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UTILIZATION OF BIOTECHNOLOGY FOR FOOD BASED ON HEALTH PRINCIPLES

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Abstract

The main background of this research is the discovery of health risks from the use of biotechnology for food. Based on this background, the study aims to find out whether the use of biotechnology for food has been carried out based on the principles of the right to health. Using this type of empirical legal research, it finds that legally the use of biotechnology for food was following the laws of the right to health using the instrument of Safety Certificate and Food Circulation Permit. Businesses that produce and/or trade-in genetically modified food products must have a Certificate of Safety and Food Distribution Permit as a form of legal responsibility to fulfil and respect the right to health as a human rights.

Keywords: *Biotechnology, Food, Right to Health.*

Introduction

Utilization of biotechnology for food is not new but has been going on for 6000 years to make food products such as bread and cheese and preservation of dairy products.¹ Food products from the use of biotechnology that we often consume or are familiar with such as tempe, oncom, bread, nata de coco, tapai, beer, wine, yoghurt, cheese, pickles, tauco, soy sauce, shrimp paste, vinegar, and bongkrek tempeh.²

Utilization of biotechnology for food has resulted in an increase in the amount of food for the world's population, which also continues to grow and increase the quality of food.³ This is important according to the results of psychology, neuroscience, and sociology research; humans have six basic needs including food,

¹ www.bio.org, *What Biotechnology?*, accessed at 5th January 2019.

² www.ebiologi.net, *Bioteknologi Pangan: 15 Contoh Produk yang Dhasilkan*, 23 Februari 2016, accessed at 5th January 2019.

³ California Council on Science and Technology, *Benefits and Risks of Food Biotechnology* (California: California Council on Science and Technology, 2002), p. 5.

water, shelter, sleep, other requirements such as physical and emotional relationships between adult humans, and novelty that creates opportunities for learning and potential for failure. which stimulates the release of dopamine to the brain.⁴ Food becomes a basic human need at the top position because every day, the human body needs calories and various nutrients, including protein, fat, and carbohydrates for growth, function, and repair. Without food, the human body will stop growing.⁵ Based on data from the World Health Organization and the United States Department of Agriculture the benefits of genetically modified food include resistance from insects, resistance from herbicides, resistance to disease, nutrition and other improvements, as well as other benefits such as the use of plants for detoxification of soil and underwater land, and conservation of natural resources.⁶

On the other hand, food derived from the use of biotechnology is full of risks, including food safety risks, environmental risks, other social risks, and ethical issues for food consumers.⁷ Food resulting from a genetic modification that is not safe for consumption has health risks, including four categories, namely allergies, toxicity, nutritional inequality, and reduced food diversity.⁸

Prevention and reduction of food risks resulting from genetic modification do through education, the right to know, and the choice of choices to consumers.⁹ In the long term, food development that utilizes biotechnology must pay attention to aspects of the right to health owned by consumers. The right to health is a human right recognized in the 1946¹⁰ Constitution of the World Health Organization and the Universal Declaration of Human Rights that was accepted and announced by the General Assembly of the United Nations on December 10, 1948, through resolution 217 1 (III) of Article 25 paragraph (1).¹¹ In Indonesia, the 1945 Constitution of the Republic of Indonesia regulates it in Chapter XA on Human Rights in Article 28H paragraph (1).¹²

The recording of biotechnology for food must base on the principles of the right to health to prevent violations of the right to health that have been guaranteed by law and prevent adverse effects with potential losses more significant than the benefits derived from the use of biotechnology itself. From a legal perspective, the use of food biotechnology based on the principles of the right to health must be enshrined in the law so that it has the force to do so.

Based on the above description, the formulation of a main problem in this study: how is the use of biotechnology for food based on the principles of the right to health? From this primary problem formulation, subproblem formulas establish:

1. Is the use of biotechnology for food now based on the principles of the right to health?
2. Does the current Indonesian legal system regulate the use of biotechnology for food based on the laws of the right to health?
3. How is the renewal of the existing legal instruments to control the use of biotechnology for food based on the principles of the right to health?

