Poultry Production Tips:

# Eight Reasons to Install Ultrasonic Water Meters

Monitoring bird water usage through the use of mechanical water meters has proven beneficial to growers for decades, because water usage is tied to feed consumption, bird health and welfare. Water meters help identify leaks or clogged filters in your houses. They can give an insight into when birds are sick or go off feed. In general, they act as a barometer for the birds in the house, a quick check to make sure all is well.


Figure 1. Ultrasonic water meter. Photo by Will Strickland

Though mechanical water meters have served growers well over the years, the recent introduction of affordable ultrasonic water meters provides growers with an improvement in their management toolbelt (Figure 1). Ultrasonic water meters are not a brand-new technology; however, they are beginning to come to a price point that is more affordable to growers. The following are some brief points as why a grower may want to install this new generation of water meter.

## 1. No moving parts

There are no moving parts in an ultrasonic water meter which adds a few positives. There are less parts that can break or get dirty, damaged or out of calibration. You can often see through an ultrasonic water meter (Figure 2) which means less chance of clogging, more capacity and less flow restriction. Because of the more open design, even if mineral deposits, such as iron or magnesium, settle onto the inside, a brush can more easily be run through it to clean these deposits off. For example, one 3/4-inch ultrasonic meter has a max flow rating of 35 gallons per minute (GPM) where a similar 3/4-inch mechanical meter is only rated for

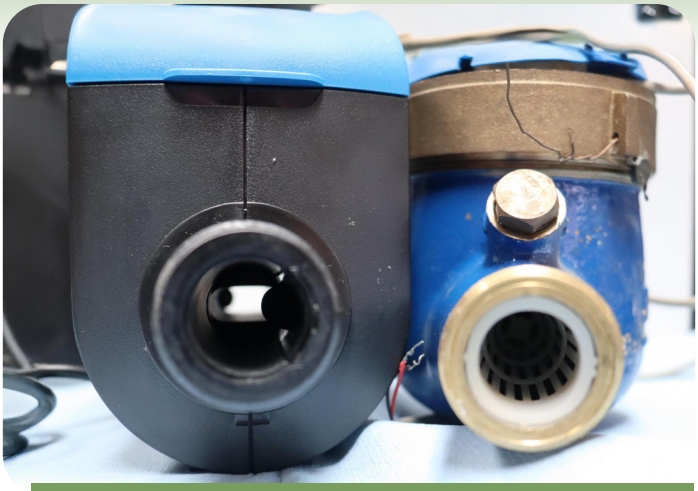

Figure 2. Ultrasonic meter, left, compared to a mechanical meter. Photo by Will Strickland

30 GPM max flow, and there is less pressure drop in the ultrasonic meter across the same flow rates (Figure 3). While the average flow rates of drinker lines are not usually high enough for this pressure drop to matter, if a meter is monitoring whole house flow with drinker lines, both cool cells systems, and other auxiliary spigots, then there are times that flow rates can be 15-20 gallons per minute.

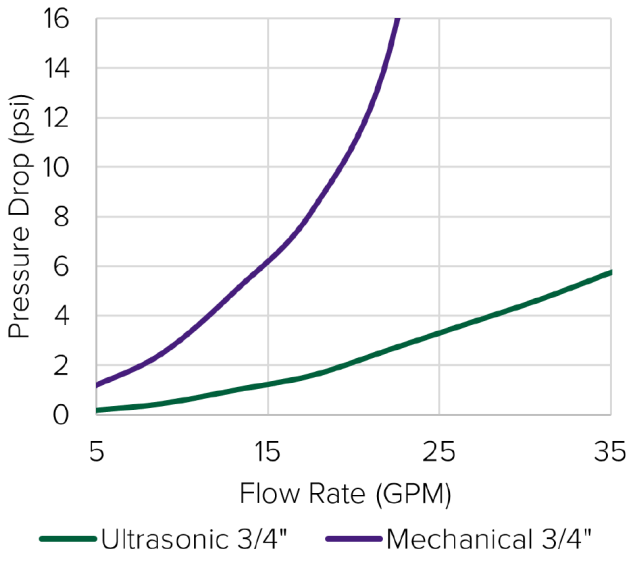


Figure 3. Pressure drop between ultrasonic meter and mechanical meter at various flowrates.

## 2. Dual output

Ultrasonic meters often have dual pulse outputs which means not only can the individual meter be hooked up to a controller, but the other output can be used for a mediactor or other components.

