

Barn Report : Water Intake : Pigs

Introduction

Water intake is a crucial indicator, because it is a feedback from the pig.

To explain - most of the factors that we measure are about conditions external to the pig - such as the temperature we provide. They don't tell us directly about the pig.

Water intake is about the pig itself.

Because Barn Report shows both how much and when they drink, we can see a great deal more than we could if we simply recorded total daily consumption.

How it works

The water supply to the room has a meter, and inside the meter is a rotating magnet. At each turn of the meter, the magnet goes past a magnetic sensor and this causes a contact to be made.

It makes no difference if the meter is directly in line with drinkers, or to a header tank supply, because the header tank doesn't introduce much delay in practice. (It shouldn't be in the output line from the header tank, because of the pressure drop of the meter.)

We count the number of times the contact makes and breaks. If you want to see this or test it for yourself, go to Test : Information on the Dicam unit and find Input Chans. Find the input used for the water meter and you'll see a number. As the meter lets water through, you'll see the number count up. (Note : the reading rolls over at 32,768, but this doesn't matter because it's the changes that we're interested in.)

We record this reading every 15 minutes (typically), and calculate the changes in every 15 minutes. We add up the changes in 24 hours to get the total daily intake.

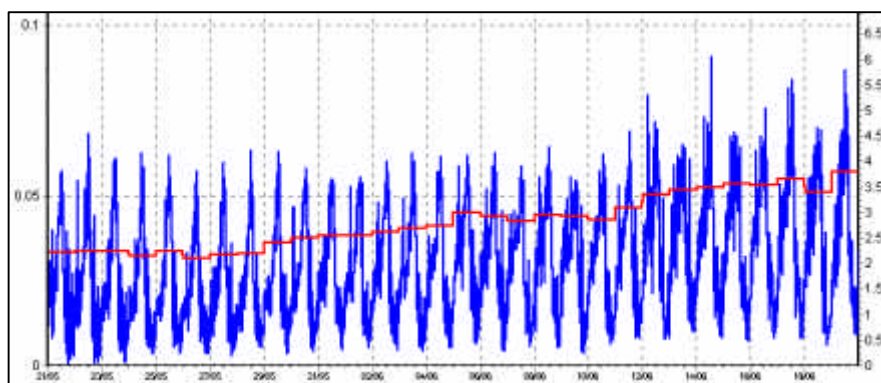
Scaling

Meters vary in how much water you get "per pulse" (revolution), but it isn't necessarily directly related to the numbers shown on the meter. For example a popular 15mm meter in the UK shows in litres, but gives a pulse every half litre. Consult the manufacturer if necessary

To get a proper scaling, you can set it up by selecting Airspace : Properties. For example, if your meter gives a pulse per half litre, set Waterscale to 0.5. For preference, tell your Barn Report supplier (by email) and we can set it up in the default set up.

Blue and Red Lines

There is no special significance to the colours we use, but by convention we use the Blue line to show the pattern of consumption, and the Red line for daily total, so I'll refer to them this way.



Red Line : Total Daily Intake

When we talk about a day, we mean a biological day - from the start of one day, to the start of the next. Pigs can't tell the time, or at least, they can't read a clock, and they haven't got into the idea that a day starts at midnight. (Thinking about it, I'm not quite sure why we do that ourselves!)

Their day starts when they get up, which is around 5 or 6 am. We'll come back to that, but for now, it means that we usually count a day as 6 am to 6 am. If your system clock is out, your daily intakes may be more erratic.

Since we expect pigs to grow bigger every day, we expect water intake to increase every day. Only marginally, but steadily upwards.

The only exception being if you take some pigs out, or if the housed population is basically static - such as in a BG barn.

So if we see water intake going down, we need to question it - take a closer look.

In fact, if we see sharp changes in either direction, we need a closer look. We'll discuss the type of problems we might have later.

To make sense of water intake in absolute terms - to compare it with other data - we need to know the number of pigs, and also how old they are. Control units have a "Pig Number" setting for this purpose, and we recommend using a curve, which will indicate day number.

Blue Line : Pattern

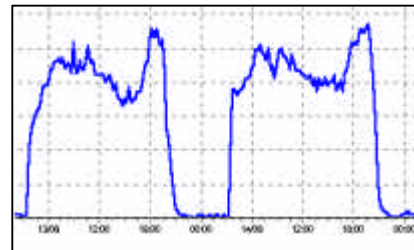
The blue line gives a great deal more insight into the way the daily total is made up. There is a wealth of detail, but you need to learn how to read it.

