Effect of soaking methods on pig farms

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Efficient cleaning and disinfection reduces the incidence of most pathologies. As part of the new European regulations on salmonella, Hygiene Package and Guide to Good Practice in pig farms, cleaning and disinfection form an essential means of control. The French Institute of Pig Farming (IFIP) has already conducted procedure evaluation tests in order to optimise the efficiency and cost of cleaning and disinfection. In order to improve further on these procedures, the increased duration of soaking and the use of a wetting agent such as Ecolab's Inciprop Wet in the soaking water remain to be investigated.

Equipment and methods

Various soaking methods were tested in experimental stations and repeated twice in each of the three types of housing – farrowing sows, weaners and finishers. Each method was compared with a control method applied in the same type of housing, the remainder of the procedure being the same in both cases.

The following practices were assessed:

- Automated sequential soaking with water (five minutes soaking at 15 minute intervals); the methods compared were: 4 hours/12 hours soaking and 6 hours/12 hours soaking.
- Sequential automated soaking with water plus a wetting agent (Ecolab's Inciprop Wet, concentration one per ml): the methods compared were: four hours soaking with wetting agent/four hours without wetting agent, two hours soaking with wetting agent/four hours without wetting agent and lastly: one hour soaking with wetting agent/four hours without wetting agent.

The effectiveness of the cleaning and disinfection were evaluated by ATP bioluminescence measurement and total bacteria count in Petri dishes using the methods previously described by Corrégé et al (2003).

The cost of the operations was calculated from the figures for working time, water consumption and products used (water: purchase price, storage and distribution; electricity: purchase price and labour) using a method of calculation that is set out in detail in a prior publication (Corrégé et al, 2002).

Table 1. Difference in water consumption, working time and cost between the method tested and the control for farrowing sows and weaners.

		Farrowing sows (100m²)			Weaners (100m²)		
Test	Control	Water (litres)[1]	Time (hours)	Cost (€)	Water (litres)	Time (hours)	Cost (€)
12 hr water	4 hr water	1008/-666	-0.60	6.09	1437/-109	0.05	6.33
12 hr water	6 hr water	831/-632	-0.50	-5.11	669/-400	-0.25	-1.59
4 hr Inciprop Wet	4 hr water	-94/-94	-0.08	2.3	-279/-279	-0.45	-4.3
2 hr Inciprop Wet	4 hr water	-729/-267	-0.05	-1.48	--	-	-
1 hr Inciprop Wet	4 hr water	-756/7	0.05	-0.90	--	-	-

[1]Including soaking water/not including soaking water. [2]Calculated on the basis of 140 T weaner-finisher farming; results expressed per sow per year.

Table 2. Difference in water consumption, working time and cost between the method tested and the control for finishers and weaning to finishing.

		Finishers (100m²)			Weaning to finish/sow/year		
Test	Control	Water (litres)[1]	Time (hours)	Cost (€)	Water (litres)[1]	Time (hours)	Cost (€)
12 hr water	4 hr water	1031/-905	-0.45	-3.52	494/-285	-0.17	-0.89
12 hr water	6 hr water	864/277	-0.20	0.00	357/-71	-0.13	-0.86
4 hr Inciprop Wet	4 hr water	-621/-621	0.35	-6.64	-167/-167	-0.13	-1.11
2 hr Inciprop Wet	4 hr water	-658/-101	-0.07	-1.51	-233/-57	-0,20	-0,51
1 hr Inciprop Wet	4 hr water	-544/96	0.07	-0.13	-213/20	0.02	-0.15

[1]Including soaking water/not including soaking water. [2]Calculated on the basis of 140 T weaner-finisher farming; results expressed per sow per year.

Results and discussion

In all the situations that were compared, the results of the ATP measurement and the total flora count were identical (no significant difference) and this may be explained by the fact that:

- The results from more than 70% of the sites were good or very good. In housing that is very biologically clean the margin for improvement is limited.
- The methods used are semi-quantitative and do not allow very fine variations in the level of contamination to be detected.
- The shorter soaking time is balanced out by a longer working period, thus leading to an identical final level of decontamination.

Table 1 shows the differences in water consumption, working time and cost for each type of housing between the method being tested and the control for each of the tests carried out.

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In spite of the water consumption required, increasing the soaking time leads to reduced working time and reduced water consumption later during washing.

This means less difficulty and at the same time reduces costs. However, it should be noted that these reductions in working time and costs are small.

In practice, long soaking times are not always compatible with the constraints of housing rotation and work organisation. The addition of a wetting agent to the soaking water may be an option in order to reduce soaking time or improve its effectiveness.

It assists the penetration of water into the deposits, which soften more quickly and remain moist for longer. Given equivalent soaking times, the wetting agent enables the working time and water consumption to be reduced, and therefore, the costs and difficulty.

Soaking with a wetting agent for two hours has the same effect as soaking without a wetting agent for four hours: it reduces washing time and water consumption and it saves money.

When the time is reduced to one hour, even though the water consumption is markedly reduced because less soaking water is used, the washing time increases.

In terms of money, the cost and consumption of the wetting agent are low (short soaking time and used at concentrations of one per ml). Even when the wetting agent is added to the working time, the savings on soaking water are such that they compensate for this.

Thus, the reduced soaking time when Inciprop Wet is used is always better in terms of costs, even if the observed differences are slight.

However, it should be noted that this economic calculation does not take account of the equipment required (dosing pump, separate water circuit or bypass), nor of the time required to install the equipment and prepare the solution.

Conclusion

Although increasing the soaking time increases water consumption it reduces working time, difficulty and costs. The addition of Ecolab's wetting agent Inciprop Wet enables soaking time to be reduced, limits water consumption and meets farmers' expectations in terms of housing rotation.

Nevertheless, only one hour's soaking with a wetting agent appears insufficient, while a minimum time of two hours enables working time, water consumption and costs all to be reduced. ■