Description

Dust (particulate matter) within livestock and poultry facilities is composed of dander (or feathers with poultry), feed particles and dried manure to name a few sources. These impact the air quality within buildings, possibly having a negative impact on animals and workers. Particulate matter (PM), which can absorb gases, plays a role in the transport of gaseous and odorous compounds as they leave the building through the ventilation system. Removal of dust from the environment within livestock and poultry buildings not only reduces the overall emission of airborne bacteria, PM, gases and odor, but also results in improved indoor air quality.

The principle behind vegetative oil sprinkling is that oil is sprayed into the air causing dust particles to stick to oil droplets and other dust particles, thereby settling to the floor. Oil droplet size is very important in that droplets that are too small, thereby forming a mist, could be breathed in by animals or workers. Droplets that are too large will settle out too quickly causing poor distribution within the building. Sprinkling should be done on a daily basis with a very small amount of oil, found to be approximately one gallon per day per 1000 head finishing.

Several vegetable oils have been tested and found to be effective, safe and economical. Crude canola, purified canola, flax, corn, sunflower and soybean oils have all proven effective in research trials. Oils have varying viscosity characteristics but in general they should be kept at room temperature (60 to 70°F) to flow in a sufficient manner. They should be applied through sprayers at 30 psi or greater in most cases. MWPS (1997) gives detailed information on acceptable ranges of applications. The fact that various oils perform well allows selection of the most economical oil at the time of purchase without sacrificing performance. The total amount required varies from 0.5 to 0.7 quarts per finishing pig marketed.

Oil sprinkling can be done in a number of ways. Backpack hand sprayers can be used to apply oil but should be equipped with a pressure gauge so as to maintain the pressure and, therefore the droplet size, in the right range. The biggest drawback to this approach is the labor involved and applying an appropriate amount uniformly. Another approach has been to utilize more automated approaches. One study utilized the “soaker system” in a finishing building which is normally used to apply extra water to the floor prior to cleaning. In this approach oil was injected into the soaker system as it operated for 1 minute each day. This was an effective approach but nozzles tended to clog requiring that the lines be purged with water once the oil injecting had ceased.
The biggest challenges to using sprinkled oil are the impact on cleaning time and possible safety concerns. Excessive oil can build up on alley surfaces and can make the floors slightly slick, adding to the potential for falls. Flooring will be more difficult to clean due to oil buildup. Degreasers can help to reduce the extra time required but cleaning will still take longer than normally might be expected.

**Effectiveness**

<table>
<thead>
<tr>
<th>Component</th>
<th>Reduction*</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH3</td>
<td>0 to 30%</td>
<td>Research results vary greatly on ammonia reduction.</td>
</tr>
<tr>
<td>H2S</td>
<td>20 to 30%</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>25 to 60%</td>
<td>Estimated</td>
</tr>
<tr>
<td>Particulate Matter</td>
<td>60%</td>
<td>Total PM</td>
</tr>
<tr>
<td></td>
<td>80 to 85%</td>
<td>Inhalable PM</td>
</tr>
<tr>
<td></td>
<td>60 to 80%</td>
<td>Respirable PM</td>
</tr>
<tr>
<td>Volatile Organic Compounds (VOC)</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

| Cost | $ | Materials and labor |

*Based on a rounded overview of data. For more detailed efficiencies see specific research studies.

### Cost Considerations

Cost includes the cost of oil (0.5 to 0.7 quarts per pig finished), the application equipment, labor to sprinkle oil and added labor to clean. MWPS (1997) estimated the cost as $1.14 per pig marketed when using a simple backpack sprayer. Adjusting for changes in oil prices and labor would yield a cost between $2.00 and $2.50 per pig marketed. More automated systems would cost more for equipment but labor would be reduced for application. Labor for cleanup would remain elevated.

### More Information

Sprinkling Oil to Reduce Dust, Gases and Odor in Swine Buildings. MWPS AED-42.

https://www-mwps.sws.iastate.edu/sites/default/files/imported/free/aed_42.pdf

### References


Ouellette, C., S. Lemay, S. Godbout, I. Edeogu. 2006. Oil application to reduce dust and odour emissions from swine buildings. CSBE Paper No. 06-147. CSBE, Winnipeg, Canada.


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