

Fish safety

Catchy solutions from Corbion



Improved food safety



Listeria control



Shelf life extension

Today's seafood producers face long production chains and challenging consumers, who demand safer food products with longer shelf life. Fish meat is highly susceptible to microbial growth, including food borne pathogens. Fish products typically do not undergo any form of heat treatment, which is key to killing off pathogens such as *Listeria monocytogenes*.

In 2009, member states of the EU examined over 2,000 items of (mainly smoked) RTE fish products¹. Of these products, 7% were found positive for *Listeria*, demonstrating the importance of including safety hurdles in fish products to reduce bacterial growth and prevent pathogen growth. The Food and Agricultural Organization (FAO) estimates that every million servings of smoked fish results in 0.053 cases of listeriosis annually.²

Listeria monocytogenes is a particularly challenging pathogen as it is ubiquitous by nature and able to grow at refrigerated temperatures. A combination of refrigeration, salt and smoking is not enough to prevent the growth of *Listeria* in fish products. Corbion can help to comply with current legislation on *Listeria monocytogenes*. With a wide product range and sound reputation in the food industry,

Corbion is the most experienced partner for controlling *Listeria* growth and extending shelf life. We have proven experience with smoked salmon and can share successes in products such as surimi, trout and halibut. Most of our solutions are available as both liquid and powder and can be applied via injection and during both wet or dry curing process.

¹ EFSA 2011, The Community Summary Report on trends and sources of zoonoses and zoonotic agents in the European Union in 2009.

² FAO/WHO 2004. Risk assessment of *Listeria monocytogenes* in ready-to-eat foods.

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Opti.Form

With a ten year reputation as the gold standard for *Listeria* control in food products, *Opti.Form*[®] represents a range of solutions based on the organic acid salts of lactate and (di-)acetate. *Opti.Form* provides protection against the outgrowth of *Listeria* with minimal impact on the taste of the finished product.

Figure 1 shows the result of a study examining the effect of *Opti.Form*[®] PD Plus on the safety of smoked salmon, inoculated with *Listeria monocytogenes*. In the control products, 1 log *Listeria* growth was reached after a few days. When the salmon was formulated with *Opti.Form*, outgrowth was prevented for almost 15 days.

The effect of *Opti.Form* PD Plus on microbial spoilage in cold smoked salmon is shown in Figure 2. In this study, the time before total plate count reaches 2 log outgrowth is extended by 10 days when *Opti.Form* is added. Sensory analyses concluded that *Opti.Form* did not negatively affect flavor or odor.

Verdad[®]

This line of label friendly and natural ingredients has been developed to increase food safety in products where the listed ingredients must be easily recognizable for consumers. Verdad[®] consists of natural ferments and/or vinegar, derived from carefully selected food cultures including organic acids, sugars and peptides.

Corbion's *Listeria* Control Model

Corbion offers a unique software tool — Corbion's *Listeria* Control Model. The model calculates the appropriate amount of Corbion solution required to control *Listeria* in meat items. The model is adjustable for several formulation parameters to accurately predict *Listeria* suppression. This tool enables producers to save development cost, decrease time to market and increase food safety levels.

Go to www.corbion.com/clcm to find out more.

Growth of *L. monocytogenes* in smoked salmon at 10°C/50°F

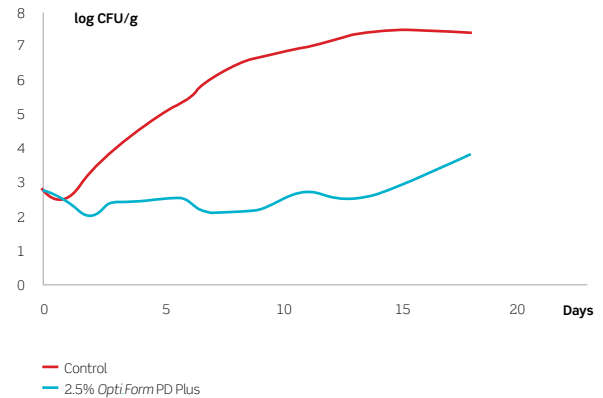


Figure 1

Total plate count in minced cold smoked salmon at 10°C/50°F

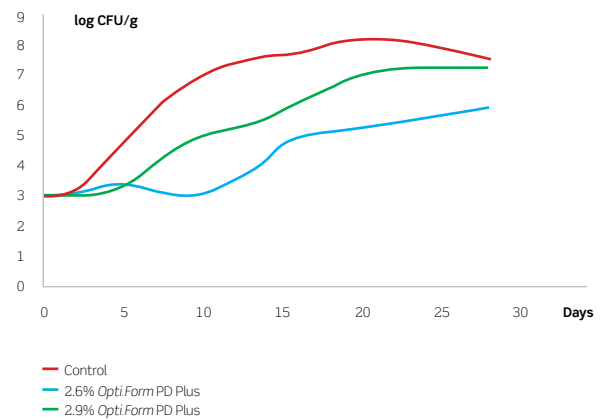


Figure 2

Interested in Corbion solutions? Go to www.corbion.com/meatandpoultry



Corbion is the global market leader in lactic acid, lactic acid derivatives, and a leading company in emulsifiers, functional enzyme blends, minerals, vitamins and algae ingredients. We develop sustainable ingredient solutions to improve the quality of life for people today and for future generations. For over 100 years, we have been uncompromising in our commitment to safety, quality, innovation and performance. Drawing on our deep application and product knowledge, we work side-by-side with customers to make our cutting edge technologies work for them. Our solutions help differentiate products in markets such as food, home & personal care, animal nutrition, pharmaceuticals, medical devices, and bioplastics. In 2018, Corbion generated annual sales of € 897.2 million and had a workforce of 2,040 FTE. Corbion is listed on Euronext Amsterdam. For more information, visit www.corbion.com.

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