

## Raw Materials Inventory and Fermentation Process in Lemea Industry the Traditional Food of Rejang Tribe

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**Abstract**— The traditional food is a food that is processed from surrounding natural and treated hereditary, so it became one of the pillars of food tenacity. Lemea is a traditional food of Rejang tribe that has not been properly inventoried. The purpose of this study is an inventory and characterization of physical, chemical and organoleptic of Lemea from various small industries in the districts. Characterization of traditional food Lemea required as a basis for the agro-industry design of Lemea of Rejang traditional standardized food (raw materials and processes), so resulting in consistent product quality, hygienic and attractive so as to compete with other containers food products, as well as preserving traditional food. The research method used was a survey method, by interviewing a small industry regarding raw materials used and the fermentation process of Lemea. Results shows that the raw materials used are Mayan bamboo sprout (Kepahiyang and North Bengkulu District), Kepea bamboo sprout (South Lebong District) and all kinds of bamboo sprout in the Rejang Lebong District, depending on available bamboo sprouts. The fish used in Central Bengkulu and Kepahiyang District is Tilapia fish, South Lebong District (White fish), North Bengkulu (Mayung fish). The fermentation process classified on 2 groups, namely (1) fermentation with the addition of rice porridge as a source of glucose and (2) without the addition of fermented rice porridge as a source of glucose. Lemea from various sources have variations in color, aroma, acidity, integrality, turbidity and overall appearance of different.

**Keywords**— Lemea; traditional food; bamboo sprout; Rejang tribe

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### I. INTRODUCTION

In efforts to achieve food tenacity is necessary to study not only on the availability of food, but is largely determined by the distribution and the ease in obtaining food. One of the potential food sources to be developed is traditional food which is processing has been done for generations by using specific local materials and easy to obtain, which is a comparative advantage. However, these food products have not been developed since many people have no idea the benefits of nutritional value of traditional foods, inconsistent quality, the less attractive form of packaging, use and less practical distribution as well as the short shelf life. This resulted in traditional foods become foreigner in their own, crushed by outside food products which is packaged attractive with nutritional value information advertised excessively. In addition, traditional food is scarce because of the complexity in the making and only known by certain circles [10]. This tendency is feared will result in the loss of culinary riches, which is the nation's wealth.

As a province located in coastal areas, Bengkulu has a rich diversity of typical fish-based meals that can be

developed. It makes a lot of fish used as raw material in typical food, especially in coastal communities. Reference [16] reported Bengkulu traditional food fish based, such as Pendap fish, Pais fish, *Lemea* fish, Bagar shark, fried Badar. Efforts to make the traditional foods as local knowledge in food tenacity pillar, has been studied in a sustainable manner from raw material modifications ([7], [8], [9]). Today, the advantages of traditional foods has been the in-depth study in many countries ([4], [5], [12], [13], [14], [15]).

Bengkulu Province has the culture and customs which is characterized by three major tribes clump, namely Rejang tribe which centered in Rejang Lebong district, Serawai tribe centered in South Bengkulu district and Malay tribes centered in Bengkulu city. All three major tribes were generally occupy different areas. Mostly Rejang tribes inhabited the highlands or mountains, while Serawai and Malay tribes occupy low areas or coastal ([1], [3]). References [6] and [17] reported that *Lemea*, the traditional food Rejang tribe was found only in five districts. Each product "*Lemea*" of all counties using specific raw materials and fermentation [11]. So that the resulting product is also highly variable.

The purpose of this study is to conduct an inventory and characterization of physical, chemical and organoleptic properties of *Lemea* which is came from various small industries in the districts. Characterization of traditional food *Lemea* is required as a basis for the agro-industry design of *Lemea* of Rejang traditional standardized food (raw materials and processes), so resulting in consistent product quality, hygienic and attractive so as to compete with other containers food products, as well as preserving traditional food.

