

Ozone Gas Disinfection of Orlando Supermarket Meat Prep Room

May 12, 2020

Introduction

On May 5, 2020 the meat preparation room at an Orlando Supermarket was re-treated with the Ohxyphog system to provide enhanced disinfection of the all contact surfaces and a continued reduction of the bio-load within the prep room. The system was set up with the 2 ozone fogging stacks, spaced apart in the prep room. The localized A/C chiller for the prep room was shut down for the duration of the test, the cooling fans were turned off and a floor blower was used to provide stirring of the air and ozone fog in the room. The ozone concentration and Ct trends are provided in **Figures 1 and 2**.

Before the test began, steel plates inoculated with Enterobacter were placed at various locations within the prep room. Additionally, the plastic curtain, **Figure 3**, was swabbed before and after the ozone fog treatment for aerobic and Enterobacteriaceae bacteria. When the Ohxyphog process was complete, the inoculated plates were removed, swabbed and sent to an independent lab for analysis. The results of the inoculated plates and swabs are provided in **Tables 1 and 2**.

Observations

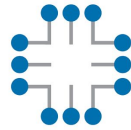
The Ohxyphog system was able to steadily increase the ambient ozone level throughout the duration of the fogging run with a maximum concentration of ~13 ppmv, see **Figure 1**. The microdroplets (~2-10 micron) of the ozonated fog was clearly visible during the duration of the treatment. The prep room was ozone fogged for a period of 120 minutes. After 120 minutes, the ozone generator was turned off and the ozone was allowed to degrade back to safe levels, which took about 40 minutes.

Results

The 6 inoculated plates that were placed throughout the prep room showed very good kill with all but one with <10 cfu's. The average log kill was very good at 4.26 log, see **Table 1** for the details. The curtain swabs showed fairly high Aerobic counts, even with the one that was wiped with a bleach spray, having counts of 14,000 cfu (~12" x 12" area), **Table 2**. The post ozonated curtain showed much lower Aerobic counts at 950 cfu's. This would be an approximate 1.42 log kill based on the 25,000 cfu count of the curtain that was only wiped with a wet cloth. The Enterobacteriaceae counts were <10 cfu for all swabs.

Conclusion

The Orlando supermarket employees attempted to provide a greater level of cleaning of the meat prep room before being treated with the Ohxyphog system. The level of bacterial contamination though improved was still high. The extended Ohxyphog treatment of 2 hours with a higher ambient ozone level of ~13 ppmv showed its capability of providing a higher level of bacteria kill as evidenced by the greater than 4 log kill of the Enterobacter bacteria on the inoculated steel plates. Repeated Ohxyphog treatments of the meat prep room will lead to a continual reduction of environmental bacteria. It is recommended for the Orlando supermarket team to further



review their cleaning and disinfection protocols for the both the meat and fish prep rooms to achieve better and more consistent levels of cleanliness and microbiological control.

Table 1. Inoculated Plate Enterobacter Results

| Plate ID # | Location | Colony Forming Units (cfu) | % Kill | Log Kill |
|-------------------|--------------------------------|-----------------------------------|---------------|-----------------|
| Plate #1 | Flat on Cutting Table | <10 | 99.997% | >4.58 |
| Plate #2 | Flat by Meat Cutter | <10 | 99.997% | >4.58 |
| Plate #3 | Flat by Weigh Balance | <10 | 99.997% | >4.58 |
| Plate #4 | Flat by Sink Area | 80 | 99.791% | 2.68 |
| Plate #5 | Flat by Meat Grinder | <10 | 99.997% | >4.58 |
| Plate #6 | Upside Down over Cutting Table | <10 | 99.997% | >4.58 |
| Control (average) | | 38,333 | | |

Table 2. Microbiological Swab Results

| Locations | Aerobic Bacteria (cfu) | Enterobacteriaceae (cfu) | Notes |
|-------------------|-------------------------------|---------------------------------|----------------------------|
| Plastic Curtain-1 | 28,000 | <10 | Wet cloth wiped only |
| Plastic Curtain-2 | 14,000 | <10 | Wet cloth and bleach wiped |
| Plastic Curtain-3 | 950 | <10 | No wiping, after Ohyxphog |

