

## OPTIMIZATION OF OCCUPATIONAL HEALTH AND SAFETY IMPLEMENTATION IN THE AGRICULTURE FACULTY LABORATORY OF SRIWIJAYA UNIVERSITY

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### ABSTRACT

*Working in a laboratory is inextricably linked to the various potential hazards. The majority of workplace accidents are the result of unsafe behavior, with the remainder being the result of unsafe working conditions. The purpose of this study was to determine the extent of the application of occupational safety and health in laboratories within the Faculty of Agriculture, Sriwijaya University and to find out the obstacles to the application of occupational safety and health. This research is a descriptive study with a qualitative approach. The data was collected by means of interview, observation and documentation, then data analysis was carried out which included data collection, data reduction, data presentation and data verification. This research was conducted in nine laboratories in the Faculty of Agriculture, namely the Agricultural Cultivation Laboratory, Agricultural Product Technology Laboratory, Plant Pest and Disease Laboratory, Soil Laboratory, Aquaculture Laboratory, Agricultural Product Technology Laboratory, Animal Nutrition and Feed Laboratory. Based on the results of the research that has been obtained, it can be concluded that the overall percentage of questionnaire results is 54% who answered yes and 46% answered no. This means that most of the Agricultural Faculty laboratories have not implemented OHS properly. Researchers hope that this research can optimize the application of safety and occupational health in the laboratory so that it can reduce the number of work accidents in the laboratory.*

**Keywords:** Occupational Health Safety, laboratory, work accidents

### INTRODUCTION

The laboratory is an academic support unit in an educational institution that is managed systematically for practicum activities using equipment and materials based on certain scientific methods in the context of implementing education, research, and community service. The practicum class is an important part of the curriculum because it emphasizes students' psychomotor (skills), cognitive (knowledge), and affective (attitude) aspects, allowing them to put the theory being studied to the test in greater detail and increase their interest in the field being studied.<sup>(1),(2)</sup>

Working in a laboratory is inextricably linked to the various potential hazards posed by chemicals. Furthermore, it is not uncommon for laboratory equipment to pose a high risk of harm to the practitioner.<sup>(3),(4),(5)</sup> The majority of workplace accidents are the result of unsafe behavior, with the remainder being the result of unsafe working conditions.<sup>(6)</sup>

Occupational Health and Safety (OHS) is a method of creating a workplace that is safe, healthy,

and free of environmental pollution, in order to reduce and/or eliminate occupational accidents and diseases, which in turn can increase work efficiency and productivity. OHS is important to implement because it prevents and reduces the risk of work accidents caused by laboratory managers' lack of awareness of OHS implementation and laboratory infrastructure that does not follow OHS.<sup>(7),(8),(9)</sup>

Occupational health is organized to achieve optimal productivity including occupational health services, prevention of occupational diseases and occupational health requirements. In essence, it is the harmonization of work capacity, workload and the environment that each workplace must maintain.<sup>(10)</sup> Work safety is an effort to prevent and reduce the number of work accidents, fires, explosion hazards, occupational diseases, environmental pollution which generally causes loss of life, time and property for workers and the people living in their environment<sup>(11),(6)</sup>

Given the large risk of accidents and health problems that can occur as a result of existing activities in the laboratory, it is very necessary to

optimize the application of good and correct laboratory OHS according to procedures.<sup>(12)</sup> The Faculty of Agriculture, Sriwijaya University has 7 (seven) laboratories that are active in practicum and research activities. Therefore, it is necessary to optimize the application of OHS through good management of laboratory OHS.

## RESEARCH METHODS

This research used a qualitative approach and descriptive observational to determine the laboratory conditions, whether it has implemented OHS properly or not. Observations were made in various laboratories at the agriculture faculty, Sriwijaya University. The questionnaire was conducted by distributing to laboratory assistants the required data regarding the completeness of OHS in the laboratory.<sup>(13)</sup> This method was designed to describe everything related to the research topic; data was collected in the form of words rather than numbers.<sup>(14),(15)</sup>

The data obtained from the laboratory assistant of the agriculture faculty at Sriwijaya University's observations and questionnaires were then collected and recapitulated into:

1. General occupational health and safety,
2. Security,
3. Floors/roads passing by,
4. Lighting and room temperature,
5. Hazardous materials (b3),
6. Storage,
7. Workplace layout,
8. Electrical equipment,
9. Room safe,
10. Fire fighting and building construction.

## RESULT AND DISCUSSION

### 1. General Occupational Health and Safety

This category aims for workers and users to know the instruments that protect workers, and users from the dangers of work accidents. There were 5 points surveyed in the seven categories of laboratories that were surveyed regarding general occupational health and safety, with a perce.

### 2. Security

Security is crucial in laboratories because there is a lot of expensive equipment there, and laboratories are frequently visited for research and practicum. As a result, having Closed Circuit Television (CCTV) cameras in the laboratory is essential. However, only two of the seven laboratories have CCTV. Despite the fact that CCTV is an extremely useful security and monitoring tool in the laboratory.

