

Environmental Agent Management in Taiwan

Abstract

The environmental agent management in Taiwan, as specified in “Environmental Agents Control Act (EACA)”, consists of three major types of agents, environmental sanitation agents, pollution control agents and microbial preparations for environmental use. Based on their concentration and application, the agents are divided into general use agents, restricted use agents and environmental microbial preparations for regulation management. The priority for their management strategy is a sound regulation system that includes (1) certification and registration of permits; (2) permit and license issuing; (3) advertisement management; (4) criteria for environmental agent facility establishment; (5) personnel training and deploying; (6) pest control operator management; (7) use, storage, placement, auditing and inspection of environmental agents; and (8) legislation and prosecution. To avoid the hazards from using environmental agents, uphold human health and protect Mother Nature, the Environmental Protection Administration (EPA) has announced the banned chemical substances for environmental agents based on different hazardous characteristics, such as accumulation in the environment, tumor causing, fetal deformity causing and abnormal metabolism induction, as well as for the control of international conventions like Montreal Convention, and no environmental agent is allowed to contain any of such compositions. There are 18 environmental agents that have been banned, including Aldrin, Hexachlorocyclohexane, Chlordane, DDT, Diazinon, methyl bromide and Heptachlor and

others. The priorities of future missions will be strict review of applications for environmental agent permits, thorough auditing on environmental agents, and intensified educational campaigns in order to improve the safety level of agent uses, protect public health and create a safe and low toxic environment.

Foreword

Situated in the subtropics, Taiwan, a warm and humid island, is perfect breeding ground for pests like mosquitoes, flies, cockroaches, rodents and microorganisms, such as germs and molds. These pests and microorganisms have devastated the quality of living environment. To keep these pests and microorganisms from breeding and growing, environmental agents have become necessary in our everyday life. Therefore, whether chemical or microbial, environmental agents should be used under proper management before becoming hazards to the environment, ecology or even our health due to misuses or abuses.

For effective management of environmental agents, the “Environmental Agents Control Act (EACA)” was established and published on July 10, 1997. It has undergone three amendments and the latest one is the 4th as of January 27, 2006. To follow the legislation, the EPA established several relevant regulations for businesses to follow, in the hope that these agents are used in an appropriate fashion, to prevent misuse, abuse or inappropriate usage in order to create a much better environment for Taiwan.

Scope of Environmental Agent Management

I. Type of Environmental Agents

According to the EACA of 2006, there are three major types of environmental agents included, which are:

1. Environmental sanitation agents: these refer to pesticides, miticides, rodenticides, bactericides, and fungicides for environmental sanitation, and other chemical agents used against organisms injurious to environmental sanitation.
2. Pollution control agents: officially announced by the EPA, these refer to synthetic chemical agents used to treat water or prevent air, water, or soil pollution; for example, degreaser is used to remove spilled oil in water.
3. Microbial preparations for environmental usage: these refer to Microbial preparations produced from natural or genetic-modified microbe organisms or their metabolic products, and used to control air pollution, water pollution, or soil contamination, solid waste, or disease vectors, and that have been officially announced by the EPA, for example, bacillus thuringiensis.



The nine disqualified samples



The environmental sanitation agents

II. Environmental Agent Enterprises

According to the EACA and relevant regulations, the following enterprises are environmental agents related enterprises:

1. Environmental agent manufacturing enterprises: those enterprises engaged in the manufacture, processing, or packaging of environmental agents; the export, wholesale, or retail sales of self-produced products; and the import of technical grade environmental agents for self-use.
2. Environmental agent vendors: those enterprises engaged in the import, export, wholesale, and retail sale of environmental agents. However, wholesale suppliers and retailers of general use environmental agents are not included.
3. Pest control operators: those enterprises engaged in the control of pests and disease vectors such as insects, mites, rodents, or in disinfection for environmental and sanitary purposes.



The qualified samples

Strategies for Environmental Agent Management

I. Environmental Agent Management System

The complete management consists of registration and permit system, operation management system and auditing and random inspection system (Fig. 1):

1. **Registration and permit system:** According to Article 9 of the EACA, those intending to manufacture, process, or import environmental agents shall apply to the EPA for checking and registration by submitting the product's name, components, performance data, key aspects of the manufacturing process, analytical methods, and other relevant information or documentation. The operation may begin only after the EPA has issued a permit.
2. **Operation management system:** Once an environmental agent is registered and allowed for sales, the management priority will be management of operations such as manufacture, packaging, storage, placement, marking, advertisement and pest control. For each of different operations, the EPA has developed corresponding rules, standards and guidelines for better management.
3. **Auditing and random inspection system:** The EPA may send personnel, with proper document of proof, to enter the public places or private facilities and examine the use of environmental agents in order to ensure legal operations through strict auditing.

