

## Assessment of eating capability of elderly subjects in UK: a quantitative evaluation

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Within next 15 years, nearly a quarter of the UK population will be aged over 65 years. With ageing, elderly people undergo progressive loss of muscle mass as well as physical, physiological and mental capabilities<sup>(1)</sup>. Weakened hand muscular forces, oro-facial muscle forces and reduced saliva secretion tend to cause difficulties in food handling and food oral management. In this study, we introduce a new concept termed as “eating capability” that includes various measurable physiological factors: hand, oral, sense and mental capability. Assessment of eating capability in elderly will indicate how capable an elderly individual is in food handling and food oral management.

In this study, eating capability was assessed in elderly subjects ( $n$  100; 65–95 years, living in 7 community centres and 2 shelter homes) in UK. Diverse forces were measured including maximum hand and finger gripping strength, finger touch sensitivity threshold, maximum biting force, maximum isometric tongue and lip sealing pressure. As expected, there was a gradual decline in both hand muscle forces as well as oro-facial muscle forces throughout the age span of 75–95 years with the age increment. A strong linear relationship was established between right hand gripping strength and oro-facial muscle force (*i.e.* lip sealing pressure, tongue pressure and biting force) (Fig. 1). This is in line with previous report suggesting that there is significant correlation between masticatory ability and handgrip strength in elderly population after adjusting for skeletal muscle mass, dentition status and background factors<sup>(2)</sup>. These results suggest that caregivers can easily assess eating capability and needs of elderly populations by using simple hand muscle measurements.

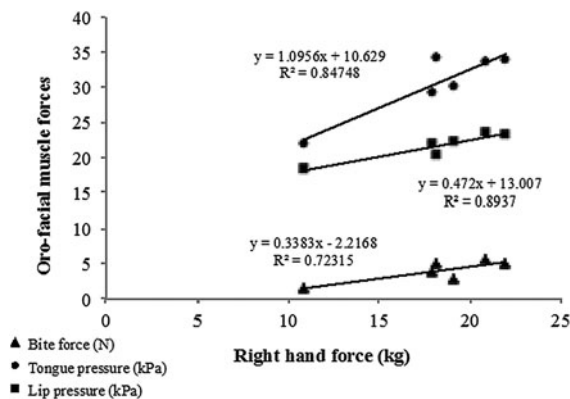


Fig. 1. Correlation between hand and oro-facial muscles.

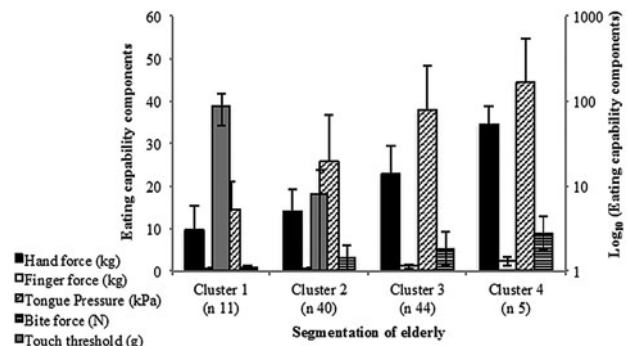


Fig. 2. Eating capability assessment.

Secondly, eating capability components were measured to classify the population in four different groups with cluster 1 as the weakest group and cluster 4 being the strongest (Fig. 2). 84% of the studied subjects had a medium eating capability with maximum hand force of 13.8–22.6 kg, maximum finger force of 0.7–1.1 kg, maximum tongue pressure of 25.7–37.7 kPa and biting force of 3.0–5.2 N. In conclusion, these inputs can offer the potential for development of food products tailored to the individual needs of elderly.

The research leading to these results has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under Grant Agreement No. Kbbe- 311754 (OPTIFEL).

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