Exploration of Cow Bone as a Material for Necklace Accessories

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Abstract Excessive consumption due to population density causes the amount of waste to increase, for example, the city of Bandung. Bandung is a tourist city that provides a lot of typical ole and typical food too. Like beat noodles. Mie kocok is a food made from noodles and uses beef broth. Beef broth is obtained using decoction of beef bone as the main ingredient. Mi shake results in cow bone waste. The beef bone that becomes this waste is quite disturbing. In this report the use of cow bone waste is the main material for making accessories products. To get a good result of processed beef bone material, several studies were carried out, such as conducting observations, case studies, and interviews with business owners of cow bone craftsmanship. The method used for processing was obtained from several experiments. Processed cow bone material that is clean and odorless which can be made as the main ingredient in making accessories.

Keywords waste, ox bone, material, accessories

1. Introduction

Today's consumption of society greatly affects the surrounding environment. Waste generated from increased consumption makes waste very disturbing in the community. This waste is usually called garbage.

The author takes the example of food waste which is a characteristic of Bandung, namely shake noodles. Mie kocok is a food made from noodles and uses beef broth. Beef broth is obtained using decoction of beef bone as the main ingredient. The author uses beef bone as the main material in this report.

In society, beef bones can only be processed into several dishes. Ox bone that can be used is also not in all parts but only certain parts. In the noodle shake food, the beef bone used is only the thighs and calves. Because there are a lot of marrow in the thighs and calves which are enhancers of the broth flavor in the beat noodles. Cow bone waste is also a waste problem that must be considered by the community. Because it still sounds trivial, usually cow bone waste is only thrown in the trash or left lying in the corner of the house and left to parse itself.

Processing of cow bone waste in the Bandung area is only around the Cileunyi area. This type of cow bone waste processing product is still relatively small. The product variants that are still small make the products of beef bone material less known and less interested, especially the women.

Ox bone has several advantages and its own unique side. The typical color is the cream color that only bones have. A hard and strong material is the main advantage of having a cow bone. Even though it has hard properties, cow bones are not difficult to form.

From the problem above, the author found a solution to further explore and utilize the excess bone of cattle. Therefore, the author develops how to explore bovine bone if it is used as a product of women's necklaces.

2. Type of Bones

1. Skull bones

The skull bone is one of the endoscopes in the head area. Composed by various parts of the bone which become one complex unit (Nurhayati, 2004).

2. Spine (vertebrate Columna)

The spine functions to form the axis of the body. The spine is flexible (not stiff) because it is broad and each segment is connected by an interverbal disc composed of cartilage. Joints between the vertebrae allow movement to the front, back and sides. The shape of the spine as a whole is curved to strengthen and balance the shape of the body when standing (Syamsuri, 2004).

3. The spine consists of 7 vertebrae, 12 vertebrae, 5 vertebrae, and sacrum and coccyx. In adults, a single cranial bone is a combination of 5 vertebrae. Likewise, the coccyx is a single bone produced by fusion 4 or 5 of the spine (Syamsuri, 2004).

4. Each vertebra has the same structure except the two uppermost segments, namely the atlas bone and axis bone. The atlas bone has a special joint with the skull bone so that it allows the head to nod. The existence of bone atlas and axis bone allows the head to move around (Syamsuri, 2004).

5. Costae (ribs)

Ribs are the treatment of intesegmental cartilage or bone replacement articulating with the spine. Initially they were an extension of the curved axis. The bones then experience ossification or hardening of the bone (Hildebran, 1988).

True ribs have 7 pairs and are attached directly to the sternum. There are 5 pairs of fake ribs, namely 3 ribs attached to the ribs above it, and 2 pairs of floating ribs (Syamsuri, 2004).

6. Sternum (breastbone)

The breastbone is a ventral midline element that usually articulates with many anterior thoracic ribs. Its function is to strengthen the body shape, help protect the internal organs, and accommodate the muscles of the shoulder. In addition, the breastbone also functions as a protective organ that is very important as a protector of the lungs (Hildebrand, 2004).

