

# Managing Water Intake

## Auditing Best Management Practices - Part 8



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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 basis<sup>1</sup>. 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.

**Table 1. Water Flow Rate Recommendations**

	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.<sup>2</sup>

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).

### 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) and we assumed that there was no wastage, water consumption 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 would be considered as wasted water. Therefore, the daily water disappearance would increase by 70% (or 29,642 L) to reach a total disappearance of 71,642 L/day. The direct cost of water wastage (29,642 L) associated with manure disposal would translate into approximately \$114/day or \$40,000 per year if the previous assumptions were met.

### Assumptions

- 6,000 head finishing barn
- Average daily water consumption per pig - 7L/day
- 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.

### 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 reduce water waste to the same level as bowl drinkers.<sup>1,3</sup>

Properly mounting nipple drinkers will reduce water wastage.<sup>4</sup> Nipple drinkers mounted at 900 should be set to shoulder height, while nipple drinkers mounted at 450 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. 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

- 1 Water Usage and Wastage from Nipple Drinkers  
(English) <http://www.prairieswine.com/water-usage-and-wastage-from-nipple-drinkers/>
- 2 Pork Production Reference Guide  
(English) [http://www.prairieswine.com/wp-content/uploads/2010/07/2000\\_Prairie\\_Swine\\_Reference\\_Guide.pdf](http://www.prairieswine.com/wp-content/uploads/2010/07/2000_Prairie_Swine_Reference_Guide.pdf)
- 3 Effects 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/>
- 4 Recommended Flow Rate & Height of Nipple Drinkers  
(English) <http://www.prairieswine.com/recommended-flow-rate-height-of-nipple-drinkers/>
- 5 A Checklist for Water Use  
(English) <http://www.prairieswine.com/a-checklist-for-water-use/>

**Table 2. Measured Water Flow Rates – 24 audited farms**

	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% > 2.5

**Table 3. Hypothetical water disappearance measurements**

	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	1,758	3,258	654
Daily Water Disappearance /Pig (L/pig)	3.5	7	14	19.25
Total Daily Water Disappearance/Day (L)	1,134	12,306	45,612	12,590

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

L/Day	
Calculated Water Disappearance	71,642
Target Water Disappearance	42,000
Water Wastage	29,642
Additional Manure Disposal Cost/Day	\$114.12

*(Are Sows Motivated ... continued from page 3)*

### Results and Discussion

Sows showed a greater highest price paid for feed, than movement, but for gilts the highest price paid for each reward did not differ. Sows also showed a greater highest price paid to access feed than gilts. However, the highest price paid for movement did not differ between sows and gilts.

Additional control sows were presented with the operant panel for 30 minutes for seven consecutive days, with no rewards. Initially they interacted with the panel, generating total push counts on day 1 within the range of the HPP by sows and gilts for access to time out of the stall. However, over the course of six days repeated presentation, total interaction with the panel reduced. In contrast, sows trained to associate interaction with the panel with generating a reward maintained levels of interaction with the panel over consecutive days, and as the FR increased (Figure 5).

### Conclusions

Results suggest that stall-housed sows and gilts are motivated to access time out of their stall. The levels of motivation for both rewards are equal in gilts, but in sows the motivation

for movement is moderate when compared to their greater motivation for feed. The greater motivation to receive a feed reward in sows may be because they were recovering from lactation during the testing period. To provide more substantial evidence on which to base Code recommendations, further studies will be done to examine sows' motivation to exit the stall at different feeding levels, and a comparison of the impact of weekly exercise compared to group housing and stall housing on sow behaviour and production when fed at different feeding levels.

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