



Modified Atmosphere Packaging

Baked Goods

Extend Shelf Life with Linde

The most common shelf-life issues encountered in baked goods are mold, staling, and, to a lesser extent, rancidity and swelling. These are most commonly addressed through a combination of modified atmosphere, mold inhibitors and packaging barriers. For baked foods, mold is the most prevalent shelf-life issue due to the low water activity of baked goods.

Reducing product storage temperature and controlling water activity are just the beginning and may have both cost limitations and negative sensory considerations. Applying modified atmospheres and using appropriate packaging barriers, MAP offers the possibility of further extending shelf life. With gas mixtures of carbon dioxide (CO₂) and nitrogen (N₂) Linde has the right mix to get the greatest shelf life for your product.

The Right Atmosphere for Your Product

Carbon dioxide has an inhibitory effect on microbial growth. Since the gas solubility increases as product temperature is lowered, the effectiveness of the CO₂ application increases as the temperature is lowered. Nitrogen, an inert gas, is used to displace oxygen and reduce oxidative reactions that degrade fat, flavor, appearance and texture. Specific blends of carbon dioxide and nitrogen must be determined for individual product types. The combination of package barrier and food formulation properties can vary considerably.

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|-----------------|---|--|
| Features | → Proven gas mixtures for bakery products | → Gas purging and delivery equipment expertise |
| | → Convenient, reliable supply | → Laboratory testing for new formulations |
| Benefits | → Increase shelf life | → Excellent mold control |
| | → Widen distribution opportunities | → Reduce staling and expired product |

Major Food Products	Gas Mixture			Recommended Storage Temperature	Typical Shelf Life	Linde MAP Shelf Life
	N ₂	O ₂	CO ₂			
White Pan Bread	●		●	Ambient	5-6 Days	14-18 days
Waffles	●		●	Ambient	3-4 Days	20 days
Doughnuts	●		●	Ambient	7 Days	20 days
Fruit Pies	●		●	Ambient	7 Days	14 days
Cakes	●		●	Ambient	7 Days	20 days
Rolls	●		●	Ambient	3 Days	14 days
Cheesecake	●		●	Ambient	7 Days	14 days
Muffins	●		●	Ambient	3-4 Days	20 days
Potato Chips	●			Ambient	6 weeks	12 weeks

**A Wealth of Experience
and Support**

Years of food research at our technology center have identified the ideal modified atmosphere conditions for a broad range of bakery products. When you choose Linde, you're selecting more than the largest supplier of industrial gases in North and South America.

**Contact Linde
Today**

For more information about baking applications that benefit from processing with gas mixtures, call **1-844-44LINDE** or visit our website at www.linde.com.

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