Analysis of Blue Swimmer Crab (Portunus Pelagicus) Processing Efficiency In The Sort Stage In Pt. Blue Star Anugrah Cold Storage Company, Pemalang

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Abstract. PT. Blue Star Anugrah Pemalang is company exporting crabs (Portunus pelagicus) in form of pasteurized crab meat canned products. Including crab fishery products are perishable (easily damaged / rotten). Therefore, efficiency of crabs’s handling in sorting stage has to be properly made to maintain the quality. This study aimed at determining flow at process, organoleptic value, and relationship between the organoleptic value and crabs meat temperature as well the processing efficiency in sorting stage. Method used in this research was survey method. Data was collected by assesing activities during the sorting stage. The data was analysed using statistical analysis i.e. correlation and descriptive comparative analysis. Parameters study included organoleptic value, velocity (speed) and temperature sorting crab meat of various kinds. Based on the research process flow and organoleptic value still meet the standards according to ISO. The influence factor sorting speed and temperature on organoleptic not have a significant correlation. Processing crab (Portunus pelagicus) at the sorting stage at PT. Blue Star Anugrah relatively efficient.

1. Introduction
Indonesia as an archipelago has considerable potential in fisheries. The sea area is quite extensive, namely 5.8 million km² and a coastline of 95,181 km with extensive aquaculture and fish ponds spread in several regions. Indonesian fisheries productions come from fishing and aquaculture activities [1]. Some of the product is used for raw materials for fisheries processed products and some other products are directly marketed for fresh consumption [2]. Fishery products are a source of high protein, cheap and easy to obtain. Production of fishery products is still very likely to be improved, both for the purpose of local consumption and for exports. Commodities of fishery products which are currently starting to develop rapidly and have high economic value are crabs [3].

Indonesia as a member of The ASEAN Free Trade Area (AFTA) which has abundant natural potential has opened up greater market opportunities for Indonesia to establish cooperation with ASEAN member countries in the international market [4]. The application of quality management to fishery products which is a perishable commodity which is an effort to deal with free markets is expected to be able to increase the competitiveness of fishery products that are safe, healthy and beneficial to consumers.
in the international market [5]. The company must own and develop its own specifications or quality standards so that the objectives to meet product specifications are achieved. Specifications can be determined by the company itself or from outside the company such as consumers or authorized bodies / associations. The specifications or quality standards owned by a company for the products it produces are tools in the competition in marketing their products.

Portunus pelagicus or blue swimming crab is sea crab species that widely found in Indonesian waters. Blue swimming crab is one of fisheries product that has good economic value. Indonesia is a blue swimmer crab exporting country to various countries such as Singapore, Malaysia, China, Japan, Europe and America. Every year almost 90% of Indonesian blue swimmer crab meat production was exported to American market [6].

Portunus pelagicus is perishable fishery products. Quality degradation in crab meat is mainly caused by enzyme and bacterial activity [7]. Easily decayed crab meat can cause problems in its distribution process, especially for export purposes which require strict quality requirements. The solution of this problem can be solved if the crab meat is handled properly. Furthermore, crabs are processed into food products that can withstand the decaying process.

Organoleptic test is done in the processing of fishery products including crab products in addition to biochemical and microbiological tests. Organoleptic tests are very widely used to assess quality in the food industry and other fishery products industries, which are usually carried out by trained panelists who are considered sensitive and can analyze or measure appearance, texture, aroma, and taste [8]. Identification of sensory properties by panelists will help to describe the product and can be used to observe changes that occur during the process and also to help make changes that are desired or unwanted.

Product quality in processing crabs is strongly influenced by cold chains. Cold chain is closely related to product temperature which is a parameter in determining overall quality by consumers. One way to preserve fishery products is by cooling and freezing. Cold storage plays an important role as a provider of cold storage facilities for products that require storage at certain cold temperatures to maintain the quality of these products. The existence of cold storage is also an attempt to describe various technical aspects in determining the selection and method of using equipment used in the process of cooling, freezing, and storing fishery products. This research aim to study Processing efficiency of blue swimmer crabs meat (Portunus pelagicus) at the sorting stage at PT. Blue starAnugrah, Pemalang. The output of this study is as input and guidance for company management, especially in making decisions and policies of company management relating to the effect of implementing quality management on export performance

2. Materials And Methods

2.1 Research Materials

2.1.1 Tools
The tools used in the study included a stopwatch, stationery, and a camera.

2.1.2 Materials
The materials used in the study include all types of crab meat (Portunus pelagicus) which are used as raw materials for pasteurized crab products.