II. Officially Announced Prohibited Environmental Agents

To prevent hazards from using environmental agents, uphold human health, protect the environment and uphold international conventions, the EPA had officially announced the ban on hazardous compositions in environmental agents according to various hazardous characteristics (such as accumulation in the environment, tumor causing, fetal deformity causing, extreme toxicity, toxicity to marine life, abnormal metabolism induction, and body temperature rise) and the requirements of Montreal Convention on April 20 1998. At present, 18 chemical substances, including Aldrin, Hexachlorocyclohexane, Chlordane, DDT, Diazinon, methyl bromide, Heptachlor and others, are announced as banned environmental agents (see Table 1). The manufacture, import or usage of any of the above-mentioned substances in environmental agents is prohibited.

III. Current Status of Environmental Agent Permits, Inspection and Registration

For effective management of permit issuing, 872 permits have been issued up to July 10, 2008, including 868 for environmental sanitation agents, 2 for pollution control and 2 for microbial preparations for general use (see Table 2). The active compositions of pesticides as environmental agents include synthetic pyrethroids, organophosphate, carbamates, insect growth regulators and others, but organochloride pesticides are not included. Located in the subtropics, Taiwan is warm and humid. Thus, for effective control of vector mosquitoes for dengue fever, 438 environmental agent permits have been issued. In addition, there are also 37 environmental agent manufacturers, 339 environmental agent vendors and 734 pest control operators (Table 3.) issued permits. For better management of pest control operators, training for agent apply operators, management for equipment and records are required in order to improve the proficiency in disease vector operation and safety of using agents in Taiwan.

IV. Environmental Agent Auditing

1. Intensify the auditing of environmental agents: According to the implementation of environmental agent auditing plan in 2007, the marking of 33,124 environmental agent products available in the market were audited and 98.9% of products examined were qualified. Unqualified products were investigated and issued an official letter for recall and improvement.
2. For the implementation of testing the content of active compositions in environmental agents available in 2007, 120 market-available environmental agents were inspected. Nine samples were found disqualified and punished by a fine from 60,000 to 300,000 NT dollars, and the business owners were asked to recall and improve the disqualified products within given deadlines.

Future Priority Mission

I. Strict Review of Applications for Environmental Agent Permits

When an application is received, the toxicology and performance reports shall be closely reviewed to ensure the safety of using the agent, and the indicated content shall be carefully examined. Particularly, the substances that are banned for composition of environmental agents shall be prohibited for registration and operation to uphold human health and protect environment.

II. Intensified Environmental Agent Auditing

In response to entering WTO, the environmental agents shall be closely audited. The auditing shall cover the auditing of market-available counterfeit, banned and poor-quality environmental agents and the auditing of labeling and active compositions in environmental agents to ensure the quality of environmental agents and safety of consumers.

III. Intensified Education and Campaign for Environmental Agents

1. To develop and publish online booklets containing information of environmental agent management regulations and safety of using environmental agents (<http://www.epa.gov.tw>) for people to download.
2. To enrich the information that environmental agent management website can provide information (such as official announcements of regulation, application rules and public guidance information) to business owners and the general public to access.

3. To supervise local environmental protection agencies to organize educational presentations for environmental agents, to educate citizens the right ways to use environmental agents, to improve environmental cleaning to suppress the growth of pests and disease vectors like mosquitoes and flies in order to reduce the use of environmental agents and protect the environment.

