

Interim BMP: Broiler Mortality Freezers Chesapeake Bay Program Partnership's Phase 6.0 Model

--Approved by the AgWG on July 19, 2018- addendum to AgWG-approved interim BMP (April 21, 2016)*--

Recommendations:

- **BMP Name:** The BMP will be named Broiler Mortality Freezers, and be available for interim credit for WIP and milestone planning purposes only.
- **BMP Treatment Categories:** Broilers are the only eligible animal type for this BMP.
- **Measurement Names to be submitted:** States will submit wet tons of dead birds removed and county from which they were removed.
- **Model Simulation:** Associated nutrients will be removed from manure available for application to crops functioning the same way manure transport out of the watershed currently functions. Nutrient assumptions follow below.
 - Assume that each dead broiler carcass contains 2.9% N and 0.49% P.¹ This translates to 58 lbs of N and 9.8 lbs of P per ton of dead broiler carcasses:
 - 2,000 lbs dead broiler carcasses X 0.029 lbs N/lb carcass = 58 lbs N/ ton broiler carcass.
 - 2,000 lbs dead broiler carcasses X 0.0049 lbs P/lb carcass = 9.8 lbs P/ ton broiler carcass
 - Apply a conservation factor of 50% as this is an interim BMP and values have not been assessed by an expert panel. This results in final values of for interim credit of 27 lbs of N and 4.9 lbs of P per ton of dead broiler carcasses.
 - Assume the individual nitrogen and phosphorus constituents within total nitrogen and total phosphorus are the same as that of broiler litter given the lack of information available.

Interim BMP: Livestock Mortality Management Chesapeake Bay Program Phase 6.0 Modeling Tools

--Approved by the AgWG on April 21, 2016--

--Not currently available in CAST--

BMP Name: Livestock Mortality Management

BMP Definition: This BMP represents the management and treatment of agricultural livestock mortality which is intended to reduce or eliminate the need for the land application of treated carcasses and their associated nutrients in the same area in which the mortality was generated. Mortality management can be accomplished by several treatment practices, including composting, gasification for nitrogen reductions, offsite disposal in permitted landfills, or on-farm freezing and removal for recycling to alternative uses.

¹ Values taken from Simpson, T. and S. Weammert. 2009. Mortality Composting: Definition and Nutrient and Sediment Reduction Effectiveness Estimates. In: Developing Best Management Practice Definitions and Effectiveness Estimates for Nitrogen, Phosphorus, and Sediment in the Chesapeake Watershed: Final Report. University of Maryland Mid-Atlantic Water Program. p. 393-413.

BMP Treatment Categories:

Mortality Composting
Mortality Freezers
Mortality Gasification
Mortality Landfill

Measurement Names to be submitted: Tons (of carcass weight); Animal Type; County From (county in which mortality occurred and was treated); County To (county in which treated carcasses were transported for land application)

Model Simulation: States will submit the tons of carcass weight per animal type that was treated in a way consistent with the interim BMP definition. Each ton of reported mortality managed and treatment on an annual basis will be associated with default pounds of N and P in the Phase 6.0 Model for representative livestock types. The tons or carcass weight should be assigned by the states to permitted or non-permitted livestock production feeding areas, or a default distribution will be assigned.

The Agricultural Modeling Subcommittee (AMS) will define the pounds of N and P per ton of carcass based on available literature values. The subcommittee will also estimate the annual nutrient load attributable to livestock mortality based on available mortality data. The AMS recommendations will be reviewed by the Agriculture Workgroup (AgWG) for recommendation for Phase 6.0. The number of tons of carcass weight reported will be converted to pounds of N and P, and removed from the Phase 6.0 simulation so they are no longer available for runoff from the feeding operation area in the county in which the mortality occurred. Those nutrients will then be applied to cropland in the county to which the nutrients were transported, or removed from the modeling simulation if the treatment resulted in no land application. If the treatment resulted in no land application, states should report nothing for the County To measurement value.

The Chesapeake Bay Program Office will create an interim BMP for Phase 6.0 that will be listed as "DRAFT" in the NEIEN Appendix. This will allow states to use the interim BMP for planning purposes, and to report subsequent implementation information to NEIEN. However, the interim BMP will not receive credit through annual progress reporting until the availability of a partnership approved BMP Expert

Panel recommendation report. At that time, prior reported BMP implementation information post the Phase 6.0 model calibration period can receive nutrient reduction credits.

References Cited:

Malone, G., W. Saylor, K. Lomax, and J. Rosenberger, 1990. Acid Preservation and Utilization of Poultry Carcasses Resulting from Mortality Losses. Research Report to Delmarva Poultry Industry, Inc., Univ. of Delaware, Research and Education Center, Georgetown, DE.

