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**Health Quiz**

## NADIS Pig Health – September 2009

### Twisted Guts and Stomach

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Sudden death in the growing pig is a not uncommon finding in the modern pig herd. One of the most common causes of such losses is rotation of the intestine within the abdomen about all or part of its attachment to the body underneath the spinal column. Such a twist will cut off the blood supply to

the gut, causing gangrene and rapid death. The condition may be seen sporadically or in outbreaks. Adult animals, whilst occasionally susceptible to torsion of the intestine, are more likely to suffer gastric dilation and torsion, which is equally fatal.

#### INTESTINAL TORSION

##### Presentation and Diagnosis

In most cases pigs will be found dead. It can occur at any age, although most commonly in the grower stage between 25 and 100kg. The typical case will have a grossly swollen abdomen often with the rectum protruding and will rapidly discolour and decompose. The whole carcass will be pale.

At post mortem examination, the loops of gut will be distended with gas, have a deep purple colour and be filled with heavily blood stained liquid. (Fig 1)

The wall of the gut is thin, differentiating it from acute Porcine Intestinal Adenomatosis/Proliferative Haemorrhagic Enteropathy. There is usually an accumulation of bloody fluid free in the abdomen. Depending on how much of the gut has twisted, a palpable knot can be found in the suspensory tissues that normally hold the gut. Twists involving the whole of the intestine can be fully 360°, although usually are less and, as such, the most obvious part of the gut – the caecum – will not be pointing towards the pelvis and anus which is its normal orientation (Fig 2).

Just occasionally pigs may be noticed prior to death, during which time they will be pale, depressed, inactive and, if very early, showing signs of severe pain. They will tend to lie in sternal recumbency with a hunched aspect. Teeth grinding – a sign of pain – may be evident. Once the gut tissue has died inside, the pain passes and death is peaceful.

##### Causes

The pig is particularly susceptible to torsion of the gut and, as such, can be viewed as a “design fault” that is seen equally in boars and gilts. The whole of the gut is attached to the body by a suspensory mechanism called the mesentery, which connects the 20m or so of gut loops to the underside of the spinal column within the abdomen over a length of a few centimetres. It is, thus, fundamentally unstable. The prelude to a twist is likely to be excessive filling



**Fig 1: Typical infected gut secondary to torsion of the intestine**



**Fig 2: In the twisted gut the caecum is pointing in the opposite direction to normal**

of all or part of the gut with gas, increasing the instability of the gut as it hangs down in the abdomen. Sudden movements then allow the gut loops to rotate and cause a constrictive twist.

Therefore, the basic causes of twisted guts are conditions which encourage gas development in gut.

These can be listed as:-

- 1) **Overeating**
- 2) **Winter feeding of fermentable wet feed** e.g. whey – in summer the higher storage temperatures allows some fermentation before feeding reducing gas production in the gut. This process is reversed in the winter.
- 3) **Erratic feeding**, especially but not exclusively on wet feed. Where feed supply is interrupted e.g. at weekends, following pipe breakdowns or freezing up, a surge of twisted guts may occur once supply is restored.
- 4) **High density diets** and diets including very high levels of specific raw materials e.g. Soya promoting fast growth
- 5) **Colitis** – Where this condition exists, the proliferation of bacteria in the hindgut tends to

create more feed fermentation and gas production and precipitate twists. As a general rule twisted guts (torsion or volvulus as it is otherwise known) are more common where there is any evidence of scour in the growing pig.

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Control of twisted guts will obviously centre around control of feed intake, dietary manipulation and control of enteric disease. However, given that the condition is most common in populations where feed intake and growth are high, twisted guts can be regarded as very much a production disease and perversely is often a sign that pigs are doing well. It will therefore require careful evaluation of the cost of deaths measured against the potential loss of growth if feed levels or nutrient density are reduced. There may be some breed influence affecting the prevalence of twisted guts but no breed type is immune.

### GASTRIC DILATION AND TORSION

Compared to torsion of the intestine, gastric dilation – the massive over inflation of the stomach with gas – and its possible rotation to create a similar pathological process to intestinal torsion are more commonly seen in adult pigs.

Ordinarily food is not fermented in the stomach to any great degree and small amounts of gas can be belched up. If gas production becomes excessive it gets trapped and effectively the junction between the oesophagus (gullet) and stomach closes like a valve. (The condition is similar to that seen in certain dog breeds e.g. Basset Hound).

Whilst there is no definitive data to measure the prevalence of the condition, the clinical impression gained is that it is far less common in dry sows than was the case when sows were stalled and tethered. In that situation, manual feeding of rows of dry sows once daily tended to led to some sows having to wait a considerable time to receive feed once the feeding cycle has started and become very agitated. This resulted in gorging of feed, possibly swallowing large amounts of air, which started a process of gastric dilation. However, questionable hygiene of “river” systems may have encouraged exposure to clostridial organisms, which are important in triggering fermentation. (On some farms there appeared to be an association with *Clostridium novyi* infection (aero chocolate liver) as a separate cause of death).

With all dry sows in the UK now loose housed and the majority on straw, the condition appears to have shifted to be more of an issue in post farrowing/early lactation, probably associated with reduction in both feed and bulk intake around this stage and a change of diet. In some cases mycotoxins have been implicated.

### Clinical Appearance

If spotted alive, the abdomen, particularly the forward part of it will be visibly distended and the sow will demonstrate signs of pain similar to that in growing pigs with twisted guts.



**Fig 3: *Clostridium novyi* infection (aero chocolate liver) may be seen in association with gastric dilation in sows**



**Fig 4: Dry sows in stalls and tether were particular problems with gastric dilation and torsion**

More frequently, the sow will be found dead with a hugely distended abdomen – fermentation continues or even increases after death – although pallour is not a regular feature.

At post mortem examination, the hugely dilated stomach may be twisted (along with the spleen) and

the lungs will be congested as a result of the pressure on the diaphragm.

### Control

The availability of clean good quality barley straw provides the sow with large amounts of fibre, which seems to reduce the risk of gastric fermentation. Provision of bran (1kg/day) over the farrowing period may help to maintain fibre intake and avoid problems if they occur around farrowing. In the farrowing house, once lactation is well established, feeding at least 2 or even 3 times a day reduces the risk of gastric fermentation. As always, good hygiene of feeding is also key. (Use of clostridial vaccines alone have been shown to have little value in controlling a herd problem of gastric dilation and torsion).

### Costs

Problem herds suffering ongoing cases of twisted guts in growing pigs can experience 2-3% mortality due to this alone. If they occur in the older growing pigs – worth upwards of £100 each at current prices – a 500-sow herd can lose £500/week of £25000/year. If slowing growth is a control option this must be offset against such costs.

Outbreaks of gastric dilation and torsion have occurred (in stalls) where 10% of the herd can die over a 3-month period. 50 pregnant sows dying (at different stages of gestation) can lead to a shortfall in farrowings in the sow herd over a 6 month cycle, leaving the herd 500 pigs short plus the costs of the sow death themselves. More commonly, this condition is seen as a low grade grumbling problem contributing up to 2% points of mortality over the year. Such costs are very difficult to quantify.

***Comments made in this paper are based on the practical clinical experiences of the author working in the field and opinions expressed are derived from those experiences; others may have different experiences.***

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