

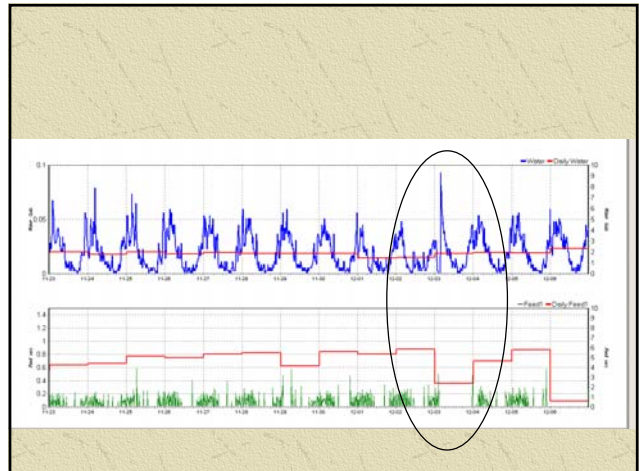
Common Feed and Water Mistakes in Finishing Facilities

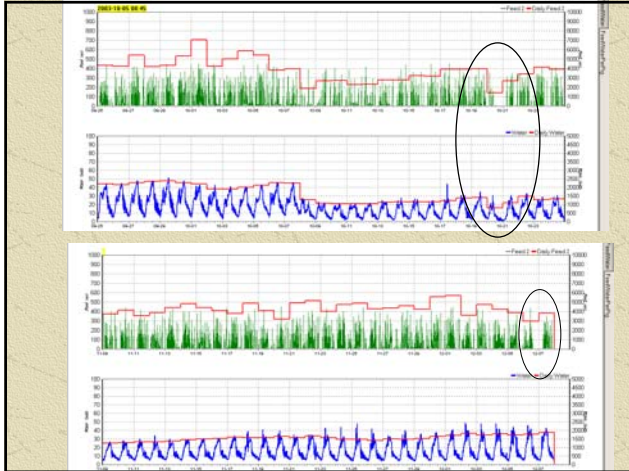
Dr Mike Brumm
 Extension Swine Specialist
 University of Nebraska



Out of Feed Events

More Often Than We Think!





Out of Feed Events

- ✦ Empty bulk bins – human error
 - ◆ Increases with toll milling
- ✦ Bridging of feed
 - ◆ Fat + hammermill + 700 microns
 - ◆ DDGS inclusion
- ✦ Equipment failures
 - ◆ Proximity switches
 - ◆ Motors, etc



Out of Feed Events

- ✦ Increase with increasing facility age
 - ◆ Equipment
 - ◆ Caregiver malaise



Out of Feed Events

✘ Estimates of impact – does the pig recover?

◆ Increased variation

◆ Health

- Hemorrhagic bowel syndrome (HBS)
- Ileitis
- Ulcers
- Tail biting?

◆ Welfare



Experimental Outline – NPPA Funded

✘ Experiment 1

◆ Out-of-feed 20 hrs

- 0, 1, 2 or 3 x every 2 weeks for 16 weeks

✘ Experiment 2

◆ Out-of-feed 0 vs 1x weekly

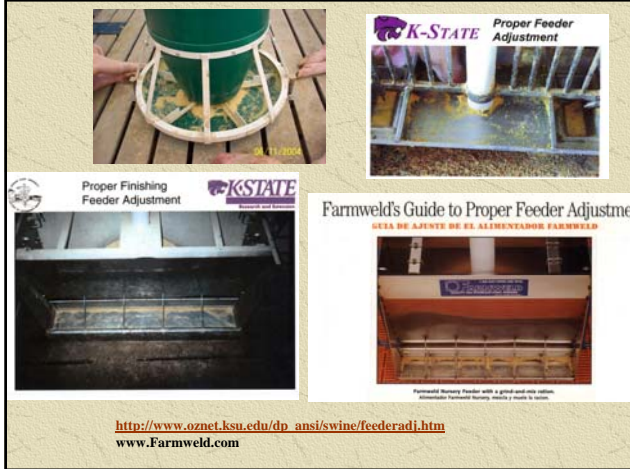
◆ 700 vs 1000 micron particle size



The impact of out-of-feed

2005 Nebraska Swine Report

<http://ianrpubs.unl.edu/swine/pigpdf.htm>



Water

Getting the Plumbing Right!



Water Flow Rate Recommendations

Nursery Pigs	1-2 Cups/Min	250-500 ml
Finishing Pigs	2-4 Cups/Min	500-1000 ml
Lactating Sows	4 Cups/Min	1000 ml

2 Issues of Concern with Water

1) Daily water needs – total usage per day

- ◆ University of Nebraska grow-finish
 - Nipples – 1.5 gal/pig/day
 - Cups – 1+ gal/pig/day
- ◆ 330 days x 1000 hd x 1.5 gal/d
- ◆ = 495,000 gal
- ◆ = 18.2 acre inches

2 Issues of Concern with Water

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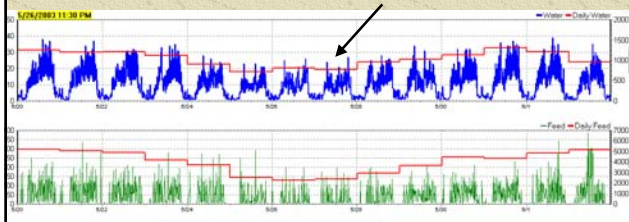
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Water meters to
predict oncoming
health problems