## 3. Orientation

Ultrasonic meters are often more forgiving of the orientation they are installed in than mechanical meters (Figure 4). When mechanical meters are installed in the incorrect orientation, this often results in reduced accuracy. Many manuals state if they are installed incorrectly that leaks and meter damage can occur (Figure 5).

However, make sure to reference the specific meter's manual for the correct installation.

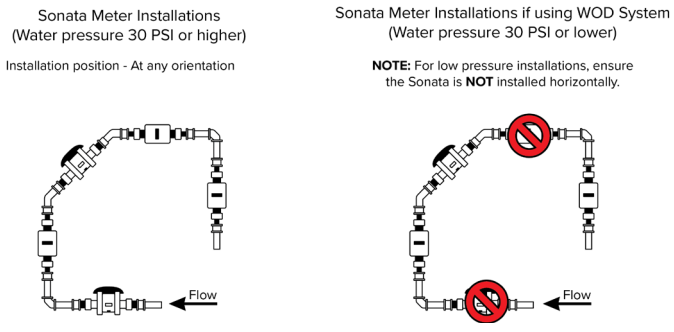


Figure 4. Excerpt from Arad Sonata ultrasonic water meter manual.

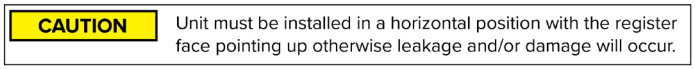


Figure 5. Excerpt from Dwyer WMT2 mechanical water meter manual.

## 4. Instant flow rate on the display

Another feature of many ultrasonic water meters is that they digitally display the current flow rate through the meter so someone can quickly look and see the GPM. Most mechanical meters have a volumetric dial. With those, you could count the seconds it takes to do a full revolution and then use math to get the current flow rate. The digital display makes this task much quicker and easier to see if the flow rate is normal and expected or if something may be going on in the house.

## 5. Increased accuracy

Ultrasonic water meters have increased accuracy compared to their mechanical counterparts, especially at low flow. This creates a better picture of what is going on inside the houses, especially with young birds. For example, the accurate low flow limit for one 3/4-inch ultrasonic meter is 0.05 GPM, whereas in a similar sized mechanical meter, flow readings are not accurate until 0.25 GPM. The average flow rate for broilers (per 10,000 birds) is shown in Figure 6. Remember the phrase, "garbage in, garbage out." In this instance, it means that you need good information in order to make good decisions, and bad or "garbage" information will lead to bad decisions. Accurate information is needed not only to make correct management decisions but to also prioritize where time is spent or attention needed on the farm.

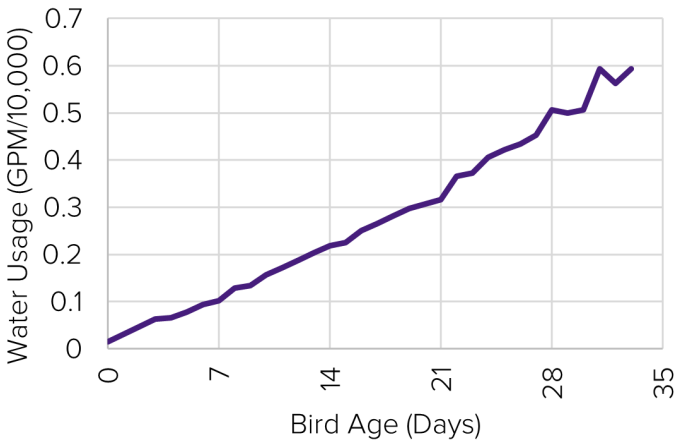


Figure 6. Average broiler water flow rate over 33 days.

## 6. Increased precision

Ultrasonic water meters are often more precise than mechanical water meters. Many ultrasonic meters generate a pulse for every 1/10 of a gallon or less, versus the common rate of one pulse per gallon in mechanical meters. This means the water graph is more defined and a better understanding of what is occurring in the house can be gained. Figure 7 is the same usage but with different pulse outputs.

Figure 7 on next page ▶

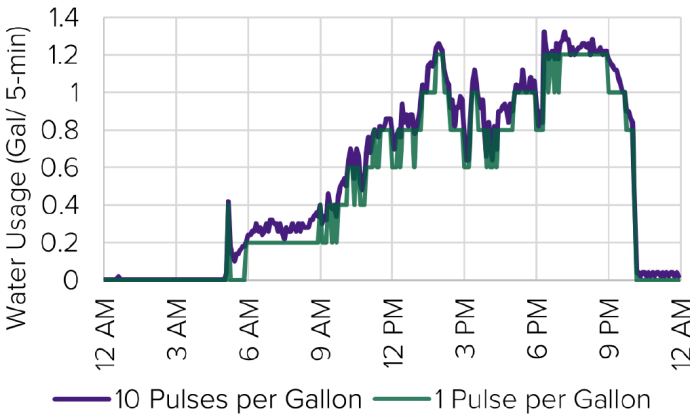


Figure 7. Daily water usage profile with 10 pulses per gallon versus one pulse per gallon.

