

How far is far enough?

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people welcome developments in principle, so long as they are "not in my backyard." But just how big is a backyard? The answer depends on a number of factors and Guenther Schaubberger of the University of Veterinary Medicine, has now developed a mathematical model to calculate appropriate distances from residential areas for livestock building to be sited. The model is published in the journal *Atmospheric Environment*.

Heavy industry and livestock farming have two features in common: both are widely regarded as essential but both produce smells that inconvenience or discomfort people living nearby. When considering where new industrial plants or [farming practices](#) are to be built – or whether a particular plot of land would be suitable for housing – it is important to ensure that people do not live too close to the source of smell.

In practice, regulatory authorities enforce a minimum separation between residential areas and sources of unpleasant smells. This distance must take a variety of factors into account, including the amount of "smelly gas" that is emitted, the effect of the smell in question and the wind and weather conditions. Together with colleagues from Germany, Günther Schaubberger of the Department of Biomedical Sciences at the University of Veterinary Medicine, Vienna has combined these parameters into a single [mathematical model](#) that essentially defines a "no go" area around livestock farms. The model is deliberately conservative, i.e. separation distances are overestimated rather than underestimated to ensure that people are not unnecessarily disturbed by

smells from the farms.

The model is applicable to all sources of odours so could greatly simplify the currently bewildering array of guidelines and regulations. In Germany, for example, there are presently separate guidelines for pig farms, poultry farms and cattle farms (this latter still in its 1994 draft version!) These could now all be combined into a single regulation. In addition, the model is also applicable to other types of odours, e.g. those resulting from industrial plants, presently covered by even more guidelines.

And the model has another significant advantage. As Schauberger notes, 'The nice thing about it is that a quick calculation can be carried out on the back of an envelope.' Such "quick and dirty" calculations generally lead to an overestimation of the required separation but nevertheless provide a useful first indication. If the results cause problems for farmers, e.g. in cases when the available space for a new livestock building is limited, it is possible to calculate the distance much more precisely, considering wind speed and direction and the stability of the atmospheric conditions.

The results may never fully eliminate nimbyism. But they have a genuine potential to ensure that planning decisions – and any objections to them – are based on scientific criteria and can be debated in a constructive manner.

More information: *Atmospheric Environment* (Volume 46, January 2012, pp. 508-515). www.sciencedirect.com/science/.../S1352231011008454

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