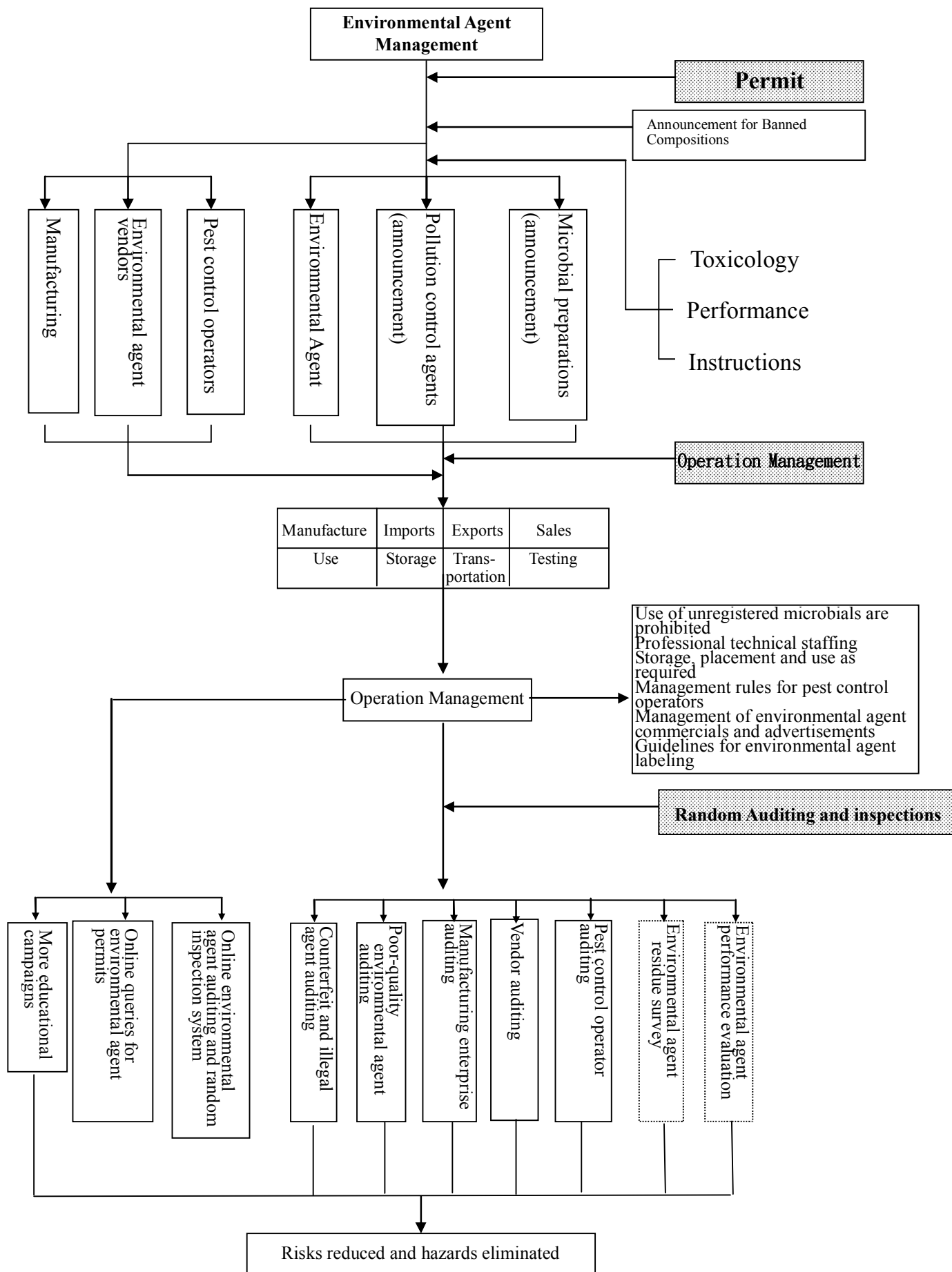


Fig. 1 Management Structure for Environmental Agents in Taiwan

Table 1 Compositions Banned from Environmental Agents

Chinese Name	English Name	CAS No.	Remark
阿特靈	Aldrin	309-00-2	
蟲必死	Hexachlorocyclohexane	319-84-6 319-85-7 319-86-8 6108-10-7	
可氣丹	Chlordane	57-74-9	
滴滴涕	4,4'-Dichlorodiphenyl-Trichloroethane (DDT)	50-29-3	
大利松	Diazinon	333-41-5	
鄰-二氯苯	o-Dichlorobenzene (1,2-Dichlorobenzene)	95-50-1	
二氯松	Dichlorvos (DDVP)	62-73-7	
地特靈	Dieldrin	60-57-1	
大滅松	Dimethoate	60-51-5	
2,4-二硝基酚	2,4-Dinitrophenol	51-28-5	
二溴乙烯	Ethylene dibromide	106-93-4	
一品松	EPN	2104-64-5	
樂乃松	Fenchlorphos (Ronnell)	299-84-3	
飛佈達	Heptachlor	76-44-8	
靈丹	Lindane (γ -BHC)	58-89-9	
巴拉松	Parathion	56-38-2	
溴化甲烷	Methyl bromide	74-83-9	○
百滅寧(cis: trans = 40: 60)	Permethrin (cis: trans = 40: 60)	52645-53-1	

Note: ○ indicates controlled chemical substance listed Montreal Convention.

