Efficacy Review for Dispatch Hospital Cleaner/Disinfectant Towels with Bleach:
DP Barcode 328949
EPA Registration No. 56392-8

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF
PREVENTION,
PESTICIDES
AND TOXIC
SUBSTANCES

August 4, 2006

MEMORANDUM

Subject: Efficacy Review for EPA Reg. No. 56392-8, Dispatch Hospital Cleaner Disinfectant Towels with Bleach; DP Barcode: 328949

From: Tajah L. Blackburn, Ph.D., Microbiologist 8/4/06
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Thru: Nancy Whyte, Team Leader
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Product Science Branch
Antimicrobials Division (7510P) August 4, 2006

To: Emily Mitchell PM 32/ Wanda Henson
Regulatory Management Branch II
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Applicant: Caltech Industries, Inc.
2420 Schuette Drive
Midland, MI 48642

Formulations from Label

Active Ingredient(s)	% by wt.
Sodium Hypochlorite	0.52%
Inert Ingredients	99.48%
Total	100.00%

I BACKGROUND

The product, DISPATCH Hospital Cleaner Disinfectant Towels with Bleach (EPA Reg. No. 56392-8), is a registered, ready-to-use, pre-moistened, disinfectant towel (bactericide, virucide, fungicide) for use on hard, non-porous surfaces in hospital environments. The proposed label indicates that the product disinfects in "one step." The applicant requested to amend the registration of this product to include claims for effectiveness against *Staphylococcus aureus* - MRSA, *Enterococcus faecalis* Vancomycin Resistant, *Clostridium difficile* (vegetative), and the Avian Influenza (H3N2) virus. In addition, the applicant requested to amend the registration of this towel product to add claims for effectiveness against Norovirus, Hepatitis A virus, Hepatitis B virus, Hepatitis C virus, and Rotavirus. Efficacy studies conducted on the liquid product, DISPATCH Hospital Cleaner Disinfectant with Bleach (EPA Reg. No. 56392-7), were cited for these additional microorganisms. All studies were conducted at ATS Labs, located at 1285 Corporate Center Drive, Suite 110, in Eagan, MN 55121.

This data package contained a letter from the applicant's representative (dated April 13, 2006), four studies (MRID Nos. 468155-01 through 468155-04), Statements of No Data Confidentiality Claims for all four studies, and the proposed label.

Note: The formulation for Dispatch Hospital Cleaner Disinfectant with Bleach differs slightly from Dispatch Hospital Cleaner Disinfectant Towels with Bleach, the subject of this refer. This difference in formulation is not significant.

Dispatch Hospital Cleaner Disinfectant with Bleach	
Active Ingredient(s)	% by wt.
Sodium Hypochlorite	0.52%
Inert Ingredients.....	99.48%
Total	100.00%

II USE DIRECTIONS

The product is designed to disinfect hard, non-porous surfaces such as autoclaves, bed railings, blood glucose monitors, cabinets, carts, chairs, changing tables, counters, cribs, equipment, exam tables, gurneys, infant incubators and care cribs, IV poles, phlebotomy trays, PVC tubing, stretchers, tables, trash cans, toys, and ultrasound transducers and probes. The product may be used on hard, non-porous surfaces, including those made of glass, glazed ceramic tile, glazed porcelain, hard plastic, Plexiglas, stainless steel, and vinyl. Directions on the proposed label provided the following information regarding use of the product as a "one-step" disinfectant: Gloves should be worn. Remove gross soil prior to disinfecting. Wipe surface with towel until completely wet. Allow surfaces to remain wet for 1 minute at room temperature (68-77ºF). Wipe clean or allow to air dry.

