

Canola oil sprinkling and low crude protein diet reduce respirable dust and ammonia concentrations from swine production



Y. Jin PhD



B. Predicala PhD

Tests over a nine-month monitoring period evaluated the effect of canola oil sprinkling and low crude protein diet on ammonia (NH₃) and respirable dust concentrations.

The test was conducted in six swine grow-finish rooms with partially slatted floor; each 5.49 x 14.63 m room has six pens with a total capacity of 72 pigs. Each treatment, namely canola oil-sprinkling, low crude protein diet, and control (no measures), were applied to two rooms each. (No changes from typical production)

Pigs were moved into the rooms from nursery at about 20 kg and were taken to market weight of about 120 kg after 14 to 15 weeks. Except for the two rooms given the experimental low crude protein diet, all pigs were fed identical diets.

A variable sprinkling schedule was followed from the same day of admission of pigs into the rooms: 40 ml/m²/d for the first two days, 20 ml/m²/d for the third and fourth days, and 5 ml/m²/d for the succeeding days. Dietary crude protein was reduced by adding supplemental

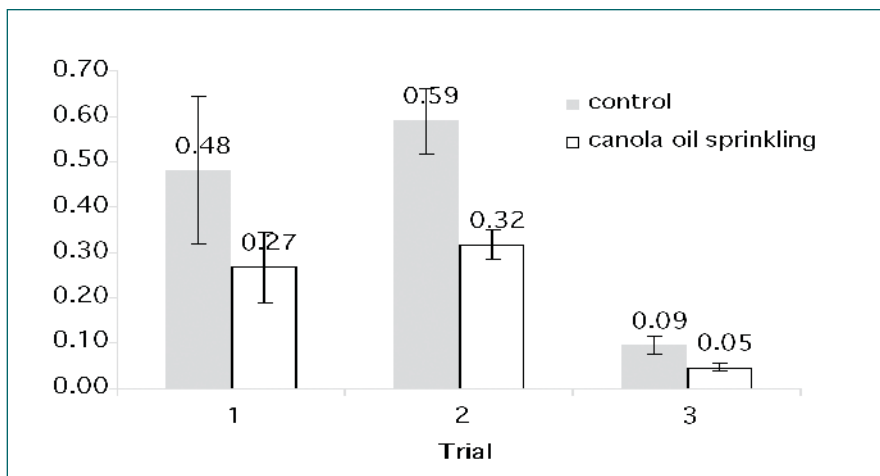


Figure 1. Respirable dust concentrations measured in the control and experimental rooms

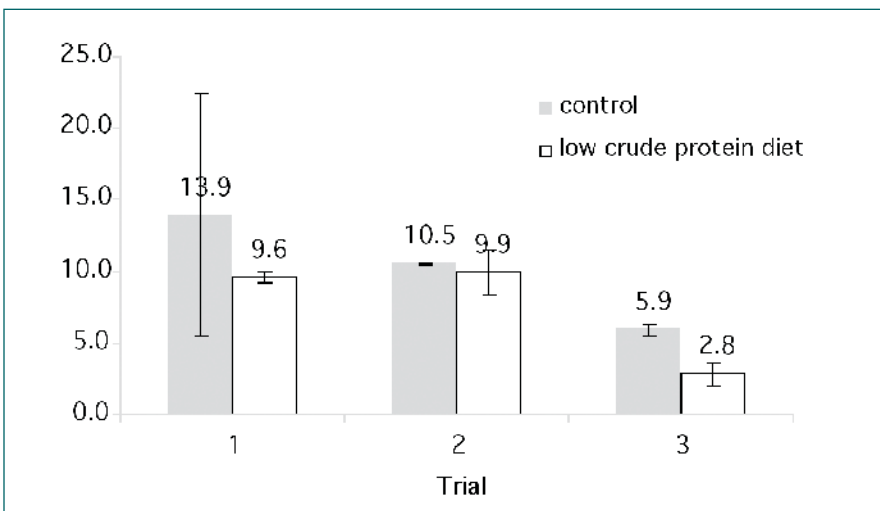


Figure 2. Ammonia concentrations measured in the control and experimental rooms (NIOSH method).

amino acids to the normal diet such that the amino acid requirement of the pigs were achieved with concomitant reduction in dietary N.

Each trial was run for 16 weeks, which includes two weeks of animal and room preparation at the start of each trial and 14 weeks of data collection. Ammonia and respirable dust concentration were measured by area sampling according to National Institute of Occupational Safety & Health (NIOSH) 6015 and 0600 methods (NMAM, 1994), respectively. Ammonia concentration was also measured using commercial gas monitors (GasBadge Pro, Industrial Scientific). The pigs were weighed at the start (week 0), middle (week 6) and end (week 12) of each trial to determine the average daily gain. Ammonia and dust concentration were measured every three weeks (week 2, 5, 8, 11, and 14) for two consecutive days.

The results plotted in Figure 1 shows that the respirable dust concentration in the room sprinkled with canola oil (mean=0.18 mg/m³, SD=0.19) is significantly lower (P=0.036) than in the control room (mean=0.33 mg/m³, SD=0.39). This was expected based on previous tests.