The first thing to understand is that the pig is a complex sophisticated animal - compared to poultry. The pig has a biological clock, running according to its own needs and responses.

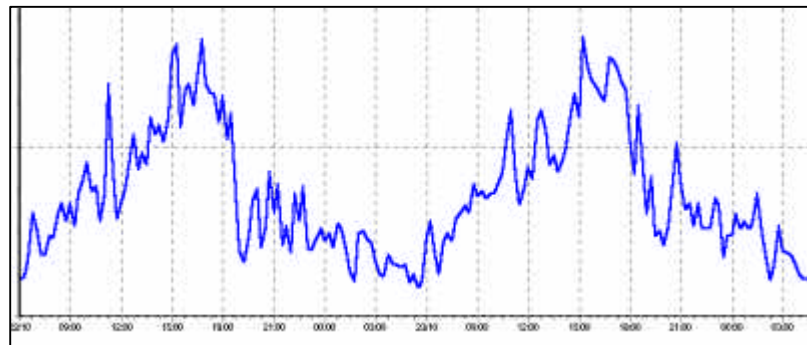
To show what I mean, here are a couple of days of water intake in a poultry barn. The sudden rise is when lights are turned on, and the fall is when lights are switched off. You can turn them on and off like a machine, just using the lights.

Whilst there is a pattern in the variation - some kind of response is going on - the variation is only around 10% of the mean value.

Since there is virtually no water use outside the lighted period, you can take the day's consumption at any time when the lights are off.



But when we look at a couple of days of pig water intake pattern, there is a great deal more detail (and not just because I've made the picture bigger). This is from a naturally ventilated barn which is of course mostly



naturally lit, and lights are switched off at night.

You can see the drop off - this is at sundown. In fact, with naturally lit pigs it's noticeable that intake rises to a peak just before sundown. But they still drink during the night.

It seems like pigs drink during the day because they *want to*, but drink during the night because they *have to*. For example, if they have been short of feed during the day, there's no difference in day time intake, but night time intake is a lot less.

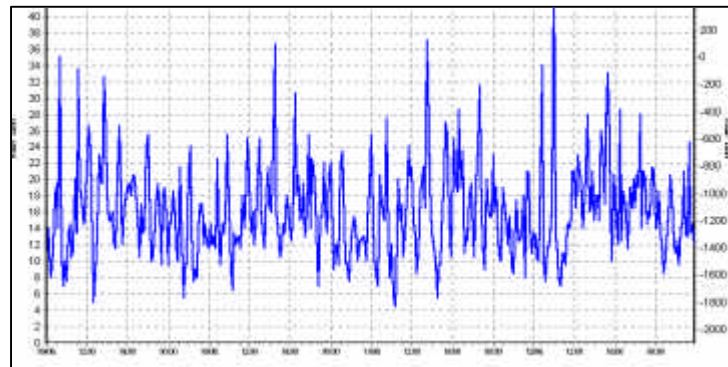
On top of the underlying shape, notice the ripples, which generally seem around an hour and a half. This might be to do with sleep cycles.

It's important to remember that we're looking at the sum total from all the pigs in the barn. If it goes up, say, you don't exactly know whether this is more pigs drinking, or pigs drinking more. But it's probably some of both. For example, when it drops to little or nothing, you can be sure there are few pigs drinking.

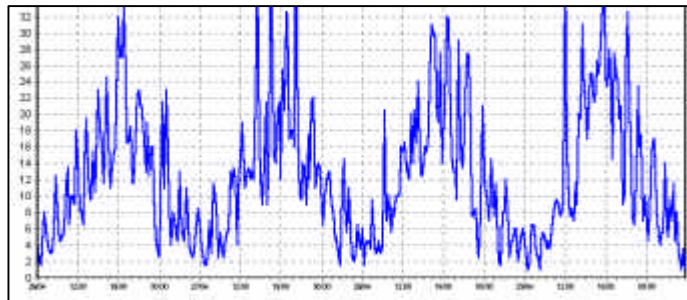
But there is one thing that's obvious. If you have a clear pattern, you can be pretty sure that the population of pigs is doing pretty well the same thing at the same time. That's what you would expect, and hope for. Since they have the same drives and needs, and the same stimuli, you expect them to "get into synch". Which, generally, should indicate happy pigs. They eat together, sleep together.

But just **look at this for comparison -**

This is four days of intake, and you can't see any clear pattern. Although there are peaks, it never goes to zero. It paints a picture of pigs which are not in tune with one another. In fact, this is a building with a bad history of tail biting.