III AGENCY STANDARDS FOR PROPOSD CLAIMS

Antimicrobial Products for Use on Hard Surfaces Using Pre-saturated or Impregnated Towelettes

Towelette products represent a unique combination of antimicrobial chemical and applicator, pre-packaged as a unit in fixed proportions. As such, the complete product, as offered for sale, should be tested according to the directions for use to ensure the product's effectiveness in treating hard surfaces. The standard test methods available for hard surface disinfectants and sanitizers, if followed exactly, would not closely simulate the way a towelette product is used. Agency guidelines recommend that a simulated-use test be conducted by modifying the standard test methods. Agency guidelines further recommend that instead of spraying the inoculated surface of the carrier, the product should be tested by wiping the surface of the carrier with the saturated towelette, and then subculturing the slides after a specified holding time. Liquid expressed from the used towelette should also be subcultured. Performance standards of the standard test methods must be met. In addition, subcultures of the liquid expressed from the used towelettes should be negative for growth. These Agency standards are presented in EPA Pesticide Assessment Guidelines, Subdivision G, §91-2(h), Pre-saturated or impregnated towelettes; and the April 12, 2001 EPA Memorandum, Draft Interim Guidance for Non-Residual Sanitization of Hard Inanimate Food Contact Surfaces Using Pre-Saturated Towelettes.

Disinfectants for Use on Hard Surfaces in Hospital or Medical Environments (Additional Bacteria)

Effectiveness of disinfectants against specific bacteria other than those named in the AOAC Use-Dilution Method, AOAC Germicidal Spray Products as Disinfectants Method, AOAC Fungicidal Test, and AOAC Tuberculocidal Activity Method, must be determined by either the AOAC Use-Dilution Method or the AOAC Germicidal Spray Products as Disinfectants Method. Ten carriers must be tested against each specific bacteria with each of 2 product samples, representing 2 different product lots. To support products labeled as "disinfectant" for specific bacteria (other than those bacteria named in the above test methods), killing of the specific bacteria on all carriers is required. In addition, plate count data must be submitted for each microorganism to demonstrate that a concentration of at least 10^4 microorganisms survived the carrier-drying step. These Agency standards are presented in DIS/TSS-1.

Virucides

The effectiveness of virucides against specific viruses must be supported by efficacy data that simulates, to the extent possible in the laboratory, the conditions under which the product is intended to be used. Carrier methods that are modifications of either the AOAC Use-Dilution Method (for liquid disinfectants) or the AOAC Germicidal Spray Products as Disinfectants Method (for spray disinfectants) must be used. To simulate in-use conditions, the specific virus to be treated must be inoculated onto hard surfaces, allowed to dry, and then treated with the product according to the directions for use on the product label. One surface for each of 2 different product lots of disinfectant must be tested against a recoverable virus titer of at least 10^4 from the test surface for a specified exposure period at room temperature. Then, the virus must be assayed by an appropriate virological technique, using a minimum of four determinations per each dilution assayed. Separate studies are required for each virus. The calculated viral titers must be reported with the test results. For the data to be considered acceptable, results must demonstrate complete inactivation of the virus at all dilutions. When cytotoxicity is evident, at least a 3-log reduction in titer must be demonstrated beyond the cytotoxic level. These Agency standards are presented in DIS/TSS-7.

Supplemental Claims

An antimicrobial agent identified as a "one-step" cleaner-disinfectant, cleaner-sanitizer, or one intended to be effective in the presence of organic soil must be tested for efficacy with an appropriate organic soil load, such as 5 percent serum. This Agency standard is presented in DIS/TSS-2.

IV SYNOPISIS OF SUBMITTED EFFICACY STUDIES

1. MRID 468155-01 "Virucidal Efficacy of Pre-Saturated Towelettes for Hard Surface Disinfection, Virus: Avian Influenza A (H3N2) virus (Avian Reassortant)" for Dispatch Hospital Cleaner Disinfectant Towels with Bleach, by Mary J. Miller. Study conducted at ATS Labs. Study completion date – October 4, 2005. Project Number A03123.