Furthermore, when combined with biometric technology, such as retinal, fingerprint, face, and DNA biometrics, as well as behavioral biometrics such as voice, gesture, and typing, CCTV can be used to limit and secure access to laboratories.<sup>(16),(17)</sup> This technology assists in limiting the number and duration of people who are permitted to enter the laboratory.<sup>(18)</sup>

### 3. Floor/Passing Street

In the water questionnaire, 75% said yes and 25% said no to passing floors/roads. The floors/roads passing through the faculty of agriculture's laboratory are in good condition, with no signs of wet floors or being repaired. The laboratory floor must be flat, not slippery, and easy to clean, as well as impermeable, resistant to the chemicals, and disinfectants used in the laboratory; for example, vinyl or linoleum are suitable materials for floors.<sup>(19),(20),(21)</sup>

### 4. Lighting and Room Temperature

Lighting is very important, especially in microbiology or analysis laboratories that use light intensity, for example a refractometer. All laboratories that were surveyed were well lit. The lighting standard that has been set by SNI 03-6575-2001 is 300-500 lux.<sup>(22)</sup> Different areas of the laboratory may have different lighting requirements, but all activities must have adequate lighting. Emergency lighting must be bright enough and available for a long enough period of time to ensure safe exit from the laboratory.<sup>(21)</sup>

The problem is that, some laboratories don't have air conditioning, so the room temperature can't be controlled. Based on the applicable provisions, ventilation in the laboratory room must be provided either in the form of windows (natural ventilation) or air conditioning (artificial ventilation).<sup>(22),(23)</sup> The use of air conditioning is primarily intended to obtain the optimal temperature required in the testing and/or calibration process, as well as to protect instrumentation equipment and other spaces that do not allow artificial ventilation. The need for air conditioning in the laboratory room is calculated as 1 PK for 20 m<sup>2</sup> to obtain the optimal temperature.<sup>(21)</sup>

According to SNI 03-6572-2001 concerning procedures for designing ventilation and air conditioning systems in buildings, natural ventilation provided must consist of permanent openings, windows, doors or other means that can be opened, with the number of ventilation openings not less than 5% of the total ventilation openings. floor area of the room that requires ventilation.<sup>(24),(25)</sup>

### 5. Hazardous Materials

From the results of the water questionnaire survey, all laboratories have a cupboard for storing

chemicals, it's just that all surveyed laboratories do not have a material safety data sheet (msds) and there is no standard operating procedure (SOP) on the management of chemicals. All hazardous materials, such as chemicals, require proper storage, even if they will be used in a future experiment.<sup>(26)</sup>

#### 6. Storage

In this category, 100% answered yes. This explains that all laboratories have storage facilities such as shelves and cabinets for storing chemicals and documents. Storage facilities are required in a laboratory room to ensure that everything is in order and that accidents do not occur.<sup>(27)</sup> Chemical storage and inventory are divided into solids, liquids, strong acids, and others. The grouping must be accompanied by an inventory, data on each chemical, its stock, and a control card.<sup>(28)</sup> This laboratory's cabinets and storage lockers are neatly arranged and closed to prevent items from falling.<sup>(29)</sup>

#### 7. Workplace Layout

In this category, it can be seen that there are computer or laptop facilities for the laboratory. But there are several laboratories such as Aquaculture laboratory, Fishery product technology laboratory and animal husbandry laboratory, do not have separate special rooms. All laboratories do not have a telephone network.

#### 8. Electrical equipment

The electrical installation has been installed properly, because electrical work can result in serious accidents and complications with high risk.<sup>(30),(31)</sup> The power supply must be kept out of wet areas and the installation must adhere to local electrical safety regulations.<sup>(21)</sup> However, there are still many SOP regarding electricity that the laboratory does not have.

#### 9. Safe room

According to the responses, the Agriculture Faculty laboratory does not yet have emergency exits, double-locking doors, or telephones in every room (32% said yes and 68% said no).

#### 10. Fire Management and Building Construction

Every laboratory does not have a fire alarm system. Although several laboratories have fire extinguishers, the equipment has never been checked on a regular basis. The laboratory also does not have personal protective equipment (PPE) in case of an electric leak. In fact, there has been Law No. 1 of 1970 concerning Occupational Safety and Health, such as PPE or work safety for electrical workers and users of electricity services.<sup>(1)</sup>

Personal protective equipment is an important part of the application of occupational safety and

health in the laboratory; work accidents can occur if you do not follow the principle of "unsafe condition and unsafe action".<sup>(32)</sup>

Electrical work safety is the responsibility and obligation of everyone who provides, serves, or uses electricity,<sup>(33),(34)</sup> for example class C fire extinguishers, which shoot a very fine non-flammable and non-conductive powder to extinguish electrical fires, should be kept in the laboratory in case of an emergency.<sup>(35)</sup> Furthermore, safety lanes and emergency exits of laboratory must be clear of obstructions, open holes must be closed or secured.<sup>(36)</sup>

### CONCLUSION

Based on the results of the research that has been obtained, it can be concluded that the overall percentage of questionnaire results is 54% who answered yes and 46% answered no. This means that most of the Agricultural Faculty Laboratories have not implemented OHS properly.

### SUGGESTION

Hopefully, the university will be able to improve and readjust the conditions of each laboratory based on the laboratory standards and laboratory K3 regulations set by the government, so that the laboratory becomes an even safer place and the implementation of laboratory K3 goes well.

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