Table 2 Statistics for Environmental Agents Permits Issued
(as of July 10, 2008)

Environmental Agent Type of Environmental Agents	General Use Agents	Restricted Use Agents	Technical Grade Agents	Total (Permits)
Environmental Sanitation Agents	554	218	96	868
Pollution Control Agents	2	0	0	2
Microbial Preparations for Environmental Uses	2	0	0	2
Total (Permits)	558	218	96	872

Table 3 Statistics of Environmental Agent Related Enterprises
(as of July 10 2008)

Environmental Agent Enterprises	Manufacturers	Vendors	Pest Control Operators
Number	37	339	734

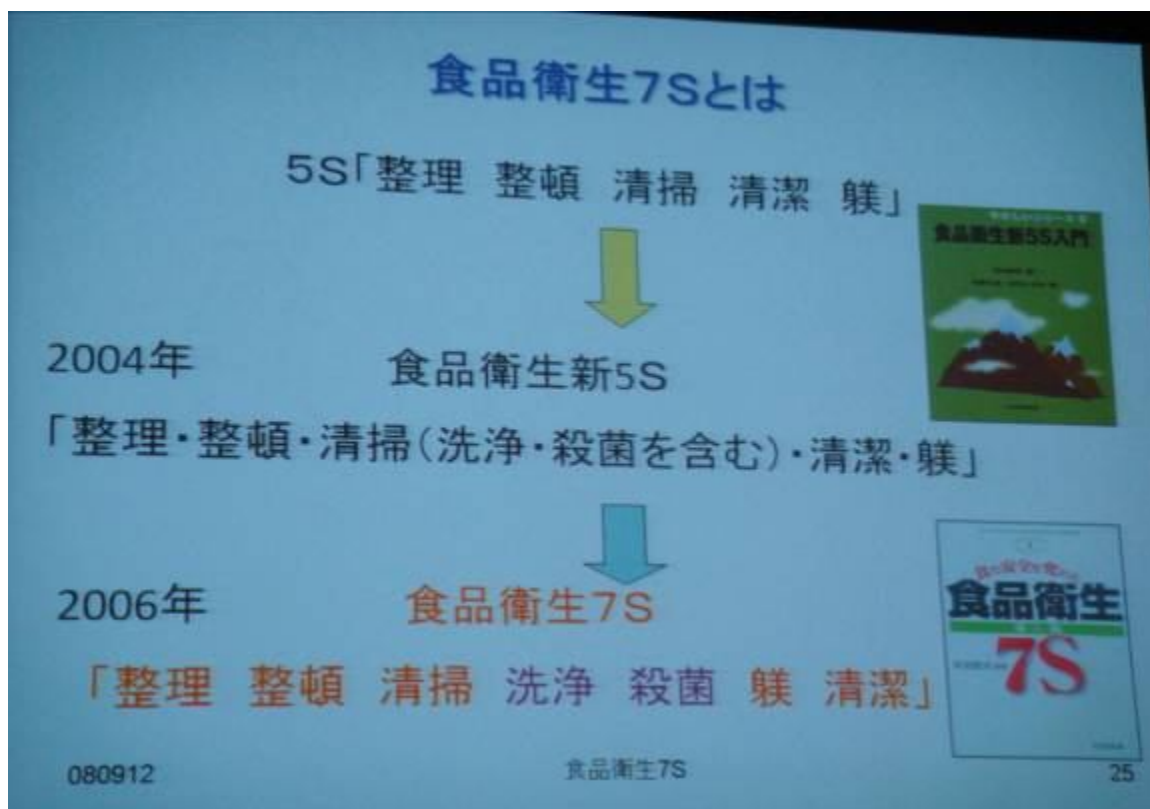


圖1 食品衛生7S的發展演變圖

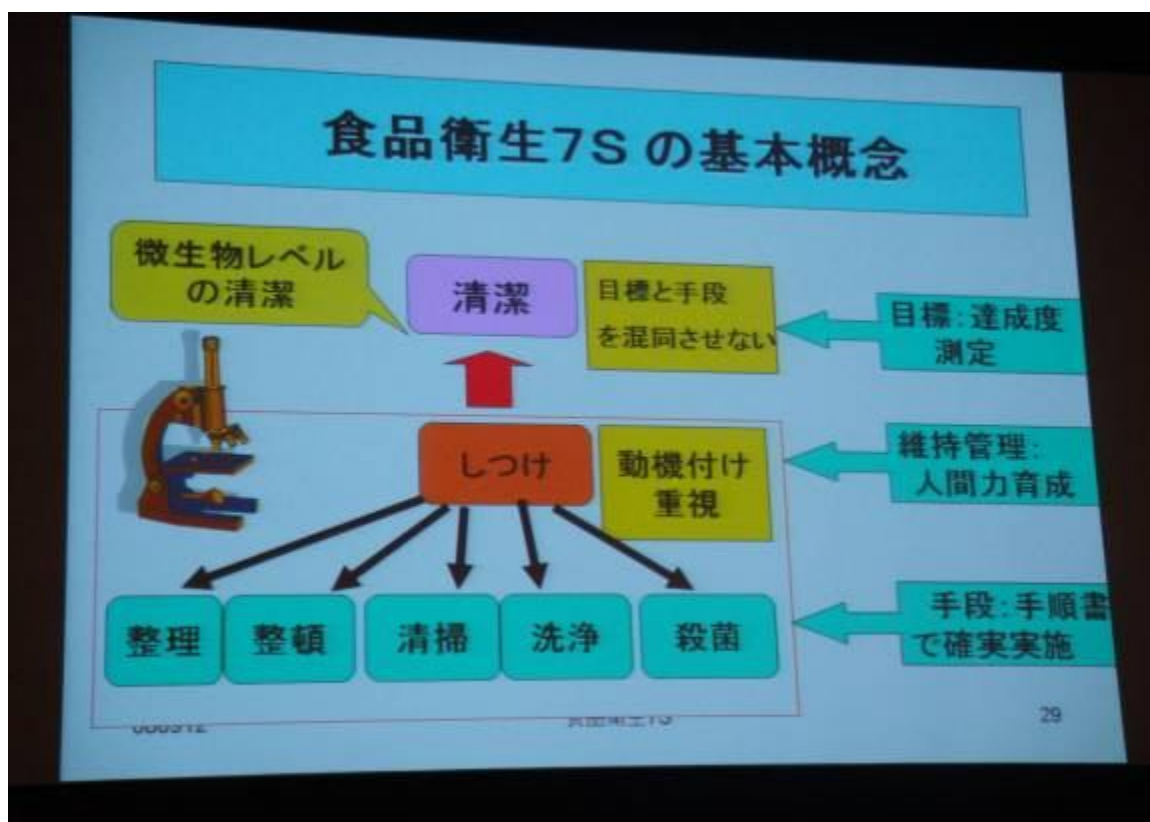


圖2 食品衛生7S的基本概念圖

除菌の基礎知識

