FOOD & NUTRITION
NORTH AMERICA

Hydrocolloids

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A colloid is a type of mixture where one substance is dispersed evenly throughout another. A hydrocolloid is a colloid system where the colloidal particles are dispersed in water. Hydrocolloids may be reversible or irreversible, which means they can fluctuate between a gel-state and a solid-state, and many are naturally derived. Hydrocolloids provide many functions in food products including texture modification, thickening, emulsification, stabilization, binding, and adhesion. While some hydrocolloids are used independently, many are used in tandem with one another to provide the optimum result within the formulation.

![Hydrocolloids](image)

**HYDROCOLLOID** | **RAW MATERIAL** | **SOLUTION CLARITY** | **NATURAL STATUS** | **GRAS** | **SOLUBILITY** | **pH RANGE IN APPLICATION** | **ADD STABILITY** | **VISCOITY** | **GELING MECHANISM** | **EFFECT ON MILK AT pH >4.6** | **EFFECT ON MILK AT pH <4.6** | **KEY FUNCTIONAL PROPERTIES** | **POTENTIAL APPLICATIONS**
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Carrageenan | Seaweed extracts | Good | Y | Y | Hot | 4-10 | Poor | N/A | Ke-gels with Kappa | Ca++-gels Lambda | both gel with Iota | Increased gel and viscosity | Precipitates | Provides cocoa suspension in chocolate milk, improves the quality of milk by enhancing texture, dispersibility, and mouthfeel. Provides texture to dessert gels. Frozen desserts, ice cream, chocolate milk, meats (ham, poultry), sauces and dressings, dessert gels, jams and jellies.
Guar gum | Seeds of Guar bean | Fair | Y | Y | Cold or hot | 4-9 | Fair | Medium | Non-gelling | None | None | None | None | Provides body and texture in sauces and cheese products. Dairy products, frozen desserts, sauces and dressings, processed cheese, dips.
Gum arabic | Tree exudates | Excellent | Y | Y | Cold or hot | 2-10 | Good | Low | Non-gelling | None | None | None | None | Stabilizes beverage emulsions, flavor encapsulation, prevents syrup crystallization in confectionery applications, stabilizes toppings and kings. Beverage emulsions, confectionery applications, baked goods, syrups, dietary fiber.
Gum tragacanth | Tree exudates | Fair | Y | Y | Cold or hot | 4-10 | Good | High | Non-gelling | None | None | Excellent emulsion stabilizer. Sauces and dressings, crystallization inhibition.
Locust bean gum | Seeds of Carob bean | Fair | Y | Y | Hot | 4-10 | Fair | High | Non-gelling | None | None | Excellent emulsion stabilizer. Sauces and dressings, crystallization inhibition.
Pectin | Plant extracts and fruit skins | Excellent | Y | Y | Hot | 2-7 | Good | Varies | High Ester: none | Low Ester: Ca++ forms gels | Precipitates | Stabilizes | Jams and jellies, confectionery applications, beverages, yogurt, fruit jams, bakery fillings.
Propylene glycol alginate | Seaweed extracts | Fair | N | Y | Cold or hot | 3-8 | Good | Varies | None | None | None | None | Provides excellent pH stability and temperature stability. Excellent secondary emulsion stabilizer properties. Salad dressings, beverages, frozen dairy, fresh citrus fruit dressings.
Sodium alginate | Seaweed extracts | Good | Y | Y | Cold or hot | 4-10 | Good | Varies | Ca++ forms gels | None | None | Precipitates | Provides excellent pH, shear, temperature stability. Excellent food grade setting, suspension, foaming, emulsion, and suspension properties. Helps stabilize emulsions. Cheese sauce, restructured foods, puddings, desserts, candy, frostings.
Xanthan gum | Produced via fermentation | Fair | Y | Y | Cold or hot | 2-10 | Good | High | Non-gelling | None | None | Precipitates | Provides excellent pH, shear, temperature stability. Pseudoplastic rheology unique. Excellent dispersing polymer. Helps stabilize emulsions. Sauces and dressings, dry mixes, beverages, bakery, frozen foods.