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Identification of Risk Work Accident on The Making Process Tofu Study Case UD. Ainul Yaqin Wringinanom Gresik

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Abstract

Introduction*: In the process of making tofu, there is a risk of danger that causes work accidents and occupational diseases to occur. Hazard risks can occur from environmental factors and the workers themselves.* ***Objective:*** *Therefore, this study aims to identify a description of the risk of work accidents in the process of making tofu at UD. Ainul Yaqin.* ***Method:*** *This research is qualitative research while the data obtained from the results of observations and interviews. There were 6 informants involved in the study consisting of 1 supervisor and 5 workers. Data analysis using JSA method.* ***Result and Discussion:*** *The identification results show that there are 23 hazards in the process of making tofu at UD. Ainul Yaqin there are physical hazards, ergonomic hazards, biological hazards and chemical hazards. The risk assessment is categorized as very high 3, high 10, medium 7 and low 3. The control efforts provided are not fully based on the control hierarchy, namely elimination, substitution, engineering control, administrative and personal protective equipment (PPE).* ***Conclusion:*** *The conclusions from the results of the study indicate that there is a risk of slipping, falling, tripping, slipping, itching, minor injuries, hearing loss, eye irritation, physical fatigue and skeletal muscle disorders experienced by workers in the process of making tofu. The industry should improve the conditions of the work environment so as to minimize the occurrence of work accidents and occupational diseases.*

Keywords: *Work Accident; Risk Assessment; Control Measures;*

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Introduction

Occupational Health and Safety (OHS) is an effort to prevent and reduce the risk of accidents and occupational diseases by recognizing things that have the potential to cause accidents and occupational diseases as well as anticipatory measures in the event of accidents and occupational diseases. Occupational safety and health are out of place so that industrial accidents often occur (Pangestu 2019)

A work accident is an unforeseen and unwanted event, which disrupts the regulated process of an activity and can cause losses to both human victims and property of the Ministry of Manpower and Transmigration of the Republic of Indonesia, 1970 (Kementrian Tenaga Kerja dan Transmigrasi RI 1970)

According to official information from the Gresik Regency Manpower Office, in 2011 in Gresik Regency there were 1,037 workers who experienced work accidents, while in 2014 the number of work accidents increased to 2,388 people. BPS Gresik.

Work accidents occur because the existing work environment and behavior still do not pay attention to OHS (Bhastary and Suwardi 2018). Ainul Yaqin Tofu Factory is a home industry located in Wringinanom District, Gresik Regency. This home industry is engaged in food production, namely tofu making. In the tofu making process, it seems to have several potential dangers, judging from the lack of awareness of the employees on OHS. Most of the employees still ignore work safety when doing their jobs.

Preliminary observations were made by researchers in order to find out firsthand a picture of environmental conditions and workers in the tofu making department at UD. Ainul Yaqin. According to one of the workers in the production department, if they have a work accident, their view or supervisor is normal and can be handled by themselves without having to be taken to the local health service. Even in the Industry, there is no follow-up or improvement regarding what can cause accidents to happen again. So it is important to know the potential dangers for workers.

Based on the description above, the purpose of this study was to identify a picture of the risk of work accidents in the tofu making process at UD. Ainul Yaqin".

Method

The type of research used is qualitative descriptive research with an observational approach. This study used total sampling with participants of 1 supervisor and 5 workers. Data collection is obtained from observations and interviews to determine a risk of danger in the tofu making process. Observations were made using the JSA method to identify hazards and risks. This data analysis technique uses data condensation, data presentation and drawing conclusions.

Results And Discussion

A. Identification of Work Accident Hazards In The Tofu Making Process at UD. Ainul Yaqin.

Based on the results of observations and interviews identifying risk hazards in the tofu making process at UD. Ainul Yaqin Wringinanom Gresik as follows.

