

Evaluation of the Occupational Health and Safety Work Environment at PT. Japfa Comfeed Indonesia Tbk. Gedangan – Sidoarjo Unit

Riza Irianingtyas¹, Endang Dwiyantri², Alen Prahadinata³

¹Master of Occupational Safety and Health, Faculty of Public Health, Universitas Airlangga, Indonesia

²Departement of Occupational Health and Safety, Faculty of Public Health, Universitas Airlangga, Indonesia

^{1,2}Campus C Mulyorejo, Surabaya, East Java, 60115, Indonesia

³PT Japfa Comfeed Indonesia Tbk. Gedangan –Sidoarjo Unit, Indonesia

Jalan Raya Tebel KM 3.8 Gedangan, Sidoarjo, East Java 61254 Indonesia

ABSTRACT

Introduction: An Occupational Health and Safety (OHS) work environment is defined as all activities undertaken to ensure and protect the health and safety of workers through the controlling of the working environment and the implementation of sanitation and hygiene principles in the workplace with the aim of creating a safe and healthy working environment to minimize the risk of accidents and illness. The purpose of this study was to evaluate the suitability of occupational health and safety (OHS) in the working environment of PT Japfa Comfeed Indonesia Tbk. Gedangan – Sidoarjo Unit based on the regulation of Minister of Manpower No. 5/2018. **Methods:** This research was descriptive and qualitative. The data used was primary and secondary. The primary data are taken from the Company Health Safety Environment (HSE) Department and the secondary data was from the company measurement results and documentation. **Result:** The results show that the measurement and control of the risk factors was quite good but there were still inconsistencies, namely room temperature which still exceeded the provisions, and the measurement and control of ergonomic and psychological factors which had not been implemented. The availability of hygiene facilities and the infrastructure in the company was classified as good and supports the work activities but it still needs improvement including the presence of a sewer that is not closed, and the air quality in the rooms and the trash still not meeting the standards. **Conclusion:** The implementation of Occupational Health and Safety (OHS) in the working environment of PT. Japfa Comfeed Indonesia Tbk. The Gedangan-Sidoarjo Unit based on the Minister of Manpower Regulation No. 5/2018 is quite good but there are several aspects where improvement is necessary.

Keywords: occupational health and safety, secure work, working environment

Corresponding Author:

Riza Irianingtyas

Email: rizairianingtyas@gmail.com

Telephone : +6281240538520

INTRODUCTION

As time has passed by, increasingly advanced technology has produced various innovations in various fields of life including industry, one of which is manufacturing companies. Based on the research data, the number of large and medium-scale manufacturing industry companies has reached 33,923 companies and continues to increase. The labor absorption in manufacturing companies was recorded as 15 million workers with the largest contribution coming from West Java at 3.98 million workers (24.93%), followed by Central Java with

3.21 million workers (20.16%) and East Java with 2.94 million workers (18.46%).

Manufacturing companies are companies that process raw materials into semi-finished or finished goods. Manufacturing companies are identical to factories that use machinery and equipment as well as engineering techniques. They possess a high potential for danger due to the interaction of humans, machines and the working environment. Companies are obliged to guarantee occupational health and safety (OHS) for all people in the company environment, especially the workers, with the aim of comforting the worker and increasing work productivity.

Occupational Health and Safety (OHS) in the working environment is defined as all activities undertaken to ensure and protect the health and safety of workers through controlling the working

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environment and the implementation of sanitation and hygiene principles in the workplace (Ministry of Manpower, 2018). The regulations on creating a safe and healthy working environment are listed in the Regulation of the Minister of Manpower of the Republic of Indonesia No. 5/2018 concerning occupational health and safety in the working environment that, through its implementation, it is hoped that a safe, healthy and free from environmental pollution working environment can be created, so as to reduce accidents and occupational diseases, especially in the production area (Ministry of Manpower, 2018).

One of the types of manufacturing company that require a good working climate and environment is animal food production companies in which each production process must prioritize the principles of effectiveness, efficiency, productivity, and safety. One of the animal food companies that has implemented OHS in the working environment is PT. Japfa Comfeed Indonesia Tbk. Gedangan – Sidoarjo Unit. The use of machines in every production process means that the company has a high risk of occupational accidents, occupational diseases, and working environment pollution. Every existing production process will certainly pose risks that can come from the materials, processes, and workers. Based on the previous research at PT. Japfa Comfeed Indonesia Tbk. The Gedangan Unit has experienced several work accidents such as being stabbed, pinched, lower back pain, hand injury, and several other injuries (Suci, 2018).

In addition, also based on the previous research, due to dust exposure in the animal food industry, it has caused the workers to have a greater risk of experiencing damage to their respiratory system. The subsequent impact can decrease their productivity which may harm the company. Based on these problems, the purpose of this study is to analyze the suitability of the application of Occupational Health and Safety (OHS) in the working environment of PT. Japfa Comfeed Indonesia Tbk. Gedangan – Sidoarjo Unit by referring to Permenaker No. 5/2018.

