

# ABSTRACT

**Thesis title:** Development of Meat-Reduced Mushroom-Based Burger Patty

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The research investigates the techno-functional, physical, and sensory properties of a mushroom-based burger patty with reduced meat content, aiming to develop a nutritionally valuable product for consumers who wish to maintain their traditional eating habits. The research used ground beef as its base meat component and selected oyster mushrooms (*Pleurotus ostreatus*). The research involved preparing 11 different patty mixtures, which decreased the meat content by 10% increments from 100% meat to 0% meat while substituting oyster mushrooms proportionally. The techno-functional properties were evaluated through rheological measurements and yield evaluations to determine the product's processing behavior and industrial feasibility. The research team conducted instrumental color analysis and visual shrinkage measurements to determine product consistency and appearance while assessing shelf appeal. The research used statistical methods to determine how rheological measurements and physical properties related to each other in different sample formulations. Consumer testing evaluated taste and aroma along with overall acceptability to determine the palatability and market potential of the developed patties. This research examines the practical application of this hybrid product as a nutritional supplement for human diets. The research investigates how consumer acceptance of mushroom-enriched burger patties relates to their techno-functional and physical attributes.

The results of the analysis of the data obtained showed that not all of the combinations can be deemed suitable. Oven-baked patties containing lower meat amounts demonstrated superior yield performance, which makes this processing method suitable for industrial production. The yield measurements for grilled samples decreased after meat reduction,

which could restrict industrial production. The color evaluation of L\*, a\* and b\* values confirmed that oyster mushroom proportion did not significantly change the color but resulted in minor shifts. The lightness of the product slightly increased, yet redness and yellowness decreased when the mushroom content increased. The addition of high levels of oyster mushroom beyond 50% resulted in structural instability according to rheological measurements. These products displayed a loose structure, which caused them to break apart easily, thus rendering them useless for manufacturing operations. The texture integrity decreased as measured by both maximum piercing force and adhesive work area when mushroom content increased. Visual shrinkage analysis showed that grilling led to greater shrinkage than oven baking. The results from yield data support oven baking as the better method to produce meat-reduced patties with acceptable physical attributes. Consumer acceptance ratings remained stable when oyster mushroom content reached 40%, while beef content reached 60% in samples. The 20% mushroom to 80% meat ratio produced the best sensory scores since it matches consumer preferences. Sensory scores decreased when the oyster mushroom ratio exceeded 40%, indicating that excessive meat reduction led to decreased acceptance. The replacement of meat with oyster mushroom in burger patties shows promise for the food production sector. According to our research, the maximum acceptable oyster mushroom ratio for production should remain at 40% to preserve product integrity and consumer acceptance, as well as manufacturing capabilities.

Multiple additional steps should be taken to validate these research findings. An expanded sensory analysis with a larger participant group from diverse demographics should be conducted to better understand consumer acceptance. Evaluating market implementation feasibility requires comparisons to existing industrial standards and production regulations, as well as labelling requirements. A detailed nutritional analysis should be performed to determine how substituting oyster mushrooms for meat affects the nutritional content of the finished product.