Weak Acid Hypochlorous Solution used for Hygienic Control in the Laboratory Animals Facilities and the Poultry Farms

Mana Miyake

HSP corporation , Japan

Mana Miyake
The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

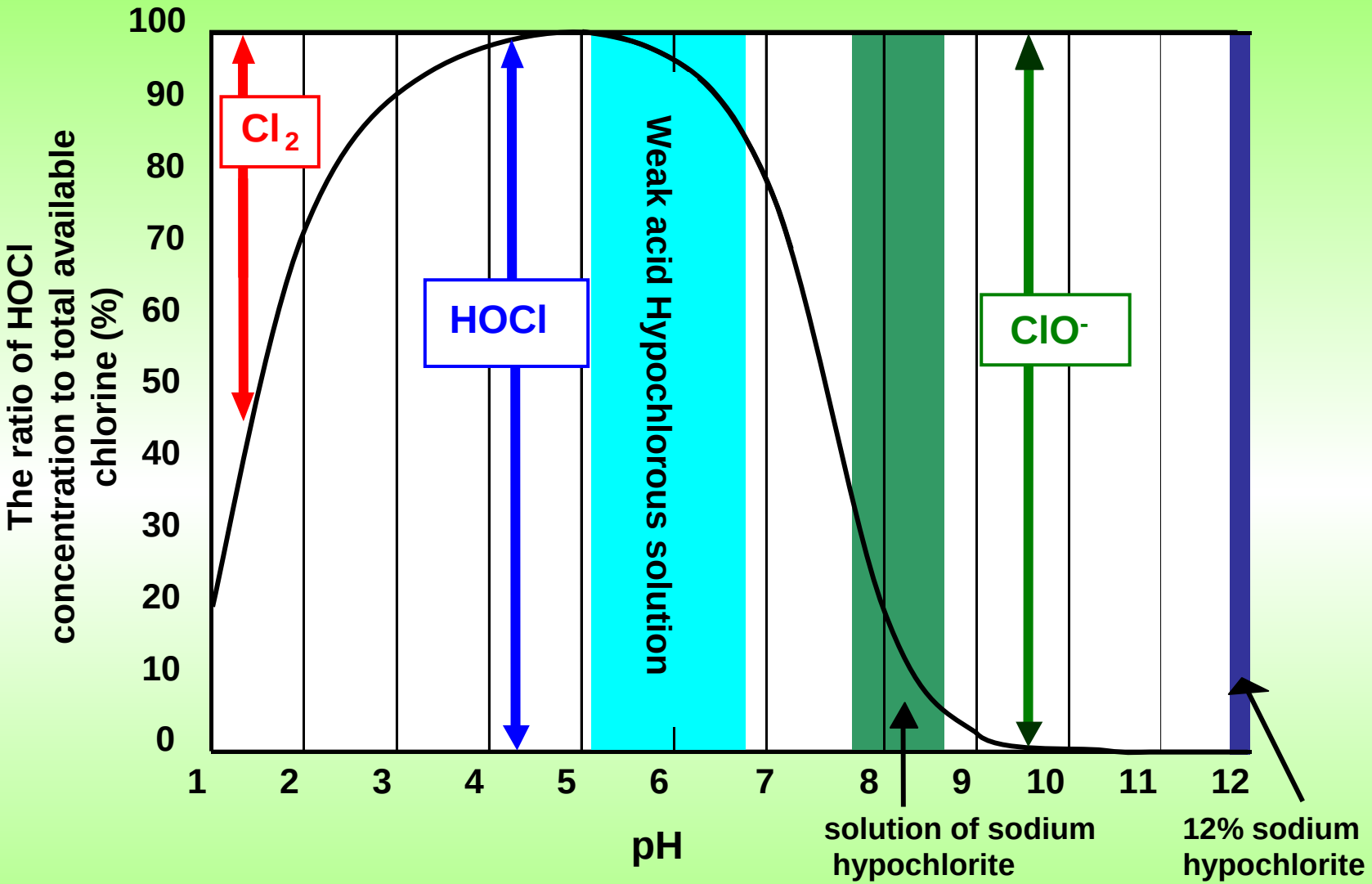


Fig.1 The ratio of HOCl concentration to total available chlorine in water

出典 浄水の技術 一部改変

H.16.8.25 食安基発第 0825001 号

Table. Bactericidal effect of Weak Acid Hypochlorous solution

Strain	ATCC	Inoculum ×10^{7}cfu/ml	Time (sec) 15	30	60	300	600
P.aeruginosa	27853	2.0～16	−	−			
S.aureus	25923	1.1～16	−	−			
E.faecalis	29212	1.1～11	−	−			
E.faecium	35667	1.4～16	−	−			
E.coli	25922	2.0～9.2	−	−			
S.maltophilia	13637	2.1～7.0		+	−	−	
C.albicans	10231	1.0～3.4	−	−			
B.subtilis	6633	4.7～7.2			+	+	−

※ WAHS pH 6.0～6.3
available chlorine concentration 50ppm

The 17th Annual Meeting of Japanese Society of Environmental Infections

Mana Miyake
The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

Table. Bactericidal effect of Weak acid Hypochlorous solution

Strain	Time	pH 5.0	6.0	7.0	8.0
C.albicans ATCC10231	15sec	−	−	−	+
	30sec	−	−	−	−
S.maltophilia ATCC13637	30sec	+	+	+	+
	1min	−	−	+	+
	3min	−	−	−	−
B.subtilis ATCC6633	1min	+	+	+	+
	5min	−	−	+	+
	10min	−	−	−	+
	60min	−	−	−	−

brain heart infusion broth at 37℃ for 72h
+；alive -；not detected
available chlorine concentration 50ppm

The 17th Annual Meeting of Japanese Society of Environmental Infections

Mana Miyake

The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

Table. Efficacy of a Weak Acid Hypochlorous Solution Against Various Kinds of Virus

