

PRODUCT LEAFLET

FOOD SAFETY¹ – Shelf life and colour stability

Our FOOD SAFETY range includes various types of *engineered blends* to extend the microbial shelf life and colour stability of food products. Their excellent performance is based on well selected anti oxidative substances, very active anti microbial compounds and/or other various, well screened preservatives.

The FOOD SAFETY range helps you next to GMP to create products with increased shelf life and excellent colour and flavour. Important to know is that the FOOD SAFETY range does not create a negative off-flavour in the final product.

The growth of microorganism and pathogens in food can be slowed down by making use of GMP and by making use of the hurdle techniques as described by Leistner (Leistner, 1995; Leistner, 2000). These techniques are build in an intelligent way into the FOOD SAFETY range and are based on:

- Lowering of pH
- Lowering the water activity
- Contribution to the ionic strength
- Effect of an un-dissociated salt
- Preservative addition
- Reduced redox potentials

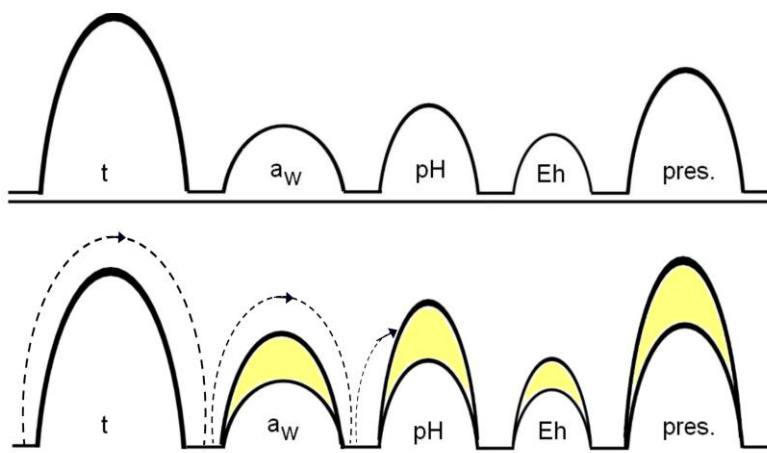


Figure 1: The Leistner Hurdle techniques to create significant better shelf life and food safety. The FOOD SAFETY range combines the hurdles in such an intelligent way that a multi-target, mild but reliable effect can be achieved.

The Leistner Hurdle technique employs the intelligent combination of different hurdles or preservation techniques to achieve multi-target, mild but reliable preservation effects. Hurdle technology provides a framework for combining a number of milder preservation techniques to achieve an enhanced level of product safety and stability. Next to ingredients that contribute to the Leistner hurdle techniques colour promoting or colour stabilizing agents can be included, making this range unique in terms of shelf life enhancement, colour stability and food safety.

¹ Within the SFINC Industry product range, in some countries PROTEK has the name FOODSAFETY.

PRODUCT LEAFLET

Overview of standard FOOD SAFETY product range

POWDER FORM

Name	Usage level	Effect
FOOD SAFETY	3 - 5 g/kg	Basic shelf life improvement for many food products.
FOOD SAFETY HP	16 g/kg	Advanced shelf life improvement mainly due to extra salts.
FOOD SAFETY KL	5 - 8 g/kg	Shelf life improvement and colour stability.
FOOD SAFETY KL A	5 – 8 g/kg	Shelf life improvement and extra colour stability.
FOOD SAFETY KL PLUS	5 – 8 g/kg	Shelf life improvement and colour stability based on other anti-oxidants compared to FOOD SAFETY KL.
FOOD SAFETY TOTAL	4 g/kg	Shelf life improvement and colour stability based on wider range of preservatives and anti-oxidants and salts. To be used in buffered systems due to low pH effect
FOOD SAFETY STR	5 g/kg	A white powder-blend as preservative for different type of meat products. This product contains sulphite.
FOOD SAFETY SFINC	5 - 7 g/kg	Shelf life improvement and colour stability mainly used on fresh meat and poultry to suppress pathogens. Not for cooked products.
FOOD SAFETY FM EXTRA	5 - 8 g/kg	Colour stability and shelf life improvement mainly used for fresh minced red meat.
FOOD SAFETY MEAL	5 - 8 g/kg	Conservation of meals. ²
FOOD SAFETY FISH	5 – 8 g/kg	Conservation of fish preparations. ¹
FOOD SAFETY ANTIOX F	5 g/kg	Excellent anti fat oxidation blend to add to meat products