The breastbone is shaped like a dagger. The breastbone consists of three parts, namely upstream (manubrium), body, and taju sword (xipoid processus). Manubrium (upstream) is continuous with the first clavicle and rib. The body part is where the next 9 ribs attach.

3. Type of Bone Forms

Based on the shape of the bone can be divided into 3 types, namely the bone pipe, flat bones and short bones.

1. Bone Pipe

It is called a pipe bone because of its shape like a pipe, which is round, elongated, with a hollow center. For example the arm bones, thigh bone, legs, and joints of the finger bone. Tualang pipe consists of 3 parts, namely the two ends that are buried with another bone called the epiphysis, the middle part is called the diaphysus, and between the epiphysis and diaphysis is the epiphyseal chakra (Syamsuri, 2004).

2. Flat bones

Flat bones are flat, consisting of compact bone plates and spongy bones. Inside contains red marrow. Red marrow serves as a place for making red blood cells and white phlegm cells. Examples of ribs, sternum, shoulder blades, pelvic bones and forehead bones (Syamsuri, 2004).

3. Short bones

Short bones are often referred to as bone segments because they are round and short. It contains red marrow which functions as a place for making white blood cells. Examples of short bones are bones in the wrists, ankles, palms and soles of the feet and vertebrae (Syamsuri, 2004).

4. Analysis

4.1. Material Exploration

Exploration is one type of study conducted by searching according to need. Explorative study is a research that seeks to explore the causes or initial things that affect the occurrence of something and explore new knowledge to find a problem. (Arikunto, 2010). This exploration is used to achieve an interest with defined limits using various methods or methods that are eligible to elicit such achievements. With the exploration of this material, the way and stage of processing can be tailored to the needs and search results can be done in accordance with what is intended or desired. Exploration will be done is the exploration of bone material.

The exploration and create valuable ideas sometimes occur by the Divergent and Convergent Thinking as it is consciously or unconsciously happened (Yudiarti *et al*, 2017).

4.2. Crafting of cow Bone

Figure 1 Crafting of Cow Bone
(doc., 2018)

Cow bone craftsmen around Bandung are located in Kampung Pasir Tukul, Cileunyi Wetan. Cattle bone waste is processed into unique handicrafts, such as cigarette pipes, commandos and key chains. The tools used are still fairly simple, all products produced are still using manual techniques or limited. The tools used are in the form of machetes, chisels, file, kerik, and sandpaper. Starting from the 1970s, now almost all residents in Kampung Pasir Tukul pursue processing of cow bone waste into handicrafts. Bovine bone pengjarin, take material from the seller of beaten noodles in the Majalaya area. The bone used is the thigh and calf bone because it is stronger and has a longer size.

Figure 2 Crafting of Cow Bone
(doc., 2018)

4.3 Products that have been Produced

Products that have been produced by cattle bone craftsmen in the market, but most are ordered in advance by consumers.

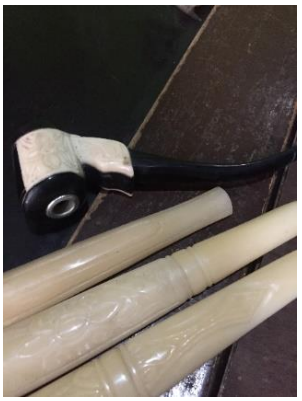

Figure 3 Images of Cow Bone Cigarette Pipes
(doc., 2018)

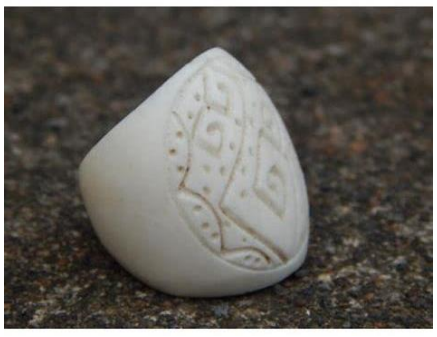

Figure 4 Images of a cow bone ring
(doc., 2018)

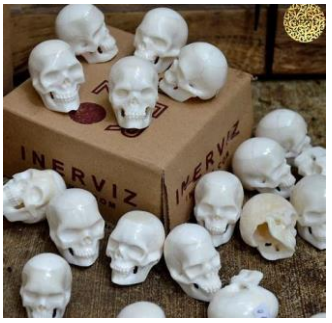

Figure 5 Images of tengkorang displays from cow bones
(doc., 2018).