⁴ www.forbes.com, *Six Fundamental Human Needs We Need To Meet To Live Our Best Lives*, 5 Februari 2018, accessed at 4th January 2019.

⁵ *Ibid.*

⁶ Deepa Arya, *Genetically Modified Foods Benefits and Risks* (Massachusetts: Massachusetts Medical Society, 2015), p. 3.

⁷ California Council on Science and Technology, *op.cit.*, p. 6.

⁸ International Union of Nutritional Sciences, *Statement on Benefits and Risks of Genetically Modified Foods for Human Health and Nutrition*, www.iuns.org, accessed at 5th January 2019.

⁹ Ricki M. Helm, *Food Biotechnology: is this Good or Bad? Implications to Allergic Diseases*, Ann Allergy Asthma Immunol, Volume 90, June 2003, p. 90.

¹⁰ World Health Organization, *Health is a Fundamental Human Right*, www.who.int, accessed at 6th January 2019.

¹¹ www.un.org, Universal Declaration of Human Rights, accessed at 4th January 2019.

¹² Provisional People's Consultative Assembly of the Republic Indonesia, *Undang-Undang Dasar Negara Republik Indonesia Tahun 1945* (Jakarta: Sekretariat Jenderal MPR RI, 2011), p. 154.

Materials and Methods

This research is empirical legal research that is legal research related to the application of the law in practice¹³ whose purpose is to find the operation of law in non-legal practice on paper.¹⁴ Empirical legal research use to find the workings of legislation related to the use of biotechnology for food based on the principles of the right to health.

The data used are secondary data that is data that has been collected and analyzed by others.¹⁵ The secondary data includes publications by the government which have the authority in the form of laws and regulations relating to the use of biotechnology for food and health as well as publications without authorisation, namely the results of reports from government agencies or agencies whose tasks and authority relating to the use of biotechnology for food and health. Other secondary data include journal articles, research reports, as well as textbooks on law, biotechnology, food, and health.

The Discussion

Food is a unique basic human need. Without adequate food, humans will face many risks, especially health risks and deaths from starvation. Utilization of biotechnology for food has increased the amount, and preserved food products are beneficial for humans in conditions of growing levels of need for food in line with the continued growth of the human population.

Biotechnology offers increased agricultural productivity, or increased quality and nutritional characteristics and its processing which can contribute directly to improving human health and development. From a health perspective, the indirect benefits of biotechnology include reducing the use of agrochemicals and increasing agricultural income, crop sustainability, and food security, especially in developing countries.

Food from the use of biotechnology needs to increase given the various benefits, namely:¹⁶

1. Pest resistance. Growth in the use of biotechnology helps eliminate the use of chemical pesticides by farmers who are potentially hazardous to health and runoff of agricultural waste from excessive use of chemical pesticides and fertilizers that can poison water forces and damage the environment.
2. Herbicide tolerance. Plants that genetically engineered to be resistant to one powerful herbicide can help prevent environmental damage by reducing the amount of herbicide needed.
3. Resistance to disease: There are many viruses, fungi, and bacteria that cause plant diseases. Plant biologists work to make genetically modified plants that have resistance to this disease.
4. Cold tolerance. Antifreeze genes from raw water fish have incorporated into plants such as tobacco and potatoes. With this antifreeze gene, this plant can tolerate cold temperatures which will usually kill unmodified seeds.
5. Drought tolerance/salinity tolerance. As the world population grows and more land use for housing than food production, farmers need to plant crops in locations that were not suitable for growing crops. Creating plants that are resistant to prolonged drought or high levels of salt in the soil and groundwater will help people plant crops in places that were not plant-friendly before.
6. Nutrition. Malnutrition is common in developing countries where poor people depend on one type of plant, such as rice for their staple food. However, rice does not contain sufficient amounts of all the

¹³ Mathias M. Siems dan Daithi Mac Sithigh, *Mapping Legal Research*, The Cambridge Law Journal, Vol. 71, Issue 03, November 2012, p. 655.

