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PIES

AFTER READING THIS CHAPTER, YOU SHOULD BE ABLE TO:

1. Prepare pie doughs.
2. Roll pie doughs, and assemble and bake single-crust pies, double-crust pies, lattice-topped pies, and unbaked pies.
3. Prepare a variety of pie fillings, including fruit, soft or custard-type, cream, and chiffon fillings.
4. Judge the quality of pies.



ON THE EARLY American frontier, it was not uncommon for the pioneer housewife to bake 21 pies each week—one for every meal. Pies were so important to settlers that in winter, when fruits were unavailable, cooks would bake dessert pies out of whatever materials were available, such as potatoes, vinegar, and soda crackers.

Few of us today eat pie at every meal. Nevertheless, pies are still a favorite American dessert. Most customers will order and pay a higher price for a piece of chocolate cream pie than for chocolate pudding, even if the pie filling is the same as the pudding, and even if they leave the crust uneaten.

In this chapter, we study the preparation of pie doughs and fillings and the procedures for assembling and baking pies.

PIE DOUGHS

BEFORE YOU BEGIN studying this section, review the Mixing and Gluten Development section in Chapter 5.

Pie pastry is a simple product in terms of its ingredients: flour, shortening, water, and salt. Yet success or failure depends on how the shortening and flour are mixed and how the gluten is developed. The key to making pie dough is proper technique, and you will remember the techniques better if you understand why they work.

Ingredients

Flour

Pastry flour is the best choice for pie doughs. It has enough gluten to produce the desired structure and flakiness, yet is low enough in gluten to yield a tender product, if handled properly. If stronger flours are used, the percentage of shortening should be increased slightly to provide more tenderness.

PIES IN HISTORY

If we take the word *pie* to mean any of a variety of foods enclosed in pastry and baked, then there have been pies for nearly all of recorded history. In ancient Greece and Rome, doughs made with olive oil were used to cover or enclose various ingredients.

In English, the word *pie* used in this way dates back to at least 1300. It is probably a short form of *magpie*, a bird that collects a variety of things, just as bakers do when they are assembling ingredients to bake in a pie. In the Middle Ages, the word *pie* almost always referred to savory pies containing meats, poultry, or game. Today, in England, the word is still used largely for meat pies, both hot and cold (cold pies being similar to what we might call *pâtés*), while in North America, savory pies, such as chicken “pot pie,” are still enjoyed.

North Americans, however, are responsible for turning the development of pies firmly away from savory and toward sweet. Fruit pies, especially apple, are perhaps still the most popular, but pastry cooks have devised dessert pie fillings from many other ingredients as well.

Pies are so popular that across the continent they are the feature of annual summer festivals. The little town of Braham, for example, which bills itself as the Pie Capital of Minnesota, hosts a popular festival called Pie Day, featuring pie sales, baking contests, art and craft shows, and daylong entertainment, all in celebration of pies.

Fat

Regular hydrogenated shortening is the most popular fat for piecrusts because it has the right plastic consistency to produce a flaky crust. It is firm and moldable enough to make an easily workable dough. Emulsified shortening should not be used, as it blends too quickly with the flour and makes it difficult to achieve a flaky pastry.

Butter contributes excellent flavor to pie pastry, but it is frequently avoided in volume production for two reasons: It is expensive, and it melts easily, making the dough difficult to work.

It is desirable, if costs permit, to blend a quantity of butter into the shortening used for piecrusts to improve flavor. The large quantity of piecrust dumped into the garbage after customers have eaten the filling is evidence that many people are not satisfied with the taste of shortening piecrusts.

If butter is used to replace all the shortening for pie doughs, the percentage of fat in the formula should be increased by about one-fourth. (If 1 pound shortening is called for, use 1 pound 4 ounces butter.) The liquid can be reduced slightly, as butter contains moisture.

In the case of richer pastries and short doughs, butter is specified as the primary fat in the formulas here. These doughs are used primarily for European-style tarts and pastries, in which the flavor of the butter is an important part of the dessert.

Lard is an excellent shortening for pies because it is firm and plastic, properties that produce good flakiness. However, it is not widely used in food service.

Liquid

Water is necessary to develop some gluten in the flour and to give structure and flakiness to the dough. If too much water is used, the crust will become tough because of too much gluten development. If not enough water is used, the crust will fall apart because of inadequate gluten structure.

Milk makes a richer dough that browns more quickly. However, the crust is less crisp and the production cost is higher. If dry milk is used, it should be dissolved in the water to ensure even distribution in the dough.

Whether water or milk is used, it must be added cold (40°F/4°C or colder) to maintain proper dough temperature.

Salt

Salt has some conditioning effect on the gluten (see p. 88). However, it contributes mainly to flavor. Salt must be dissolved in the liquid before being added to the mix to ensure even distribution.

Temperature

Pie dough should be kept cool, about 60°F (15°C), during mixing and makeup, for two reasons:

- Shortening has the best consistency when cool. If it is warm, it blends too quickly with the flour. If it is very cold, it is too firm to be easily worked.
- Gluten develops more slowly at cool temperatures than at warm temperatures.

Pie Dough Types

There are two basic types of pie dough:

- Flaky pie dough.
- Mealy pie dough.

The difference between the two is in how the fat is blended with the flour. Complete mixing procedures are given in the formulas that follow. First, it is important to understand the basic distinction between the two types.

Flaky Pie Dough

For *flaky pie dough*, the fat is cut or rubbed into the flour until the particles of shortening are about the size of peas or hazelnuts—that is, the flour is not completely blended with the fat, and the fat is left in pieces. (Many bakers distinguish between this crust, which they call *short-flake*, and *long-flake crusts*, in which the fat is left in pieces the size of walnuts and the flour is coated even less with shortening. Blitz puff paste, introduced in the next chapter, is actually a long-flake pie dough that is rolled and folded like puff paste.)

When water is added, the flour absorbs it and develops some gluten. When the dough is rolled out, the lumps of fat and moistened flour are flattened and become flakes of dough separated by layers of fat.

Mealy Pie Dough

For *mealy pie dough*, the fat is blended into the flour more thoroughly, until the mixture looks like coarse cornmeal. The more complete coating of the flour with fat has three results:

- The crust is very short and tender because less gluten can develop.
- Less water is needed in the mix because the flour won't absorb as much as in flaky dough.
- The baked dough is less likely to absorb moisture from the filling and become soggy.

Mealy dough is used for bottom crusts, especially in baked fruit pies and soft or custard-type pies, because it resists sogginess. Flaky doughs are used for top crusts and sometimes for prebaked shells.

To produce mealy doughs with even greater resistance to soaking, the flour and fat can be blended together completely to make a smooth paste. Such a dough is very short when baked. It is especially appropriate for custard pies.



Fat-and-flour mixtures for flaky pie dough and mealy pie dough.

The formula called Enriched Pie Pastry included in this section is essentially a mealy dough, except it contains more sugar, is enriched with egg yolks, and works especially well with butter as the only fat. Its delicate, rich flavor makes it suited for European-style tarts and single-crust pies.

3-2-1 Dough

A popular pie dough formula is called 3-2-1 dough. The numbers refer to the ratio of ingredients by weight: 3 parts flour, 2 parts shortening, and 1 part ice water. The ratios of ingredients in this chapter's basic pie dough formulas have been modified slightly from the 3-2-1 standard. In particular, they contain slightly less water to yield a somewhat more tender dough. However, the 3-2-1 ratio is easy to remember and is always reliable. It can be used for both mealy and flaky doughs. To mix the ingredients, use the same procedure as that given in the basic formulas below.

Trimmings

Reworked scraps or trimmings are tougher than freshly made dough. They may be combined with mealy dough and used for bottom crusts only.

Mixing

Hand mixing is best for small quantities of dough, especially flaky dough, because you have more control over the mixing. Quantities up to 10 pounds (4.5 kg) can be mixed almost as quickly by hand as by machine.

For machine mixing, use a pastry knife or paddle attachment. Blend at low speed.

The mixing method for pie doughs is sometimes called the *rubbed dough method*. It is nearly identical to the *sanding method* discussed in the next chapter (p. 312), except that for flaky doughs the fat is rubbed in less thoroughly. Although the procedure has several steps, the two main steps are characteristic of the method:

1. Rub the fat into the sifted dry ingredients.
2. Carefully mix the combined liquid ingredients into the dry ingredients.

The six steps in the pie dough recipe that follows explain the rubbed dough method in more detail. Most pie doughs and several other basic pastries are mixed with this procedure or a variation. Also, compare this procedure with the biscuit method outlined on page 215. Although biscuit dough is softer and contains leavening, it is mixed with a similar procedure.

Crumb Crusts

Graham cracker crusts are popular because they have an appealing flavor and are easier to make than pastry crusts. For variation, vanilla or chocolate wafer crumbs, gingersnap crumbs, or zwieback crumbs may be used instead of graham cracker crumbs. Ground nuts may be added for special desserts.

Crumb crusts are used primarily for unbaked pies, such as cream pies and chiffon pies. They can also be used for such desserts as cheesecake. Be sure the flavor of the crust is compatible with the filling. Lime chiffon pie with a chocolate crumb crust, for instance, is not an appealing combination. And some cream fillings are so delicate in flavor they would be overwhelmed by a crust that is too flavorful.

Baking a crumb crust before filling it makes it firmer and less crumbly, and gives it a toasted flavor.

PIE DOUGH

For large-quantity measurements, see page 720.