- 除菌洗剤の効果
 - 実家庭での洗濯除菌評価
 - パネリスト: 219家庭
 - 大阪近郊
 - 小学生の子供のいる家庭 (3~4家族)
 - 週4回以上縦型洗濯機で洗濯
 - 対象衣料
 - 新品の子供用Tシャツ(予洗済み)を配布し、4回着用・洗濯を繰り返してもらい、5回目の着用の翌日、Tシャツを半数し、一方はそのまま、残りの一方は洗濯後に回収し、洗濯前と洗濯後の菌数を測定。
 - 試験期間中
 - 洗濯は通常通り他の衣類とともに洗濯。
 - 水道水のみで洗濯
 - 指定洗剤のみ使用
 - ▶ 通常合成洗剤(漂白剤・漂白活性化剤なし): 110家庭
 - ▶ 除菌合成洗剤D(P&G社製): 109家庭
 - 対象衣類はつり干し乾燥(屋内・屋外)で乾燥機は使用しない











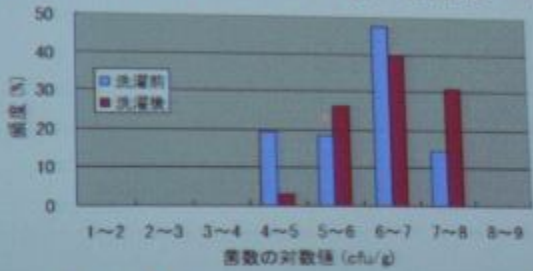











圖3 洗濯剤洗滌除菌試験評価

除菌の基礎知識

- 除菌洗剤の効果
 - 実家庭での洗濯除菌の効果
 - 通常洗剤で洗濯した場合
 - 洗濯前後のTシャツ上の菌数(対数值)

一般細菌: 洗濯前=6.0 cfu/g、洗濯後=6.5 cfu/g



菌数の対数值 (cfu/g)	洗濯前 (cfu/g)	洗濯後 (cfu/g)
1~2	0	0
2~3	0	0
3~4	0	0
4~5	20	5
5~6	18	25
6~7	45	38
7~8	15	30
8~9	0	0






















圖4 洗濯剤洗滌除菌試験効果(一)

