

Pies Background Information

There are two keys to making good pastry dough:

1. Avoid gluten development as much as possible since excessive gluten will make for a very dense, tough texture. The lower water content and minimal manipulation of the dough both help reduce gluten development.
2. Disperse the shortening or fat so that it will perform its two tenderizing functions: (a) isolating very small particles of starch and protein in the flour from each other, and (b) isolating whole sheets of dough from each other.

Pastries (pie crusts) are made from four basic ingredients: flour, fat, salt, and water.

Flour

Just as in breads, flour gives structure to the pastry. Good pastry requires a fairly soft wheat flour as opposed to bread which is best made with a hard wheat flour. At the same time, the flour should not be too starchy; that would produce a mealy pastry. All-purpose flour, which is a compromise between hard and soft, generally works well.

Fat

Fat makes pastry tender because it inhibits or holds back the development of gluten in the flour. Fat helps the flakiness because it separates the layers of gluten.

There are two ways in which shortening tenderizes pastry dough. In order to separate starch granules and gluten strands from each other, the fats must be dispersed throughout the dough. Coarser and less homogenous fat particles will separate whole layers of dough.

Even dispersion is easiest with liquid oils, but the coarser dispersion is best accomplished with solid fats or hydrogenated oils. If a crumbly, mealy crust is desired, oil is the best fat; flaky crusts are best made with lard or solid vegetable shortening.

Lard, the traditional favorite, produces superior flakiness because it forms crystals so large that they give the fat a noticeably grainy texture. However, lard will spoil or become rancid rather quickly unless refrigerated, and has a bad reputation for being high in cholesterol and saturated fats. Most flaky crusts are made with hydrogenated fats.

Salt

Salt has only one purpose-to add flavor. The quantity of salt may be decreased or increased as desired without hindering tenderness or flakiness. If a salted fat is used, the amount of salt in the recipe should be decreased.

Liquid

Water is the most common liquid used in pastry although milk and other liquids may be used. Liquids hydrate or moisten the flour so that sufficient gluten can be developed to form a cohesive dough. When the amount of water is increased, more gluten develops from the flour proteins and the pastry is less tender than desired. Liquids also provide some steam to leaven or raise the gluten which produces flakiness or puffiness.

Tenderness

The proportions of flour, fat, and liquid and the level of manipulation influence pastry tenderness. Facts to remember:

1. Pastry becomes progressively less tender as the quantity of water or flour is increased-the proportion needs to remain balanced.

2. Too much water increases toughness by hydrating more gluten than is needed.
3. Additional flour incorporated during rolling of dough also contributes to the toughness since water is already present in the dough and the addition of more flour changes the proportion desired.
4. Manipulation of dough is kept to a minimum after water is added to avoid tough pastry. Rerolling pastry overdevelops gluten and decreases tenderness.
5. The flour must be coated with fat to limit hydration before liquid is added. Solid shortening is cut in until the particles are the size of rice kernels or the texture of cornmeal.
6. Liquid fats blend easily with flour to produce short gluten strands.

Flakiness

Flakiness develops as the small to coarse particles of fat are coated with moistened flour, flattened into layers by the rolling pin, melted in the oven, and absorbed by the adjacent dough to form hollow spaces between layers of baked dough.

Too much or too little water in proportion to the fat decreases flakiness which is promoted by the production of steam. As the expanded protein molecules are coagulated by the heat of the oven, the flaky structure becomes firm. Facts to remember:

1. A uniform distribution of fat can yield a flaky pastry.
2. Firm fat that remains in layers when rolled yields a flakier pastry than a soft liquid fat.
3. Liquid fat that is thoroughly and evenly distributed tends to decrease flakiness while increasing tenderness.

Methods of Mixing

Conventional or Biscuit Mixing Method

1. Measure flour and salt and sift.
2. Cut fat into flour until mixture resembles cornmeal.
3. Sprinkle small amount of liquid (water) and stir gently with a fork. Keep the mixing and manipulation to a minimum.
4. Gather dough with fingers and press into a ball, kneading very gently.
5. Roll into the desired circle.
6. Fit gently into pie pan.

