



**IN**  **LENS**

**Longer shelf  
life of your fine  
bakery products,  
naturally**

*Bakery products, especially the enriched ones, are important part of daily diet, providing consumer with sufficient intake of complex carbohydrates, fibers, minerals and vitamins.*

Due to composition and high fat content, products which are especially prone to oxidation are:

- » butter cookies high in fat content,
- » seeds and nuts enriched cookies,
- » croissants and similar pastry products,
- » toast breads and more.

Rancidity is frequently manifested as an unpleasant change of taste, odor and color. It can occur early, at warehousing and processing stage, or later, on the retail shelf in the store.



To help prevent or slowdown rancidity problems, Frutarom is offering a variety of oxidation management solutions from INOLENS family of products.

Table 1: INOLENS Bakery Application Areas

TYPE	PROCESSING NEED	PRODUCT	RECOMMENDED USAGE LEVEL	APPLICATION
Cookies, cakes, biscuits, cereal bars, pastries, pies, scones, cornets, wafers, crackers and more	Add to dry mix	INOLENS 12 (301888)	0,3 g/kg	Add to flour and other dry ingredients, mix well
	Add to liquid phase	INOLENS 4 (301779)	1 g/kg	Add to the fats / oils and mix well
	Add to dry mix	INOLENS 4 (301894)	1 g/kg	Add to flour and other dry ingredients, mix well

## Test protocol

### Activity of INOLENS 12 (301888) was tested in:

- » croissants,
- » butter cookies.

INOLENS 12 (301888) was dosed to flour in concentrations of 0,015 % and 0,03 %. Ascorbic acid was used as a “gold standard” at 0,05 %, following good manufacturing practice. Controls contained no antioxidant.

### Storage conditions:

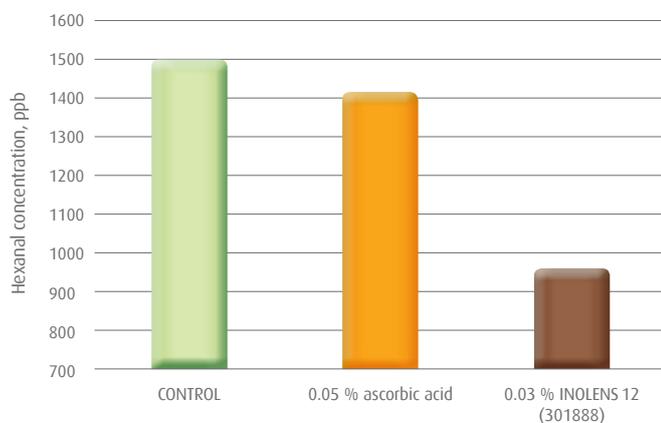
- » croissants were stored in plastic foil at room temperature and relative air humidity of 50-55 %,
- » butter cookies were stored in plastic boxes at room temperature and relative air humidity of 50-55 %.

### Oxidative changes were measured by Hexanal test.

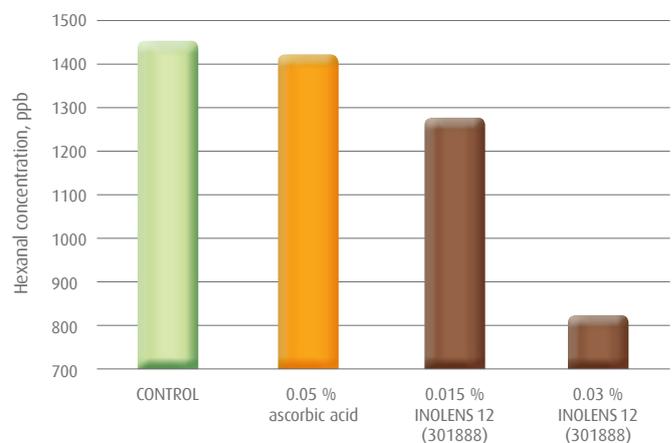
- » For croissants: 14 days after production.
- » For cookies: one, six and ten months after production.

## Results

Graph 1: Results of hexanal concentration in croissants without antioxidant (control) and in croissants with addition of ascorbic acid and INOLENS 12 (301888) after 14 days of storage



Graph 2: Results of hexanal concentration in butter cookies without antioxidant (control) and butter cookies with addition of ascorbic acid and INOLENS 12 (301888) after 10 months





## Conclusion

At usage level as low 0,03 % of INOLENS 12 (301888) in croissants and butter cookies, rancidity of products is greatly reduced comparing to non-treated control and product with addition of ascorbic acid. Shelf life can be extended up to two fold.

While providing the benefit of protection, at the same time there was no negative change of taste, odor and other organoleptic properties of croissants and butter cookies.

## Benefits

Benefits of using INOLENS 12 (301888) and other INOLENS products for bakery applications are:

- » shelf life extension naturally,
- » better oxidation management and product market positioning,
- » fresher taste of products,
- » 100 % natural non-allergenic formulations.

## Legislation status and labeling:

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





**FOOD PROTECTION**



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