

Appetizing and Healthy Muffins for Older Consumers

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Abstract

The prevalence of malnutrition among elderly is a serious health problem. This study aims to develop protein enriched muffins in order to increase the intake of protein. The muffins were enriched by proteins from almond, soy, whey protein and whey. It was possible to enrich muffins and the most appreciated muffin was the muffin enriched by almond protein.

Keywords: *protein enriched muffins; high-quality protein; Almond protein enriched; Soy protein enriched; Whey protein enriched*

Introduction

The prevalence of malnutrition, among elderly is considered a serious public health problem. The malnutrition is mainly an effect of lack of proteins and energy. Reasons for malnutrition are very complex and include loss of appetite, dysphagia, i.e. mastication and swallowing problems, physiological and psychosocial changes and more [1,2,3]. Well, tasting and appetizing protein-enriched foods are important in order to avoid malnutrition among elderly [4]. It is further of importance to be aware of older consumers' preferences in order to develop food products that are both appreciated and that may help to cover the nutritional needs. Muffin is an appreciated product for many older people to have with their afternoon coffee. Development of protein enriched muffins to be served with coffee seems as a simple way to help older consumer to increase their intake of protein through something they like.

Material and Methods

Three types of protein enrichments were added to a reference (standard) muffin recipe, these were almond protein, soy protein and whey protein. All are considered as high-quality protein.

The amount of added protein was 9.4g per 100g muffin. The limiting factor for adding a large amount of protein as possible was to be able to produce a muffin that still could be considered a muffin.

The following muffins were included:

1. Reference (REF)
2. Almond protein enriched (APE)
3. Soy protein enriched (SPE)
4. Whey protein enriched (WPE).

The muffins were evaluated according to their sensory properties and likings. The physical properties included evaluation of water activity, weight loss and volume of the muffins. In addition, the preparation of the muffins was evaluated by testing different whipping speeds and times.

Results and Discussion

The sensory results showed that the REF was the most liked muffin and associated with a home-baked muffin, while the WPE was perceived as artificial due to the peaky and glazed outer surface. The appearance of APE was reminding of scones since it had a hard surface. The texture was evaluated as dry and hard. Further the APE was appreciated due its nutty taste. The SPE reminded of APE in its appearance attributes, however the SPE was considered rather taste and scentless. The enriched muffins had higher water activities compared to REF. The weight losses were higher and the volumes were lower in the protein enriched muffins. The results can to some extent be explained by the variation in protein content, water binding capacities due to starch content, amount of fat, the emulsifying capacity and the gelling properties of the ingredients [5-9]. Further studies should be considered in order to investigate impact added proteins.

It should be noted that whipping time and speed had a great impact on the texture. Both a short and a long whipping time resulted in a compact and flat muffin. This since the leavening agent needs air bubbles to increase the dough volume [7,10]. In case of short whipping time no bubbles are formed and in case of long whipping time the bubbles are ruined, both cases resulting in a flat muffin [11].

Conclusions

Protein enrichment of muffins was possible. The most appreciated enriched muffin was the almond enriched muffin, however there is still need for further studies and development.

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