DEVELOPMENT IN THE TEXTURAL PROPERTIES OF SOFT MEAT LOAVES TO ENHANCE THE MEAT PRODUCTS-INTAKE OF OLDER AND INCAPABLE ADULTS

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Introduction

There is a correlation between growing old and a decrease in the performance of daily activities. The most significant physical changes in the human body of people in advanced age (over 80 –years old) are the mandibles, maxillae and teeth impuissance as well as regression in mechanical body movements. The pressure and fractional force between the teeth, which are important for the actions of biting and chewing food decrease in advanced age. Many elderly people are facing difficulty in swallowing up food through the esophagus. Generally, this results from dysfunction of the pharynx, which pushes the chewed food down the esophagus. That difficult also may result from the movement of the epiglottis. Incorrect action of the epiglottis while food passes down the esophagus may induce food aspiration in the trachea and breathing difficulties. Losing the ability to chew and swallow food has become a significant problem for many (Muguruma, et al., 2006). If elderly people eat stiff food such as tough meats, they are more at risk for suffering severe consequences. In order to ease these processes for many elderly people, the innovations of soft food, such as beef soft loaves, are necessarily and important. The objectives of this study were to present soft beef loaves for those who have debility in biting and chewing meat products.

Materials and Methods

The loaf paste was prepared by mixing 1.2 kg of ground beef with 0.8 kg of ground pork and 200 ml of egg yolk with 400 ml olive oil. These mixtures were added to 2 kg of onion paste and processed by a food processor. The onion paste made from onion and oil (10:1, w/v), the onion and oil mixture was steamed by a steam convection oven, 100 % steam at 200°C for 20 min. Yet, the paste of the meat containing onion paste was mixed with other ingredients to improve the flavor and textural properties such as 20 g potato starch, 8 g salt and 40 g of ginger extract, 16 g of paste of fermented beans (miso) and 0.8 g nutmeg. The mixtures were placed in a food processor for 5 min. and divided into four groups. The first set consisted of soft loaves without any treatment, the comparative group. The second group was soft loaves subjected to a filtration process by a strainer. The third group was soft loaves included gelatin and was not filtered. The fourth set was soft loaves with gelatin and subjected to the filtration process. Forty grams of the pastes were placed in plastic bowls and then the pastes were cooked in a steam convection oven at 85°C for 8 min. We determined the breaking strength values, cohesiveness and adhesiveness, and for the target population, sensory evaluations were also conducted. The participants engaged in this panel were 4 people with an average age of 86 years-old. They had variety of teeth conditions, one person had natural teeth, another person had artificial teeth and two persons had no teeth. Video-fluorographic films were shot on a geriatric female (75 years-old) to illustrate the swallowing process in her esophagus. This was her first meal after residing in a care unit for one year and eating with a feeding-tube.

Results and Discussion

Stiff foods such as meat steaks are culturally not preferred by many elderly persons, especially in Japan. Since that in the last couple of years, we have developed two new soft meat loaves, the first made from pork and the second one made from chicken. Those products have become a part in the meals menu of a local elderly care facility in Japan. It is critical for the consumer acceptance that a commercially applicable method be developed to ensure a consistently tender product (Pietrasik &Shand, 2004). Yet, this study presents a new product made from beef as a third part of our soft meat products series.

Breaking strength values significantly decreased (P <0.01) in both the samples filtered by strainer and samples treated by gelatin which were also filtered by a strainer (Figure 1). The adhesiveness was significantly decreased (P <0.01), the soft beef loaves showed a very good cohesiveness which considered as normal as in ordinary soft food (Figure 2 and 3). The soft beef loaves were smooth and extremely softened by the means of gelatin and filtration treatments when compared to ordinary soft food. In addition, the video-fluorographic profiles showed that the participant was chewing and swallowing beef loaf normally without any obstacles (Figure 4). In the sensory evaluations, all participants were voted positively for the taste, softness and elasticity.

Three participants accepted the product and passed positive remarks over other quality traits such as tongue sense, and showed the ability to chew and crumble the product. Finally, from the quality point of view the elderly people who participated in the sensory evaluation accepted soft beef loaves.

