# Feed additive reduces enteric methane emissions in dairy cows

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The enteric methane mitigation potential of 3-nitrooxypropanol (3-NOP) has been confirmed in previous studies. 3-NOP is highly soluble and rapidly metabolized in the rumen. Previous studies have shown a

persistent methane mitigation effect when 3-NOP is administered through the total mixed ration (TMR). In a recent article appearing in the *Journal of Dairy Science*, scientists from six universities studied the methane mitigation effects of varying doses of 3-NOP in the feed of 49 multiparous Holstein cows at The Pennsylvania State University's Dairy Teaching and Research Center.

After a 14-day adjustment period, cows received the base TMR mixed with a placebo or one of six treatment doses of 3-NOP ranging from 40 to 200 mg of 3-NOP/kg of feed. Dose levels were chosen based on previous research at this laboratory as well as studies conducted in beef cattle. The scientists hypothesized that within the range of application rates studied, 3-NOP would decrease enteric methane emissions without affecting dry matter intake or lactational performance of the cows.

The inclusion of 3-NOP in the TMR quadratically decreased daily enteric methane emissions by 22 to 40 percent in lactating dairy cows, with an average reduction of 31 percent. In this experiment, 3-NOP had no effect on dry matter intake or milk yield but linearly increased milk fat concentration and yield.

"We can determine by calculation that the decrease in daily enteric methane emissions would have increased the availability of feed digestible energy," said lead investigator Alexander Hristov, Ph.D., Department of Animal Science, The Pennsylvania State University, University Park, PA, USA. "The reduction in emitted methane with 3-NOP would represent, in theory, additional energy for lactation that could potentially be used for productive purposes."

The results of this study suggest that 3-NOP is a promising feed additive for reducing enteric methane emissions, while maintaining lactational performance in dairy cows and potentially increasing milk fat yield.

**More information:** A. Melgar et al, Dose-response effect of 3-nitrooxypropanol on enteric methane emissions in dairy cows, *Journal of Dairy Science* (2020). DOI: 10.3168/jds.2019-17840

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