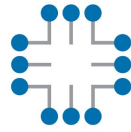
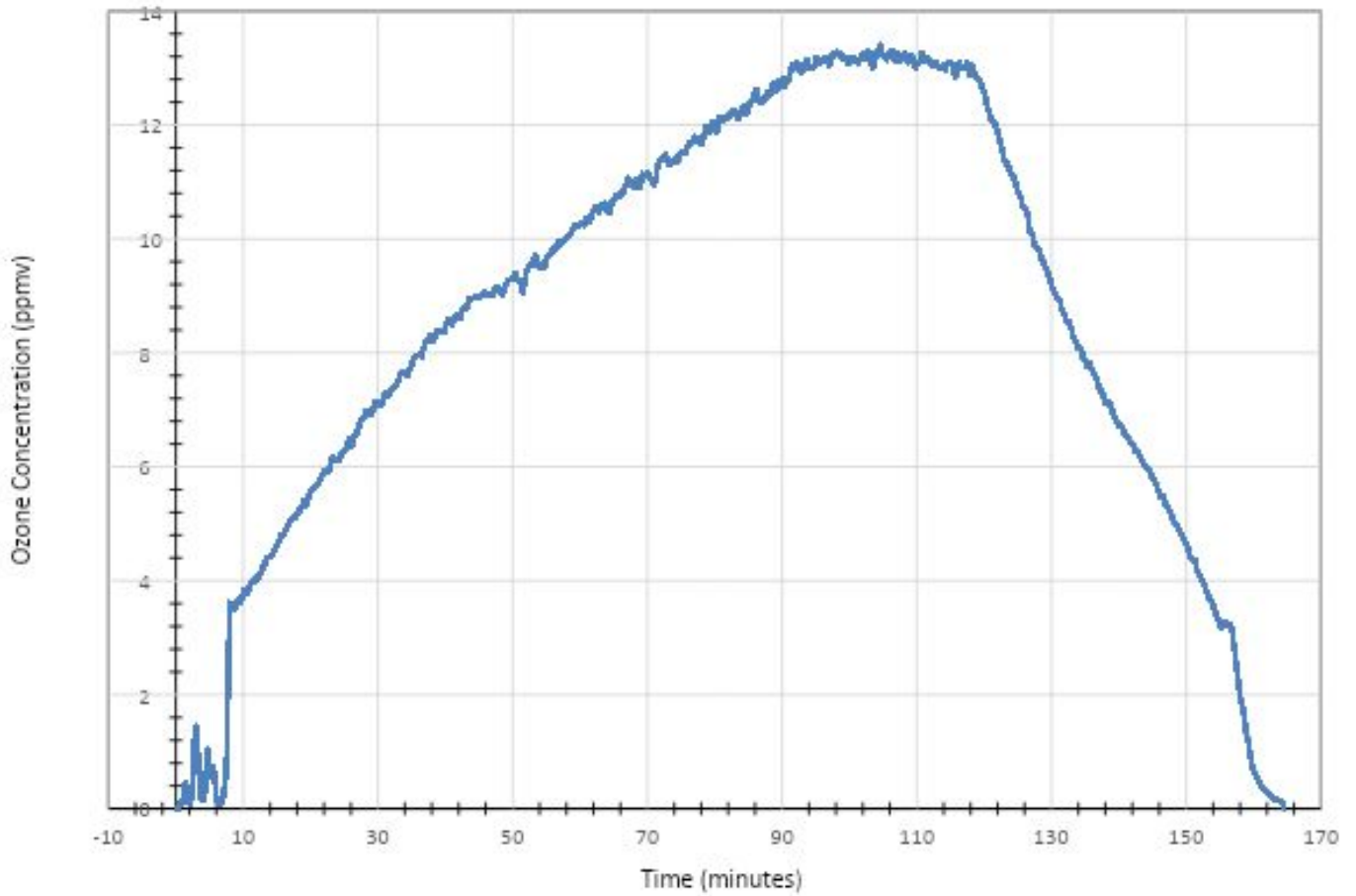
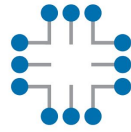


