

## Possible Use of Lagoon Water for Dust Abatement on Dairies

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Recently much attention has been focused on the possible effects of dairies on air quality. Dust from dairies may contain bacterial pathogens and reactive compounds that present a health hazard. Air quality control boards are concerned about the impacts of dairies on air quality. A recently reported study examined the possible use of lagoon water for control of dust in Texas feedlots<sup>1</sup>. Their study focused on the effect of dust control on the performance and carriage of *E coli* O157 and *Salmonella* spp. on feedlot steers.

Two groups of feedlot steers comprising 3,510 steers for study of pathogen carriage and 3,737 for performance were housed in a large commercial feedlot in the Texas panhandle. Steers were systematically allocated to the various treatment pens approximately 60 days after arrival in the feedlot. Steers in 14 pens with about 125 animals each were studied. All the pens were of similar dimensions. For pathogen carriage, feces and hide swabs were collected from 25 steers in each pen within 10 days of slaughter. For performance, body weights were measured upon arrival and slaughter along with feed delivered to each pen of steers.

Dust was controlled in the pens by periodic sprinkling with high pressure sprinklers. The sprinklers delivered about 1,400 liters/minute of water from the retention ponds. The sprinklers provide coverage over the entire pen so it was not possible for the steers to avoid the spray. The feedlot manager determined the amount of sprinkling based on recent rainfall and perceived dust potential. However, the steers in the exposed group received at least 1 cycle of sprinkling per day for 7 consecutive days prior to the collection of samples for analysis. On average, the exposed steers were sprinkled on 76 days with 141 sprinkling cycles.

Overall prevalence of *E coli* O157 in feces, on hides or both was 9.9%, 12.1% and 19.0%. There was no significant difference between the exposed and unexposed groups of steers. The estimates for *Salmonella* spp. prevalence was 44.9%, 88.4% and 93.5% for feces, hides or both. Exposure to the retention pond water did not significantly increase the amount of *Salmonella* spp. for the exposed steers compared to the controls. *Salmonella* Anatum was the mostly commonly found species. No significant differences were detected between the exposed and unexposed steers in average daily gain, morbidity, or mortality. Previous studies have shown that these pathogens can be routinely found in the water retention ponds used on feedlots and it was anticipated that a negative impact would be found.

While direct application of this feedlot research may not be possible to all dairy situations, it is worth considering the use of dairy lagoon water for dust abatement. For

instance, lagoon water might be used on dirt roadways. It also might be used for non-milking dairy cows as well as replacement animals during dry, warm weather. Perhaps, the sprinkler could be directed in a manner to allow the animals to avoid the spray of water. Milking cow pens may possibly be sprinkled when the cows are away at the milking parlor. One critical area not addressed in the feedlot study report was that of odor. Personal conversation with the first author suggested that they did not perceive a significant odor nuisance problem during their study. However, it should be kept in mind that the Texas feedlots are not located in densely populated areas. Dairies in close proximity to housing areas could probably anticipate complaints from their neighbors if intensive sprinkling was practiced.

In the feedlot study, the use of retention pond water for dust abatement was not associated with an increase in potential bacterial pathogens on the cattle prior to slaughter or with negative impact on weight gains. The use of this dust abatement strategy will require on-dairy research before it can be attempted on dairies to determine the impact on mastitis and other diseases.

Loneragan G and Brashears M. Effects of using retention-pond water for dust abatement on performance of feedlot steers and carriage of *Escherichia coli* O157 and *Salmonella* spp. *JAVMA* 226(8):1378-1383, 2005.