	Envelope	Strain		Infectivity (log)	Control	Time (sec) 5	15	30	60	180	300	600	Chloride concentration (ppm)	Cited literature
DNA	-	*HSV*	HF	6.8	+	—	—	—	—				50	※3
			UW	6.8	+	—	—	—	—					※3
			1- HS	6.2	+	+		+	—		—	—		※1
			2 - KP	4.4	+	+		+	+		—	—		※1
	+	*Adeno V.8- SRL*	TC-21847 clinical isolate	2.0	+		—	—	—		—	—	50	※1
		CAV	D43	6.8	+			—		—			50	※2
RNA	-	*CoxA*	9	3.5	+	—	—	—	—		—		50	※3
			16	4.9	+	—	—	—	—		—			
		CoxB	1	5.0	+	—	—	—	—		—		50	※3
			2	6.3	+	—	—	—	—		—			
			3	6.8	+	—	—	—	—		—			
			4	6.0	+	—	—	—	—		—			
			5	5.9	+	—	—	—	—		—			
		Echo	7	4.4	+	—	—	—	—		—		50	※3
		En	71	6.8	+	—	—	—	—		—	—	50	※3
	+	*Inf*	A/PR/8/34	4.0	+	—	—	—	—		—	—	50	※1
			A/Tokyo/2/75	5.9	+	+	—	—	—		—	—		※3
			AA/FM/1/47	5.6	+	+	—	—	—		—	—		※3
		HIV	1-ⅢB	3.0	+	—		—	—				30	※1
					+	—		—	—				50	
		CDV	Ondersteport Strain	5.8	+			—		—			50	※2
		CCV	1-71	5.9	+			—					50	※2
		Semliki forest virus	National Institute Infectious Diseases origin	5.0	+		—	—	—		—	—	50	※1

Cited literature

※1 Efficacy of a Weak Acid Electrolytic Water Against Various Kinds of Pathogenic Microorganisms Takako TACHIKAWA

※2 beneficial effect against various kinds of dog virus (MLT company data)

※3 Deliberation report of the antiviral efficacy of electrolyzed oxidizing water made by Aquatid

Mana Miyake

The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

The technique to improve the contact with WAHS and the bacteria

Nonionic suefactant (Polyglycerol esters of fatty acids or Washing agent with Sucrose fatty acid esters) were added to WAHS (P-WAHS,S-WAHS)

Table Surface Tension of Tap water, Sodium hypochlorite, WAHS, P-WAHS, S-WAHS, Polyglycerol esters of fatty acids or Washing agent with Sucrose Fatty Acid Esters.

