Emissions comparison from liquid manure storage facilities: Uncovered, straw-covered and NAP-covered storages

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In Western Canada, earthen manure basins (EMB) are very popular for storing liquid manure. Greenhouse gas (GHG) and odour emissions from manure storage facilities can be controlled using various cover methods (e.g.: concrete or steel covers, floating or inflated tarps, floating straw or woodchips, and negative air pressure synthetic covers (NAP)), the most popular being floating straw biocovers. The effectiveness of straw and NAP covers at reducing GHG and odour emissions is discussed, and seasonal effects on emissions and emissions from concrete storage tanks are also presented.

In general, the straw cover reduced GHG emissions from the uncovered surface by 80.2% while the NAP cover showed a reduction of 84.1%. The straw and NAP covers were more effective at reducing CH_4 emissions than CO_2 emissions. In addition, both types of covers were more effective at reducing GHG emissions from the secondary cell than the primary cell. Overall, the straw cover reduced odour emissions by 50% compared to the uncovered surface, and preliminary studies indicate a 99% odour reduction with the NAP cover.

Implications:
The Kyoto agreement will make it both environmentally and economically beneficial for livestock producers to quantify and reduce the greenhouse gas emissions from their operations. Straw and NAP covers have been shown to significantly reduce both GHG and odour emissions from earthen manure storage facilities and the widespread adoption of these technologies by the pork industry may be a significant step towards reducing GHG emissions from livestock facilities.