



Standard Operating Procedures

Estimating Volume and Bulk Density of Poultry Litter in the House

Mike Smolen, Hailin Zhang and Doug Hamilton

OBJECTIVES: To estimate the volume of poultry litter in a poultry house. This measurement is useful to determine the amount of litter available for marketing or land application. Volume can be used directly to estimate truck capacity needed. With bulk density estimate, the volume can be converted to tons.

PROCEDURES FOR ESTIMATING VOLUME:

- 1. Measure the length and width of the house, or obtain dimensions from a floor plan.
2. Measure depth of the litter in at least 20 random locations sampling all areas of the house as showing in Figure 1:
3. Calculate average Depth in inches.
4. The volume of the litter is:

V (ft.^3) = Width (ft) X Length (ft) X Average Depth (inches)/12

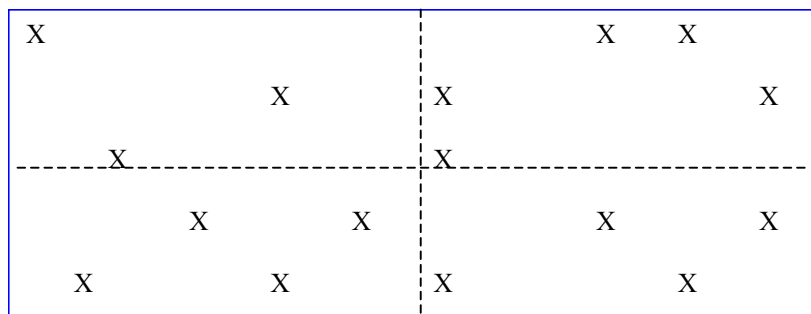


Figure 1. Measure litter depth at 20 random locations inside the house.

PROCEDURES TO ESTIMATE BULK DENSITY AND TOTAL WEIGHT:

Obtain bulk density of the litter in the house (lbs/ft^3) by sampling 1 ft square at four locations. Samples should represent the average depth of the house.

- 1. Divide house into quadrants.
2. In each quadrant, toss 1 ft square frame.
3. Measure depth in center of square frame, where it lies. If depth is more than 150% of Average Depth (determined in step 3 above) or less than 50% of the Average Depth, do not sample, but toss the frame again.
4. Scoop up and weigh all litter from area bounded by the one square foot frame.

5. The bulk density is:

$$\text{Bulk Density (lbs/ft}^3\text{)} = \frac{\text{Litter weight (lbs) X depth of litter (inches)}}{12}$$

$$\text{Total Weight (tons)} = \frac{\text{Density (lbs/ft}^3\text{) X V (ft.}^3\text{)}}{2000}$$

#### ERRORS ASSOCIATED WITH THIS METHOD:

Thickness of the litter and bulk density vary a lot inside a poultry house. The accuracy of the total volume and weight depends largely on how well the thickness and bulk density are measured.

For more information on use of poultry litter please refer to the follow extension publications:

- F-2207 - How to Get a Good Soil Sample
- F-2228 - Fertilizer Nutrients in Animal Manure
- F-2246 - Using Poultry Litter as Fertilizer
- F-2248 - Sampling Animal Manure
- F-2249 - Managing Phosphorus From Animal Manure
- PT2002-24 Poultry Litter Quality Criteria

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