CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2016
DateRun:	10/10/2016
Experimenters:	George Liang, Vinh Tran, Alicia McCarthy, Austin Buda
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Liquid
PartType:	Part
Contaminants:	Odor
Cleaning Methods:	Immersion/Soak
Analytical Methods:	Smell
Purpose:	To evaluate supplied products for malodor elimination
Experimental Procedure:	Clean 250 ml glass bottles were filled with 6 ml of whole milk. The bottles were capped and stored at room temperature for three days. At the end of the 3rd day, the bottles were opened and observed for signs of malodor. A panel of three was subjected to evaluating the untreated bottles after the 3rd day. Cleaning products were used at the recommended concentrations. Three bottles were treated for each supplied cleaning product for three treatment cycles. One treatment cycle consists of two sprays of the cleaning product directly into the contaminated milk bottle. Bottles were capped and swirled to mix the cleaner with the milk after each cycle. The panel of three was subjected to rating the malodor in the bottle after each treatment cycle at random until all three treatment cycles were done. After the panelists rated the odors, bottles were recapped and allowed to sit overnight. Bottles were reopened and assessed for malodor. An initial overnight rating of the contaminated bottles was done to see if the malodor had increased back to its initial malodor level from the overnight sit. Thereafter, each bottle was subjected to one treatment cycle and the same panelist from the day before gave a rating for each contaminated bottle. The rating was according to the scale set as1 being the best and 5 being the worst. An effective cleaning product would have a rating of two or below after its 3rd treatment cycle. The treatment of the contaminated bottles was stopped at a maximum of six sprays (three treatment cycles); the cleaning product is considered ineffective if the malodor rating is not 2 or below after its third cycle of treatment.

Results:

Cleaner	Post Clean	Original		Average
Bottle 1	4.5	5.0	5.0	4.8
Bottle 2	4.5	4.5	4.0	4.3
Bottle 3	5.0	5.0	5.0	5.0
				% Average: 4.7
Cleaner	Post Clean	Sprays: 2		Average
Bottle 1	5	5.0	4.0	4.7
Bottle 2	4.5	4.8	4.5	4.6
Bottle 3	5.0	4.0	5.0	4.7
				% Average: 4.6
Cleaner	Post Clean	Sprays: 4		Average
Bottle 1	4.5	4.0	4.5	4.3
Bottle 2	4.0	4.8	4.5	4.4
	2.5	3.5	3.0	3.0

CLEANING LABORATORY EVALUATION SUMMARY

Bottle 3				
				% Average: 3.9
Cleaner	Post Clean	Sprays: 6		Average
Bottle 1	2.5	5.0	3.0	3.5
Bottle 2	4.0	5.0	3.5	4.2
Bottle 3	2.5	5.0	3.5	3.7
				% Average: 3.8
Cleaner	Pre Clean	Original		Average
Bottle 1	5.0	5.0	5.0	5.0
Bottle 2	5.0	5.0	4.5	4.8
Bottle 3	5.0	5.0	5.0	5.0
				% Average: 4.9
Cleaner	Pre Clean	Sprays: 2		Average
Bottle 1	3.7	3.5	2.5	3.2
Bottle 2	3.0	2.0	3.0	2.7
Bottle 3	1.5	2.0	2.5	2.0
				% Average: 2.6
Cleaner	Pre Clean	Sprays: 4		Average
Bottle 1	3.5	3.0	3.0	3.2
Bottle 2	2.0	2.0	2.5	2.2
Bottle 3	1.0	1.0	1.0	1.0
				% Average: 2.1
Cleaner	Pre Clean	Sprays: 6		Average
Bottle 1	1.5	1.0	1.0	1.2
Bottle 2	1.5	1.5	1.5	1.5
Bottle 3	1.0	1.0	1.0	1.0
				% Average: 1.2
Cleaner	Biological Liquid Odor Control/Cleaner	Original		Average
Bottle 1	4.0	5.0	4.5	4.5
Bottle 2	5.0	5.0	4.5	4.8

CLEANING LABORATORY EVALUATION SUMMARY

Bottle 3	5.0	5.0	5.0	5.0
				% Average: 4.8
Cleaner	Biological Liquid Odor Control/Cleaner	Sprays: 2		Average
Bottle 1	4.5	3.5	3.0	3.7
Bottle 2	4.5	3.5	4.0	4.0
Bottle 3	5.0	4.0	4.0	4.3
				% Average: 4.0
Cleaner	Biological Liquid Odor Control/Cleaner	Sprays: 4		Average
Bottle 1	4.5	2.5	3.5	3.5
Bottle 2	4.5	4.0	3.2	3.9
Bottle 3	5.0	3.5	3.5	4.0
				% Average: 3.8
Cleaner	Biological Liquid Odor Control/Cleaner	Sprays: 6		Average
Bottle 1	3.0	4.0	2.0	3.0
Bottle 2	4.0	4.2	3.0	3.7
Bottle 3	4.0	5.0	3.5	4.2
				% Average: 3.6
Cleaner	Odor Eliminator (Spring Scent)	Original		Average
Bottle 1	5.0	5.0	5.0	5.0
Bottle 2	5.0	4.7	5.0	4.9
Bottle 3	5.0	5.0	5.0	5.0
				% Average: 5.0
Cleaner	Odor Eliminator (Spring Scent)	Sprays: 2		Average
Bottle 1	2.0	3.0	2.5	2.5
Bottle 2	2.0	2.5	2.5	2.3
Bottle 3	2.0	2.0	2.0	2.0
				% Average: 2.3
Cleaner	Odor Eliminator (Spring Scent)	Sprays: 4		Average
Bottle 1	2.0	2.0	3.0	2.3

CLEANING LABORATORY EVALUATION SUMMARY

Bottle 2	1.5	2.0	2.0	1.8
Bottle 3	1.5	2.5	1.0	1.7
				% Average: 1.9
Cleaner	Odor Eliminator (Spring Scent)	Sprays: 6		Average
Bottle 1	1.5	1.0	1.0	1.2
Bottle 2	1.0	1.0	1.0	1.0
Bottle 3	1.0	1.0	1.0	1.0
				% Average: 1.1

Summary Table

Cleaner	Sprays	% Average
Post Clean	6	3.8
Pre Clean	6	1.2
Biological Liquid Odor Control/ Cleaner	6	3.6
Odor Eliminator	6	1.1

Summary:

Substrates:	Liquid				
Contaminants:	Odor				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
Rochester Midland Corporation	PRS Water Damage Pre Clean	100	0.00	☑	Rank 1.2
Rochester Midland Corporation	PRS Water Damage Post Clean	100	0.00	☐	Rank 3.8
Rochester Midland Corporation	Biological Liquid Odor Control Cleaner	100	0.00	☐	Rank 3.6
Wurth	Odor Eliminator	100	0.00	☑	Rank 1.1

Conclusion:

Treatment of bottles is given a rating for its malodor level, with 1 being the best to 5 being the worse. An effective cleaner would have a rating of 2 or below after the 3rd treatment cycle. The only effective cleaners were Pre Clean and Odor Eliminator. After the 3rd treatment cycle, Post Clean and Biological Liquid Odor Control/Cleaner was not as effective in eliminating the malodor from the contaminated bottles, because the malodor ratings for the cleaning product: Post Clean is at 3.8. Whereas the rating for the cleaning product: Biological Liquid Odor Control/Cleaner cleaning product is at 3.6. The most effective overall cleaner is listed as follows: Odor Eliminator, Pre Clean, Biological Liquid Odor Control/Cleaner and Post Clean.