Malone, G. W., 1992. Fermentation of mortality. Pages 49–55 *in*: Proceedings 1992 National Poultry Waste Management Symposium. J. P. Blake, J. O. Donald, and P. H. Patterson, ed. National Poultry Waste Management Symposium Committee. Auburn University Printing Service, Auburn, Alabama

Dead Animal Nutrient Concentrations (AMS to Complete Table for Phase 6)

| Animal Type | TN/lb dead weight | TP/lb dead weight | Lbs of dead weight/Animal |
|--------------------|-------------------|-------------------|---------------------------|
| broilers | 0.0283 | 0.0038 | ? |
| turkeys | ? | ? | ? |
| pullets | ? | ? | ? |
| layers | ? | ? | ? |
| dairy | ? | ? | ? |
| beef | ? | ? | ? |
| other cattle | ? | ? | ? |
| hogs for slaughter | ? | ? | ? |
| hogs for breeding | ? | ? | ? |
| sheep and lambs | ? | ? | ? |
| horses | ? | ? | ? |
| goats | ? | ? | ? |

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*The above interim BMP addendum did not receive the customary 30-day review period, due to time constraints placed on interim BMP approval for 2018-2019 milestone period by the CBPO. These time constraints have since been relaxed. Below are the approved minutes from the July 19, 2018 AgWG call:

Excerpts from AgWG July 19th, 2018 approved minutes:

Discussion:

- Frank Schneider: Looking at these numbers presented, I think they are very realistic and I will make a motion to approve as interim.
 - Chris Brosch seconded the motion

- Kelly Shenk: How do bird weights factor in to the nutrient levels? Does it adjust as bird weights change throughout the years?
 - Loretta: If I recall correctly, the Simpson Weiner Report assumed 3 lbs for dead broiler weight and I believe Matt Johnston used 3.5 lbs.
 - Kelly Shenk: We would have to check with Matt Johnston to see if that adjusts as broiler weight increased since 2009.
 - Chris Brosch: I think your question may be about concentration, because this will be measured in tons of bird.
 - Victor D'Amato: It's a per pound calculation, size of the bird will be factored in with change because you will multiply the nutrient concentration by the weight of the bird, which could vary from year to year.
 - Chris Brosch: So, calculating this by ton of bird will satisfy any concerns about bird weight change over time, as long as the nutrient concentration does not change.
- Kelly Shenk: Are ammonia losses from the volatilization process factored into this efficiency? I would like further clarification on that.
 - Chris Brosch: Matt Johnston would be the one to answer that question. From my recollection from the Ag Modeling Subcommittee, volatilization of manure is taken one time in the model between generation and land application although in the real world it's a slow process. Then there is a separate volatilization event during land application.
 - Jason Kepler: This is an alternative to traditional composting, and I would assume if composted correctly, there is little volatilization from the composting process.
- Alisha Mulkey: I don't have an objection to this BMP as interim. Whether it is through freezers or traditional composting, I don't understand how this relates to mortality being quantified in the model. I was under the impression that the new method for poultry inventory accounted for mortality numbers already. How would this be credited against poultry population assumptions?
 - Loretta Collins: There are still questions about how mortality is represented in the model and the expert panel will be tasked with figuring out these details.
- Mark Dubin: The purpose for the freezer mortality system is to remove nutrients from the farm in a nutrient transfer. This may help address that question.
- Ken Staver: I'm wondering where this is headed in terms of the amount of nutrients applied to a field which makes a change in our nutrient losses.
 - Adam Lyon: I would assume if it is a truly composted product, that the mineralization rate for N would be much lower than say a poultry litter.
 - Ken Staver: The nutrient management plan is based on plant available N, so if it's not available, then you would apply a higher rate of total N to compensate.
 - Frank Schneider: From my view, this is just removing some of the manure out of the calculation, no different than a manure transport out of the watershed, so it's reducing the overall volume of manure that is applied.
 - Ken Staver: As a farmer, I'm not going to apply less N to my field because I composted carcasses.
 - Frank Schneider: I agree, in my opinion this will be a rounding error, this is just for freezing mortality and only for planning purposes. The panel will come back with their recommendations.
- Chris Brosch explained that the size of the bird is not impacting the nutrients. We have no reason to expect the nutrient concentration of the carcasses will be vastly different than 2.9% and 0.49% for N and P, respectively. The size of the bird would not dictate the concentration of N and P, the genetics and the feed of the bird would dictate that. The unit is pound per pound or

kg per kg. Since this is tracked by tons of carcasses rendered, it is just a percentage of nutrient to that weight.

- Kelly Shenk: Thanks for taking the time to explain that to me, this makes sense.
- Jason Kepler: The 50% conservative factor also accounts for change over time in concentrations because it is dropping the nutrient reduction in half.

Decision: The AgWG approved the CBPO updated interim BMP effectiveness value for broiler freezer mortality for future planning purposes only.

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