Objective of the Study

Based on the information shared with Effectual Services so far, Effectual Services understands the client wants to identify alternative sweeteners - the protein sweetener for soda/beverage, with special parameters on cost and processing techniques.

Sweeteners include natural sweeteners such as sucrose, high fructose corn syrup, molasses, maple syrup, and honey and artificial sweeteners such as aspartame, saccharine, and sucralose. Excluding the simple sugars and polyols, there are 100 or so sweet compounds found in nature. They fall into three main classes (terpenoids, flavonoids and proteins).

We understand that the Client is interested in naturally occurring sweet proteins and taste modifying proteins , especially plant sourced protein.

The increasing awareness among the public over the adverse effects of sucrose and artificial sweeteners is creating opportunities for the exploration of naturally derived alternatives, such as plant-derived sweeteners.

The Client is looking for answers to the following questions -
- Recommendations – Which specific variety of sweet protein or variants of sweet protein fulfils the special parameters on cost and processing techniques (including the parameters disclosed on the right hand side) and who is primarily working in the domain and on what technologies.
- Technologies – What methods are available to modify the sweetness and stability of sweet-tasting protein; scalable production and purification process for sweeteners and effective extraction approaches and fulfilling the defined parameters.

We have noted all the important parameters to be considered for the study and we understand that the Client is not primarily interested in any breakthrough technology but the technology fulfilling the parameters:
- ❖ Non caloric or very low calorie contribution
- ❖ Stable at low pH (~pH 3.0)
- ❖ Sensory profile closer to sugar: many protein sweeteners tend to have a licorice taste that lasts even after beverage consumption
- ❖ Relative stability to typical thermal processing regimes for beverages (95C for 1-2 min; 140C for 4-5 sec).
- ❖ Stable to UV exposure
- ❖ Parity cost-in use to sugar (there could be some compromises if the taste and stability factors are unique)
- ❖ Line of sight to a robust supply chain

One of the most crucial factors to take into account while considering sugar replacers is the sweetness. The sweetness factor is measured with reference to sucrose and the sweetness perception occurs when sugar dissolves with the saliva and bind with the receptors on the tongue.