Food test: Shortening

**Objective**

To investigate the shortening power of different types of fats

**Principles**

Shortening is the ability of fats to shorten gluten strands (the structural protein network in wheat-containing cake mixture, batters and dough). This gives the baked mixture a tender and melt-in-the-mouth texture because the fat has shortened the tougher gluten strands. The shortening ability depends on the plasticity and degree of saturation of fat.

**Equipment & materials**

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| **Equipment** | **Materials** |
| Medium mixing bowlsForksRolling pinPastry brushBaking tray | 260g plain flour70g butter70g margarine70g pure lard70ml vegetable oil1/2 tsp saltCold waterPlastic wrap |

**Procedures**

1. For each sample, add 65g flour and 1/8 tsp salt in a medium mixing bowl. Cut the solid fats into the flour and mix with a fork. Mix until the mixture looks crumbly but fairly even, with the average piece of fat about the size of a pea. Form a well in the centre.
2. Pour cold water into the flour and fat mixture. Knead lightly until the dough comes together into a ball and shape it into a rough square.
3. Flour the work surface and rolling pin lightly.
4. Roll out the dough into a long rectangle, about 25cm in length.
5. Remove excess flour on the dough with a pastry brush and fold the dough in three so the top and bottom overlap.
6. Repeat Step 4 and 5 for 3 times (so you will roll and fold the dough for at least 4 times).
7. After the last fold, wrap the pastry in plastic wrap and place into the refrigerator to chill for an hour.
8. Roll out the pastry to about the thickness of a $1 coin and cook it at 180°C for about 20 minutes.

**Results**

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| --- | --- | --- | --- |
| **Sample** | **Treatment** | **Appearance** | **Texture** |
| **Before baking** | **After baking** | **Before baking** | **After baking** |
| 1 | Butter |  |  |  |  |
| 2 | Margarine |  |  |  |  |
| 3 | Pure lard |  |  |  |  |
| 4 | Vegetable oil |  |  |  |  |

**Questions**

1. What types of fats are more effective in making flaky pastry?
2. Compare the taste, texture, and appearance of the pastries with different types of fats used.
3. Suggest the reasons for the different shortening ability of fats.