Ingredients	Flaky Pie Dough			Mealy Pie Dough		
	U.S.	Metric	%	U.S.	Metric	%
Pastry flour	1 lb 4 oz	500 g	100	1 lb 4 oz	500 g	100
Shortening, regular	14 oz	350 g	70	13 oz	325 g	65
Water, cold	6 oz	150 g	30	5 oz	125 g	25
Salt	0.4 oz (2 tsp)	10 g	2	0.4 oz (2 tsp)	10 g	2
Sugar (optional)	1 oz	25 g	5	1 oz	25 g	5
Total weight:	2 lb 9 oz	1035 g	207%	2 lb 7 oz	985 g	197%

PROCEDURE

1. Sift the flour into a mixing bowl. Add the shortening.
2. Rub or cut the shortening into the flour to the proper degree:
For flaky dough, until fat particles are the size of peas or hazelnuts.
For mealy dough, until mixture resembles cornmeal.
3. Dissolve salt and sugar (if used) in water.
4. Add the water to the flour mixture. Mix very gently, just until the water is absorbed. Do not overwork the dough.
5. Place the dough in pans, cover with plastic film, and place in the refrigerator or retarder for at least 4 hours.
6. Scale portions of dough as needed.

ENRICHED PIE PASTRY

For large-quantity measurements, see page 720.

Ingredients	U.S.	Metric	%	PROCEDURE
Pastry flour	12 oz	375 g	100	
Sugar	2 oz	62 g	17	This pastry is mixed somewhat like mealy pie dough, except the quantity of sugar is too large to dissolve easily in the water. 1. Sift the flour and sugar into a mixing bowl. 2. Add the butter and rub it in until it is well combined and no lumps remain. 3. Beat the egg yolks with the water and salt until the salt is dissolved. 4. Add the liquid to the flour mixture. Mix gently until it is completely absorbed. 5. Place the dough in pans, cover with plastic film, and place in refrigerator at least 4 hours. (Alternatively, if the sizes you need are known in advance, scale the dough, form into discs, wrap separately, and refrigerate.) 6. Scale portions as needed.
Butter	6 oz	188 g	50	
Egg yolks	1 oz	30 g	8	
Water, cold	3 oz	94 g	25	
Salt	0.13 oz ($\frac{5}{8}$ tsp)	4 g	1	
Total weight:	1 lb 8 oz	753 g	201%	
VARIATION				
For quiches and other savory pies and tarts, omit the sugar.				

GRAHAM CRACKER CRUST

Yield: enough for four 9-in. (23-cm) pies or five 8-in. (20-cm) pies

Ingredients	U.S.	Metric	Crumbs at 100%	PROCEDURE
			%	
Graham cracker crumbs	1 lb	450 g	100	1. Mix the crumbs and sugar in a mixing bowl. 2. Add the melted butter and mix until evenly blended; crumbs should be completely moistened by the butter. 3. Scale the mixture into pie pans: 8 oz (225 g) for 9-in. (23-cm) pans 6 oz (180 g) for 8-in. (20-cm) pans 4. Spread the mixture evenly on the bottom and sides of the pan. Press another pan on top to pack the crumbs evenly. 5. Bake at 350°F (175°C) for 10 minutes. 6. Cool thoroughly before filling.
Sugar	8 oz	225 g	50	
Butter, melted	8 oz	225 g	50	
Total weight:	2 lb	900 g	200%	
VARIATION				
Substitute chocolate or vanilla wafer crumbs, gingersnap crumbs, or zwieback crumbs for the graham cracker crumbs.				

KEY POINTS TO REVIEW

- What are the steps in the mixing method for pie doughs?
- What is 3-2-1 dough?
- Flaky dough is best for what kind of piecrusts? Mealy dough is best for what kind of piecrusts?
- What are the ingredients and procedure for making a crumb crust?

ASSEMBLY AND BAKING

PIES MAY BE classified into two groups based on method of assembling and baking.

- Baked Pies.** Raw pie shells are filled and then baked. *Fruit pies* contain fruit fillings and usually have a top crust. *Soft pies* are those with custard-type fillings—that is, liquid fillings that become firm when their egg content coagulates. They are usually baked as single-crust pies.
- Unbaked Pies.** Prebaked pie shells are filled with a prepared filling, chilled, and served when the filling is firm enough to slice. *Cream pies* are made with pudding or boiled custard-type fillings. *Chiffon pies* are made with fillings that are lightened by the addition of beaten egg whites and/or whipped cream. Gelatin or starch gives them a firm consistency.
- The two main components of pies are the dough or pastry and the filling. These two components are produced in quite separate and distinct operations. Once the pastry and fillings are made, rolling the dough and assembling and baking the pies can proceed rapidly.
- Because these operations are separate and involve different kinds of problems and techniques, it is helpful to concentrate on them one at a time. The preparation of pie dough is described above. This section begins with procedures for making pie pastry into pie shells and for filling and baking pies, followed by a discussion of pie fillings in the next section.
- Instead of being given a top crust, fruit pies are sometimes topped with Streusel (p. 195) or a *lattice crust* (see the Procedure for Making a Lattice Top Crust). Streusel is especially good on apple pies. Lattice crusts are best for pies with attractive, colorful fruit, such as cherry or blueberry.

PROCEDURE: Rolling Pie Dough and Lining Pans

1. **Select the best doughs for each purpose.** Mealy pie doughs are used whenever soaking is a problem, so they are mainly used for bottom crusts, especially bottom crusts for soft pie fillings such as custard and pumpkin. This is because mealy doughs resist soaking better than flaky doughs.

Flaky pie doughs are best for top crusts. They can also be used for prebaked pie shells if the shells are filled with cooled filling just before serving. However, if the prebaked shells are filled with hot filling, it is safer to use mealy dough.

2. **Scale the dough.** The following weights are only guidelines. The depth of pie tins, and hence their capacity, varies. For example, disposable tins are often shallower than standard tins.

8 oz (225 g) for 9-in. (23-cm) bottom crusts

6 oz (170 g) for 9-in. (23-cm) top crusts

6 oz (170 g) for 8-in. (20-cm) bottom crusts

5 oz (140 g) for 8-in. (20-cm) top crusts

Experienced bakers use less dough when rolling out crusts because they know how to roll the dough to a perfect circle of the right size and, therefore, need to trim away little excess dough.

Be aware that pie pans are often mislabeled to suggest they are larger than they actually are. It is possible to find pans labeled as 9-in. that are actually smaller than 8-in. pans. “Pan size” as used in this book refers to the inside top diameter of the pie pan.

3. **Dust the bench and rolling pin lightly with flour.** Too much dusting flour toughens the dough, so use no more than needed to prevent sticking.

Instead of rolling the dough directly on the bench, you may roll it out on flour-dusted canvas. Rolling on canvas does not require as much dusting flour.

4. **Roll out the dough.** Flatten the dough lightly and roll it out to a uniform $\frac{1}{8}$ -in. (3-mm) thickness. Use even strokes and roll from the center outward in all directions. Lift the dough frequently to make sure it is not sticking. The finished dough should be a nearly perfect circle.

5. **Place the dough in the pan.** To lift the dough without breaking it, roll it lightly around the rolling pin. A second method is to fold the dough in half, place the folded dough into the pan with the fold in the center, and unfold the dough.

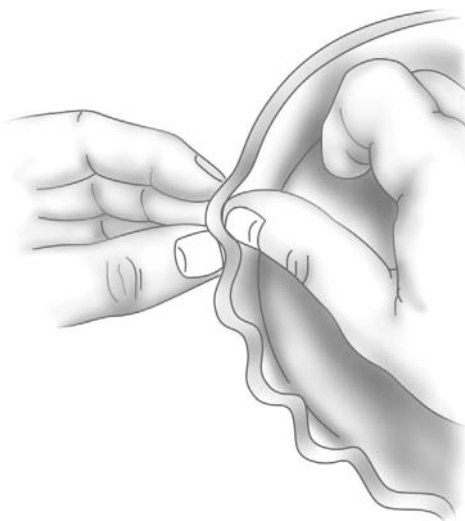
Allow the dough to drop into the pan; press it into the corners without stretching it. Stretched dough will shrink during baking. There should be no air bubbles between the dough and the pan.

6. **For single-crust pies, flute or crimp the edges, if desired, and trim off excess dough.** For double-crust pies, fill with cold filling, brush the edge of the crust with water, and top with the second crust, as explained in the Procedure for Preparing Baked Pies (p. 287). Seal the edges; crimp or flute, if desired. Trim off the excess dough.

The simplest way to trim excess dough is to rotate the pie tin between the palms of the hands while pressing with the palms against the edge of the rim. This pinches off the excess dough flush with the rim.

Some bakers feel that fluted edges add to the appearance of the product. Others feel that fluting takes too much time and produces nothing more than a rim of heavy dough that most customers leave on their plates. Follow your instructor's directions on this procedure. Whether you flute the edges or not, be sure that double-crust pies are well sealed. Many bakers like to make a raised, fluted rim of dough on pie shells for soft-filled pies such as custard or pumpkin. This raised edge, as shown in the illustration, enables them to fill the shell quite full while reducing the chance of spillover.

7. **Rest the made-up pies for 20–30 minutes, preferably refrigerated.** This helps prevent crust shrinkage.