LIQUIDS

Name	Usage level	Effect
ACETALACT REF191 25KG	10 g/kg	Mix of sodium lactate and sodium acetate to extend the microbiological shelf life of heated meat preparations and heated prepared meat under vacuum.
FOOD SAFETY PL 60	20 – 30 g/kg	Liquid potassium lactate with standard increased shelf life.
FOOD SAFETY SL 60	20 - 30 g/kg (pH 5,8) 5 – 10 g/kg (pH 3,5 – 5)	Liquid sodium lactate with standard increased shelf life.

Special *tailor-made blends* can be made in order to suit specific conditions. The R&D team of the SFINC group keeps on looking for new innovative solutions for shelf life extension and colour stability. For more information ask your local contact person.

² Please confirm within the applicable legislation if this product can be used in your final end product.

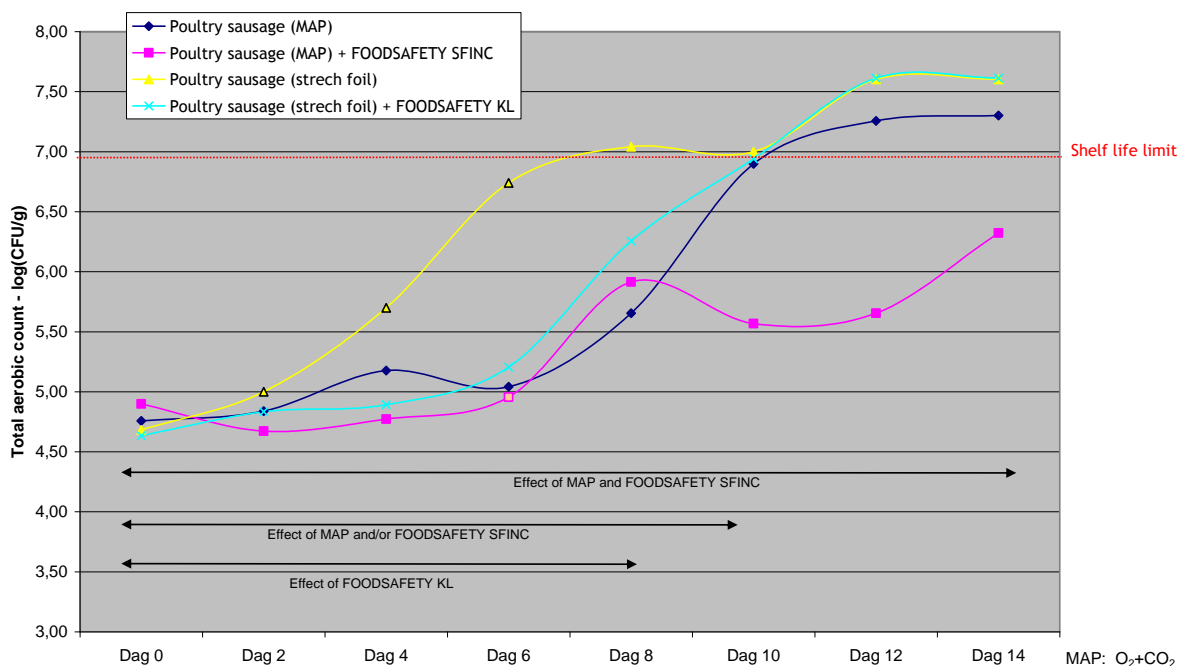
PRODUCT LEAFLET

RESEARCH AND DEVELOPMENT BY SFINC R&D

We develop innovative products and concepts based on scientific research, ingredients and additives knowledge, market and trend analysis and an intensive internal R&D activity. For our FOOD SAFETY product range, the SFINC group has done many tests to ensure that the products can bring what customers expect of it.