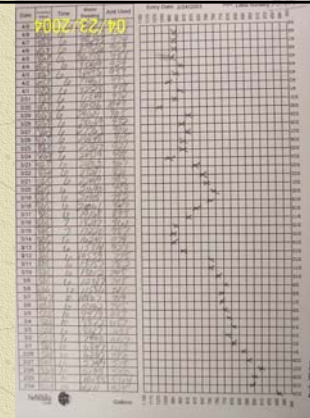
Water and feed as predictors of illness

Medication begun

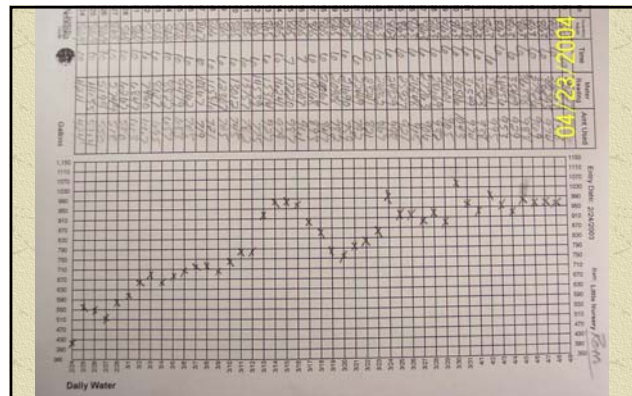
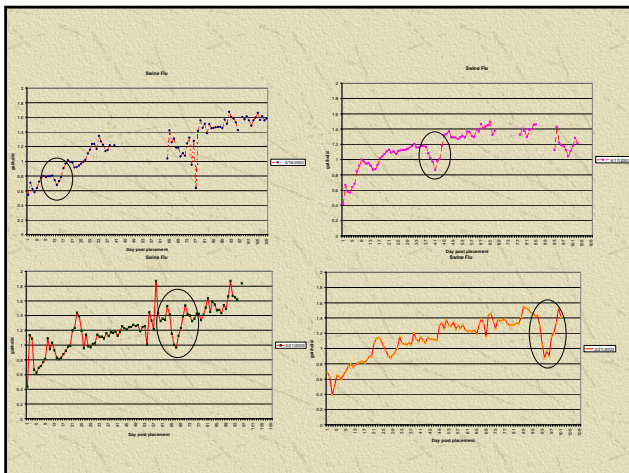


DicamUSA.com
Building Management Services
Fremont, NE

POBZ #2, 710



<http://Porkcentral.unl.edu>



<http://Porkcentral.unl.edu>
<http://www.ipic.iastate.edu/information/WaterchartV100.xls>

2 Issues of Concern with Water

1) Daily water needs – total usage per day

- ◆ University of Nebraska grow-finish
 - Nipples – 1.5 gal/pig/day
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2) Instantaneous Delivery Rate

- ◆ Can we meet the need at the moment?



Max recommended flow in plastic pipe - MWPS

Nominal Diameter, in	Flow, gpm
½	1.5
¾	3.1
1	5.7
1¼	12
1½	18
2	35

Ignores friction loss due to elbows, etc. 4 ft/sec max flow

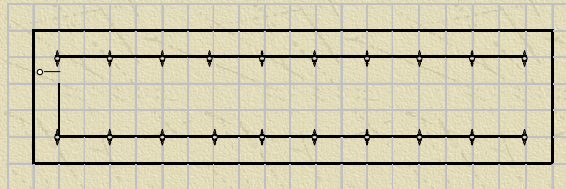
Let's do the math!

$\frac{3}{4}$ " ID pipe

$$= \pi r^2 \times 4 \text{ ft/sec} \times 60 \text{ sec/min} \times 7.5 \text{ gal/ft}^3$$

$$= 5.5 \text{ gal/min}$$

Drinkers and Water



Lets do the math!

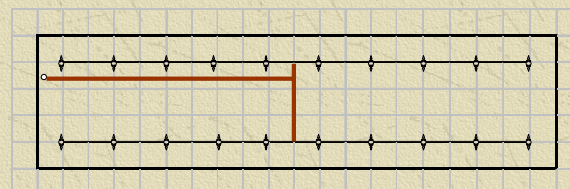
40 nipple drinkers per side (2/pen x 20 pens/side)
4 cups/min flow (.25 gal/min)

$$40 \times .25 = 10 \text{ gal/min need}$$

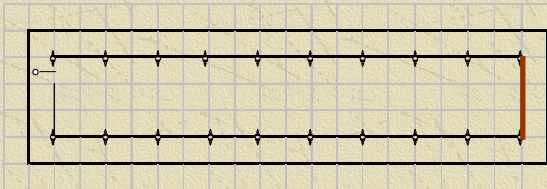
1" line = 5.7 gal/min flow

1 $\frac{1}{4}$ " line = 12 gal/min flow

Drinkers and Water



Drinkers and Water



1/2" washing machine hose

Minimal restrictions

12/02/200

Other Common Restrictors of Water

Water Medicator

- ◆ 5/8" hose bib on 1"+ line – 4 gpm max?



5/8" OD plastic elbow
5/8" ID hose



Taken at 2005 Iowa Pork Congress



Water flow at end of drinkers without medicator in-line @ 11am

Other Common Restrictors of Water

✘ Water Medicator

- ◆ 5/8" hose bib on 1"+ line – 4 gpm max?

✘ Filters

- ◆ 3/4" inlet on 1"+ line



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✘ Water Medicator

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✘ Incoming line from well

Follow manufacturers recommendations for water pressure



10 psi wet/dry

20 psi drinkers



Electrolytes being added to water line by medicator pump



Effect of pressure on flow

$$\sqrt{\frac{P_1}{P_2}} = \sqrt{\frac{20 \text{ psi}}{40 \text{ psi}}} = 0.71$$

Reducing pressure 50% reduces flow to 71% of original

Doubling pressure increases flow to 141% of original



Abigail Van Buren

—♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦—
If we could sell our experiences for
what they cost us,
We would all be millionaires!
—♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦—

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