This study was conducted against Avian Influenza A (H3N2) virus (Avian Reassortant) (Strain A/Washington/897/80 X A/Mallard/New York/6750/78; ATCC VR-2072), using RMK cells (Rhesus monkey kidney cells; obtained from ViroMed Laboratories, Inc., Minneapolis, MN) as the host system. Two lots (Lot Nos. AG050407 and BG050628) of the product, Dispatch Hospital Cleaner Disinfectant Towels with Bleach, were tested according to ATS Labs Protocol No. SRC36072105.AFLU (copy not provided). The product was received ready-to-use. The stock virus culture was adjusted to contain 5% fetal bovine serum as the organic soil load. A sterile gauze pad saturated with filter sterilized deionized water was used as the system control. Films of virus were prepared by spreading 0.2 ml of virus inoculum uniformly over the bottoms of separate sterile glass Petri dishes. The virus films were dried at 20.0ºC at 42% relative humidity for 20 minutes. **Each carrier was wiped with a saturated towelette back and forth for a total of two passes.** The virus films were allowed to remain exposed to the product for 1 minute at 24.0ºC. After the exposure period, 2.0 ml of test medium was added to each Petri dish, and the dishes were scraped with a cell scraper to re-suspend

the contents. Following the wiping procedure, each used towelette was placed into a sterile Petri dish and held for the remainder of the 1-minute exposure period at 24.0ºC. After the exposure period, liquid was expressed from each used towelette and a 2.0 ml aliquot of liquid was collected. The virus-disinfectant mixtures (i.e., carrier, expressed liquid) were each passed immediately through Sephadex columns using a syringe plunger. Ten-fold serial dilutions were prepared, using Minimum Essential Medium supplemented with 1% heat-inactivated fetal bovine serum, 10 µg/ml gentamicin, 100 units/ml penicillin, and 2.5 µg/ml amphotericin B. RMK cells in multi-well culture dishes were inoculated in quadruplicate with 0.1 ml of the dilutions. The cultures were incubated at 36-38ºC in a humidified atmosphere of 5-7% CO_2. The cultures were scored periodically for 7 days for the presence or absence of unspecified cytopathic effects, cytotoxicity, and viability. Controls included a system control (clean pad without product) and those for dried input virus count, cytotoxicity, and neutralization. Viral and cytotoxicity titers were calculated by the method of Spearman Karber.

Note: No protocol deviations/amendments were cited in this study.

2. MRID 468155-02 "Pre-Saturated Towelettes for Hard Surface Disinfection, Test Organism: *Clostridium difficile* (ATCC 9689)" for Dispatch Hospital Cleaner Disinfectant Towels with Bleach, by Jill Ruhme. Study conducted at ATS Labs. Study completion date – January 23, 2006. Project Number A03297.

This study was conducted against *Clostridium difficile* (ATCC 9689). Two lots (Lot Nos. AG050407 and BG050628) of the product, Dispatch Hospital Cleaner Disinfectant Towels with Bleach, were tested using the AOAC Germicidal Spray Products as Disinfectants Method (modified for towelettes) as described in the AOAC Official Methods of Analysis, 17th Edition, 2000. The product was received ready-to-use. Fetal bovine serum was added to the culture to achieve a 5% organic soil load. Ten (10) glass slide carriers were tested. Each carrier was inoculated with 0.01 ml of a 24±2 hour old broth culture of the test organism. The carriers were dried for 30 minutes at 35-37ºC at 32.1% relative humidity under anaerobic conditions. **One saturated towelette was used to treat 10 carriers.** The area of the towelette used was rotated so as to expose a maximum amount of the towelette surface during the course of the wiping procedure. Each carrier was wiped with a saturated towelette back and forth for a total of two passes. The product delivered by this wiping was allowed to remain on the carrier surface for 1 minute at 21ºC. Following treatment of every 10th carrier, each used towelette was placed in a sterile Petri dish and held for 1 minute. Following exposure, each of the carriers was transferred to 40 ml of Fluid Thioglycollate Medium with 0.1% sodium thiosulfate to neutralize. After at least 30 minutes, the carriers were transferred to individual secondary subculture tubes containing 40 ml of Fluid Thioglycollate Medium. Liquid was expressed from each used towelette, and a 0.1 ml aliquot of the expressed liquid was subcultured in 40 ml of Fluid Thioglycollate Medium with 0.1% sodium thiosulfate. After at least 30 minutes, a 0.1 ml aliquot of each primary subculture was transferred to 40 ml of Fluid Thioglycollate Medium. All subcultures were incubated for 48±4 hours at 35-37ºC. The subcultures were stored for 3 days at 2-8ºC prior to examination. Following incubation and storage, the subcultures were examined for the presence or absence of visible growth. Controls included those for purity, sterility, viability, neutralization confirmation, carrier population, verification of vegetative cells on

