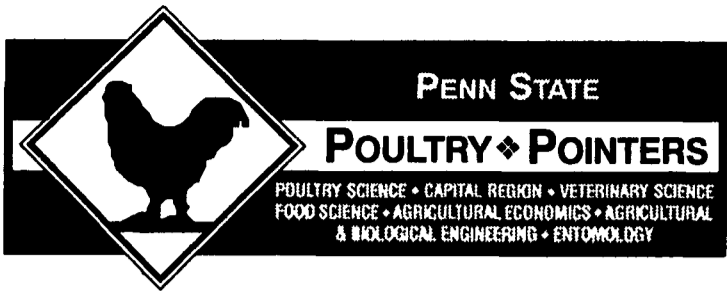


Winter Ventilation and Ammonia In Broiler Houses



Eileen F. Wheeler,
Assistant Professor
Environmental Control
Department of
Agricultural and
Biological Engineering

Broiler house management under cold winter conditions offers challenges in environmental control with the competing functions of heating air to an acceptable temperature for the birds while ventilating for desirable air quality, such as acceptable ammonia and humidity levels. Typically, house minimum ventilation requirements are based on removal of the moisture produced by the birds in order to keep house relative humidity in the range of 50 to 70%. Moisture comes from bird respiration and evaporation of manure moisture and drinker spillage.

Elevated aerial ammonia in the broiler house environment is known to be detrimental to bird health and performance. An industry guideline recommends keeping

ammonia levels below 25 ppm to avoid adverse affects on bird health and productivity, not to mention worker health risks. Realization of this goal is spurious due to an inability to carefully monitor ammonia levels and lack of guidelines for ventilation rates to control ammonia. Ammonia levels may be determined by feed representatives or the grower through periodic measurements with gas detector tubes (sampler pump \$350 with ammonia-specific tube \$4 each) or dosimeter tubes (\$4 each). Newer, but expensive (\$1000 + datalogger), technology will allow continuous monitoring of ammonia levels in the house. Another way to detect ammonia levels is by using your nose. This works, NOT. After a couple years of growing chickens, most growers can no longer detect elevated ammonia.

Increased ventilation rates have been proposed to alleviate the high ammonia concentrations. High ammonia levels have been

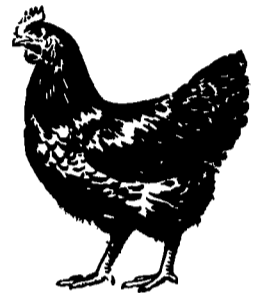
correlated to high humidity conditions, but on old litter, acceptable humidity levels are often NOT correlated to acceptably low ammonia levels. Other ways to reduce ammonia levels include the use of litter or feed additives which decrease litter pH or lower excreted nitrogen both of which reduce ammonia volatilization. Litter management which reduces wet spots from drinkers and caked litter will improve ammonia control in the house. Old litter can volatilize large amounts of ammonia when used on a subsequent flock so litter replacement between winter flocks is another option.

Research suggests that the unacceptable ammonia level generated from wet, warm, or high pH litter and the practice of placing chicks on reused, built-up litter requires a higher ventilation rate to dilute ammonia levels to acceptable levels for flock productivity. A recent Arkansas broiler house study found that the ventilation rate necessary to control ammonia levels on reused litter the first week of brooding was two to nine times higher than that needed to control humidity. Ventilation rate on day one of bird placement

for growouts on old litter averaged nine times the standard minimum ventilation rate. This ventilation rate declined exponentially with bird age so that by two-weeks old, the standard minimum ventilation rate was effective in both ammonia and humidity control. Evaluations from this study included fuel use, provision of new litter for each winter flock, increased heater capacity for elevated ventilation use with increased supplemental heat demand, and over-heating the house to 95°F for two days prior to chick placement to drive off ammonia from old litter. Partial litter replacement in the brooding end only, in partial brood houses, was considered the most cost effective in most circumstances. This is a practice which may be even more cost effective under colder Pennsylvania conditions.

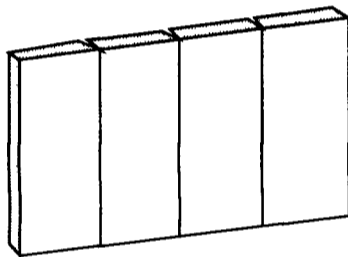
Winter ventilation strategy should provide healthy environmental conditions with economical production of broilers, yet minimization of fuel use often drives management decisions. Birds will substitute costly feed for fuel if conditions are too cool. Inadequate ventilation results in high ammonia levels which leads to respiratory challenges, poorer

feed conversion, lower weight gain, disease challenge and carcass condemnations at the processing plant. Pennsylvania has relatively cold winter conditions compared to other major poultry producing regions which makes management of fuel use and ventilation control strategies of more concern. Strategies employed in warmer climates are not necessarily directly applicable to Pennsylvania conditions. An economic analysis of fuel use versus air quality and bird productivity under Pennsylvania conditions is being done with funding from the Pennsylvania Broiler Research Program to provide guidance for better management control of broiler house environment. Data are being collected and evaluations conducted this winter with results and recommendations available in time for next winter's ammonia season.