The Soggy Bottom

Underbaked bottom crusts or crusts that have soaked up moisture from the filling are a common fault in pies. Soggy bottoms can be avoided in several ways:

1. Use mealy dough for bottom crusts. Mealy dough absorbs less liquid than flaky dough.
2. Use high bottom heat, at least at the beginning of baking, to set the crust quickly. Bake the pies at the bottom of the oven.
3. Do not add hot fillings to unbaked crusts.
4. For fruit pies, line the bottom of the pie shell with a thin layer of cake crumbs before pouring in the filling. This helps absorb some juice that might otherwise soak into the crust.
5. Use dark metal pie tins, which absorb heat. (Because so many bakers use disposable aluminum pans, other methods must be relied on. Disposable pans with black bottoms are sometimes available.)
6. If finished pies still have underbaked bottoms, they can be set on a flattop range for a few minutes. However, exercise extreme care to avoid scorching.

PROCEDURE: Making a Lattice Top Crust

1. Roll out fresh pie dough (not scraps) $\frac{1}{8}$ in. (3 mm) thick.
2. Cut long strips about $\frac{3}{8}$ in. (1 cm) wide and long enough to cross the center of the pie.
3. Egg-wash the strips and the rim of the filled pie.
4. Place the strips across the pie about 1 in. (2.5 cm) apart. Be sure they are parallel and evenly spaced. Seal them well onto the rim of the pie shell and trim off excess.
5. Place additional strips across the pie at an angle to the first. They may be at a 45-degree angle to make a diamond pattern or at a 90-degree angle to make a checkerboard pattern. Seal and trim excess.

Note: Instead of laying the strips across each other, you may interweave them (a, b, c), but this is usually too time-consuming for a bakeshop and generally done only in home kitchens. When you interweave the strips, some juices from the filling are likely to cling to the bottoms of the strips, as in the illustration. It is best to remove most of these juices as you go, so that they do not mar the appearance of the crust when baked.



A



B



C

PROCEDURE: Preparing Baked Pies

Note: For pies without a top crust, omit steps 3 to 7.

- 1. Line pie pans with pie dough as in the basic procedure (a).



- 2. Fill with cooled fillings (b). (See the table below for scaling instructions.) Do not drop filling on the rims of the pie shells; this will make it harder to seal the rims to the top crusts, and leaking may result during baking.



To avoid spilling custard fillings in single-crust pies, place the empty shells on the racks in the ovens before pouring in the filling.

- 3. Roll out dough for the top crusts.
- 4. Cut perforations in the top crusts to allow steam to escape during baking.
- 5. Moisten the rim of the bottom crusts with water or egg wash to help seal them to the top crusts.
- 6. Fit the top crusts in place (c). Seal the edges together firmly and trim excess dough. The rims may be fluted or

crimped if desired. Pressing with the tines of a fork is a quick way to seal and crimp the edge. An efficient way to trim excess pastry is to rotate the pie tin while pressing on the edges with the palms of the hands (d).



- 7. Brush tops with desired wash: milk, cream, egg wash, or melted butter. Sprinkle lightly with granulated sugar, if desired. Egg-washed tops have a shiny appearance when baked. Tops brushed with fat, milk, or cream are not shiny but have a home-baked look.
- 8. Place pies on the lower level of an oven preheated to 425°–450°F (210°–220°C). The high initial heat helps set the bottom crust to avoid soaking. Fruit pies are baked at this high heat until done. For custard pies, reduce heat after 10 minutes to 325°–350°F (165°–175°C) to avoid overcooking and curdling the custard. Custard pies include all those containing large quantities of egg, such as pumpkin pie and pecan pie.

SCALING INSTRUCTIONS FOR BAKED PIES			
U.S.		METRIC	
PIE SIZE	WEIGHT OF FILLING	PIE SIZE	WEIGHT OF FILLING
8 in.	26–30 oz	20 cm	750–850 g
9 in.	32–40 oz	23 cm	900–1150 g
10 in.	40–50 oz	25 cm	1150–1400 g
Note: Weights are guidelines only. Exact weights may vary, depending on the filling and the depth of the pans. Disposable tins are usually shallower than standard tins.			

PROCEDURE: Preparing Unbaked Pies

1. Line the pie pans with pie dough as in the basic procedure.
2. Dock the crust well with a fork to prevent blistering. (To *dock* means to pierce or perforate the pastry, using a fork or other suitable tool.)
3. Place another pan inside the first one so the dough is between two pans.
4. Place the pans upside down in a preheated oven at 450°F (230°C). Baking upside down helps keep the dough from shrinking down into the pan.
Some bakers like to chill the crusts at least 20–30 minutes before baking to relax the gluten and help reduce shrinkage.
5. Bake at 450°F (230°C) for 10–15 minutes. One pan may be removed during the last part of baking so the crust can brown.
6. Cool the baked crust completely.
7. Fill with cream filling or chiffon filling. Fill as close as possible to service time to prevent soaking the crust.
8. Chill the pie until it is set enough to slice.
9. Most cream pies and chiffon pies are especially good topped with whipped cream. Some cream pies, especially lemon, are popular when topped with meringue and browned (Procedure for Making Meringue Pie Topping follows).

PROCEDURE: Making Meringue Pie Topping

1. Make common meringue or Swiss meringue, using 1 pound of sugar per pound of egg whites. Whip until just stiff. See pages 258–259 for procedure.
2. Spread a generous amount of meringue on each pie. Mound it slightly, and be sure to attach it to the edge of the crust all around. If this is not done, the meringue may slide around on the finished pie. Leave the meringue in ripples or peaks.
3. Bake at 400°F (200°C) until the surface is attractively browned. Do not use higher temperatures, which will cause the surface of the meringue to shrink and toughen.
4. Remove from the oven and cool.

KEY POINTS TO REVIEW

- What are the steps in the procedure for rolling pie dough and lining pans?
- What are the steps in the procedure for preparing baked pies?
- What are the steps in the procedure for preparing unbaked pies?

FILLINGS

MOST PIE FILLINGS require thickeners of some sort. The two most important thickeners for pies are starches and eggs.

Starches for Fillings

Many kinds of pie filling, especially fruit fillings and cream fillings, depend on starch for their thickness. Some egg-thickened fillings, such as pumpkin, also sometimes contain starch. The starch acts as a stabilizer and may also reduce the cost by allowing for a lower egg content. Starches for fillings include:

Cornstarch is used for cream pies because it sets up into a firm gel that holds its shape when sliced. It may also be used for fruit pies.

Waxy maize or **modified starches** are best for fruit pies because they are clear when set and make a soft paste rather than a firm gel. Waxy maize should be used for pies that are to be frozen, as this starch is not broken down by freezing.

Flour, tapioca, potato starch, rice starch, and other starches are used less frequently for fillings. Flour has less thickening power than other starches and makes fruit fillings cloudy.

Instant or pregelatinized starch needs no cooking because it has already been cooked. When used with certain fruit fillings, it eliminates the need to cook the filling before making up the pie. It loses this advantage, however, when the filling is made of raw fruit that must be cooked anyway. In the case of soft fillings such as pumpkin, *instant starch* can be used to eliminate a problem that often occurs with cornstarch: Cornstarch tends to settle out before gelatinizing. This creates a dense, starchy layer on the bottom and improperly thickened filling on top. Instant starches differ in thickening power, so follow the manufacturer's recommendations.

Cooking Starches

To avoid lumping, starches must be mixed with a cold liquid or sugar before being added to a hot liquid.

Sugar and strong acids, such as lemon juice, reduce the thickening power of starch. When possible, all or part of the sugar and strong acids should be added **after the starch has thickened**.

Fruit Fillings

Fruit fillings consist of solid fruit pieces bound together by a gel. The gel consists of fruit juice, water, sugar, spices, and a starch thickener. As explained, a modified starch such as waxy maize is the preferred thickener for fruit fillings because it makes a clear, not cloudy, gel.

Other starches, such as cornstarch, tapioca, or potato starch, may also be used. Cornstarch is frequently used in food service operations in which baking is only one aspect of the food preparation, making it inconvenient to have on hand all the specialty ingredients found in a bakery.

The functions of the gel are to bind the solid fruit pieces together, to help carry the flavors of the spices and the sweetness of the sugar, and to improve appearance by giving a shine or gloss to the fruit. Of course, the solid fruit is the most important part of the filling. To have a good-quality pie filling, you should have 2 to 3 pounds of drained fruit for each pound of liquid (juice plus water).

The two basic methods in food service for making pie fillings are the *cooked juice method* and the *cooked fruit method*. We also describe a third, the old-fashioned method, at the end of the section. In the cooked juice method, the gel is made separately by cooking fruit juice, water, and sugar with a starch. The gel is then mixed with the fruit. In the cooked fruit method, the fruit, water, and juices (if any) are all cooked together and then thickened with a starch.

Fruits for Pie Fillings

Fresh fruits are excellent in pies if they are at their seasonal peak. Fresh apples are used extensively for high-quality pies. The quality of fresh fruits can vary considerably, however, and many fruits require a lot of labor.

Frozen fruits are widely used for pies because they are consistent in quality and readily available. Frozen fruits for quantity use are commonly packed with sugar in 30-pound (13.6-kg) tins. They may be thawed in the refrigerator for 2 to 3 days, or in a water bath. A third method is to thaw the fruit just enough to free it from its container, add the water to be used in making it into a pie filling, and heat it to 185° to 195°F (85° to 90°C). Then drain the juice well and make the filling. Whichever method you use, be sure the fruit is completely thawed before preparing the filling. If it is partially frozen, you will not be able to drain the juice properly to make the gel, and the frozen, undrained juice will water down the filling later.