test carriers, verification of spores present in the initial suspension, and initial suspension count.

Note: Protocol deviations/amendments reported in this study did not impact the study, as documented.

Note: The applicant provided the data for a failed trial set up on October 15, 2005. In that trial, the carrier population control was below the required number (at least 10^4). Thus, the test was invalid. These data were not used to evaluate efficacy of the test product. See Attachment I of the laboratory report.

3. MRID 468155-03 "Pre-Saturated Towelettes for Hard Surface Disinfection, Test Organism: *Staphylococcus aureus* - MRSA (ATCC 33592)" for Dispatch Hospital Cleaner Disinfectant Towels with Bleach, by Sally Nada. Study conducted at ATS Labs. Study completion date – October 11, 2005. Project Number A03125.

This study was conducted against *Staphylococcus aureus* - MRSA (ATCC 33592). Two lots (Lot No. AG050407 and BG050628) of the product, Dispatch Hospital Cleaner Disinfectant Towels with Bleach, were tested using the AOAC Germicidal Spray Products as Disinfectants Method (modified for towelettes) as described in the AOAC Official Methods of Analysis, 17th Edition, 2000. The product was received ready-to-use. Fetal bovine serum was added to the culture to achieve a 5% organic soil load. Ten (10) glass slide carriers were tested. Each carrier was inoculated with 0.01 ml of a 48-54 hour old broth culture of the test organism. The carriers were dried for 40 minutes at 35-37ºC at 40% relative humidity. **One saturated towelette was used to treat 10 carriers.** A different section of the towelette was used to treat each carrier. Each carrier was wiped with a saturated towelette back and forth for a total of two passes. The product delivered by this wiping was allowed to remain on the carrier surface for 1 minute at 21ºC. Following treatment of every 10th carrier, each used towelette was placed in a sterile Petri dish and held for 1 minute. Following exposure, each of the carriers was transferred to 40 ml of Letheen Broth with 0.1% sodium thiosulfate to neutralize. Sufficient liquid could not be expressed from the used towelettes; therefore, each towelette was transferred to 40 ml of Letheen Broth with 0.1% sodium thiosulfate. The subcultures bottles were mixed, and the used towelettes were removed and discarded. All subcultures were incubated for 48±4 hours at 35-37ºC. Following incubation, the subcultures were examined for the presence or absence of visible growth. Controls included those for purity, sterility, viability, neutralization confirmation, carrier population, and antibiotic resistance.

Note: Protocol deviations/amendments reported in this study did not impact the study, as documented.

Note: Antibiotic resistance of *Staphylococcus aureus* - MRSA (ATCC 33592) was verified on a representative culture. The laboratory performed a Kirby Bauer Susceptibility assay. *Staphylococcus aureus* (ATCC 25923) was the control organism. The measured zone of inhibition confirmed antibiotic resistance of *Staphylococcus aureus* - MRSA to oxacillin. See pages 9 and 16 of the laboratory report.

