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EDITORIAL

On the Utility and Safety of Food Additives

A food additive is any substance that is deliberately added to foods to yield specific desirable effects such as preservation and organoleptic attributes. These conferred attributes are crucial in the marketability, acceptability, aesthetics, shelf life and value enhancement of foods. Food additives have been in use by mankind since antiquity. The Egyptians coloured food with saffron, while the Romans added alum (potassium aluminum sulfate) to whiten it. Interestingly, in the 19th century, bakers in England used alum to make bread whiter and bulkier. The Indians used spices (curries) in food preservation and traded in the same with other continents, thus resulting in the renowned inbound caravans from Europe. Salting was so effective and highly valued to the extent of being applied as 'payment/wages' among the Romans. Actually, the word 'salary' bears its etymology (Roman, '*sal*') form this practice. The deliberate use of salt to preserve fish and meat, through dehydration was commonly used in diverse cultures. Traditional methods for food preservation include pickling with vinegar, salting, smoking, sugaring and alcoholization.

The advent of industrial kitchens in modern manufacturing ushered in the era of legally sanctioned food additives. These modernized highly organized and sophisticated kitchens apply science in raw materials, processing, packaging, storage, transport and preservation. In this context, preservatives are used to conserve the chemical and microbial integrity of food products. These comprise anti-oxidants (sodium metabisulfite, ascorbic acid) and antimicrobials (sodium benzoate) that prevent food spoilage. Nitrites and nitrates in processed meats (bacon, ham, corned beef) keep their red appearance, develops the 'cured' flavor and confer antimicrobial effects. Artificial sweeteners (aspartame, acesulfame potassium) on the other hand are employed for enhanced palatability and limited calorie contribution for weight conscious users. Buffering agents maintain the right acidity for stability while colours are added to enhance visual appeal and hence elevate consumer attraction. Other substances employed in the food industry include bulking agents and fortifiers (vitamins, minerals, herbs), humectants (to prevent drying out), thickeners (to increase viscosity and improve consistency) as well as acidulants such as vinegar, citric acid and lactic acid that confer sour or acid taste.

Despite their popularity, food additives have been associated with numerous untoward effects. Reported side effects include hyperacidity in children, allergenicity, asthma, digestive disorders, mental health disorders, cardiovascular disease and weight gain. Additionally, some compounds have been associated with carcinogenicity. The World Health Organization (WHO) in collaboration with Food and Agriculture Organization (FAO) carries out risk assessment of food additives to ensure their safety. This is typically performed thorough review of underlying science (including biochemical, toxicological, and other relevant data), law enforcement and investigation of reported problems. Consequently, several food additives including Red Dye 3, potassium bromate and brominated vegetable oil have been banned and withdrawn in the United States of America, the United Kingdom and the European Union.

In light of the foregoing, potassium bromate is utilized in the baking industry to strengthen dough and enhance its texture. Nevertheless, there is controversy concerning the safety of this reagent with claims of carcinogenic potential owing to its oxidative activity. Consequently, the substance is banned in most countries based on its toxicological profile which supports its avoidance in foods. Despite this drawback, the use of this substance is still legal in several countries. Acute symptoms of high potassium bromate levels in bread have been reported as diarrhea, coughing, vomiting and digestive tract irritation. In this issue of the journal Magoiga *et al.* have demonstrated the occurrence of excessive potassium bromate in breads marketed in Mwanza and Kagera regions of Tanzania. The article is a revelation for most food

researchers and consumers on the quality and safety of bakery products in the market, and a stark reminder of the critical role played by regulatory authorities in developing countries regarding food safety.

The persistent use of unsafe food additives in third world countries may be attributed to poor regulatory frameworks, lack of consumer information and education, scanty label declaration and obscured safety profiles of specific additives. Deliberate legislation and regulatory sanctions should therefore be instituted in order to protect the unsuspecting public from the dangers of inappropriate food additives. Commonly, religious alliances, 'healthy living' pressure groups and public health promotions make statements about unhealthy processed foods without providing specific information on the pernicious materials. Despite the foregoing, it appears that food additives are here to stay, hence the perpetual need to ensure their safety and sanctioning of unscrupulous non-compliant dealers in the market. Furthermore, these substances should be constantly monitored in market surveillance studies to reveal any interactions and reactions that may produce toxicity.

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