Effect of Differences in Salt Concentration on the Quality of Rebon Shrimp Paste (Acetes Sp) in Tegal District

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Abstract. Rebon Shrimp Paste (RSP) in Indonesia uses different percentages of salt addition, ranging from 2 to 20% or not at all. This study aims to determine the influence of different salt concentration (5%, 10%, 15% and without salt) on the quality of RSP organoleptic, microbiological and chemical. This research was conducted in Munjung Agung, Tegal and Cirebon Fisheries Product Quality Testing and Application Laboratory. The results showed that the addition of different salt concentration (5%, 10%, 15% and without salt) affected the quality of organoleptics, microbiology, and chemistry. Organoleptic quality with salt concentration of 5% and 10% favored panelists with an average value of 6.8 (not yet meeting Indonesian National Standards). The highest water content value is found in RSP that are not added salt (40.19%-43.22%) and lowest at 15% salt concentration (31.12%-34.82%) in accordance with the SNI. E.Coli and Salmonella growth was negative in all four samples and didn’t different materially, according to SNI standard 2716.1:2009. The best increase in salt concentration in the study was 5%, with an average organoleptic value of 6.8 in the coliform contamination sample A2 APM/g <3, negative E.Coli and Salmonella with a water content value of 39.15.

1. Introduction

Terasi is widely traded in the market. In general, it can be divided into two types based on its raw materials, namely shrimp paste and fish shrimp paste. Terasi is a food flavoring ingredient and is usually used in making chili sauce and is well known not only in Indonesia, especially Java, but also in Southeast Asia such as Thailand, Vietnam, Laos and other countries [1].

Terasi is one of the fermented fish or shrimp products that only undergoes a salting treatment without adding acid, then leaves it for a while to allow the fermentation process to occur. In making shrimp paste, the fermentation process can take place due to activity enzyme originating from the body of the fish or shrimp itself. Fermentation is a process of decomposing simpler compounds by enzymes or fermen which comes from the fish's own body or from microorganisms and takes place under controlled environmental conditions. This decomposition process can take place with or without the activity of microorganisms, especially fungi and yeast [2].

The formulation of the problem in this study were: whether the difference in the addition of salt concentration in the shrimp paste as much as 5%, 10%, 15% and 0% affect the quality in Organoleptic, Microbiological and Chemical. In 100 grams of fresh rebon shrimp contains 16.2 grams of protein and 757 mg of calcium. However, rebon shrimp spoil easily if not processed. Therefore, Rebon must be processed first so as not to lose its nutritional value, one example of a processed product is shrimp paste. Good quality also needs to be considered for fishery products [3].
There are many ways that can be done to maintain the quality and nutritional quality of rebon shrimp, one of which is by doing traditional processing, namely making shrimp paste using fermentation techniques. Fermentation is one way of processing through the process of utilizing the decomposition of compounds from complex protein materials [4]. The salt used is very important in the fermentation process, therefore it is necessary to add appropriate salt for making shrimp paste so that the quality is well maintained. This study aims to determine the good quality of rebon shrimp paste with the addition of different salt concentration.

2. Materials and Methods

The method used in this research is experimental analysis, it can be said as an experimental research method used to find the effect of certain treatments on others under controlled conditions [5]. Collecting data by observation, namely by observing and recording, then tested semiquantitatively at the UPTD Laboratory. Testing and Application of Quality Fishery Products in Cirebon, West Java and statistically analyzed to determine the effect of differences in the addition of different salt concentration, namely A 5%, B 10%, C 15% and D 0% or without salt in the shrimp paste.

The method of data collection is carried out observation and data analysis by systematically observing and recording the symptoms or phenomena being investigated [6]. The phenomenon observed in this study was the effect of adding salt concentration to the shrimp paste. The experimental design in this study is described in Table 1.

| Table 1. Research Experiment Design |
|-------------------------------------|
| Testing                             | Repetition | Treatment of Adding Salt Concentration (%) To 1 Kg Shrimp Paste | Amount Sample |
| Organoleptic                        | 1 (6 panelists) | A:5% B:10% C:15% D:0% | Sample |
| Microbiology                        |            | A | B | C | D | 4 |
| E.Coli bacteria                     | 2          | A1 and A2 B1 and B2 C1 and C2 D1 and D2 | 8 |
| Bacteria Salmonella                 | 2          | A1 and A2 B1 and B2 C1 and C2 D1 and D2 | 8 |
| Chemistry Water Content             | 2          | A1 and A2 B1 and B2 C1 and C2 D1 and D2 | 8 |

2.1. The Process of Making Shrimp Paste

a) Raw Material Preparation

The raw material in the form of fresh rebon shrimp is then carried out in the sorting stage, washed to remove dirt, mucus, and drained. The washing process uses clean water that has been placed in a container then the rebon shrimp is put into a container to be washed.

