

## Pig Drinking Water Quality and Delivery - Improving Efficiency

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### Background

Water is cited as the forgotten component in animal production systems, with good cause. Any factor that reduces water intake from optimum has the potential to reduce food intake and thereby influence FCR of growing pigs. Similar impact on lactating sows can cause reduced milk production with subsequent effects on piglet health and growth, and subsequent breeding efficiency.

Water quality is not monitored on livestock units. The poultry sector has come to understand the basics of water quality as a critical control point in bird health, productivity and food safety, and the pig sector should be encouraged to follow. Low level contamination of water will be impacting at least on the immunological competence of the whole enteric system, whilst higher levels of contamination will compromise health and productivity directly.

In a study of 36 UK pig units (Defra project VM02103, 2003) less than one fifth of samples from farrowing houses, one fifth of samples from weaner

houses and one quarter of samples from finishing houses were below the recommended levels of 200cfu/ml. A similar level of contamination with Coliforms was also found. Up to 56% of drinkers within one housing type failed to deliver recommended minimum flow rates.

### Objective

- To describe the quality and quantity of water available at pig pen level.
- To provide results to individual units that allows comparison with recommended levels and other units.
- To provide producers with information on best practice for the repair, cleaning and maintenance of water delivery systems for pigs. (Phase two of project)

### Method

Water samples and flow rates were collected from nine commercial pig units ranging from southern to northern Scotland.

Samples and flow rates were collected and recorded from the five different stages in the production unit (farrowing, weaner, grower, finisher and dry sow).

### QMS Water Quality Audit – Flow rates – Results

Farm ID = 1-9

Drinker type:

N = nipple

NB = bite nipple

NS = spray nipple

BO = bowl

SBO = Small bowl

TR = trough

Time change: indicative of water pressure loss within room. May be indicative of build up of debris within water lines/drinkers.

Flow rates 1 & 2: actual flow rates for first and last drinkers in the room.

Flow rate QA: recommended flow rates.

Farm ID	1	1	1	1				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	N	31	33	2	2.1	2.0	1.5 - 2.0	Extra Water Given
Weaners	SBO	28	29	1	2.4	2.3	0.7	Liquid Feed
Grower 1st stage	BO	27	27	0	2.4	2.4	1.0	Liquid Feed
Grower 2nd stage	BO	26	26	0	2.5	2.5	1.5	Liquid Feed
Finishing House	N	37	37	0	1.8	1.8	1.5 - 2.0	Liquid Feed
Dry sow house	TR						1.5 - 2.0	Liquid Feed

Farm ID	2	2	2	2				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	BO	7	8	1	9.4	8.3	2.5	Good
Weaners	NB	55	53	-2	1.2	1.2	0.7	Good
Grower 1st stage	NB	55	53	-2	1.2	1.2	1.0	Good
Grower 2nd stage	TR	80	80	0	0.8	0.8	1.5	Low
Finishing House	NB	90	55	-35	0.7	1.2	1.5 - 2.0	V Low
Dry sow house	NB/NM	130	40	-90	0.5	1.7	1.5 - 2.0	1st=NB Last=NM

Farm ID	3	3	3	3				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	NB	20	20	0	3.3	3.3	1.5 - 2.0	Good
Weaners	NM	60	60	0	1.1	1.1	0.7	Good
Grower 1st stage	NB	24	18	-6	2.8	3.7	1.0	Good
Grower 2nd stage	NM	29	26	-3	2.3	2.5	1.5	Good
Finishing House	NM	75	80	5	0.9	0.8	1.5 - 2.0	V Low
Dry sow house	TR	80			0.8		1.5 - 2.0	

Farm ID	4	4	4	4				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	N	55	60	5	1.2	1.1	1.5 - 2.0	Low
Weaners	N	75	90	15	0.9	0.7	0.7	OK
Grower 1st stage	N	170	180	10	0.4	0.4	1.0	V Low
Grower 2nd stage							1.5	
Finishing House	N	110	150	40	0.6	0.4	1.5 - 2.0	V Low
Dry sow house	TR						1.5 - 2.0	

