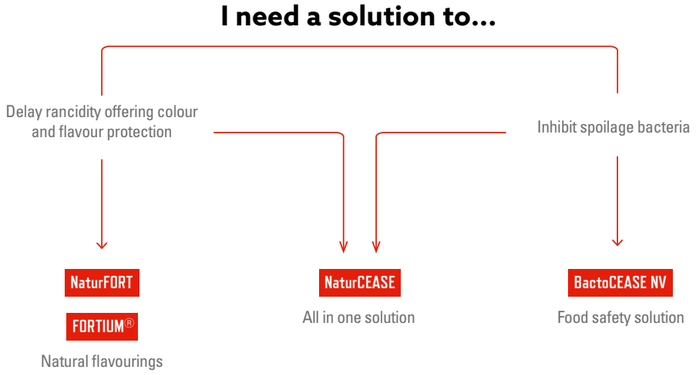
PRODUCTS

NATURCEASE™ DRY
An all in one solution consisting of buffered vinegar and natural plant extracts to protect meat products against oxidative rancidity and microbial spoilage.

BACTOCEASE® NV DRY & LIQUID
A dry or liquid buffered vinegar product made with natural ingredients and providing a balanced flavour profile that can be added to processed meat, poultry and fish products as well as deli salads. An organic liquid version is also available.

NATURFORT™ 12 DRY
A natural plant extract combination of rosemary and green tea extract with a balanced flavour profile.

DECISION TREE



CUSTOMER LABORATORY SERVICES

Kemin's **Customer Laboratory Services (CLS)** team uses their technical expertise and problem solving skills to uncover the source of a problem and **develop a tailored solution**. The CLS team provides dedicated support throughout all phases of testing to understand the influences of all food ingredients on the stability of your final product to keep it safe and fresh.

Our research scientists evaluate the **oxidative and microbial stability** of your food products using a combination of analytical techniques and accelerated oxidation tests. We work with you to determine your desired project objectives and the best protocol to provide you with customised shelf life solutions.

Scan the QR code for a video about CLS services

PTP-1842

REFERENCES

1) Wold, J. P. and Mielnik, M., (2000). Nondestructive assesment of lipid oxidation in minced poultry meat bu autofluorescence spectroscopy. Journal of Food Science, 65 (1), 87-95.

2) Tarladgis, B. G., Watts, B. M., Younathan, N. T. and Dugan, L., (1960). A distillation method for the quantitative determination of malonaldehyde in rancid foods. Journal of the American Oil Chemists Society, 37, 44-48.

3) Campo, M. M., Nute, G. R., Hughes, S. I. Enser, M., Wood, J. D. and Richardson, R.I., (2006). Flavour perception of oxidation in beef. Meat Science, 72, 303-311.

4) Greene, B. E. and Cumuze, T.H., (1981). Relationship between TBA numbers and inexperienced panellists' assesments of oxidized flavor in cooked beef. Journal of Food Science, 47, 52-54.

5) Sallam, K.I., (2007). Antimicrobial and antioxidant effects of sodium acetate, sodium lactate, and sodium citrate in refrigerated sliced salmon. Food Control, 18, 566-575.

6) RASFF consumers portal: https://webgate.ec.europa.eu/rasff-window/consumers/

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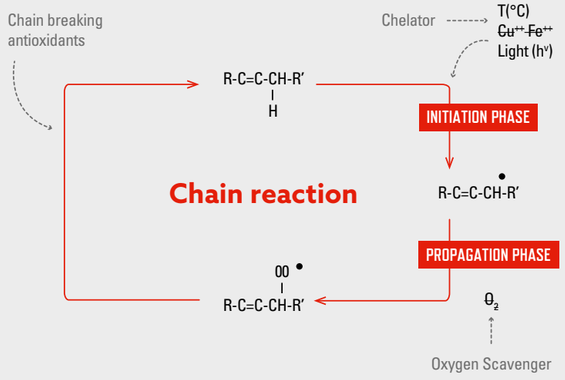
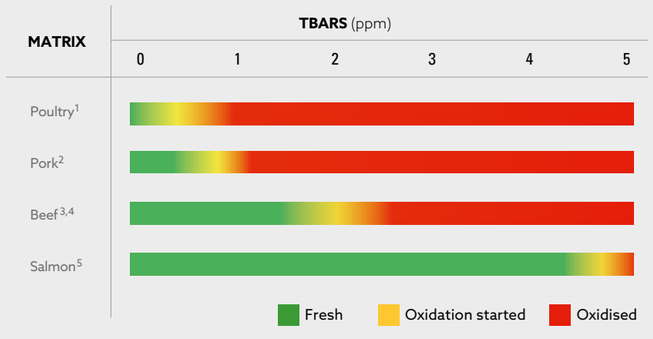
OXIDATION



Kemin products delay oxidation at multiple sites of the chain reaction

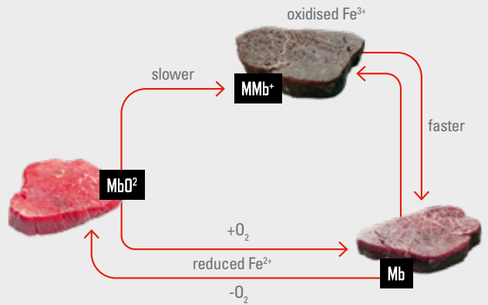


Meat oxidation is evaluated by secondary oxidation products that react with thiobarbituric acid (TBARS). TBARS values are highly correlated with sensorial rancidity.

COLOUR

"COLOUR IS THE DECISION-MAKING PARAMETER FOR CONSUMERS WHEN SELECTING MEAT"

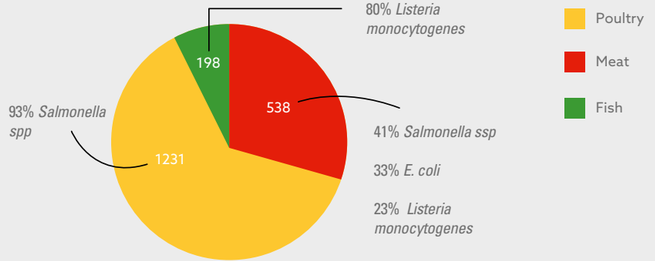
Schematic of myoglobin redox interconversions on the surface of meat.

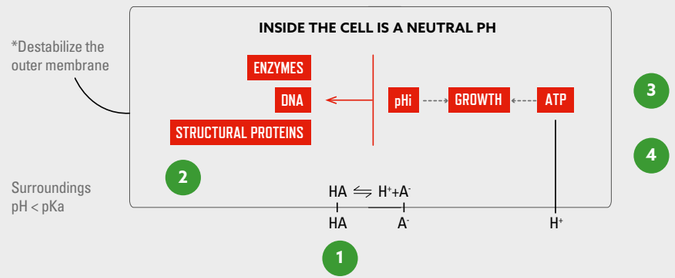


Because visual assessment of colour is subjective, objective L* a* b* values using a HunterLab colourflex® Instrument are used to measure colour.

MICROBIOLOGY

Recalls and health warnings due to microbial contamination (EU 2014-2019[6])





1. Undissociated form of the organic acid enters bacterial cell wall
2. Undissociated form enter high pH environment and dissociates: formation of H^+ and A^-
3. Cell resists the change by using part of its energy pumping out H^+ and A^- ions
4. Because less energy for growth, bacterial cell growth is inhibited