2.2 Research Methods
2.2.1 Methods and Data Collection Techniques
The method used in this study is the survey method. The data collection technique is done by observation, interview and documentation. The observation technique used is participatory observation, where researchers are directly involved in daily activities of objects that are being observed or used as research data sources, with the aim of obtaining more complete and accurate data. This research is a type of case study by conducting an in-depth study of handling activities, quality implementation, and production of crunching canning at PT. Blue Star Anugrah, Pemalang.

2.2.2 Research Parameters
The parameters in this study include:

- Flow of blue swimmer crab processing is a stage in the process starting from the stage of receipt of raw material to the delivery of the final product in the form of pasteurized crab meat.
- Organoleptic Value Sensory assessment carried out by a quality control and several panelists in almost all stages before entering the pasteurization stage. Data on organoleptic values are obtained through direct participation and using company archive data.
- Sort Speed Sorting speed is a person's ability to sort raw materials of each type of crab meat in units 4 times. Data on sorting speed is obtained through collecting data in the sort line.
- Temperature of blue swimmer crab Meat The temperature of crab meat is a quantity that states the degree of cold heat of crab meat and is a measured unit that is carried out in an effort to control one of the parameters supporting the quality of meat.

2.3 Place and Time of Research
The study was conducted in November - December 2016 at PT. Blue Star Anugrah, Pemalang.

2.4 Data Analysis

2.4.1 Flow of Blue Swimmer Crab Processing Process
Data processing of crab processing is analyzed descriptively and presented in the form of a working scheme.

2.4.2 Organoleptic Values
Organoleptic data which includes color, odor, texture, and taste were analyzed descriptively comparatively and presented in graphical form.

2.4.3 Relation of Sort Speed and Temperature to Organoleptics
The relationship of sorting speed and temperature to organoleptics was analyzed using Correlation analysis using Minitab 16. The formula for correlation equations

\[ r = \frac{n \sum xy - \sum x \sum y}{\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}} \]

Description:
y: organoleptik
x1: sorting speed
x2: temperature
2.4.4 Blue Swimmer Crab Meat Processing Efficiency at Sorting Stage

The efficiency of crab processing in the sorting stage is determined based on the comparison of organoleptic values between pre-sorting stage and post-sorting stage. The crab processing is declared efficient if the organoleptic at pre-sorting is not significantly different from the organoleptic value at the post-sorting. The organoleptic value at the time of pre-sorting was analyzed by Kruskal Wallis analysis using Minitab 16. General formula for Kruskal analysis the general formula for Kruskal Wallis analysis is as follows:

\[ H = \frac{12}{n(n+1)} \sum \frac{R_i^2}{n_i} - 3(n+1) \]

Description:
Ri: number of ranks in the first treatment
Ni: a lot of observations in the treatment

3. Results and Discussion

3.1. Blue Swimmer Crab Meat Processing at PT. Blue star Anugrah, Pemalang

Product produced by PT. Blue Star Grace, Pemalang is currently a canned product of pasteurized crab meat. Source of raw materials processed by PT. Blue Star Anugrah comes from various processing agents (mini plants) in several areas on the islands of Java, Sumatra and Kalimantan. The crab meat supplied by the mini plant is in the form of crab meat which has been separated from its shell and has undergone boiling. Meat is accepted in containers of plastic jars or mica and put together in fiber and styrofoam. The mini plant is responsible for the quality feasibility of crab meat. If the raw material from the collector is not in accordance with export standards, it will result in further product quality degradation. Next at PT. Blue Star the the raw materials will be controlled by parameters that affect product quality according to the standards that apply in the company. The parameters in question include organoleptic values, temperature, speed and accuracy of employee work.