## II. MATERIAL AND METHODS

### A. Material and Tools

Raw materials used in this study are *Lemea*, traditional foods of Rejang tribe which was obtained from various *Lemea* producers at district in the Bengkulu province, plastic packaging material and bottles and chemicals used for the identification of microorganisms and determination of the chemical characteristics and values nutrition of *Lemea*, the traditional food of Rejang tribes

The tools used in this study is the equipment used for the production (measured: scales, temperature and time packaging equipment (bottle packaging equipment, sealer packaging equipment and vacuum packaging equipment) and equipment in physical properties testing, equipment for chemical properties (pH meter , oven, desiccator and ashing).

### B. Research Methodology

Observations on the spread of *Lemea* industry performed using survey method by interviewing a small industry and society (consumers) who are in the region of Bengkulu province, especially in the traditional markets. Through field surveys district to district that is in the province of Bengkulu data showed manufacturers' *Lemea* "producing" *Lemea* "as a small business (commercial).

The spread of industry "*Lemea*" conducted by survey method with a small interview with industry and the public (consumers) who are in the region of Bengkulu province, especially in the traditional markets. Field survey-district to district in the Bengkulu province has obtained the data producers who produce *Lemea* as a small business (commercial).

## III. RESULT AND DISCUSSION

### A. Identification and *Lemea* raw materials characteristics

The raw materials used by the *Lemea* manufacturing industry were almost the same among the districts in the Bengkulu province, that is bamboo sprouts and fish. The difference in raw materials used were only found in bamboo sprouts types and fish species. The complete characterization of the raw material used (type of bamboo shoots, fish species, the ratio of bamboo shoots and fish w / w), additional materials used are listed in Table 1. Table 1 shows that the difference in raw materials used in *Lemea* industry are found only in the inter-district, this difference was not seen in the industry in the same district. Bamboo sprouts used in

Kepahiyang district was different from the type of bamboo sprout which is used in the South Lebong district. The survey results showed the raw materials industry in Kepahiyang District consists of: The main raw material in the form of bamboo sprout from betung plant and additional materials in the form of fish. In District kepahiyang, bamboo shoots which often found are betung, and fish that often found are of tilapia fish. Therefore, almost all of industries using the same bamboo sprout and fish types, that is bamboo sprout and small tilapia fish.

In addition to these two raw materials, some *Lemea* industries in the Kepahiyang district use the extra material such as rice porridge, which is rice that has been cooked into porridge. The material composition used in the manufacture of *Lemea*, among industries located in the District Kepahiyang also vary. Comparison between the use of bamboo shoots and fish is of 5% w / w to 25% w / w, therefore for as much as 50 kg of bamboo sprout it only takes about 4 kg-5 kg of tilapia fish.

In general, based on the constituent materials, *Lemea* divided into 2 groups, namely (a) *Lemea* which uses bamboo sprout as a source of carbon and fish as a source of protein, and rice porridge as a source of glucose at the beginning of fermentation and (b) *Lemea* which uses bamboo sprout as a source of carbon and fish as a protein source, do not use rice porridge as a source of glucose at the beginning of fermentation. The use of rice porridge as a source of glucose in the early period of growth will provide varying levels of acidity in the product. *Lemea* which uses rice porridge usually will result in higher levels of acid. In addition to differences in acidity (pH), also showed differences in turbidity.

### B. Inventory of the production process of *Lemea*

In order to achieve Good Manufacturing Process (GMP) for the traditional food *Lemea*, all stages of processing traditional foods *Lemea* are identified in detail (see Fig. 1). When view from the pre-treatment of fish, its divided into: fish boiled first before curing (fermentation) and the fish were not boiled before it is fermented. According to industry players (producers), boiling and without boiling the fish will have an effect on the resulting aroma *Lemea*. The difference is caused by the scent of protein degradation in fish that have been boiled and not boiled. *Lemea* production capacity varies from small industries, produce of 5 kg-10 kg of bamboo shoots, does not produce a continuous, using bamboo sprout which are taken by himself in the wood and fish which are caught by the family.