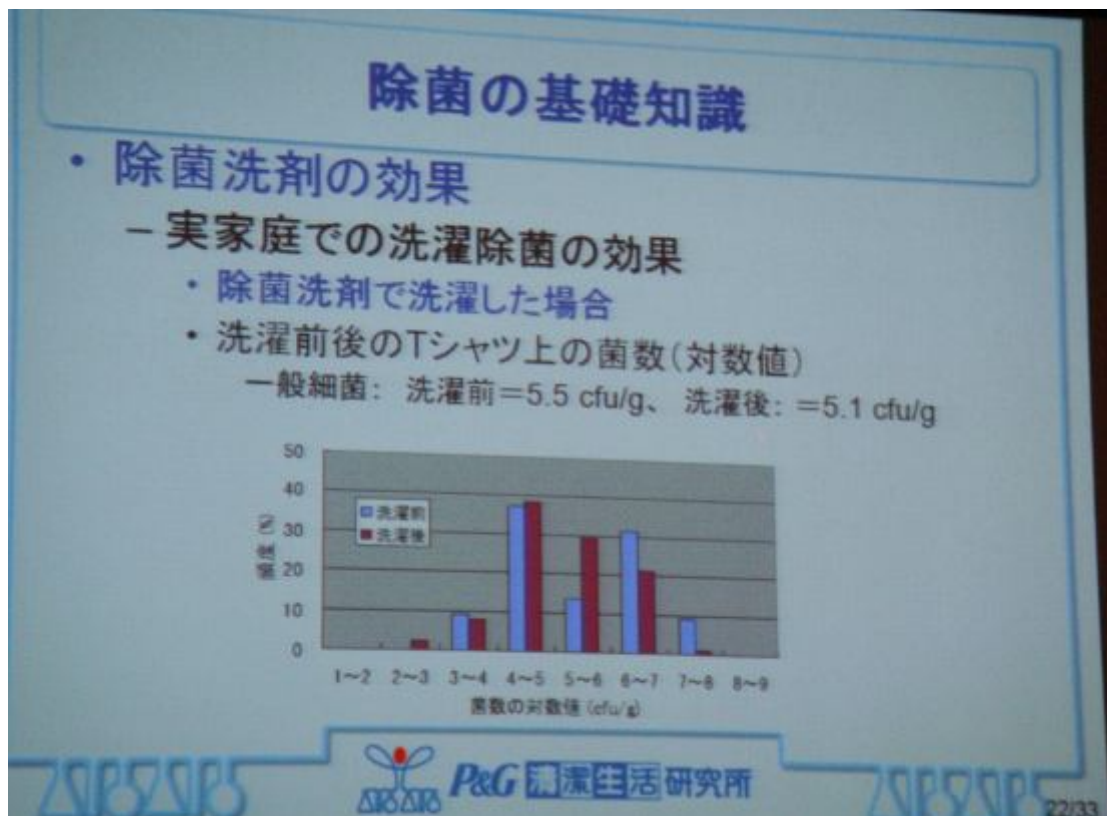


圖 5 洗潔劑洗滌除菌試驗效果(二)