APPLICATION OF FOOD SAFETY RANGE IN FRESH POULTRY PRODUCTS

Graph 1 here below shows that several FOOD SAFETY products can help the prevention of the growth of micro-organisms but also the growth of moulds, yeasts and pathogens are suppressed! Specially the product FOOD SAFETY SFINC will lead to a significant reduction in the growth of pathogens like *Salmonella*, *Campylobacter*...



Graph 1: Shelf life of fresh poultry sausages by a combination of FOOD SAFETY products and packaging types. MAP: O₂+CO₂

CONCLUSION

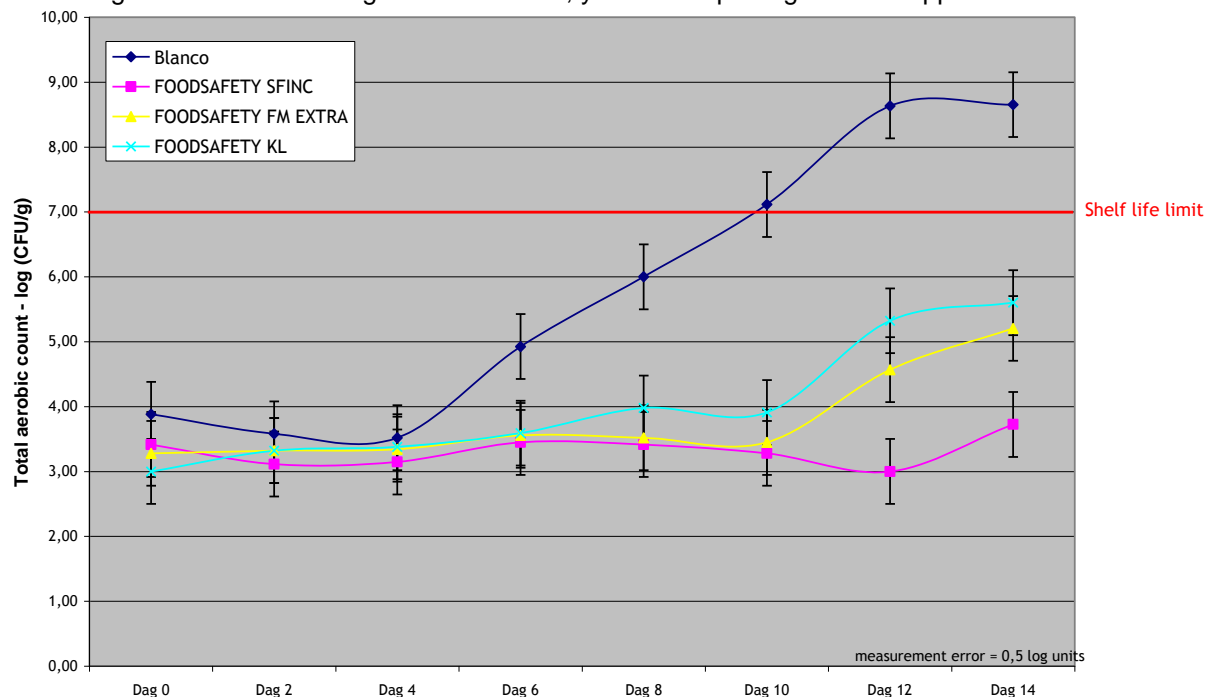
Graph 1 show that in these test conditions the use of several FOOD SAFETY products will lead to an increased shelf life by several days in fresh poultry products.

PRODUCT LEAFLET

APPLICATION OF FOOD SAFETY RANGE IN FRESH RED MEAT PRODUCTS

In fresh red (minced) meat, microbial growth (microbial shelf life) and oxidation of myoglobin (optical shelf life) are two critical facts that influence the total shelf life of the product:

Graph 2 here below shows that several FOOD SAFETY products can help the prevention of the growth of micro-organisms but also the growth of moulds, yeasts and pathogens are suppressed!



Graph 2: Aerobic mesophilic plate count of minced pork meat + 5 % water + 7g/kg FOOD SAFETY X application.

Figures 2,3 and 4 here below show that after 7 days, both fresh minced meat products with FOOD SAFETY added still have a bright red colour (as desired by the customer) in comparison with the blanco sample without the use of FOOD SAFETY.



