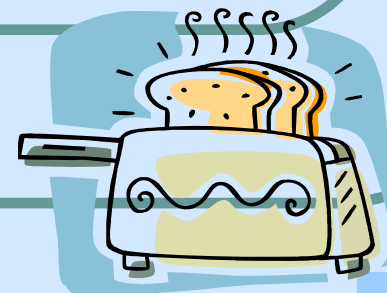


Food Safety (level 3)

Food Additives FS0724

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Harmful Effects of Food Additives

- Preservatives
- Flavouring Agents
- Colouring Agents
- Emulsifiers, Stabilizers and Thickeners
- Nutrients
- Antioxidants
- Harmful Effects of Food Additives →
- Monitoring of Use of Food Additives

- Allergies
- Hyperactivity
- Long-term illnesses
- Controversy over BHA and BHT
- Side Effects of MSG
- Toxicity and Potent carcinogenic Nature of Nitrates (III)
- Toxicity of sulphur dioxide
- Potent carcinogenic nature of saccharin

Monitoring the Use of Food Additives

- Preservatives
- Flavouring Agents
- Colouring Agents
- Emulsifiers, Stabilizers and Thickeners
- Nutrients
- Antioxidants
- Harmful Effects of Food Additives
- Monitoring of Use of Food Additives



- By Research
- By Legislation

Esters

- The sweet smell in fruit is due to the presence of ester compounds
- Natural fruit flavours can be extracted from fruits and other plant materials
- Most fruit flavouring used in the food industry are *synthetic compounds*
- Esters are used in ice-cream and many fruit juices
e.g. ethyl ethanoate which has a pineapple flavour.



Saccharin

- ✚ Kind of sweetener
- ✚ Used as a sugar substitute or diet sugar.
- ✚ Saccharin has no food value
- ✚ Sweetness about 500 times that table sugar



Carboxymethylcellulose

- ✚ Used to stabilize batter for coating steaks and fish fillets



Xanthan Gum

- ✦ Used in Salad dressings, dessert toppings and frozen pizzas



Pectin

- 🍓 Used to make the gel in jams and jellies



Dextrins

- ❖ Used to emulsify and stabilize cream, mayonnaise(蛋黃醬) and salad dressings



Sodium Alginate

- Commonly used to emulsify and stabilize ice-cream, yogurt, sauces and syrups(糖水)



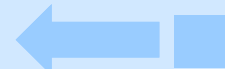
Vitamins

- ❖ Vitamin C
for fruit juices
- ❖ Vitamin B
for enriched flour
- ❖ Vitamin D
for milk and margarine



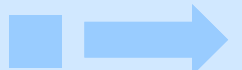
Minerals & Iodine

- ❏ Ammonium ferric citrate in infant milk formulations and bread flour
- ❏ Iodine in iodized salt



Allergies

- ✚ Some people are allergic to certain additives. It is suspected that MSG and Tartrazine may cause rashes, stomach upsets and asthma.

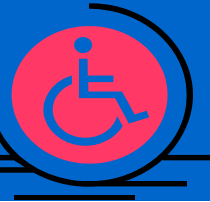


Hyperactivity

- ✚ In the 1970s, it was suggested by some scientists that food additives may be linked to hyperactivity and attention deficient disease (ADD) in children
- ✚ Some hyperactive children show improvement when fed with additive-free diets
- ✚ Well-controlled studies have produced no evidence of these additives causing hyperactivity or learning disabilities in children



Long-term illnesses



- ✚ Some additives, such as sodium nitrate (III), are suspected to be carcinogens
- ✚ Some additives are believed to be the causes of some long-term illnesses



Controversy over BHA and BHT

- Small amount of BHT shown to prevent cancer
- Larger amounts can cause cancer



Side effects of MSG

- ✚ Some people allergic to MSG
- ✚ Dizziness
- ✚ Thirst
- ✚ Headache
- ✚ Chest pain
- ✚ Sweating
- ✚ Abdominal discomfort



Chinese Restaurant Syndrome /
MSG Syndrome



Toxicity and potent carcinogenic nature of nitrates



✚ Short term

- ✚ Decrease in haemoglobin in blood

✚ Long term

- ✚ Malnutrition
- ✚ Growth retardation
- ✚ Impairment of reproductive capacity
- ✚ reduced lifespan



Toxicity of Sulphur Dioxide

- ✚ Sulphur dioxide is poisonous
- ✚ Attack respiratory system



Potent carcinogenic nature of saccharin

- ✦ Bitter aftertaste which renders it unpleasant to some users
- ✦ High doses cause cancer



Research

- ✚ Salt, sugar, vitamins and some minerals had long been used as additives to food and are Generally Recognized As Safe (GRAS)
- ✚ No food additive may be used unless it has been extensively tested on animals



Legislation in World

✚ In USA

- ✚ Food and Drug Administration (FDA) is responsible for monitoring the safety, purity, and wholesomeness of food additives

✚ In UK

- ✚ Food Advisory Committee compiles in European Economic Community, a permitted food additive is assigned a E number.



Legislation in World



Type of Additive

E Number

Colouring

Most begin with 1

Preservatives

Most begin with 2

Flavourings

Not numbered

Antioxidants

E300 – 321

Emulsifiers and stabilizers

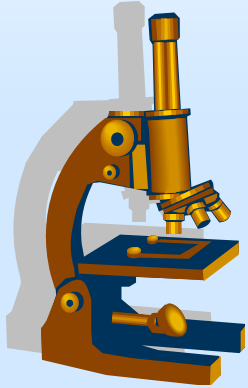
E322 and some numbers
between E400 and E495

Sweeteners

Most begin with 4 or 6



Legislation in Hong Kong



- ✚ Legislate permissible additives and maximum limits of additives in particular foods
- ✚ Require supply of information as to composition of substances used in the preparation of food
- ✚ Check on food labeling
- ✚ Inspect food- processing industries
- ✚ Take samples for chemical analyses on foods and food additives
- ✚ Seize and destroy food
- ✚ Prosecute for false labeling, advertisement, using non-permitted additives or using additives beyond the permissible limits.



SUMMARY



- 1. A food additive is a chemical added to food to improve it or to preserve it.**
- 2. The main reasons for using food additives are:**
 - To colour food (by colourings)**
 - To flavour food (by flavourings)**
 - To keep oils and water mixed in food (by emulsifiers and stabilizers)**
 - To add nutrients**
 - To preserve food (by preservatives)**

SUMMARY

- 3. Food additives approved by the EU countries often have an E number. (See Table 34.1 on p. 305.)**
- 4. Paper chromatography can be used to separate the dyes in food colourings.**
- 5. Common food flavourings include common salt, sugar, vinegar and synthetic esters. MSG is a flavour enhancer.**
- 6. Food spoilage is mainly due to micro-organisms (bacteria, fungi, yeast).**

SUMMARY

- 7. Food preservatives include common salt, sugar, vinegar, sulphur dioxide, benzoic acid and sodium nitrite**
- 8. Food preservatives can function as such because they either kill microbes or inhibit their growth.**
- 9. Some food additives such as tartrazine (E102) and sodium nitrite are hazardous to health.**