Management

by Stuart Lumb

Odour control

Many UK urban residents want to live in the countryside. When they finally realise their ambition they are annoyed that animal smells should upset their idyllic existence.

The fact that the farms were there first before the 'townies' arrived holds no sway these days.

Even countries with greater agricultural production than the UK are not exempt – Danish pig farmers are accused of polluting the atmosphere and causing devaluation of house prices because of bad odours from their pigs.

A slurry digester in Thailand.

On a similar theme, some years back Brittany pig farmers were asked not to spread slurry over the weekend as many Parisians had second homes in the region, plus that part of France is a very popular holiday destination for UK tourists. In fact, pig farmers have been known to have to relocate their businesses because of complaints about smells.

So how come smells and odours are such a problem with pig units?

Smells arise from manure and also from air extracted from the pig buildings. Pig units have become larger over the years and, consequently, odours and smells have increased as well.

One large UK unit when faced with complaints from nearby residents about smells erected several masts on the unit from which sprays discharge a pleasant perfume when the wind is blowing in the direction of the complainants' dwellings. Quite often slurry is stored in pits under sheds before being pumped out and spread on to the land or transferred to a slurry store.

Anaerobic bacteria, which work without oxygen, break down slurry and produce hydrogen sulphide – the familiar smell of rotten eggs – ammonia and volatile fatty acids.

Hence the reason for slurry smelling. There are numerous products on the market which when added to the slurry reduce its smell.

One such is sarsaponin, a natural extract from the yucca plant.

Actually if slurry can be spread fresh there is minimal smell as the anaerobic bacteria have not had chance to start working, but this is not often practical as certainly in many northern hemisphere countries slurry spreading is banned for much of the winter.

Also, having shallow slurry

channels which are flushed frequently reduces ammonia levels.

The shape of the slurry channel also has quite an effect on the amount of ammonia produced.

Traditionally, slurry channels are U-shaped. Danish researchers compared conventional U-shaped channels with V-shaped ones and found that ammonia concentrations were 15% lower in finishing houses with the V-shaped slurry pits.

A Danish company, Staring Maskinfabrik A/S, has developed an interesting approach to the problem which reduces the evaporation of ammonia in slurry. The technique involves adding sulphuric acid to slurry contained in a special processing tank.

Generally, slurry is transferred from a lagoon, or a slurry store which may be above or below ground, to a slurry tanker for spreading.

Thirty years ago slurry tankers discharged slurry in a fantail pattern which threw droplets high into the air – guaranteeing smells galore.

Today, low level discharge is the norm along with direct injection into grassland, stubble or plough land, to minimise smells.

Adding air to slurry by means of floating impeller pumps – aerobic digestion – is also another way to reduce smells, but there is the cost of the equipment to take into account plus the running costs. If you put slurry into a sealed tank and warm it up, methane will be produced. This process is anaerobic digestion.

The methane can be cleansed of impurities, used to power a modified internal combustion engine which is linked to a generator which, in turn, produces electricity. This though, tends to be easier said than done. The technology is derived from municipal sewage treatment.

However, human sewage generally has a more consistent make up than pig slurry. Sow slurry is different in composition to say finishing pig slurry and ensuring that the digester gets fed slurry of a uniform composition is quite difficult to achieve.

Many piggeries used controlled environment systems which incorporate powerful fans that suck foul air up ducts and out into the atmosphere.

Naturally gases produced from slurry and manure are part of this foul air which then gets dispersed over considerable distances.

Consequently, reducing these noxious emissions which are dispersed through these ducts is another way of cutting down smells.

Slurry injection in East Yorkshire, UK.

Turbovent A/S is another Danish company and they manufacture an air purifying system which the company claims can remove 70-80% of odours from pig houses.

This system removes odorants using water. The air purifier can be installed in the exhaust chimney or it can be suspended in the building, which also ensures that airborne dust particles are also separated.

The air purifier can operate constantly or be controlled by the wind direction so that it only need operate when odours would otherwise reach adjacent housing developments. One large US pig business when faced with ever increasing complaints about smells from local residents decided to get round the problem by relocating and building a brand new pig farm in a sparsely populated western state.

Once operational, there were very few complaints about smell. However, because the unit was miles away from anywhere it was very difficult to find and retain staff – so whilst solving one problem the business found itself faced with another one. ■

Reference: Danish National Committee Pigs Report 2001.