	Tap water	Sodium hypochlorite	WAHS	P-WAHS	S-WAHS	Polyglycerol esters of fatty acids	Washing agent with Sucrose Fatty Acid Esters
surface tension (dyne/cm)	71.7	67.2	70.6	31.3	28.0	30.7	29.2

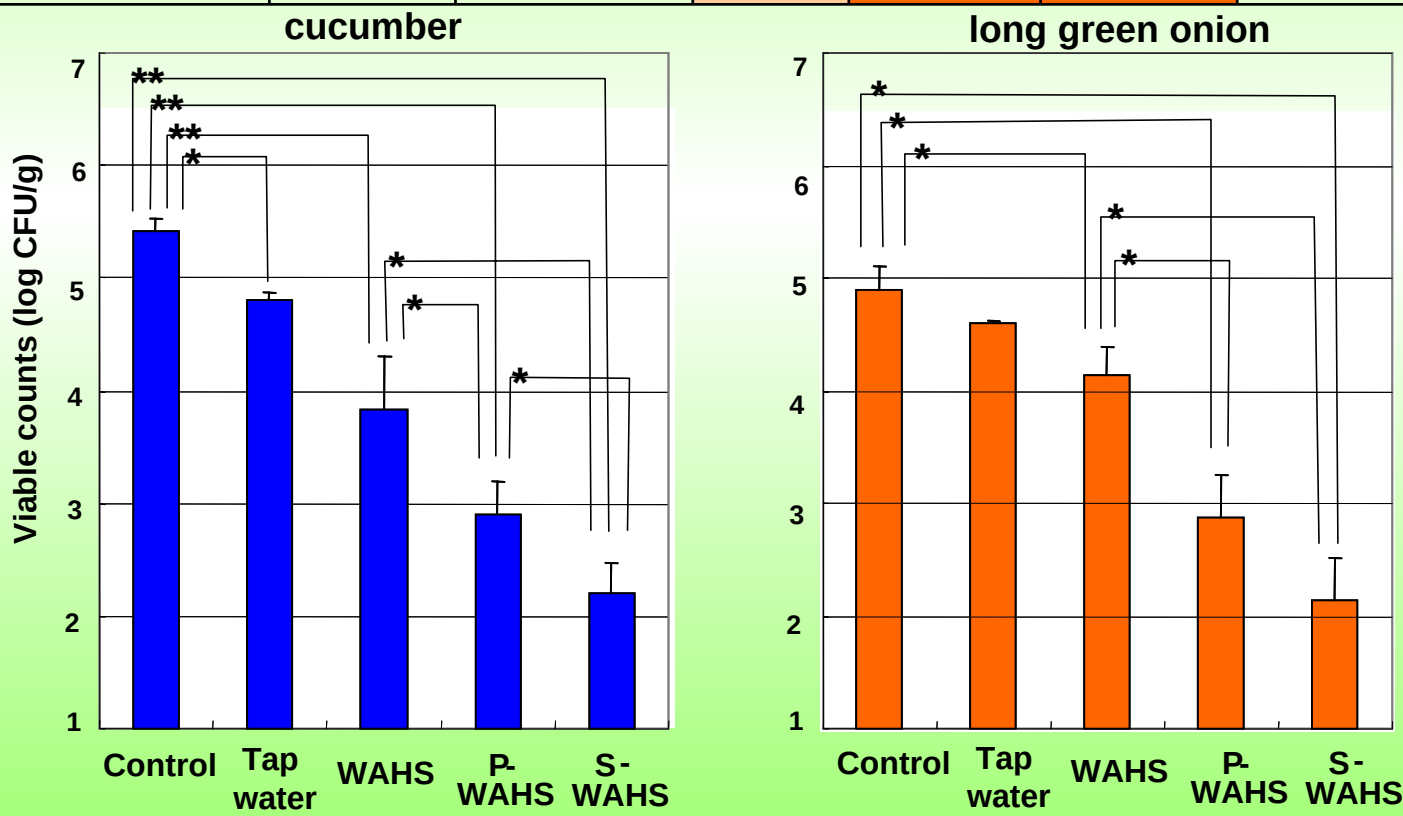


Fig
Bactericidal effect on the cucumber and the long green onion with treated Tap water, WAHS,P-WAHS or S-WAHS

