Water Usage in Young Pigs – Not All Drinkers Are Created Equal

Torrey, S.[1], Toth, E.L.M., Widowski, T.M.*
Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada N1G 2W1

Introduction

Drinker management is a mostly overlooked aspect of pork production, even though water is the most important nutrient in a pig's diet. Newly weaned piglets often drink excessively, have trouble initiating independent feeding, and exhibit higher levels of behavioural problems, specifically belly-nosing. In our previous studies, we found that the presence of different drinker devices can result in different feed intake, water usage and levels of belly-nosing. We found that piglets given access to a push lever bowl drinker, rather than a nipple drinker, belly-nosed significantly less and consumed more food during the first two days post-weaning, a critical period for early-weaned piglets. Additionally, piglets with a nipple drinker used double the amount of water as those with a push-lever drinker. The excessive water usage might be because young piglets are filling their guts with water since consuming fluid is familiar to them. Drinkers that reduce excessive intake but still meet water requirements may be best for the younger piglet. To determine if drinker type has an effect on feed intake, water consumption, growth and behavioural problems, two experiments were undertaken:

Objectives

1. To determine the impact of the different drinker devices on overall performance, water intake and belly nosing (Experiment 1).
2. To determine the preferred drinker style for piglets weaned at two different ages and to identify the relationships between a piglets' drinker preference and their initiation of feeding (Experiment 2).

The Drinkers

1.

2.

3.

1. The standard nursery pig bite nipple drinker
2. The stainless steel nursery push-lever bowl drinker
3. The plastic automatic float bowl drinker

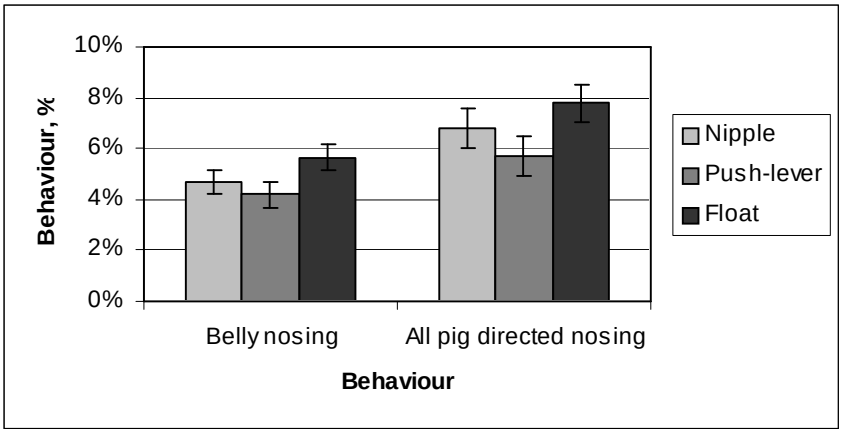
Experiment 1

In this experiment 6 replicates of 45 pigs were weaned at approximately 18 days of age into one of three treatments. Each treatment had one of the drinker types listed above. Feed intake was determined daily and water usage was measured using positive displacement water meters. Wasted water was also collected in order to calculate water consumption. The piglets were weighed at weaning and on days 7 and 14 thereafter. Pens were continuously video recorded for forty-eight hours on days 9 and 10. Behaviour was instantaneously scan sampled every 5 minutes from 0600-0800, 1200-1400 and 2000-2200 for lying, feeding, drinking, belly nosing, pen-mate directed nosing and other behaviour.

Results

- Piglets with nipple drinkers wasted significantly more water than those with the other types of drinkers (P<0.001; push-lever 0.16±0.05 L/pig/day; float bowl 0.36±0.07 L/pig/day; nipple 1.08±0.05 L/pig/day)
- Water intake was significantly lower for the float bowl drinkers than for the other drinkers (P < 0.01; push-lever 0.76 ± 0.05 L/pig/day; float bowl 0.46 ± 0.06 L/pig/day; nipple 0.86 ± 0.05 L/pig). Water intake was not different between the push-lever and nipple drinkers.
- Feed intake and weight were not affected by drinker type
- Piglets with the push-lever bowl exhibited the lowest levels of abnormal behaviour (Figure 1)

Figure 1. Effect of drinker type on the frequency of different behaviour patterns on days 9 and 10. Piglets with the push-lever bowl belly nosed less (P < 0.10) and performed less pig directed nosing (P < 0.05) than piglets with the float bowl.



