BRENNTAG
FOOD & NUTRITION

SENSE THE DIFFERENCE

Antioxidants & Preservatives

Brenntag Food & Nutrition North America

www.brenntag.com/food-nutrition

Antioxidants & Preservatives

Preservatives can be grouped into two main categories: 1) antimicrobials that block the growth of bacteria, molds and/or yeasts; and 2) antioxidants that prevent or slow the oxidation of fats and lipids. Preservatives can be natural or synthetic and are used in almost all processed foods. Salt and sugar have been used as preservatives since ancient times. Overall, preservatives and antioxidants are used to assure that our foods are safe, appealing, taste fresh and, can be transported and stored throughout the country.

	PRESERVATIVE	FORM	PRESERVATIVE ACTIVITY	NATURAL STATUS	GRAS	PH	HEAT STABLE	USAGE LEVEL	KEY FUNCTIONAL PROPERTIES / COMMENTS	POTENTIAL APPLICATIONS
ANTIMICROBIALS	Sorbates	Potassium Sorbate, Sorbic Acid	Yeast, Molds, Select Bacteria	N	Y	4.0-6.5	Y	Max 0.1%	Breaks down to Sorbic Acid	Dairy products, cheese, cakes, pies, beverages, vegetables, pet foods, dressings
	Benzoates	Sodium Benzoate, Benzoic Acid	Yeast, Molds, Select Molds	N	Y	2.5-4.5	Y	Max 0.1%	Breaks down to Benzoic Acid which inhibits the growth of microorganisms	Fruit products, beverages, dressings, pie fillings, icings, salads, jams, jellies; Most effective in low pH foods
	Parabens	Methyl and Propyl Parabens	Bacteria, Fungi	N	Y	3.0-8.0	Y	Max 0.1%	More effective than Benzoates and Sorbates at higher pH ranges	Bakery products (non-yeast), beverages, flavor extracts, food colors, fruit products, gelatin, fish, pickles, dressings
	Propionates	Propionic Acid, Sodium, and Calcium Propionates	Molds, Rope Bacteria	N	Y	4.0-5.5	Y	Max 0.4%	No action against yeast, so can be used in bakery products with yeast	Breads, pizza crusts, puddings, gelatins, jams, meats, cheeses
	Nitrites	Sodium and Potassium Nitrite	Bacteria	N	Y	up to 6.0	Y	Max 0.5%	Used to prevent the growth of Clostridium botulinum, preserves color	Cured meats such as bacon, hams, luncheon meats, sausage, poultry
	Sulfites	Sulfur Dioxide (gas), Bisulfites and Metabisulfites	Yeast, Fungi, Bacteria, Molds	N	Y	up to 4.0	Y	Max 0.03%	Antimicrobial agent, bleaching agent, and dough conditioner (all forms yield sulfur dioxide which increases the pH of food)	Wines, seafood, leafy green vegetables, dried fruits (to preserve color)
	Other Acidulants	Acetic/Glacial, Malic, Citric, Fumaric, Phosphoric, Lactic, Succinic and Tartaric Acids, GDL	Bacteria, Yeast, Molds	Some	Y	less than 5.0	Y	Varied	Lowers pH to prevent growth of certain microorganisms	Meat, poultry, fish, beverages, dressings, confections, dairy products, baked goods, flavors, seasonings
	Acetates	Sodium Acetate, Sodium Diacetate	Bacteria, Molds	N	Y	less than 5.0	Y	Max 2.0%	Lowers pH to prevent growth of certain microorganisms	Baked goods, cheese, meat products
	Natural Preservatives	NaCl, KCl, Rosemary Extract, Green Tea Extract, Chitosan, Raisin/Prune Juice Concentrates	Bacteria	Y	Y	up to 5.5	Y	>10%	Causes dehydration and modifies osmolality of foods which kills bacteria	Meats, poultry, seafood, pickles, sauces
	Sweeteners	Fructose, Sucrose, Dextrose, Invert Sugar, Honey	Bacteria	Y	Y	5.0-11.0	Y	>50%	Modifies the osmolality of foods which kills bacteria	Fruit products, beverages, jellies, jams, sauces
ANTIOXIDANTS	Ascorbate	Ascorbic Acid, Sodium Ascorbate, Calcium Ascorbate		N	Y	>5.0	N	Varies	Prevention of discoloration, lowers pH to prevent growth of microorganisms	Beverages, fruits, vegetables, meats, dough
	Erythorbate	Erythorbic Acid, Sodium Erythorbate		Some	Y	5.5-5.8	Y	Max 0.03%	Works in conjuntion with nitrites in meat preservation systems	Meats, beverage
	Tocopherols	Mixed Tocopherols, alpha-Tocopherol		Y	Y	2.5-8.0	Y	Max 0.06%	Prevent rancidity of fats	Oils, pet foods
	Rosemary Extract	Rosemary Extract 10%		Y	N/Y	2.5-8.0	Y	Max 0.5%	Inhibit fat oxidation in food, effective when used in conjunction with BHT/BHA, GRAS when used as a flavor/not GRAS when used as a preservative	Pet foods, meats
	BHT/ BHA/TBHQ	BHT/ BHA/ TBHQ		N	Y	2.5-8.0	N	Max 0.02%	Prevent rancidity of fats	Cereals, meats, pet foods, oils
	Propyl Gallate	Propyl Gallate		Some	Y	2.5-8.0	Y	100-200 ppm	Prevent rancidity of fats	Oils, dressing, sauces, confectionery, meats
	EDTA	Calcium and DiSodium EDTA		N	Y	6.5-7.5 Ca or 4.3-4.7 Na	Y	Max 0.01%	Sequesters minerals to prevent discoloration	Canned foods, dressings, sauces, margarine, beer, juice

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Edition #10