Some frozen fruits, especially berries, are packed without sugar. Naturally, the sugar content of any fruit must be taken into account when adding sugar to pie fillings.

Canned fruits are packed in four basic styles: solid pack, heavy pack, water pack, and syrup pack. *Solid pack* means no water is added, although you will be able to drain off a small

quantity of juice. **Heavy pack** means only a small quantity of water or juice is added. **Water pack** fruits are canned with the water that was used to process them. Sour cherries are usually packed this way. **Syrup pack** fruits are packed in a sugar syrup, which may be light, medium, heavy, or extra-heavy. Heavy syrup means there is more sugar in the syrup. In general, fruits packed in heavy syrup are firmer and less broken than fruits in light syrup.

With water-pack and syrup-pack fruits, it is important to know the **drained weight** (the weight of the solid fruit without the juice). This information may be indicated on the label or available from the processor. The **net weight** is the weight of the total contents, including juice or syrup.

If the drained weight of a fruit is very low, you may need to add extra drained fruit to a batch of filling in order to get a good ratio of fruit to gel.

Dried fruits must be rehydrated by soaking and, usually, simmering before they are made into pie fillings.

Fruits must have sufficient acid (tartness) to make flavorful fillings. If they lack natural acid, you may need to add some lemon, orange, or pineapple juice to supply the acid.

Cooked Juice Method

The advantage of this method is that only the juice is cooked. Thus, the fruit retains better shape and flavor because it is subjected to less heat and handling. This method is used when the fruit requires little or no cooking before filling the pie. Most canned and frozen fruits are prepared this way. Fresh berries can also be prepared with this method: Part of the berries are cooked or puréed to provide juice, and the remaining berries are then mixed with the finished gel.

PROCEDURE: Cooked Juice Method

1. Drain the juice from the fruit.
2. Measure the juice and, if necessary, add water or other fruit juice to bring to the desired volume.
3. Bring the juice to a boil.
4. Dissolve the starch in cold water and stir it into the boiling juice. Return to a boil and cook until clear and thickened.
5. Add sugar, salt, and flavorings. Stir until dissolved.
6. Pour the thickened juice over the drained fruit and mix gently. Be careful not to break or mash the fruit.
7. Cool.

Cooked Fruit Method

This method is used when the fruit requires cooking or there is not enough liquid for the cooked juice method. Most fresh fruits (except berries) are prepared this way, as are dried fruits such as raisins and dried apricots. Canned fruits should not be prepared by this method because they have already been cooked and are likely to break up or turn to mush.

PROCEDURE: Cooked Fruit Method

1. Bring the fruit and juice or water to a boil. Some sugar may be added to the fruit to draw out juices.
2. Dissolve the starch in cold water and stir into the fruit. Return to a boil and cook until clear and thickened. Stir while cooking.
3. Add sugar, salt, flavorings, and other ingredients. Stir until dissolved.
4. Cool as quickly as possible.

VARIATION

Some fruits, such as fresh apples, may be cooked in butter, rather than boiled in water, for better flavor.

Old-Fashioned Method

This method is commonly used for homemade apple pies and peach pies. However, it is not often used in food service operations because of its disadvantages. First, the thickening of the juices is difficult to control. Second, because raw fruit shrinks as it cooks, it is necessary to pile the fruit high in the shell. The fruit then shrinks, often leaving a large airspace between the crust and fruit, so the top crust becomes misshapen. Also, the juices given off are more likely to boil over than when the filling is cooked and the juice thickened before filling the pie.

For these reasons, the cooked fruit method usually gives better results than the old-fashioned method. See the Apple Pie formula and variations on page 294.

PROCEDURE: Old-Fashioned Method

1. Mix the starch and spices with the sugar until uniformly blended.
2. Mix the fruit with the sugar mixture.
3. Fill the unbaked pie shells with the fruit.
4. Place lumps of butter on top of the filling.
5. Cover with a top crust or Streusel (p. 195) and bake.

KEY POINTS TO REVIEW

- What are the steps in the cooked juice procedure for making pie fillings?
- What are the steps in the cooked fruit procedure for making pie fillings?
- What are the steps in the old-fashioned procedure for making fruit pie fillings?

APPLE PIE FILLING (CANNED FRUIT)

Yield: about 9½ lb (4500 g)—five 8-in. (20-cm) pies; four 9-in. (23-cm) pies; three 10-in. (25-cm) pies

Ingredients	U.S.	Metric	PROCEDURE
Canned apples, solid pack or heavy pack (one No. 10 can)	6 lb 8 oz	3000 g	Use the cooked juice method (p. 290). 1. Drain the apples and save the juice. Add enough water to the juice to measure 1½ pt (750 mL). 2. Mix the cold water and starch. 3. Bring the juice mixture to a boil. Stir in the starch mixture and return to a boil. 4. Add the remaining ingredients, except the drained apples. Simmer until the sugar is dissolved. 5. Pour the syrup over the apples and mix gently. Cool completely. 6. Fill the pie shells. Bake at 425°F (220°C) about 30–40 minutes.
Drained juice plus water	1 pt 8 fl oz	750 mL	
Water, cold	8 fl oz	250 mL	
Cornstarch	3 oz	90 g	
or			
Modified starch (waxy maize)	2.5 oz	75 g	
Sugar	1 lb 4 oz	570 g	
Salt	0.25 oz	7 g	
Cinnamon	0.25 oz (¾ tsp)	7 g	
Nutmeg	0.08 oz (1 tsp)	2 g	
Butter	3 oz	90 g	

VARIATIONS

DUTCH APPLE PIE FILLING

Simmer 8 oz (250 g) raisins in water. Drain and add to apple pie filling.

CHERRY PIE FILLING

Use one No. 10 can sour cherries instead of apples and make the following ingredient adjustments:

- Increase starch to 4 oz (125 g) cornstarch or 3 oz (90 g) waxy maize.
- Increase sugar to 1 lb 12 oz (825 g).
- Add 1½ oz (45 mL) lemon juice in step 4.
- Omit cinnamon and nutmeg. Add almond extract to taste (optional).
- If desired, color with 2 to 3 drops red coloring.

PEACH PIE FILLING

Use one No. 10 can sliced peaches, preferably solid or heavy pack, instead of apples. Increase liquid in step 1 to 1 qt (1 L). Omit cinnamon and nutmeg.

PINEAPPLE PIE FILLING

Use one No. 10 can crushed pineapple instead of apples. Gently press the fruit in a sieve to squeeze out the juice. Make the following ingredient adjustments:

- Increase the liquid in step 1 to 1 qt (1 L).
- Increase the starch to 4 oz (125 g) cornstarch or 3 oz (90 g) waxy maize.
- Use 1 lb 8 oz (750 g) sugar and 8 oz (250 g) corn syrup.
- Omit the cinnamon and nutmeg. If desired, color with 2 to 3 drops yellow coloring.

BLUEBERRY PIE FILLING (FROZEN FRUIT)

Yield: about 7 lb 8 oz (3375 g)—four 8-in. (20-cm) pies; three 9-in. (23-cm) pies

Ingredients	U.S.	Metric	PROCEDURE
Blueberries, frozen, unsweetened	5 lb	2250 g	Use the cooked juice method (p. 290).
Drained juice plus water	12 fl oz	375 mL	1. Thaw the berries in their unopened original container.
Sugar	6 oz	175 g	2. Drain the berries. Add enough water to the juice to measure 12 oz (375 mL). Add the first quantity of sugar.
Water, cold	6 fl oz	190 mL	3. Mix the cold water and the starch.
Cornstarch	3 oz	90 g	4. Bring the juice mixture to a boil. Stir in the starch mixture. Return to a boil to thicken.
or			5. Add the remaining ingredients, except the drained berries. Stir over heat until the sugar is dissolved.
Modified starch (waxy maize)	2.25 oz	68 g	6. Pour the syrup over the drained berries. Mix gently. Cool completely.
Sugar	14 oz	412 g	7. Fill pie shells. Bake at 425°F (220°C) about 30 minutes.
Salt	0.25 oz	8 g	
Cinnamon	0.12 oz (1¼ tsp)	4 g	
Lemon juice	1.5 fl oz	45 mL	

VARIATIONS

APPLE PIE FILLING

Use 5 lb (2.25 kg) frozen apples instead of blueberries. Make the following ingredient adjustments:

Reduce the starch to 1.5 oz (45 g) cornstarch or 1.25 oz (38 g) waxy maize.

Reduce the second quantity of sugar to 8 oz (225 g).

Add ½ tsp (1 g) nutmeg and 3 oz (87 g) butter in step 5.

CHERRY PIE FILLING

Use 5 lb (2.25 kg) frozen cherries instead of blueberries. Make the following ingredient adjustments:

Increase the liquid in step 2 to 1 pt (500 mL).

Reduce the starch to 2.5 oz (75 g) cornstarch or 2 oz (60 g) waxy maize.

Reduce the second quantity of sugar to 10 oz (285 g).

Omit the cinnamon.

Reduce the lemon juice to 0.75 fl oz (22 mL).

RAISIN PIE FILLING

Yield: about 2 lb (1 kg)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 720.