b) Drying I

After clean, the rebon shrimp is dried in the open so that it is exposed to direct sunlight. In this drying, there should not be a thick layer so that the rebon shrimp dry evenly and if there is dirt it must be removed. The purpose of drying is not to dry completely but just half dry so that it is easy to grind or pound [1]. Drying is done for one to two days [4].

c) Pulverization

Enter the dried rebon shrimp into the pounder then puree. The process of milling the shrimp paste uses a mortar and pestle made of stone for mortar and a pestle made of wood, in addition to smoothing the pounding it is used to obtain homogeneous results. Meanwhile, salt treatment A 5% [7], treatment B 10% [8] and treatment C 15% was added [9]. Use treatment D without added salt. The crushed and mashed shrimp are in a square shape and then wrapped in dried banana leaves to make them smell unique.

After the dough is made into clumps, it is then wrapped in dry banana leaves. Then ripen overnight. This ripening is the first stage of the fermentation process. Enzymes that play a role in the
fermentation process in fishery products are mainly dominated by proteolytic enzymes that are able to break down protein and are carried out at room temperature 20 to 25°C [2].

d) Drying II
Reopen the shrimp paste that has been broiled or fermented overnight, and crush the clumps of shrimp paste back into the sun again. Drying is done for three to four days [4]. When finished in the sun, mash again and form the shrimp paste into a square, pack it with dried banana leaves.

e) Packaging
The packaging is done with dried banana leaves.

f) Fermentation
Fermentation is carried out for four to seven days [1]. This fermentation process is intended for the process of breaking down complex compounds from shrimp meat into simple compounds. Enzymes that play a role in the fermentation process in fishery products are mainly dominated by proteolytic enzymes that are able to break down protein [2].

2.2. Tests for Determination of Coliform Bacteria and Escherichia Coli

a) Testing using APM 3 Series Tube
Take the rebon shrimp paste to be tested then cut it into small pieces until the weight of each sample is 25 g, then put it in a container or sterile plastic and add 225 mL of solution Butterfield's Phosphate Buffer. Homogenize using stomacher for two minutes. This stage is a solution with a 10-1 dilution.

Coliform Estimation Test procedure stages (presumptive coliform) are as follows.
1. Prepare 9 ml of Butterfield's Phosphate Buffer solution and enter into two test tubes.
2. Prepare 102 dilutions by dissolving 1 ml of 101 solution into 9 ml of Butterfield's Phosphate Buffer diluent for 103 dilutions by dissolving 1 ml of 102 solution into 9 ml of Butterfield's Phosphate Buffer diluent. At each dilution, the shaking was performed at least 25 times.
3. Prepare 9 ml in each test tube of the LTB (Lauryl Tryptose Broth) solution, the tube used is 6 test tubes containing durham tubes.
4. Transfer, using a sterile pipette, as much as 1 ml of solution from dilution 102 into 3 tubes of LTB (Lauryl Tryptose Broth) containing durham tubes. Do the same with dilution 103.
5. Incubate the tubes at 35 °C for 48 hours ± 2 hours.
6. Note the gas formed after 24 hours incubation in the LTB (Lauryl Tryptose Broth) tube.
7. Positive tubes are characterized by turbidity and gas in the durham tube. Re-incubate the negative tubes for 24 hours and record the results at 48 hours ± 3 hours.
8. Perform a "coliform affirmation test" for positive tubes.

b) Coliform confirmation test (confirmed coliform)
Coliform confirmation test procedure (confirmed coliform) as follows:
1. Inoculate the LTB (Lauryl Tryptose Broth) tubes from the 101, 102 and 103 positive dilutions into the BGLB (Briliant Green Lactose Bile) and EC Broth tubes containing the durham tubes using an Ose needle.
2. Incubate the BGLB (Briliant Green Lactose Bile) which has been inoculated at 35°C ± 0.5°C. Check BGLB cylinders producing gas for 48 hours ± 3 hours at 35 ° C ± 0.5°C. Positive tubes are characterized by turbidity and gas in the Durham tube.
3. For the EC Broth tube, incubate it into a circulating water bath for 48 hours ± 3 hours at a temperature of 45°C ± 0.2°C.
4. Check the BGLB (Briliant Green Lactose Bile) and EC Broth cylinders which produce gas for 48 hours ± 3 hours at 35°C. Positive tubes are characterized by turbidity and gas in the Durham tube.
5. Determine the most likely number value (APM) for coliforms based on the number of positive BGLB (Brilliant Green Lactose Bile) tubes using the Most Likely Number (APM). Express the coliform number as "APM/g".

c) E. coli confirmation test (confirmed E. coli)
Confirmation test procedure E. coli (confirmed E. coli) as follows:
1. From the positive EC broth tubes by inoculating using an Ose needle and rubbing it into L-EMB (Levine's Eosin Methylene Blue) agar and incubating for 18 to 24 hours at 35°C.
2. The E. coli colonies are suspected to have typical characteristics, namely black in the middle, flat and with or without metallic green.
3. According to the Indonesian National Standard SNI 2332.1: 2015, if one of the five colonies identified as E. Coli is sufficient to state that the EC broth tube is positive, the five colonies do not need to be tested [10].

