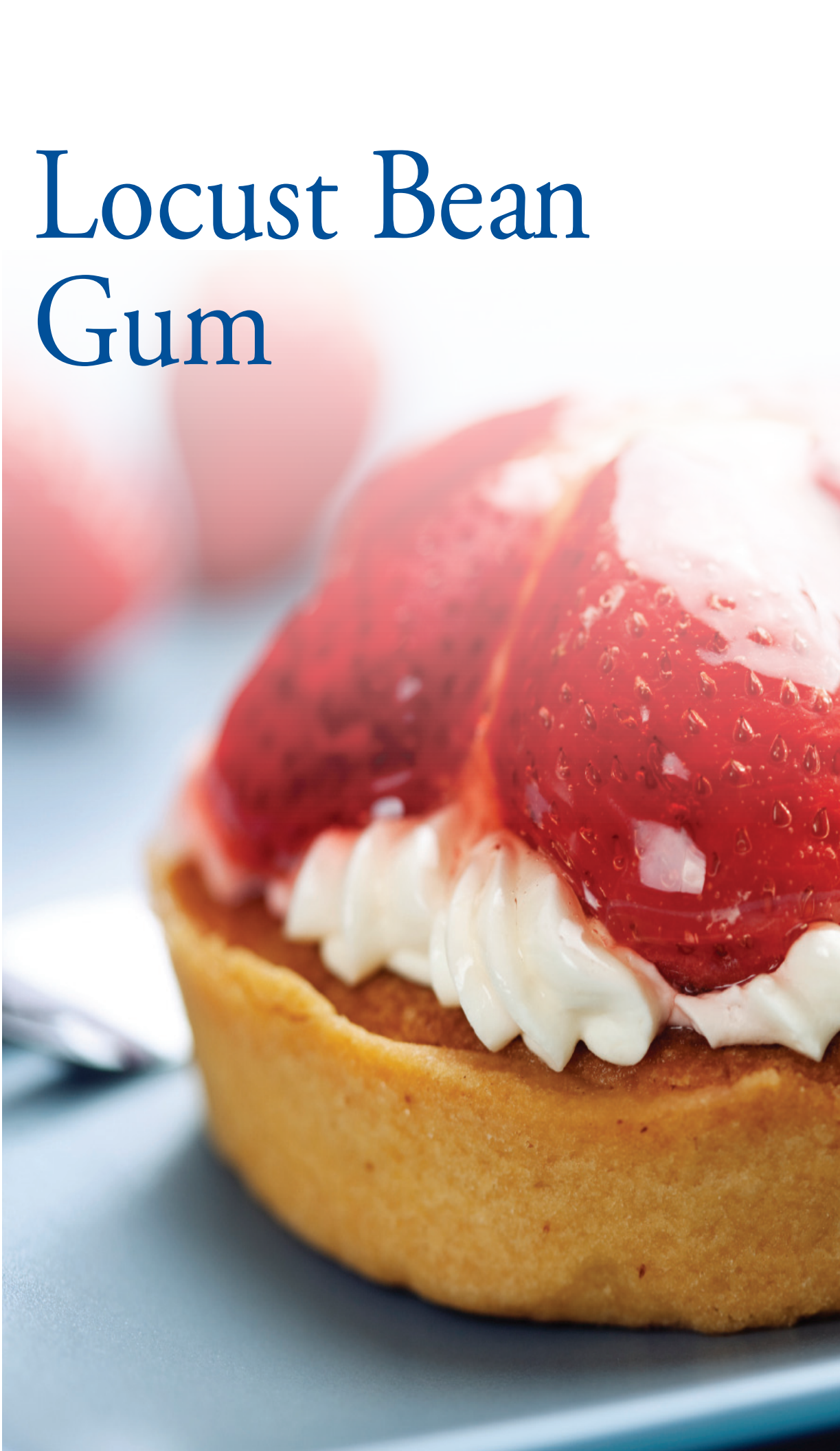
COLONY GUMS
Hydrocolloid & Stabilizer Systems

Locust Bean Gum



Locust Bean Gum

SOURCE

Carob is processed from the seeds of the leguminous tree known as Ceratonia Siliqua.

QUALITIES

- **Water-Binding**
- **Thickening Agent**
- **Stabilizer**
- **Heat-Shock Resistance**

USES

- **Food**
- **Paper**
- **Textiles**
- **Tobacco**

SOURCE & PROCESSING

Carob– or Locust Bean Gum– is processed from the seeds of the leguminous tree known as Ceratonia Siliqua, family Leguminosae. This tree is widely cultivated in the Mediterranean area and, to a smaller extent, in California. The seeds are dark, chocolate-covered pods that are 10-20 cm. long. The seed or kernel is composed of the outer husk (30-33%), the germ (23-25%), and the endosperm (42-46%). The powdered endosperm is the commercial Locust Bean Gum. The trees are harvested in late fall.

Processing of the gum involves dehusking the tough seed coat and separating the endosperm from the yellow germ. The seeds are conditioned and the dehusked and degerminated by various mechanical rolling and milling operations. Efficient removal of the husk eliminates brown specks. The pure endosperm is then ground into fine flour.