Farm ID	5	5	5	5				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	NS	10	10	0	6.6	6.6	1.5 - 2.0	Good
Weaners	NS	30	30	0	2.2	2.2	0.7	Good
Grower 1st stage	NB	25	25	0	2.6	2.6	1.0	Good
Grower 2nd stage							1.5	
Finishing House	NB	12	12	0	5.5	5.5	1.5 - 2.0	Good
Dry sow house	TR						1.5 - 2.0	

Farm ID	6	6	6	6				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	N	35	30	-5	1.9	2.2	1.5 - 2.0	Good
Weaners	N	70	110	40	0.9	0.6	0.7	OK Check
Grower 1st stage	N	85	85	0	0.8	0.8	1.0	Low
Grower 2nd stage	N	55	95	40	1.2	0.7	1.5	V Low
Finishing House	N	110	150	40	0.9	1.2	1.5 - 2.0	V Low
Dry sow house	N	65	70	5	1.0	0.9	1.5 - 2.0	V V Low

Farm ID	7	7	7	7				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	N	17	20	3	3.9	3.3	1.5 - 2.0	Good
Weaners	N	100	120	20	0.7	0.6	0.7	OK Check
Grower 1st stage	N	16	17	1	4.1	3.9	1.0	Good
Grower 2nd stage	N	16	17	1	4.1	3.9	1.5	Good
Finishing House	N	16	16	0	4.1	4.1	1.5 - 2.0	Good
Dry sow house	N	10	10	0	6.6	6.6	1.5 - 2.0	Good

Farm ID	8	8	8	8				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	NSP	22	30	8	3.0	2.2	1.5 - 2.0	Good
Weaners	NSP	170	210	40	0.4	0.3	0.7	V V Low
Grower 1st stage	NB	30	50	20	2.2	1.3	1.0	Good
Grower 2nd stage							1.5	
Finishing House	NB	120	115	-5	0.6	0.6	1.5 - 2.0	V V Low
Dry sow house	N	70	75	5	0.9	0.9	1.5 - 2.0	V Low

Farm ID	10	10	10	10				
	Drinker type	Time 1st drinker	Time last drinker	Time change	Flow rate 1	Flow rate 2	Flow rate QA	Comments
Farrowing House	N	18	20	2	3.7	3.3	1.5 - 2.0	Good
Weaners	N	65	75	10	1.0	0.9	0.7	Good
Grower 1st stage	N	42	25	-17	1.6	2.6	1.0	Good
Grower 2nd stage							1.5	
Finishing House	N	17	19	2	3.9	3.5	1.5 - 2.0	Good
Dry sow house	N	45	50	5	1.5	1.3	1.5 - 2.0	Low

**Farm ID**

1-9.

**Coliform bacteria**

Background indicator of general contamination. Counts of > 2000 suggest the system needs cleaning down.

**E.coli bacteria**

Indicator of faecal contamination of water supply. There is no specific indication of what levels become detrimental to health. > 1000 as a cut-off for action.

**Location**

- A = farrowing house
- B = Weaners
- C = growers
- D = finishers
- E = dry sows



Farm ID		1	2	3	4	5	6	7	8	10
Bacteria	Location on Farm									
Coliform	A	145	530	>2010	50	2	1300	5800	461	187
Coliform	B	2010	160	24	48	118	>2010	15540	9	198
Coliform	C	>2010	410	>2010	>2010	8	>2010	>2420	249	119
Coliform	D	1180	130	>2010	530	>2010	1650	88	10	132
Coliform	E	>2010	>2010	>2010	14500	>2010	>2010	49	0	156
>2000	needs cleaning									

Farm ID		1	2	3	4	5	6	7	8	10
Bacteria	Location on Farm									
Coliform	A	21	12	>2010	4	1	24	1	2	136
Coliform	B	145	25	11	9	10	89	0	3	39
Coliform	C	>2010	8	1300	53	2	2010	0	179	36
Coliform	D	36	8	>2010	11	1300	66	0	9	19
Coliform	E	830	78	>2010	7800	1090	48	2	0	48
>2000	needs cleaning									