Ingredients	U.S.	Metric	PROCEDURE
Raisins	13 oz	360 g	Use the cooked fruit method (p. 290).
Water	13 fl oz	400 mL	1. Combine the raisins and water in a saucepan. Simmer 5 minutes.
Water, cold	2 fl oz	50 mL	2. Mix the water and starch. Stir into the raisins and simmer until thickened.
Cornstarch	0.5 oz	15 g	3. Add the remaining ingredients. Stir until the sugar is dissolved and the mixture is uniform.
or			4. Cool thoroughly.
Modified starch (waxy maize)	0.4 oz	12 g	5. Fill the pie shells. Bake at 425°F (220°C) about 30–40 minutes.
Sugar	4 oz	114 g	
Salt	0.06 oz (¾ tsp)	2 g	
Lemon juice	0.6 fl oz	18 mL	
Grated lemon zest	0.02 oz (⅓ tsp)	0.6 g	
Cinnamon	0.012 oz (⅓ tsp)	0.4 g	
Butter	0.6 oz	18 g	

FRESH APPLE PIE FILLING I

Yield: about 2 lb 6 oz (1070 g)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric
Apples, peeled and sliced	2 lb	900 g
Butter	1 oz	30 g
Sugar	3 oz	90 g
Water, cold	2 oz	60 g
Cornstarch	0.75 oz	24 g
or		
Modified starch (waxy maize)	0.5 oz	15 g
Sugar	3.5 oz	100 g
Salt	0.06 oz (¼ tsp)	1 g
Cinnamon	0.06 oz (1 tsp)	1 g
Nutmeg	0.02 oz (¼ tsp)	0.5 g
Lemon juice	0.33 oz (2 tsp)	10 g
Butter	0.25 oz	7 g

PROCEDURE

- Use this variation of the cooked fruit method (p. 290).
1. Sauté the apples lightly in the first quantity of butter until they are slightly softened. Add the first quantity of sugar as the apples cook. This will draw juices out of the apples, which will then simmer in these juices.
 2. Mix the water and starch until smooth. Add the starch mixture to the apples and boil until the liquid is thick and clear.
 3. Remove from the heat. Add the remaining ingredients. Stir gently until the sugar is dissolved and the butter is melted.
 4. Cool completely.
 5. Fill the pie shells. Bake at 425°F (220°C) about 30–40 minutes.

VARIATIONS

FRESH APPLE PIE FILLING II

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric
Water	3.5 oz	100 g

Omit the first quantity of butter. Instead, simmer the apples in water and the first quantity of sugar as in the basic cooked fruit method, using the quantity of water listed above.

APPLE GINGER PIE FILLING

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric
Ground ginger	0.03 oz (¼ tsp)	0.5 g
Candied ginger, finely chopped	0.67 oz	20 g

Prepare as for Fresh Apple Pie Filling I or II, but omit the cinnamon and instead add ground and candied ginger.

APPLE PEAR PIE FILLING

Prepare as for Fresh Apple Pie Filling I or II, but substitute slightly firm pears for half the apples.

APPLE WALNUT PIE FILLING

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric
Chopped walnuts	2.5 oz	75 g

Mix walnuts into Fresh Apple Pie Filling I or II.

RHUBARB PIE FILLING

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric
Fresh rhubarb	1 lb 6 oz	650 g

Substitute rhubarb, cut into 1-in. (2.5-cm) pieces, for the apples. Omit the cinnamon, nutmeg, and lemon juice.

APPLES FOR PIES

Which varieties of apples are best for making pies? Two criteria are important: taste and texture. First, the apples should have good flavor and a noticeable level of acidity. Apples that are very mild make pies with little flavor. The sugar content, or sweetness, of the apple, is less important, as the sugar in the recipe can be adjusted.

Second, the apples should hold their shape when cooked. Apples that turn to mush, such as McIntosh, are better for applesauce than for pies.

Popular apple varieties that have good taste and texture for use in pie fillings include Granny Smith, Jonathan, Jonagold, Newton Pippin, Rome, Macoun, Pink Lady, Stayman-Winesap, Haralson, and Golden Delicious.

PEACH SOUR CREAM PIE FILLING

Yield: 2 lb 4 oz (1125 g)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 720.

Ingredients	U.S.	Metric	PROCEDURE
Sour cream	8 oz	250 g	1. Mix the sour cream, sugar, and cornstarch until smooth.
Sugar	4 oz	125 g	2. Add the eggs, vanilla, and nutmeg and mix in.
Cornstarch	0.5 oz	15 g	3. Carefully fold the peaches into the sour cream mixture.
Eggs, beaten	3.33 oz (2 eggs)	100 g (2 eggs)	4. Fill unbaked pie shells.
Vanilla extract	½ tsp	2 mL	5. Top with Streusel (p. 195).
Nutmeg	⅛ tsp	0.5 mL	6. Bake at 425°F (220°C) for about 30 minutes, until the filling is set.
Fresh peaches, sliced (see Note)	1 lb	625 g	
Streusel (p. 195)	6 oz	180 g	

NOTE: If fresh peaches are not available, substitute canned peaches packed in light syrup. Drain them well before weighing.



VARIATION

PEAR SOUR CREAM PIE

Substitute sliced pears for the sliced peaches.

OLD-FASHIONED APPLE PIE FILLING

Yield: about 11 lb (5 kg)—six 8-in. (20-cm) pies; five 9-in. (23-cm) pies; four 10-in. (25-cm) pies

Ingredients	U.S.	Metric	PROCEDURE
Apples, peeled and sliced	9 lb	4100 g	Use the old-fashioned method (p. 291).
Lemon juice	2 fl oz	60 mL	1. Select firm, tart apples. Scale after peeling and coring.
Sugar	2 lb	900 g	2. Combine the apple slices and lemon juice in a large mixing bowl. Toss to coat apples with the juice.
Cornstarch	3 oz	90 g	3. Mix together the sugar, cornstarch, salt, and spices. Add to the apples and toss gently until well mixed.
Salt	0.25 oz	7 g	4. Fill the pie shells, packing down the apples well. Dot the tops with pieces of butter before covering with top crusts. Bake at 400°F (200°C) about 45 minutes.
Cinnamon	0.25 oz	7 g	
Nutmeg	0.08 oz (1 tsp)	2 g	
Butter	3 oz	90 g	

FRESH STRAWBERRY PIE FILLING

Yield: about 12 lb (5.5 kg)—six 8-in. (20-cm) pies; five 9-in. (23-cm) pies; four 10-in. (25-cm) pies

Ingredients	U.S.		Metric	PROCEDURE Use the cooked juice method (p. 290). 1. Hull, wash, and drain the berries. Set aside 7 lb (3.2 kg) berries. If small, these may be left whole; if large, cut in halves or quarters. 2. Mash or purée the remaining 2 lb (900 g) berries. Mix with the water. (If a clear filling is desired, strain this mixture.) 3. Mix together the sugar, starch, and salt. Stir into the berry-and-water mixture until no lumps remain. 4. Bring to a boil, stirring constantly. Cook until thickened. 5. Remove from the heat and stir in the lemon juice. 6. Cool to room temperature but do not chill. 7. Stir to eliminate lumps. Fold in the reserved berries. 8. Fill baked pie shells and chill (do not bake).
Fresh whole strawberries	9 lb		4100 g	
Water, cold	1 pt		500 mL	
Sugar	1 lb 12	oz	800 g	
Cornstarch	4	oz	120 g	
or				
Modified starch (waxy maize)	3	oz	90 g	
Salt	0.17 oz (1 tsp)		5 g	
Lemon juice	2	fl oz	60 mL	
VARIATION				
FRESH BLUEBERRY TART FILLING Substitute blueberries for the strawberries. This recipe works best with small berries and with cornstarch rather than modified starch. Adjust the sugar as desired, depending on the sweetness of the fruit. Force the cooked, thickened juices through a sieve (cooking the juices before straining gives more color to the gel). Fold the glaze into the berries while it is still hot. This mixture is more suitable for tarts than for pies. Because pie shells are deeper, the filling may not hold its shape when sliced. One recipe makes enough filling for eight or nine 8-in. (20-cm) tarts, seven or eight 9-in. (23-cm) tarts, or six 10-in. (25-cm) tarts.				

Custard or Soft Fillings

Custard, pumpkin, pecan, and similar pies are made with an uncooked liquid filling containing eggs. The eggs coagulate during baking, which sets the filling. For more information on custards, see page 515.

The method for one pie in this section is unusual. Key Lime Pie is similar to other soft pies, except it is not baked. Instead, the acidity of the lime juice is sufficient to coagulate the proteins and thicken the pie filling.

Many soft fillings contain starch in addition to eggs. Flour, cornstarch, and instant starch are frequently used. Although starch is unnecessary if enough eggs are used, many bakers prefer to add a little starch because it allows them to reduce the egg content. Also, the use of starch helps bind the liquids and reduce the chance of separating, or “weeping,” in the baked pie. If starch is used, be sure the mix is well stirred before filling the pies in order to reduce the danger of the starch settling out.

The greatest difficulty in preparing soft pies is cooking the crust completely without overcooking the filling. Start the pie at the bottom of a hot oven (425° to 450°F/220° to 230°C) for the first 10 to 15 minutes to set the crust. Then reduce the heat to 325° to 350°F (165° to 175°C) to cook the filling slowly. An alternative approach is to *partially* bake the empty shells before filling. See page 288 for baking empty shells (called *baking blind*), but bake until about half cooked. Cool, fill, and bake the pie.

