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Cite as: AIP Conference Proceedings 2572, 020006 (2023); <https://doi.org/10.1063/5.0118752>  
Published Online: 12 March 2023

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# Eco Enzyme Sustainable Living Product based Halal Lifestyle in Ternate

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**Abstract.** This research created an innovative product made from fruit peels and unused vegetable residues (household waste). This product is called eco enzyme. In this study, eco-enzymes were made by taking into account the indicators of halal production with all processes from production, processing and distribution of products according to sharia. Used a weak experiment research method. The subjects of this study were students of Tadris Biology IAIN Ternate, as many as 60 students. As a result of this activity, students understood the concept of halal living as a lifestyle and can produce eco enzymes as an environmental conservation action based sharia.

## INTRODUCTION

The development of the 21st century was affected by the Covid-19 outbreak that attacked the whole world. It has been almost two years since the world has been hit by this virus. The latest threat to global health is the ongoing outbreak of a respiratory disease called *Coronavirus Disease 2019* (Covid-19). Covid-19 was discovered in December 2019. It was quickly shown to be caused by a new coronavirus that is structurally related to the virus that causes severe acute respiratory syndrome (SARS). As in the two previous cases of coronavirus disease emergence in the last 18 years SARS (2002 and 2003) and Middle East respiratory syndrome (MERS) (2012 to present) the Covid-19 outbreak has posed critical challenges to public health, research and the medical community<sup>1</sup>. As the COVID-19 pandemic continues to change lives and ways of life around the world<sup>2</sup>.

In addition to the stresses inherent in the disease itself, the directives for mass isolation at home (including stay-at-home orders, quarantine and isolation) are new to Indonesians and raise concerns about how people will interact individually and in groups. A recent review of psychological symptoms in a sample of quarantined persons and health care providers may find useful in revealing many emotional outcomes, including stress, depression, irritability, insomnia, fear, confusion, anger, frustration, boredom, and stigma associated with quarantine, some of which survived after quarantine<sup>3</sup>. Longer confinement durations, inadequate supplies, difficulties in obtaining medical care and medicines, result in financial losses.

In the current pandemic, the confinement of the public at home for an indefinite period, the disparity between stay-at-home orders issued by various jurisdictions, and conflicting messages from governments and public health authorities are likely to increase the pressure<sup>4</sup>. Indonesia is a country with a majority Muslim population in the world. This is one of the strengths for Indonesia to apply *halal lifestyle* a leading global. Potential sectors to be developed in Indonesia include food and beverage, tourism, fashion, media and recreation, pharmaceuticals and cosmetics, and Islamic finance. This sector, especially in Indonesia, is an advantage, this is due to the dominance of the population, especially in areas where the majority of the population is Muslim. Halal and haram in various ways related to whether or not something is permissible<sup>5</sup>.

In the Qur'an, the verses that mention the word halal, namely in the QS Al-Baqarah verses 168, 172, 187, 275; QS Ali Imran verses 50, 93; QS An-Nisa verse 160; QS Al-Maidah verses 1, 4, 5, 87, 88, QS AnNahl verses 66-69, 114-115; QS Thaha, verse 81; QS Al-Hajj verses 27-28; QS Al-Mukminun, verse 51; QS Yasin verses 33-35, 71-73, QS Al-A'raf, verse 157, and others. Based on these verses, it is clear the definition of halal and haram, where everything that is good (body, mind, and soul) is halal, while everything that brings danger (body, mind, and soul), then the law is haram<sup>6</sup>. Halal-haram for Muslims, this relates to how it affects the current life and also life after death<sup>7</sup>. In other words, for Muslims, halal-haram is related to maintaining health and maintaining obedience. As for non-Muslims, halal haram is only related to how aspects of life in this world are fulfilled, without paying attention to how life after death<sup>8</sup>. Based on this, researchers have alternatives to develop a product where this product can be produced. or made by anyone.

This product is called *eco-enzyme*, which is a processed product from household waste such as fruit peels and vegetable waste, which is easy to make. Making *eco-enzymes* can also overcome environmental pollution from household waste. According to the results of an interview with the Head of the Ternate Environment Agency, it is known that the consumption of TPA (a final waste disposal site) during the PPKM period due to COVID-19 was 100-120 tons/day, the standard for TPA consumption when there was no covid was around 80 tons/day. The Ternate millennial generation can be entrepreneurial in producing *eco-enzymes* as well as having the ability to solve real problems that will be faced in the present and in the future during the covid-19 pandemic. The millennial generation is expected to be able to solve environmental problems by applying concepts they have from various related sciences, in accordance with the verse of the Qur'an Surah Qashash: 77 which means "*And do not do mischief (on) the earth. Verily, Allah does not like those who do mischief*". The verse clearly explains that Allah SWT does not like people who do mischief on earth. Based on this explanation, it is important to develop *eco-enzyme living products* based on *halal lifestyle* during the COVID-19 PPKM period in Ternate.