## 7. Monitoring separate areas of the house

Because of the increased accuracy and precision provided by these meters, it provides the ability to monitor more areas of the house accurately. Many of the drinker line supplies are split between the front and back. With an ultrasonic meter on both sections, issues such as uneven bird density can quickly be seen. This is a problem that usually doesn't show differences in weight until the end of the flock and after the damage is done. As seen in Figure 8, the birds were turned out from half house brood on Day 6 but were not evenly distributed. Immediately differences were seen between front and back water usage. There was almost a 0.7-pound weight difference between the front and back of this house at the end of the flock. This difference in usage was picked up on the first day after turnout because of the increased accuracy and precision of the ultrasonic water meters. While it is true that front and back mechanical meters would eventually pick up this difference in the flock, the faster a difference in density is detected the easier it is to fix. More precise ultrasonic water meters could even monitor individual drinker lines if wanted.

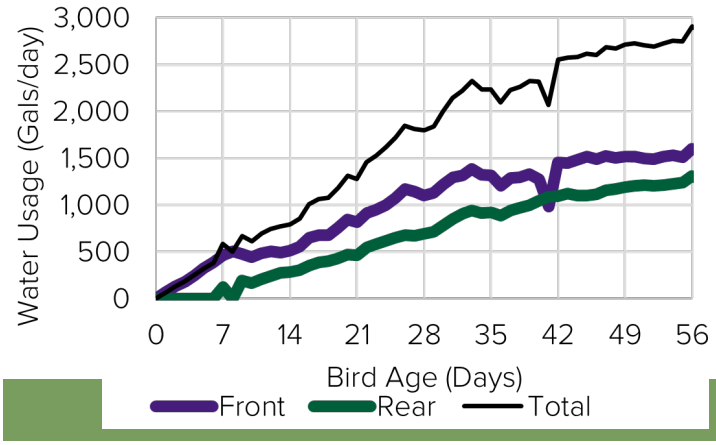


Figure 8. Water usage in house with unequal bird distribution.

## 8. Accurate chick water usage data

The most important reason to install ultrasonic water meters may be the ability to get accurate water usage on the day of chick placement (Figure 9). Mechanical meters that are properly installed may not give accurate water usage readings until three to seven days after placement, and if improperly installed, it may be seven to 10 days before accurate readings are had. The first seven days are some of the most critical for the entire growout. Chicks will increase their body weight by four fold or more during this time. During this time, chicks are also very suseptable to cold stress as they cannot fully regulate their body temperature yet, and the best feed conversion of the entire growout is during this time.

You want to have all of the management and monitoring tools possible during this period to maximaxe your performance and minimize issues as quickly as possible. There are lots of things that accurrate water data can illuminate at this time. Firstly are the chicks being adquately supplied with water or are the lines too high, or a filter clogged, or a valve not turned? It can also show  if the lighting program is correctly set, and since water consumption is correlated to feed consumption, it can give an insight to if the chicks are getting on feed well.

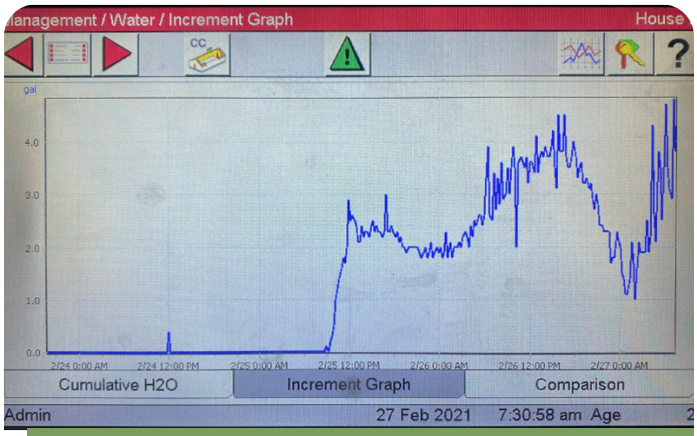


Figure 9. Water usage graph from controller on first day of placement. Photo courtesy of Mike Czarick and Brian Fairchild, University of Georgia

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