

## **Study for effects of PureWave Magnetic Discs by Chrysalis Energies on different microorganisms.**

**Objective:** To determine the efficiency of a magnetic field to significantly reduce pathogens in food.

### **Study food samples:**

1. Ground minced chicken meat from a local supermarket.
2. Frozen raspberry from a local supplier.

**Magnetic field: A permanent magnetic disk by Chrysalis Energies.**

### **Pathogen indicators used in study:**

1. Brewers's Yeast
2. E.coli (coliform count)
3. Staphylococcus (staph infection)
4. Listeria Bacteria

### **Preparation of pathogen inoculum:**

1. A fresh culture was prepared by inoculating colonies in a non-selective agar.
2. Approximate colony counted after 18h was  $\log_7$  CFU/mL
3. Five serial dilution of factor 10 was prepared and plated on non-selective agar.
4. The log factor of serial dilutions was confirmed by evaluating countable colonies and a linear relationship was found in dilution and log.
5. Colonies were streaked on selective agar to confirm the identification of microorganism.

### **Inoculating samples:**

Chicken and raspberries in plastic bags were inoculated with pathogens.

### **Treatment:**

Samples were treated for five minutes with magnetic fields by placing sampling bags on the PureWave magnetic disc.

### **Analysis:**

Compare log reduction of pathogens for treated and untreated samples.

## Conclusion:

This study depicts that Purewave Magnetic Disks by Chrysalis Energies can be used to efficiently reduce pathogens found in food matrices. The percentage of the log reduction of various microorganisms in different matrices can be seen in the table below.

<b>Pathogen name</b>	<b>Chicken</b>	<b>Raspberry</b>
<b>Bacteria Listeria ATCC 19111</b>	<b>0.00%</b>	<b>38.16%</b>
<b>Bacteria Listeria ATCC 19112</b>	<b>0.00%</b>	<b>53.40%</b>
<b>Bacteria Listeria ATCC 19113</b>	<b>0.00%</b>	<b>45.72%</b>
<b>Brewer's Yeast ATCC 2601</b>	<b>- 5.23%</b>	<b>46.60%</b>
<b>Brewer's Yeast ATCC 2602</b>	<b>- 6.44%</b>	<b>32.63%</b>
<b>Brewer's Yeast ATCC 2603</b>	<b>- 49.73%</b>	<b>11.09%</b>
<b>Klebsiella (Coliform count) ATCC 13047</b>	<b>39.57%</b>	<b>100.00%</b>
<b>Klebsiella (Coliform count) ATCC 13048</b>	<b>41.99%</b>	<b>100.00%</b>
<b>Klebsiella (Coliform count) ATCC 13049</b>	<b>17.34%</b>	<b>100.00%</b>
<b>Staphylococcus (STA) ATCC 25923</b>	<b>66.67%</b>	<b>60.80%</b>
<b>Staphylococcus (STA) ATCC 25924</b>	<b>50.76%</b>	<b>56.63%</b>
<b>Staphylococcus (STA) ATCC 25925</b>	<b>56.25%</b>	<b>65.05%</b>