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Fragmentation of a viscoelastic food by human mastication

Naoki Kobayashi, Kaoru Kohyama, Kouichi Shiozawa

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Fragment-size distributions have been studied experimentally in masticated viscoelastic food (fish sausage).The mastication experiment in seven subjects was examined. We classified the obtained results into two groups, namely, a single lognormal distribution group and a lognormal distribution with exponential tail group. The facts suggest that the individual variability might affect the fragmentation pattern when the food sample has a much more complicated physical property. In particular, the latter result (lognormal distribution with exponential tail) indicates that the fragmentation pattern by human mastication for fish sausage is different from the fragmentation pattern for raw carrot shown in our previous study. The excellent data fitting by the lognormal distribution with exponential tail implies that the fragmentation process has a size-segregation-structure between large and small parts.In order to explain this structure, we propose a mastication model for fish sausage based on stochastic processes.

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