While *Lemea* industry in manufacture scale, a continuously 50 kg/day, stating that raw material purchased in the traditional market or delivered by the supplier remains. Betung spout purchased with fluctuating prices, from Rp 2,000/kg up to Rp 5000/kg depending on the season. While the price of tilapia fish used (small sized) is Rp 10,000/kg. In general, the production of *Lemea* are shown as in Fig. 2.

TABEL I  
IDENTIFICATION AND CHARACTERIZATION OF RAW MATERIAL

No	District	Name of producer	Types of bamboo shoots	Types of Fish	Ratio (shoots : fish : other materials) (w/w)	other addition
1	Kepahiyang	Asia	Betung	Mujair	10000kg : 2000 kg	-
2	Kepahiyang	Ott	Betung	Mujair	50 : 2 kg : 1 kg	+ Rice
3	Kepahiyang	Sariau	Manyan	Mujair	5 kg : 2 kg : 0,25kg	+ Rice
4	Kepahiyang	Nurhasanah	Betung	Mujair	2 kg:0.5 kg:0.25 kg	+ Rice
5	Kepahiyang	Nul	Manyan	Teri/Mujair	3 kg : 0.1 kg	-
6	Kepahiyang	Lel	Betung	Mujair	10 kg : 2 kg	-
7	Kepahiyang	Bay	Manyan	Mujair		-
8	Rejang Lebong	Emma	Telang	Mujair	50 kg : 0.5 kg	-
9	Rejang Lebong	Zulaiha	Gebu	Mujair	5 kg : 0.250 kg	-
10	Rejang Lebong	Firyana	Manyan	Mujair	50 kg : 0.5 kg	-
11	Rejang Lebong	Mariana	Bebas	Ikan sungai	50 kg : 0.5 kg	-
12	Rejang Lebong	Mulyuam	Bebas	Ikan sungai	30 kg : 0.5 kg	-
13	Rejang Lebong	Husna	Manyan	Mujair	3 kg : 0.5 kg	-
14	Rejang Lebong	Fatimah	Betung	Seluang	50 kg : 0.5 kg	-
15	Lebong Selatan	Uda	Kapeah	Ikan Putih	5 kg : 0.1 kg	-
16	Lebong Selatan	Nah	Manyan	Puyuh	1 kg : 0.25 kg	-
17	Lebong Selatan	Ana	Kapeah	Ikan Putih	25 kg : 0.250 kg :	-
18	Lebong Selatan	Inal	Kapeah	Ikan Putih	10 kg ; 0.100 kg	-
19	Lebong Selatan	Kemala	Sei	Ikan Nila	25 kg : 0.5 kg	-
20	Lebong Selatan	Rohimah	Manyan	Ikan Putih	20 kg : 1 kg	-
21	Lebong Selatan	Hendra	Kapeah	Ikan Putih	5 kg : 0.1 kg	-
22	Lebong Selatan	Nur	Manyan	Ikan Putih	25 kg : 0.250 kg	-



Fig. 1 Raw materials and products of *Lemea*, the traditional food of Rejang tribe