## RESEARCH METHODS

This research used qualitative methods and descriptive research types. In conducting the research, the writer uses research steps, literature, field research with observation and questionnaires. Sources of data and data collection comes from primary and secondary data collected by means of questionnaires, literature studies and Likert scale. The subjects of this research are Biology students at IAIN Ternate was 40 students.

## RESULT DAN DISCUSSION

### Result

There are problems faced in the midst of the Covid-19 pandemic, namely starting to sluggish economy, household waste increased, the people of Ternate are too proud to be entrepreneurs, lack of public knowledge of reprocessing household organic waste so that it is of sale value, consumption increases but lack of interest in increasing money income by entrepreneurship

### Discussion

In 2003, a doctor from Thailand received an award from the FAO (UN agency that deals with food red) Regional Thailand for his discovery called *eco-enzyme*<sup>9</sup>. In Indonesian we call it *ecoenzyme*. This discovery was an attempt by Dr. Rosukon Poompanvong for the environment by helping local farmers to obtain better yields while being environmentally friendly. Ecoenzymes have multiple benefits. By utilizing organic waste as raw material, then mixed with molasses sugar and water, the fermentation process produces gas O<sub>3</sub> (ozone) and the end result is a

cleaning fluid and fertilizers that are environmentally friendly, and will reduce the greenhouse effect and global warming<sup>10</sup>.

*Eco Enzyme* can be a multipurpose liquid and its applications include households, agriculture and livestock. Basically, *eco enzyme* accelerates bio-chemical reactions in nature to produce useful enzymes using fruit or vegetable waste. Enzymes from "garbage" is one way of waste management that utilizes kitchen scraps for something very useful. This liquid can be used as a house cleaner, as well as an effective natural fertilizer and pesticide. Enzymes convert ammonia into nitrate (NO<sub>3</sub>), a natural hormone and nutrient for plants. Meanwhile it converts CO<sub>2</sub> into carbonate (CO<sub>3</sub>) which is beneficial for marine plants and marine life.

Based on this explanation, we conducted community service-based research on Biology Tadris students at IAIN Ternate. The activities carried out are provide entrepreneurship training, provide training on making eco enzyme, provide knowledge about halal products and provide training on the application of halal life style in daily life

### *Eco Enzyme Sustainable Living Product based Halal Lifestyle in Ternate*

This ECE based Halal used the LPPOM MUI HAS 23000 halal rules (Halal Assurance System), the results of the research are as follows; management is carried out by students and lecturer; the training is in the form of training in making ECE; the material is using raw materials for waste banana peels, watermelon skins, cassava peel, tomato, orange peel, salak fruit and bark. Then add distilled water and coconut sugar. All ingredients are mixed in a 7 liter bucket, and allowed to stand for 3 months without contamination from the outside; product facilities is manufacture of products in the Biology laboratory of the IAIN Ternate campus. Using kitchen utensils, such as knives, spatulas, duct tape, buckets, scales, measuring cups; the product we named this ECE ByE (Biology Enzyme); written procedure fruit peel waste is obtained in the market. The skin is still fresh, not rotten, because it can affect ECE products. The material is washed clean to avoid other microbes. During fermentation, ECE is stored in the laboratory, not contaminated with heat or air conditioning and tightly closed using duct tape. During product manufacture and product marketing, when the call to prayer is recited, prayer is required first; products are marketed through whatsapp, instagram, facebook, and directly to consumers by selling ECE; Handling of products that do not meet the criteria: If the ECE product does not meet the criteria or is constrained by the presence of other microbes in the ECE, improvements will be made by adding palm sugar to the ECE; Internal audit identification of improvements in management is carried out every two weeks when controlling and opening the ECE cover so that oxygen air produced from the fermentation process comes out and does not cause an explosion.; management evaluation is also carried out every two weeks so that students can apply the Maqasid Shari'ah halal lifestyle. Halal Lifestyle follows salient point<sup>11</sup>: concept, what, how, for whom, knowledge, motivation, and stakeholder.

## CONCLUSION

ECE sustainable living product has passed procced halal treatment and based on halal lifestyle in Ternate. Tadris Biology were Tadris Biology can implemented Shari'ah Maqasid Lifestyle kosher, where they did teamwork with regard halal product planning process, manufacture and marketing of products.

## ACKNOWLEDGMENTS

The authors would like to thank IAIN Ternate, LITAPDIMAS and all reviews those who have provided financial and moral support for this research.

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