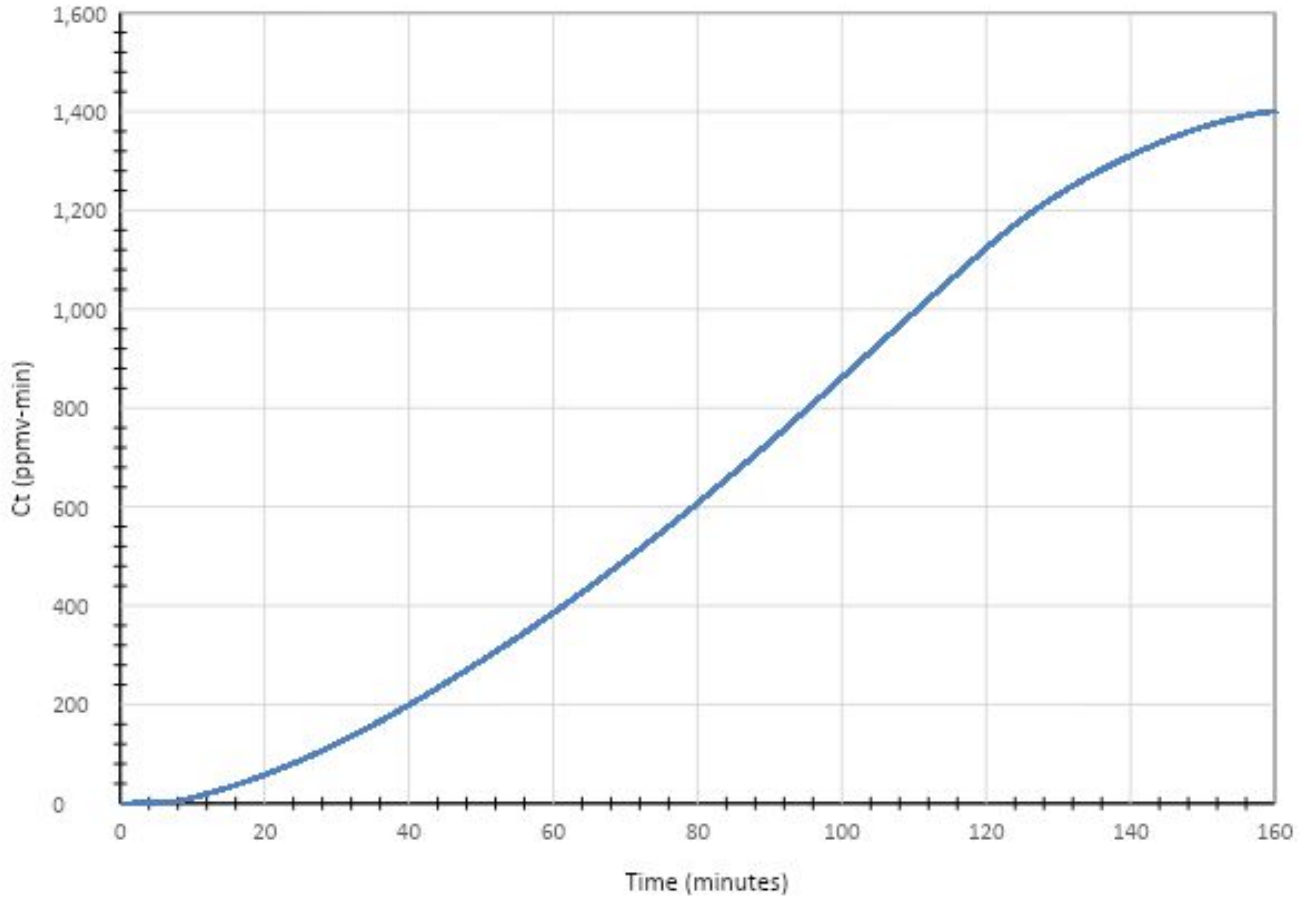
Figure 1. Ozone gas concentration trend

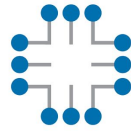




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Figure 2. Concentration x Time (Ct) Trend





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Figure 3. Plastic Curtain Swab Locations