5. Ideas of Concepts

Based on the exploration and research of materials carried out, organic waste in the area around our residence can be recycled or can be utilized as new material. Exploration of organic waste material to be used is coconut coir waste. Waste treatment is intended for the manufacture of new materials as the main material of making accessories / jewelry. This exploration is assisted by a variety of chemicals to help the process of making the material as desired. The exploration of this material will be designed as an accessory / jewelry that can be sold and used. Products to be made are jewelry products. In addition to that goal also to reduce organic waste in the surrounding area.

3.1. Cow Bone Processing Techniques

The author took a number of references to cow bone processing techniques. Then the techniques that become the reference in this study are:

1. **Cutting Method**

   The whole bone-shaped material is boiled for several hours, then dried in the sun for several days. After the material is dry, then the dried material is cut using a grinding. To cut material into small pieces, you can use a worm saw.

2. **Carving Method**

   Bone material that has been cut, then sketched directly in the material of the cut bone cow. This method is used

3.2 Eksperiment

3.2.1 Eksperiment 1 (Cutting)

Table 1 Experimental Activities 1
(doc., 2018)

Photo	Tools and Materials	Description
	- Cow bone calf section - Hacksaw	What was produced in this experiment was an experiment using a manual hacksaw to cut bones into several parts. The result is an experiment FAILED.
	- Cow bone - burrs	Then the next experiment on the same day, using a grinding as a tool to cut bones, the result was a SUCCESSFUL trial. Bones can be cut into several parts.

3.2.2 Eksperiment 2 (Eliminate leftover meat)

Experiments using several ingredients to remove the remaining meat from the bone by soaking the bones a few days. The ingredients are mixed with water and the results, namely:

Table 2 Experimental Activities 2
(doc., 2018)

Photo	Tools and Materials	Description
	- Cow bone - Wipol - Vixal	Results SUCCESSFUL, the remaining meat in the bone is lost.
	- Cow bone - Sunlight - kamper	Results SUCCESSFUL, the remaining meat and fat in the bone is lost and the bones become clean.

3.2.3 Eksperiment 3 (Eliminating odor)

This experiment was carried out with the aim of removing the remaining meat and odor in the bones. There are several ingredients mixed with water and the bone is soaked in the mixture and left for a few days and then dried in the sun.

Table 3 Experimental Activities 3
(doc., 2018)

Photo	Tools and Materials	Description
	1.Cow bone 2.Sunlight 3.camphor	The result is a smell of bone that still tastes.
	1.Cow bone 2.Downy	The result is that the smell is still very pronounced.
	1. Cow bone 2. Sunlight 3. Downy	The result is that the odor in the bone is not completely gone
	1. Cow bone 2. Rice water	The result is that the odor in the bone is not completely gone

3.2.4 EksperimenT 4 (Eliminating odor)

Table 4 Experimental Activities 4
(doc., 2018)

Photo	Tools and Materials	Description
	- Cow bone - water - Detergent - Clothes deodorizers	SUCCESSFUL, the odor in the bone almost completely disappeared. This experiment is done by boiling the detergent water mixture and clothes fragrances for 1 hour 30 minutes.

3.2.5 Eksperimen 5 (Eliminating odor)

Table 5 Experimental Activities
(doc., 2018).

Photo	Tools and Materials	Description
	- Cow bone - water - Detergent - H2O2	SUCCESSFUL, the odor in the bone almost completely disappeared. This experiment is done by boiling the detergent water mixture and clothes fragrances for 4-7 Hours.

