PRAIRIE SWINE CENTRE
Research Profits Everyone

Volume 4, Number 5

E-Zine

Tips for Saving Water

Like energy, protein, minerals and vitamins, water is a nutrient that is required in the diet of the pig. Indeed, the pig can survive much longer without these other nutrients than it can without water. This becomes especially true in hot weather.

Pigs obtain water from three sources: water physically contained in the feed, water consumed by drinking, and water produced through chemical reactions as part of normal metabolism in the body. Maintaining water balance is extremely important, as even small changes in water balance can result in serious consequences to the pig. The water requirements of the pig have never really been defined. Research at the Prairie Swine Centre and elsewhere has found that free choice water intake in young growing pigs with free access to feed is about 2.2 to 2.8 times the intake of feed. Thus, a pig eating two kilograms (kg) of feed will normally drink at least 4.5 litres of water per day.

Nursing sows have a somewhat higher intake, approaching four times their feed intake, due to the water needed for milk production. The above estimates do not allow for wastage, which can be quite high (40+%), especially with nipple drinkers. Also, additional water must be added to the above intake levels to compensate for hot weather, excess minerals or protein in the diet, or to help the pig deal with certain health problems such as scours. Pigs do not drink only to satisfy their physiological need for water. Pigs will also drink water to alleviate a feeling of hunger, or out of boredom. The impact of "luxury" intake must not be underestimated, especially in gestating sows since they are limit fed; boredom and hunger can increase water intake many fold over basic requirements. One critical question for pork producers is what are the minimum and maximum flow rates necessary to optimize health and productivity?

1. Do a water audit. Wasted water costs money to pump and to dispose of in slurry. The average usage is 78L per sow (farrow to finish farm), however actual usage has been reported as low as 65L/sow and as high as 120L/sow, a variation of as much as 50% from the mean!

2. Water requirements have been found to be 2.3L for every kilogram of feed consumed (grower and finisher pigs).

3. Mounting water nipples correctly reduces wasted water. For nipples pointed straight out pigs should drink from shoulder height. For nipples mounted downward at 45o the nipple should be 5cm (2 inches) above the back of the pig. Mounting lower will increase water wastage. Nipples should be set for the height of the smallest pig in the pen.

4. Check flow rates. Flow rates determine time spent at the nipple, water intake and water wastage. Too little is just as costly as too much when it comes to flow rates. Flow rates of 1,500 ml for lactating sows, 700 ml in grow-finish are recommended. Research on wastage found 23% at 2080ml/min versus 8.6% at 650 ml/min.

5. Adjust nipple height. Improved water nipple design by providing a step for smaller pigs resulted in a reduction of water waste of 13%, and reduced manure volume of 10% compared to conventional nipple drinkers. Well-managed nipple drinkers (including nipple height changed every two weeks and flow rate) gave similar results to the improved nipple designs.

6. Cup or bowl drinkers waste less water, reducing spillage by 10-15%.

7. Water wastage has been measured at 25% of total water disappearance in grower-finisher pigs at Prairie Swine Centre, this is lower than the 40-60% estimated on commercial farms. Proper flow rates and nipple height could contribute to reduced losses.

8. Use wet/dry feeders in grow-finish. Wet/dry feeders reduce water used by 34%, and slurry volume by 20-40% compared with dry feeders and a bowl. Wet/dry feeders also increase consumption of mash diets compared to dry feeders and a separate water nipple, resulting in a 5% improvement in average daily gain.

9. Avoid high mineral water sources. High levels of sulphate in water results in an osmotic diarrhea but has no effect on animal performance.

10. Feeding a diet containing excessive protein and/or excessive mineral levels results in increased water usage.

11. Temperature impacts water requirements. For every 1°C above 20°C results in a sow drinking 0.2L more water each day.

12. Wasted water results in increased slurry application costs. Assuming grow-finish pigs waste 40% of water delivered to the nipple, 396L will be wasted per market hog. This will result in increased manure slurry produced and cost an additional $0.60 per pig in manure application costs.

Factors Affecting Ab Libitum Water Intake

Increase Intake	Decrease Intake
Heat stress	Cold stress
Hunger	Warm water temperatures
Boredom	Very Saline water
Elevated dietary protein	
Elevated dietary minerals	
Moderately mineral levels in water	
Pelleted feed	

Water Intake, Recommended flow rate and height of nipple drinkers

Phase	Weight (kgs)	Intake (L/day)	Nipple Drinkers		
			Flow ml/min	Height, cm @ 45^0	Height, cm @ 90^0
Gestation		Variable	0.5 - 1.0	90 cm, 35"	75 cm, 30"
Lactation		12 to 20	1.0 to 2.0	90 cm, 35"	75 cm, 30"
Piglets		Variable	0.5 - 0.7	15 cm, 6"	10 cm, 4"
Weanling	5	1.0 - 2.0	0.5 - 1.0	30 cm, 12"	25 cm, 10"
Weanling	7	1.5 - 2.5	0.5 - 1.0	35 cm, 14"	30 cm, 12"
Growout	15	2.5 - 3.5	0.5 - 1.0	40 cm, 16"	35 cm, 14"
Growout	20	3.0 - 4.0	0.5 - 1.0	45 cm, 18"	40 cm, 16"
Growout	25	3.0 - 4.0	0.5 - 1.0	50 cm, 20"	45 cm, 18"
Growout	50	5.0 - 7.0	0.5 - 1.0	55 cm, 26"	55 cm, 22"

Re-printed from the Prairie Swine Centre's PorkInsight database, the complete article can be found at:
http://www.prairieswine.com/tips-for-saving-water/

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