



اَبُو سَيِّدِي تَكْوَلُ لِي مَا اَنَا
UNIVERSITI
TEKNOLOGI
MARA



PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIIICaS 2024)



*“Flourish and Nurturing Sustainable
Innovation for a Prosperous Nation”*

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e ISBN: 978-967-0033-25-9



**Published in Malaysia by
Universiti Teknologi MARA Cawangan Johor
Kampus Pasir Gudang
81750 Masai**



Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students and get some ideas to develop future innovation products.

Foreword Rector



Assalamualaikum warahmatullahi Wabarakatuh,
Salam Sejahtera, Salam Malaysia MADANI and
Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most Merciful.

It is a great honor to welcome you to the Johor International Innovation, Invention, Competition, and Symposium 2024 (JIIICaS 2024). This event

connects various disciplines, focusing on education and engaging educators, students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and determination to turn those ideas into reality. The remarkable projects showcased today highlight the dedication and spirit of all participants. Initiatives like this not only explore new technologies but also cultivate skills and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor Branch, we are fully committed to fostering a dynamic culture of innovation, promoting the commercialization of new products, and encouraging meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all sponsors, judges, the College of Computing, Informatics and Mathematics, UiTM Pasir Gudang Campus as the event organizer, as well as to the researchers and participants for their hard work in making this event a success. Let us continue striving for innovation and excellence. May the ideas presented today inspire us and lay the groundwork for future achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
Johor Branch

(A-SS035) SUSTAINABLE INTEGRATION: BUILDING A DIRECT COMPOST TUNNEL TO PRODUCE CHICKEN BRAN AND ENHANCE RESOURCE EFFICIENCY

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ABSTRACT

This project aspires to create a sustainable waste management system by constructing a direct compost tunnel to the chicken coop and producing chicken bran from the compost waste simultaneously. It suits those who want to breed chicken by using organic waste. By minimizing organic waste, compost waste is added to poultry feed to increase its nutritional value and encourage resource efficiency. Through this innovative approach, the project aims to improve the environmental sustainability of the chicken coop while also providing a cost-effective method for feed production. This procedure includes developing and constructing the compost tunnel, monitoring the composting process, and analyzing the chicken bran's nutritional quality. We expect that this technology will have a major positive impact on feed savings, waste reduction, and overall environmental effect mitigation. This product is useful to anyone especially those who wish to begin farming chickens on a small scale.

Keywords: compost, organic waste, cost-effective, sustainable

1.0 INTRODUCTION

Building A Direct Compost Tunnel to Produce Chicken Bran and Enhance Resource Efficiency. Introducing a new product that is not sold yet in the market. a product built specifically for chicken breeders or people who like raising chickens for fun. This innovation is designed to increase the chicken coop's environmental sustainability while offering an affordable feed production alternative. According to (Agrifoodsa, 2021), this is in line with this article that states poultry feeding system will ensure chicken get their daily portion at the right time. So, the modern features of this product help ease the process of feeding chickens. The features include the design and construction of the composting tunnel, the observation of the composting process, and the nutritional analysis of the chicken bran. These modern and advanced features help solve problems like the hassle of transporting compost from the compost pile to the chicken coop, waste food that often goes to waste, inconsistent feeding time, etc. With its sophisticated features and stylish design, this device

makes the daily tasks of a chicken breeder easier.

2.0 OBJECTIVE

This objective is to provide an overview of the project, emphasizing the importance of sustainability, chicken health, and environmental care. Firstly, this system is to promote sustainability and waste reduction. According to (Klaudia.H, 2023), this study aims to develop a direct compost tunnel system integrated with chicken coops to recycle organic waste into nutrient-rich compost effectively. By fostering a circular economy approach, our objective is to minimize organic waste generation and promote sustainable farming practices. Next is to improve chicken health and nutrition. Our objective is to enhance the nutritional content of chicken feed by incorporating compost-derived chicken bran. According to (Lewis, 2021), through the utilization of natural nutrients found in compost, such as black soldier fly larvae and organic materials, we seek to improve chicken health and well-being while reducing reliance on commercial feed additives. Lastly, is to foster environmental stewardship. This study seeks to promote environmental stewardship by encouraging composting as a means of waste management, reducing reliance on synthetic fertilizers, and minimizing environmental pollution associated with conventional farming practices. By integrating waste reduction with feed production, our objective is to contribute to a more sustainable and environmentally conscious approach to poultry farming aligned with (Klaudia.H, 2023).