METHOD

This research was conducted in PT. Japfa Comfeed Indonesia Tbk. Gedangan Unit located on Jalan Raya Tebel KM 3.8 Gedangan, Sidoarjo, East Java. The type of this research was observational and descriptive. The methods of the data collection were interviews, observations, and a literature study.

The interviews were conducted with the company's HSE and observations were made in the work environment to determine the condition of the work environment in the company.

The data collected in this study consisted of both primary data and secondary data. The primary data was taken from the results of the interviews with the Company's HSE Department and the secondary data was related to the general description of the company, the OHS policies, its organizational structure, the Standard Operating Procedures (SOP), the company measurement data, and other supporting documentation related to the implementation of OHS in the working environment. The data collection and measurement data results were carried out online due to the company policies during the COVID-19 pandemic, so the measurement of the exposure factors could not be measured directly.

The instrument of this research was a questionnaire and an observation checklist sheet based on the Ministry of Manpower No.5/ 2018 which was used to evaluate the suitability of the occupational health, safety and work environment in the company. The measurement method was carried out by comparing the results of the observations in the company's work environment with the results of the conformity assessment as part of the checklist table based on the Minister of Manpower of the Republic of Indonesia No. 5/2018.

This research received an ethical approval certificate from Universitas Airlangga's Faculty of Dental Medicine Health Research Ethical Clearance Commission and the number of the ethics certificate is 448/HRECC.FODM/VII/2021. The purpose of this research was to consider the suitability of the implementation of an occupational health, safety and work environment in the company's work environment based on Permenaker (2018).

RESULTS

Evaluation of the Occupational Health and Safety Working Environment at PT. Japfa Comfeed Indonesia Tbk. Gedangan – Sidoarjo Unit

Based on Permenaker (2018), the implementation of the OHS work environment was carried out through measurements and the control of the working environment as well as the application of hygiene and sanitation practices. At PT. Japfa Comfeed Indonesia Tbk, to support the creation of a safe and comfortable working

environment, the Gedangan Unit has implemented OHS in the working environment by measuring and controlling the work environment. This was as well as implementing environmental hygiene and sanitation principles. Based on the results of this research, the results of the evaluation of the suitability of the implementation of an occupational health safety and work environment in the company through the checklist table based on Permenaker (2018) has been described in Table 1.

Environment Controls and Measurement

Permenaker (2018) article 5 paragraph 1 states that the measurement and control of the working environment is one of the conditions for controlling the work environment. The measurement and control of the working environment at PT. Japfa Comfeed Indonesia Tbk. Gedangan - Sidoarjo Unit is conducted twice a year, including the measurement of both physical and chemical

Table 1. The checklist table for evaluating the implementation of OHS in the working environment at PT Japfa Comfeed Indonesia, Tbk Gedangan Unit based on Permenaker No. 5/2018

Observed Aspects	Evaluation		Description
	Yes	No	
Physical Factors			
Measuring the physical factors in the work environment	√		The company measures the physical factors including temperature, humidity, noise, and lighting.
The results of the measurement of the physical factors matching or below the threshold limit value.		√	There are still measurement results in the production room that exceed the threshold limit value.
Controlling the physical factors in the work environment.	√		The control of the physical factors in the production area is carried out technically, administratively, and using PPE.
There are emergency lighting facilities for rescue and evacuation in an emergency.	√		Emergency lighting provided for evacuation routes in the production area.
Emergency lighting works automatically.	√		The emergency lighting provided works automatically.
Emergency lighting has a sufficient lighting intensity to carry out a safe evacuation or rescue.	√		The emergency lighting in the production area has a sufficient lighting intensity.
Emergency lighting installed on evacuation routes or access egress.	√		In the production area, emergency lighting is provided on the evacuation route equipped with emergency exits and emergency stairs.
The exit access is equipped with an exit guideline made of reflective material that emits light.	√		In the production area, an evacuation route is provided, equipped with emergency doors and emergency stairs with each instructional material made of acrylic with glow in the dark paint so then it can be seen even in the dark.
Chemical Factors			
Measurement of the chemical factors that exist in the work environment.	√		The company measures the exposure to chemicals or substances.
Measurements are made to determine exposure and if workers are exposed.	√		Measurement of exposure in the production area.
The results of the measurement of chemical factors matching or below the threshold limit value.	√		The measurement results for each substance or chemical in the production area are still below the threshold limit value.
Controlling the chemical factors in the work environment	√		The control of chemical exposure in the production area is carried out technically, administratively, and using PPE.
Biological Factors			
Measurement of the biological factors that exist in the work environment.		√	For now, no measurement of the biological factors has been carried out.
Monitoring and controlling the biological factors in the work environment.	√		Conducting of pest identification in relation to the raw materials and access in and out of the raw materials in the form of pesticide spraying.