Figure 2: Blanco sample packed in HiOx MAP packaging without FOOD SAFETY (result after 7 days).



Figure 3: Combination of FOOD SAFETY KL with HiOx MAP packaging (result after 7 days).



Figure 4: Perfect combination of FOOD SAFETY FM EXTRA with HiOx MAP packaging (after 7 days).

CONCLUSION

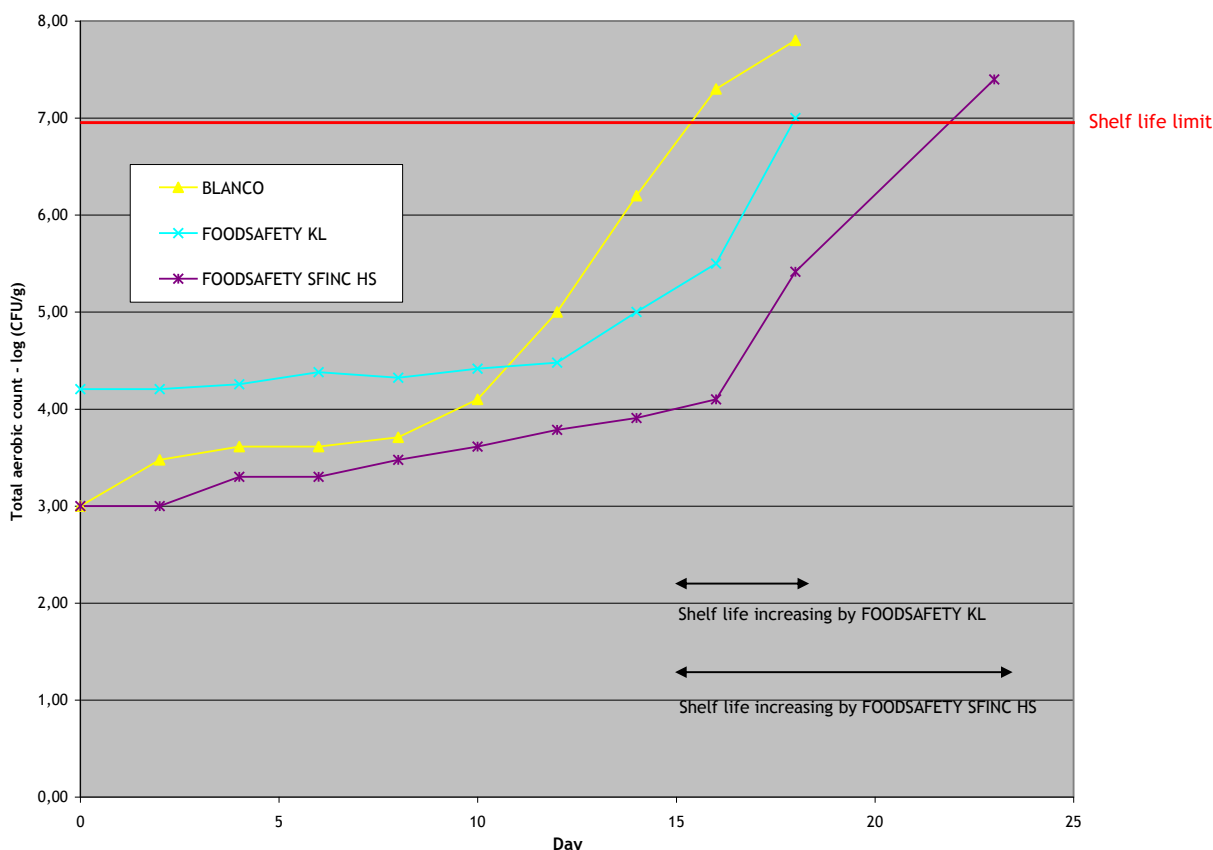
Graph 2 and figures 2, 3 and 4 shows that in these test conditions the use of several FOOD SAFETY products will lead to an increased colour stability and microbial shelf life by several days in minced pork meat.

