

# **Methods of Starter Distillates and their Merits/Demerits**

1. Starter distillate is made from fermentation of skim milk or non fat dry milk by several bacteria. Starter distillate is considered as GRAS by FDA and regulated under code of food regulation.
2. According to FDA, starter distillate/butter starter distillate is a steam distillate of the culture of any or all of the following species of bacteria grown on a medium consisting of skim milk usually fortified with 0.1% citric acid: *L. lactis* ssp. *lactis*, *L. lactis* ssp. *cremoris*, *L. lactis* ssp. *lactis* biovar *diacetylactis*, *Leuconostoc citrovorum* and *L. dextranicum*.
3. The ingredient contains >98% water and reminder is a mixture of butter like flavouring organic compounds. Besides diacetyl, starter distillate contains minor amounts of acetaldehyde, ethyl formate, ethylacetate, acetone, ethyl alcohol, 2-butanone, acetic acid and acetoin.
4. These natural butter flavor systems possess smooth, rich, fresh butter character, making them ideal for applications in numerous food formulations and usage in the manufacture of dairy products, baked goods, confections, salad dressings, snack foods.

**Starter Distillates** are derived from selective lactic culture fermentation of milk and further purified by steam distillation. These Liquid Butter flavours have a standard identity as described in the food additive regulations of 21 CFR 184.1848. Generally Recognized as Safe (GRAS) ingredients and can be labeled as natural flavours.

## **Production and application**

**Bacterial Distillates:** Natural butter aroma distillate can be prepared by growing the mixed cultures consisting of *L. lactis* ssp. *lactis*, *L. lactis* ssp. *cremoris* and *L. lactis* ssp. *lactis* biovar *diacetylactis* in the culture medium containing skim milk or whey as substrate. The cultures will produce substantial amount of  $\alpha$ -acetolactic acid. The bacterial culture medium having a large amount of  $\alpha$ -acetolactic acid is acidified to a pH of about 3.5. Water vapour distillation is carried out effectively in the presence of oxygen to convert the  $\alpha$ -acetolactic acid to diacetyl and distill off approx. 5-15% of the bacterial culture medium. The resultant distillate has a diacetyl content ranging from 1369 -2666 mg/kg.

**Synthetic Distillates:** The synthetic distillates contains edible fats which replaces souring by starter cultures

## **Advantages:**

- 1. Results in yield of sweet buttermilk.**
- 2. Greater freedom when optimizing the temperature treatment of cream before churning.**
- 3. Yields more consistent product quality in particular as regards odour and flavour.**

## **Disadvantage**

- 1. Addition of pure synthetically prepared diacetyl gives a harsh undesirable taste of diacetyl.**

**A balanced butter flavour can be obtained by adding other important aroma substances, such as acetic acid, dimethyl sulphide, acetaldehyde and certain lactones.**