Abstract:

Puffed rice cakes are a very popular snack. Tempered rice puffs when the grain attains a temperature where starch can exhibit plastic flow characteristic under pressure.

This study was undertaken to answer the following research questions:

1. How can rice cake quality be measured?
2. What is the microstructure of puffed rice?
3. What is the mechanism for puffing and adhesion of puffed rice?

The variables that were selected for study are: moisture content, temperature, cooking time, brown or white rice, and extra 1% oil or sugar. The cake quality was characterised with cake mass, volume and density, break strength, colour, and textural properties. The cake microstructure was characterised by cell size and shape. Gelatinisation of starch was also studied.

Results show that the cake quality has an optimum moisture level, temperature and cooking time. White rice increased break strength and texture while addition of oil decreased it. The microstructure has heterogeneous polyhedron cells with smaller cells that may be in the chalky section. The mechanism for puffing is melting of starch granules plasticised with water which vaporises on release of pressure. The mechanism for adhesion is melted starch diffuses to the grain boundaries where it entangles and forms a solid mass on cooling.