JRS Fibers for Life.

TECHNICAL BULLETIN

Formulating Pectin Gelled Gummies

MARKET TRENDS

According to the National Confectioners Association, US confectionery sales in 2023 were nearly $43 billion and expected to approach $45 billion by 2026. Over 40% of these sales are in the non-chocolate category, which includes chewy confectionery like gummies[1]. In addition to mainstream confections, consumer demand for dietary supplements continues to accelerate with projected double-digit year over year category growth. Increasing portions of these supplements are transitioning to the gummy format with vitamins accounting for the highest market share in the supplement application segment. With consumers seeking vegan and plant-based products in key global markets, manufacturers are looking to replace animal-derived raw materials like gelatin with a plant-based ingredient such as pectin to offer gummy products targeting this most important consumer trend.

CHOOSING THE RIGHT GELLING AGENT

There are multiple options available to product developers for creating gelled confectionery products with desired characteristics of the finished product driving that selection. Key characteristics such as texture, sensory, raw material source and manufacturing concerns need to be accounted for when making this selection. Critical aspects to consider include degree and type of texture desired, need for product clarity, targeted consumer practice such as vegan, and manufacturing process requirements. The table below highlights the most popular hydrocolloids used in gelled confectionery products and the key characteristics they deliver.

Characteristics	Pectin	Gelatin	Starch
Texture	Short	Elastic	Tough
Clarity	Good	Good	Opaque
Flavor release	Excellent	Fair	Poor
Source	Vegetable	Animal	Vegetable
Usage level	Low: 1.5 - 3.0%	High: 7.0 - 9.0%	High: 9.0 - 14.0%
Gelling time	Short	Long	Long
Melt temperature	Stable	<100°F	Stable

[1]Sweet Insights: State of Treating 2022. "A Bite-Sized Taste". National Confectioners Association.

TEXTURE IS A DRIVING FORCE

In the chewy confectionary category, texture is a key attribute that drives consumer acceptance and repeat purchase intent. With this in mind, it is important to measure the critical aspects of texture including initial product hardness and stickiness as well as changes that may occur over the shelf life of the product. One approach is to leverage the capabilities of a texture analyzer *(Texture Technologies TA-XT2, see picture below)* which can measure the force for penetration

of a probe (hardness) and the resistance to the removal of that probe from the product (stickiness). It is important to choose the correct hydrocolloid based on the properties of your finished product and the demands of your consumer. While starch tends to produce a texture that is tough and sticky, gelatin and pectin result in textures that behave more similarly, with gelatin being more elastic while pectin is short. Figure 1, on the next page, demonstrates the differences in texture between the three main gelling agents.

CHOOSING THE RIGHT PECTIN

JRS SILVATEAM has a complete line of pectins designed to deliver the desired texture and functionality in a wide variety of applications. It is important to choose the correct pectin based on the other ingredients in your formula and the properties of your finished product, including Brix and pH. Table 1 below highlights the JRS Silvateam pectin options for gelled confectionery products, the key benefits they deliver, recommended use level, and their primary applications.

Table 1: JRS SILVATEAM Pectins for Gelled Confectionery Product

Product	Benefit	Use Level	Application
Aglupectin® HS SB3 High Methoxyl Pectin	Excellent flavor release, specular cut, shiny appearance; chewy and lasting texture	2.0-3.0%	Vegan gummies
Aglupectin® HS SBR150 High Methoxyl Pectin	Excellent transparency and flavor release; short texture and specular cut	1.0-2.0%	Acid jellies
Aglupectin® HS SBR150M High Methoxyl Pectin	Provides same benefits as **Aglupectin**® HS SBR150 but used in sugar free applications	1.0-2.0%	Sugar-free gummies
Aglupectin® LA S10SB Low Methoxyl Amidated Pectin	Neutral flavor release; firm and short texture; specular cut; shiny appearance	1.5-2.5%	Neutral jellies

The following formulas are two examples of chewy confectionery gelled using Aglupectin® High Methoxyl Pectins along with the resulting texture profiles. The Acid Jellies formula tends to deliver softer textured product with reduced adhesion and stickiness while the Vegan Gummies formula is closer to formulas that use gelatin with a firmer, chewier texture (see Figure 2).

PROCESS

1. Disperse pectin, sugar A and sodium citrate into hot water under strong agitation.
2. Heat mixture to boiling until a complete solubilization is obtained.
3. Add sugar B under agitation and heat again to boiling.
4. Add glucose syrup and evaporate until desired solids are reached.
5. Remove from heat and add citric acid solution. Flavor and color can also be added at this time, if desired.
6. Check the Brix and pH. If necessary, adjust to desired values.
7. Fill hot into jelly molds. Let set at ambient temperatures 24 hours before removing.

Ingredient	Acid Jellies (%)	Vegan Gummies (%)
Aglupectin® HS-SBR150	1.25	0.00
Aglupectin® HS-SB3	0.00	2.30
Sugar A (sucrose powder)	3.58	9.20
Sodium citrate (powder)	0.31	0.18
Water	26.82	18.40
Sugar B (sucrose powder)	44.26	24.84
Glucose syrup (42 DE/82 Brix)	22.35	43.70
Citric acid (50% solution)	1.43	1.38

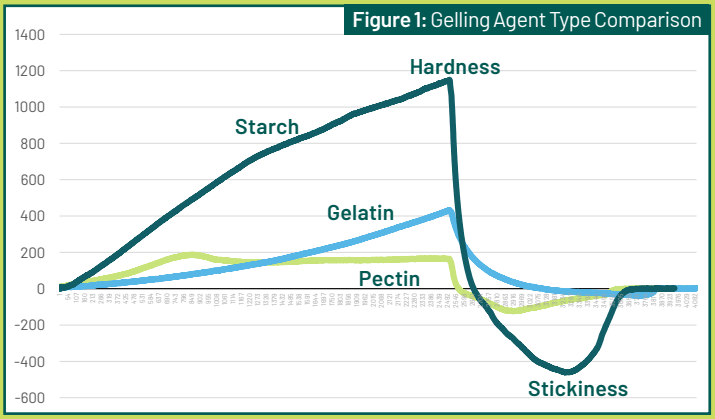

Figure 1: Gelling Agent Type Comparison

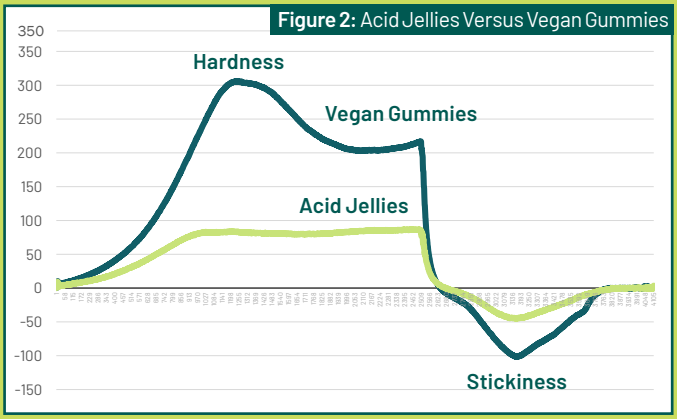

Figure 2: Acid Jellies Versus Vegan Gummies