

A photograph of a man and a young boy in a grocery store. The man, wearing a grey patterned sweater, is leaning over the boy, who is wearing a grey turtleneck and a striped sweater. They are both looking intently at a piece of food, possibly a piece of salmon or a similar fish product, which the man is holding. The background is a blurred grocery store aisle with shelves of products.

A Natural Alternative

Bioprotection Explained

CHR HANSEN

Improving food & health

Protecting consumers from harmful pathogens is a top priority for ready-to-eat food brands. Today's consumers are more concerned than ever about how their food is processed, the ingredients it contains and the safety of the food they consume.

Balancing this, manufacturers need to maintain optimum protection to their business and brand.

Freshness, consistency of product quality and food safety are critical elements to maintaining a successful food business.

Protecting food using cultures with bioprotective effect is a compelling solution





Adam Harris

Owner and CEO
Harris Smokehouse Australia



Scan to watch
Adam's story

A product recall is every business and brand owner's worst nightmare. The impact can be devastating. Financial loss due to recovering stock and lost future sales, damage to brand reputation and risking the health and safety of consumers.

Adam Harris, from Harris Smokehouse, a fourth generation, family-owned business, and manufacturer of high quality seafoods walked this path in August 2022. *Listeria monocytogenes*, a pathogenic bacteria, was discovered during routine testing of their product.



You don't know what you don't know. I don't want anyone to go through this experience (product recall). If I could take lessons from this and share, it would be - just take this proactive and preventative approach. Now we have learnt this, learn from us.