Stir-and-Roll Method

Oil or melted fat and a liquid (milk or water) are combined and then stirred into the flour to form the dough. More manipulation is required to develop sufficient gluten. The pastry tends to be less flaky than conventional pastry.

Hot-Water Method

Boiling water is whipped into the fat, and the whipped mixture is stirred into the flour. This method distributes the fat evenly and produces a pastry that is more tender and mealy but less flaky than the conventional method.

Water-Paste Method

The distribution of water and gluten is more controlled. All of the measured liquid is combined with enough of the fat-flour mixture to make a lumpy paste. The paste is stirred into the rest of the fat-flour mixture. This pastry is as tender and flaky as that prepared by the conventional method.

Summary of Good Pie Crust Production

Because of the chemical properties of each ingredient, it is important to measure exact amounts and mix/handle the dough using particular techniques.

The following details are important:

1. Just the right amount of flour will produce enough gluten to hold the air/steam result in a flaky/tender pie crust.
2. Too much flour makes it tough.
3. Fat forms a waterproof coating around the flour particles so that the water doesn't develop too much gluten.
4. Too much fat produces a crumbly crust; too little fat produces a tough crust.
5. Only a small amount of water is used-just enough to form an optimum amount of gluten. Too much water causes toughness; too little water makes the dough crumbly and hard to roll.
6. The exact amount of water depends on the type of flour and the humidity of the room. Most recipes give a range of water amount (e.g., 4-5 Tbsp.). Practice will tell when to stop adding water. The right amount allows the dough to hold together.
7. Stretching the dough while inserting it into the pie pan will cause the crust to shrink away from the edges while baking.
8. Adding too much flour on the surface while rolling the dough will add extra flour and cause toughness.
9. Rerolling dough forms more gluten and adds toughness.

Storage of Pies

Pastry dough may be tightly wrapped and stored in the refrigerator for a short period of time.

Cooked pies such as custard, chiffon, or cream pies need to be refrigerated. Fruit pies are also best when refrigerated but can be left on the counter for a short period of time. Cover with waxed paper or foil.

Pies are best if eaten within 1-2 days. Fruit pies can be frozen and kept for 3-4 months. It is best to freeze fruit pies before baking, but they can be baked and then frozen. Cream pies do not freeze well.

Freezing of Pies

(Hints from Betty Crocker's Picture Cookbook)

Pie crusts, baked or unbaked, can be frozen. Fruit pies, mince pies, and chiffon pies freeze successfully. It is best not to freeze custard or meringue pies. Meringue toppings tend to toughen, shrink, separate, and stick to wrappers. Baked and unbaked pie shells and cookie crumb crusts may also be frozen.

Preparing Pies for Freezing

Both baked and unbaked pies may be frozen. They should be cooled and frozen immediately. Freeze either kind unwrapped just until frozen, keeping pie level. Before wrapping, place another pie plate over the top to protect the crust. Wrap and seal.

Unbaked pies should be frozen as soon as they have been prepared. The top crust should not be slotted before freezing. (This is to prevent evaporation of juices during freezing.) The lower crust may absorb juices and become a little soggy when baked. Deep dish pies may be frozen, eliminating the problem of a soggy bottom crust.

Freezing Pie Filling

Save freezer space by freezing pie fillings to be defrosted and put into pie shells later. A pint frozen food container holds about the right amount for an 8" pie.

Thawing Pies

Unbaked Pie: Remove wrapping. Make several slits in top crust of unbaked two-crust pie. Bake without thawing according to the recipe, allowing 15 to 20 minutes extra baking time.

Frozen Baked Pie: Heat in moderate oven (350 F) until just warm. Do not reheat chiffon pie; instead, thaw in refrigerator about 3 hours or at room temperature about 45 minutes.

Length of Storage Storage time varies with the filling. Most pies may be kept frozen for 2 to 3 months.