The ammonia concentrations measured using the NIOSH method in the room given low crude protein diet (mean=4.2 ppm, SD=2.3) were significantly lower (P<0.01) than the control (mean=6.3 ppm, SD=2.0) (Figure 2).

The Bottom Line

Canola oil sprinkling and use of low crude protein diet resulted in significantly lower respirable dust and ammonia concentrations, respectively. The findings from this study would aid pork producers in implementing these measures to improve the barn environment for animals and workers.

Acknowledgement: Project funding was provided by Manitoba Livestock Manure Management Initiative. Strategic program funding provided to Prairie Swine Centre Inc. by the Saskatchewan Pork Development Board, Alberta Pork, Manitoba Pork Council and Saskatchewan Ministry of Agriculture is also acknowledged. 🐷

(PSC Website Changes ... continued from page 1)

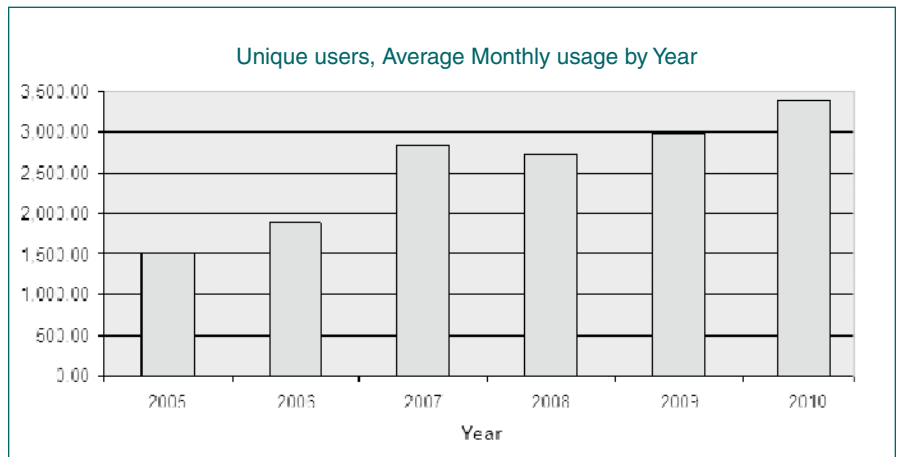
Pork producers continue to look for more efficient ways to manage their farms. The practical information found on the PSC website seems to meet that need as we look at the steady increase in users coming to the website year over year for the past 5 years.

“During the past 3 years it has been all about looking for ways to reduce production costs” notes Lee Whittington, President of Prairie Swine Centre.” The website provided a way to communicate a large amount of detailed information efficiently. The Survival Strategies checklist will remain an important feature on the website, the big STOP sign icon is a quick way to access easy to use checklists producers could

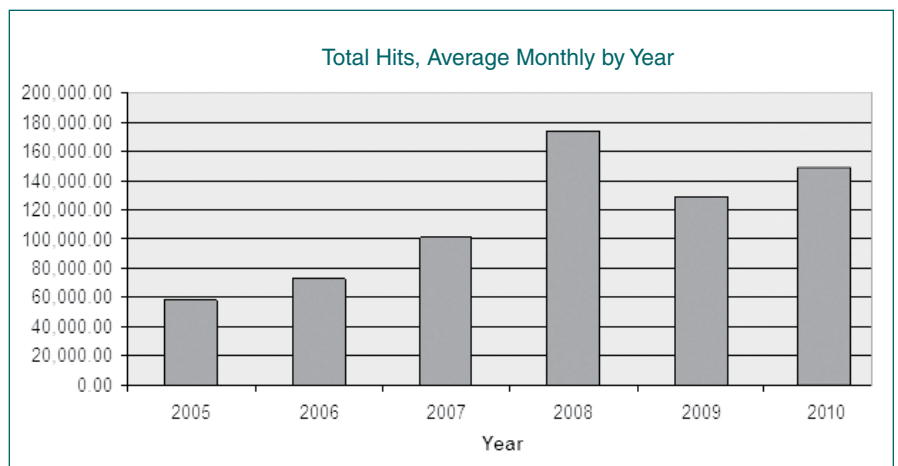
use to do a thorough review of the operating conditions within each barn.

We are constantly adding new information to the website and publish an update of interesting new material every two weeks via an email reminder. If you would like to receive this email just send a message to Lee.whittington@usask.ca with message line “Add me to Prairie Swine Centre Ezine list”.

Thank you to our ongoing program funders Sask Pork, Alberta Pork and Manitoba Pork Council, and Saskatchewan Ministry of Agriculture, ADF Fund. Project funding for the website redevelopment has been provided by ALMA and ACAAFS. 🐷



Unique Visitors represent the number of individual viewers to the website. The number of visitors using the PSC website has increased steadily over the past 5 years, this at a time when the industry has been declining in number of farms. Pork producers have come in increasing numbers to the website seeking new information to reduce costs and improve productivity in the face of declining market prices since 2007.



The number of ‘hits’ reflects the number of pages and images viewed by visitors. Although not as accurate as tracking Unique Visitors, the total traffic on the website can be monitored through ‘hits’. The peak in 2008 suggests that when visitors came to the website during the lowest point in the pig price cycle they spent more time surfing the site to find information.