** $p<0.01$ * $p<0.05$

Bokin Bobai (Antibacterial and Antifungal) Vol.33 No.5 2005

Mana Miyake

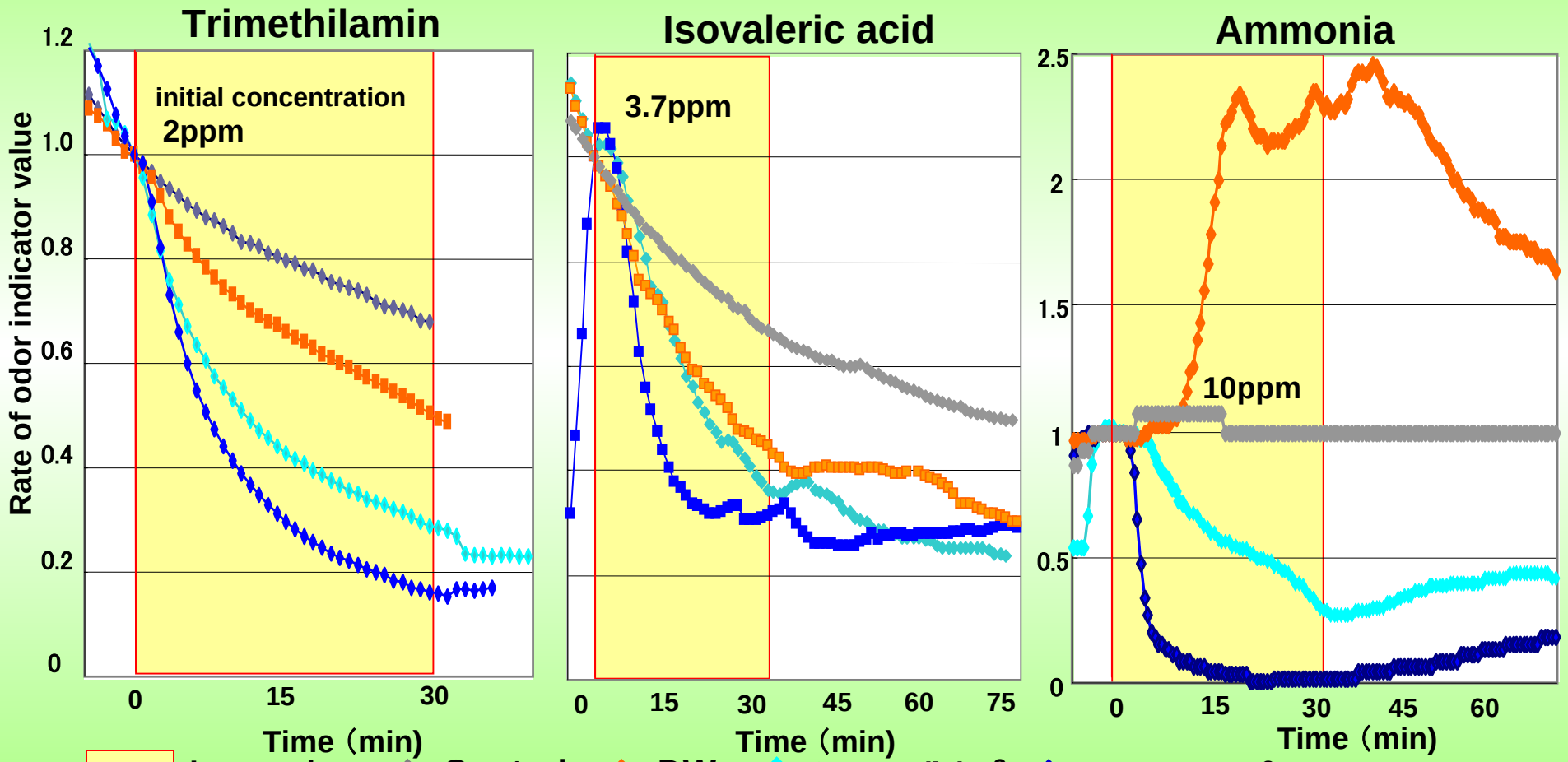
The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

