FOOD ADDITIVES E-171, E-173 AND MECHANISM OF THEIR INFLUENCE ON THE ORGANISM FROM THE BIOCHEMICAL POINT OF VIEW

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Abstract: In this dissertation, the biological and biochemical definitions of food additives are given from a clinical point of view, and the effects of food additives E171 and E 173 on the human body and their negative and positive roles in the body are covered based on clinical medicine. Dietary supplements are covered extensively and comprehensively in this dissertation in scientifically proven terms.

Keywords: titanium dioxide, white pigment, aluminum pigments, antioxidant, mineral aluminum, allergens, Alzheimer's disease, gelatins, asthma, Antibiotics.

ПИЩЕВЫЕ ДОБАВКИ Е-171, Е-173 И МЕХАНИЗМ ИХ ВЛИЯНИЯ НА ОРГАНИЗМ С БИОХИМИЧЕСКОЙ ТОЧКИ ЗРЕНИЯ

Аннотация: В данной диссертации даны биологические и биохимические определения пищевых добавок с клинической точки зрения, а также на основе клинической медицины освещено влияние пищевых добавок Е171 и Е173 на организм человека, их отрицательная и положительная роль в организме. . Диетические добавки подробно и всесторонне рассмотрены в этой диссертации в научно обоснованных терминах.

Ключевые слова: диоксид титана, белый пигмент, алюминиевые пигменты, антиоксидант, минеральный алюминий, аллергены, болезнь Альцгеймера, желатин, астма, антибиотики.

INTRODUCTION

E171 titanium dioxide is one of the most common food additives used in the food industry. Its main function is to give products a white or crystalline appearance. E171 is commonly found in foods such as confectionery, chewing gum and cosmetics. In addition to the food industry, titanium dioxide is used in cosmetology; the substance has the property of light resistance and white color to cosmetics; UV protection is in demand, especially in the production of high-end tanning creams and sprays. In addition, it is used in the production of paints and varnishes, in particular, titanium white, in the production of plastics, in the production of laminated paper, in the production of rubber products, in the production of glass (heat-resistant and optical glasses). refractory (coating of welding electrodes and coating of casting molds). Natural sources of titanium dioxide are minerals (brookite, rutile), which are extracted from ores containing titanium. When used in the food industry, the main feature of E171 is that it improves the organoleptic properties of food products without affecting the smell and taste.

MATERIALS AND METHODS

The effect of titanium dioxide E171 on the human body has not been fully studied, so it is considered conditionally harmless until the harm from additional use is proven. It is known that the dye E171 is not absorbed by the intestines and does not dissolve in gastric juice, does not accumulate in the body and is completely destroyed after a very short time. However, there is

evidence that breathing titanium dioxide powder increases the risk of cancer. Therefore, from a biochemical point of view, its role in the body is limited. Studies show that in high doses, titanium dioxide can accumulate in organs and cause inflammatory reactions.

E173 aluminum or aluminum pigments is also a food additive used as an antioxidant and preservative in food and beverages. Its main function is to prevent oxidation and preserve product freshness. Biochemically, aluminum is the third most abundant element in the earth's crust and is almost ubiquitous. E173 is usually excreted naturally from the body through the kidneys. However, if you take large doses of E173 or its normal metabolism is disturbed, problems with the liver, kidneys and nervous system may occur. However, it should be noted that the use of aluminum pigments in the food industry raises some questions, and scientific research is devoted to studying their possible effects on the body. It is known that aluminum can accumulate in body tissues, and long-term and excessive consumption of it can be associated with a number of diseases, including neurodegenerative diseases such as Alzheimer's disease. There is also an ambiguous attitude towards the food additive E173. The use of E173 dye is banned in a number of countries, but there is no scientific evidence that the E173 additive is harmful to the body.

RESULTS AND DISCUSSION

Food additives are normally grouped by their function. The main groups of food additives are described below:

Antioxidants – decreases the chance of oils and fats in foods from combining with oxygen and changing colour or turning rancid. Rancid fats smell and taste unpleasant and are a health risk. Antioxidants are also used in fruits, vegetables and juice to extend the shelf life. Vitamin C (ascorbic acid) is one of the most widely used antioxidants (link to vitamin C).

