

Under What Condition a Hard Noodle Doesn't Break When It Hits a Hard Surface?

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Abstract

When a noodle fall down from a specific height ,it falls being affected by its weight force .other force also impose some force on it such as air resistance force which is caused by the constructs placement in the air stream. When a noodle hits a surface some upward force is imposed on it from the surface itself. Therefore, a question will rise: “under what conditions a hard noodle doesn’t break when it hits a hard surface?” For the purpose of the present study, a pack of noodles branded Mak was used. After carrying out various experiments under different condition, it was found out that the amount of fractures in noodles depends on the angles the noodles fall on the hard surface. The more the angle is, the less are the fractures .on the other hard, the more the height is, the more the fractions, take place.

Key words:

Introduction

When an object falls from a specific height, it is affected by its height force. Considering the Newton s second law and motion changes, we come to the following relation:

$$\vec{F} = m\vec{a}, |\vec{p}| = \int \vec{F} dt, \Delta \vec{p} = m\Delta \vec{v} \rightarrow \vec{j} = \Delta \vec{p}$$

According to the above-mentioned relations, when a noodle hits a hard surface, it is supposed that a completely inflexible hit takes place.

$$Mv_1 = mv_2 \rightarrow v_1 = v_2, \Delta p = 2mv_1 = 2m\sqrt{2gh}$$

Thus, it is to state that every part of the noodle is influenced by the force imposed on it from the hard surface .the some force also spreads through each part of the noodle.

Experimentation

To launch the experiments, first the 205cm long noodles were chosen and the mass of them were used to calculate their weight along the length of each noodle .then, they were checked not to contain any bulbs in their construct to ensure that the fractures are just as a result of the falls, not the infirmity of the noodles.

The experiments were done for three different heights .the noodles fell in three different angles including horizontal ,vertical and inclined to find out the most and least amount of fractures happen in the determined heights.

Experiment: The heights of 250, 170 and 120cm were considered. Eighteen 25cm long noodles were chosen and the experiment was repeated for 5 times for each height including three angles (horizontal, vertical, inclined) to determine the conditions for the most and the least fractures for the most and the least fractures (table 1-3). Having done the experiments, the researchers came to these conclusions that

when the noodle falls from a higher place, the more fractures take place, and the more the angle of falls will be, the less the fractures become.

Table 1

Descriptions(120cm height)	Amount (mm)	Fractures	Non-fractures	Falls
	23	1	17	Horizontal
	0	0	18	Vertical
Average	13/8	3	15	Inclined

Table 2

Descriptions(170cm height)	Amount(mm)	Fractures	Non-fractures	Fall
Noodle length average	14/7	6	12	Horizontal
Noodle length average	11/7	6	12	Vertical
Noodle length average	24	1	17	Inclined

Table 3

Descriptions(250cm height)	Amount(mm)	Fractures	Non- fractures	Fall
Noodle length average	15/5	10	8	Horizontal
Noodle length average	7/23	10	8	Vertical
Noodle length average	18	4	14	Inclined

Taking the initial result in to consideration, the 250cm height was considered for the experiment and the angles were 0-15, 30-45, 60-75 and 90 degrees. To be more accurate, each experiment was done three times for each angle and almost the same results were found .How ever the experiment for oriental angle was repeated for 6 times since for each experiment the results were different. Finally the average of the results was taken into account for reporting the overall results. It was revealed that the more the angle becomes approaching vertical angle, the less the number of fractions get.

Table 4

Fractures(cm)	Fracture Number	Non-fractures	Repetition Time	Angle
23	4	14	3	90
20	4	14	3	75
15/5	7	11	3	60
11/8	7	11	3	45
14/3	5	13	3	30
16/2	5	13	3	15
12/6	9	9	6	0

Final Results

1. When the heights increase, more fractures occur since the force of the hit on the hard surface increases, and the force of the hit on the hard surface can break the molecular bonds of the noodle.
2. When the angles approach the vertical line and increase, the fractures decrease because the time for the force of the hit on the hard surface prolongs and the surface upward force decrease and the fracture probability reduces.