圖6 抗菌熱潮相關文獻及報導資料

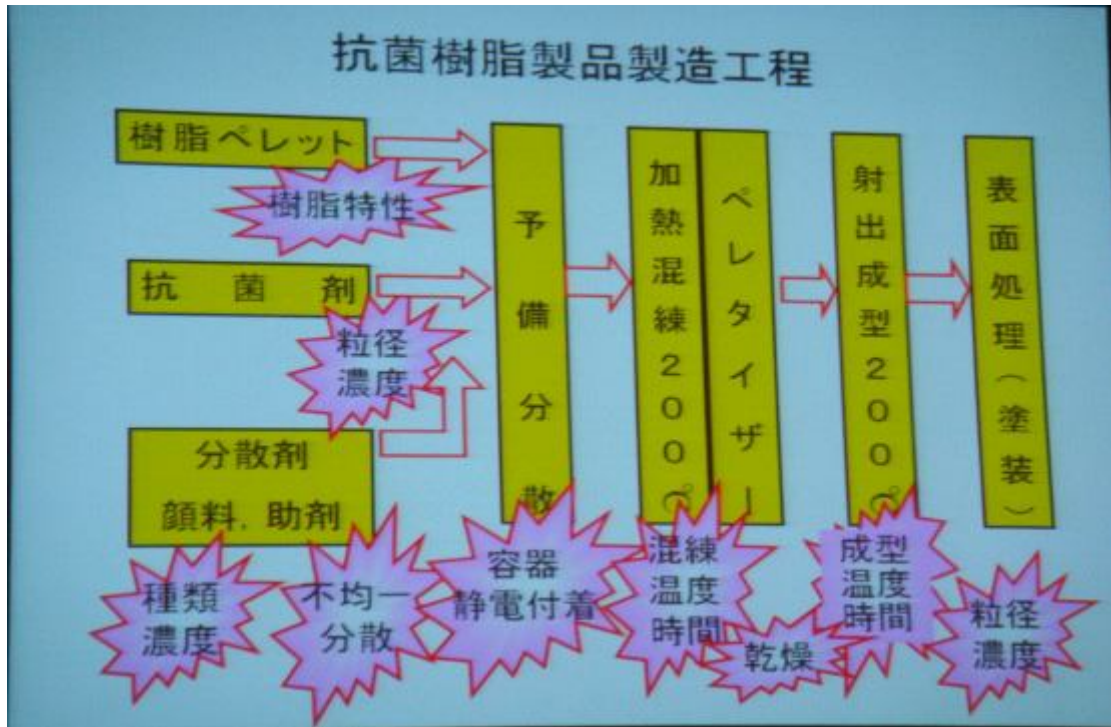


圖7 抗菌樹脂製品製造流程



圖8 成型加工應用製品實例

JNLA認定試験所の試験結果の活用事例

業界団体の製品認証制度での活用事例



業界団体での製品表示における活用事例

(社)全国家庭電気製品公正取引協議会
(公正取引委員会傘下の業界団体)

会員メーカー家電製品の「抗菌」表示
(任意活用)

圖9 製造商訂定抗菌性能薬劑自主管理之標準廠商範例

公正取引規約(非食品)

コード	業種	規約名	認定年月日	抗菌標榜
D-1	(非食品)身の回り品	帯締め羽織ひも	S51.10.20	—
D-2	(非食品)身の回り品	人造真珠	S43.2.15	—
D-3	(非食品)身の回り品	眼鏡類	S61.3.31	—
E-1	(非食品)家庭用品	家庭電気製品製造業	S53.6.1	抗菌など
E-2	(非食品)家庭用品	家庭電気製品小売業	S59.6.1	—
F-1	(非食品)医薬品・化粧品等	化粧品	S.46.10.22	—
F-2	(非食品)医薬品・化粧品等	化粧石けん	S46.12.7	—
F-3	(非食品)医薬品・化粧品等	合成洗剤・家庭用石鹸	S59.5.15	除菌
F-4	(非食品)医薬品・化粧品等	歯みがき類	S.50.9.3	—
F-5	(非食品)医薬品・化粧品等	防虫剤	S39.2.6	—
G-1	(非食品)(自動車等)	自動車	S46.9.7	—
G-1-2	(非食品)自動車等	二輪自動車	H15.10.8	—
G-2	(非食品)自動車等	タイヤ	S55.7.15	—
G-3	(非食品)自動車等	農業機械	S57.6.28	—
I-1	(非食品)写真機	写真機類小売業	S62.3.31	—
I-2	(非食品)その他非食品業	ペットフード	S49.3.30	—
I-3	(非食品)スポーツ用品等	釣り竿	S59.4.10	—
I-4	(非食品)楽器	ピアノ	S59.5.15	—
I-5	(非食品)楽器	電子鍵盤楽器	H4.11.30	—
I-8	(非食品)スポーツ用品等	スポーツ用品	S62.6.5	—
I-9	(非食品)その他非食品業	記録メディア製品	H5.1.21	抗菌など
I-6	(サービス業)旅行業	募集型企画旅行	H4.5.26	—
I-7	(サービス業)金融業	銀行業	H6.3.8	—
I-10	(サービス業)その他	指定自動車教習所業	H16.6.29	—
H-1	(不動産)	不動産	H.14.12.26	—

引用:(社)全国公正取引協議会連合会 HPより

圖10 抗菌製品之用語使用規章(一)

菌等の抑制に関する用語使用基準 (社)全国家庭電気製品公正取引協議会

用語	定義	使用区分	備考
滅菌	微生物を完全に死滅させること。	禁止	医療医療に深く関与する用語であり、誤事法に抵触するおそれもあるため。
消毒	微生物のうち、病原性のあるものをすべて殺滅・除去してしまうこと。		
殺菌	微生物を死滅させること。	上記以外禁止	「作用を及ぼす」ことを標ぼうせず、「殺菌された状態」を説明する範囲で使用できる。
除菌	ある物質又は限られた空間より微生物を除去すること。	別途基準に基づき使用可	
抗菌	微生物の発生・成育・増殖を抑制することをいい、細菌のみを対象とする。		
防カビ(防黴)	カビの発生・成育・増殖を抑制することをいい、カビのみを対象とする。		
抗ウイルス	ウイルスの活動を抑制することをいい、ウイルスのみを対象とする。		
制(粉)菌		使用せず	抗菌との区別が不明確なため、用語として使用されておらず、また除菌との区分が不明確なため。
滅菌			

引用:(社)全国公正取引協議会連合会 HPより

圖11 抗菌製品之用語使用規章(二)

