

CHEMISTRY OF FLAVOR, ODOUR AND TASTE COMPONENTS IN FOOD

1. FLAVOUR AND ODOUR

- Flavour plays an important and indispensable role in modern food
- Flavor is the sensation produced by a material taken in the mouth, perceived principally by the senses of taste and smell, and also by the general pain, tactile, and temperature receptors in the mouth.
- Flavor also denotes the sum of the characteristics of the material which produces that sensation.
- The flavour of the food can be altered with natural or artificial flavourants which affect these senses

1. Natural Food Flavors

Natural flavoring substances are obtained from plant or animal raw materials, by physical, microbiological or enzymatic processes.

They can be either used in their natural state or processed for human consumption.

The natural flavorants are first extracted from the source substance by solvent extraction, distillation, or using force to squeeze it out.

The extracts are then usually purified and subsequently added to food products to flavor them

Classification of Natural Food Flavors

Flavor types	Examples
1. Fruit flavor i. Citrus-type flavors ii. Berry-type flavors	grapefruit, orange apple, raspberry, banana
2. Vegetable flavors	lettuce, celery
3. Spice flavors i. Aromatic ii. Lachrymogenic iii. Hot	cinnamon, peppermint onion, garlic Pepper, ginger
4. Beverage flavors i. Unfermented flavors ii. Fermented flavors iii. Compounded flavors	juices, milk wine, beer, tea soft drinks

<p>5. Meat flavors</p> <p>i. Mammal flavors</p> <p>ii. Sea food flavors</p>	<p>lean beef</p> <p>fish, clams</p>
<p>6. Fat flavors</p>	<p>olive oil, coconut fat, pork fat, butter fat</p>
<p>7. Cooked flavors</p> <p>i. Broth</p> <p>ii. Vegetable</p> <p>iii. Fruit</p>	<p>Beef bouillon</p> <p>Legume, potatoes</p> <p>Marmalade</p>
<p>8. Processed flavors</p> <p>i. Smoky flavors</p> <p>ii. Broiled fried flavors</p> <p>iii. Roasted, toasted, baked flavors</p>	<p>Ham</p> <p>Processed meat products</p> <p>Coffee, snack foods, processed, cereals</p>

2. Artificial food flavorants or flavorings

- An artificial flavorant is a substance that gives another substance flavor, altering the characteristics of the solute, causing it to become sweet, sour, tangy, etc.
- e.g. Different flavors due to the use of different scents or fragrances in artificially flavored jellies, soft drinks and candies, which are made of bases with a similar taste.
- Artificial flavorings are focused on altering or enhancing the flavors of natural food product such as meats and vegetables, or creating flavor for food products that do not have the desired flavors such as candies and other snacks.
- Most types of flavorings are focused on scent and taste.
- Few commercial products exist to stimulate these senses, since these are sharp, astringent, and typically unpleasant flavors.
- These are of two types

i. Nature-identical flavoring substances

These are flavoring substances that are obtained by synthesis or isolated through chemical processes, which are chemically and organoleptically identical to flavoring substances naturally present in products intended for human consumption

ii. Artificial flavoring substances

- Flavoring substances not identified in a natural product intended for human consumption, whether or not the product is processed.
- These are produced by fractional distillation and additional chemical manipulation of naturally sourced chemicals or from crude oil or coal tar.
- They are chemically different but in sensory characteristics are the same as natural ones.

- Most artificial flavors are specific and often complex mixtures of singular naturally occurring flavor compounds combined together to either imitate or enhance a natural flavor.
- These mixtures are formulated to give a food product a unique flavor and to maintain flavor consistency between different product batches or after recipe changes.
- The known flavoring agents include thousands of molecular compounds, and the flavorist can often mix these together to produce many of the common flavors.
- Many flavorants consists of esters, which are often described as being "sweet" or "fruity".

Type of Artificial Flavorants

Type of Flavour	Artificial flavourant
Buttery	Diacetyl
Banana	Isoamy acetate
Bitter almond	Benzaldehyde
Cinnomon	Cinnamic aldehyde
Fruity	Ethyl propionate
Grape	Methyl anthranilate
Orange	Limonene
Pear	Ethyl,2,4decadienoate
Pineapple	Allyl hexanoater
Sugar cotton candy	Ehtyl maltol
Vanilla	Ethylvanillin
Winter green	Methyl salicylate

2. TASTE

- The basic taste of food is limited to sweet, sour, bitter, salty, and savory (umami).
- While salt and sugar can technically be considered flavorants that enhance salty and sweet tastes, usually only compounds that enhance umami, as well as other secondary flavors are considered and referred to as taste flavorants.
- Artificial sweeteners are also technically taste flavorants.

