

Poultry Industry Building - Related Problems and Solutions

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happy with the arrangement. All concepts of manure handling should be developed with the attitude of it being a valuable by-product rather than a waste. Deep pits are employed in Pennsylvania as a system of handling manure on commercial layer farms. This is a dropping pit from 2½ to 6 or 7 feet deep, located beneath the cages of birds. The pit is cleaned out periodically or annually with a tractor and manure loader. In one case, this manure is allowed to accumulate for six years.

The problem with this system is that it does not solve the fly problem or the rodent problem, and there is a considerable odor problem when the pit is disturbed.

Dropping pits that are shallow and utilizing automatic scrapers work reasonably well, provided they utilize a stainless steel cable. However, these cables last only a relatively short period of economic time due to the corrosive action of acid in the droppings. Breakdowns, of course, require replacement of the cable at considerable cost, to say nothing of the accumulation of the manure during the breakdown period.

This constant agitation of the manure causes an odor problem, and if no provision is made for

storage of the manure at the end of the building, it must be spread immediately on the land.

In Pennsylvania, not too many cage-layer houses allow the manure under the cages to "cone up" and dry under the cages. In other states, this system is a little more popular. However, again, when this manure is disturbed for removal from the house and for spreading on the land, the odors are rather pronounced, to put it mildly, and we have a neighbor problem.

The liquid manure system for handling poultry waste is used rarely in Pennsylvania. Where it is used, dropping pits or concrete spillways are under the birds and these are flooded with water. Then the droppings and the water are moved to a holding tank. The holding tank must be agitated before the material can be removed from the pit and this creates some odor problems.

Lagoons as a means of manure disposal in the poultry industry will be mentioned only in passing, as this system has been tried in Pennsylvania and for one reason or another has been abandoned as a system for handling poultry manure. I might mention, however, that other states have utilized this method of manure disposal.

However, in these particular areas, they are not too close to their neighbors.

Handling poultry manure by drying has been investigated at Cornell University. However, in their trials the costs of drying manure have run relatively high.

There has been some investigation of a system for removing water from poultry manure by electro-osmosis. Such a system involves placing electrodes with positive and negative poles in wet manure. Electric current is then passed through the wet manure in such a way that water would be removed and filtered off in the process. I do not have any information on the costs of this process, however I have found out that it takes about two weeks time to dry poultry manure from 60 percent moisture to a point of non-conduction of electricity which in itself would make it impractical.

Incineration, as a means of taking care of poultry manure, has been tried in Pennsylvania, however, there are many problems involved with this process. In fact, the incineration equipment, along with its added pollution problems, may be as expensive as drying equipment to build, install and operate.

handling, the poultry manure have been investigated throughout the country. In Canada, they have aerated the liquid manure in an attempt to bring the water content down to 25 percent to reduce the odors.

In other parts of the country, they have tried bacterial digesters with a limited amount of success.

A new experiment involves the use of insects as a control of poultry manure odors. In this study, fresh poultry manure was seeded with a known concentration of fly eggs and the eggs were allowed to hatch into larvae. The larvae then tunneled downward through the wet manure, thereby reducing and aerating the mass, so the moisture content was reduced by 50 percent. After the larvae had tunneled through the manure, it was essentially deodorized and would not support further fly egg or larvae development.

Interestingly, the fly pupae was harvested later and ground up and fed back to the chicks as a substitute for soybean meal.

The Penn State Effort

In my estimation, Pennsylvania State University has come up with an ultimate in providing an answer to the poultry manure problem. Workers here

have investigated the use of high-speed fans below sloping wire floors and daily, mechanically stirring the manure utilizing a spike-tooth harrow type device to expose wet surfaces. This constantly keeps the surface of the manure broken up, and utilizes the fan air speed to vaporize the moisture of the poultry manure. The ventilation system of the poultry house is utilized to remove the moisture from the house.

There is no odor involved with the process, and the resultant product is approximately 30 percent moisture. This product may be further dried to less than 10 percent and utilized as a fertilizer.


This appears to be the direction that the poultry industry must go in the future if they are going to handle a poultry manure in such a manner that they can get along with their neighbors.

The Industry's Future

Practically all new poultry housing in three years will have some form of controlled environment—some even with air-conditioning by refrigeration. This is a prediction made by a recent publication.

Rather than describe what we have now in the way of poultry housing, I would like to pose some trends in the 70's. The ac-

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