USES

Food

The stabilizing and water-binding characteristics of Locust Bean Gum give excellent heat-shock resistance and slow, creamy meltdown with no masking of flavor to ice cream products as well as inhibiting the formation of ice crystals. Lactic acid or calcium salts do not significantly affect the gum. In soft cheese manufacturing, Locust Bean speeds coagulation increases the yield of curd solids by 10% and facilitates the separation and remove of the curd. The finished homogeneous cheese has excellent body and structure. Cheese spreads made with a high water content by mixing 1-2% gum are more easily refined and have a fine texture, good mouth feel and spread easily.

Other Foods

Baking flours vary in gluten content and water-holding properties. Locust Bean, with its good water-binding characteristic, yields drier, more resilient products that have better texture and more softness. When used with cake and biscuit dough, Locust Bean gives a higher yield with a considerable reduction in the amount of eggs necessary. Also, the cakes are softer, have a longer shelf life, firmer texture, can be easily removed from the pans and can be cut or sliced more easily. About 1-2% Locust Bean Gum is used in fruit pie fillings to yield a clearer, more fruit-like filling, which is more palatable and does not mask the flavor. Locust Bean Gum, in combination with other hydrocolloids, stabilizes a variety of prepared foods as instant dry sauces and soups, frozen concentrated soups and frozen butter and cheese sauces for vegetable and fish dishes. This gum also stabilizes and thickens mayonnaise, tomato catsup, and natural as well as imitation whipped cream.

Visit www.ColonyGums.com for samples, technical assistance or placing an order.

PROPERTIES

Physical

Locust Bean Gum is almost odorless and has a bland taste. Its color is off-white to very light tan. The highest grades have no visible brown husk specks. Mesh sizes are readily available from 100 to 200. The highest grades have the minimum of impurities and color and also have the highest viscosity.

Solubility

Locust Bean Gum is incompletely soluble in cold water, and must be heated for maximum solubility. The highest viscosity is obtained by dispersing the gum into 95° Celsius water and then cooling. This method minimizes the slight cloudiness due to the insoluble protein and cellulose impurities. Dried films of the gum sol are tough and pliable. The gum is insoluble in most organic solvents.

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Paper Industry

As a wet-end additive in papermaking, Locust Bean Gum finds one of its most important uses. It results in an overall improved sheet with greater strength and improved machine speed. Guar Gum is used more extensively, but many mills still use Locust Bean Gum although it is more expensive.

Textile Industry

Locust Bean Gum derivatives are widely used as print-paste thickeners. These derivatives are also used in roller and screen-printing as well as finishing agents. Their pastes are homogenous, transparent, free flowing and have high stability. They are easily washed off the printed cloth to impart a soft and smooth touch. Locust Bean pastes gives purity and uniformity of shades, sharp outlines, and deeper penetration of dyes. They are compatible with most other thickeners, and improve the homogeneity and flow peroperties of the paste. Locust Bean Gum derivatives, used as finishing agents, impart body and smooth touch, attractive appearance, and bright colors. The fabric remains clean without dusting of the weighing material, because both loading and weighing materials are firmly held to the fabric by the thin, transparent gum film.

Tobacco Industry

Locust Bean Gum, mixed and kneaded with pure fragmented tobacco fines, forms a sheet having flexibility and strength characteristics similar to whole tobacco leaf. Locust Bean Gum is used in making slow combustion cigarette paper.

Viscosity
A 1% sol of a high quality gum develops a viscosity in the 3000-3500 centipoise ranges, when measured with a Brookfield viscometer at 20 rpm. At 2-3% gum concentration, a viscous, non-flowing paste having no gelling tendencies is formed. Locust Bean Gum sols are pseudo-plastic.

Chemical Characteristics
Locust Bean Gum, like Guar Gum, is a polysaccharide consisting of a stright chain of D-mannopyranose unites joined by b 1à4) linkages with a side-branching unit of a single D-galactopyranose unit joined to every fourth mannose unit by a-(1à6) linkages. Guarm Gum has a single galactose side-branch every other mannose unity. The molecular weight of Locust Bean Gum is 330,000 +10%. An average-quality Locust Bean Gum contains about 78% galactomannan, 12% water, 6% protein, 3% acid insoluble residue or crude fiber, 0.8% ash, 1% fat, a trace of heavy metals, zero arsenic, and zero lead.

pH
Since Locust Bean Gum is a nonionic, neutral polysaccharide, its viscosity is little affected over a pH range of 3 to 11. A 1% sol has a pH range of 5.0 to 6.5.

Compatibility
Locust Bean Gum is compatible with other hydrocolloids as well as carbohydrates and proteins. Neutral salts such as sodium chloride have little influence on the viscosity of the sol. Locust Bean Gum, like other hydrocolloids, may be precipitated from aqueous sols by some electrolytes, particularly polyvalent ones such as lead acetate, phosphotungstic acid, and tannic acid. Locust Bean Gum sols are gelled by the addition of small amounts of borax and a pH above 7.5. A cohesive structural gel that is transparent is formed. This gel will note adhere to glass and has no syneresis. The gel is reversible by decreasing the pH below 7 or by heating.

Preservatives
Bacterial attack, common to all plant hydrocolloids, may be controlled by about 0.1% of benzoic acid, sodium benzoate, sodium propionate or citric acid, or a mixture of 0.15% methyl and 0.02% propyl prahydroxybenzoate.

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