Advanced Table 1. The checklist table for evaluating the implementation of OHS in the working environment at PT Japfa Comfeed Indonesia, Tbk Gedangan Unit based on Permenaker No. 5/2018

Observed Aspects	Evaluation		Description
	Yes	No	
Ergonomic Factors			
Measurement of the ergonomic factors in the work environment.	√		The ergonomics factor has not been measured yet.
Controlling the ergonomic factors in the work environment.	√		The ergonomics factor has not been controlled yet.
Psychological Factors			
Measurement of the psychological factors in the work environment.	√		The measurement and control of psychological factors has not yet been carried out.
Controlling the psychological factors in the work environment.	√		The measurement and control of psychological factors has not yet been carried out.
Hygiene and Sanitation			
Workplace Building			
The place is clean, neatly arranged, even, and not muddy.	√		The yard in the company's environment looks clean, neatly arranged, and dry. The yard is also decorated with some greenery so then it looks beautiful and the yard is cleaned every day.
The place is wide enough for the traffic of both people and goods.	√		The road in the company environment is wide enough to be used by traffic regarding both workers and goods.
There is a sewer in the yard where the drain must be closed and made of a material that is strong enough. Wastewater must flow and must not be stagnant.	√		There is a water drain at the end of the yard that is clean and flowing smoothly, and it is cleaned every day.
The walls and ceilings of the buildings are dry and not damp.	√		The walls and ceilings of the building in the company are clean and not damp.
Repainting the walls and ceilings of the building at least once every 5 (five) years and cleaning them at least 1 (one) time a year.	√		The company repaints the walls and ceilings of the building once a year and its cleanliness is monitored every day.
The floor of the building is made of hard materials, waterproof, and resistant to damaging chemicals.	√		The floor in the office room uses ceramic material that is in a clean and tidy condition because it is cleaned every day. For the roads, the floor material used is cast concrete so then it is strong and not easy to crack. For the production area, the floor material used is Epoxy so then the floor is strong and resistant to chemicals.
The floor of the building is flat, non-slip, and easy to clean.	√		The floors in each building are clean and not slippery.
The floor of the building is cleaned regularly.	√		Daily cleaning is carried out in every building in the company.
The roof of the building / buildings is able to provide protection from the sun and rain.	√		The condition of the roof of each building/building is in good condition and able to provide protection.
The roof of the building / buildings does not leak, does not have holes, and is not moldy.	√		The condition of the roof on each building is in good condition and does not have holes / leaks.
Toilet facilities in the form of latrines, sufficient clean water, rinsing tools, trash cans, hand washing facilities, and soap.	√		The company provides toilet facilities and other cleaning facilities in every building in the company such as clean water, hand soap, sinks, trash cans, and other features.
The toilet facilities are clean and do not cause odors.	√		The toilet facilities in every building in the company are clean and tidy.
The toilet facilities are free of flies, mosquitoes, and other insects.	√		There are no pests or fungi in the toilets of every building because they are cleaned every day so then the cleanliness of the toilet is always maintained.

Advanced Table 1. The checklist table for evaluating the implementation of OHS in the working environment at PT Japfa Comfeed Indonesia, Tbk Gedangan Unit based on Permenaker No. 5/2018

Observed Aspects	Evaluation		Description
	Yes	No	
Hygiene and Sanitation			
Workplace Building			
The toilet facilities are equipped with sufficient clean water and good drainage.	√		Every toilet in the buildings of the company is always provided with sufficient clean water and a good drainage channel.
The toilet facilities are equipped with doors.	√		Every toilet in the buildings in the company are equipped with a door that is in good condition and functioning well.
The toilet facilities have good lighting / lighting.	√		Every toilet in the company is equipped with sufficient lighting.
The toilet facilities have good air circulation.	√		Every toilet in the company is equipped with air ventilation so then the air circulation in the toilet moves well.
The toilet facilities are cleaned every day periodically.	√		Every toilet in the company buildings is cleaned every day.
The toilet facilities can be used during working hours.	√		Every toilet in the company is always in a good condition and is always cleaned every day so then it can be used at anytime.
The toilet facilities can be used during working hours.	√		Every toilet in the company is always in a good condition and is always cleaned every day so then it can be used at anytime.
Separate toilet placements for men, women, and people with disabilities.		√	Each toilet in the company is placed separately for men and women but there are still no special toilets for people with disabilities.
Toilet placement is facilitated with clear notices.	√		Every toilet in the company is equipped with a clear toilet sign.
The number of toilet facilities and cleaning facilities provided by the company is sufficient for the number of workers.	√		Every toilet in the company is sufficient for workers and is always monitored by the cleaners.
The minimum size of the toilet room is 80 cm x 155 cm, and 220 cm x 70 cm for the door.	√		The worker toilets in each building are quite spacious.
The toilet room for people with disabilities is in accordance with Permenaker No. 5/ 2018.		√	The company does not provide toilets for people with disabilities.
Workers in certain companies are required to wear work clothes according to the established K3 requirements.	√		In the production area, special clothing is provided for workers within the established K3 provisions.
Work clothes are provided by the Manager.	√		Special production workers' clothes are provided by the company's K3 management.
Availability of a clean changing room, separate for men and women, and they are in regular use so then they are not crowded.	√		There is a separate changing room for men and women.
The changing room has a place to store clothes / lockers for each Worker.	√		The workers' changing rooms are equipped with lockers and shoe racks.
Availability of trash cans and cleaning equipment in every workplace.	√		Trash cans are available in all areas of the company both outside and inside the buildings.
Segregated and labeled trash bins for organic, non-organic, and hazardous materials.	√		The trash cans are separated between organic, non-organic, and hazardous materials and are labeled.
The trash can are equipped with a cover, are made of waterproof material, and do not become a nest for flies and other insects.	√		The trash cans are equipped with a lid, are made of waterproof material, and are cleaned every day.
Availability of sanitary napkins in the women's toilet room which are made of liquid-resistant material, equipped with a cover and clearly labeled.		√	There has been a trash can in the women's restroom, but the company has not provided a special trash can for sanitary napkins that is labeled, making it is necessary to separate the waste first.

