

# Water Usage in Finishing Facilities: Wet/Dry Feeders Versus Dry Feeders with Nipple Waterers

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### Summary and Implications

Water usage was measured in swine finishing facilities containing wet/dry tube feeders and more traditional dry feeders with nipple waterers. Comparisons of groups finished with the two systems show a trend toward a reduction in water wastage of 17.2%. A water efficiency is introduced that shows a reduction of 0.27 gal/lb gain. Pigs finished using wet/dry feeders also had a poorer feed efficiency. Due to lack of replications of this on-farm trial, statistical analysis was not practical.

### Introduction

Water conservation in swine finishing facilities has become more of an issue in modern production. This is not generally for conservation or utility cost as much as for the minimization of water that is unnecessarily added to the liquid manure system. Reducing wasted water reduces the number of gallons required to be field applied, thereby reducing application cost; reduces the required manure storage capacity, thereby reducing construction cost; and reduces costs associated with pumping or purchasing water.

Wet/dry feeder manufacturers claim water wastage reduction. The objective of this research was to compare a wet/dry tube feeder with a conventional dry feeder and nipple waterer.

### Materials and Methods

Information was collected on a farrow-to-finish swine farm near Wellman, IA (southeastern Iowa) that had a curtain-sided finisher (CS) with two rooms of 400 head and a 400 head modified open front (MOF) facility.

The curtain-sided finisher was constructed in 1993 and is typical of finishing facilities constructed currently in the Midwest. It contains two rooms, each holding 400 head. The overall building is 41 ft. by 160 ft. with an 8-ft ceiling height and is completely slatted with a deep pit below the floor. The east room (CSE) used two nipple waterers per pen. Feeders were ordinary bin-type 5-ft long feeders. The west room (CSW) used Aqua Tube TF-60<sup>1</sup> wet/dry feeders that supply feed in a trough with a nipple waterer mounted over the feed pan to reduce water wastage.

The modified open front finisher was approximately 10 years old and held approximately 400 finishing pigs. The

overall building was 28 ft by 120 ft. Each of the 12 pens were approximately 10 ft by 25 ft and were partially slatted in the south 10 ft of each pen. A 3-ft alley ran the length of the building along the south wall. The roof was a monoslope with the north sidewall being 80 in. and the south sidewall being 142 in. Ordinary feeders and nipple waterers were used in the building.

### Results and Discussion

Figure 1 shows an example of a summer water consumption patterns for the wet/dry feeder and the nipple waterers. In the example given in Figure 1, pigs consumed 1.56 gallons/pig during the day with the wet/dry feeder and 1.68 gal/pig with the nipple waterer. This amounts to a reduction in water usage of 7.4%. Brumm and Dahlquist (1) showed a 25.6% reduction in water usage in a similar trial. They also found that pigs on the wet/dry feeder had a poorer feed efficiency. This effect appears slight in this study. Feed efficiency averaged 2.87 for dry feeders with nipples (CS and MOF) and 2.94 for wet/dry feeders, although these were not statistically different.

An appropriate way to get a more complete picture of water consumption is to compare the average over an entire growth period. Figure 2 shows average consumption for dry feeders with nipple waterers to be 1.63 gallons per pig-day and for wet/dry feeders to be 1.35 gal/pig-day. This represents a reduction in water consumption of 17.2%.

In an attempt to relate water consumption to actual growth, Figure 3 shows a "water efficiency" in gallons of water per pound of gain and water/feed ratio in gallons of water per pound feed. This graph also shows a trend of improved water efficiency from 1.04 to 0.77 gal/lb gain. This is a 26% improvement.

The advantage in this is the reduction of wasted water, which reduces the amount of manure to be hauled from the building. If water wastage is reduced from 1.04 to 0.77 gal/lb gain, this means that each finisher that gains 200 lb will require 54 gallons less water when using the wet/dry feeders. This translates into a savings in manure depth accumulation of 11 inches per turn through the finisher. Based on data collected by Lorimor (2) that gave the average custom manure hauling injection rate as \$0.077 per gallon, this translates into a cost savings of 42 cents per pig finished.

The main disadvantage of tube wet/dry feeders, as cited by the farmer, was the lack of a feed reservoir that allows a time cushion between the time the bulk bin becomes empty and the time the feeders are empty.

