

Kitchen Knife Research

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Abstract. This report is to do a research on kitchen knife because of the recession of kitchen knife market in recent year. Using the method of interview is to collect the data information from 15 participants. Data analysis and key results find that kitchen knife, to some extent, needs to improve its working environment and ergonomic design. And it also should consider more about the safety and hygiene conditions when the users are using this product. In this report, it presents some of the design implications on this product and investigates if there could have a new idea to change this product, make it safer, easier and more sustainable to use.

1. Introduction

In recent year, the growth of the kitchen knife manufacturing is recovered and it will still rise in 2013. Although the growth is strong, it still cannot reach the levels in 2007, according to severe deductions during the recession. And it still has an optimistic viewpoint on the kitchen knife market in the next 5 years based on the Kitchen Knife Manufacturing Market Research Report (IBISWorld, 2012). Hence, the aim of this report is to research the kitchen knife and to find out new improvements on this product and make a big breakthrough for the coming knife market through using the research methods. And the report also helps to make a further understanding on the needs of consumers to create a new health market development for the future.

Through the research, the data analysis and redesign the kitchen knife which would be mentioned in this report, the problem of knife market could be solved to some extent and the prosperity of the knife market would come back.

2. Ideal methodological approach

In this report, the participants are either the friends or the relatives of the researchers. Because through this relationship, it could make the participants feel more relax during the survey and would make them feel free to complaint about this product. It would be a good way to collect their emotional signals through ideal method.

While the participants are all having different background and knowledge, different age and time of using knife experience would help this report more comprehensive.

The best way to do this survey is to interview them separately face-to-face and then observe how the participants' operations during the cooking time. For the first part of interview is to ask them some questions on this product by using their memory and collect the data for later analysis. After a relax chat, they could show how they operate during the cooking time by giving them a real scenario. When they are cooking, to some extent, the scenario would help the participants to think more deeply and come up with more details that they have not mentioned in the interview.

Hence, interview and observation would be the best method to work on this survey. It is more considerate to combine two methods than just use one. The benefits of this method are to state the real emotions of the researchers' friends and family members through interviews and observations. While the researcher really knows well about her/his participants, sometimes the researcher could not read the exact emotions or could make a very subjective judgement through the thinking: "I know him/her

well even though he/she does not say a word”. So this thinking could be a limitation of this report. An objective data analysis is necessary in this report. To collect data should be very caution.

3. Selected method and its development

Due to the distance, jet lag, and some reasons, we cannot see all of our participants face-to-face and observe their behaviours by operating this product. To solve this problem we chose to use the telephone interview. We hope through using this method we could hear their voice by not looking at their face to make it more objective. Another reason we picked this method was we found that sometimes participants have already mentioned the question that we would ask later or found some questions that we have not thought before during the interview. These findings helped me to redesign and perfect my next interview and collect the data thoroughly.

By not looking at their face to read their emotions that we have known well, we tried to ask one question at the beginning of the interview, and then asked again to see if they would come up with more information. The aim of that is to test the two notes we have written are objective and on the other hand is to collect more useful data.

4. Data collection and analysis; key results

4.1 Data collection (15 participants)

1) The participator’s basic information(age, sex, job)

Age range: 22 – 60, sex 5 males 10 females, Job: one teacher, one housewife, one engineer, one interaction designer, one office lady and ten students

All from China

2) How long have you cooked so far?(Chart 1)

1~2 years	3~5 years	over 5 years	over 30 years
40%	33.3%	6.7%	20%

Chart 1

3) When do you usually use a kitchen knife? What do you do with it?

100% of them use a kitchen knife for cooking the dinner, 2 of 15 participants also use it in the morning

4) What kind of kitchen knives have you used? Can you describe their features or shapes?

They all had same experience of using the same shape of knife because of their background, nationality and culture. (Fig.1)



Fig.1

5) When you buy a knife, which aspects of it would you consider? (brands, quality, or others)

Quality, the feel of handle, blade is sharp, brand must be famous, 75% of the male participants mentioned that knife would be better if it is a little bit heavy.

6) Will you use different knives according to different conditions or foods?

66.7% will use the different knives according to different conditions or foods, one knife is for raw meat, one is for vegetable, and one is for fruits

7) Which kind of food do you think is the most difficult one to cut with a kitchen knife? Why? Root vegetables, potato, carrot, some roundish vegetables, raw meat (too slippery to hold)

What kind of shapes do you usually cut? (Slice, dice, etc.) And which shape do you think is the most difficult to have?

Piece; slice; dice; the tiny slice is the most difficult shape to cut

8) Do you care the slices or dices you cut are equal?

33.3% care the equal size of the each slice or dice they cut, 100% of the age over 50s care about it.

9) Which part of knife blade do you use to cut food? The front, the middle, or the back of knife blade?

46.7% use the middle, two participants will depend on the food, and three of them use the front because it is sharp, another three of them use the back because they can put more stress on the back part

10) Have you used the side face and the back blade of a kitchen knife? What do you use them for?

All of them use the side part to bat cucumbers or garlic; only two of them use the back blade to cut the steak. And 1 of them use the back blade to chop the skin of potatoes

11) Except to use a kitchen knife to cut food, would you use it in any other situations? Can you use some other verbs to describe your movement when use a kitchen knife? (Such as cut, slice and etc.)

Chop the skin of potatoes or carrots; bat the cucumbers or garlic; cleaning fish; cut through meat bones; open a can; open a package; put butter on bread; two of the age over 50s claimed that it also could be used as a defense tool.