Advanced Table 1. The checklist table for evaluating the implementation of OHS in the working environment at PT Japfa Comfeed Indonesia, Tbk Gedangan Unit based on Permenaker No. 5/2018

Observed Aspects	Evaluation		Description
	Yes	No	
Air Necessity			
The need for clean and healthy air has been met in every workplace.	√		The meeting of the need for air in the company is quite good following the planting of a thousand trees.
Workplaces to perform types of administrative work, public services, and managerial functions to fulfil a healthy and clean KUDR. (KUDR as intended is determined by temperature, humidity, oxygen content, and air contaminant levels).		√	KUDR in the administrative work rooms, public services, and managerial functions has not been fulfilled due to the humidity not being in accordance with the provisions.
The room temperature is appropriate, namely at a dry temperature of 23oC - 26oC with a humidity of 40% - 60%.		√	The room temperature is appropriate, namely at a temperature of 19oC – 25oC. However, the humidity of the room has not been met because it exceeds the standard that have been set, which is 70 - 80%.
Oxygen levels are appropriate, namely oxygen levels of 19.5% – 23.5% of the total volume of air.	√		The oxygen level in the room is not yet known because it has not been measured yet.
Management is required to provide an air ventilation system to ensure the workers' air needs are met and to reduce the levels of contaminants in the workplace.	√		The company provides ventilation in all rooms but the exact amount and adequacy of the ventilation in the rooms is not yet known.
Ventilation is cleaned periodically at least once every 3 (three) months.	√		The ventilation is cleaned regularly.
Household Management			
Entrepreneurs and/or Management carry out good housekeeping in the workplace.	√		The implementation of housekeeping in the workplace is good enough,
Separate tools and materials that are needed or used compared to those that are not used.	√		Separate tools and materials that are needed or used are separate from those that are not used.
Cleaning of the tools, utensils, and materials regularly.	√		The tools, utensils, and materials are cleaned regularly every day.
Establish and carry out cleaning, placement, and arrangement procedures for the tools, and materials.	√		Cleaners make arrangements for tools and materials in the workplace.
Develop hygiene, placement, and arrangement procedures for the tools, utensils, and materials.	√		The officers develop cleaning, placement, and arrangement procedures for the tools, utensils, and materials.
Materials and equipment are stored in warehouses and clearly labeled to distinguish between the items.	√		Materials and equipment are stored and labeled to distinguish between these items.

Source: PT. Japfa Comfeed Indonesia Tbk

parameters. The measurement of the physical and chemical parameters takes place in the production room because this room poses the highest risk of exposure to the workers due to the use of production tools and processing activities which may cause occupational accidents and occupational illness.

Physical Parameters

The physical parameter measurements included the measurement of temperature, humidity, noise, and lighting. In Table 2, based on the measurement data over the year, the measurement results,

including those that exceed the predetermined standards, are displayed. The average temperature in the production room was 34.5°C, which means that the temperature in the production area is higher than the predetermined standard of 25.5°C. For the other measurement results such as humidity, noise, and lighting, they are still below the standard or threshold value that has been determined. The humidity in the production room was 63.5%, the noise intensity in the production room was 74.5 dBA, while the lighting intensity in the first measurement was 190 Lux and in the second measurement it was 188 Lux.

Table 2. Physical Parameter Measurements in 2019 at Production Area of PT. Japfa Comfeed Indonesia Tbk.

Physical Parameter	Date of Data		Threshold Value	Unit	Measuring Method
	14 May 2019	25 Nov 2019			
Temperature	34.5	-	25.5	°C	IKA-10
Humidity	63.5	-	70	%	IKA-10
Lighting	190	188	Min. 100	Lux	SNI 16-7062-2004
Noise	74.5	-	85	dBA	SNI 7231-2009

Source: PT. Japfa Comfeed Indonesia Tbk.

Table 3. Chemical Parameter Measurements in 2019 at Production Area of PT. Japfa Comfeed Indonesia Tbk.