4. MRID 468155-04 "Pre-Saturated Towelettes for Hard Surface Disinfection, Test Organism: *Enterococcus faecalis* - Vancomycin Resistant (ATCC 51299)" for Dispatch Hospital Cleaner Disinfectant Towels with Bleach, by Sally Nada. Study conducted at ATS Labs. Study completion date – October 11, 2005. Project Number A03126.

This study was conducted against *Enterococcus faecalis* - Vancomycin Resistant (ATCC 51299). Two lots (Lot No. AG050407 and BG050628) of the product, Dispatch Hospital Cleaner Disinfectant Towels with Bleach, were tested using the AOAC Germicidal Spray Products as Disinfectants Method (modified for towelettes) as described in the AOAC Official Methods of Analysis, 17th Edition, 2000. The product was received ready-to-use. Fetal bovine serum was added to the culture to achieve a 5% organic soil load. Ten (10) glass slide carriers were tested. Each carrier was inoculated with 0.01 ml of a 48-54 hour old broth culture of the test organism. The carriers were dried for 30 minutes at 35-37ºC at 40% relative humidity. **One saturated towelette was used to treat 10 carriers.** A different section of the towelette was used to treat each carrier. Each carrier was wiped with a saturated towelette back and forth for a total of two passes. The product delivered by this wiping was allowed to remain on the carrier surface for 1 minute at 20.0ºC. Following treatment of every 10th carrier, each used towelette was placed in a sterile Petri dish and held for 1 minute. Following exposure, each of the carriers was transferred to 40 ml of Letheen Broth with 0.1% sodium thiosulfate to neutralize. Liquid was expressed from each used towelette, and a 0.1 ml aliquot of the expressed liquid was subcultured in 40 ml of Letheen Broth with 0.1% sodium thiosulfate. All subcultures were incubated for 48±4 hours at 35-37ºC. Following incubation, the subcultures were examined for the presence or absence of visible growth. Controls included those for purity, sterility, viability, neutralization confirmation, carrier population, and antibiotic resistance.

Note: Protocol deviations/amendments reported in this study did not impact the study, as documented.

Note: Antibiotic resistance of *Enterococcus faecalis* - Vancomycin Resistant (ATCC 51299) was verified on a representative culture. The laboratory performed a Kirby Bauer Susceptibility assay. *Staphylococcus aureus* (ATCC 25923) was the control organism. The measured zone of inhibition confirmed antibiotic resistance of *Enterococcus faecalis* - Vancomycin Resistant to vancomycin. See pages 9 and 16 of the laboratory report.

V RESULTS

MRID Number	Organism	No. Exhibiting Growth/ Total No. Tested		Carrier Population (CFU/ carrier)
		Lot No. AG050407	Lot No. BG050628	
468155-02	*Clostridium difficile* Carrier Expressed Liquid	1º=0/10; 2º=0/10 1º=0/1; 2º=0/1	1º=0/10; 2º=0/10 1º=0/1; 2º=0/1	4.3×10^6
468155-03	*Staphylococcus aureus* - MRSA Carrier Expressed Liquid	0/10 0/1	0/10 0/1	1.98×10^6
468155-04	*Enterococcus faecalis* - Vancomycin Resistant Carrier Expressed Liquid	0/10 0/1	0/10 0/1	3.2×10^4

MRID Number	Organism	Results – Carrier Surface			Dried Virus Control ($TCID_{50}$/0.1 ml)
			Lot No. AG050407	Lot No. BG050628	
468155-01	Avian Influenza A (H3N2) virus*	10^{-1} to 10^{-7} dilutions	Complete inactivation	Complete inactivation	$10^{6.0}$
		$TCID_{50}$/0.1 ml	$\leq 10^{0.5}$	$\leq 10^{0.5}$	

* Complete inactivation was similarly observed in all dilutions derived from the expressed liquid.