Use one of these methods to test for doneness:

- Shake the pie very gently. If it is no longer liquid, it is done. The center will still be slightly soft, but its own heat will continue to cook the pie after it is removed from the oven.
- Insert a thin knife blade an inch from the center. If it comes out clean, the pie is done.

CUSTARD PIE FILLING

Yield: 2 lb (0.9 kg)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 720.

Ingredients			U.S.	Metric	PROCEDURE
Eggs	8	oz	225	g	
Sugar	4	oz	112	g	
Salt	0.06	oz (¼ tsp)	1	g	
Vanilla extract	0.25	fl oz (1½ tsp)	7.5	mL	
Milk (see Note)	1.25	pt	600	mL	
Nutmeg	0.018–0.035	oz (¼–½ tsp)	0.5–0.75	g	
NOTE: For a richer custard, use part milk and part cream.					
VARIATION					
COCONUT CUSTARD PIE FILLING					
Use 2.5 oz (70 g) unsweetened, flaked coconut. Sprinkle the coconut into the pie shells before adding the custard mixture. The coconut may be lightly toasted in the oven before it is added to the pies. Omit the nutmeg.					

PECAN PIE FILLING

Yield: 1 lb 12 oz (820 g) filling plus 5 oz (142 g) pecans—one 9-in. (23-cm) pie

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric	PROCEDURE
Granulated sugar (see <i>Note</i>)	7 oz	200 g	1. Using the paddle attachment, at low speed, blend the sugar, butter, and salt until evenly blended. 2. With the machine running, add the eggs a little at a time until they are all absorbed. 3. Add the syrup and vanilla. Mix until well blended. 4. To assemble pies, distribute the pecans evenly in the pie shells and then fill with the syrup mixture. 5. Bake at 425°F (220°C) for 10 minutes. Reduce heat to 350°F (175°C). Bake 30–40 minutes more, until set.
Butter	2 oz	60 g	
Salt	0.06 oz (¼ tsp)	1.5 g	
Eggs	7 oz	200 g	
Dark corn syrup	12 oz (about 8½ fl oz)	350 g	
Vanilla extract	0.25 oz (1½ tsp)	8 g	
Pecans	5 oz	142 g	
NOTE: Brown sugar may be used if a darker color and stronger flavor are desired.			
VARIATION			
MAPLE WALNUT PIE FILLING			
Substitute pure maple syrup for the corn syrup. Substitute coarsely chopped walnuts for the pecans.			

PUMPKIN PIE FILLING

Yield: about 4.25 lb (2 kg)—two 9-in. (23-cm) pies

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric
Pumpkin purée (one No. 2½ can)	1 lb 10.5 oz	750 g
Pastry flour	1 oz	30 g
Cinnamon	0.12 oz	4 g
Nutmeg	0.018 oz (¼ tsp)	0.5 g (1 mL)
Ginger	0.018 oz (¼ tsp)	0.5 g (1 mL)
Cloves	0.01 oz (⅛ tsp)	0.3 g (0.5 mL)
Salt	0.12 oz (½ tsp)	4 g
Brown sugar	10 oz	290 g
Eggs (see Note)	10 oz	300 g
Corn syrup or half corn syrup and half molasses	2 oz	60 g
Milk	1 pt 4 fl oz	600 mL

NOTE: Pumpkin pie filling should be allowed to stand at least 30 minutes before being poured into the pie shells. This gives the pumpkin time to absorb the liquid and makes a smoother filling that is less likely to separate after baking. If the filling is to stand for much more than 1 hour, do not add the eggs until the pies are to be filled. If the eggs are added earlier, the acidity of the pumpkin and brown sugar may partially coagulate the eggs.

PROCEDURE

1. Place the pumpkin in the bowl of a mixer fitted with the whip attachment.
2. Sift together the flour, spices, and salt.
3. Add the flour mixture and sugar to the pumpkin. Mix at first speed until smooth and well blended. Avoid whipping air into the mix.
4. Add the eggs and mix in. Scrape down the sides of the bowl.
5. With the machine still at low speed, gradually pour in the syrup, then the milk. Mix until evenly blended.
6. Let the filling stand for 30–60 minutes.
7. Stir the filling to remix. Fill the pie shells. Bake at 450°F (230°C) for 15 minutes. Lower the heat to 350°F (175°C) and bake until set, about 30–40 minutes more.

VARIATIONS

SWEET POTATO PIE FILLING

Substitute canned sweet potatoes, drained and puréed, for the pumpkin.

SQUASH PIE FILLING

Substitute puréed squash for the pumpkin.

KEY LIME PIE FILLING

Yield: 1 lb 5 oz (630 g)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 721.

Ingredients	U.S.	Metric
Egg yolks, pasteurized	2.67 oz (4 yolks)	80 g (4 yolks)
Sweetened condensed milk	14 oz	400 g
Freshly squeezed key lime juice (see Note)	5 oz	150 g

NOTE: If key limes are not available, substitute regular lime juice. Bottled or frozen key lime juice is also available.

Classic key lime pie filling is pale yellow in color, not green. However, if desired, tint the filling pale green with a few drops of food color.



PROCEDURE

1. Beat the egg yolks lightly, then stir in the sweetened condensed milk.
2. Add the lime juice and beat until smooth.
3. Pour the filling into a baked pie shell or a graham cracker crumb pie shell. Refrigerate overnight. The acidity of the limes will partially coagulate the egg and milk proteins so the filling becomes firm. Key lime pie must be kept refrigerated at all times.
4. Top with a meringue or whipped cream border.

Cream Pie Fillings

Cream pie fillings are the same as puddings, which, in turn, are the same as basic pastry cream with added flavorings such as vanilla, chocolate, or coconut. Lemon filling is made by the same method, using water and lemon juice instead of milk.

There is one difference between pastry cream and pie filling you should note: *Cream pie fillings are made with cornstarch, so slices hold their shape when cut.* Pastry cream may be made with flour, cornstarch, or other starches.

The basic principles and procedures for making pastry cream are included in Chapter 12, pages 262–263. For your convenience, the formula for vanilla pastry cream is repeated here under the name Vanilla Cream Pie Filling. Popular flavor variations for cream pie fillings follow this basic recipe.

Opinion is divided as to whether pie shells should be filled with warm cream fillings, which are then cooled in the shell, or the filling should be cooled first and then added to the shell. For the best-looking slices, warm filling is best. The filling cools to a smooth, uniform mass and the slices hold sharp, clean cuts. However, you must use a well-prepared mealy pie dough that resists soaking, or you risk having soggy bottom crusts. Enriched Pie Pastry (p. 283) is good for this purpose.

Many food service operations prefer to fill each pie shell with cold filling shortly before the pie is to be cut and served. The slice will not cut as cleanly when you do this, but the crusts will be crisp and you can use flaky dough for them.

We use the warm filling method in this book, but you can, of course, modify the procedure to suit your needs.

KEY POINTS TO REVIEW

- What methods can be used to ensure that the crusts of soft pies are fully baked without overcooking the fillings?
- How are custard pies tested for doneness?
- What is the difference between pastry cream and cream pie filling?

VANILLA CREAM PIE FILLING

Yield: about 1½ pt (0.5 L) or 13 oz (0.8 kg)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 722.

Ingredients	U.S.	Metric	PROCEDURE
Milk	1 pt	500 g	Before beginning production, review the discussion of pastry cream on pages 262–263. 1. In a heavy saucepan or kettle, dissolve the sugar in the milk and bring just to a boil. 2. With a whip, beat the egg yolks and whole eggs in a stainless steel bowl. 3. Sift the starch and sugar into the eggs. Beat with the whip until perfectly smooth. 4. Temper the egg mixture by slowly beating in the hot milk in a thin stream. 5. Return the mixture to the heat and bring it to a boil, stirring constantly. 6. When the mixture comes to a boil and thickens, remove it from the heat. 7. Stir in the butter and vanilla. Mix until the butter is melted and completely blended in. 8. Pour into baked, cooled pie shells. Cool, then keep chilled. If desired, decorate chilled pies with whipped cream, using a pastry bag with a star tube.
Sugar	2 oz	60 g	
Egg yolks	1.5 oz	45 g	
Whole eggs	2 oz	60 g	
Cornstarch	1.25 oz	38 g	
Sugar	2 oz	60 g	
Butter	1 oz	30 g	
Vanilla extract	0.25 oz (1½ tsp)	8 g	

VARIATIONS

BANANA CREAM PIE FILLING

Using vanilla cream filling, pour half the filling into pie shells, cover with sliced bananas, and fill with remaining filling. (Bananas may be dipped in lemon juice to prevent browning.)

CHOCOLATE CREAM PIE FILLING I

For large-quantity measurements, see page 722.

Ingredients	U.S.	Metric
Unsweetened chocolate	1 oz	30 g
Semisweet chocolate	1 oz	30 g
Melt together the unsweetened and semisweet chocolate and mix into the hot vanilla cream filling.		
CHOCOLATE CREAM PIE FILLING II		
<i>For large-quantity measurements, see page 722.</i>		
Ingredients	U.S.	Metric
Milk	14 fl oz	438 mL
Sugar	2 oz	60 g
Egg yolks	1.5 oz	45 g
Whole eggs	2 oz	60 g
Cold milk	2 oz	60 g
Cornstarch	1.25 oz	38 g
Cocoa	0.75 oz	22 g
Sugar	2 oz	60 g
Butter	1 oz	30 g
Vanilla extract	0.25 fl oz	8 mL

This variation uses cocoa instead of chocolate. The cocoa is sifted with the starch. Some of the milk must be included with the eggs in order to provide enough liquid to make a paste with the starch and cocoa. Follow the procedure in the basic recipe, but use the above ingredients.

