Modelling Clay as Portion Size Estimation Aid

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Aim
To assess the validity of modelling clay versus measuring cups as portion size estimation aids for small and large portions of amorphous food (minced meat, pumpkin, rice) in 16-19 year old girls.

Methods
Female volunteers (n=36) observed a plate with three test foods (plus spinach as constant) of known portion size (60-250mL). They then used modelling clay and measuring cups to estimate the quantities. Test-retest reliability was checked, as was participants’ liking of each food. Statistical analyses included paired t-tests, two-sample t-tests, one-way analysis of variance (Bonferroni) and (intraclass) correlations.

Results
Modelling clay
- Difference between actual and estimated quantity was non-significant (minced meat: P=0.5495; pumpkin: P = 0.7225; rice P=0.5710).
- Test-retest reliability was established (intraclass r=0.78 [P=0.0055]).
- No significant difference (P=0.8020) among the three test foods.

Measuring cups
- Difference between actual and estimated quantity was highly significant (P=0.000 for all three foods).

Portion size
- Small portions were systematically overestimated.
- For minced meat the mean difference between actual and estimated quantity for small and large portions was significant (clay: P=0.0013; measuring cups: P=0.0108), yet for pumpkin and rice this was not the case (pumpkin: P=0.4209 and P=0.7774; rice: P=0.5335 and P=0.1018 for clay and measuring cups respectively).

Food liking
- No correlation between percentage difference between actual and estimated quantity, and liking of food (minced meat: r=-0.0952 [P=0.5808]; pumpkin r=-0.1008 [P=0.5585]; rice r=-0.0458 [P=0.7909]).

Conclusion
Modelling clay, in contrast to measuring cups, appears to be a valid portion size estimation aid for amorphous foods in groups of female adolescents. Portion size may play a role, but liking the food was unrelated.