

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2015
 DateRun: 04/20/2015
 Experimenters: Jason Marshall, George Liang
 ClientType: Cleaner Manufacturer
 ProjectNumber: Project #1
 Substrates: Liquid
 PartType: Coupon
 Contaminants: Odor
 Cleaning Methods: Low Pressure Spray
 Analytical Methods: Smell
 Purpose: To evaluate supplied products for odor elimination

Experimental Procedure: Clean 250 ml glass bottles were filled with six ml of whole milk. The bottles were capped and stored at room temperature for three days. At the end of the three days, the bottles were opened and observed for signs of spoiling odor.

Cleaning products were used at the recommended concentrations. Three bottles were opened and treated with two sprays of one of the supplied cleaning products. Bottles were capped and swirled to mix the cleaner with the milk.

A panel of three was initialized to the various odors. An untreated bottle, a bottle with spoiled milk, a bottle with Product 1 solution, a bottle with Product 2 and a bottle with Product 3 were presented to the panelist. The exposure was to set a bench mark for each possible odor contributor.

The treated bottles were then presented uncapped to one member of the odor panel. The panelist was asked to describe odor and rank the level of intensity of the malodor. Each panelist was subjected to three bottles for each product/milk mixture plus a selection of the initial odor bottles in random odor.

After the panelists observed the odors, bottles were recapped and allowed to set overnight. Bottles were reopened and assessed for odors. Each bottle was subjected to a second round of treatment and each panelist rated the malodor stench. The rating was according to the scale set being 5 as worse and 1 being the best. Each bottle was treated with 2 sprays (1 cycle of spray) of the selected cleaner until it has reached the point in which the panelist has evaluated the malodor level to be 3 or below. The treatment of the contaminated bottles was stopped at a maximum of 6 sprays (3 cycles of sprays) as this is considered ineffective at removing the malodor level from the bottle. The bottles were then left overnight to sit to assess if any malodor level would rise. If it did another round of treatment was applied to see if it can get rid of the malodor.

Chemistries Evaluated: E-50, Febreze, Water

Results:

Cleaner	E-50	T1	T2	T3	Average
Bottle 1		5	4	4	4.3
Bottle 2		4.5	3	4	3.8
Bottle 3		5	3	4	4
% Average: 4.0					
Cleaner	E-50	Sprays: 2			Average
Bottle 1		2.5	2	3	2.5
Bottle 2		3	2	3	2.7
Bottle 3		3.5	2	3	2.8
% Average: 2.6					
Cleaner	E-50	Sprays: 4			Average
Bottle 1		1	1	1	1
Bottle 2		2.5	2	2	2.2
Bottle 3		2	1	2	1.7
% Average: 1.6					

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Cleaner	E-50	Sprays: 6	Average		
Bottle 1		1	1	1	1
Bottle 2		1	1	2	1.3
Bottle 3		1.5	1	1.5	1.3
% Average: 1.2					
Cleaner	Febreze	Original	Average		
Bottle 1		4.5	5	3	4.2
Bottle 2		5	4	5	4.7
Bottle 3		4.5	5	4	4.5
% Average: 4.4					
Cleaner	Febreze	Sprays: 2			Average
Bottle 1		4.5	3	3	3.5
Bottle 2		5	4	4	4.3
Bottle 3		4	3	4	3.7
% Average: 3.8					
Cleaner	Febreze	Sprays: 4			Average
Bottle 1		4.5	3	3	3.5
Bottle 2		4.5	3	4	3.8
Bottle 3		4	3	3	3.3
% Average: 3.5					
Cleaner	Febreze	Sprays: 6			Average
Bottle 1		4.5	3	3	3.5
Bottle 2		4.5	3	3.5	3.7
Bottle 3		3.5	2	3	2.8
% Average: 3.3					
Cleaner	Water	Original			Average
Bottle 1		5	3	5	4.3
Bottle 2		5	5	4	4.7
Bottle 3		5	5	5	5
% Average: 4.6					
Cleaner	Water	Sprays: 2			Average
Bottle 1		5	3	5	4.3
Bottle 2		5	5	4	4.7
Bottle 3		5	5	5	5
% Average: 4.6					
Cleaner	Water	Sprays: 4			Average
Bottle 1		5	3	4.5	4.2
Bottle 2		5	4.5	4	4.5
Bottle 3		5	5	4.5	4.8
% Average: 4.5					

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Cleaner	Water	Sprays: 6			Average
Bottle 1		5	3	4	4
Bottle 2		4.5	4	4.5	4.3
Bottle 3		5	4.5	4	4.5
% Average: 4.2					

Summary Table

Cleaner	Sprays	% Average
E-50	6	1.2
Febreze	6	3.3
Water	6	4.2

Overnight

Cleaner	E-50	Overnight			Average
Bottle 1		2.5	3	3	2.8
Bottle 2		2.5	2	2	2.2
Bottle 3		2	1	2.5	1.8
% Average: 2.2					
Cleaner	E-50	Overnight 2 Sprays			Average
Bottle 1		1.5	2	1	1.5
Bottle 2		2	2	3	2.3
Bottle 3		2	2	1.5	1.8
% Average: 1.8					
Cleaner	Febreze	Overnight			Average
Bottle 1		4	4.5	4	4.2
Bottle 2		4.5	4	4	4.2
Bottle 3		5	4	3	4
% Average: 4.1					
Cleaner	Febreze	Overnight 2 Sprays			Average
Bottle 1		4	4.5	3	3.8
Bottle 2		4	3	4	3.7
Bottle 3		4.5	3	2.5	3.3
% Average: 3.6					
Cleaner	Water	Overnight			Average
Bottle 1		5	4.5	5	4.8
Bottle 2		5	4.5	5	4.8
Bottle 3		5	4	5	4.7
% Average: 4.7					
Cleaner	Water	Overnight 2 Sprays			Average
Bottle 1		4	4.5	3.5	4
Bottle 2		5	4.5	5	4.8
Bottle 3		4	4	4.5	4.2
% Average: 4.3					

Overnight Summary Table

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Cleaner	Overnight Avg.	After Spray
E-50	2.2	1.8
Febreze	4.1	3.6
Water	4.7	4.3

Summary:

Substrates:		Liquid				
Contaminants:		Odor				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:	
EcoLogic Solutions, Inc.	Deodorizing Cleaner E-50	100		<input checked="" type="checkbox"/>	Effective at removing malodor level	
Procter & Gamble	Febreze Free Nature	100		<input type="checkbox"/>	Not Effective at removing malodor level	
Water	Water	100		<input type="checkbox"/>	Not Effective at removing malodor level	

Conclusion:

Treated bottles were given a rating of 1 being the best to 5 being the worse in malodor level. An effective cleaner would have a rating of 2 or below after 3 cycles of sprays. E-50 was the only effective cleaner at removing the malodor level down to a rating of 1.2. However with that said Febreze has partially subdued some of the malodor level to a rating of 3.3. Water was not so effective at removing the malodor level. An overnight sit was conducted to see if the overall smell of the malodor would rise overnight. It has been noted that all bottles treated with the three cleaners have a greater malodor level than it was the day before. However each cleaner was able to lower the malodor level down to or close to its malodor level from the day before after one cycle of spray. Overall the best cleaner would be E-50, Febreze and lastly Water.