Deodorization effect of Weak acid Hypochlorous Solution

Experimental condition Booth capacity 6㎥

Sprayed DW, 2.1, 8.3 mg/h/m^3 WAHS in 30min (250ml/h)

odor indicator value Handheld Odor Meter (OMX-LR、SHINEI)



Rate of odor indicator value = odor indicator value / odor indicator value at the start of spraying

Fig Deodorization effect of WAHS on malodorous substance

Mana Miyake

The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

Application of Weak Acid Hypochlorous Solution to Husbandry

Poultry farm
(breeding hen farm)

- Hand and utensil washing
- Poultry house disinfection
- Drinking water
- Spraying in the poultry house
- Disinfection of hatching eggs

Disinfection of Hatching Eggs by spraying Weak Acid Hypochlorous Solution

Alternatives to formalin fumigation

No mutagenicity and No irritation
High degradability

Experimental condition

Temperature ：16.5～24.5℃

Capacity ：24m³

Formalin ： 10g/m³·20min
fumigation (20min) →emission (70min)

WAHS： 200ppm pH 5.5～6.0
7.1mg/m³·90min

(The 37th meeting of JAEAT)

Mana Miyake
The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

Results

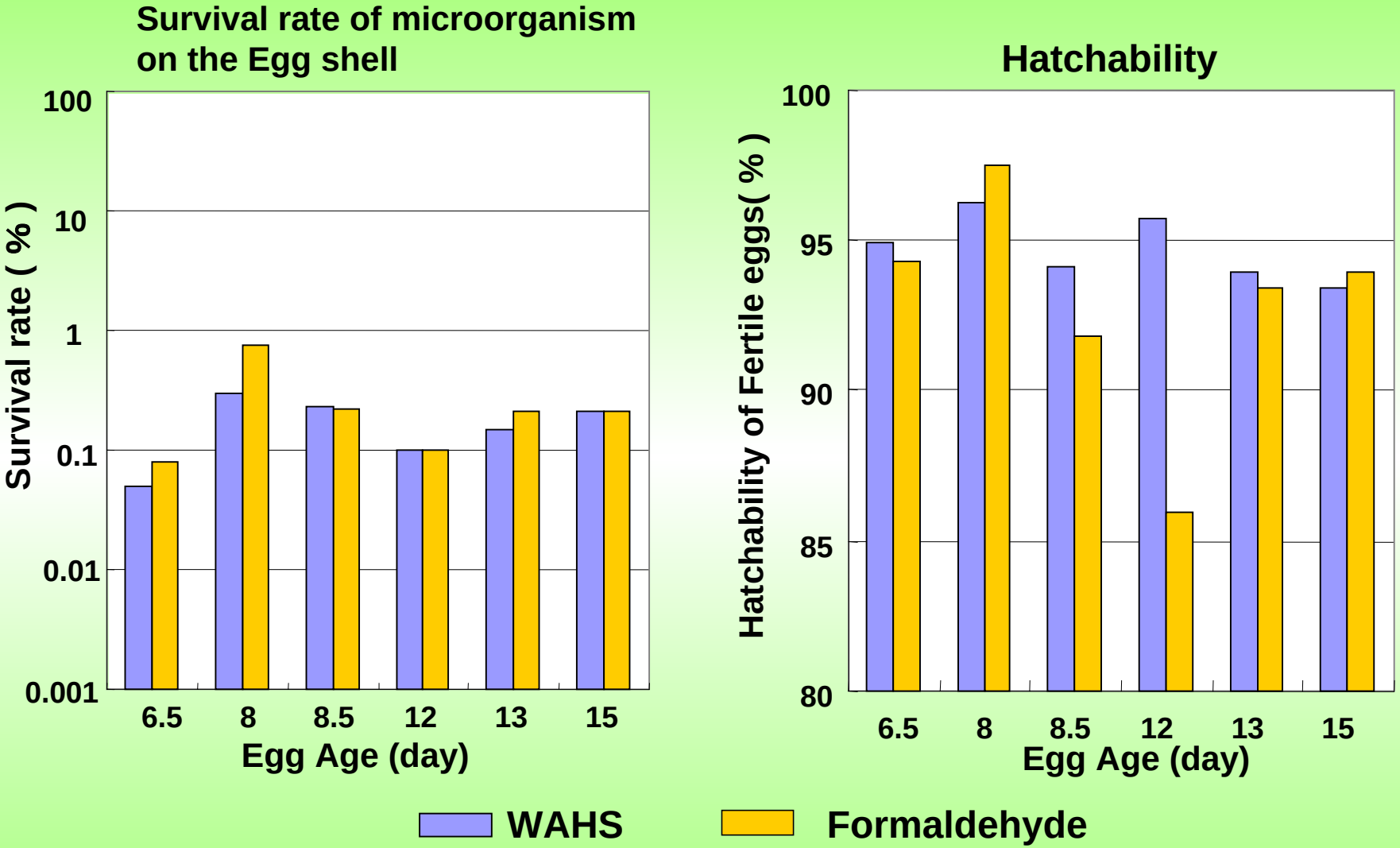


Fig. The comparison in the disinfection effect and the hatchability between Spraying WAHS and Formaldehyde Fumigation

Mana Miyake

The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)

Effect of Drinking Weak Acid Hypochlorous Solution on the survival rate of chicken

(ongoing research)

50ppm WAHS drinking test in chicken from hatching to culled

※ Control ; Tap water

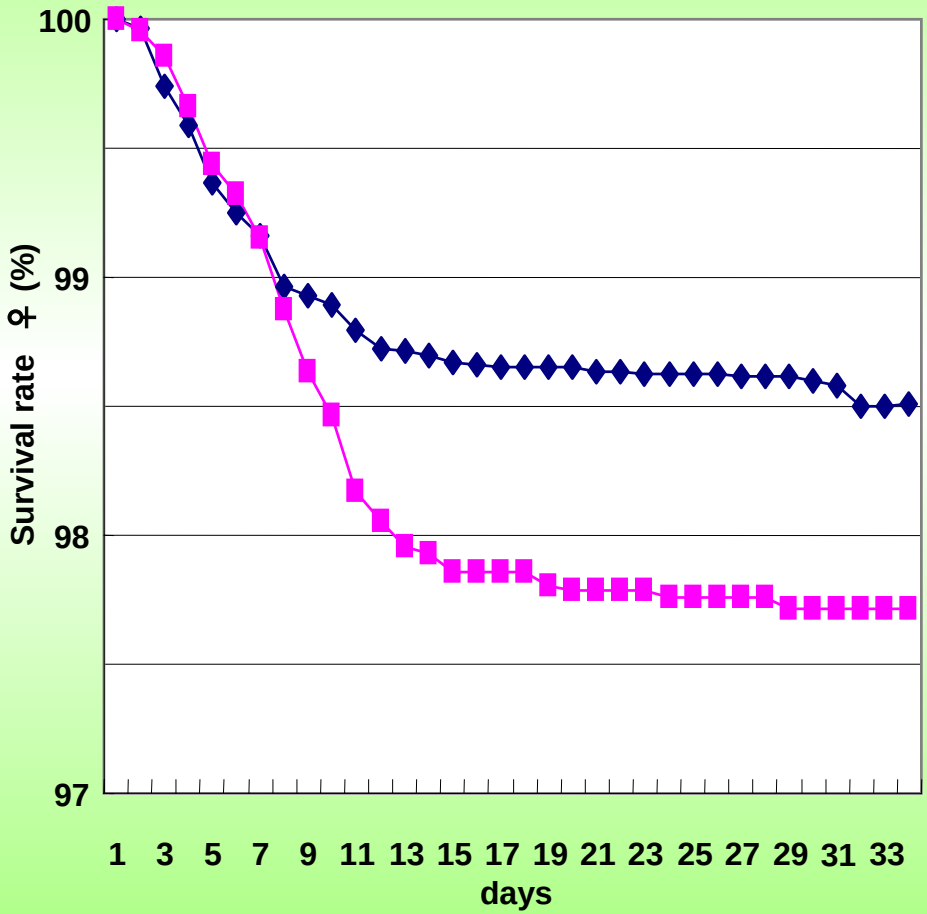


Fig. Survival rate of chicken

Mana Miyake

The 53rd Annual Meeting of the Japanese Association for Laboratory Animal Science Luncheon Seminar (2006)