2.3. Tests for Determination of Salmonella Bacteria

a) Sample preparation stage
Take a sample of shrimp paste that will be tested then cut into small pieces until the weight of each sample is 25 g, put it in sterile plastic and add 450 ml of Lactose Broth solution. Homogenize the sample for two minutes to be analyzed, remove the sample solution in a diluent bottle and leave it at room temperature for 60 minutes with the container closed. Shake gently and if necessary, determine the pH to (6.8 ± 0.2). Shake well and loosen the lid of the container. The incubation 24 hours ± 2 hours at 35°C ± 1°C [11].

b) Enrichment
The enrichment is carried out as follows:
1. Tighten the lid of the container and gently shake the incubated sample.
2. Prepare 10 ml of Rappaport-Vassiliadis (RV) solution and 10 ml of TTB (Tetrathionate Broth) into a test tube.
3. Transfer 0.1 ml of sample solution into 10 ml of Rappaport-Vassiliadis (RV) and 1 ml of sample solution into 10 ml of Tetrathionate Broth (TTB).
4. Incubation of selective enrichment media as follows: Incubation of RV (Rappaport-Vassiliadis) for 24 hours ± 2 hours at 42 °C ± 0.2 °C (water bath) and TTB (Tetrathionate Broth) incubation for 24 hours ± 2 hours at temperature 43 °C ± 0.2 °C (Water bath) [11].

c) Salmonella isolation
Prepare BSA media (Bismuth sulfite Agar), HE (Hectoen Enteric) and XLD (Xylose Lysine Desoxycholate) a day before use, weigh it based on the suspension to be used and add distilled water and store it at room temperature [11]. Scratch from incubated RV (Rappaport-Vassiliadis) and TTB (Tetrathionate Broth) media using a loop needle (3mm) into HE (Hectoen Enteric), XLD (Xylose Lysine Desoxycholate) and BSA (Bismuth sulfite Agar) media. Incubation plates of BSA (Bismuth sulfite Agar), HE (Hectoen Enteric) and XLD (Xylose Lysine Desoxycholate) for 24 hours at 35°C ± 1 °C. Observe possible Salmonella colonies.

d) Observation of Typical Salmonella Colony Morphology (Typical)
The typical Salmonella colonies are as follows:
1. HE (Hectoen Enteric) Agar
   The colour is bluish green to blue colonies with or without a black core. Generally Salmonella cultures form large colonies, shiny black nuclei or almost the entire colony looks black.
2. XLD (Xylose Lysine Desoxycholate) Agar
   The colour is pink colonies with or without a black core. Generally Salmonella cultures form large colonies, shiny black nuclei or almost the entire colony looks black.
3. BSA (Bismuth sulfite Agar)
   Colours of colonies are brown, gray or black, sometimes metallic. Usually the media around
   the colony is initially brown, then turns black.

   At the time of testing samples A 5%, B 10%, C 15% and D 0% did not have typical Salmonella
   characteristics in HE (Hectoen Enteric) Agar, XLD (Xylose Lysine Desoxycholate) Agar and BSA
   (Bismuth sulfite Agar) media so there is no need for further testing [11]. If its have salmonella
   characteristics or typical colonies (typical) Salmonella grows on BSA (Bismuth sulfite Agar) after 24
   hours ± 2 hours incubation, take 2 or more colonies. Incubate the BSA (Bismuth sulfite Agar) medium
   again for 24 hours ± 2 hours. After 48 hours ± 2 hours, take 2 or more colonies that are typical
   (typical) growing on BSA medium (Bismuth sulfite Agar). This collection was carried out only if the
   colonies that grew on BSA (Bismuth sulfite Agar) media were incubated for 24 hours ± 2 hours gave
   inappropriate reactions to TSI (Triple Sugar Iron) and LIA (Lysine Iron Agar), which made this
   culture expressed as not Salmonella. Refer to table 10 below for further details on interpreting the TSI
   (Triple Sugar Iron) and LIA (Lysine Iron Agar) reactions [11].

