



**VivOX 4**

**Longer shelf  
life and better  
meat products,  
naturally**

*Average fat content of meat products range from 5 to 30 %. Fat spoilage known as rancidity, changes the flavor profile and overall quality of meat to a great extent.*

Unwanted oxidation changes of fat and fat soluble components can be significantly reduced by using oil-soluble, water-dispersible and heat stable natural rosemary extract formulations from VivOX family of products.



Table 1: **VivOX Meat Application Areas**

| TYPE OF PRODUCT  | INGREDIENT       | USAGE LEVEL | APPLICATION   |
|--|------------------|-------------|---|
| <ul style="list-style-type: none"> <li>» Ham</li> <li>» Salami</li> <li>» Sausages (dry, fermented etc.)</li> <li>» Mortadella</li> <li>» Bologna (similar types of cooked sausages)</li> <li>» Frankfurter</li> <li>» Hot dogs</li> <li>» Fried products (i.e. schnitzel, nuggets)</li> <li>» and more</li> </ul> | VivOX 4 (302510) | 1 g/kg      | For injection: dissolve into injection brine, mix well  |
|  |                  |             | For tumbling: mix with seasonings and apply   |
|  |                  |             | Mix with actual seasonings and add directly to the blender                                      |
|  |                  |             | Dry blends: mix with seasonings (if applicable) or/and add directly to the blender/mixer/mincer |
|  |                  |             | For batter: mix with bread crumbs/seasoning and proceed as usual                                |
|  |                  |             | For spraying: mix with seasoning/liquid and apply   |

\*In addition to VivOX 4 (302510), Frutarom is offering other customized solutions that fit specific product needs and processing conditions.

## Test Protocol

VivOX 4 (302510) was tested in:

- » dry salami,
- » pre-fried frozen chicken Cordon Bleu.

Dry salami was dosed with VivOX 4 (302510) at a concentration 0,1 %. The comparison products were competitor's sample and sodium ascorbate. Dosage as per supplier's recommendation. Controls contained no antioxidant.

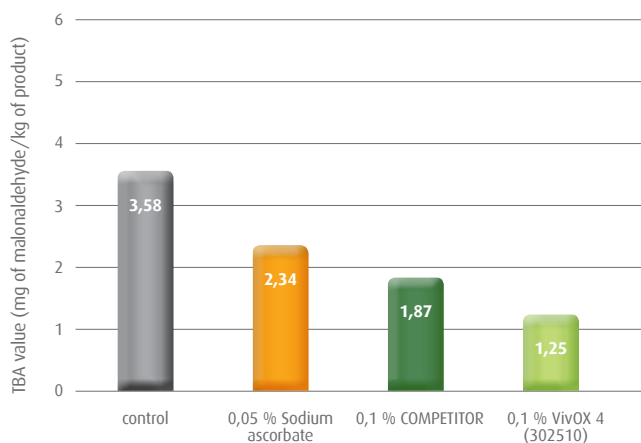
Pre-fried frozen chicken Cordon Bleu was dosed with VivOX 4 (302510) at a concentration 0,1 %. The comparison products were competitor's sample and sodium ascorbate. Dosage as per supplier's recommendation. Controls contained no antioxidant.

### Oxidation inhibition was measured by TBA test.

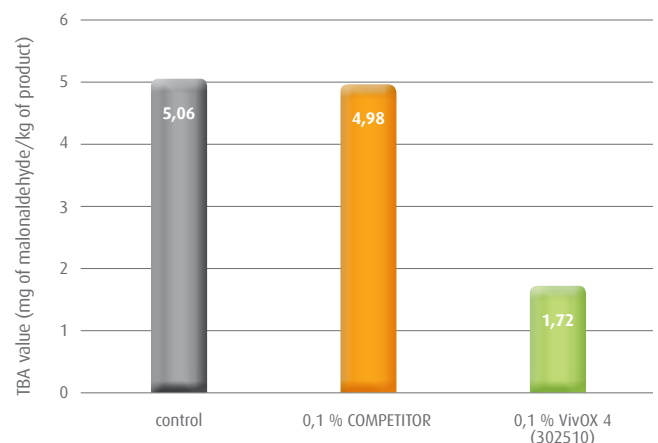
- » For dry sausage: 5 months after ripening, storage at 16°C.
- » For frozen chicken Cordon Bleu: after 6 months storage at -18°C.

## Results

Graph 1: **TBA test results for salami**



Graph 2: **TBA test results for Cordon Bleu**





## Conclusion

VivOX 4 (302510) effectively protects meat products from rancidity, already at low dosages of 20-40 ppm of active ingredient (0,05 - 0,1 %).

Addition of VivOX 4 (302510) extends the shelf life of salami up to twelve-fold and to chicken Cordon Bleu up to two fold.

While providing the benefit of protection, at the same time there was no negative change of taste, odor or other organoleptic properties of dry salami and chicken Cordon Bleu. Moreover, significant WOF (warmed over flavor) reduction was clearly noticed in chicken Cordon Bleu.

## Benefits

The benefits of using VivOX 4 (302510) and other VivOX products for meat applications are:

- » shelf life extension naturally,
- » fresher taste of the products,
- » better oxidation management and product market positioning,
- » no negative organoleptic change of treated products,
- » 100 % natural non – allergenic formulation,
- » various meat processing technological demands such as:
  - meat injection,
  - thermally processed sausages,
  - salami production,
  - injection procedure,
  - dry salting and tumbling procedure,
  - spice blend formulations and more.



## Regulatory

» For legislation status and additional labelling advices, please contact us at [foodprotection@frutarom.com](mailto:foodprotection@frutarom.com).



**FOOD PROTECTION**



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