家庭用合成洗剤及び家庭用石けんの表示に関する公正競争規約

公正競争規約
(除菌の表示基準)
第6条の2 事業者は、施行規則に定める除菌基準を満たす合成洗剤又は石けんに、「除菌」の表示をすることができる。

公正競争規約施行規則
(除菌の表示)
第5条の2 規約第6条の2及び本条に用いられる用語を以下に定義する。

(1) 除菌
「除菌」とは、物理的、化学的又は生物学的作用などにより、対象物から増殖可能な細菌の数(生菌数)を有効数減少させることをいう。
ただし、当該細菌には、カビ・酵母などの真菌類は含まない。

(2) 除菌基準
「除菌基準」とは、洗濯用・台所用・住宅用合成洗剤又は石けんのうち、別添の用途に掲げるものに関して定める除菌試験方法により測定される特定菌種の除菌活性値のことをいう。ただし、上記の試験方法が適切ではないような用途又は使用方法による除菌に関して表示をする場合は、事業者が合理的に設定する試験方法を用い、除菌基準を満たすことを立証する必要がある。この場合、公正取引協議会は、当該試験方法の妥当性を確認する目的で、事業者に対して、必要な資料の提示を求めることができる。

2 事業者は、合成洗剤又は石けんが除菌基準を満たすものであっても、次に掲げる表示をしてはならない。

(1) 誤事法に抵触する表示
(例) 「殺菌」
(2) 除菌することにより安全性を強調する表示、あるいは除菌することにより健康被害を防止又は軽減する効果があるかのような虚偽を与えるおそれのある表示
(例) 「除菌で安全」、「除菌で病気を防ぐ」

3 事業者は、除菌基準を満たす合成洗剤又は石けんに「除菌」の表示をする場合は、次に掲げる表示のいずれか、あるいはその両方を表示するものとする。

(1) 「除菌」のマーク表示
(2) 公正取引協議会の除菌基準を満たしている旨の表示

引用:(社)全国公正取引協議会連合会 HPより

圖12 抗菌製品之用語使用規章(三)

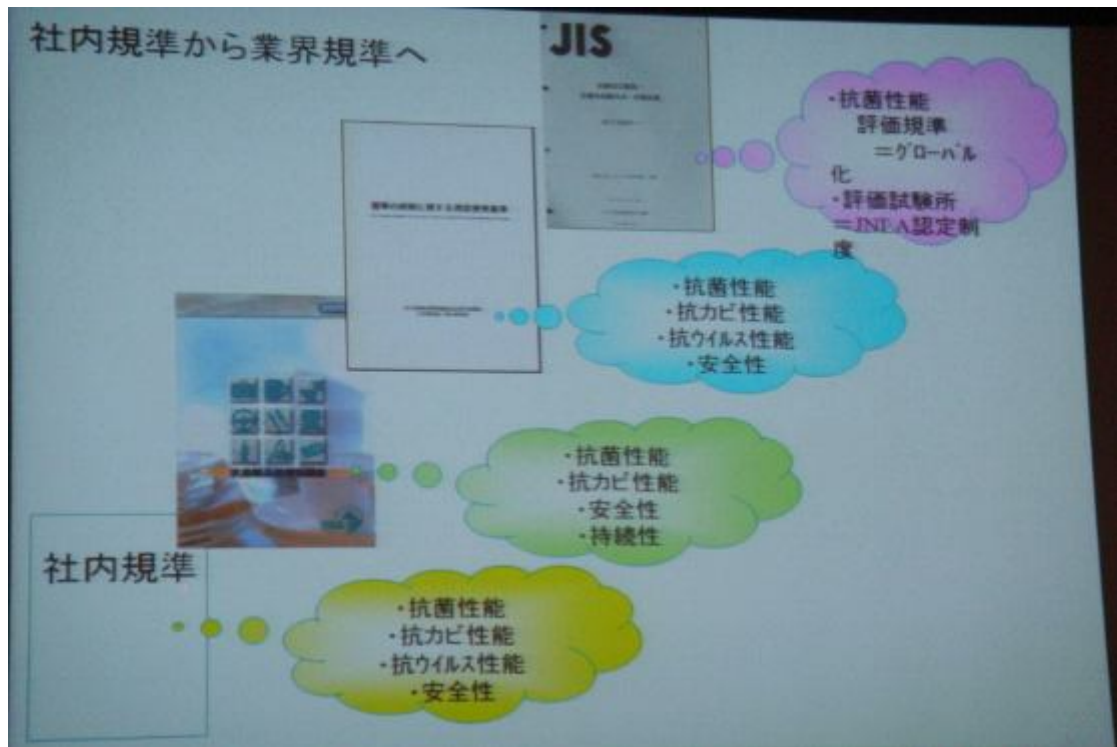


圖 13 業界團體抗菌製品之各種標準