

# New Food Product Development with 3D Printed Food

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## BACKGROUND

Aging leads to certain health problems, especially dysphagia. The elderly generally faces chewing and swallowing problems which contribute to different complications such as malnutrition, dehydration, and aspiration pneumonia, etc. Elderlies who have swallowing difficulties require a specific menu as they need to eat soft foods. This study aims to develop a range of mousse foods with various ingredients to improve the eating quality of the elderly. A new flavor of mousse food can be produced with a 3D food printer, which can create more food choices for those who suffer from chewing and swallowing problems. Moreover, the new mousse foods may create new menu ideas that meet the nutritional requirements for the elderly and enhance their appetite in order to maintain their health.

## OBJECTIVES

- Investigate the current food trends and eating problems of the elderly
- Formulate a range of mousse foods with various ingredients
- Improve the eating quality of the elderly

## METHODOLOGY

A Survey is conducted via an online link with 150 participants. The survey mainly focused on people's acceptance of mousse foods and if they would try mousse foods if available in the market. The expectation for mousse foods are also a concerning factor in this study.

Q3. Are you interested in tasting the mousse food if available in the market?

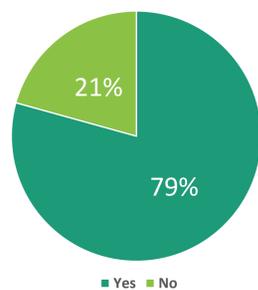


Fig 1. Responses of question 3 (n =150)

Laboratory experiments were also conducted. The aim was to develop a new food product for the elderly and people who suffer dysphagia. The expected new food products should be presented in a mousse-like form with little texture, unlike the normal mousse dessert. Generally, mousse foods have a very soft texture, but this study wants to present it in a solid form but still soft enough so there is no need to chew. The ideal form of the mousse food is that it can be sliced but still be very soft.

## FINDINGS

Two types of mousse food are presented with a soft texture but not as soft as the dessert type. Generally, the mousse dessert that we eat is very soft and can not be sliced since it does not have a solid texture. However, the tuna and spinach mousse food in this study, both have a "jelly" texture which can withhold a shape but are still very soft.



Fig 2. Sliced Spinach mousse food



Fig 3. A portion of Spinach mousse food



Fig 4. Tuna mousse food



Fig 5. A portion of Tuna mousse food

The reagent used in this experiment is modified starch, which acts as a thickener. Since the objective of this study is to provide a mousse food with nutritional value for the elderly and people who suffer from dysphagia, we want the mousse food to be soft enough so that they do not have to chew, or can reduce the chewing time. We also still want the mousse food to have some texture so people are more willing to eat it. Also, having some texture can increase viscosity so that people can have more time to swallow.

## RECOMMENDATIONS

3D food printing has many advantages in different aspects. For health, 3D food printing can satisfy an individual's taste and nutritional requirements. Problems related to a lack of nutrients, a focused meal can be designed to improve people's health. Also, they can regulate additives or other chemicals to achieve a healthier meal. For the environment, a 3D food printer can help reduce food wastage as it uses the required amount of ingredients. Since the availability of this technology, 3D food printing can produce a large number of meals at a given time and therefore reduce costs.

## CONCLUSION

The new food product development of a tuna and spinach mousse food provide more choices for the elderly and people who have chewing or swallowing problems. The ideal texture of mousse foods is to maintain the mousse-like texture but have a little "jelly" texture to enhance the appetite of the elderly. Mousse foods are easy to prepare which can help relieve the pressure for caregivers. Also, the new mousse foods developed in this study may create new menu ideas to meet the requirements of the elderly e.g., having vegetables with meat in order to maintain their health.