Experiment 2

Over seven replicates, 104 piglets from 21 litters were split-weaned at either 20 or 28 days of age into pens of 8 piglets. Each pen contained each of the three drinker devices described in Experiment 1. Waste water was measured from collection troughs that were placed under the flooring below each drinker. The difference between the volumes of water dispensed and waste water collected was used to determine daily water intake and group preference for the different drinkers. The video recording system was the same as in Experiment 1. 22 piglets were observed for individual drinking behaviour at the three drinker devices through two days post-weaning.

Preliminary Results

- At the group level, piglets weaned at 28 days drank significantly more from the nipple while piglets weaned at 20 days drank the same amount from the nipple and the push lever (Figure 2, Figure 3).
- Younger piglets waste more from the nipple than older piglets (Figure 2, Figure 3).
- Individual piglets had different drinker preferences. When given three drinker devices, 11 piglets preferred the nipple drinker, 7 preferred the push-lever bowl, and 4 had no preference. No piglet preferred the float bowl drinker.

Figure 2. Water intake and waste at nipple and push-lever drinkers for piglets weaned at 20 d of age There was no difference in overall water intake between the nipple and the push-lever drinkers ($P = 0.52$); however, piglets wasted significantly more water from the nipple drinker ($P < 0.001$).

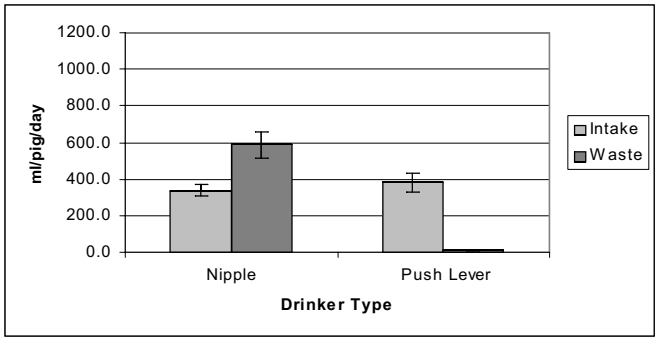
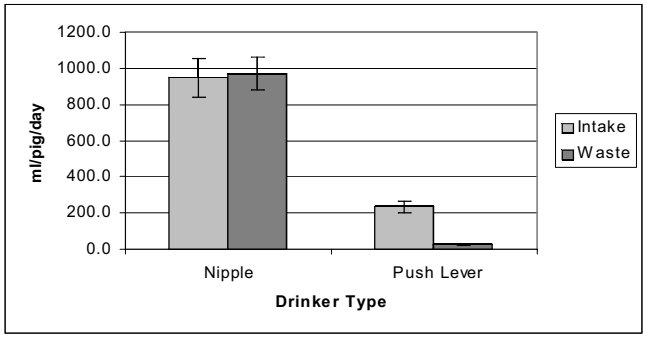


Figure 3. Water intake and waste at nipple and push-lever drinkers for piglets weaned at 28d of age. Overall, piglets consumed ($P < 0.0001$) and wasted ($P < 0.0001$) more water from the nipple drinker than from the push-lever drinker.



Conclusions

Drinker style affects multiple aspects of production and behaviour of the newly weaned piglet. Nipple drinkers contribute to high levels of water wastage, regardless of weaning age. Float bowl drinkers limit water consumption due to soiled water, and result in higher levels of behavioural problems such as belly nosing.

The push-lever drinker keeps water wastage in check while still ensuring that piglets consume adequate amounts of water. This style of drinker also appears to benefit younger weaned piglets through their initial feeding behaviour and overall growth.

Acknowledgements

This research is supported by the National Pork Board of the United States and by OMAFRA. The authors also wish to thank Bill Szkotnicki for his assistance with the data analyses and Meghan Mackenzie-Bell and Myriam Huot for their assistance with the behavioural analyses.