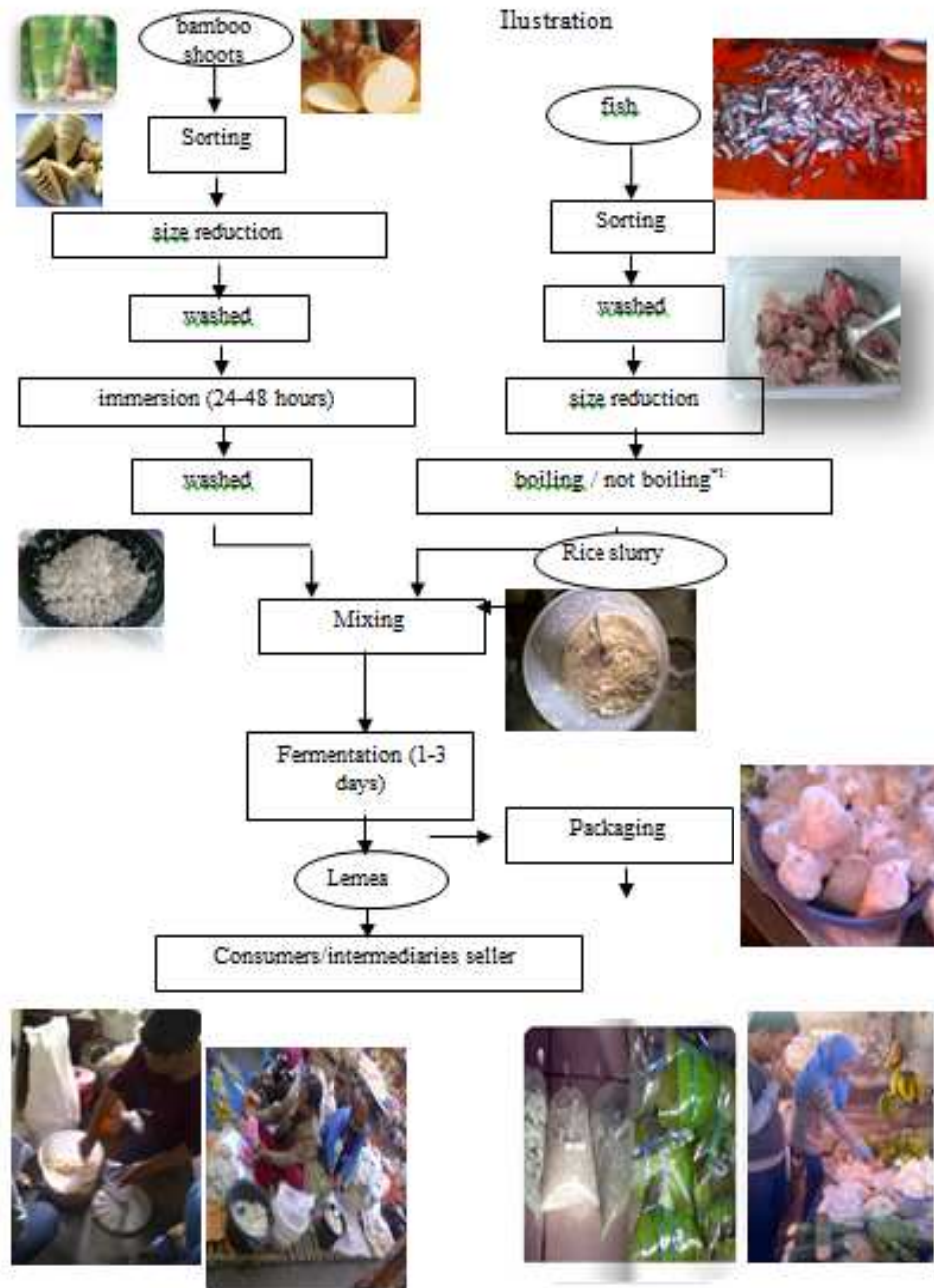


Fig 2. Identification and characterization of traditional food production process lemea Rejang tribe

#### IV. CONCLUSIONS

Raw materials used in the manufacture of *Lemea* is varies depending on the type of bamboo sprout and fish that is widely available in the area, namely Tilapia fish, White fish and Seluang fish, while the bamboo sprout used are Betung sprout, Kepeah and Mayan. The fermentation process is carried out in the making *Lemea* also varies between districts. Raw materials and fermentation process that are varying

gives the *Lemea* product produced will also vary in terms of shape, scent, color, acidity, integrity and overall appearance.

The need for studies on consumer preferences towards *Lemea* at each District in order to obtain a superior *Lemea* product of each district. The importance of choosing a superior *Lemea* product Provincial, which is selected from the superior *Lemea* product of the District. The need for further study of *Lemea* processing, so that *Lemea* becomes a product that consumers demand

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