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Editorial

Hydrocolloids Great Perspective in Food Industries

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Hydrocolloids or gums are characterized group of long chain polymers as diverse group due to their property of forming viscous dispersions/gels on dispersing in water. Hydrocolloids were first found in exudates from plants or sea weeds, seed's flours or grains, gummy exudates from fermentation processes, and various other natural products. A large number of hydroxyl groups occurred noticeably increases their affinity for binding water molecules provide them hydrophilic compounds. Dispersion is produced, which is intermediate between a true solution and a suspension, and exhibiting the properties of a colloid. With consideration of these two properties, they are befittingly termed as 'aqua-philic colloids' or 'hydrocolloids'. Hydrocolloids have a wide assemblage of functional properties in foods for thickening, gelling, emulsifying, stabilization, coating and so on. Hydrocolloids have an extreme impact on food properties on using when employed at levels ranging from a few parts per million for carrageenan in pasteurized dairy products to high levels of acacia gum, starch or gelatin in jelly confectionery.

The main reason being the ample use of hydrocolloids in foods is their ability to modify the rheology of food systems. This entails two basic properties of food systems as flow behavior (viscosity) and gelling property (texture). Modifying of texture and/or viscosity of food systems results in modifying its sensory properties and therefore hydrocolloids are used as significant food additives to perform specific purposes. As evidence several hydrocolloids belong to the category of permitted food additive in many countries across the world. Hydrocolloids are being used in soups, gravies, salad dressings, sauces and toppings as additives to achieve the preferred viscosity and mouth feeling. They also find applications in many food products like ice creams, jams, jellies, gelled desserts, cakes and candies, for creating the desired textures. Additionally with the functional attributes, future prominence and, possibly, positive endorsement may derive from the recognition that fibers will contribute many physiological benefits to the natural function and wellness of the body.

Hydrocolloids also function as an emulsifiers and/or emulsion stabilizers correlating the phenomena of retardation of precipitation of dispersed solid particles. It also decreases creaming rates of oil droplets and foams, preventing the aggregation of dispersed particles. It also prevents syneresis of gelling systems which contain oils and retardation of coalescence of oil droplets. The gums also adsorb (onto solid or liquid surfaces) very slowly, weakly and with very limited surface load. Classification of the hydrocolloids was according to their activity at the interface. Gum Arabic is probably the most studied hydrocolloid with proven significant surface activity. Gum Arabic is the only gums that is adsorbed onto oil-water interfaces and make sterically stabilized. While other gums, viz. Galactomannans, xanthan, pectin, etc. is known to reduce surface and interfacial tensions, to adsorb onto solid surfaces and to improve stability of oil-in-water emulsions. MCC (Micro crystalline cellulose) is hydrocolloid with no solubility in water that adsorbs at the interface.

Another class of hydrocolloid is pectin whose emulsifying power has drawn attention in recent years. On the other hand citrus and apple pectin is obviously used to lower pH of gelling or thickening agents, sugar beet pectin unable to form gels with calcium ions or with high sugar concentrations. Due to its higher protein content, sugar beet pectin is considerably more surface-active than gum Arabic due to higher protein. Therefore it is very effective in stabilizing fine emulsions comprising of orange oil or triglyceride oil at a pectin/oil ratio of 1:10.

Modern life style changes and the growing awareness of the diet and health, in addition new processing technologies is led to a rapid rise in the consumption of ready-made meals, novelty foods and the development of high fiber and low-fat food products. High calorie materials such as fats and oils may be replaced with 'structured water' to provide healthy, reduced-calorie foods with excellent eating quality. Numerous hydrocolloid products have been developed specifically in particular for use as fat replacers in food. This has need fully led to an increased demand for hydrocolloids. The Italian dressing comprised xanthan gum as a thickener and the 'Light' mayonnaise with guar gum and xanthan gum as fat option to enhance viscosity.

Inulin is characterized as particle gel and may be concluded that inulin functions as a fat option but only in water-based systems. Beyond 15% concentration of insulin it is able to form a gel or cream which exhibiting an excellent fat-like texture. Thus inulin gel has caught attention as a perfect fat option offering various opportunities in a wide range of foods. Dispersion of inulin in the aqueous phase of any food system will contribute to the creamy texture of the finished food. Inulin is also aimed to be employed as a fat option in frozen desserts, since it processes fatty mouth feeling, excellent melting properties, as well as freeze thawing stability, with no wanted off-flavors.

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