The Impact of Anthropometry on Terasi Packaging

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Abstract The packaging is a protective material for the product to last longer. The purpose of this research is to design an ergonomic packaging using anthropometric methods for terasi products. Terasi is a spice that has special characteristics for Acehnese food. The results obtained in designing packaging with the anthropometric method using the dimensions of the width of the palm. The percentile used is 5% percentile with a mean value of boys and girls of 7.11 centimeters.

Keyword: anthropometry, design, packaging, percentile, terasi.

1. Introduction
Terasi is a fermented product [1], made of small shrimp that are black to brown [2]. Terasi one of the seasonings for various kinds of food, especially in Aceh food. Acehnese foods that use terasi seasoning, for example, are chili lado terasi, grilled fish, chili paste and various Acehnese foods. The increasing number of processed shrimp paste products now makes shrimp paste a best-selling product on the market. Products are complex properties that can be touched, felt, not touched, which are accepted by buyers to satisfy the wants and needs of consumers [3]. The wants and needs of consumers towards the product are seen from the quality, including the quality of terasi. The quality of shrimp paste is seen from the aroma and taste of the shrimp paste itself. But to attract the first time consumer interest in the product is packaging.

The packaging is a container to protect products from dirt and make products last longer. Aside from being a product protector, it can also attract consumers to buy the product [4], besides that, it is also necessary to pay attention to the packaging in its use. The use of convenient packaging can make it easier for humans to do their jobs and vice versa. The terasi packaging in the market is only in the form of a very simple plastic wrap so that the terasi packaging is uncomfortable in its use, this is evidenced by the results of the interview at the time of observation of some consumers. Consumers of terasi complain that when they open the packaging terasi, the terasi often spills over so that it makes the work increase in addition to cooking, namely cleaning the scattered of the terasi. Consumer complaints about terasi are a problem in this study and research is limited to dried terasi products.

Anthropometry is the study of adjusting the size of the tool/machine to the size of the human body [5], in other words anthropometry is used to determine the dimensions that will be used on terasi packaging, while percentiles are used to determine the size of the tool/machine that is adjusted to human size. Human size is used in the design of terasi packaging so that humans are comfortable [6] in using packaging. The size that does not fit between the size of humans and products can cause various
complications [7] in its use. Different human sizes one of which is caused by ethnic differences [8], including Indonesia. Therefore, this research focuses on the Acehnese tribe, because the Acehnese like the flavor of terasi cuisine, in accordance with the research conducted, so this research aims to design terasi packaging which is limited to powdered terasi.

2. Methods
The study was conducted with adult objects people in the age from 25 to 55 years who volunteered to become samples. The number of research objects is 100 women and 100 men. The first determination of the anthropometric dimensions of the hands that will be used is the beginning of the research, found in Table 1.

| Picture | Aim |
|---------|-----|
| ![Hand Image](image) | Reference in determining the length and width of the packaging |

The anthropometric dimension of the hand used to design the terasi packaging is the length dimension of the palm of the hand. The dimensions of the palm length are used as a reference in determining the length and width of the packaging.

Measurements were taken directly in the field by an ergonomics laboratory assistant who had been trained for ninety days. The martin body instrument is a tool used in measurements for reasons of being more practical in the field, and samples also feel more comfortable using the instrument.

3. Result
Results can be made after knowing the dimensions of the hand used. Statistical tests were performed on the dimensions of the length of the palm. The data uniformity test, including the statistical test performed, is shown in Figures 1 through 4.

![Figure 1: Male Right Hand Anthropometry Data](image)
Figure 2. Men Left Hand Anthropometry Data

Figure 3. Men Right Hand Anthropometry Data

Figure 4. Female Right Hand Anthropometry Data

Data is between control limits so all data is uniform. Data sufficiency test and normality test are carried out, to see the data collected is sufficient and normally distributed, it is found in table 2.
Table 2. Data Validity Test

| Men/Female | N  | N'  | Information |
|------------|----|-----|-------------|
|            |    |     |             |
| Men        | 100| 9   | 9           | Valid       |
| Female     | 100| 15  | 15          | Valid       |

Table 3. Data Normality Test

| Men/Female | Dα | D  | Information |
|------------|----|----|-------------|
|            |    |    |             |
| Men        | 0.134 | 0.036 | 0.047 | Normal    |
| Female     | 0.134 | 0.019 | 0.025 | Normal    |

Data obtained from the results of the data adequacy test are all valid and have a normal distribution.

4. Discussion

Designing powdered terasi packaging is the goal of research. The preliminary study in our study showed the inconvenience of using terasi packaging. The design of the terasi packaging is done to be comfortable in its use. Comfort is related to ergonomics. Ergonomics is defined as a human-related study [9] with its activities. Ergonomically designed based on percentiles, are in Table 4.

Table 4. Percentile for the Right Hand

| No | Men/Females | Mean (cm) | σ  (cm) | Percentiles 5 (cm) | Percentiles 50 (cm) | Percentiles 95 (cm) |
|----|-------------|-----------|---------|---------------------|---------------------|---------------------|
| 1  | Men         | 8.73      | 0.65    | 7.76                | 8.73                | 9.79                |
| 2  | Females     | 7.76      | 0.74    | 6.54                | 7.76                | 8.98                |

There are statistical differences in the dimensions of the length of the palm of the hand between Men and Females, where the dimensions of Men are bigger than Females.

This research also has limitations that need to be considered. First, the low number of samples needed in the study, given the large Acehnese population, so it is necessary to increase the number of samples for subsequent research. Second, the measurement instruments used are still manual, which may have problems related to lack of reliability, so more sophisticated and reliable measurement methods are needed.

Apart from the shortcomings, the design of terasi packaging is a first step in designing packaging using anthropometry and percentiles for the Acehnese tribe. The design of convenient terasi packaging can be seen in figure 5.
The percentile used to design terasi packaging is percentile 5 (P5) with the reason that consumers who have a small dimension of palm length can also use the packaging.

Determination of terasi packaging design is obtained from the first, the average size dimensions of the right-hand length and the length of the left hand, the second the average of the sexes, found in table 5.

|                | Right Hand (cm) | Left Hand (cm) | Average (cm) |
|----------------|-----------------|----------------|--------------|
| Men            | 7.67            | 7.50           | 7.58         |
| Females        | 6.54            | 6.40           | 6.47         |
| Average        |                 |                | 7.03         |

5. Conclusion
In designing this terasi packaging, only one anthropometric dimension is needed, the dimension of hand length, with the 5th percentile.

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