming a full cleanout is performed.
- The estimated 150 tons of litter generated from a broiler house when used as a phosphorus source to fertilize crop ground (assuming an application rate of 53 lb P_2O_5 per acre (estimate grain P_2O_5 removal for 160-bushel corn) and a litter phosphorus content of 53 lbs P_2O_5 per ton) will meet the phosphorus need for 150 acres.
- Poultry litter best management practices for utilization as a source of fertilizer for crop production include:
  - Obtain current soil and poultry litter nutrient analyses to enable accurate application rate calculations.
  - Calculate application rates based on soil fertilizer P recommendations, crop removal rates, and expected yield.
  - When appropriate incorporate manure.
  - Maintain appropriate setbacks from the edge of field and tile outlets when applying poultry litter.

Thank you for the opportunity to speak with you today. I will stand for questions at the appropriate time.

Respectfully,

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