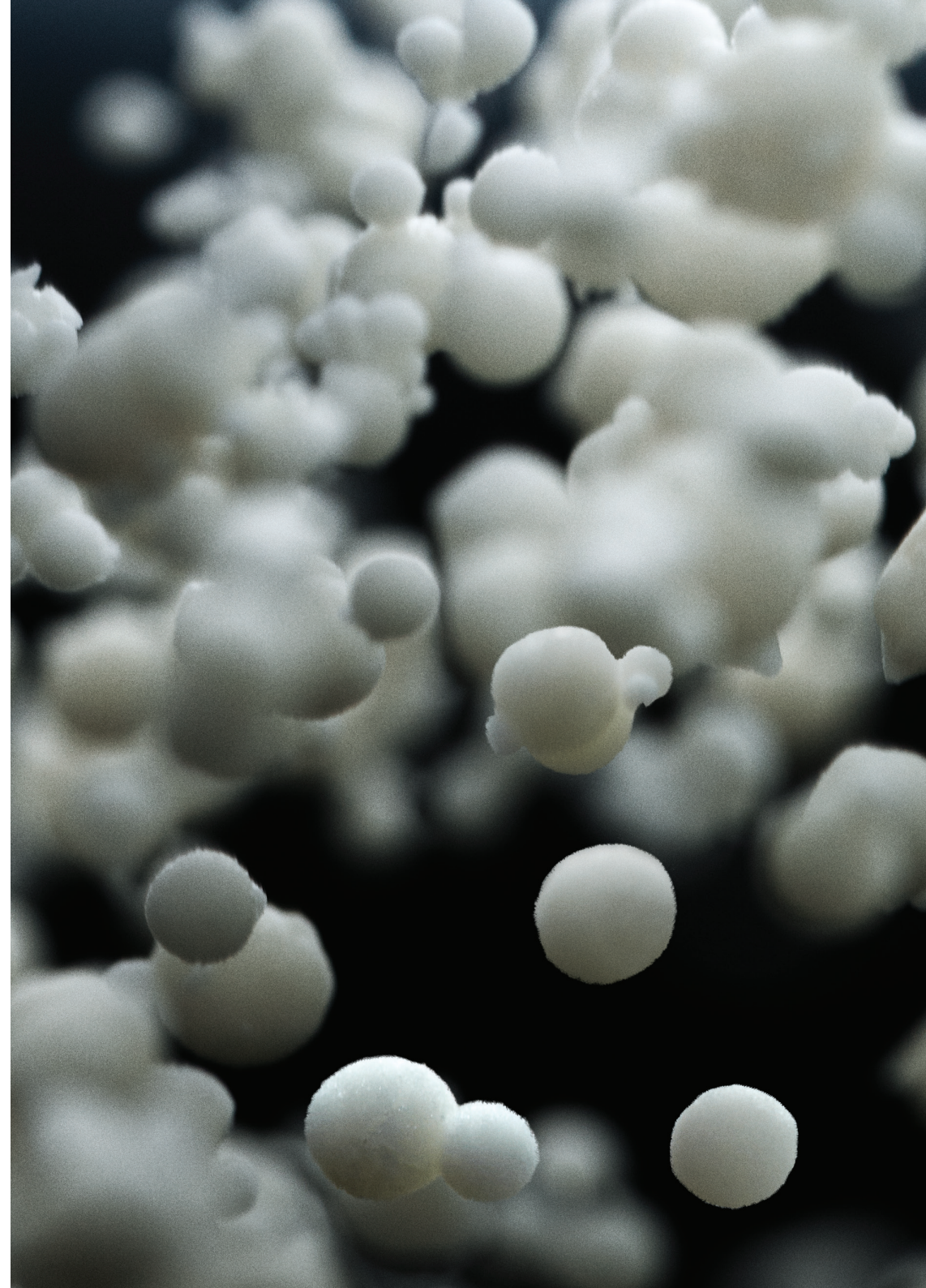


Chr. Hansen were able to provide a natural solution that wouldn't alienate our consumers, they had the scientific data and back-up, they had done all of the hard work and were respected for their science, and it was trusted. They steered us out of our troubles.

The natural food culture alternative

SafePro® food cultures are unique strains of naturally occurring lactic acid bacteria specifically selected for effectiveness to inhibit pathogens and spoilage organisms resulting in fresher and safer food.

Easy-to-apply in an industrial setting, SafePro® food cultures are a natural ingredient, while supporting a more environmentally friendly and sustainable outcome.



How does Bioprotection work?

Bioprotection is a natural fermentation process used to increase the microbiological safety of foods. SafePro® cultures are typically strains of Lactic Acid Bacteria from the Genus *Lactobacillus*.

These cultures do not transform or alter the sensory aspects of the food it is added to, despite there being a very slow fermentation occurring during the shelf life of the food.

This slow fermentation enable SafePro® cultures to outcompete contaminating organisms and prevent the growth of some specific pathogens.

Additional sensory and shelf life benefits are often possible due to the highly competitive nature of the cultures against spoilage organisms:

- Keeps food fresher
- More consistent quality at end of shelf life
- An enabler to increase shelf life

SafePro® cultures can be considered a valuable tool in the food preservation toolbox to supplement other relevant hurdles.



Food Safety regulations

SafePro® cultures are regarded as safe.

EFSA: In the specific case of SafePro B-LC-48 (*Lb curvatus*), the species is listed on the Qualified Presumption of Safety list from EFSA (European Food Safety Authority) since 2007 and is also on the IDF (International Dairy Federation) list of microorganisms traditionally used in foods (Bourdichon et al., 2018).

FDA: The SafePro® range is recognized as safe (GRAS) by the US Food and Drug Administration for the use in ready to eat cooked meat and poultry products above the level of 6.5 log cfu/g and considering a level below 9.0 log cfu/g at the end of the shelf life of the processed meat and other RTE food products.

ANZFSC: *Lb curvatus* is an ingredient that has been traditionally consumed as food and which does not fall into the additive regulation (Australia New Zealand Food Standards Code - Standard 1.2.10). Its safe use is not limited to categories of products or to maximum level.



How do SafePro® cultures fit with FSANZ and the Australian food standards code?

Like other cultures (fermentation cultures and probiotics), cultures with bioprotective effect are considered to be “ingredients” in accordance with the FSANZ code. There are no permitted levels or limits for ingredients in the FSANZ code and therefore no limits on the amount of culture required in food. The amount of culture (the dose) typically needed for an adequate bioprotective effect is 10E7 cfu/g.

