Producing Superior Quality Pizza & Bread Dough With A Spiral Mixer

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This study aims to provide a better understanding of the impact of dough aeration produced by a spiral mixer on pizza and bread dough. Kneading pizza and bread dough to incorporate gas into the dough and maximize dough aeration by subdividing gas bubbles is a well-known strategy to produce high levels of elasticity and gluten in the creation of professional pizza and bread dough. **The study finds that a spiral mixer is by far the best tool to introduce aeration into pizza and bread dough, relative to other available means of kneading.**

Dough aeration is very important in the bread-making process because it contributes to oxidation reactions and initiates proofing by entrapping air bubbles. Bread dough aeration is a criterion of quality and the desired bubble distribution depends on the method of kneading the dough. Eventual alveolation of the end product is a direct result largely of the kneading and proofing process imparted into the dough. Thus controlling and optimizing dough aeration is essential to obtain superior product quality. Dough aeration occurs during kneading, the first step of the bread-making process during which the kneading spiral agitator rotation combines the dry and liquid ingredients to obtain a homogeneous dough. This mixing makes several biochemical reactions occur, between the ingredients themselves and between the ingredients and air, which contributes to the formation of the gluten network. Additionally, the kneading spiral agitator movement entraps air bubbles.

Gluten network establishment gives to the dough its rheological properties. During mixing, in its oxidizing environment, glutenins are linked together creating a network of proteins that makes the wheat flour dough visco-elastic, and thereby retains gas bubbles. The establishment of the gluten network during kneading results in an increase in dough viscosity which gives the dough its rheological properties contributing to its gas retention capacity. During kneading, as the gluten network is forming, the dough becomes increasingly resistant so that the power needed to maintain the spiral agitator rotation speed increases until the maximal cohesion of the gluten network is achieved. The kneading spiral agitator rotation exerts compression, elongation and shearing on dough. Overall, it stretches the dough batch, which come into contact again later, entrapping air bubbles and contributing to optimal dough structuring. The spiral agitator movement has two effects: first, stretching the dough batch leads to bubbles break-up and disentrainment, then, introducing gas bubbles into the dough by folding up the stretched dough. This repeated, systematic, consistent and continual kneading produced by a spiral mixer results in the ideal and optimized amount of entrapped gas in the dough, thereby producing the most professional quality end product.