International Pig Topics'
Pighealth BYTES
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108 – Toxic gases II

Housing

The housing of pigs in large numbers increases gas related toxicities, especially where there is opportunity for excrement breakdown in the pen or ventilation is inadequate or fails. Normally, the toxic gas level from faecal decomposition, for example ammonia, even in cold weather with minimal ventilation, remains safe.

Ammonia

As ammonia is highly soluble in water it can be highly irritant to exterior mucous membranes, for example in the eye or respiratory tract. The accompanying signs are excessive tears or nasal discharge respectively.

The primary impact of ammonia in many housing situations is that of a chronic stressor that can affect the course and manifestation of various diseases and adversely affect piglet growth. For example, 50ppm ammonia can reduce piglet growth rate by 12%, while at 100-150ppm the growth rate can be reduced by up to a third. It has also been shown that at 50-70ppm the piglet's ability to clear bacteria from their lungs is reduced and at 50-100ppm airborne ammonia exacerbates nasal turbinate lesions in pigs infected by Bordetella bronchiseptica, but does not further add to growth depression.

Hydrogen sulphide

Hydrogen sulphide, the foul smelling gas that reminds one of rotten eggs, is a potentially lethal gas. Most of the hydrogen sulphide gas produced in the slurry holding pits and channels remains there and away from the pigs. Slurry agitation to resuspend the solids can cause a rapid release of large volumes of this gas, but since this gas is heavier than air it tends to remain adjacent to its source. In a normal pig house the level of hydrogen sulphide is usually <10ppm, which is not toxic. Slurry agitation can produce levels of 1,000ppm or greater.

Hydrogen sulphide can kill pigs (and farm staff). Its irritant nature produces irritation of the eye membranes and respiratory tract and, in the case of the latter, it causes greatest damage in the deeper structures – the bronchi and lungs. At high levels it can be absorbed through the lungs and cause a fatal systemic intoxication. At levels between 500 and 1,000ppm, permanent nervous changes can occur. Death is from asphyxiation or respiratory paralysis caused by intoxication.

Prevention is all about correct slurry/manure management.