3.0 METHODOLOGY

The methodology includes choosing a suitable site for the chicken coop for the construction of a compost tunnel to ensure easy access and proper drainage. After a site is selected, the compost tunnel is built with basic materials like wire mesh and wood with a focus on providing enough insulation and ventilation. According to (US EPA, 2015), Organic waste materials such as kitchen scraps, green waste, and chicken manure, are then layered inside the tunnel to initiate the composting process. Regular turning of the compost pile facilitates decomposition and aeration. As the compost matures, it observes the temperature and moisture levels to ensure optimal conditions for microbial activity. After matured, the compost is collected and turned into chicken bran via a grinder or other such machinery. Feeding trials take place to determine the hens' health response and acceptance of the new bran. Throughout the whole process, the evaluation of feed production efficiency, waste reduction, and chicken performance metrics during the process offers important information about the compost tunnel system's overall effectiveness. Details documentation procedures and outcomes are included to allow ongoing enhancement and replication of the procedure in similar contexts.

An example of a Figure is given below.

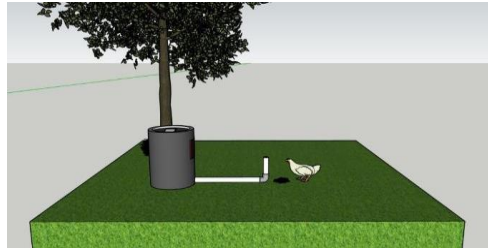


Figure 1: Mock-up of the direct compost to chicken coop

4.0 RESULTS

According to (Run-Chicken, 2023), one of the issues for chicken producers is environmental contamination. Chicken coops produce a lot of rubbish, including droppings, bedding, and food scraps. Improper disposal can produce unpleasant aromas, attract bugs, and harm the environment. Furthermore, many poultry owners face space constraints while composting, especially in urban or suburban regions with little outdoor space. Chicken excrement contains nutrients that can be collected and used to improve soil fertility.

Direct compost to the chicken coop with tunnel is the solution to this problem. Implementing a direct composting system within the chicken coop, particularly with a tunnel design, may solve food waste issues while increasing space efficiency and nutrient recycling. A designated area within the coop is allocated for composting, featuring multiple bins or compartments for different stages of the composting process. This area is strategically placed to allow easy access for adding new waste materials, turning the compost, and harvesting finished compost.

A recent survey on direct composting to chicken coops showed highly satisfied replies from those who found it advantageous. This indicates that the innovative idea of adding compost directly to the chicken coop will result in healthier chickens.

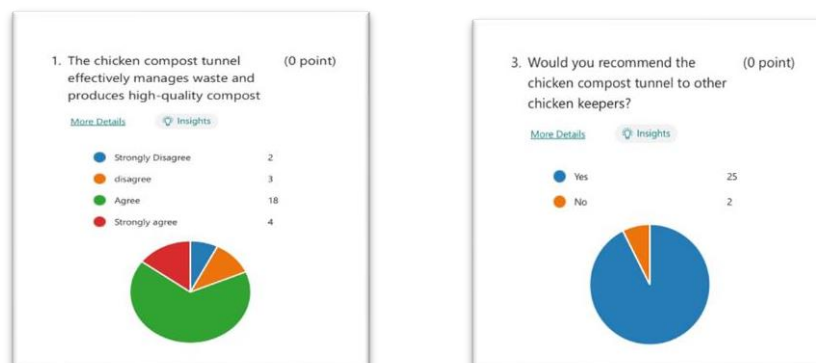


Figure 2: The result shows how interested respondents are in building a direct compost to chicken coop and how far the agree with this product.

5.0 CONCLUSION

To sum up, this project is able to compost directly to the chicken coop using the tunnel system which is a great idea for addressing the critical issue of food waste problem and chicken health. This project also shows that composting, raising chickens, and soil enrichment are all combined into a single, harmonious system in this method, which has several advantages, from cost savings and organic pest control to trash reduction and nutrient recycling. This direct-compost-to-chicken coop using a tunnel system is a new creative method that can be used to reduce the environmental effects of food production and waste generation. Therefore, this project shows that the use of this new system will give many benefits such as saving the breeder's time and chicken feeding schedule more organized. Lastly, hopefully, this new system will receive a high response from all parties, especially for new breeders.

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