Chemical Parameters	Date				Unit	Measuring Method
	14 May 2019		25 Nov 2019			
	Result	Threshold	Result	Threshold		
CO	<1	25	<1	25	ppm	IKM-104
NO ₂	<12	150	<12	150	µgram/m ³	SNI 7119-2-2017
O ₃	74	61	12	50	ppb	SNI 7119. 8-2017
Pb	0.0009	0.05	<0.00002	0.05	Mg/m ³	OSHA ID-125G 2002
SO ₂	0.037	PSD 0.25	0.013	PSD 0.25	ppm	SNI 71 119.7-2017
H ₂ S	0.009	1	0.001	1	ppm	SNI 12-1499-1989
NH ₃	0.0960	25	0.171	25	ppm	SNI 19-71 19.1-2005
HC	<0.05	1000	<0.05	1000	ppm	SNI 19-71 19.1-2005
Dust	0.626	10	0.010	10	Mg/m ³	NIOSH0500 : 1994

Source: PT. Japfa Comfeed Indonesia Tbk.

Chemical Parameters

Table 3 shows the measurement of chemical substances in the production room over a year including the measurement of carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur oxide (SO₂), hydrogen sulfate (H₂S), ammonia (NH₃), hydrocarbon (HC), Pd, and dust. Based on this data, the chemical parameters are still below the threshold value.

As we can see, ozone (O₃) at the point of the first measurement is higher than the threshold value. However, in the second measurement, the level of ozone (O₃) has decreased and is lower than the threshold value. This is due to the control that has been carried out by the company in the form of ventilation arrangements in the production area.

This adds a clean and tidy impression to the working environment. However, based on the observations in the power plant area, there are several open water gutters, including along the shoulder of the road to the production area.

The buildings at PT Japfa Comfeed Indoensia Tbk. Gedangan – Sidoarjo Unit are in good condition, are made of sturdy material, and are being

cleaned every day. The walls are repainted once a year. The condition of the floor in each building is different based on their respective functions. In the office buildings, the material used is ceramic. Concrete is used for the road while in the production building, the floor material used is epoxy floor. The condition of the floors in each building are clean, not slippery, and level or flat.

The overall condition of the walls is in good condition, well-maintained, bright, and sturdy. The walls are regularly painted and cleaned every day. The ceilings of the entire building are also in good condition. The ceilings of the buildings are cleaned every day. Some ceilings are cleaned less periodically due to their hard-to-reach position. The roof of the PT Indonesia Power UP building is cleaned periodically in accordance with the cleanliness of the roof.

Hygiene Facilities

Toilets

Toilets are available in every building at PT. Japfa Comfeed Indonesia Tbk. Gedangan – Sidoarjo

Unit such as the office buildings, production buildings, and prayer rooms. The number of toilets in each building is sufficient for the number of workers. The condition of the toilets is clean and odorless, with well-flowing drainage, equipped with a door, good air circulation, well-lit, regularly cleaned, and can be used during working hours. The toilets are equipped with several facilities such as latrines, a hand-washing sink, hand washing soap, sufficient clean water, trash cans, and tissues / a dryer beside the area for washing hands. There are hand washing posters showing the steps for washing hands and the importance of washing hands. The condition of the toilet floor is strong, watertight, not slippery, and clean because it is cleaned every day.

The toilets are separated between men and women. In the women's toilets, there is no special sanitary waste disposal area whereas based on Permenaker (2018), a separate sanitary napkin disposal area should be provided, separate from the toilet trash can.

Lockers and Changing Rooms

PT. Japfa Comfeed Indonesia Tbk. Gedangan – Sidoarjo Unit provides a changing room equipped with locker facilities and shoe racks. The number of lockers is sufficient for the number of production workers.

Trash Cans

PT. Japfa Comfeed Indonesia Tbk. Unit Gedangan - Sidoarjo has provided trash cans that are placed and spread out in the company's working environment, both outside the building such as in the yard and indoors such as in the offices and toilets. The trash cans are in a clean condition, equipped with a cover, and are made of a water-resistant material. The trash cans are labeled and separated for organic, non-organic, and hazardous materials. However, in some places such as the toilets, the trash cans are not equipped with a cover and they are not separated between organic and inorganic.

Air Necessity

The results of the measurement of the working climate in each building are different in comparison to the results for the production room which has the highest working climate. Measurements have been made in the office buildings but the parameters for the oxygen levels and contaminant levels have not been measured. It is known that the temperature of

the working room ranges from 19°C - 20°C with a humidity of 70% - 80%, with high humidity in the room indicating that the resulting emissions are still below the quality standard.

For the air ventilation system, the company uses more artificial ventilation consisting of an Air Conditioner (AC) to maintain the comfort of the workers in the room. The AC is cleaned regularly. Meanwhile, the production building uses a ventilation system in form of an exhaust fan and the windows and vents present to maintain the condition of the engine in the room.

Based on Permenaker (2018) article 42 paragraph 2, every person working indoors must have a cubic space of at least 10 cubic meters. The air demand at PT. Japfa Comfeed Indonesia Tbk. Gedangan - Sidoarjo Unit is sufficiently fulfilled. In the office building, the HRD area gets 34.2 cubic meters. Air space is affected by the height of the room measured from floor to ceiling, which is at least 3 meters, while the HRD room has a height of 10 meters. It can therefore be concluded that the air space for everyone in the room has been fulfilled.