   Take carefully the center of the colony using a sterile inoculation needle and scratch it onto the
   surface of the TSI (Triple Sugar Iron) medium so that it is slanted and stabbed to make it straight.
   Without taking a new colony, use the same needle to scratch the LIA (Lysine Iron Agar) media, by
   stabbing it so that it is upright first, then scratching it to make it slanted. Because the Lysine
   Decarboxylase reaction is highly anaerobic, it is LIA (Lysine Iron Agar). Oblique must have a deep (4
   cm) puncture. Store the selective media that has been colonized at 5°C up to 8°C.

   Incubate TSI (Triple Sugar Iron) and LIA (Lysine Iron Agar) for 24 hours ± 2 hours at 35°C ± 1°C
   by leaving the lid slightly loose to prevent excessive H2S formation. In TSI (Triple Sugar Iron), the
   typical Salmonella culture gave an alkaline reaction (red) to the oblique agar streak and acid (yellow)
   on the upright puncture, with or without H2S (blackish color on agar) [11].

   In LIA (Lysine Iron Agar), a typical Salmonella culture gives an alkaline (purple) reaction to the
   whole tube. A completely yellow reaction on the prick is stated as culture negative. Don't just look at
   the discoloration on the prick to reveal a negative culture. Generally, Salmonella cultures form H2S on
   LIA (Lysine Iron Agar). Some non Salmonella cultures form brick red reactions on LIA (Lysine Iron
   Agar) agar. Reaction from TSI (Triple Sugar Iron) and LIA (Lysine Iron Agar) can be seen in table 2
   [11].

   | Media  | Slant Agar (scratch) | Upright Agar (prick) | H2S  |
   |--------|----------------------|----------------------|------|
   | TSI    | Alkaline/K (red)     | Acid/A (yellow)      | +/-  |
   | LIA    | Alkaline/ K (purple) | Alkaline/ K (purple) | +/-  |

   * generally culture Salmonella forming H2S on LIA

2.4. Water Content Testing

a) Sample preparation stage

   Mash the sample, namely shrimp paste rebon which has a different treatment in adding salt
   concentration with a blender or the like so that the particles are as small as possible so that they can be
   mixed until homogeneous. The sample is homogenized by spreading it on a flat surface evenly along
   with the mixing process until an imaginary rectangle is obtained. Samples are taken by taking in an
   intermittent sequence until the weight required for testing is obtained.

b) Water Content Testing Procedure Stage

   Water content testing is carried out as follows.
   1. Place the oven at a temperature to be used at 95°C to 100°C until the temperature stabilizes.
   2. Place the empty cup in the oven for at least two hours.
   3. Transfer the empty cup into a desiccator for about 30 minutes until it reaches room temperature
      and weigh the empty cup (A).
4. Weigh ± 2 g of the prepared sample into the cup (B).
5. Place the cup filled with the test sample in a vacuum oven at a temperature of 95°C to 100°C, with an air pressure of not more than 100 mmHg for five hours.
6. Transfer the plate using a tweezer into a desiccator for ± 30 minutes then weigh (C).
7. Do the test at least twice.

Calculation of water content uses the following formula.

\[
\text{Water Content} = \frac{B - C}{B - A} \times 100 \%
\]

Information:
A: is the weight of the empty cup expressed in gr
B: is the weight of plate + initial sample, expressed in gr
C: is the weight of plate + dry sample, expressed in gr

c) Reporting
The calculation result is expressed as a decimal number with two digits after the decimal point. If the calculation result shows that the decimal number is less than five, then rounding is down, but if more than five, rounding is up. Example: 14,454 is rounded to 14.45 and 14,466 is rounded to 14.47. If the calculation result shows that the decimal number five will be rounded off from the even number in front of it, then the number five will be lost. However, if the number in front of it is odd, then rounding up is performed. Example: 14,465 is rounded to 14.46 and 14,475 is rounded to 14.48 [12].

2.5. Organoleptic Testing
Organoleptic testing is carried out using the sensory test method according to the Indonesian National Standard SNI number 2346 using sensory or five sensory assessments. The number of panelists used in this study was six standard panelists [13].
a) Test Implementation Requirements
The condition of the room is located in a quiet location and free from pollution that can disturb the panelists. The taster booths are made in barriers to prevent direct or indirect contact between the panelists. The tasting booth measures 60 to 80cm in length, 45 to 55cm in width and ± 75cm of bulkhead height with ± 75cm of table height from the floor. There are at least six tasting booths [13].

b) Testing Time
The test is carried out when the panelists are not hungry or full, which is around 09.00 to 11.00 GMT and 14.00 to 16.00 GMT.