6. Design Concept

1. The initial idea of designing accessories products becomes a reference for material exploration. This limit will maximize the yield of the finished product.
2. Products are necklace accessories using the main material of cow bones with the concept of natural form.
3. Attracting the public interest in the use of waste and accessories with the main material of cow bone.

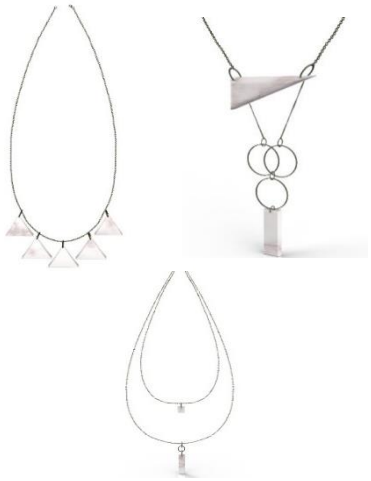

Figure 6 Design Concept
(doc., 2018)

4.1 Flow Of Activity

Flow Of Activity consists of the stages of activities carried out when the user uses a necklace. Divided into several variables such as table Flow of Activity and Chart of Flow of Activity.

Table 6 *Tabel Flow Flow Of Activity*

(doc., 2018)

Prosedur	The user stage uses jewelry
Female	users aged 15-35 years
Struktur	Natural daily
Material	Ox and Iron Bone

4.2 Table of Design of Activity

No.	Activity	Sub Activity	KHD	KTHD
1.	Display Store	1. Seeing 2. Jewelry. 3. Take 4. Jewelry. 5. Wear 6. Jewelry. **7.** Cared for.	a. Form b. Packaging	a. Color Size b. Jewelry c. Locking, chains, hooks d. Jewelry Display
2	Packaging	1. Store jewelry. 2. Giving 3. Jewelry.	1. Packaging 2. Color **3.** Shape	1. Color jewelry box. 2. Standard Size 3. Finger Weight 4. Jewelry Standards. 5. Locking, chains, **6.** hook
3	Used As Needed	1. Take it from the Storage Place 2. Used in ears. 3. Enter 4. To Place **5.** Storage	**1.** Overall earrings	1. Good visuals 2. Comfortable and safe to use **3.** Using the original color of the material
4	User Storage	-Save jewelry.	- structure Storage	

(doc., 2018)

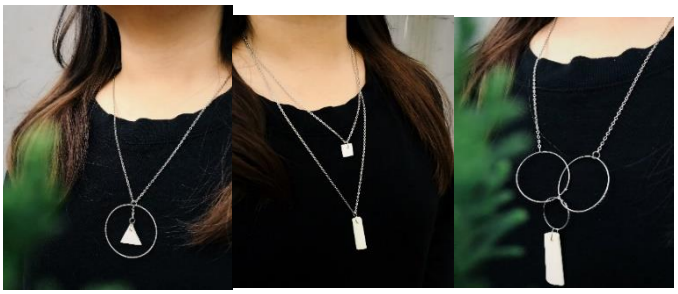

Figure 7 3D Detail
(doc., 2018).

7. Conclusion

After passing through several experimental processes such as cutting, removing the remaining meat, and removing odors, it can be concluded that cutting the ticket can be done by using a grinding, then to remove the remaining meat can be done by soaking the cut bone with a mixture of sunlight and water, and to eliminate unpleasant odors in the bones can be done by soaking pieces of poured beef with a mixture of liquid H2O2 and water. H2O2 liquid can also whiten beef bones and make the bone surface of cattle more clean and smooth.

This design still requires an evaluation and development stage because the exploration of cow bone material can be carried out more optimally than this design.

This design is far from perfectly said. Exploration of bone can still be developed with several different methods. Different methods can make beef bones valuable waste. The combination of cow bones in the manufacture of handicraft products can be compiled with wood, leather, metal, textiles and other materials.

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