BUTTERSCOTCH CREAM PIE FILLING

For large-quantity measurements, see page 722.

Ingredients	U.S.	Metric
Brown sugar	8 oz	250 g
Butter	2.5 oz	75 g

Combine brown sugar and butter in a saucepan. Heat over low heat, stirring, until the butter is melted and the ingredients are blended. Prepare the basic vanilla cream filling recipe, but omit all the sugar and increase the starch to $1\frac{1}{2}$ oz (45 g). As the mixture comes to a boil, in step 5, gradually stir in the brown sugar mixture. Finish as in the basic recipe.

LEMON PIE FILLING

For large-quantity measurements, see page 722.

Ingredients	U.S.		Metric	
Water	14	fl oz	400	mL
Sugar	7	oz	200	g
Egg yolks	2.5	oz	75	g
Cornstarch	1.5	oz	45	g
Sugar	2	oz	60	g
Salt	0.025	oz (⅓ tsp)	0.5	g
Lemon zest, grated	0.16	oz (2 tsp)	5	g
Butter	1	oz	30	g
Lemon juice	3	fl oz	90	mL

Follow the procedure for vanilla cream filling, but use the above ingredients. Note that the lemon juice is added after the filling is thickened.

COCONUT CREAM PIE FILLING

Add 2 oz (60 g) toasted, unsweetened coconut to the basic filling.

STRAWBERRY RHUBARB PIE FILLING

Yield: 3 lb 8 oz (1680 g)—two 9-in. (20-cm) pies

For large-quantity measurements, see page 723.

Ingredients	U.S.	Metric	PROCEDURE
Rhubarb, fresh or frozen, in 1-in. (2.5-cm) pieces	1 lb 4 oz	600 g	1. Place the rhubarb, sugar, and water in a heavy saucepan. Cover and set over low heat. Bring to a simmer. The sugar will help draw juices out of the rhubarb. Simmer until the rhubarb is soft and the sugar is dissolved. 2. Beat the egg yolks with the cream until well mixed. Add the cornstarch and stir until evenly blended. 3. Remove the rhubarb from the heat. Stir in the cream mixture. 4. Return the rhubarb to the heat and bring to a simmer. Simmer about 1 minute, until thickened. 5. Pour out the rhubarb into a bowl and mix in the strawberries. Let stand until slightly warm. Mix again to blend the strawberry juices with the filling, then fill the baked pie shells. Chill until firm.
Sugar	12 oz	360 g	
Water	4 oz	120 g	
Egg yolks	2.67 oz (4 yolks)	80 g (4 yolks)	
Heavy cream	4 oz	120 g	
Cornstarch	1.5 oz	45 g	
Fresh strawberries, hulled and quartered	1 lb	480 g	

Chiffon Pie Fillings

Chiffon fillings have a light, fluffy texture created by the addition of beaten egg whites and, sometimes, whipped cream. The egg whites and cream are folded into a cream or fruit base, which is stabilized with gelatin. The folding-in of the egg whites and the filling of the baked pie shells must be done before the gelatin sets. After the pie is chilled to set the gelatin, the filling should be firm enough to hold a clean slice.

When chiffon filling contains both egg whites and whipped cream, most chefs and bakers prefer to fold in the egg whites first, even though they may lose some volume. The reason is that if the cream is added first, there is more danger it will be overbeaten and turn to butter during the folding and mixing procedure.

For a review of the guidelines for beating egg whites, see page 258. For the guidelines for whipping cream, see page 255.

For safety, always use pasteurized egg whites.

Bases for chiffons include the following three main types:

Thickened with starch. The procedure is the same as for fruit pie fillings made by the cooked juice method or cooked fruit method, except the fruit is finely chopped or puréed. Most fruit chiffons are made this way.

Thickened with egg. The procedure is the same as for Crème Anglaise (p. 261). Chocolate chiffons and pumpkin chiffons are sometimes made this way.

Thickened with egg and starch. The procedure is the same as for pastry cream or cream pie fillings. Lemon chiffon is usually made this way.

Guidelines for Using Gelatin

Although some chiffons contain starch as their only stabilizer, most contain gelatin. Gelatin must be handled properly to ensure it is completely dissolved and mixed evenly throughout the filling. (*Note:* All references to gelatin in this book mean unflavored gelatin, not flavored, sweetened gelatin mixes.)

In addition to the guidelines here, please refer to Chapter 4 for additional information on gelatin. There you will find guidelines for using leaf gelatin as well as powdered gelatin.

1. Measure gelatin accurately. Too much gelatin makes a stiff, rubbery product. Too little makes a soft product that does not hold its shape.
2. Do not mix raw pineapple or papaya with gelatin. These fruits contain enzymes that dissolve gelatin. You may use these fruits only if they are cooked or canned.
3. To dissolve unflavored gelatin, stir it into *cold* liquid to avoid lumping. Let it stand for 5 minutes to absorb water. Then heat it until it is dissolved, or combine it with a hot liquid and stir until dissolved.
4. After the gelatin is dissolved in the base, cool or chill it until it is slightly thickened but not set. If the base starts to set, it will be difficult or impossible to fold in the egg whites uniformly.
5. Stir the base occasionally while it is cooling so it cools evenly. Otherwise, the outside edges may start to set before the inside is sufficiently cooled, which creates lumps.
6. If the gelatin sets before you can add the egg whites, warm the base slightly by stirring it over hot water just until the gelatin is melted and there are no lumps. Cool again.
7. When folding in egg whites and whipped cream, work rapidly and without pause, or the gelatin might set before you are finished. Fill the pie shells immediately, before the filling sets.
8. Keep the pies refrigerated, especially in hot weather.

In addition to the following chiffons, you may also use Bavarian creams (p. 525) as pie fillings. Although Bavarian creams contain gelatin and whipped cream, they are not, strictly speaking, chiffons, because they do not contain whipped egg whites. Nevertheless, their texture is similar to that of chiffons because of the lightening effect of the whipped cream.

Finally, this section includes a recipe for a popular pie, French Silk Pie, that doesn't fit any of the standard categories in this chapter. The filling is a rich mixture of creamed butter, sugar,

chocolate, and eggs. The procedure is similar to the creaming method for cakes, except that no flour is mixed in. Because the filling contains raw eggs, be careful always to use pasteurized eggs for French Silk Pie filling.

PROCEDURE: Making Chiffon Fillings

1. Prepare the base. Figure (a) shows thickening juice with cornstarch.



2. Soften gelatin in cold liquid. Stir it into the hot base until dissolved (b). Chill until thickened, but not set.



3. Fold in beaten egg whites (c).



4. Fold in whipped cream, if used (d).



5. Immediately pour into pie shells and chill.

STRAWBERRY CHIFFON PIE FILLING

Yield: 1 lb 5 oz (600 g)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 723.

Ingredients	U.S.	Metric
Frozen sweetened strawberries (see <i>Note</i>)	13 oz	370 g
Salt	0.04 oz (½ tsp)	1 g
Cornstarch	0.2 oz	6 g
Water, cold	1 fl oz	30 mL
Gelatin	0.2 oz	6 g
Cold water	1.5 fl oz	45 mL
Lemon juice	0.2 fl oz	6 mL
Egg whites, pasteurized	3 oz	85 g
Sugar	2.5 oz	70 g

NOTE: To use fresh strawberries, slice or chop 10 oz (285 g) fresh, hulled strawberries and mix with 3 oz (85 g) sugar. Let stand in refrigerator for 2 hours. Drain and reserve juice and proceed as in basic recipe.



PROCEDURE

1. Thaw and drain the strawberries. Chop them coarsely.
2. Place the drained juice and salt in a saucepan. Bring to a boil.
3. Dissolve the cornstarch in the water and stir into the juice. Cook until thick. Remove from the heat.
4. Soften the gelatin in the second quantity of water. Add it to the hot, thickened juice and stir until completely dissolved.
5. Stir in the lemon juice and the drained strawberries.
6. Chill the mixture until thickened, but not set.
7. Beat the egg whites until they form soft peaks. Gradually add the sugar and continue to beat until a thick, glossy meringue is formed.
8. Fold the meringue into the fruit mixture.
9. Pour the mixture into baked pie shells. Chill until set.

VARIATIONS

STRAWBERRY CREAM CHIFFON PIE FILLING

For a creamier filling, reduce the egg whites to 2.5 oz (70 g). Whip 3.25 fl oz (100 mL) heavy cream and fold it in after the meringue.

RASPBERRY CHIFFON PIE FILLING

Substitute raspberries for strawberries in the basic recipe.

PINEAPPLE CHIFFON PIE FILLING

Use 10 oz (285 g) crushed pineapple. Mix the drained juice with an additional 3.25 fl oz (100 mL) pineapple juice and add 1.6 oz (48 g) sugar.

CHOCOLATE CHIFFON PIE FILLING

Yield: 1 lb 6 oz (640 g)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 723.