Production supporting facilities owned by the company include raw material reception space, temporary raw material storage, chilled storage finish good, production money, pasteurization room, laboratory, sanitation room and warehouse. Pasteurized canned crab products produced at PT. Blue Star Anugrah consists of 6 types including colossal (imperial), jumbo, regular (backfin), super lump, special, and clawmeat. The distribution of these types of products is based on the existence or location of meat in the crab body or based on its size. The flow of processing of crab (Portunus pelagicus) into pasteurized crab meat products can be seen in the Figure 1.
1. Receiving
Blue crab meat is received from various mini plant. The raw material received is in the form of peeled crab meat which is placed in a jar and then put together in fiber or styrofoam and must be closed tightly. Next, the reception staff will check the temperature and weighing. The temperature of the crab meat must remain under control, not more from 4°C. To maintain the temperature of the crab meat to keep handling low, namely heap jars with steamed ice on fiber and styrofoam. The use of ice is important in order to keep the temperature cool [9]. After this stage is completed, samples of each type of crab meat for each supplier will be taken for analysis of chloramphenicol.

2. Quality Checking
This stage was carried out by several panelists to conduct organoleptic tests on the crab meat that had been received. Raw materials received in processing units are tested organoleptically to determine their quality, then raw materials are handled carefully, quickly, meticulously and cleanly [9]. The organoleptic score standard applied at PT. Blue Star Anugrah is 1-5, then the assessment will be checked again and approved by the Quality Control Supervisor.

3. Temporary Chilled Storage

Figure 1. Meat Processing Flow at PT. Blue Star Anugrah, Pemalang
Is a temporary storage stage of raw material before being processed to the next stage, controlling the temperature of the meat and checking it regularly to keep the meat quality.

4. Sorting 1
Sorting meat is separating process of objects other than meat such as shell fragments, gills, dirt, eggs and other foreign objects such as gravel, hair and pieces of insect body parts from meat. Separation of meat is intended to streamline work and ensure that meat is not mixed, because each part has a different price. The maximum standard temperature at the sorting stage is 15 °C. Sorting must be done quickly, meticulously, and sanitary with a maximum temperature of 50 °C [9].

5. Sorting 2
Special type of crab meat and the claw meat will pass the sorting stage second in a dark room (dark room) using ultraviolet light so that the meat will be more clearly visible.

6. Mixing
Crab meats from suppliers are mixed to get good quality meat. Meat mixing does not only come from two suppliers, but can be more than two suppliers. Mixing meat is also based on the type of meat that has been determined by the company. Formulation mixed meat has been determined based on the type of meat and the standard set by the buyer (buyer).

7. Filling
Mixed crab meats are then put into a tin container sized 401 x 301. Before filling, the cans are first given SAPP (sodium acid pyrophosphate) powder to prevent blueing. Arrangement is also made in this filling process. After the meat is neatly arranged, SAPP powder is added for the second time. The second addition of SAPP powder is intended to flatten the solution throughout the contents of the can. The use of these additives is food additives which have been permitted to be used based on Regulation of the Republic of Indonesia Minister of Health Regulation No.722 / Menkes / Per / IX / 1988 concerning Food Additives [3].

8. Weighing
After the meat has been fully filled in accordance with company standards, final weighing is carried out. Final weighing is done to determine the net weight of the product before closing the can.

9. Seaming
Cans that have been filled with meat given a cover with a label or brand according to the type of meat. Closure is done using double seamer. The quality of the product is also largely determined by the efficiency of the seamer machine.

10. Coding
Coding is done after the can is closed. The code is given in part under cans using a jet print coding machine. The purpose of coding is to find out the history of the product originating. In the code there is information on the date of production (form of date), basketball number, supplier code and type of meat. Every product to be traded must be given label correctly and easy to read, include the language required by the importer and provide information [9].

11. Pasteurizing
Closed cans are put into basketball for subsequent pasteurization. Pasteurization is carried out on pasteurized tubs that have been filled with clean water. The heat source of pasteurization comes from the heat vapor produced by the boiler and is channeled with a special pipe to the pasteurized tub. In the pasteurization bath, gas is also gassed which causes air bubbles to come from the compressor and aims to flatten the heat. Pasteurization is carried out for 140 minutes at a temperature of 86-87.5 °C. Cans that have been closed are then boiled with boiling containers temperature of 70-80 °C for 115-180 minutes depending on the size of the can [9].

12. Chilling
Cooling is the process carried out immediately after the pasteurization process is complete. Cooling is carried out in a cooling bath that has been filled with clean water and ice fragments. During cooling, the temperature is maintained at a temperature of 0 - 0.5 °C for 160 minutes. The coolant is also fed with gas which causes air bubbles which come from the compressor and aims to flatten the temperature. This process is intended to kill thermophilic bacteria that have not died during pasteurization. Cans that have been pasteurized are immediately cooled by inserting cans into crushed ice and water at ± 0 °C for 2 hours [9].

