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Analysis Of The Influence Of Noise On Employee Workload With Ergonomic Approach At Pt. Ciomas Adisatwa Unit Maros

Aliah Alfiah Aras[1*], Nur Ihwan Safutra[2], A Pawennari[3]
[1,2,3]Teknik Industri, Universitas Muslim Indonesia, Indonesia

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ABSTRACT

This study aims to determine the effect of noise levels on employee workload with an ergonomic approach at PT. Ciomas Adisatwa Maros Unit. In this study, the determination of the sample taken was 15 people who worked in shift 1 in the factory area. The research method used a quantitative method and a qualitative method. The results of this study found that there was a positive and significant effect between noise level and workload of 0.74. For the significance of the correlation coefficient with an error rate of 5%, and with dk 79, t table = 1.99085 is obtained. It turns out that the calculated t value is greater than the t table price, so Ho is rejected. This means that there is a positive and significant effect of noise level on workload.

***Corresponding Author**

Name: Nur Ihwan Safutra
E-mail: nurihwansaputra44@gmail.com

INTRODUCTION

PT Ciomas Adisatwa Unit Maros is a company engaged in broiler commercial farms and chicken slaughterhouses, the company is a subsidiary of PT Japfa Comfeed. The company has been operating since 1996. This company has a variety of products, that are then marketed abroad and domestically. The total production capacity of the PT Ciomas Adisatwa Maros Unit is 12,000 chickens. Along with the increasing demand for chicken meat, PT Ciomas Adisatwa increased its production capacity which resulted in production machinery operating longer resulting in noise.

In industrialized countries, one of the main occupational health problems is noise. According to WHO (2004), it is estimated that almost 14% of the total workforce of industrialized countries is exposed to noise exceeding 90 dB in their workplace. It is estimated that more than 20 million people in America are exposed to the noise of 85 dB or more. In addition, in Quebec-Canada, it is found that 55% of industrial areas have noise levels above 85 dB and in Indonesia, it is estimated that the result of noise exposure can cause fatigue of 27.43%, hearing loss of 17.14%, and balance disturbance of 27.17% the total number of disturbances reaches 72.28% [1]. Noise that exceeds the threshold value can cause hearing loss and the risk of damage to the ear either temporarily or permanently after exposure for a long time without the use of adequate protective equipment. This potential risk has encouraged governments in various countries to make regulations that limit the sound exposure of industrial workers (EPA, 1974). [2] According to the Canadian Centre of Occupational Health and Safety (2018), the impact of noise can be in the form of auditorial effects (auditory effect) this impact affects hearing loss, such as loss of hearing loss, the second non-editorial effects (non-editorial effect) this effect is psychological, such as hearing loss of communication methods, confusion, stress, and lack of sensitivity to workplace safety issues. [3] Work that generates high-intensity noise is generally found in textile factories, factory generators used as power plants, steel plate cutting work, lathe work, grinding, sanding metal materials, rice milling, and so on.

Noise occurs in the production room of PT Ciomas Adisatwa Maros Unit, especially in the production room of the boiling tub. The noise that occurs is caused by the vibration of the poultry scalder machine that operates for 8 hours/day causing a loud sound that exceeds the threshold value that has been set by the Ministry of Manpower which is 85 dB. and causes noise that can cause danger to employees or workers who are in the production area during work. Noise with high intensity that occurs continuously has a bad impact on workers. [4]

The work environment is suitable for the continuity of employee work and improves employee performance. Research states that the work environment variable has a very significant influence on employee performance. [5] A comfortable, conducive, and supportive work environment is considered to be able to create a feeling of comfort and security in employees so that employees can have high productivity and work enthusiasm. [6] The conditions around a good work environment can support the implementation of work in fostering enthusiasm at work which can improve employee performance. [7]

A workload is many activities that must be completed by an organizational unit or position holder within a certain period. [8] The workload is a concept that arises due to the limited capacity to process information. When facing a task, individuals are expected to complete the task at a certain level. If the limitations of the individual hinder/obstruct the achievement of work results at the expected level, there is a gap between the expected level of ability and the level of capacity possessed [9] Specifically, the workload can be divided into two, namely physical and mental workload. Physical load tends to lead to the burden received by an employee in a job related to his physiological conditions, such as noise, vibration, and hygiene. If such working conditions are bad enough, there will be work stress with physical symptoms, such as high blood pressure, diarrhea, obstipation, etc. Excessive job description due to a limited number of employees is an indication of excessive physical workload. While the perception of work incompatibility and stressful work environment is an indication of excessive mental workload. [10]

One way to solve the noise problem is to improve the work environment with an ergonomic approach. This approach is used to observe the work environment and evaluate the effect of noise levels and workloads that have occurred in the production area of PT Ciomas Adisatwa Maros Unit.