Household Management

The implementation of household management at PT. Japfa Comfeed Indonesia Tbk. Gedangan - Sidoarjo Unit is conducted through implementing the 5S principles in the working environment, namely Seiri (Sort), Seiton (Set-in-Order), Seiso (Shine), Seiketsu (Standardization), and Shutsuke (Sustain/Self Discipline). The implementation of the 5S principles includes the establishment of the 5S committee, the 5S Work Program, and the implementation of the 5S Patrol. Housekeeping workers are required to clean, tidy up, and maintain the working environment both outdoors and indoors. The monitoring of the 5S principles is carried out using a checklist related to cleanliness and the working infrastructure. This aim to lessen the effort needed to maintain the environment, as well as the safety and health of the workers.

DISCUSSION

Evaluation of the Implementation of Environment Measurements and Control at PT Japfa Comfeed Indonesia Tbk., Gedangan - Sidoarjo Unit

PT Japfa Comfeed Indonesia, Tbk Unit Gedangan is a manufacturing company that produces

animal food, particularly for poultry. The production process is mostly carried out using tools or machines prioritizing the principles of work effectiveness, efficiency, productivity, and safety. Regarding the promotion of the safety of both the workers and the company environment, there is the implementation of occupational health and safety of the working environment in accordance with Permenaker (2018) concerning occupational health and safety. One way of doing this was by measuring and controlling for hazards including the physical parameters (temperature, noise, lighting, vibration, etc.), as well as the chemical, biological, ergonomical, and psychological parameters. The implementation of the measurement and control of hazard factors at PT Japfa Comfeed Indonesia Tbk., Gedangan Unit is quite good. However, in some aspects, it is still not in accordance with the requirements regarding the applicable regulations. Therefore, it is necessary to make some improvements to the existing practices to comply with the prevailing regulations.

Physical Parameters

Based on the measurement data, there are physical factor measurement results that still exceed the Net Asset Value (NAV) or predetermined standards. The temperature of the production room is 34.5°C, which means that the temperature of the production room is higher than the standard based on the Permenaker (2018) where the temperature that is considered comfortable for workers is 24°C to 26°C. The high temperature is caused by the production area using machines that produce continuously for 24 hours without stopping, meaning that they can produce excess heat (Kosha and Paskarini, 2017). Workplace conditions that are too hot can cause the workers to become uncomfortable where their body temperature will increase which can cause health problems such as decreased muscle contractions, which means that the body experiences fatigue. The working environment conditions under the NAV need to be improved and controlled for comfort and safety at work. One of the controls that have been carried out by the company is regulating the working time which is justified by Wulandari (2011). They state that to avoid health problems due to exposure to high heat, the length of work in a hot place must be adjusted according to the level of work and the heat stress faced by the workforce.

Apart from temperature, humidity is the main parameter determining comfort in the work environment (Mandey and Kindangen, 2017) Based

on the measurement data, the humidity level in the production room is in accordance with Permenaker (2018) which is 40% to 70%. This means that the humidity in the production room is still within normal limits and is safe for workers. Humidity is the amount of water contained in the air (Farisy and Nugroho, 2017). Incompatibility regarding the humidity in the room can cause health problems. Low humidity can cause dryness and eye irritation. Meanwhile, high humidity can have an impact on the growth of bacteria and viruses which encourages the grouping of particles in the air that can cause infection (Murniati, 2018). In addition, high humidity will also cause a large reduction in body heat (due to the evaporation system) and a faster heart rate due to the increased blood circulation, leading to fatigue and decreased performance (Farisy and Nugroho, 2017). To maintain the humidity of the room, the company always regulates the room temperature and provides adequate ventilation so then the air circulation in the room is always maintained.

Noise refers to an unwanted sound that can disturb hearing and or endanger health, according to Malau, Manao and Kewa (2017). Sounds produced from work equipment can interfere with hearing if it exceeds the recommended threshold value. Based on the measurement data, the noise level in the production room is still under the safe threshold. However, exposure continuously will pose a risk to health, so control measures are still carried out. Two of the preventive measures that have been taken up the company include managing the working time and using hearing protection devices in the form of earplugs to avoid the occurrence of occupational illness due to continuous noise exposure (Eryani, Wibowo and Saftarina, 2017).

The measurement data shows that the intensity of the lighting in the work environment in the production room is in accordance with Permenaker (2018) which means that the intensity of lighting is sufficient to illuminate the work objects. According to Odi, Purimahua and Ruliati (2018), the fulfillment of lighting intensity makes it easier for the workers to see clearly so then their job can be done quickly, so then their productivity can be increased, and also to minimize the risk of accidents.

Chemical Parameters

PT. Japfa Comfeed Indonesia Tbk. use a variety of chemicals to support the company's production process, starting from the fumigation process in silos, checking the quality of feed in the QC Lab,

and mixing feed additives, which are complementary food ingredients used to improve the quality of the feed that provides vitamins, minerals, antibiotics, and other chemicals (Pirgozliev, Rose and Ivanova, 2019). Based on the chemical measurement data, the chemical content is still under the NAV. This is in accordance with Permenaker (2018) which states that the chemicals used should be within safe limits in order to minimize the risk of health problems and occupational diseases.