PRODUCT LEAFLET

APPLICATION OF FOOD SAFETY RANGE IN COOKED PRODUCTS

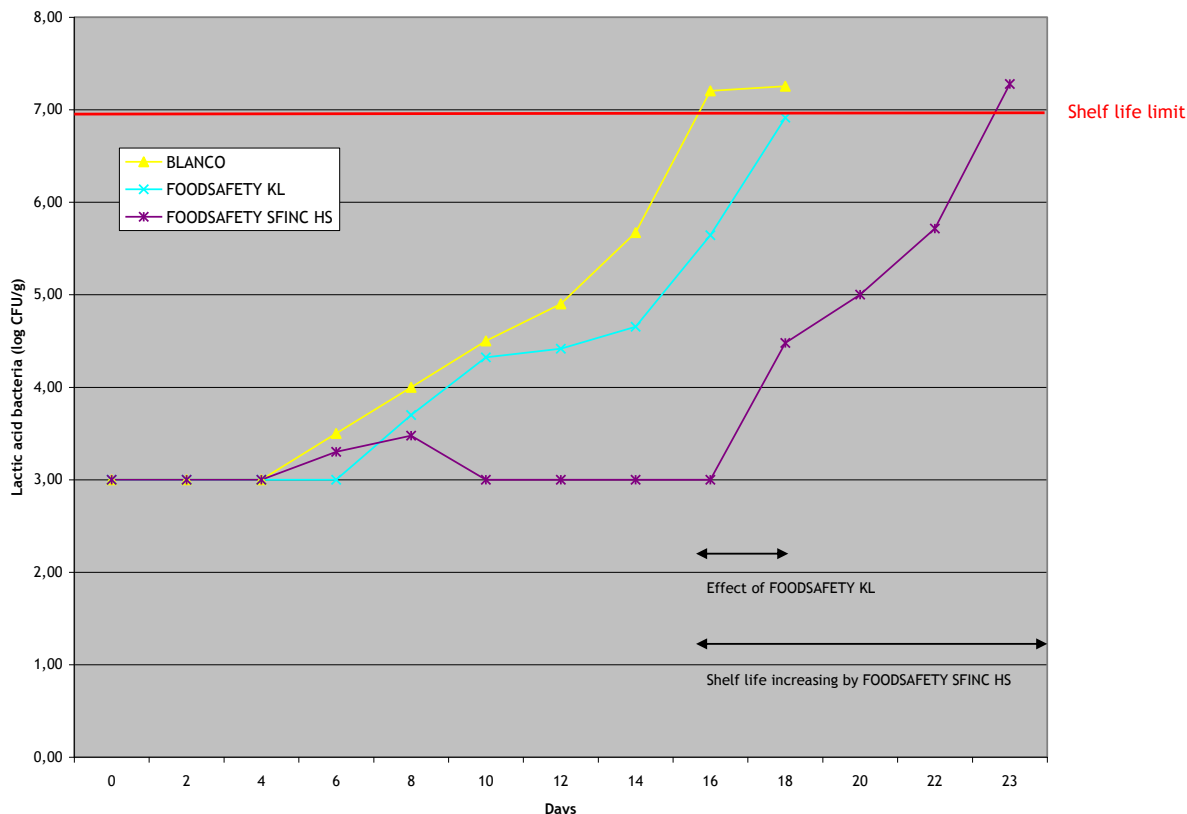
Besides for fresh meat, the FOOD SAFETY product range also contains special shelf life extenders for cooked products such as poultry breasts, frankfurters, cooked sausages, cooked ham and for dry fermented products ...

In graph 3 and 4 there can be seen that FOOD SAFETY KL and especially FOOD SAFETY SFINC HS (*still under further development*) can extend the shelf life for generally 3 to 7 days.



Graph 3: Effect of FOOD SAFETY KL and FOOD SAFETY SFINC HS on total aerobic count of unpacked cooked poultry breasts.

PRODUCT LEAFLET



Graph 4: Effect of FOOD SAFETY KL and FOOD SAFETY SFINC HS on lactobacilli count of unpacked cooked poultry breasts.

CONCLUSION

Graph 3 and 4 shows that in these test conditions the use of several FOOD SAFETY products in cooked meat products will lead to a significant increased shelf life by several days.