13. Packing and Labeling
Packing is done with using master carton (MC) which can hold 12 cans. Master carton is then labeled according to the type of meat, production code, and expiration date (expired date). The process of packing and labeling is still done manually by workers.

14. Chilled Storage
The packaged cans are then stored in a cold storage with a temperature of 0-4 °C. Arrangement of products in a cold room is arranged so that allows the circulation of cold air to be evenly distributed and facilitates disassembly.

15. Stuffing
Stuffing is the process of transporting final products from cold storage to containers for export. Stuffing is done if the final product in cold storage reaches the order quantity. The temperature of the container for export is set at 0-6 °C. PT. Blue Star Anugrah usually exports every 2 weeks.

In general, the flow of crab processing at PT. Blue Star Anugrah, Pemalang has met the standards. This is confirmed by the statement of [8] that the stages of the crab canning process (Portunus pelagicus) according to SNI 01-6929.3- 2002 is the stage of acceptance, sorting / selection, filling in cans, can closure, labeling and coding, pasteurization, cooling, packing and storage processes.

3.2 Organoleptic Value in Processing Crab (Portunus pelagicus) on Sorting Phase
Organoleptic assessment is a subjective assessment conducted by several panelists using a score sheet. Organoleptics show the physical quality of crab meat which will be processed into pasteurized crab meat products. The quality parameters of crab meat assessed in the organoleptic test include color, odor, texture, and taste.
Figure 2. The whole organoleptic value the type of crab meat at the sorting stage

Based on Figure 2, the organoleptic values in each type of crab meat generally show differences. The range of organoleptic values in jumbo meat ranges the level of efficiency of the final product (finish good), because it requires employees who can minimize time by relying on their foresight but still pay attention to the quality of the sort. The sorting speed shown in units of kg / hour shows time travel required by sorting employees to sort all types of crab meat. 4.25-4.75, the type of flower ranges from 3.75 to 4.5, type backfin ranges from 4-4.5, a special type of range 3.75–4.12, and the types of clawmeat range from 4 to 4.5.

Organoleptic assessment applied at PT. Blue Star Anugrah is a scale of 1–5 on each organoleptic parameter. Consideration of using a scale of 1-5 on a score sheet that is in accordance with the buyer's request and in accordance with the principles of organoleptic assessment in accordance with SNI.

Organoleptic assessment is a method of evaluating the quality or nature of a commodity using an organoleptic test form as an instrument or tool [10]. Also mentioned by [7], that crab meat for pasteurized crab raw materials must have an organoleptic value more than equal to 3. Organoleptic assessments generally can represent consumers in assessing quality aspects of pasteurized crab products. The organoleptic value in the sorting phase depends on the condition of the raw material of the mini plant and is also influenced by the treatment during the processing of the crab meat. Often high organoleptic values are an indicator of good fishery commodity products. This is as in the statement [11] that color is an important factor because it influences the initial perception of consumers. A material that is considered nutritious, tasty, and very good texture will not be eaten if it has unsightly colors [11].

3.3 Relationship to Sort and Speed Factors Temperature against Organoleptics

3.3.1 Relationship of Sort Speed Factors against Organoleptics

Sorting is one of several stages in processing crab (*Portunus pelagicus*) into pasteurized crab meat products. Sort is the activity of separating meat from shell and other foreign objects. Stage sorting is the decisive part the level of efficiency of the final product (finish good), because it requires employees who can minimize time by relying on their foresight but still pay attention to the quality of the sort. The sorting speed shown in units of kg / hour shows time travel required by sorting employees to sort all
types of crab meat. The difference in travel time of each type of crab meat during the study is illustrated in the graph below.

