International Pig Topics'

Pighealth BYTES

YOUR OWN REFERENCE SOURCE ON PIG HEALTH

107 – Toxic gases

Introduction

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.

Methane

Methane is a product of the microbial degradation of the carbonaceous content of slurry/manure. Methane is not a poisonous gas. It displaces oxygen if present in high levels, where it effectively kills pigs by asphyxiation. Methane has to reach levels of approximately 90% before respiratory irregularities are seen – eventually respiratory arrest and death occur due to the induced anoxia.

It should be remembered that at lower concentration (5-15% of air) methane is an explosive hazard.

Carbon dioxide

Carbon dioxide is an odourless gas that is found in air/the atmosphere. Carbon dioxide is a respiratory waste product of animals and is also produced by improperly vented fuel burners or brooders. Even so, it never reaches toxic levels in pig housing.

Carbon monoxide

Carbon monoxide is a product of the inefficient combustion of carbonaceous fuels and is potentially lethal to swine and staff.

Carbon monoxide poisoning typically occurs when incorrectly adjusted and improperly vented space heaters are operated in virtually air tight, poorly ventilated buildings, such as farrowing houses.

Carbon monoxide acts in the body as a competitor to oxygen for oxygen binding sites on various proteins, including haemoglobin, which carries oxygen in the blood. The affinity of haemoglobin for carbon monoxide is 250 times that for oxygen, which means the haemoglobin preferentially binds carbon monoxide, thereby reducing the bloods' carrying capacity. Cellular and tissue hypoxia ensues and the carboxyhaemoglobin makes tissues appear a cherry red colour.

In farrowing houses, levels of carbon monoxide >250ppm can increase the number of stillborn piglets.