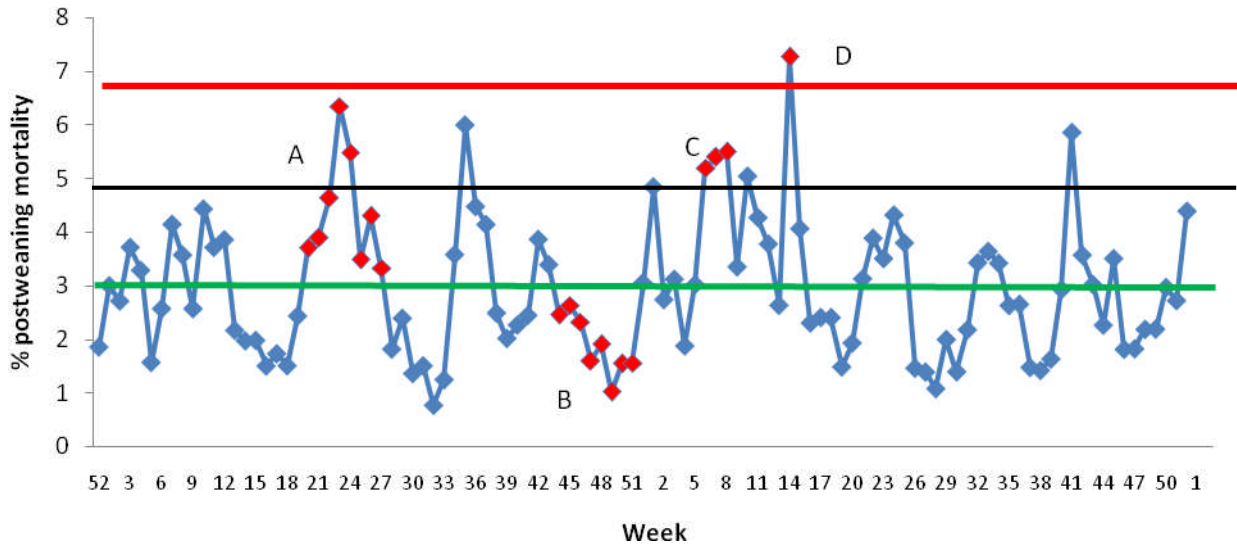


Statistical Process Control on Pig Farms

To make an assessment of events on a farm, it is possible to use statistical process control. For example, post-weaning mortality over time.



Mean/centre line – green line. Upper control limit – red line. Midline – black line.

Method

1. It is important to have 20 points to establish your control lines
2. Determine the mean (centre line)
3. Determine control limits – 3 standards deviations from the mean – upper and lower
4. Determine midline between mean and upper control limit

In the example above

Mean calculated to be **3.0**

The standard deviation is 1.3. Therefore **upper control limit** is $3+(3*1.3) = 6.9$. **Lower** is $3-(3*1.3) = -0.9$

The **midline** between upper control limit and mean is $((6.9-3)/2)+3 = 4.95$

There are three rules to determine if the system process is “out of control”.

1. A single point outside control limits
2. Three out of four consecutive points closer to the control limit than to the centre line
3. Eight or more successive points on one side of the centre line

Using the example above the system was out of control at four incidences

A = Eight or more successive points on one side of the centre line

B = Eight or more successive points on one side of the centre line – even through below

C = Three out of four consecutive points above the midline

D = A single point outside control limits – more than 3sd away from the mean

The other fluctuations are within “normal” variation.

To explain the pattern

Normal variation is explained by “Common causes” – associated with inherent random variation

Variation outside the control limits is “Special causes” – sporadic, unstable and unpredictable – a tornado or absence of personnel for example.