



COLONY GUMS

Hydrocolloid & Stabilizer Systems

A BRENNTAG GROUP COMPANY

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Konjac



SOURCE & PROCESSING

Konjac is obtained from the edible tubers of *Amorphophallus konjac*, which is cultivated in warm subtropical eastern Asia from Japan and China south to Indonesia. The tuber of this plant is called a corm- and is often referred to as a yam. Harvested tubers are cleaned, dried and ground resulting in the powder we know as konjac gum or konjac flour.

Freshly harvested konjac tubers contain approximately 64% as glucomannan (dry basis) while the processed powder contains approximately 85% glucomannan.



Konjac

POLYMER CHEMISTRY

The primary functional carbohydrate in konjac is a high molecular weight glucomannan polymer. The glucose and mannose are linked by $\beta(1-4)$ bonds along the polymer backbone and are in the ratio of approximately 2:3. Side chains or branches are present as well as acetyl group substitutions. This large, branched polymer has the tremendous ability to absorb water (up to 100-200 times powder volume) and deliver very high viscosity. The nature of the polymer does slow the speed to reach maximum viscosity and moisture binding. Adding heat to processing can speed up the process.

Gels can also be formed using konjac alone at elevated pH or when heat is added to synergistic hydrocolloid combinations (xanthan, carrageenans, agar, locust bean gum). The stability of these gels in hot applications depends on the components, temperature and pH.

FUNCTIONALITY

- ~ Thickening
- ~ Gel Formation
- ~ Binding Agent
- ~ Film Formation
- ~ Moisture Management

USES

- ~ **Beverages**
Particle suspension, thickening, texture, moisture management
- ~ **Noodles, Meat and Dairy Alternatives**
Gel formation, firm and elastic texture, structure, moisture management
- ~ **Baked Goods and Gluten-Free Products**
Structure, texture, moisture management

APPLICATIONS

Of the common hydrocolloids, konjac exhibits the highest molecular weight and strongest ability to add viscosity once fully hydrated in water. Although it is slower to hydrate than other cold water soluble hydrocolloids, there are still the usage challenges associated with lumping at the time of addition to water. As with all cold functional hydrocolloids, we recommend combining konjac with other powders for use as dispersing aids and addition into liquid in motion with a fully visible vortex.

Konjac functions well at high levels of salt and across a wide range of pH. Caution must be taken at high pH since konjac will form gels above pH 8.5 without the addition of heat or other synergistic hydrocolloids. This characteristic is used in the production of some heat-stable noodles.

When heat is added to synergistic blends using konjac, gels form on cooling that can be utilized for suspension, structure building and added texture. The functionality of these synergistic gels is influenced by total solids, pH, salt level, usage level, hydrocolloid proportions and temperature. These gels aid in moisture management and deliver a brittle and elastic textures desirable in many foods (baked goods, gluten-free products, meat and dairy alternatives).



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Three generations of excellence in service, innovation and quality.