![Figure 3. Sorting speed (kg/hour) in all types of crab meat](image)

Sorting speed shows a person’s ability (man power) in sorting raw materials (raw material) each unit of time. The data shows a significant difference in sorting speed during the study. The different types of crab meat (meat) will produce different sorting speeds. Based on the data obtained, the highest sorting speed is when sorting on special types of meat. The speed range of employees in sorting meat types of jumbo ranged from 1.21 to 1.47 kg/hour, backfin types ranged from 1.48 to 2.86 kg/hour, flower types ranged from 1.39 to 2.32 kg/hour, special types range from 3.18 to 4.96 kg/hour, and the types of clawmeat range from 1.08 to 1.31 kg/hour. Different sorting speed is influenced by several factors including skills, age, and one's productivity level. According to [12], at this sorting stage the skills and accuracy of employees are needed so that there is no error in the separation of the types and sizes of crab meat, especially because this activity is done manually. The higher the sorting speed of employees, the lower the level of quality degradation in the final product. This is made clear by [13] that quality degradation can be prevented by speeding up the processing process, including at the sorting stage.

Organoleptic values are a manifestation of the quality of fishery commodity products including pasteurized crabs. Good raw materials can produce the final product with good quality too. It does not rule out the possibility that internal factors such as sorting speed will indirectly affect the quality of meat. So that there will be a correlation between the time needed by employees sorting with organoleptic values. Correlation is the degree of relationship or degree of association between two variables. Correlation is represented by $r$ provided that the value of $r$ is not more than the price ($-1 \leq r \leq 1$). If the value of $r = -1$ means perfect negative correlation, $r = 0$ means there is no correlation, and $r = 1$ means that the correlation is very strong. To find out the significance of the correlation compare between the probability value of 0.05 and the probability value of sig. If the probability value of 0.05 is smaller or equal to the probability value sig (0.05 ig sig) the meaning is not significant. If the probability value of 0.05 is greater than the probability value of sig (0.05 > sig) the meaning is significant.
Table 1. Correlation of sorting speed to organoleptic values at the sorting stage

| Parameter   | Color | Odor  | Texture | Taste  |
|-------------|-------|-------|---------|--------|
| Sorting Speed | 0.388* | 0.778* | -*      | 0.521* |

Description: *: Not significant at 95% level
Effect of sorting speed factor on organoleptics based on correlation analysis with 95% confidence interval that is obtained p value 0.388 for color, 0.778 for odor, and 0.521 for taste. Sorting speed factors have different effects on each organoleptic parameter. Texture parameter values during the study show a constant value so that the p-value is identical. Then it can be concluded that there is no significant effect between sorting speed and organoleptic value at the sorting stage during the study. The absence of influence on organoleptics is caused by the speed of the employee (man power) is still within tolerance so that it does not cause inefficiency in the processing of crabs at PT. Blue Star Grace. Means the work productivity of employees at PT. Blue Star Grace is still relatively high.

3.3.2 Relationship of Temperature to Organoleptics Temperature

Meat is a measured unit that is in the processing stage of the crab. Temperature measurement is carried out at almost all stages of the crab processing process. Crab meat has a predetermined temperature standard for each company to be processed further. Meat temperature which is indicated by the unit °C shows the degree of cold heat of the crab meat during the sorting process. Temperature differences of each type of crab meat during the study are illustrated in the graph below.

![Figure 4. Temperature of crab meat (°C) at the sorting stage](image)

Changes in temperature meat are a result of treatment during meat in the canning process into pasteurized crab products. The temperature range of meat jumbo ranges from 12 - 14.9 °C, the type of
backfin ranges from 14 - 18 °C, the types of flowers range from 12 - 15.5 °C, special types range from 9.4 - 15.7 °C, and the type of clawmeat ranges from 10.2 - 15.1 °C. The maximum standard for meat temperature is the process until before seaming is applied at PT. Blue Star Anugrah is 15 °C. The potential for temperature fluctuations occurs at the sorting stage. The temperature value will greatly determine the handling to be taken at the next stage. High temperature of crab meat will cause a bad influence on its organoleptic value. High temperatures cause browning reactions of sugars and amino acids (maillard reactions) which increase affect unwanted colors and flavors on food ingredients. Organoleptic assessment which includes the parameters of appearance, smell, texture, and taste can be the initial perception of consumers in assessing a product. Organoleptic changes can occur due to treatment at stages in the crab processing process. The stages that have a significant influence on the organoleptic value are one of the sorting stages, because in the sorting phase the accuracy of the employees is needed but still can minimize the time needed to sort. Correlation test can be used to find out how far the relationship between subjective measurement and objective measurement.

