# 減少養豬廢水氣味的新方法-紫色菌的應用

如何降低養豬廢水的不良氣味是現代養豬產業的一大挑戰。大型養豬場常會設置大型的廢水池，而減少廢水氣味是每個養豬場須面對的難題。愛荷華州立大學的微生物專家 Alan DiSpirito 注意到美國中西部豬場的廢水池裡，顏色隨著早春至初夏的溫度上升而由褐轉紫，氣味也逐漸變好。他認為這種顏色的改變一定是由於光合作用菌所造成。後來，他和同事們分離了 Rhodobacter 的紫色菌，發現此菌可以在 15°C以上的環境下快速生長並去除養豬廢水的不良氣味。過去使用消化槽或曝氣槽來處理廢水所費不眥，如能加上此氣味消除紫色菌的作用，應可以加速廢水處理並減少成本花費。此菌的使用已獲得美國的專利。

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資料來源：

http://www.nature.com/nsu/030310/030310-10.html; Nature News Service / Macmillan Magazines Ltd 2003

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# Purple bugs freshen pig waste

Bacteria save nostrils from stench of swine.

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**Purple lagoons could reduce the piggy problem.**
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A purple bacterium could make pig farms smell sweeter.

Large farms create lagoons of waste. "In the mid-West it is hard to miss the odour-related problems," says microbiologist Alan DiSpirito of Iowa State University in Ames. He likens the smell to a combination of garbage, food and manure.

As the temperature rises and spring turns into summer, the whiff abates and the lagoons' colour changes from brown, to pink, to purple, DiSpirito noticed. "I looked at the colour and thought 'it has to be a photosynthetic bacterium'," he says.

The purple odour-eater is a previously unknown strain of the bacterium Rhodobacter, DiSpirito and his colleagues found[1]. A bloom of the bugs can make up as much as a tenth of the lagoons' bacteria.

"Within three weeks of the bacterial bloom, the smell was barely detectible from 100 yards away," says DiSpirito. Iowa State University has patented the bug and is recruiting companies that are interested in developing a microbiological

odour-eater.

Rhodobacter only works when the temperature is above 15 ºC. If farmers who seed their waste pits with the purple bacterium can keep the pit warm, they might be able to stop their neighbours complaining.

Indoor heated pits or insulating covers can keep temperatures up year round, says Mike Williams, a specialist in animal-waste management at North Carolina State University in Raleigh. "I'm very optimistic that this could be done," he says.

Farmers can eliminate some odours by sending the waste through a digester or by aerating lagoons. But these techniques are expensive, and smell is a problem in most farming regions.

"There is no silver bullet — biological or engineered — but if you combine the systems, you start to win the battle," says Williams.

**References**


1. Do, Y. S. *et al*. Role of Rhoderbacter sp. strain PS9, a purple non-sulfur photosynthetic bacterium isolated from an anaerobic swine waste lagoon, in odor remediation. *Applied and Environmental Microbiology*, **69,** 1710 - 1720, (2003).
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