

PhageGuard Listex Application Data Sheet Salmon

PhageGuard Listex

PhageGuard Listex is a highly concentrated solution containing Phage P100. Phages are the most abundant microorganisms in the world and can be used for targeted bacterial control.

The phage used in PhageGuard Listex is selected for its killing ability against *Listeria monocytogenes*, but targets all *Listeria* strains.

Products that reduce *Listeria* contamination are useful in the food industry as *Listeriosis* has a 20-25% mortality rate. Listex can effectively be applied as surface intervention against *Listeria* contamination in smoked salmon and fresh salmon fillets. Listex has no effect on the colour, texture or taste.

Product supply

PhageGuard Listex is supplied in 100ml and 1 ltr bottles at a concentration of 2×10^{11} phages per ml.

Approvals

PhageGuard Listex is USDA/FDA GRAS approved. It is further accepted as a processing aid in Australia, New Zealand, Israel, Switzerland, The Netherlands (EU) Canada and others. It is organic certified (OMRI USA and SKAL EU). As a processing aid no labelling is required.

Application

Listeria contamination is typically found on the outside of products. Smoked salmon is typically at risk since *Listeria* continues to grow at refrigeration temperatures.

A sufficient amount of phages need to be present to ensure the statistical probability that the phage encounter the bacteria. The number of phages required depends on the type of surface.

PhageGuard Listex can be applied using various methods:

- Spray onto product prior to packaging
- Spray into package
- Spray onto slicer blade/dicer blades
- Dipping/immersion into a solution containing Listex

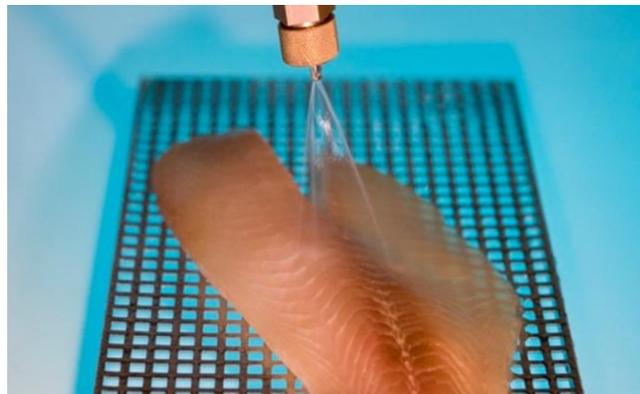
We work closely with a major spray equipment supplier to offer an optimal application solution.

PhageGuard Listex can also be applied in combination with other anti-microbial interventions. PhageGuard Listex can be used in combination with growth inhibitors, like lactate salts

PhageGuard Listex is effective in solution between +0°C and 35°C. PhageGuard Listex is diluted with clean water prior to application.

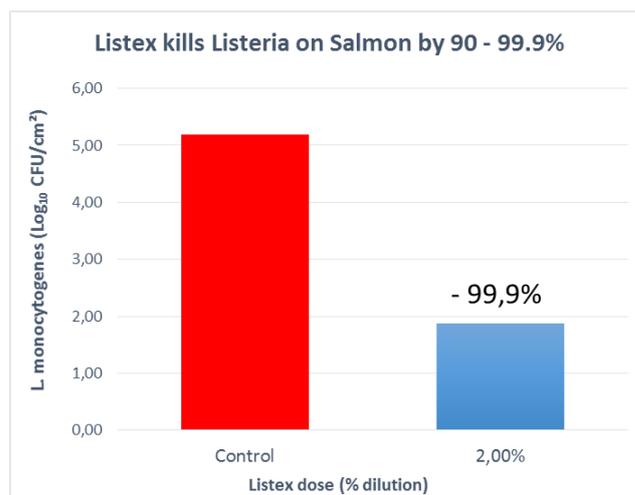
Concentration	PFU/(phage forming units) per ml
100% Listex	2×10^{11}
2%	4×10^9
0,2%	4×10^8

A typical application for fresh salmon filets is during filleting process. PhageGuard Listex can be applied during the filleting process by spraying a 2% solution on the slicer, the conveyor belt and to the top of the fillet to ensure Listex comes in contact with both sides of the fillet.



Benefits

The graph below shows the result of tests on Salmon fillet with an inoculation of ~ 100.000 cfu/cm².



Reductions of L. monocytogenes within 2hrs at 4°C on raw salmon fillet tissue with different concentrations of PhageGuard Listex.

A 2% PhageGuard Listex solution resulted in a 99.9% reduction after 2 hours at 4 °C. Typically we observe a 1 log reduction within minutes and a 1.5-3 log reduction in cell count after 24hrs

Detection

The concentration of phages in PhageGuard Listex can be measured via titration using the double agar overlay (DLA)

Literature

2010 **Bacteriophage significantly reduces *Listeria monocytogenes* on raw salmon fillet tissue.**
Soni KA, Nannapaneni R. Journal of Food Protection. 2010 Jan;73(1):32-8