Lancaster Poured Walls

- Agriculture
- Commercial • Residential



Call for Prices On:

- SCS approved Manure Storage Pits
- Basements
- Footers
- Retaining Walls
- Floors

Customer Satisfaction is Our Goal

Lancaster Poured Walls

2001 Jarvis Rd. • Lancaster, PA 17601 • (717) 299-3974

CONESTOGA VALLEY ENTERPRISES

HI-MAG Agricultural Lime Spreading HI-CAL

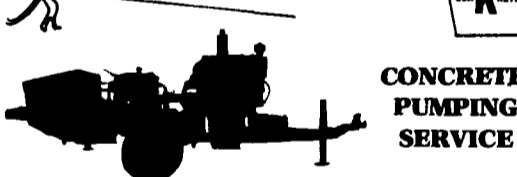


Cash Discount Savings on Delivery
Call Toll Free day and evening

1-800-724-3277

Serving PA, MD, Delmarva, NJ, NY & (LI)

KEYSTONE GUN-KRETE



CONCRETE
PUMPING
SERVICE

Featuring
• Sidewinder 45 Concrete Pump • Up To 40 Cubic Yards Per Hour
• Pump Up To 150 Ft. Vertical And 800 Ft. Horizontal

CONCRETE SPRAYING SERVICE

A Proven Way Of Applying Concrete

- Repair Retaining Walls
- Strengthen Existing Masonry Walls
- Reseal Manure Pits
- Manure Pit Construction
- Trench Silo Construction
- Silo Repair

KEYSTONE GUN-KRETE

61 Poplar Street Gordonville, PA 17529

(717) 768-3641

ALL PURPOSE CART

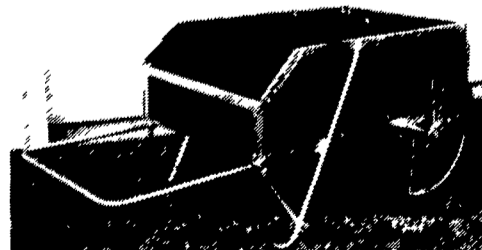


Photo Is 15 Cu. Ft. Size

- 15 Cu Ft Model—assembled with removable front & back, 26" pneumatic tires \$165.⁰⁰
- 8 Cu Ft Model—assembled with solid front & removable back, 20" pneumatic tires \$138.⁰⁰

Elam M. Ebersol

558 Gibbons Road
Bird-In-Hand, PA 17505

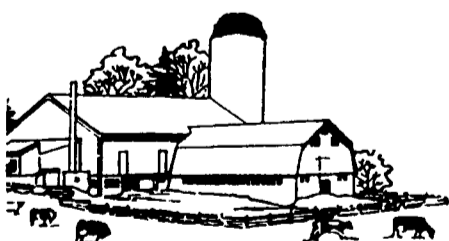
Leave Message

717-661-9131

Dealer Inquiries Welcome

WHITEWASHING with ADVANTAGE FARM WHITE

- DRIES WHITE • NO WET FLOORS
- IS COMPATIBLE WITH DISINFECTANT AND FLY SPRAYS
- DOES NOT RUB OFF EASILY
- WASHES OFF WINDOWS & PIPELINES EASILY



10% CASH
Discount
through Month
of March 1998
on Total Bill

BARN CLEANING SERVICE AVAILABLE WITH COMPRESSED AIR

To have your barn cleaned with air it will clean off dust, cob webs & lots of the old lime
This will keep your barn looking cleaner & whiter longer

CALL US ABOUT ON THE FARM FLY CONTROL

Serving Southeastern Pa. And More

BEITZEL'S SPRAYING

Witmer, PA 17585 717-392-7227 or

Toll Free 1-800-727-7228 7:00 AM to 5:00 PM

CERTIFIED COMMERCIAL APPLICATORS

LICENSED 37 YEARS EXPERIENCE INSURED

5 Trucks For Air Cleaning And Whitewashing

RADIO DISPATCHED TRUCKS

Barn Spraying Is Our Business, not a sideline.

Spraying Since 1961

RAY EAGER & SONS

Agricultural Washdowns



717-949-3212

SPECIALIZING IN

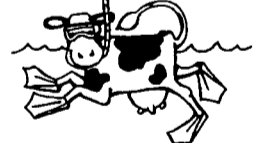
Poultry Houses: Layers, Breeders, Broilers

Hog, Veal and Dairy Barns

High Pressure, Low Volume Washing

RD #1 Box 147, Newmanstown, PA 17073

HYDRO COW FLOTATION



With the Hydro Cow Flotation System you can float a down cow back onto its legs harmlessly without using clamps, belts or chains. The Hydro Cow is a natural way to get a cow back on its legs using only warm water.



Hydro Cow Flotation Service is available in Lancaster, York and Chester Counties, and northeastern Maryland

From:

Solanco Veterinary Service

496 Solanco Rd., Quarryville, PA

717-786-1303, 1-800-262-7331

717-786-8550 Evenings