### Acknowledgments

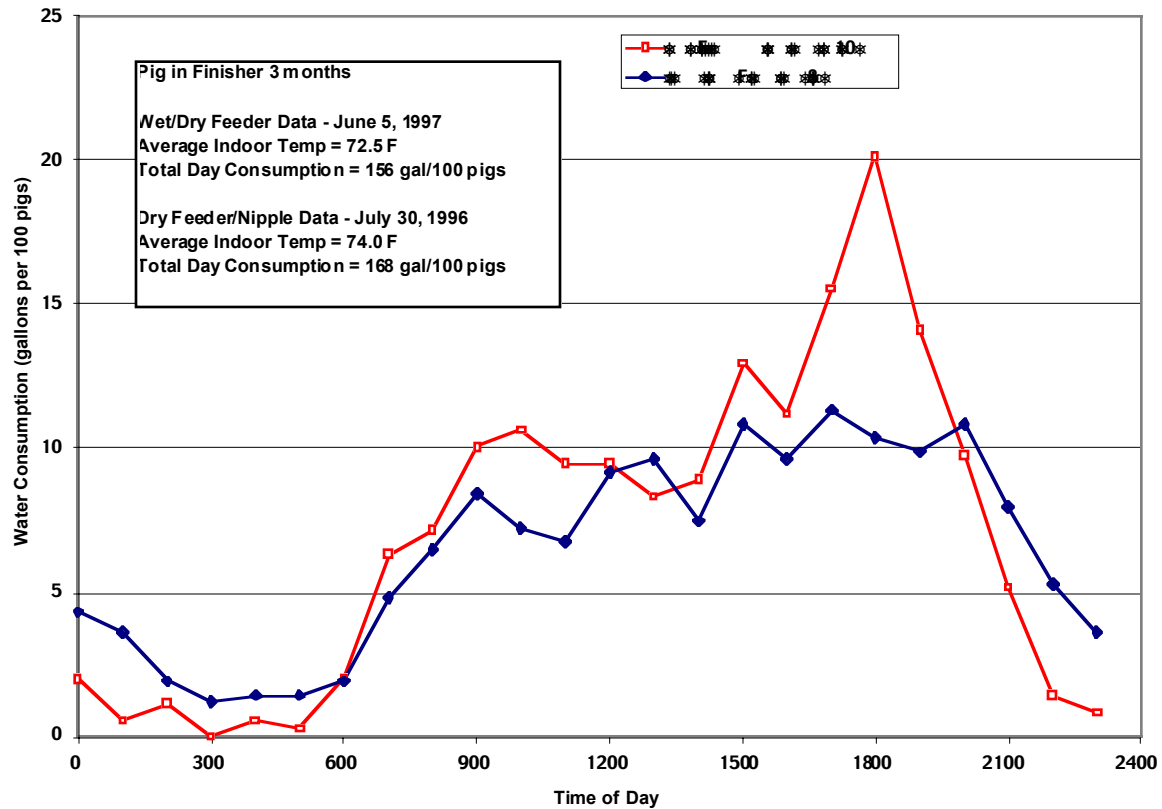
The author wishes to thank the owners/operators of Prairie Pork, Inc. for cooperating on the project and the Iowa Pork Industry Center for funding.

### References

<sup>1</sup> Mention of vendor or product names in this paper is for presentation clarity and does not imply endorsement by the authors or Iowa State University nor exclusion of other suitable productions.

1. Brumm, M., and J. Dahlquist. 1997. Impact of feeder and drinker designs on pig performance, water use and manure production pp. 34-35. Nebraska Swine Report EC97-219, Univ of Nebraska Coop Ext, Lincoln..
2. Lorimor, J. 1998. Commercial Manure Applicator Directory. <http://www.ae.iastate.edu/manurdir98.htm>

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**Figure 1. Daily water consumption pattern during summer.**

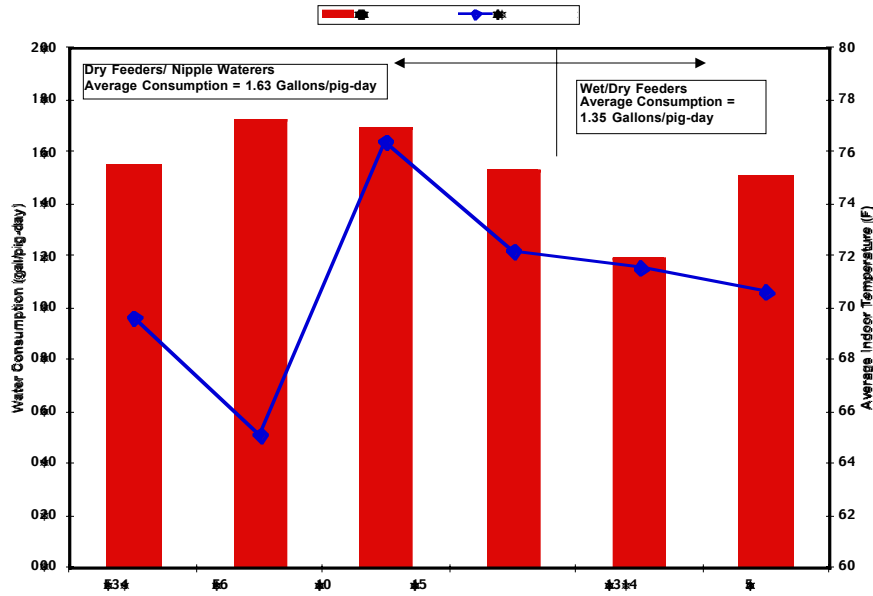


Figure 3. Average water consumption for dry feeders with nipple waterers and wet/dry feeders over the entire growth period.

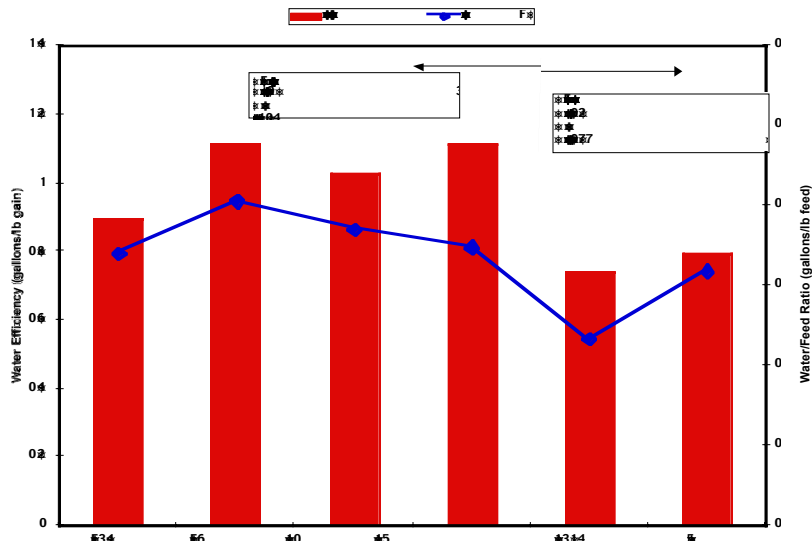


Figure 2. Water consumption efficiencies for wet/dry feeders and dry feeders with nipple waterers.