**Table 2. Temperature correlation to organoleptic values in the Parameter sorting stage**

| Parameter | Color   | Odor   | Texture | Taste  |
|-----------|---------|--------|---------|--------|
| Temperatur| 0.073*  | 0.345* | -       | 0.498* |

Description: *: Not significant at 95% level Effect of temperature factor on organoleptics based on correlation analysis with 95% confidence interval, that is obtained p value 0.073 for color, 0.345 for odor, and 0.498 for taste. The temperature factor has different effects on each organoleptic parameter. The value of texture parameters during the study shows a constant value so that the p value is identical. It can be concluded that there was no significant effect between changes in crab meat temperature and organoleptic values at the sorting stage during the study. The absence of influence on organoleptic is caused by changes in temperature that are still within the tolerance limit so that it does not cause a significant effect in the processing of crabs at PT. Blue Star Grace. It can be said also that the temperature of crab meat at PT. Blue Star Grace is always controlled during the crab processing process.

3.4 **Processing Efficiency of Crab (Portunus pelagicus) at Sorting Phase**

Organoleptic is a measurable quality unit that is tested through subjective assessment by several panelists. At the receiving stage can determine the quality of meat at the time of good finish. The treatment of crab meat during the processing can affect changes in the organoleptic value of raw materials. Sorting activities affect the temperature of the crab meat which causes a potential decrease in organoleptic values.
Comparison of organoleptic values at the receiving stage with organoleptic sorting stage is a description of fluctuations in one of the parameters of the quality of raw materials during the processing process. Almost all types of crab meat have decreased organoleptic values after passing the sorting stage. The decrease is still within the range to meet the standards as raw material to be processed into pasteurized crabs. Organoleptic data obtained during the study were then analyzed using the Kruskal Wallis test. The Kruskal Wallis test is a rank-based non-parametric test that can be used to determine whether there are statistically significant differences between two or more independent variables on a continuous or ordinal dependent variable. Significant differences between organoleptic values at the reception stage with organoleptics at the sorting stage will show inefficiency in product processing.
Table 3. Results of Kruskal Wallis analysis of organoleptic values at the reception stage with the sorting stage

| Parameter | Color  | Odor   | Texture | Taste  |
|-----------|--------|--------|---------|--------|
| Color     | 0.277* |        |         |        |
| Odor      |        | 0.727* |         |        |
| Texture   | -      |        |         | 0.715* |

Description: *: Not significant at 95% level
Changes in organoleptic values at the sorting stage can occur due to the influence of high temperatures during the sorting process.

Based on the Kruskal Wallis test with a confidence interval of 95% it can be seen that the value of p is 0.277 for color, 0.727 for texture and 0.715 for taste. This explains that the treatment at the sorting stage does not have a significant effect on the value of all organoleptic components (color, smell, texture, and taste). It can also be concluded that the processing process at PT. Anugrah Blue Star is quite efficient.

Changes in organoleptic values in crab meat are a result of handling during the crab processing. Quality deterioration characterized by a decrease in organoleptic values can occur due to several reasons. Direct contact with air during the screening stage can cause potential contamination by decomposing bacteria. Microbiological damage is caused by activity by microbes, especially bacteria. Crab meat is a very good substrate for the growth of microorganisms. The growth of bacteria and other microbes in crab meat can also produce enzymes that can accelerate the decomposition of compounds found in crab meat [13]. The bacteria can then produce enzymes. The enzyme will speed up the process of decomposing the compounds in the crab meat. The process of decomposing macromolecules into simple micromolecular compounds and volatile compounds will cause unpleasant odors. Signs of decay are the appearance of an unwelcome odor. The smell of normal and fresh changes to fishy and foul odor due to the formation of compounds trimethylamine, hydrogen sulfide, ammonia, and indole and other components of foul odor [14].

5. Conclusions
Based on the results of the study it can be concluded as follows: 1. Flow of the crab processing (Portunus pelagicus) at PT. Blue Star Anugrah has met the standards of crab canning (Portunus pelagicus) according to SNI. 2. Organoleptic values during the study of all types of crab meat still meet the standards as raw materials to be processed into pasteurized crabs. 3. The effect of sorting speed and temperature on organoleptic does not have a significant correlation. 4. Processing of crab (Portunus pelagicus) at the sorting stage at PT. Anugrah Blue Star is quite efficient.

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