

Dear Reviewer,

Thank you for your review. I would like to explain some aspects in my paper and show the improvements which were made by me according to your suggestions.

- 1. There is a (in my eyes reasonable) claim that spaghetti break due to dynamic deformation and waves propagating in the spaghetti. Please give a reference for this claim. Please also give references for the less generally known formulae you apply.**

Spaghetti breaks due to dynamic deformation because the time of impact is very short. That's why it can't be called a static deformation.

About waves: there are many researches about waves in spaghetti. I added references of it to my paper.

About formulae I apply: the formulae of determination of velocity of bending wave in spaghetti is derived for our spaghetti with the help of book [1] (Ландау Л. Д., Лифшиц Е. М., Теория упругости, 3 изд., М., 1965 (Теоретич. физика, т. 7)). I have added it to the section "References" in my paper.

- 2. A quite limited subset of the problem (vertical impact) was chosen. However, partial bending and compression were used in the explanation, which means that the spaghetti is actually bent in a certain direction. Please elaborate on the condition of vertical falling that allows bending into a certain direction.**

Spaghetti really bends in a certain direction in case of vertical falling. The cause of it is the fact that even in case of vertical falling spaghetti can't hit the surface ideally perpendicular. Also, there is heterogeneity in spaghetti because it is not ideal too. I didn't add it to my paper because this information doesn't leads us to solution of the problem.

- 3. Please improve the structure of your report as the "theoretical model" section includes experimental observations and similar.**

I changed the title of "theoretical model" section: now it is called "Explanation of processes in spaghetti"

- 4. As you say the breaking of the spaghetti is, to a large extent, driven by plastic deformation, could you please give some indication of the materials the spaghetti consists of and its rigidity, for example?**

Spaghetti consists of flour and water. Different producers make different spaghetti with different rigidity. I didn't measure its rigidity. That's why I can't add this information to my paper.

It goes without saying that spaghetti breaks due to plastic deformations: if we bend a spaghetti some way, there can be either elastic deformation or plastic deformation. If

we have elastic deformation, spaghetti will unbend – it will not break. If we have plastic deformation, spaghetti will not be able to unbend – most likely it will break.

- 5. Please give references or measurement data (ideally including errors) or explanations of the measurement setup for the variables that were measured.**

I have added error bars to the graphs.

- 6. Please outline your experimental setup better – maybe you want to introduce an individual section where you do this.**

My experimental setup is very simple. I have added description of it in section “Experiment”.

- 7. The problem asks to find the conditions under which spaghetti do not break. Please elaborate on the influence of the parameters you identify (diameter, length) on this condition.**

As it was mentioned in my paper (section “Conclusion”), *“it is really hard to describe influence of all the parameters numerically. We can discuss only frequency of breaking in experimental research”*. I have added one more section “Influence of parameters”. In this section I summarize influence of each parameter.

- 8. Please give an indication of the energy needed to break a certain kind of spaghetti (as you say this can be predicted).**

The energy needed to break a certain kind of spaghetti is the energy needed to curve spaghetti so much that it will be enough to tear its fibers. And this curvature will be the critical curvature. I have added it to my paper. I didn't calculate it because it can't help me to solve the problem (because I still have no possibility to compare it with my experiments)

I hope that you will be satisfied with my explanations and corrections.

Yours faithfully,

Yulia.