The shelf life of ready-to-eat (RTE) foods that support the growth of listeria is regulated and limited by FSANZ, including strict testing criteria. The use of specific SafePro® cultures can be an enabler to eliminate the shelf life limits imposed by FSANZ and relax listeria testing regimes as their use has been demonstrated to allow the shift into “does not support growth of Listeria” category.

According to the FSANZ 2022 Compendium of Microbiological Criteria for Food, foods that are surface fermented and protected by SafePro® cultures, should now be considered in “Category 5”, as these products will now have an inherently high plate count. The standard plate count limit specified in the food previous category is no longer applicable.

| FOOD CATEGORY | | EXAMPLES | RESULT (CFU/G) | | |
|---------------|---|---|----------------|----------|----------------|
| | | | Satisfactory | Marginal | Unsatisfactory |
| Category 5 | Foods in Category 5 either have an inherently high plate count because of the normal microbial flora present or as a result of the processing received. Includes fermented, preserved and dried food products and fresh fruit and vegetables. | Fermented foods including fermented and cured meats, fermented vegetables (e.g. sauerkraut, olives), ripened cheeses, yoghurts, cultured butter, etc. | N/A | N/A | N/A |



How are SafePro® cultures used?

SafePro® Cultures come as a concentrated freeze-dried powder or in frozen pelletised formats and are dissolved into water before application. Application needs to offer optimal distribution of the food culture over the food surface.

- SafePro® culture is typically applied as
- Spray application at check weighers, over conveyer belts, at the slicer/dicer/shredder
- Distributed via mixing (tumbler, massager, bowl chopper)



Putting Bioprotection to work

Project success criteria is established at the beginning of the process. We will work with you to establish trial protocols relevant to the use of SafePro® cultures and during trial phase, all projects are conducted under the close technical supervision from Chr. Hansen. Comprehensive testing, including microbiological and sensory parameters is critical to success.

Microbiological testing in Chr. Hansen's Melbourne Laboratory can assist in validating:

- SafePro® culture concentration from the inoculation step and during the whole shelf life,
- Spoilage (bacteria, yeasts, moulds) concentration during the shelf life

Chr. Hansen collaborates with 3rd party laboratories to test in the following areas:

- *Listeria monocytogenes* challenge test protocols to evaluate the *L. monocytogenes* behaviour (growth / no growth) during the shelf life of artificially inoculated RTE food
- Metagenomic analysis to evaluate the proportion of the different bacterial species within the food and to determine if the added food culture dominate the ecosystem

Where else can SafePro® cultures be used?

Chr. Hansen has a portfolio of cultures with bioprotective effect, and their use is well established with more than 10 years' experience in dairy applications, like yoghurt. The SafePro® range is designed specifically for RTE food. This includes:

- Salami
- Dry Cured meats
- Cooked Smallgoods
- Ready to Eat Salads (Salad kits, Mixed Protein kits/ meals)
- Meat Alternative/Meat style products (Vegetarian & Vegan)
- Cured Seafood/Fish (smoked salmon)
- Salads (Single leaf or Mixed)
- Vegetables (Whole/ Sliced/Diced)
- Fruit (Whole/Sliced/ Diced)
- Value Add Meat
- Carcass (Export only)





A natural alternative for ready-to-eat food shelf-life and safety

The use of SafePro[®] cultures in RTE foods is clearly aligned to the World Health Organisation Sustainability Goals, resulting in less food waste, reducing the need for damaging chemicals and improving quality and safety of food



BETTER FOOD PRODUCTION



Quality and safety



Efficient production



Less waste

LET'S TALK

A natural alternative to ready-to-eat food shelf-life and safety

Chr. Hansen is a global bioscience company that develops natural solutions for the food, nutritional, pharmaceutical and agricultural industries. We develop and produce cultures, enzymes, and probiotics for a rich variety of foods, beverages, dietary supplements and even animal feed.

Learn more at chr-hansen.com

Find and follow



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