

THE EFFECTS OF OIL SPRAYING ON AIR QUALITY IN PIGGERY BUILDINGS – PRELIMINARY RESULTS

T. BANHAZI^A, T. MURPHY^A, M. KLOPPERS^B, and C. CARGILL^A

^A SARDI, Livestock Systems Alliance, GPO Box 397, Adelaide SA 5001.

^B University of Adelaide, Livestock Systems Alliance, Roseworthy Campus, SA 5371.

The negative effects of high concentration of bioaerosol on human and animal health, as well as on animal welfare and productivity are well documented (Donham *et al.* 1986; Cargill *et al.* 1998). Suspended airborne particles can also absorb toxic and noxious gases as well as bacteria components and act as vectors for these pollutants. Reducing the concentration of airborne particles in piggery buildings is therefore an important component of good management and can improve production efficiency and reduce the potentially harmful effects of long term exposure to humans (Donham *et al.* 1989). The objective of this research was to evaluate the effects of spraying a mixture of oil and water directly onto pen floors on the concentration of airborne particles inside a weaner accommodation.

Air quality parameters were recorded for 32 days in two partially-slatted, mechanically-ventilated weaner rooms housing 89 pigs (mean live weight approximately 18kg) at the stocking rate of 0.3 m²/pig. The floor of one of the rooms (experimental facility) was sprayed daily with a mixture of canola oil and water (50:50) at the rate of 3 g/pig (6.3g/m²), using an automatic spraying system, while the other room was not treated (control facility). Airborne respirable and inhalable particles were measured as previously described (Banhazi and Cargill, 1997) and compared between the two treatments. The data were analysed using one-way ANOVA procedures (Statistica 5).

The concentration of both inhalable and respirable airborne particles was significantly reduced in the experiment weaner facility (Table 1).

Table 1. Concentrations of respirable and total airborne particles, viable bacteria and carbon dioxide for the control and treatment periods.

Treatment	Respirable dust (mg/m ³)	Inhalable dust (mg/m ³)
Control	0.208 ^a	4.023 ^a
Treatment	0.150 ^b	2.278 ^b
Reduction %	28	44

^{ab} Values in the same column with different superscripts differ significantly (P<0.05).

The experiment achieved its aim of demonstrating a reduction in the concentrations of both inhalable and respirable airborne particles in the airspace following the direct spraying of an oil and water mixture onto the floor. This study confirmed previously published data (Takai *et al.* 1995) and the technique used in the experiment could be used by producers to effectively reduce dust levels in piggery building. However, further studies are needed to determine the long-term effects of frequent oil spraying on subsequent surface hygiene of pen floors.

Supported in part by the Australian Pork Limited.

BANHAZI, T. and CARGILL, C. (1997). In 'Manipulating Pig Production VI' (ed. P.D.Cranwell) p296, (Australian Pig Science Association: Werribee).

CARGILL, C., BANHAZI, T. and CONNAUGHTON, I. (1998). Proceedings of the 15th IPVS Congress, Birmingham, England. p248

DONHAM, K., J., HAGLIND, P., PETERSON, Y. and RYLANDER, R. (1986). *Am. J. Ind. Med.* **10**, 289-93.

DONHAM, K., J., HAGLIND, P., PETERSON, Y., RYLANDER, R. and BELIN, L. (1989). *Br. J. Ind. Med.* **46**, 31-7.

TAKAI H, MOLLER F, IVERSEN M, JORSAL S E and BILLE-HANSEN V (1995). *Trans. ASAE* **38**, 1513-8.

Email: Banhazi.thomas@saugov.sa.gov.au