Cutting-edge meat-grinder plates



Inner wall roughness of passage channels

Optimising the efficiency of meat-grinder plates with tissue-specific surface textures within the passage channels

Background

The inner wall roughness of the passage channels of meat-grinder plates has a significant influence on a grinder's performance and the quality of its cuts. This is currently an overlooked aspect in both research and industrial practice. Our own work shows that up to 50% of the energy input is lost due to uncontrolled raw material movements inside the cutting system. A defined inner wall roughness can solve this problem.

Objective

Manufacturing meat-grinder plates with a consistently uniform or segmented inner wall roughness (vertical/horizontal sub-areas) to determine the optimal tissue-specific inner wall roughness and to explore ways of maintaining the roughness when using the plates over extended periods of time.

Ideally, improved cutting quality could increase a grinder's performance by 20%, service life by 50%, while reducing energy consumption by 20%.

Initial results

Currently being investigated are meat-grinder plates with circular holes of 3 and 5 mm and a consistent inner wall roughness of 1, 5, 10 and 15 µm. Initial results confirm the expectation that increasing the roughness leads to reduced performance while increasing cell damage, temperature input, and energy consumption. In a subsequent step, we intend to produce and analyze meat-grinder plates with sub-areas displaying different degrees of roughness.

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