**Flavor Enhancers**

Flavour enhancers are the compounds that are known to improve the palatability of the food by specifically ameliorating the smell and taste thereby influencing consumer food and beverage choices. These compounds are added in low concentrations and involve a combination of physio-chemical and physiological actions stimulating the specific receptors in the body, leading to the stimulation of a wide range of sensory systems that influence the perception of substances.

Nowadays, many artificial or imitation flavours have been manufactured with the advancements in the flavor industry. Few properties such as non-toxicity, solubility, stability and compatibility with the preparation, must be taken under consideration before the consumption. Also, the compounds that raise the blood sugar or increase caloric intake cannot be included in formulations for patients especially that are diabetics. In addition, it is also important to note that flavor response alters based on certain factors such as temperature, physical nature, and some special characteristics like astringency and pungency of the flavored material. Although, the choice of flavor may change with the passage of time, it has been observed that children, adults and many old people prefer fruit flavoured syrup, acidic taste and mint flavors respectively.

Mostly, for the sweetened base flavour usually a syrup or synthetic sweetener is used. Rather than using a large excess of one flavor, mixing of different flavors is found to be more effective and acceptable. The bitter taste of few drugs is the most difficult to mask. However, chocolate or apricot flavor including adjuvants such as glycine and monosodium glutamate are known to reduce the effect to some extent. Since deterioration of flavors may be triggered by certain factors like, alkaline pH (except cinnamon oil), hydrolysis (except esters), oxidation (except citrus oils), volatilization due to improper closure etc., flavours are assessed and evaluated for their stability and taste before their usage. The experiment should be designed in such a way to minimize the effects of personal variation and other factors such as temperature, age, environment and time of the day.

**The major types of flavouring agent used in the preparation are**:

1. **Sweetening agents**: These include sucrose, invert syrup, sorbitol , saccharine sodium etc.

2. **Flavoured syrup**: These include fruit flavoured syrup, syrups with weak therapeutic activity for example the pleasantly aromatic odour and pungent taste of Ginger syrup make it a satisfactory flavour for laxative mixtures containing rhubarb while its carminative action (ability in relieve flatulence) is helpful in this type of preparation, and cocoa syrup.

3. **Aromatic Oils**: Like caraway, clove, dill, lemon, orange, pepper-mint etc.

4. **Synthetic flavours**: These include synthetic sweeteners, chloroform, vanillin, benzaldehyde etc. and variety of organic compounds like alcohols, aldehydes, esters, ketones, fatty acids and lectones are used alone or combined with essential oils.

**Uses:** In addition to food and beverage industries,the flavor enhancers are also used in formulatingunpleasant tastes of cough syrups, laxatives, sedatives antihistamines, antibiotics, vitamins and pediatric/geriatric etc. These flavors do not affect the physical and chemical properties of the therapeutics. For eg. diphenhydramine (orange-mint flavor), phenylephrine and chloropheniramine maleate (spice vanilla flavor), tranquilliser formulations (strawberry), adsorbents such as kaolin and pectin (maple combined with butterscotch), antacid preparation (mint) etc.

**The well suited flavours for a particular class of drug are shown in the following**:



Reference: Flavouring Agents In Pharmaceutical Formulations by A. V. Sharma & P. V. Sharma

Recent advances in microbial production of flavor enhancers for the food industry by Elhariry.H. etal (2004).