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RESEARCH METHODS

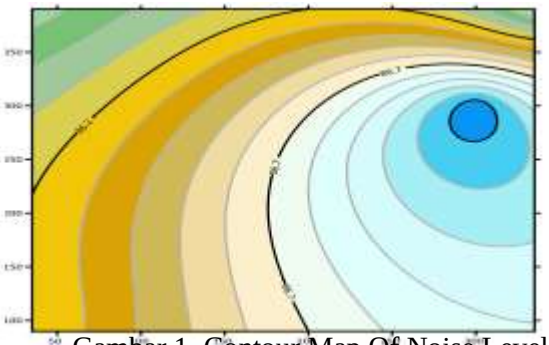
The method of collecting data in this study was carried out through observation interviews and obtained from books lecture texts, journals, articles, documents, the internet, and other reference sources which were also taken from examples of previous research. This research was conducted with an ergonomic approach. Where the stages of this research are: (1) data collection; (2) calculation of the noise level; (3) create a contour map; (4) calculation of the average pulse rate; (5) conducting an influence test; (6) evaluate the noise level and workload. The sample collection technique used is a saturated sample [11] So that the number of samples is 15 employees of pt. ciomas adisatwa maros unit. Through the data obtained, the average noise level is calculated and a contour map is made using surfer software. Then calculate the CVL (cardiovascular load) of workers and conduct an influence test. Finally, evaluate the noise level and workload.

RESULTS AND DISCUSSION

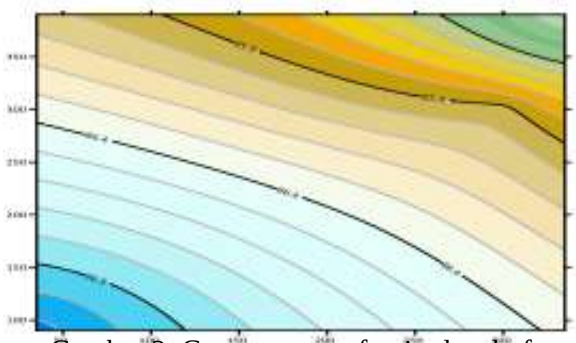
From the data obtained in the measurement of the average noise level taken once every 1 hour for 8 working hours in the evils and production areas, the average noise level results are as follows.

Area.	Workstation	Average Noise Level
1	Boiling	86,17
2	Cutting, Marinating, and Packaging	86,05

Pengolahan data,2021



Gambar 1. Contour Map Of Noise Level At production Boiling Workstation



Gambar 2. Contour map of noise level of workstation

Furthermore, the calculation of the pulse rate with the CVL (Cardio Vascular Load) approach for workers by considering before work, while working, and after work with the Pulse Oximeter Fingertip measuring instrument obtained the following results.

$$\%\text{CVL} = \frac{\text{N100 X (work pulse} - \text{pulse after work)}}{(\text{maximum pulse rate} - \text{age}) - \text{pulse after work}} \quad (1)$$

Tabel 2. Average worker pulse rate

No	Name	Age	Weight	Height	Pulse rate before work	Pulse rate during work	Pulse rate after work	CVL(%)	Description
1	Surya	25	60	166	67.6	119.6	72.8	38.28	Improvement required
2	Aldi	33	58	165	70.6	119.6	74.2	40.25	Improvement required
3	Fathul	33	60	165	66.2	111.2	72.4	33.89	Improvement required
4	Adhi	24	62	167	66.2	109.2	69.6	31.34	Improvement required
5	Aan	30	54	167	71.6	120.2	76.4	38.52	Improvement required
6	Rizki	24	57	160	71.2	109.2	76.6	27.30	No fatigue
7	Dika	27	50	165	74.4	115.6	76.8	33.24	Improvement required
8	Neli	28	53	164	66.2	107.8	69.6	31.20	Improvement required
9	Chaeril	24	60	170	68	111.2	76.8	28.85	No fatigue
10	Nunu	24	55	162	66	104.4	72.8	25.64	No fatigue
11	Rahmat	25	60	165	70.4	106.2	76.8	24.77	No fatigue
12	Richard	31	55	165	73	109.2	104.4	5.79	No fatigue
13	Rais	23	50	168	79.6	105.8	83	19.97	No fatigue
14	NIla	27	55	164	100.8	120.6	107	15.79	No fatigue
15	Said	26	60	178	93.4	112.6	104.4	7.66	No fatigue
16	Fahira	29	50	158	91	112.2	104.4	8.93	No fatigue

The results of the CVL calculation are then compared with the classification determined as follows:
$X \leq 30\%$ (No fatigue)
$30 < X \leq 60\%$ (Improvement required)
$60 < X \leq 80\%$ (Work in a short time)
$80 < X \leq 100\%$ (Immediate action required)
$X > 100\%$ (No activity allowed)

Furthermore, the test of the effect of noise level on workload can be seen that there is a positive correlation of 0.74 between noise level and workload. This means that the greater the noise level, the greater the workload. If the error rate is set at 5 &, 95% confidence level and N = 80, then the price of r table = 0.22. It turns out that the calculated r price is greater than the r table price, so Ho is rejected and Ha is accepted. So, there is a positive and significant influence between noise level and workload of 0.74. For the significance of the correlation coefficient with an error rate of 5%, and with dk 79, then obtained t table = 1.99085. It turns out that the calculated t price is greater than the t table price, so Ho is rejected. This means that there is a positive and significant influence between noise level and workload.

CONCLUSION

Based on the results of the research conducted, it can be concluded that the noise in the evils and production work areas has an average noise level of 86.17 dB and 86.05 dB exceeding the noise exposure limit of 85 dB in 8 working hours. The average CVL value of workers in the evis area needs

improvement while in the production area, there is no fatigue. the results of the calculation and influence test found that the noise level in the factory area of PT Ciomas Adisatwa Maros Unit has a positive correlation of 0.74 between the noise level and workload. which is very strong with the physical workload felt by workers in the factory area of PT Ciomas Adisatwa Maros Unit.

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