c) Panelist Requirements
Panelist requirements are as follows.
1. Interested in sensory organoleptic tests and willing to participate.
2. Be consistent in making decisions.
3. Healthy body, free from ENT disease, not color blind and psychological disorders.
4. Do not refuse the food to be tested or are not allergic (shrimp paste).
5. Do not take the test one hour after eating.
6. Wait at least 20 minutes after smoking, eating chewing gum, food and soft drinks.
7. Do not test when sick with influenza and sore eyes.
8. No eating, very spicy food at lunch, if the test is carried out during the day.
9. Do not use cosmetics such as perfume and lipstick and wash your hands with an odorless soap during the odor test.
10. It is recommended to wash your mouth with plain water during the taste test.
d) Testing Procedure Stage
The testing procedure stage is as follows:
1. Prepare an example of 28 grams of rebon shrimp paste and prepare it in the test table booths.
2. The assessment of the samples tested is described in the score sheet assessment sheet including appearance, smell, taste and texture or consistency. The sensory assessment sheet for fresh rebon shrimp and shrimp paste on organoleptic testing can be seen in Appendices 6 and 7.
3. The formula used to calculate the 95% confidence concentration of each panelist is as follows [13].

\[ P \left( z - \left( \frac{T}{\sqrt{n}} \right) \right) < \mu < P \left( z + \left( \frac{T}{\sqrt{n}} \right) \right) = 95\% \]

Information:
- \( P \) = organoleptic quality
- \( n \) = number of panelists
- \( S \) = standard deviation of quality values
- 1.96 = standard deviation coefficient of 95%
- \( \Sigma \) = the total number of quality scores
- \( X \) = average quality value

3. Result and Discussion
3.1. The process of making shrimp paste
a) Raw material
The raw material used in the process of making shrimp paste is rebon shrimp (Acetes Sp), obtained from fishermen on the beach of Munjung Agung, Tegal Regency. Rebon shrimp are caught ± 20 meters from the shoreline with a depth of approximately two meters using a blade net fishing gear. Rebon shrimp used in this study were 1000 grams of fresh rebon shrimp, before processing, the prawns were washed and sorted to keep the dirt and small fish caught clean. Sorting and maintaining cleanliness is very important because of the quality of the product the final product is greatly influenced by the quality of the raw materials used, which must be fresh and clean [2], [14]. The raw materials used are not stored but directly processed into shrimp paste to maintain the freshness of rebon shrimp, the selection of good rebon for shrimp paste raw materials is based on organoleptic tests which include clear, bright appearance, between sturdy segments, smell of fresh shrimp and elastic texture, solid and compact and directly processed. Apart from being seen from the organoleptic quality of the raw materials, it has also been tested microbiologically and chemically with good results, Escherichia Coli APM/g < 3 contamination and negative Salmonella contamination.

The treatment of the raw materials used is in accordance with SNI, that the quality standard of the raw material for fresh shrimp used must come from uncontaminated waters, the raw material must be clean from any odors that indicate spoilage, free from natural properties that can reduce quality and not endanger health [15]. Organoleptically, it must meet the following freshness characteristics:
- Appearance : clear, brilliant, firm between the sections.
- Smell : fresh
- Texture : elastic, dense and compact and the maximum allowable storage temperature is 5°C in pristine conditions

The raw material requirements used are in accordance with the standard requirements for shrimp raw materials for Escherichia Coli bacterial contamination with a maximum APM/g < 3 and negative Salmonella [15]. So the quality of the raw materials used in this assessment has good quality.

b) Drying I
The first drying is in the form of raw materials, namely fresh rebon shrimp, a tool used for drying in the form of bag sheets. Drying is done for one day under the sun, drying it back and forth until evenly distributed and if there is dirt removed. The purpose of drying is to dry the rebon so that it is
not wet or soggy when pounded. The first drying is carried out for one to two days [4]. The purpose of drying is not only to dry completely but only half dry enough to make it easy to grind or grind [1].

c) Collision I

The first pounding on dried rebon shrimp that has undergone the first drying treatment, pound until the rebon shrimp becomes half smooth or coarse dough and add the salt that has been determined for each shrimp paste that will be made A: 5%, B: 10%, C: 15% and D 0% or without the addition of salt, then add 250 ml of clean water for each shrimp paste that has been made. The water is used to help the dough to help the rebon shrimp paste dough which is made "smooth" and well mixed. After that, mash again until well blended or pulverized, pounding is done using a pounding tool or wooden mortar, after the shrimp paste is evenly mixed or pulverized, the shrimp paste dough forms into a rectangle. The salt used in the processing of rebon shrimp paste, salt types of table salt purchased in the traditional market and allowed to be consumed. After the pulverizing process and forming a rectangle, let it sit or brood for one night at a temperature of 20ºC to 25ºC, this is the initial stage of the fermentation process.

