

Managing Water Intake

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In 2017, on-farm best management practices were audited on a total of 24 farms throughout Canada as part of a national project titled From Innovation to Adoption: On-farm Demonstration of Swine Research. This article is part of an eight-part series reporting on these audits.

Among nutrients, water is required in the greatest amount but quite often receives the least attention. Water intake of finisher pigs has been reported to range up to three times feed intake, depending on body weight and feed intake. However, most 'water intake' reported is in the form of water disappearance from drinkers, including water wastage, rather than water actually consumed by pigs. Previous work has shown finishing pigs can waste 25% of water from well-managed nipple drinkers, therefore opportunities exist to reduce wastage when flow rates are adjusted on a regular basis¹. Actual on-farm water flow rates and nipple drinker heights were measured on 24 farms across Canada, representing each phase of production from gestation to finishing. Note that not all farms had nipple drinkers installed in each phase of production, for example, some producers solely relied on wet/dry feeders without an additional water source.

Table 1 outlines water flow parameters showing ranges measured for low, target, high, and very high values. Recommended

flow rates should range between 1.0 to 2.0 L/min and 0.5 to 1.0 L/min for farrowing and all other phases of production respectively, while the target range used in the analysis was expanded from 0.5 to 1.5 L/min for all areas other than farrowing.

Overall water management within audited farms varies across phase of production (Table 2). Generally producers do a better job in managing flow rates within Gestation (pens) and Nursery, where approximately 60% of the nipple drinkers measured met the target flow rate. The challenge is in Finishing, where approximately two-thirds of nipple drinkers provide flow rates in excess of pig's requirement, with 11% of nipple drinkers being rated very high (>2.5 L/min).



Table 1. Water Flow Rate Recommendations

Category	Low (L/min)	Target (L/min)	High (L/min)	Very High (L/min)
Gilt Pen	< 0.5	0.5 - 1.5	1.5 - 2.5	> 2.5
Gestation	< 0.5	0.5 - 1.5	1.5 - 2.5	> 2.5
Farrowing	< 1.0	1.0 - 2.0	2.0 - 3.0	> 3.0
Nursery	< 0.5	0.5 - 1.5	1.5 - 2.5	> 2.5
Finishing	< 0.5	0.5 - 1.5	1.5 - 2.5	> 2.5

Prairie Swine Centre. 2000. Pork Production Reference Guide.²

Table 2. Measured Water Flow Rates – 24 audited farms

Category	Low (0.5L/min)	Target (0.5 – 1.5 L/min)	High (1.5 – 2.5 L/min)	Very High (>2.5L/min)
Gilt Pen	5.1%	33.3%	56.4%	5.1%
Gestation	0.0%	59.4%	21.9%	18.8%
Farrowing	15.3%	38.9%	29.3%	16.6%
Nursery	15.2%	56.8%	19.0%	8.9%
Finishing	5.4%	29.3%	54.3%	10.9%

Economics

Table 3 represents a hypothetical situation of a 6,000-head finishing barn. In this case, if 100% of the nipple drinkers were adjusted to recommended flow rates (1L/min) water disappearance would be 42,000 L/day for the facility. However, as shown in the example in Table 3, only 29.3% of nipple drinkers would have been optimally adjusted. For this scenario, we can assume that any

water disappearance above the rate of 7 L/day could be avoided. Therefore, the daily water disappearance would increase by 70% (or 30,800 L) to reach a total disappearance of 72,800 L/day. The direct cost of water wastage (30,800 L) associated with manure disposal would translate into approximately \$119/day or \$41,500 per year if the previous assumptions were met.

Assumptions

- 6,000 head finishing barn
- Average daily water consumption per pig - 7L/day
- Duration of finishing period – 350 days/year (18 weeks/batch)
- Manure application cost - \$0.0175/gallon or \$0.00385/litre

The previous example provides potential savings for a hypothetical site; every producer should take the opportunity to assess potential savings related to manure disposal, water use, and pumping costs on a regular basis for their operation.

Properly mounting nipple drinkers can help reduce water wastage.^{3,4,5} Nipple drinkers mounted at 90° should be set to shoulder height, while nipple drinkers mounted at 45° should be set to 5cm (2 inches) above the back of the smallest pig in the pen. It is important to note that mounting nipple drinkers lower than required will increase water wastage.

Conclusion

Finishing pigs can maintain adequate water intake from a variety of drinker types, however water waste from drinkers can be very different depending on drinker type and management. Research has shown well-managed nipple drinkers can help reduce water waste to the same level as bowl drinkers.^{1,3} Finally, ensure you regularly check water flow rates, as this will 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.

For Further Reading

¹Water Usage and Wastage from Nipple Drinkers (English) <http://www.prairieswine.com/water-usage-and-wastage-from-nipple-drinkers/>

²Pork Production Reference Guide (English) http://www.prairieswine.com/wp-content/uploads/2010/07/2000_Prairie_Swine_Reference_Guide.pdf

³Effects of nipple drinker height and flow rate on water wastage in grower and finisher pigs (English) <http://www.prairieswine.com/reducing-water-wastage-from-nipple-drinkers-by-grower-finisher-pigs/>

⁴Recommended Flow Rate & Height of Nipple Drinkers (English) <http://www.prairieswine.com/recommended-flow-rate-height-of-nipple-drinkers/>

⁵A Checklist for Water Use (English) <http://www.prairieswine.com/a-checklist-for-water-use/>

Table 3. Hypothetical water disappearance measurements

Category	Low	Target	High	Very High
Measured Values**	5.4%	29.3%	54.3%	10.9%
Water Flow Rate (L/min)	0.5	1.0	2.0	2.75
Number of Pigs	324	1,760	3,260	655
Daily Water Disappearance/Pig (L/pig)	7	7	14	19.25
Total Daily Water Disappearance/Day (L)	2,268	12,323	45,646	12,613
Daily Water Wastage (L/pig)	0	0	7	12.25
Total Daily Water Wastage (L)	0	0	22,823	8,026

** Refers to the percentage of nipple drinkers that were measured in each respective category. A total of 24 farms were measured across Canada.

Category	L/Day
Calculated Water Disappearance	72,849
Target Water Disappearance	42,000
Water Wastage	30,849
Additional Manure Disposal Cost/Day	\$119

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