Generally, the effects caused by these ingredients are skin irritation, eye irritation, respiratory problems, and digestive disorders. There are ingredients that have chronic effects. One of the chemical hazards in the production process is exposure to copper sulfate dust which has irritant properties, meaning that if workers are exposed to it, it can cause irritation to the exposed organs such as irritation of the respiratory tract, digestive tract, eyes, and skin. If exposed for a long time, there is a risk of developing Chronic Obstructive Pulmonary Disease (Suci, 2018).

Based on the risk of hazard, it is necessary to control the use of chemicals. The company has carried out several risk controls, ranging from technical control, administration, and personal protective equipment such as installing exhaust fans that aim to reduce the pollution levels, implementing SOPs, periodic level measurements, setting a particular working time, and providing training (Suci, 2018). Delvika (2017) mentioned that implementation is very important to ensure that employees are aware of the hazards and risks in their work, how they can control these hazards, and how they can ensure that the employees have the competence to do their jobs and understand the laws and regulations and other applicable requirements. Another control that is also carried out is the use of personal protective equipment such as safety shoes, masks, and gloves. According to Justiani (2021), using masks can help prevent and reduce the risk of developing respiratory problems.

Biological Parameters

Permenaker (2018) in article 22 states that the measurement, monitoring, and control of biological parameters must be carried out in a working environment that possesses potential biological hazards. However, at PT Japfa Comfeed Indonesia Tbk., Gedangan – Sidoarjo Unit, there has not been any measurement of potential biological hazards but the company has carried out several controls,

especially when it comes to pests such as insects and rodents by providing disinfectants.

The main components of animal food are ingredients that contain protein and energy. The ingredients commonly used are grains such as corn and soybean meal which generally contain water, carbohydrates, and protein, as well as enzymes, fats, minerals, and vitamins (Wati *et al.*, 2018). The high protein content in the grain is one of the growth media for microorganisms such as fungi and other microbes. The improper storage of feed ingredients can cause the growth of bacteria and fungi as well as the emergence of pests such as insects and mice which may damage the quality of the raw materials, and reduce the quality and economical value of the final product (Putri, Unteawati and Fitriani, 2017).

Several controls have been carried out by the company, one of which is controlling the humidity (below 70%) and temperature in the storage room which is highly recommended as an effort to prevent food damage due to fungi, insect pests, microbes, and mites. They have also undertaken the implementation of sanitation through the use of disinfectants. Putri, Unteawati and Fitriani (2017) mentioned that one of the pest control methods that can be done is sanitation using disinfectants, which are chemicals used to prevent contamination from microorganisms, pests, bacteria, and viruses that are still left in the storage warehouses, foodstuffs, vehicles, and the surrounding environment.

Ergonomical Parameters

Permenaker (2018) in article 23 states that the measurement and implementation of ergonomical parameters for workers is a must. Ergonomics is a science that deals with human optimization, efficiency, health, safety, and comfort in and at work. A comfortable working environment provides a sense of security and allows the employees to work optimally. On the contrary, inadequate work environments can reduce employee performance (Vanessa, Matondang, dan Daulay, 2019). Thus, the working environment must be handled and designed properly. PT Japfa Comfeed Indonesia Tbk., Gedangan Unit still has not implemented ergonomic measurements and controls for its workforce. This can cause risks such as complaints of fatigue and discomfort at work which may lead to accidents. In the research by Septianto, (2019), the problem of work posture is important to pay attention to because it is directly relates to the work process itself. According to data from the Ministry

of Health, it can be seen that out of all occupational diseases that occur in every Indonesian company, musculoskeletal injury is the most vulnerable diseases. Ergonomic control is very important where, fundamentally, ergonomics is the study of human aspects in the work environment for optimization, efficiency, health, safety and human comfort in the workplace to improve performance and protect their lives to optimize their capabilities and overcome their limitations as a human being (Sugiharto and Sokhibi, 2019). Based on this, it is important for companies to identify the ergonomic risks to their workers and the work environment that can cause discomfort at work. Inadequate and non-ergonomic work equipment/facilities need to be identified which can later be dealt with through preventive and corrective actions so as to prevent or minimize the emergence of complaints of pain, especially musculoskeletal injuries in their workers.

Psychological Parameters

In the research by Idrees, Hafeez and Kim, (2017), psychological factors can be explained as the interactions between a worker and the work environment, working conditions, workload, and organizational relationships. Workload refers to all forms of work given to the human resources to be completed within a certain period of time (Ahmad *et al.*, 2019). Psychological and physiological workloads are the burdens borne by workers to complete their work. When evaluating the performance of workers, the company must look at both the physical (physiological) and mental (psychological) workloads of their workers. This is important to ensure that the results are in line with the targets set by the company (Fithri and Anisa, 2017). Both physiological and psychological workloads are closely related to workforce performance. Workloads that exceed the workers' ability may lead to a high level of fatigue and even injury while workloads that are too light may cause the workers to experience boredom (Nabawi, 2019).