12) Which is the biggest problem do you think when you are using a knife?

Sanitation; the place to collect knives; the safety of the other hand which holds the food when you cut; the quality of the knife if it is not sharp enough you have to put more strength on it and it hurts; get hurt; cut fingers

13) When you use a knife, which part of your body do you feel uncomfortable?

20% said there was a pain between the right hand's thumb and the index finger;

20% said the right hand wrist was painful; two male participants felt pain on their fingers. And one female said her right shoulder got pain; two said the right hand middle finger did not feel well.

14) Have you been hurt by a kitchen knife? Can you describe which part of your body have you been hurt?

80% said yes, they have been hurt by a kitchen knife. Most of them were on the other hand which grabbed the food while they were cutting.

15) Where do you usually put your knife in, when you do not use it?

When you are cooking, where do you usually put your knife on?

If you tend to use a knife rest, can you describe which kind of knife rest is your favorite one? And why you choose it?

40% of them put the kitchen knives in the drawer under the operation desk. Others have a knife rest and only one of them said a whole sealing rest would make her feel safe. While the rest of the knife rest group would like a transparent knife safe due to hygiene problem.

16) Have you worried about the safety of your knife during your cooking?

1 40% 2 6.7% 3 20% 4 13.3% 5 20%

(Can you give me a number to describe your worry? 5 is severely worried and 1 is not at all.)

17) If your knife blade is not as sharp as before, what will you do to deal with it? (Chart 2)

Use a knife sharpener	Ask an expert for help	Buy a new knife
66.7%	6.6%	26.7%

Chart 2

18) Do you care about the sanitation of the knife? Which part of a kitchen knife is difficult to

clean?

100% of the participants care about the sanitation situation. 20% pointed the two side parts of a knife were hard to clean. And 20% said the blade of a knife, another 20% claimed the joint between handle and the body of knife was hard to clean.

19) If you could design a kitchen knife for yourself in the future, what will you design?

Could chop the skin of potatoes while cut the food. Easy to handle, much safer, ceramic knife, can cut equal tiny slice.

4.2 Data analysis

Most of the participants use kitchen knives to cook their dinner and would separate knives depend on the food they were cooking. And the most difficult food to cut are roundish vegetables and meat. The slice shape would be the most difficult form to cut. While there seems to have an interesting phenomenon, when the users are older they do care about the slices or pieces they cut are equal in size. At the same time, all the older users chose the 5 which stands for “severely worried about the safety of their knife”. The reason why they cared so much would be that they have been hurt many times by a kitchen knife during the past decades. On the contrary, the participants who gave a 1 in the survey are all students. And some of them are even barely hurt by a knife. Hence, the person who has used a kitchen knife for a long time and has been hurt many times would tend to have a higher attention on the safety of the knife.

Female participants tended to use the back blade of a knife in this survey because they were lack of power to hold a heavy knife. On the contrary, most of the male participants would prefer to use heavier knives.

100% of the participants really care about the sanitation situation and do not want to hurt their fingers by a kitchen knife. Meanwhile, 66.7% of the users in this research would rather to use a knife sharpener to sharp their knives themselves than asking for help. 60% of the users like to have or has had a knife rest and they are all worried about two things, hygiene and safety.

The design of an ergonomic handle would be necessary because 66.7% of the participants do not feel well when hold a knife.

4.3 Key results

The results from the data analysis are the handles of knives might not base on the ergonomic study; the safety of knife storage and using a knife need to be improved; the hygiene of knife rest should be considered and knives should keep sharp so that they will not use extra energy and time to cut food. There also lacks of suitable sizes and weight on knives for women to use (Pan, 2009). A new sustainable material needs to substitute the rare mineral and to save the natural resource.

5. Discussion and design implications

To design a suitable handle for every user is impossible and every user has different shape of hands. If the surface material of handle is softer than inner one, which means it could form the shape according to different users. The users may feel more comfortable when use a kitchen knife.

The quality of a kitchen knife depends on the material and a sharp blade. The better material of a knife means it may be heavier because it has better ingredients in its material. Hence, a new sustainable material needs to substitute carbon steel knife and ceramic would be a better choice.

Ceramic knife according to the study of Wilson (2012), it is made of a rare mineral called zircon, which has mined in Australia. “After the zircon blade is fired, the ceramic becomes 50 per cent harder than steel. What’s more, it holds a sharp edge about 10 times longer, meaning these knives hardly ever have to be sharpened” based on Wilson’s statement. Hence, the new material would create a brand new market and design of kitchen knife.

Based on the study of ergonomic knife (Kenneth et al, 2003), a palm-gripping part and a hand-shape belly part consist of a hole handle. Hence to design a good handle could make them feel comfortable when users are doing a long time work. In the survey, users were worried about the safety of their holding food fingers. So to solve that problem is to design a magnetic attachment to avoid finger

touch the surface of knife directly. To help female users to suit the size of knife, one way is to make the front of knife changeable. So they can choose their favourite type of knife when they use it.

6. Issues arising from project; reflections; future implications

To make an objective data collection is difficult and challenging; because we have known the participants so well that we could predict what he/she would say in the next sentence. We would try to interview some of my foreigners' friends to help me do this interview next time. So we could search answers on a different viewpoint.

Observation is a very interesting method, if the students could simulate this method in class that would be more useful and important in the future.

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