The choice of table salt used in this study is because table salt is most widely used in the process of preserving fish and other fishery products compared to other types of preservatives [16]. The function of salt in the fermentation process is very important, namely inhibiting the growth of spoilage bacteria, the antibacterial activity of salt is due to its ability to reduce the availability of free water [17].

d) Drying II

The second drying is in the form of coarse semi-finished shrimp paste, drying it for one day in the sun. The tools used for drying are bag sheets, drying them back and forth until they are evenly distributed. When the drying results are finished, the dough turned tougher, less sticky and separated from each other. This second drying process is carried out to facilitate the pounding process and reduce the water content in the fresh rebon shrimp. Drying aims to remove the moisture content that is still present in the rebon dough so that it will simplify the grinding process [18].

e) Collision II

The pounding is used to form the dough so that it is softer and blended evenly after the pounding process the shape back into a rectangular shape. When the pounding is done, water is sprinkled on the dough with the aim of facilitating the crushing process and the shrimp paste dough is not sticky with the pounder, the second grinding is done so that the dough is getting smoother and denser.

The second grinding aims to smooth the dough that is not flat, to obtain a smooth, dense and chewy texture on the dough is done using a wooden mortar, this pulverizing causes the already smooth shrimp paste dough to become denser [18].

f) Packaging

The packaging is carried out using dried banana leaves which aims to protect the shrimp paste from the dangers that can contaminate and damage the shrimp paste, banana leaves give a distinctive aroma so that the shrimp paste aroma is more delicious. Packaging can be defined as an effort to protect the product from all kinds of damage by using a container, so that packaging aims to protect or preserve the product so that it reaches consumers in good condition [19].

g) Fermentation

This fermentation is the process of storing or curing the shrimp paste that has been mashed and shaped into a rectangle and has been packed using dried banana leaves. This fermentation process is carried out for seven days at a temperature of 20ºC to 25ºC in a clean place and room. A clean place and room is used to maintain the quality and cleanliness of the rebon shrimp paste. Fermentation is a process of decomposing simpler compounds by enzymes in the shrimp body or from microorganisms capable of breaking down proteins, enzymes and microorganisms that take place under controlled
environmental conditions. Enzymes that play a role in the fermentation process in fishery products are mainly dominated by proteolytic enzymes that are able to break down protein and are carried out at room temperature 20 °C through 25 °C [20], [2].

Fermentation is a processing method used to overcome the perishable properties of fishery products. Fermentation or ripening is the process of breaking down complex compounds contained in the bodies of fish and shrimp into simpler compounds with the help of enzymes originating from the body of the fish and shrimp itself or those from microorganisms such as Lactobacillus Sp. [21].

3.2. Organoleptic Test Results of Fresh Reborn Shrimp (Raw Material)

Based on the results of the organoleptic test assessment carried out by six panelists, the fresh rebon shrimp as raw material has a fairly good value, namely appearance specifications 9, odor specifications 9, and texture specifications 9, because the raw materials caught are directly processed to make shrimp paste rebon. This shows that the raw material for rebon shrimp used is in the good category or fit for consumption. The characteristics of rebon shrimp have a form that is still intact, sturdy, a specific smell of fresh shrimp and a solid, compact texture. The raw material requirements are in accordance with the standard value of good rebon shrimp according to SNI 01-2728.2-2006 regarding the raw material requirements for fresh shrimp with a specification value of one to nine, the minimum organoleptic value for fresh shrimp or rebon is 7 (seven).

3.3. Organoleptic Test Results for Reborn Shrimp Paste

Based on the results of the organoleptic test assessment conducted by six panelists, the addition of salt concentration A 5%, B 10%, C 15% and D 0% had various values, the highest value was in the sample with the addition of salt concentration A 5% and B 10%. The lowest value in the sample was in the addition of salt concentration C 15%. These results are due to the appearance specifications in the sample with the addition of B 10% salt concentration, because it has an attractive dark red color. The first impression that consumers feel when they see a product is usually from the appearance of these products, generally consumers choose products that are more attractive [22]. The shrimp paste that consumers like is the shrimp paste which has a dark red color. In the odor specification, the highest value is the addition of sample salt with the addition of salt concentration of B 10% and C 15% with a value of 7. The distinctive smell of shrimp paste is one of the consumer attractions. The odor formed in the shrimp paste is influenced by the presence of volatile compounds in the shrimp paste due to the fermentation process [23].

In the taste specification, the highest value is the addition of A 5% salt concentration with a value of 6, at the addition of A 5% salt concentration has the right savory and sweet salty taste. Delicious shrimp paste is usually a combination between savory and sweet taste [23]. In the Texture specification the highest value is in the addition of sample D 0% salt with a value of 8 and the lowest value is in the sample C 15% with an average value of 5. Sample C, the addition of 15% salt which has the specification is rather hard, not homogeneous and coarser than the addition of salt samples A 5%, B 10% and D 0% which have a lower salt concentration. Salt is humectant because it dissolves easily and can absorb water, causing water concentration to decrease [24]. In the Mushroom specification, the four samples were added with salt A 5%, B 10% dan D 0% does not have a difference, the sample gets a score of 9 this is the highest and good assessment value on the assessment sheet on the Indonesian national standard number SNI 01-2346-2006.