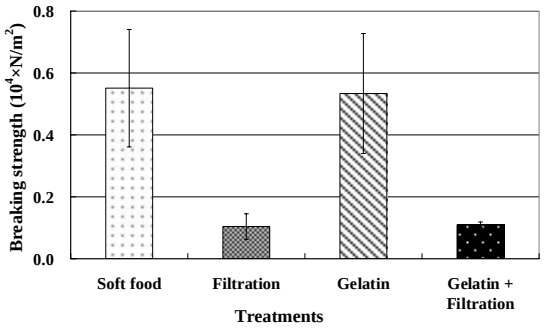
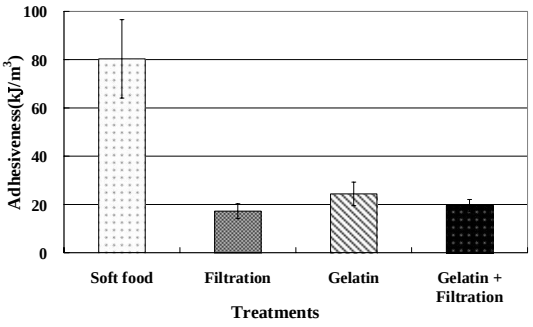


Figure 1. Values of breaking strength of filtrated samples treated with gelatin.



.**Figure 2.** Values of adhesiveness of filtrated samples treated with gelatin.

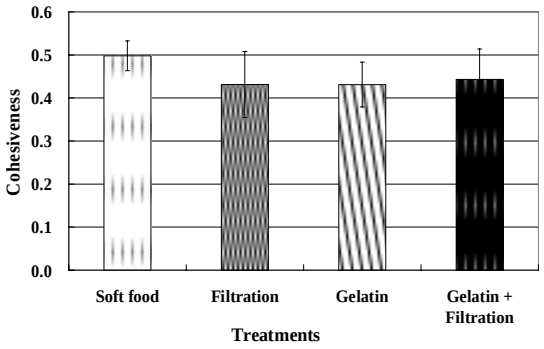


Figure 3. Values of cohesiveness of filtrated samples treated with gelatin

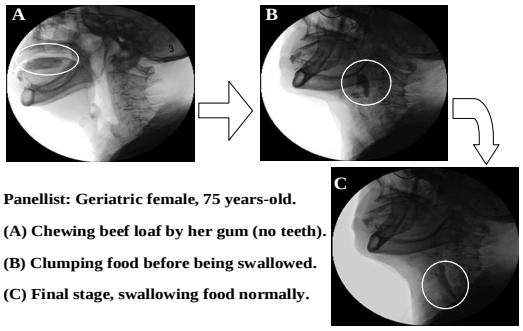


Figure 4. Profiles of video-fluorographic examination show 3 major steps of eating new soft loaf by geriatric participant (Female, 75 years-old).

Conclusions

Family care of aged adults is universally depending on strong family values that cross cultural lines. In addition psychotherapists, therapists and nurses in facilities of elderly people are working to enhance human coping and to decrease elderly persons suffering. Therapists and nurses partially are very important in daily activities of many geriatric people but they can not interfere to the acceptability and palatability of those old people to different sorts of food. Dietitians may impact indirectly on the feed process by presenting and improving food such as soft meat loaves. Therefore, this study aimed to present soft beef loaves to those elderly people who suffer sever consequences while eating stiff meats.

In the conclusion, textural values were significantly decreased in both the filtrated samples and in the samples that treated with gelatin. In these samples adhesiveness was decreased significantly and they showed a very good cohesiveness. Data suggests the new product was smooth and extremely softened. Participants were voted positively for the taste, softness and elasticity. Video-fluorographic profiles showed that the participant was chewing and swallowed the beef loaf normally without any obstacles and the food passed through the esophagus, as would be expected in ordinary people without a history of tube-feeding or chewing and swallowing difficulties. In conclusion, the findings of this study may contribute to reduce elderly people struggling in eating stiff meat, likely would much more to enhance meaty food-intake to recover the shortage in the deficiency nutrition of people fall within this category.

References

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