Table 1
Hazard identification sheet

Process	Danger
Preparation	Ergonomic hazard: sack weight
	Physical hazard: uneven, muddy and slippery roads
Soaking	Physical hazard: dirty and mossy immersion troughs
	The dangers of ergonomics: monotonous activities and the position of the body bending down.
	Biological hazard: water for soaking turbid
Laundering	Physical hazard: slippery floor
	Ergonomic hazards: the activity of pouring water into the tub
	Biological hazard: water for washing soybeans
Milling	Physical hazard: slippery, mossy floor
	Physical hazard: noise
	Ergonomic hazard: lifting the milling trough.
Boiling	Ergonomic hazard: pouring porridge into the pan
	Physical hazard: putting water in the pan
	Physical danger: vapors from decoction
	Physical hazard: splashing hot water
Filtering	Physical hazard: filtering tools
	Ergonomic hazard: sticking tofu dregs into sacks
Deposition	Chemical hazard: vinegar water
	Physical hazard: slippery floor
Printing	Physical hazard: a tool for printing tofu
	Biological hazard: tofu covering fabric
Tofu cutting	Physical danger: sharp knife
	Ergonomic hazard: the position of the body when cutting

Based on the results of hazard identification in the tofu manufacturing process, it is known that there are four types of hazards, namely physical, ergonomic, biological and chemical hazards. Bahaya in tofu factory consists of physical hazards, chemical hazards, biological hazards and ergonomic hazards (State and Ningrat 2020)

Physical hazards that occur such as tubs for soaking dirty and mossy soybeans, slippery, uneven and mossy floors, the sound of a grinding machine that is very noisy, the absence of a steam suction that causes eye irritation and heat, and the tools used are still manually made of wood so that there are wood fibers that can injure workers. Meanwhile, ergonomic hazards such as the weight of sacks carried by workers, monotonous activities so that the work process becomes not ergonomic. In the washing process, workers still use buckets taken from 1 place of the water pool so that workers experience fatigue due to the severity of the water taken. Repetitive activities due to work done can cause work fatigue and can interfere with work activities (Arifin 2019)

Danger biology in the process of making tofu comes from the pond water that is in the factory and it is known that the water pool is mossy and mixed with vinegar water for tofu deposition. Similarly, the water used in the soybean washing process so that many workers experience itching or contact dermatitis. In addition, in addition to the tofu

pressing process requires mori cloth, there are mold that arise in the fabric so that the fungus can affect workers who are in direct contact with mori cloth. Research conducted by sriningsih said that as many as 44% of tofu workers in the Semarang area experienced musculoskeletal complaints on the right hand (Dayita Sriningsih, Yuantari, and Asfawi n.d.)

The results of the study support the results of this study that it is true that workers in the factory know that they are at risk of experiencing itching due to fungi. The source of chemical hazards in the tofu making process is found in vinegar acid which comes from the settling process. Many of the workers splashed vinegar acid while working because they were not careful when mixing vinegar water with tofu essence, besides that the foam produced in the settling process was simply thrown on the floor without a special place to make foam results so that it could cause the floor to slip. This is in line with research conducted by Ferdian in the tofu industry of Tangerang city stating that tofu workers are at risk of skin diseases and suffering from contact dermatitis (Ferdian 2012)

B. Risk of Work Accidents in The Tofu Making Process at UD. Ainul Yaqin

Risk assessment in terms of *likelihood* and severity based on the results of the risk assessment, 23 risks were obtained in the tofu manufacturing process at UD. Ainul Yaqin.

Table 2.
Assessment of the Risk of Work Accidents in UD. Ainul Yaqin Wringinanom Gresik

Risk	Impact	Risk assessment		
		L	S	RR
Pinched nerve	Joint pain	3	2	6
Fall	Fractures	1	3	3
Slip	Sprain	2	3	6
Non-ergonomic body position	Muscle and own pain	4	4	16
The onset of fungus on the skin	Contact dermatitis	4	2	8
Slip	Injuries	3	2	6
Pinched nerve	Skeletal muscle disorders	3	3	9
The onset of fungus on the skin	Contact dermatitis	1	2	2
Slip	Sprain	3	3	9
Noisy	Hearing loss	5	4	20
Pinched nerve	Skeletal muscle disorders	4	3	12
Pinched nerve	Skeletal muscle disorders	4	3	12
Splashed with hot water	Blistered skin	5	2	10
Face exposed to hot steam	Eye irritation	5	3	15
Splashed with hot water	Blistered skin	5	2	10
Splashed with hot water	Blistered skin	4	2	8
Pinched nerve	Skeletal muscle disorders	1	3	3
Exposure to vinegar acid	Eye irritation and itching	3	2	6
Slip	Fractures	4	3	12
Tlusupan	Wound	3	2	6
Exposure to fungi and bacteria	Hives	4	2	8
Hand scratched knife	Wound	2	2	4
Pinched nerve	Pain	3	2	6

