

Pectin: Not Just For Jelly

The kitchen alchemists unleash the power of a familiar plant-derived edible gel

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Pectin is probably most recognizable to home cooks as the ingredient that thickens jellies and jams and gives them that smooth, sticky texture. Pectin is an indigestible soluble fiber which, when combined with water, forms a colloidal system and gels. It has a wide range of uses. It can be found as a gelling, thickening or stabilizing additive in food, an ingredient in laxatives, a demulcent in throat lozenges, and vegetable glue for cigars.



Pectin is found naturally occurring in various forms of plant life, where it helps to bind cells together. In spite of the fact that it is widely occurring, there are only a few specific sources used to manufacture pectin for food purposes. Traditionally apple peels and cores were the primary source of pectin for making jellies and preserves. The liquid extract was preserved with sulfur dioxide and sold in bulk. As the commercial industry grew, so did the need for a more stable and easily transportable source of pectin. Citrus peels, a by-product of the juice industry, became a major resource for manufacturing solid pectin products. Pectin derived from apple and citrus sources are admirably suited to our culinary purposes.

Pectin is soluble in cold water. Once dissolved it forms a viscous solution. When used in powder form, it must be dispersed rapidly as it easily forms lumps encased in a thin gel layer. This outer layer makes the lumps very difficult to dissolve and eliminate from your final product. The best ways to utilize pectin in its powdered form is by shearing it into your mixture using a standing blender, or by combining it with other soluble powders, like sugar or salt, before whisking it into your liquid ingredients. Pectin dissolves much more slowly in high-sugar solutions, so those can also be whisked into a syrup, which can then be diluted and gelled.

Pectin used for cooking is divided into two categories, high-methoxyl (HM) and low-methoxyl (LM). HM pectin is most commonly used to create fruit preserves. It requires the presence of sugar and specific levels of acidity. The amount of acid in your base solution will directly affect the setting time of the pectin. There are two types of HM pectin: rapid-set and slow-set. Rapid-set HM pectin is often used for jellies that have ingredients suspended inside the gel structure, such as chunky marmalades or hot pepper jelly, while slow-set HM pectin is often used for clear jellies like apricot or grape.

LM pectin requires the presence of calcium to activate the gelling process. Gelation is affected by many factors. There are minimum levels of calcium needed to create a gel. Above that level, the

gel strength will increase rapidly, until it reaches maximum saturation, after which point adding additional calcium will cause the gel strength to decline. A sequestrant can be used to control the availability of the calcium present; as sequestrant levels increase, the system will gel less easily and at lower temperatures. A general rule of thumb for pH is that as acidity decreases, pectin with a higher reactivity level will be needed to form a gel. LM pectin is often used to produce low- or no-sugar jellies. Pectins have a complementary relationship with dairy products and are able to utilize whey as a source of calcium, enhancing their innate capabilities for gelation, emulsification, and the ability to produce stable foams.



Amidated LM pectin (LMA) is pectin that has been treated with ammonia, which moderates the bonds formed between the amide groups and the calcium ions. LMA is also more tolerant of fluctuations in the levels of calcium present in the base solution. Amidated LM pectin requires less calcium than conventional LM pectin to gel. It is more thermally reversible than untreated LM pectin and has the ability to re-form after shearing.

From a culinary standpoint, we like pectin because it creates gels with a smooth, creamy texture and great flavor release. It can be used to create fruit and vegetable terrines, water gels, and low-sugar and low-fat applications. All that and it's a vegetarian product. We've included a couple of recipes using LM pectin and LMA pectin so that you can begin experimenting with the possibilities.

Fruit Terrine

A vacuum sealer is needed for this recipe.

1 honeydew melon
1 pineapple
500 grams water
2.5 grams calcium lactate or calcium gluconate
500 grams water at 95°C
15 grams LM pectin

Clean the fruit. Cut the top and bottom off of the melon and pineapple. Stand the fruit on its end and trim the rind vertically, removing all undesirable pieces. Slice the melon in half vertically. Remove the seeds and slice each half into quarters, leaving you with four large pieces of melon. Slice the pineapple into quarters vertically and remove the core. Trim the pieces of melon and pineapple into planks of equal size, making sure that the tops and bottoms are flat surfaces. Set aside the trimmings for fruit salad or juice.

Make a solution with 500 grams of water and 2.5 grams calcium lactate or calcium gluconate. The choice of one type of calcium over the other is based on taste. Once the solution is made, vacuum-

seal the fruit in a bag with the calcium solution. This impregnates the fruit with the calcium. It takes about five minutes for the calcium to be absorbed. Open the vacuum bag and pat the fruit dry.

Place the 500 grams of water at 95°C in a blender and turn it on low. Increase the speed to form a vortex at the center of the blender. With the blender still running, carefully remove the top and sprinkle in 15 grams LM pectin to hydrate it, and then cool down the solution. Once the pectin is cooled, brush it on one piece of the calcium-infused fruit and lay another piece on top. Repeat with two more pieces of fruit. Vacuum-seal the fruit to compress it together. Repeat process with the remaining four pieces of fruit. Let it rest in the refrigerator overnight. The following morning, cut open the bag and remove the fruit terrine. Slice and serve.

Sliced Chocolate

435 grams water

250 grams dark chocolate

135 grams milk chocolate

2 grams salt

8.22 grams calcium gluconate (1% of the total weight of the first four ingredients)

16.44 grams LMA pectin (2% of the total weight of the first four ingredients)

Place the water, chocolates, salt and calcium in a pot and bring to a simmer. When the temperature reaches 90°C, pour the ingredients into a blender. Turn it on low, and then increase the speed to form a vortex. With the blender still running, carefully remove the lid and sprinkle in the pectin. Run the machine for about five minutes, and then pour the mixture into a plastic-lined dish. Let it cool, undisturbed, at room temperature for 30 minutes. Place in the refrigerator and chill for at least four more hours until completely cool and set. Once the chocolate is cold you can slice it and serve immediately, or cover it with plastic wrap and keep refrigerated until you're ready to serve it.

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