

Acidity regulators: The multi-task players

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Previous articles of this series highlighted preservatives and antioxidants, two food additives that are familiar to most informed consumers. The present issue deals with acidity regulators and acidifiers, a less well known, but not less important food additive used to give a sour taste to food and to act as a preservative. Some acidifiers also act as stabilizers, others help antioxidants or emulsifiers, or assist in colour retention. It may seem a minor parameter, but to maintain the appropriate pH is the first step to ensure food safety and a longer shelf life.

The importance of pH

Selected pHs	
Stomach acid	1.2-3.0
Lemon	2.2-2.4
Apple	2.9-3.3
Milk	6.3-6.6
Egg white	7.6-8.0
Baking soda	8.3-8.7

The pH of a food is the measure of that product's acidity or alkalinity. The pH-scale ranges from 0 to 14. A pH less than 7 is acidic, a pH of 7 is neutral and a pH greater than 7 is alkaline or basic. Our sense of taste can recognize only major differences in the pH within complex food systems. An acid product would taste sour, while an alkaline product would taste bitter. Some examples of acid foods are citrus fruits (e.g. orange, lemon, grapefruit), juices or yoghurt. Examples of alkaline products are egg white and baking soda.

Acidity regulators are used to alter and control the acidity or alkalinity on a specific level important for processing, taste and food safety. Inadequate control of the pH can result in the growth of undesirable bacteria in the product that could be a potential health hazard.

Acidified foods and acidification

Acidification is one means of preserving food products. In addition to preventing bacteria growth, acidification helps maintain a desired product quality. Cucumbers, artichokes, cauliflower, peppers and fish are examples of low-acid foods that are normally acidified. If acidification is not adequately controlled at a pH of 4.6 or below, *Clostridium botulinum*, a dangerous toxin-producing micro-organism, can grow in certain foods.

Examples of acidity regulators in the EU

Citric acid (E 330) enhances the activity of many antioxidants, but is no antioxidant by itself. It is mainly used as an acidity regulator as well as aroma compound. In addition it increases gel consistency in marmalades and decreases enzymatic browning in fruits and fruit products.

Calcium acetate (E 263) has several functions. It is used in some foods as a thickening agent (cake mixtures, puddings, pie fillings), but can act as a buffer in controlling the pH of food during processing, as a preservative to prevent microbial growth, and as a calcium supplement in pet products.

Fumaric acid (E 297) is added to foods as an acidity regulator and flavouring agent. They are used in bread, fruit drinks, pie fillings, poultry, wine, jams, jelly.

E-Number	Substance	Some foodstuffs in which they are used
E 260	Acetic acid	fish fingers, butter, margarine, processed cheese, curry powder, cooking oil.
E263	Calcium acetate	packet desserts, pie fillings
E 270	Lactic acid	cheese, milk, meat and poultry, salads, sauces and beverages
E 296	Malic acid	tinned fruit, vegetables and pulses, jams, jelly, frozen vegetables
E 297	Fumaric acid	bread, fruit drinks, pie fillings, poultry, wine, jams, jelly
E 330	Citric acid	fruits and vegetables (lemons and limes), soft drinks
E 334	Tartaric acid	bakery, candies, jams, juices and wine

Legislation

Acidity regulators are subject, just like any other food additive, to stringent EU legislation governing authorisation, use and labelling, Directive 95/2/EC of the European Parliament and the Council of 20 February 1995 on Food Additives other than Colours and Sweeteners. This legislation requires all added acidity regulators, as all food additives, to be declared on food packaging by their category with either their name or E-number.

More information

1. Directive 95/2/EC of the European Parliament and the Council of 20 February 1995 on Food Additives other than Colours and Sweeteners: https://www.fsai.ie/uploadedFiles/95_2_EC.pdf
2. General information on food additives (rules on labelling of additives, intake, etc):
3. https://ec.europa.eu/food/safety/food_improvement_agents/additives_en
4. [Backgrounder on food additives](#)
5. <http://www.efsa.europa.eu/>
6. <http://www.codexalimentarius.net>
7. [The E-number listing for additives](#)