A number of changes were made to this building, and a few months later, the pattern looked like this -



There's a distinct difference between the pattern in a naturally lit building and artificially lit. In naturally lit buildings, the pattern is a rise to a peak, which drops off at sundown - like a gear tooth. In artificial lighting, it's more like a sine wave.

It's also noticeable that, with natural light, the "get up time" is roughly constant, regardless of time of year. For example, in the first naturally lit building shown above, they get up at around 6 am, even in June when daybreak is several hours earlier.

The best explanation seems to be that pigs respond to relative changes in intensity and hue of light. That is, they are locking onto midday - which of course stays the same time all year - not simply to dawn or dusk. (Poultry, on the other hand, are a lot simpler - simply whether there is light or not.)

It seems like natural light - or a natural lighting pattern of changing intensity and hue - contains important information for them in establishing their body clock.

If you deprive them of this natural cue, they still have a body clock, but it has nothing specific to lock onto, except perhaps the activity around them. For example, on a farm where their practice was to leave the lights on full all the time (in a weaner building), it was found that some rooms might have day and night reversed, and some might have a 25 hour day. (Yes, that means that in 25 real days, they had 24 biological days.)

The idea that leaving lights on all the time "helps them find the feed and water" and gives less dominant animals a better chance may well be a flawed concept. There's no particular indication that they struggle to find feed and water in the dark. Most indications are that their natural impulse is to do things at the same time.

Similarly, there is an idea that keeping the lights off all the time will stop aggression such as tail biting. On the whole, this seems liable to make it worse, since it deprives them even further of the cues to synchronise with one another and settle down. A lighting timer would seem like a better idea.

Hot weather

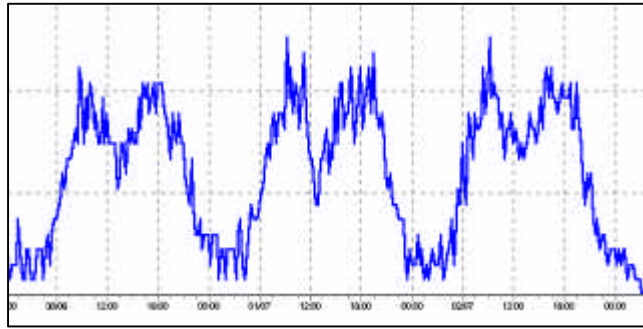
In hot weather, pigs drink more to cool down, right?

No. Unlike humans, pigs don't sweat, and a "cooling drink" really doesn't cool you down a lot. If very hot, pigs will pant (cooling by evaporation from the lungs) but it's not something they readily do.

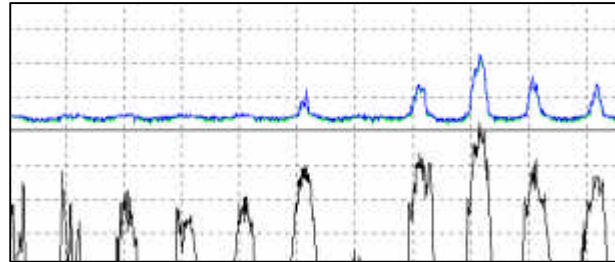
In hot weather, pigs try and reduce their heat output. That means they are less active in the hotter part of the day, and they eat less.

You're inclined to see a "double hump" in water intake - because they're less active to avoid heat stress. In practice, water intake is inclined to go down at the onset of hot weather. They eat less, so they need less water to digest it.

What most people forget is that what the pigs experience is very different from what's happening outside. As long as it's significantly cooler outside than set temperature, inside temperature is approximately constant.



It's only when outside temperature rises that bit more (close to and above set) that they start to notice any difference. As far as they see it, it's constant, constant, constant, hotter - which may be only marginally warmer outside, and generally lasts for a few days.



Water intake tends to go down when you hit this warmer weather, but recovers after a few days. This is probably not so much that they "get used to it", as that they change their habits. You may noticed that the water pattern starts slightly earlier - such as around 4 am instead of 6 am. Whether this is because they get hungry sooner, or whether their desire to eat overcomes their desire to sleep, who knows? Inevitably, a drop in feed intake for a few days will mean a drop in growth for a few days, until they learn to get up earlier. It's conceivable that we could try to teach them to get up earlier - for example, turn on the lights, or turn on some music to wake them up earlier when the weather forecasts indicate warmer weather is due.