3.4. Water Content Testing Results

The results of testing the water content of fresh rebon shrimp and shrimp paste are presented in table 3.

| Table 3. Results of Fresh Shrimp Moisture Content |
|------------------------------------------------|
| Name Sample | Code Cup | Weight Blank Cup (g) | Weight Cup + Sample | Weight cup + Dry sample (g) | Result (%) | Final Result (%) | Conclusion |
| Shrimp fresh | A1      | 45,8103           | 47,8146           | 46,0965               | 85,72      | 85,71            | Good       |
|             | A2      | 32,5426           | 34,5492           | 32,8295               | 85,70      |                 |            |
The fresh shrimp sample showed a water content of 85.71%. These results show that with the addition of salt concentration of A 5%, B 10%, C 15% and D 0% to the shrimp paste rebon shows the results:

- Sample A 5%: 36.20% up to 39.15%
- Sample B 10%: 34.76% up to 36.94%
- Sample C 15%: 31.58% up to 34.82%
- Sample D 0%: 43.22% up to 40.19%

The results of the highest water content found in the addition of salt sample D 0% or without salt of 43.22% while the lowest water content was found in the addition of 15% salt or 15% C sample with a water content value of 31.58%. The decrease in water content was due to the addition of salt to the shrimp paste.

From the results obtained for the four experimental samples with the addition of salt A 5%, B 10%, C 15% and D 0% still meet the standards according to the Indonesian National Standard SNI number 2716.1: 2009 on the permissible water content requirements for shrimp paste to test the water content of shrimp paste should range from 30% to 50%. Good quality shrimp paste has a moisture content of 30% to 40% [17]. Thus shrimp paste with the addition of salt A 5%, B 10%, C 15% and D 0% declared good.

3.5. Test result Escherichia Coli Bacteria on Fresh Rebonized Shrimp

Bacterial test results Escherichia Coli on rebon shrimp or raw materials can be seen in table 4 below.

| Code Example | Dilution | LBT | ABC | Group Califor | BGD | ABC | Escherichia Coli | ABC | LEMB | Conclusion  |
|--------------|----------|-----|-----|---------------|-----|-----|-----------------|-----|-------|-------------|
| Shrimp       | $10^4$   | -   | -   | -             | -   | -   | -               | -   | -     | APM/g = <3   |
| Rebon        | $10^2$   | -   | -   | -             | -   | -   | -               | -   | -     | APM/g = <3   |
|              | $10^{-3}$| -   | -   | -             | -   | -   | -               | -   | -     | APM/g = <3   |
| APM/g = <3   |         |     |     |               |     |     |                 |     |       | Negative    |

3.6. Test result Escherichia Coli bacteria Shrimp paste Rebon shrimp

Bacterial test results Escherichia Coli The rebon shrimp paste is presented in table 5, table 6, table 7 and table 8 below.

| Code Example | Dilution | LBT | ABC | Group Califor | BGD | ABC | Escherichia Coli | ABC | LEMB | Conclusion  |
|--------------|----------|-----|-----|---------------|-----|-----|-----------------|-----|-------|-------------|
| A1           | $10^4$   | -   | -   | -             | -   | -   | -               | -   | -     | APM/g = 20   |
|              | $10^2$   | -   | -   | -             | -   | -   | +               | -   | -     | APM/g = <3   |
|              | $10^{-3}$| -   | -   | -             | +   | -   | -               | -   | -     | Negative     |
| APM/g = 20   |         |     |     |               |     |     |                 |     |       | Negative     |
| B1           | $10^4$   | +   | -   | -             | +   | -   | -               | -   | -     | APM/g = <3   |
|              | $10^2$   | +   | -   | -             | +   | +   | +               | -   | -     | APM/g = <3   |
|              | $10^{-3}$| +   | -   | -             | +   | -   | -               | -   | -     | Negative     |
| APM/g = 36   |         |     |     |               |     |     |                 |     |       | Negative     |
Coliform growth that occurs at the addition of salt A 5%, B 10%, C 15% and D 0% is thought to be due to contamination during the processing process due to not wearing gloves and headgear as well as washing tools regularly and contaminating the water used for processing shrimp paste because one indicator of the growth of Coliform bacteria is water pollution. Coliform bacteria are a group of intestinal bacteria, which live in the human digestive tract, Coliform bacteria as an indicator of pathogenic bacterial contamination, examples of Coliform bacteria are Escherichia Coli and Enterobacter Aerogenes [25]. So, Coliform is an indicator of water quality and sanitation, the less Coliform content, meaning the better the water quality and sanitation.

