Water Consumption in Suckling Pigs

Masaru NAGAI, Kouichi HACHIMURA¹⁾, and Kiyoshi TAKAHASHI²⁾

Toyama Meat Inspection Center, Shinbori, Shinminato, Toyama 934, ¹⁾Eisai Co., Ltd., Koishikawa, Bunkyo-ku, Tokyo 112-88,

²⁾Department of Veterinary Internal Medicine, Rakuno Gakuen University, 582 Bunkyo-dai-Midorimachi, Ebetsu, Hokkaido 069, Japan
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ABSTRACT. Water consumption was measured in 199 suckling pigs aged 1 to 28 days. The suckling pigs began to drink water 3 to 5 hr after birth. Water consumption per pig increased from 36 ml/day at the age of 1 day to 403 ml/day at the age of 28 days. Water consumption per kg body weight, on the other hand, remained constant at 51 to 62 ml, regardless of age. This results indicates that it may be possible to add drugs to drinking water for the purpose of medication in suckling pigs.—**KEY WORDS:** medication in drinking water, suckling swine, water consumption.

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Suckling pigs start drinking water at the age of 1 day [1, 2, 7-10], but no accurate information is available concerning the water consumption by suckling pigs. Nothing is known about the appropriate amount of drugs to be added to drinking water for suckling pigs.

In the present report, we determined water consumption by suckling pigs at different ages and seasons.

The test animals were 199 crossbred suckling pigs born between 18 female Landrace Large White (LW) pigs and male Duroc (D) pigs. They were divided into groups of 80, 60 and 59 to determine water consumption in the

May-June period, July-August period, and September, respectively. Drinking water was provided in a suckling pig drinker of negative pressure type fitted with a ball-fitted saucer (Kolo Drinker, Meiji Seika Co., Ltd., Tokyo, Japan), 34 out of 80 pigs born in May-June were given water and to 46 other pigs a 10% amoxicillin preparation (Anxin, Eisai Co., Ltd., Tokyo, Japan) was added to the drinking water as a drug sample. The drinking water was provided *ad libitum* via a drinker filled with water or a 0.02% amoxicillin solution.

Daily water consumption was marked on the outside of

Table 1. Changes in average daily water consumption by suckling pigs

Age (days)	Daily Water Consumption per Pig (ml/pig/day) ^{a)}				
	May thru June Control (n=34) ^{b)}	May thru June (n=46)	June thru August (n=60)	September (n=59)	May thru Sep- tember (n=165)
1	29	29	47	33	36
2	28	28	176	73	102
3	40	41	154	99	105
4	56	56	174	112	122
5	58	57	202	135	141
6	77	71	258	162	176
7	90	90	341	172	218
8	120	123	265	123	181
9	127	122	210	169	173
10	135	114	201	211	182
11	161	131	183	177	167
12	177	197	187	190	191
13	233	203	215	156	192
14	228	208	245	137	199
15	231	213	201	121	177
16	236	226	269	154	219
17	243	228	303	191	245
18	239	229	319	203	257
19	278	342	323	199	287
20	296	406	267	197	281
21	342	359	245	170	250
22	374	369	257	173	259
23	376	370	290	185	276
24	398	381	347	143	288
25	384	379	394	166	314
26	394	393	425	227	350
27	389	384	485	265	385
28	411	409	504	278	403
1-28	6150	6158	7487	4621	6176

a) 0.02% Amoxicillin solution except control group.

b) Control group was given water which did not include drug.

the drinker, and water consumption per day per pig plus loss by evaporation and average water consumption per kg body weight were recorded until the suckling pigs were 28 days old. Loss per day by evaporation was measured by noting the decline in the volume of water drawn from the drinker saucer which was set outside the pigs' cage.

Table 1 shows the changes in average water consumption per pig and Table 2 the changes in water consumption per kg body weight and intake of amoxicillin from a 0.02% amoxicillin solution. There was no significant difference

Fig. 1. Changes in water consumption (ml/pig) by suckling pigs (May-September).

between the volume of water consumed by the non medicated and medicated groups in the May-June period. The suckling pigs began to drink water 3 to 5 hr after birth. Their water consumption almost linearly increased with time, from 36 ml ($n=165$) at the age of 1 day to 403 ml ($n=165$) at the age of 28 days (Fig. 1). The average total amount of water consumed by each pig from day 1 of age to day 28 of age was 6.15 liters ($n=46$) in May-June, 7.49 liters ($n=60$) in July-August, and 4.62 liters ($n=59$) in September (Table 1). Average water consumption per kg body weight was 21.6–63.5 ml ($n=46$) in May-June, 52.9–73.3 ml ($n=60$) in July-August, and 25.5–62.1 ml ($n=59$) in September. Water consumption was particularly great during the summer season of July and August (Table 2).

Throughout the May-September period, however, water consumption per kg body weight was nearly constant regardless of age (Table 2).

The doses of amoxicillin preparations approved in Japan for use in pigs are 3 to 10 mg (potency) per kg body weight. In the suckling pigs given 0.02% amoxicillin solution as drinking water the intake of amoxicillin per kg body weight was 4.3–12.7 mg in May-June, 10.6–14.7 mg in July-August, and 5.1–12.4 mg in September. The intake of amoxicillin tended to increase in the summer season of July and August.

Throughout the May-September period, however, the intake of amoxicillin was nearly constant regardless of age (Table 2). It was close to the upper limit of the approved dose range.

Suckling pigs are said not to drink water in the first days of birth, because they begin to suckle at intervals of about

Table 2. Average water consumption per kg body weight of suckling pigs and intake of amoxicillin after addition 0.02% to drinking water at a rate of

Observation Period (months)	Age (days)	Average Body Weight (kg)	Average Water Consumption by Kg Body Weight (ml/kg)	Intake of Amoxicillin (mg/kg)
May thru June ($n=46$)	3	1.9	21.6	4.3
	10	3.8	30.0	6.0
	17	4.6	49.6	9.9
	24	6	63.5	12.7
	28	6.6	62.0	12.4
July thru August ($n=60$)	3	2.1	73.3	14.7
	10	3.8	52.9	10.6
	17	5.2	58.3	11.7
	24	6.4	54.2	10.8
	28	7.1	71.0	14.2
September ($n=59$)	3	1.7	58.2	11.6
	10	3.4	62.1	12.4
	17	4.6	41.5	8.3
	24	5.6	25.5	5.1
	28	6.5	42.5	8.6
Mey thru September ($n=165$)	3	1.9	55.3	11.1
	10	3.7	49.2	9.8
	17	4.8	51.0	10.2
	24	6	48	9.6
	28	6.8	59.3	11.9

1 hr soon after birth [3]. Considering, however, that they are given a milk substitute after one week of life, they are likely to drink water [4].

In the present study suckling pigs were observed to drink water 3 to 5 hr after birth, and water consumption per pig at the age of 1 day was close to the amount (30 ml) reported by Phillips *et al.* [9].

It has been reported that the amount of mother's milk ingested [3], the occurrence of pneumonia or diarrhea [5], and the use of a warming heater affect water consumption by suckling pigs [6]. In the present study, however, the suckling pigs did not develop pneumonia or diarrhea and had no other abnormality. These observations suggested that the increase in water consumption during the summer season is due to high room temperatures.

These results indicate that it may be possible to add drugs to drinking water for the purpose of medication in suckling pigs.

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