

## About Sulphite Food Preservatives

In my mid-twenties, I started having severe allergic reactions, which began taking a toll on my overall health. My G.P. referred me to an allergy clinic and I underwent a series of tests, but the results were inconclusive. Meanwhile, I was having repeated, potentially life threatening reactions called anaphylaxis and taking lots of time off work. I was given adrenaline to carry and had to get a special, emergency bracelet inscribed with medical information in the event that I collapsed. After keeping a detailed food diary, I went into hospital, was put on a drip and fed suspect foods to see if they could determine the cause of my problems. The first of these tests didn't result in an attack, but the second one did.

I started not being able to breathe, itching and feeling faint after being fed a teaspoon of strawberry jam! This resulted in the diagnosis of sulphite sensitivity. I was given a list of foods containing sulphites to avoid. I found that many common foods and drinks had to be completely eliminated from my diet. At first it was all pretty daunting, I couldn't eat most breads, any food item containing vinegar such as mayonnaise, pickles or sauces. Processed potatoes, potato starches, anything containing stock cubes or dried onions, mushrooms or garlic were also forbidden. Wine, beer, frozen sea food, dried fruits, fruit yoghurts, bottled lemon juice, fruit juices, jams and sausages were also problematic as well as foods and drinks containing the colour caramel (E150). I even discovered (by having reactions) that sulphites can be added to something and not labelled. At first, it took me ages to go shopping, I'd have to pick every item up and check the labels (quite often I'd get followed around by store detectives wondering what I was doing). I also found eating lunches at work really hard and had to prepare meals to take with me.

Sulphites consist of a group of sulphur-based chemicals, including sulphur dioxide (SO<sub>2</sub>). Currently in the UK, food additives subject to regulatory control under The Miscellaneous Food Additives Regulations (HMSO, 1995) act are represented by E numbers. Hence in the UK, sulphites are represented by E220 – E228, excluding E225. In brief, sulphites are widely regarded as antioxidants that prevent the spoilage of foods by rendering oxygen unavailable so preventing browning. They also limit the growth of undesirable species of microorganisms.

E Number	Name
E220	Sulphur dioxide
E221	Sodium sulphite
E222	Sodium hydrogen sulphite
E223	Sodium metabisulphite
E224	Potassium metabisulphite
E226	Calcium sulphite
E227	Calcium hydrogen sulphite
E228	Potassium hydrogen sulphite

Table 1: E numbers and names of sulphite food preservatives in use in the UK.

A number of other E numbers contain sulphite chemicals (see table 2). However, these are not normally referred to as sulphites.

E Number	Name
E150b	Caustic sulphite caramel
E150d	Sulphite ammonia caramel

Table 2: E numbers in use in the UK that contain sulphites.

The chemical formulae of the most commonly used sulphites and bisulphite (which forms part of metabisulphite) are detailed in table 3.

E Number and/or Name	Chemical Formula
Sulphur dioxide (E220)	SO <sub>2</sub>
Sodium sulphite (E221)	Na <sub>2</sub> SO <sub>3</sub>
Sodium hydrogen sulphite (E222)	NaHSO <sub>3</sub>
Sodium metabisulphite (E223)	Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub>
Potassium metabisulphite (E224)	K <sub>2</sub> S <sub>2</sub> O <sub>5</sub>
Potassium hydrogen sulphite (E228)	KHSO <sub>3</sub>
Bisulphite	HSO <sub>3</sub>

Table 3: Chemical formulae for common sulphites and sulphite related chemicals.

Sulphites can also occur naturally in foods and drinks e.g. *saccharomyces cerevisiae* generates between 1–30 parts per million (ppm) SO<sub>2</sub> in wine fermentation and some strains produce in excess of 100 ppm Vena et al., (1994). It is also important to note that the human body generates sulphites endogenously through the metabolism of sulphur-based amino acids Twarog et al.,(1982) and Baker et al.,(1981). It is known that sulphites destroy thiamine (vitamin B1) Gunnison & Jacobsen (1987).

Sulphur dioxide (SO<sub>2</sub>) has been used for many thousands of years across the world in various civilisations. Bush et al., (1986) report that the ancient Greeks used SO<sub>2</sub> to fumigate dwellings. It is also noted that the Egyptians and Romans used SO<sub>2</sub> to clean containers used to store wine. The first reported use of SO<sub>2</sub> as a preservative dates from 1664 when Evelyn (1664), writing a document about fruit trees, notes that SO<sub>2</sub> was used in UK cider production to reduce spoilage.

It is now acknowledged by most authorities, including the World Health Organisation that sulphites are not safe for all. This is because there have been numerous studies that have demonstrated that sulphite preservatives can cause asthma, anaphylaxis and contact allergy and are also acknowledged to have caused a number of deaths in the USA and Canada. The true preva-

lence of sulphite sensitivity in the general population is not known. Figures of prevalence in the asthmatic population vary. Prevalence in the child population of steroid dependent asthmatics (SDA) is estimated at 20 – 66%. Whilst prevalence in the adult population of SDAs is believed to be lower, with different studies producing estimates of 3.9%, 4.5% and positive challenge rates of 16.7% and 33.6%. The reasons for potential differences between the populations of child and adult SDA is not yet established. There are several reported mechanisms for sulphite sensitivity, the most common appears to be SO<sub>2</sub> inhalation and irritation of the airways (as this affects asthmatics). However, IgE involvement has been demonstrated in some subjects and passive transfer or sensitisation of donor cells has been successfully achieved in a number of studies. A deficiency of liver enzyme sulphite oxidase is also implicated.

As I learnt more about nutrition and how to avoid foods with sulphites, I had fewer reactions so I got much better eventually deciding that I wanted to put my knowledge to good use and study to be a nutritionist. I adopted strategies to address my own deficiencies, balance my immune system, lessen allergic tendencies and improve detoxification. As a result my sulphite sensitivity is now firmly under control.

## References

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