Colours – are used to make food look more appetizing. During the processing of some food, colour can be lost so additives are used to restore the original colour, for example canned marrow fat peas. Colour additives can also be used to make the existing food colour brighter, for example, enhance the yellowness of custard. Colours are either natural (e.g. curcumin (E100) is a yellow extract of turmeric roots), nature identical or artificial. Some colours are also vitamins (e.g. riboflavin and beta-carotene) and these are the only colours allowed in baby food.

Flavour enhancers – are used widely in savoury foods to enhance the existing flavour in the food. Monosodium glutamate is an example of a flavour enhancer.

Sweeteners – are either intense or bulk. Intense sweeteners (for example saccharin and aspartame) are many times sweeter than sugar and so are only used in tiny amounts. This makes them suitable for use in products such as diet drinks, which are very low in energy. Bulk sweeteners (such as sorbitol and sucralose) have a similar sweetness to sugar so are used in similar amounts to sugar in foods.

Preservatives – are used to help keep food safe to eat for longer. Any processed food with a long shelf-life is likely to include preservatives, unless another way of preservation has been used, such as freezing, canning or drying. Traditional methods using sugar, salt and vinegar are still used to preserve some foods.

Most concerns about food additives have to do with man-made ingredients that are added to foods. Some of these are:

Antibiotics given to food-producing animals, such as chickens and cows

Antioxidants in oily or fatty foods

Artificial sweeteners, such as aspartame, saccharin, sodium cyclamate, and sucralose

Benzoic acid in fruit juices

Lecithin, gelatins, cornstarch, waxes, gums, and propylene glycol in food stabilizers and emulsifiers

Many different dyes and coloring substances

Monosodium glutamate (MSG)

Nitrates and nitrites in hot dogs and other processed meat products

Sulfites in beer, wine, and packaged vegetables

The United States Food and Drug Administration (FDA) has a list of food additives that are thought to be safe. Many have not been tested, but most scientists consider them safe. These substances are put on the "generally recognized as safe (GRAS)" list. This list contains about 700 items.

Congress defines safe as "reasonable certainty that no harm will result from use" of an additive. Examples of items on this list are: guar gum, sugar, salt, and vinegar. The list is reviewed regularly.

Some substances that are found to be harmful to people or animals may still be allowed, but only at the level of 1/100th of the amount that is considered harmful. For their own protection, people with any allergies or food intolerances should always check the ingredient list on the label. Reactions to any additive can be mild or severe. For example, some people with asthma have worsening of their asthma after eating foods or drinks that contain sulfites.

It should be noted that the role of nutritional supplements in the body depends on their dosage, the method of use and the individual reaction of each human body. If you have any specific medical conditions or allergies, it is recommended that you consult a physician or nutritionist before consuming foods containing these additives.

Some people are sensitive to particular food additives and may have reactions like hives or diarrhoea. This doesn’t mean that all foods containing additives need to be automatically treated with suspicion. All foods are made up of chemicals and food additives are not always ‘less safe’ than naturally occuring chemicals.Many of the food additives used by the food industry also occur naturally within foods that people eat every day. For example, MSG is found naturally in parmesan cheese, sardines and tomato in significantly greater quantities than the MSG present as a food additive. People with food allergies and intolerances are also often sensitive to chemicals found naturally in certain foods, such as nuts or shellfish.

Many people view food additives as a major food threat. However, in terms of health risk, food additives would come in at the end of the line, after food-borne microorganisms (like salmonella), inappropriate hygiene and eating habits, environmental contaminants and naturally occurring toxins.

If you think you may have a food additive sensitivity, it’s important to seek professional help since all of the symptoms you may be experiencing can also be caused by other disorders.

It may help to keep a food diary and note carefully any adverse reactions. In the case of a sensitivity being identified, the usual practice is to eliminate all suspect foods from the diet and then reintroduce them one by one to see which additive (or additives) causes the reaction. This should only be done under medical supervision, since some of the reactions – such as asthma – can be serious.

CONCLUSIONS

That the use of food additives is regulated by law in each country. The Food and Drug Administration (FDA) and the European Commission set certain standards and limits for the use of dietary supplements. However, if you have specific questions or concerns about E171 and E173

dietary supplements in specific products or for your health, I encourage you to consult a specialist or do further research.

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