Source: Observations and interviews

The results of the risk assessment in the tofu making process become activities that have physical, ergonomic, biological and chemical hazards and have health problems so that it is necessary to intervene by the factory owner this is in line with Law Number 1 of 1970 concerning Occupational Safety and Health which states that employers have full responsibility for occupational safety and health for their workers. The level of risk is a multiplication between events that cause losses, accidents or injuries from hazards in the workplace.

Table 3.
Level of Risk of Work Accidents

Category	Risk level	Color
1 - 3	Low	
4 - 6	Keep	
8 - 12	Tall	
15 - 25	Very high	

Source: Permenkes, (2019)

C. Efforts to Control the Risk of Work Accidents in the Tofu Making Process at UD. Ainul Yaqin

In the planning stage, the *OHSAS 18001* standard has requirements for organizations to establish control hierarchies (Lo et al. 2014). Hirarchy control is a basic stage in controlling risks and reducing the impact that can be caused by tools and work (Budiharti and Haryanto 2021).

Control efforts can be carried out starting from the industry providing safety breafing briefings to workers so that they can recognize any dangers when they come into direct contact with their work. Control through the control hierarchy is by elimination, substitution, *engineering control*, *administrative*, and personal protective equipment (PPE) (Haryandi and Setiawati 2021)

Elimination control efforts are the initial solution to control the dangers and risks that exist in the tofu making process. This is in accordance with research conducted by Santoso which states that elimination control can be done by making changes in the work process so that dangerous tasks are no longer carried out and physical dangers are eliminated (Putri, Santoso, and Rahayu 2018)

Substitution control efforts are reducing or replacing processes with lower risk ones. Because the tofu making process cannot be replaced by every stage of the process, so this study cannot use substitution control recommendations (Ramadhan 2017)

Engineering *control* efforts can be carried out by maintaining work equipment regularly to avoid damage to tools or machines during the tofu and electrical equipment manufacturing process, which is ensured to be safe to avoid short circuits due to wet and open places. This is in accordance with the research conducted by Dewi. Stating that in the tofu manufacturing process, technical control is needed for the maintenance of work and electrical equipment to avoid events that cause work accidents (Dewi et al. 2018)

Administrative control can be done by means of an improved work environment This is supported by research conducted by Utami which states that providing administrative control in the form of cleaning the work environment, arranging work facilities to avoid work accidents (Dewi and Ikhssani 2021)

This last control effort through the wearing of PPE can be done by providing personal protective equipment that complies with safety standards such as masks, gloves, boots, aprons and ear plugs, because appropriate PPE can serve to reduce exposure from the work environment. This is in accordance with the Regulation of the Minister of Manpower and Transmigration Number PER.08 / MEN / VII / 2010 concerning personal

protective equipment (PPE) is a device that has a function to protect part or all of the worker's body from potential hazards in the workplace.

Conclusion

Identify hazards in the tofu manufacturing process at UD. Ainul Yaqin contains physical hazards, ergonomic hazards, biological hazards, and chemical hazards. Risk assessment of the tofu manufacturing process at UD. Ainul Yaqin received a total of 23 hazard risks that can cause occupational accidents and occupational diseases (PAK). A very high risk exists in the process of soaking, grinding and boiling. Efforts to control the risk of occupational accidents in the tofu manufacturing process at UD. Ainul Yaqin in accordance with the hierarchy of control is elimination, substitution, *engineering control*, administration and PPE.

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