VI CONCLUSIONS

1. The submitted efficacy data (i.e., MRID Nos. 468155-02 through 468155-04) support the use of the towelette product, DISPATCH Hospital Cleaner Disinfectant Towels with Bleach as a disinfectant against ***Staphylococcus aureus* - MRSA, *Enterococcus faecalis* - Vancomycin Resistant, and *Clostridium difficile* (vegetative)** on hard, non-porous surfaces in the presence of a 5% organic soil load for a contact time of 1 minute. Complete killing was observed in the subcultures of the required number of carriers tested against the required number of product lots. No growth was observed in the subcultures of the liquid expressed from the used towelettes. Dried carrier counts were at least 10^4. Neutralization confirmation testing showed positive growth of the microorganisms. Viability controls were positive for growth. Purity controls were reported as pure. Sterility controls did not show growth.

2. The submitted efficacy data (MRID No. 468155-01) support the use of the towelette product, DISPATCH Hospital Cleaner Disinfectant Towels with Bleach, as a disinfectant with virucidal activity against the **Avian Influenza A (H3N2) virus** on hard, non-porous surfaces in the presence of a 5% organic soil load for a contact time of 1 minute. A recoverable virus titer of at least 10^4 was achieved. Cytotoxicity was not observed in dilutions derived from carriers and expressed liquid. Complete inactivation (no growth) was indicated in all dilutions derived from both carriers and expressed liquid. **Since**

only one slide was tested per product lot, the registrant must provide the surface area of the inoculated slide. Typically, one towelette is used to wipe ten inoculated carriers. However, this interim guidance is loosely defined in the DIS/TSS documents for virucides.

VII RECOMMENDATIONS

1. The proposed label claims are acceptable regarding the use of the product, DISPATCH Hospital Cleaner Disinfectant Towels with Bleach, as an effective "one-step" disinfectant on hard, non-porous surfaces against the following microorganisms for a contact time of 1 minute:

Clostridium difficile (vegetative)
Methicillin Resistant *Staphylococcus aureus* (MRSA)
Vancomycin Resistant *Enterococcus faecalis* (VRE)
Avian Flu Virus (H3N2)

Data provided by the applicant support these claims.

2. The proposed label claims are acceptable regarding the use of the product, DISPATCH Hospital Cleaner Disinfectant Towels with Bleach, as an effective "one-step" disinfectant on hard, non-porous surfaces against the following microorganisms for a contact time of 1 minute:

Hepatitis A virus (HAV)
Hepatitis B virus (HBV)
Hepatitis C virus (HCV)
Rotavirus

Data cited, from product Dispatch Hospital Cleaner Disinfectant with Bleach, support these claims.

3. The proposed label claim is not acceptable regarding the use of the product, DISPATCH Hospital Cleaner Disinfectant Towels with Bleach, as an effective "one-step" disinfectant on hard, non-porous surfaces against **Norovirus** for a contact time of 1 minute. Data cited, from product Dispatch Hospital Cleaner Disinfectant with Bleach, do not support this claim, due the inherent resistance associated with this enteric, non-enveloped pathogen. The Agency requests that efficacy data be generated, using the towelette product, against Feline Calicivirus.

4. The designation "*Salmonella choleraesuis*" has been changed to "*Salmonella enterica*" effective immediately. This change should be reflected on the current and future submissions.

5. The proposed label claims that the product may be used to deodorize. In accordance with DIS/TSS-15 requirements, please revise the proposed label to include adequate dosage recommendations and complete directions for use of the product as a deodorizer

6. The label language should be revised as follows:

   - Under the "Storage and Disposal" section on page 3 of the proposed label, change "Sore this product in cool, dry area" to read "Store this product in a cool, dry area."

   - Under the "Precautionary Statements" section on page 3 of the proposed label, change "Avoid contact with eyes or clothing" to read "Avoid contact with eyes and clothing."

   - The statement, "Wipe clean", at the conclusion of the Directions for Use (To Clean and Disinfect in One Step), is misleading. At the conclusion of the contact time, theoretically the surface should be both clean and disinfected. Maybe the statement 'Wipe Dry" or "Allow to Dry" (as stated) is more appropriate.