PT. Japfa Comfeed Tbk. have not implemented the measurement and control of psychological parameters. This is not in accordance with Permenaker (2018) which states that companies need to regulate the measurement and control of psychological parameters. However, based on the results of the interviews, it was found that the workload at PT Japfa Comfeed Indonesia Tbk., Gedangan - Sidoarjo Unit was classified as a

moderate workload especially in the packing area where the production target was large and demands high accuracy when carrying out the production process. Working under supervision could put psychological pressure on the workers. Based on these conditions, it is important for companies to be aware of the psychological condition of workers, hence it is necessary to measure the psychological workload and control it. This is also mentioned in the research by Fithri and Anisa (2017) which states that there are complaints of high psychological and physiological burdens felt at work, making it is necessary to measure the psychological workload and physiology of packing workers. These measurements were carried out in order to know the level of psychological and physiological burden experienced by the operator. This is so then the work can be adjusted according to the abilities of the workers doing the work.

Evaluation of the Implementation of Hygiene and Sanitation at PT Japfa Comfeed Indonesia Tbk., Gedangan - Sidoarjo Unit

The hygiene factor can be used as a parameter to review the work environment as it will affect employee job satisfaction. This includes the physical working conditions, work relations, organizational policies, administration, health and safety, and compensation (Susan, 2018). The implementation of hygiene and sanitation in the working environment refers to the relevant laws and regulations (Marinda and Ardillah, 2019). The implementation of industrial hygiene and sanitation in PT Japfa Comfeed Indonesia Tbk., Gedangan Unit is good enough. The condition of the buildings in the company are clean and neat. The buildings are well maintained and equipped with supporting facilities such as toilets, changing rooms, and lockers, and the availability of clean water is also quite good. However, in some aspects it is still not in accordance with the hygiene and sanitation requirements of the applicable regulations. There are a number of things that can be changed or added in relation to the existing practices to comply with the prevailing regulations.

First, there are several places where the sewer is not closed or covered properly. Based on Permenaker (2018) article 27 paragraph 2, it states that "if there is sewer channel in the open yard, the sewer must be covered by using solid material and the flow must be swift." However, there are still some sewers that have not been covered yet, namely on the shoulder

of the main road to the unit and around the unit. These open sewers may turn into vector breeding spots for flies that may cause various diseases such as diarrhea or present the risk of falling into it (Sufiliana, 2020).

Second is the air quality. Room ventilation is one of the factors that determines the indoor air quality and the thermal conditions of the room. This has a direct impact on the occupants of the room (Shania, Chandra and Utami, 2021). Based on Permenaker (2018), indoor air quality is determined by temperature, humidity, oxygen level, and the levels of contaminants in the air where the standard temperature that is considered comfortable is 24°C to 26°C. Humidity should range from 40% to 70%. There is a temperature and humidity mismatch in the office area of PT Japfa Comfeed Indonesia Tbk., Gedangan Unit where it is known that the working room temperature ranges from 19°C – 20°C with a humidity of 70% - 80%, while the production area has a temperature of 34.5°C with a humidity level of 63.5%. This discrepancy in the workspace is caused by the low room temperature which makes the humidity of the room higher. In the production area, the high temperature is caused by the use of production machines.

Third, there are several hygiene facilities that still do not meet the standards. Permenaker (2018) states that "trash cans must meet separation requirements and be labeled for organic, non-organic and hazardous waste, equipped with a cover and made of waterproof material, and free of nest of flies or other insects." Based on direct observation, there were several trash cans that did not meet the requirements like not having a proper cover and having no label in the toilets. Trash cans that are not covered properly are at risk of transmitting disease through the microbacteria such as flies and mice. Besides, trash cans are also able to become a nest for disease vectors (Kusumawardani, Sulistyaningsih and Komariah, 2020). Hence, trash cans with a cover are necessary.

Employee job satisfaction is indicated by whether or not their desires are fulfilled when it comes to the work being carried out in a supportive work environment (Bhanu and Babu, 2018). Hygiene factors that are managed properly will minimize employee job dissatisfaction where the employees feel that they have a suitable work environment in accordance with their respective fields plus an organizational culture within the company that is designed and implemented according to their

shared needs (Tiomantara and Adiputra, 2021). The existence of hygiene factors that have not been met can result in unfulfilled worker satisfaction which can affect work productivity. Improving the work environment is necessary not only to maintain the safety of its employees but also to increase worker productivity through job satisfaction (Busyairi, Tosungku and Oktavian, 2014).

CONCLUSION

The results show that the implementation of occupational health and safety in the working environment of PT. Japfa Comfeed Indonesia Tbk. Gedangan-Sidoarjo Unit, assessed based on Permenaker (2018), is quite good but there are several shortcomings such as the absence of biological measurements, the measurement and control of ergonomical and psychological parameters, as well as temperature and humidity still exceeding the standard values. Meanwhile, the existing facilities and infrastructure are classified as good which supports the working activities.

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