CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2017
DateRun:	06/21/2017
Experimenters:	George Liang, Carla De La Cruz, Vinh Tran, Alicia McCarthy, Hayley Byra
ClientType:	Cleaner Manufacturer
ProjectNumber:	Project #1
Substrates:	Glass/Quartz
PartType:	Coupon
Contaminants:	Odor
Cleaning Methods:	Low Pressure Spray
Analytical Methods:	Smell
Purpose:	To evaluate the effectiveness of the supplied cleaners with odor elimination.
Experimental Procedure:	Nine clean 250 ml glass bottles were filled with six milliliters of whole milk. The bottles were capped and stored at room temperature (68 F) and allowed to ferment for three days. After the three days, a panel of five smelled each of the nine bottles for an initial odor evaluation. The three supplied cleaning products were used at 100% concentration. Three bottles were treated for each supplied cleaner for three treatment cycles, with each treatment cycle consisting of two sprays of the respective cleaner directly into the bottle. Following each treatment cycle the bottles were swirled and agitated so the cleaner can mix with the cleaner. After each treatment cycle, the panelists rated the malodor of the milk in the bottles. The nine milk bottles were treated for a total of three treatment cycles: six sprays overall of each cleaner. The panelists rated the malodor of the milk after each treatment cycle, where one was considered close to no smell of malodor and five was the worst malodor level. Subsequently, the nine milk bottles were allowed to ferment at room temperature (68 F) overnight. The same panelists rated the malodor of the milk the following day. The nine bottles were then subjected to a final treatment cycle of two sprays of their respective supplied cleaners. The panelists smelled the bottles once again for a final rating. A value of two or higher is considered ineffective after the three treatment cycles.
Results:	Following the overnight sit, all three of the milk bottle sets exhibited a worse malodor rating but was mitigated after a treatment cycle of two sprays.

Cleaner: DFE Sabre							
Treatment:	Untreated					Average	Overall Avg.
Bottle 1	5	3.5	4	4	4	4.1	
Bottle 2	4.5	4.5	5	4.5	3	4.3	4.5
Bottle 3	5	5	5	5	5	5	
Treatment:	Sprays:2						
Bottle 1	2	1.5	2	3	2.5	2.2	
Bottle 2	1.5	2.5	2	2.5	3	2.3	2.7
Bottle 3	3	4	2.5	3.5	5	3.6	
Treatment:	Sprays: 4						
Bottle 1	1.5	2.7	3.5	1.5	2	3.5	
Bottle 2	2	2.5	1.5	2	1	1.8	2.5
Bottle 3	3	3.5	2	3.5	5	3.4	
Treatment:	Sprays: 6						
Bottle 1	2	2.5	3.5	1.5	1	1.8	
Bottle 2	1.5	3	2	1.5	3.5	2.3	2.2
Bottle 3	1.5	3.5	2	2	3	2.4	
Cleaner: Enviro Care Liqui Bac							
Treatment:	Untreated						
Bottle 1	4.5	2.2	4	4	4.5	3	
Bottle 2	5	4.5	4.5	5	3	4.4	3.9
Bottle 3	4.5	3	5	5	4	4.3	
Treatment:	Sprays:2						

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Bottle 1	4.5	3	4.5	5	5	4.4	
Bottle 2	5	4.5	4.5	4.5	5	4.7	4.4
Bottle 3	4	3.5	4	4.5	5	4.2	
Treatment:	Sprays:4						
Bottle 1	2	1	1.5	3.5	2.5	2.1	
Bottle 2	1.5	1.5	2	3.5	4	2.5	2.1
Bottle 3	1.5	1	1.5	2.5	1.5	1.6	
Treatment:	Sprays:6						
Bottle 1	1	1	1	2.5	1	1.3	
Bottle 2	1.5	1	1	2.5	1	1.4	1.4
Bottle 3	1.5	1	1.5	2	1	1.4	
Cleaner: DFE B.L.O.C.							
Treatment:	Untreated						
Bottle 1	4.5	3	4.5	5	5	4.4	
Bottle 2	5	4.5	4.5	4.5	5	4.7	4.4
Bottle 3	4	3.5	4	4.5	5	4.2	
Treatment:	Sprays: 2						
Bottle 1	3.5	3	4	4	1	3.1	
Bottle 2	3.5	3.5	4.5	4.5	2	3.6	3.3
Bottle 3	2.5	2	4.5	4.5	2	3.1	
Treatment:	Sprays: 4						
Bottle 1	2.5	3.3	2	2.5	1	2.1	
Bottle 2	3	3	3.5	4	5	3.7	2.8
Bottle 3	2.5	2	3	4	2	2.7	
Treatment:	Sprays: 6						
Bottle 1	2.5	2	3.5	2.5	1	2.3	
Bottle 2	3	1.5	4.5	3.5	3.5	3.2	2.7
Bottle 3	3	1	4	3.5	1.5	2.6	

Summary

Cleaner	Untreated	Treatment (Cycle)	Avg. Treatment (After 3 Cycles)
DFE Sabre	4.5	3	2.2
Enviro Care Liqui Bac	3.9	3	1.4
DFE B.L.O.C.	4.4	3	2.7

Overnight Results

Cleaner: DFE Sabre							
Treatment:	Overnight: Untreated					Average	Overall Avg.
Bottle 1	3	4	2.5	2	3.5	3	
Bottle 2	2.5	3.5	2	2	2.5	2.5	2.7
Bottle 3	3.5	4	2.5	2	1	2.6	
Treatment:	Two Sprays						
Bottle 1	1.5	4	1.5	1.5	4	2.5	
Bottle 2	2	3	1.5	1.5	4	2.4	2.4
Bottle 3	1.5	2.5	1.5	2	3.5	2.2	
Cleaner: Enviro							

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Care Liqui Bac							
Treatment:	Overnight Untreated						
Bottle 1	2.5	3	3	3.5	3.5	3.1	
Bottle 2	2.5	4	2.5	2.5	4	3.1	3
Bottle 3	3	3	2.5	3	3	2.9	
Treatment:	Two Sprays						
Bottle 1	2	3.5	2	2	2.5	2.4	
Bottle 2	1.5	4.5	1.5	2	2	2.3	2.1
Bottle 3	1.5	1.5	1.5	2	1	1.5	
Cleaner: DFE B.L.O.C.							
Treatment:	Overnight Untreated						
Bottle 1	4.5	4	4.5	4.5	1	3.7	
Bottle 2	4	3.5	4	4.5	1.5	3.5	3.6
Bottle 3	5	3	4.5	4	1	3.5	
Treatment:	Two Sprays						
Bottle 1	2.5	2	3.5	3.5	1	2.5	
Bottle 2	3.5	3	3	3.5	3.5	3.3	2.8
Bottle 3	3	1.5	3	3	2.5	2.6	

Summary:

Substrates:	Glass/Quartz
Contaminants:	Odor

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Fisher Scientific	Absolute Ethanol	100	0.00	☐	
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
Rochester Midland Corporation	DFE Sabre	100	0.00	☑	
Rochester Midland Corporation	Enviro Care Liqui Bac.	100	0.00	☑	
Rochester Midland Corporation	Biological Liquid Odor Control Cleaner	100	0.00	☑	

Conclusion: All three products were considered comparable and partially effective at reducing the initial malodor smell by half after overnight treatment.