After further identification the confirmed coliform test, there is no gas and does not have a cloudy color. Based on the above results for Escherichia Coli bacterial contamination, the raw materials are fresh rebon shrimp and rebon shrimp paste with the addition of salt samples A 5%, B 10% and D 0% rebon has a result of APM/g <3) or the absence of contamination from bacteria Escherichia Coli with the negative conclusion of Escherichia Coli. The results obtained above are in accordance with the quality standard requirements according to SNI number 2716.1: 2009 concerning the quality requirements of shrimp paste on microbial contamination or Escherichia Coli bacteria, a maximum of less than three or (APM / g = <3).
3.7. Testing Escherichia Coli on Salt

Test results for bacterial contamination Escherichia Coli The salt used for adding to the rebon shrimp paste can be seen in table 9.

| Code Example | Dilution | LBT | BGD | EC.M | LEMB | Conclusion |
|--------------|----------|-----|-----|------|------|-------------|
|              | $10^4$   | -   | -   | -    | -    | -           |
| Salt         | $10^3$   | -   | -   | -    | -    | APM/g = < 3 |
|              |          |     |     |      |      | Negative    |

From the results of the above research shows negative results Colifrom and Escherichia Coli on the salt used to process shrimp paste. So salt has no effect on contamination Colifrom contained in the addition of sample salt B 10%, C 15% and D 0%.

3.8. Salmonella Bacteria Testing Results

Test results for bacterial contamination Salmonella The fresh rebon shrimp and rebon shrimp paste can be seen in table 10.

| Code Example | Enrichment | Selective Agar | Conclusion |
|--------------|------------|----------------|------------|
| Fresh shrimp | RV and TTB | Not            | Negative   |
| A1 and A2    | RV and TTB | Not            | Negative   |
| B1 and B2    | RV and TTB | Not            | Negative   |
| C1 and C2    | RV and TTB | Not            | Negative   |
| D1 and D2    | RV and TTB | Not            | Negative   |

Based on the results of the assessment of Salmonella bacteria testing on fresh shrimp raw material samples and shrimp paste samples with the addition of salt, sample B 10%, C 15% and D 0% as above, it shows that it does not have special characteristics of Salmonella bacteria on all HE media (Hectoen Enteric.), XLD (Xylose Lysine Desoxycholate) and BSA (Bismuth sulfite Agar) which means that the fresh shrimp raw material samples and shrimp paste samples with the addition of salt samples B 10%, C 15% and D 0% do not contain Salmonella or Negative Salmonella bacteria. The above results are in accordance with the quality requirements according to SNI for shrimp paste regarding quality requirements according to SNI number 2716.1: 2009 for Salmonella microbial contamination must be negative or do not contain Salmonella bacteria.

4. Conclusion

Based on the research results, the process of making rebon shrimp paste with different salt concentration (5%, 10%, 15% and no salt) has the following conclusions:

a. The process of making rebon shrimp paste takes 12 days with the process stages, raw materials, first drying, one pounding, one fermentation, second drying, second pounding, packaging and second fermentation.

b. The addition of different salt concentration, namely A 5%, B 10%, C 15% and D 0% or without the addition of salt, affects the quality of Organoleptic, Microbiological and Chemical quality. Organoleptic quality for appearance specifications is found in the sample with the addition of 10% B salt concentration, because it has an attractive dark red color. In the odor specification the highest value is found in the sample with the addition of salt concentration of B 10% and C 15% with a value of 7. Taste specification has the highest value on the addition of A 5% salt.
concentration with a value of 6, in addition to the salt concentration of A 5% has a salty taste sweet fit. In the texture specification, the highest value is found in the addition of salt sample D 0% with a value of 8 and the lowest value in sample C 15% and on the specification of mushrooms, the four samples have no difference, with a value of 9.

c. The highest water content is in the shrimp paste which does not experience the addition of salt or sample D 0% with a value (40.19% to 43.22%), while the lowest water content value is in the addition of 15% salt concentration with a value (31.12 % to 34.82%). This is in accordance with the Indonesian National Standard for shrimp paste, namely (30% to 50%). The best Colifrom growth at the addition of 5% salt concentration with APM / g value < 3, the growth of Estherichia Coli did not experience a significant difference, the four experimental samples were declared negative. Salmonella growth also had no significant effect on the four samples and was declared negative for Salmonella. This is in accordance with the Indonesian National Standard 2716.1: 2009 on rebon shrimp paste, namely the growth of Escherichia Coli with a maximum APM/g < 3 and negative Salmonella.

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