Ingredients	U.S.	Metric	PROCEDURE
Unsweetened chocolate	2 oz	60 g	1. Combine the chocolate and water in a heavy saucepan. Bring to a boil over moderate heat, stirring constantly until smooth. 2. With the whip attachment, beat the egg yolks and sugar together until thick and light. 3. With the mixer running, gradually pour in the chocolate mixture. 4. Return the mixture to the saucepan and stir over very low heat until thickened. Remove from heat. 5. Soften the gelatin in the second quantity of water. Add it to the hot chocolate mixture and stir until the gelatin is completely dissolved. 6. Chill until thick, but not set. 7. Beat the egg whites until they form soft peaks. Gradually beat in the last quantity of sugar. Continue beating until a firm, glossy meringue is formed. 8. Fold the meringue into the chocolate mixture. 9. Pour the mixture into baked pie shells. Chill until set. Keep refrigerated.
Water	5 fl oz	150 mL	
Egg yolks	3 oz	90 g	
Sugar	3 oz	90 g	
Gelatin	0.2 oz	6 g	
Water, cold	1.5 fl oz	45 mL	
Egg whites, pasteurized	4 oz	120 g	
Sugar	5 oz	150 g	
VARIATION CHOCOLATE CREAM CHIFFON PIE FILLING For a creamier filling, reduce the egg whites to 3 oz (90 g). Whip 3 fl oz (90 mL) heavy cream and fold it in after the meringue.			

PUMPKIN CHIFFON PIE FILLING

Yield: 1 lb 8 oz (680 g)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 722.

Ingredients	U.S.		Metric	PROCEDURE
Pumpkin purée	8	oz	240 g	
Brown sugar	4	oz	120 g	
Milk	2.5	oz	70 g	
Egg yolks	2.5	oz	70 g	
Salt	0.04	oz (⅓ tsp)	1 g	
Cinnamon	0.055	oz (¾ tsp)	1.4 g	
Nutmeg	0.028	oz (⅔ tsp)	0.8 g	
Ginger	0.014	oz (⅓ tsp)	0.4 g	
Gelatin	0.2	oz	6 g	
Water, cold	1.5	fl oz	45 mL	
Egg whites, pasteurized	3	oz	90 g	1. Combine the pumpkin, brown sugar, milk, egg yolks, salt, and spices. Mix until smooth and uniform. 2. Place mixture in a double boiler. Cook, stirring frequently, until thickened, or until the temperature of the mix is 185°F (85°C). Remove from heat. 3. Soften the gelatin in the water. Add it to the hot pumpkin mixture and stir until dissolved. 4. Chill until very thick, but not set. 5. Beat the egg whites until they form soft peaks. Gradually add the sugar and continue to beat until a thick, glossy meringue is formed. 6. Fold the meringue into the pumpkin mixture. 7. Fill baked pie shells with mixture. Chill until set.
Sugar	3	oz	90 g	
VARIATION				
PUMPKIN CREAM CHIFFON PIE FILLING				
For a creamier filling, reduce the egg whites to 2.5 oz (70 g). Whip 3.25 fl oz (100 mL) heavy cream and fold it in after the meringue.				

LEMON CHIFFON PIE FILLING

Yield: 1 lb 6 oz (640 g)—one 9-in. (23-cm) pie

For large-quantity measurements, see page 723.

Ingredients	U.S.	Metric
Water	5 fl oz	150 mL
Sugar	1.67 oz	48 g
Egg yolks	2.4 oz	70 g
Water, cold	1 fl oz	25 mL
Cornstarch	0.6 oz	18 g
Sugar	1.6 oz	48 g
Lemon zest, grated	0.1 oz	3 g
Gelatin	0.2 oz	6 g
Water, cold	1.5 fl oz	45 mL
Lemon juice	2.4 fl oz	70 mL
Egg whites, pasteurized	3 oz	90 g
Sugar	3 oz	90 g

VARIATIONS

LIME CHIFFON PIE FILLING

Substitute lime juice and zest for the lemon juice and zest.

ORANGE CHIFFON PIE FILLING

Make the following ingredient adjustments:

- Use orange juice instead of water in step 1.
- Omit the first 1.67 oz (48 g) sugar.
- Substitute orange zest for the lemon zest.
- Reduce the lemon juice to 0.8 oz (25 mL).

PROCEDURE

1. Dissolve the sugar in the water and bring to a boil.
2. Beat together the egg yolks, second quantity of water, cornstarch, sugar, and zest until smooth.
3. Gradually beat the boiling syrup into the egg yolk mixture in a thin stream.
4. Return the mixture to the heat and bring it to a boil, beating constantly with a whip.
5. As soon as the mixture thickens and boils, remove it from the heat.
6. Soften the gelatin in the third quantity of water.
7. Add in the gelatin to the hot lemon mixture. Stir until it is dissolved.
8. Stir in the lemon juice.
9. Chill until thick, but not set.
10. Beat the egg whites until they form soft peaks. Gradually add the sugar and continue to beat until a thick, glossy meringue is formed.
11. Fold the meringue into the lemon mixture.
12. Fill baked pie shells. Chill until set.

FRENCH SILK PIE FILLING

Yield: 1 lb 8 oz (720 g)—one 9-in. (23-cm) pie

Ingredients	U.S.	Metric	PROCEDURE
Unsweetened chocolate	4 oz	120 g	1. Melt the chocolate, then cool until just barely warm.
Butter	6 oz	180 g	2. Using the paddle attachment, cream together the butter and sugar until light.
Sugar	9 oz	270 g	3. Beat the melted chocolate into the butter mixture until well blended.
Vanilla	0.25 fl oz (1½ tsp)	7.5 mL	4. Mix in the vanilla.
Eggs, pasteurized	5 oz	150 g	5. Add about one-third of the eggs. Using the whip attachment, whip at medium speed for 5 minutes.
Garnish			6. Add another third of the eggs. Whip at medium speed for 5 minutes.
Sweetened whipped cream	as desired	as desired	7. Add the remaining eggs. Again whip for 5 minutes. The mixture should be smooth and light.
Chocolate shavings or curls	as desired	as desired	8. Fill baked pie shells. Chill until firm enough to slice.
			9. Before displaying or serving, pipe a generous border of whipped cream around the top edge of the filling. Alternatively, cover the entire top with piped whipped cream. Decorate the top with chocolate shavings or curls.



STANDARDS OF QUALITY FOR PIES

ERRORS IN PIE PRODUCTION may include improper mixing of doughs, improper assembly of pies, faulty production of fillings, and problems in baking. The following chart lists common pie faults and their causes. To judge the quality of a pie, examine it for each of the defects listed in the table, to see if it avoids those defects. In other words, a well-made pie should have the following characteristics:

- Tender crust, but one that holds together and is not crumbly.
- Flaky top crust.
- Tender bottom crust that is fully baked and not soggy.
- Crust that hasn't shrunk or pulled away from the pan.
- Top crust well sealed to bottom crust.
- Filling of good flavor for its type and properly seasoned.
- Filling that is properly cooked and hasn't boiled out of the crust.
- Custard-type fillings properly set and not curdled or weeping.

To correct any faults you find, check the troubleshooting guide here for possible causes and then correct your procedures.

Fault	Causes
CRUST	
Dough too stiff	Not enough shortening Not enough liquid Flour too strong
Tough	Overmixing Not enough shortening Flour too strong Too much rolling or too much scrap dough used Too much water
Crumbly	Not enough water Too much shortening Improper mixing Flour too weak
Not flaky	Not enough shortening Shortening blended in too much Overmixing or too much rolling Dough or ingredients too warm
Soggy or raw bottom crust	Oven temperature too low; not enough bottom heat Filling hot when put in shell Not baked long enough Use of wrong dough (use mealy dough for bottom crusts) Not enough starch in fruit fillings
Shrinkage	Dough overworked Not enough shortening Flour too strong Too much water Dough stretched when put in pans Dough not rested
FILLING	
Filling boils out	No steam vents in top crust Top crust not sealed to bottom crust at edges Oven temperature too low Fruit too acidic Filling hot when put in shell Not enough starch in filling Too much sugar in filling Too much filling
Curdling of custard or soft fillings	Overbaked

KEY POINTS TO REVIEW

- What are the three types of bases for chiffon pie fillings?
- What are the guidelines for using gelatin?
- What is the procedure for making chiffon pie fillings?
- What are the most common faults found in pies, and how can these faults be corrected?

TERMS FOR REVIEW

flaky pie dough	fruit pie	instant starch	water pack
mealy pie dough	soft pie	cooked juice method	syrup pack
rubbed dough method	cream pie	cooked fruit method	drained weight
crumb crust	chiffon pie	solid pack	
	lattice crust	heavy pack	



QUESTIONS FOR REVIEW

1. Discuss the factors that affect tenderness, toughness, and flakiness in pie dough. Why shouldn't emulsifier shortening be used for pie dough?
2. What are some advantages and disadvantages of using butter in pie dough?
3. What would happen to a flaky pie dough if you mixed it too long before adding the water? After adding the water?
4. Describe the difference between mealy pie dough and flaky pie dough.
5. What kind of crust would you use for a pumpkin pie? An apple pie? A banana cream pie?
6. How can you prevent shrinkage when baking empty pie shells?
7. How can you prevent soggy or undercooked bottom piecrusts?
8. Which starch would you use to thicken apple pie filling? Chocolate cream pie filling? Lemon pie filling? Peach pie filling?
9. Why is lemon juice added to lemon pie filling after the starch has thickened the water? Wouldn't this thin the filling?
10. Why is the cooked juice method usually used when making pie fillings from canned fruits?
11. What problem might you have if you make blueberry pie filling out of blueberries that are still partially frozen?
12. How can you test a custard pie for doneness?