

Appetizing muffins designed for the nutritional needs of older adults

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The population of elderly is growing. By increasing age the risk of disease related malnutrition (DRM) increases.

Reasons for DRM are complex including loss of appetite, mastication problems, social changes and more.

DRM entails prolonged hospital stays and high health care costs due to elevated risk of weakened immune system, muscle loss, depression etc.

In Sweden, more than 1/3 of adults admitted to hospitals and 1/2 of residents in nursing homes have (or are at risk of) DRM.

In order to counteract disease related malnutrition appetizing and nutritious food products are needed.

| | Recipe | Content ^c (g/100g muffin) | | Weight loss ^d (%) | Water content ^e (%) | Water activity ^f | Width ^g (mm) | Height ^h (mm) |
|------------------------|--|--------------------------------------|---------|------------------------------|--------------------------------|-----------------------------|-------------------------|--------------------------|
| | | Fat | Protein | | | | | |
| Reference | 300 g muffin mix ^a 120 g rape seed oil 120 g water | 26.7 | 4.9 | 8.5 | 24.7 | 0.87 | 47.3 | 29.5 |
| Extra fat | 300 g muffin mix ^a 252 g rape seed oil 120 g water | 42.3 | 3.8 | 7.2 | 19.8 | 0.85 | 48.2 | 24.7 |
| Extra proteins | 300 g muffin mix ^a 120 g rape seed oil 165 g water 66 g whey powder ^b | 23.2 | 12.4 | 8.4 | 27.0 | 0.89 | 48.3 | 31.4 |
| Extra fat and proteins | 300 g muffin mix ^a 252 g rape seed oil 165 g water 66 g whey powder ^b | 37.4 | 10.2 | 7.5 | 23.2 | 0.89 | 48.0 | 26.4 |

One way of enabling adequate nutritional intake for those with poor appetite is to offer energy/protein rich snacks between meals.

In Sweden, coffee time is normally a much appreciated part of the day and muffins are a popular choice among older adults. Designing muffins to suit older adults' nutritional needs could contribute to decreased DRM.

The aim of this study was to investigate added nutritional value along with the sensorial effects of increased fat/protein content in muffins.

Added Protein

Enough whey powder could be added to markedly increase the muffin protein content.

Protein addition resulted in hard and pointy muffins with a smooth and shiny surface. The total flavour was low.

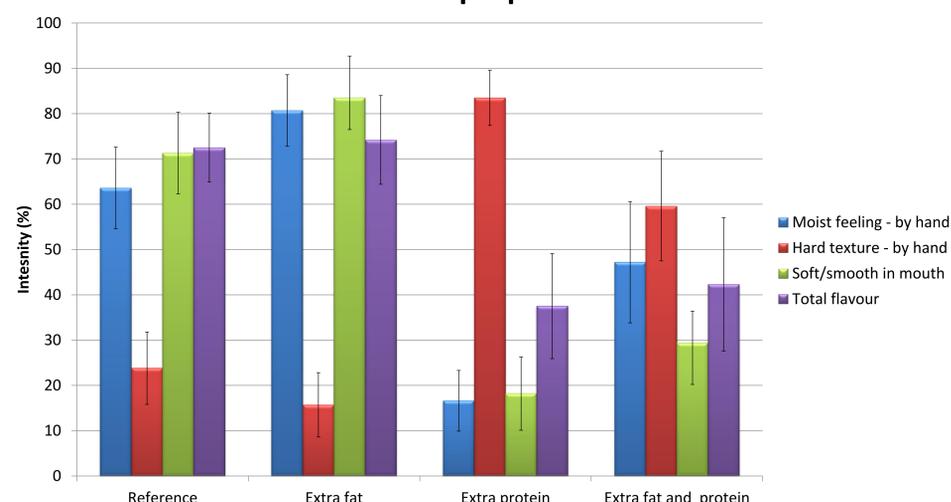
Added Fat

Addition of extra fat made the muffins flat with a moist feeling when touched by hand, and a smooth and fatty mouth feel.

Added Fat and Protein

Regarding muffin flavour and appearance, the effects of the added protein dominated the effects of fat addition. Texture-wise, these muffins were a bit harder and less smooth than the reference muffin, and had larger bubbles in the crumb.

Muffin properties



Designing muffins for older adults' nutritional needs is promising and with further recipe/process development appetizing sensory properties can be achieved

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