¹⁴ Aikaterini Argyrou, *Making the Case for Case Studies in Empirical Legal Research*, Utrecht Law Review, Volume 13, Issue 3, 2017, p. 97.

¹⁵ C.R. Kothari, *Research Methodology Methods & Techniques*, Second Revised Edition (New Delhi: New Age International Publishers, 2004), p. 111.

¹⁶ Food Safety Department World Health Organization, *Modern Food Biotechnology, Human Health and Development: an Evidence-Based Study* (Geneva: World Health Organization, 2005), p. 2.

nutrients needed to prevent malnutrition. If rice can genetically engineer to contain additional vitamins and minerals, nutrient deficiencies can reduce.

7. Medicines and vaccines are often expensive to produce and sometimes require special storage conditions. Biotechnology use to develop edible vaccines in tomatoes and potatoes. These vaccines will be far easier to send, store and manage than traditional vaccines that can inject.
8. Phytoremediation. Plants such as poplar trees have been genetically engineered to clean up heavy metal pollution from contaminated soil.¹⁷

However, biotechnology is not free from potential adverse effects. The use of biotechnology for food is full of risks, such as risks to the environment and human health. The World Health Organization has identified three main problems of concern to human health relating to genetically modified foods as follows.

1. Allergy. Foods that result from the use of biotechnology have the potential to cause allergic reactions in general; this risk is comparable to threats originating from the menu from traditionally grown plants. However, proteins produced by newly introduced genes have the potential to cause additional allergic responses.
2. Gene Transfer. Biotechnology food has the potential to cause the transfer of genetic material to cells of the human body or bacteria in the intestinal tract. DNA from digested food not completely degrade by digestion and small fragments of DNA from biotechnology foods are found in various parts of the digestive tract.
3. Out-crossing is the movement of genes from genetic modification plants to traditional plants or related species in the wild. In cattle, outcrossing is a cross between livestock in a nation but does not have a kinship.¹⁸

Recognizing the potential risks of food resulting from the use of biotechnology on human health, its purpose and development must be carried out with due regard to the right to health. The principles of the right to health form the basis of the regulation and use of biotechnology for food to prevent the risks to health.

Based on the legal perspective, the instrument used to ensure that the use of biotechnology for food has taken into account the right to health is the Safety Certificate and Food Circulation Permit. The genetically engineered food that already has the certificate and permit is legally meant to be following the principles of the right to health unless it is proven later on the contrary. Safety Certificate and Food Distribution Permit give for genetically modified food after passing the testing and research process, one of which is the safety aspect of human health. If later it is found that the food produced by biotechnology that has obtained a Safety Certificate and Food Distribution Permit turns out to be a danger to human health, then it becomes the basis for revocation and cancellation of the Safety Certificate and Food Distribution Permit.

Indonesian legal instruments regulate the use of biotechnology for food based on the principle of the right to health in a sectoral manner that scatters in various types of laws and regulations. The statutory regulations start at the constitutional level, the rules and regulations of the delegation.

Arrangements for the use of biotechnology for food based on the principles of the right to health in the constitution (the 1945 Constitution of the Republic of Indonesia) relate to the right of citizen to a decent living, the power of everyone to defend their lives and lives, the right of everyone to benefit from science and technology to improve the quality of life and welfare of humankind, the right to information, and the right to obtain health services. The use of biotechnology for food that takes into aspects of the right to health is implied where everyone has the right to benefit from science and technology to improve their quality of life

¹⁷ Charu Verma et.al, *A Review on Impacts of Genetically Modified Food on Human Health*, The Open Nutraceuticals Journal, Volume 4, 2011, p. 4.

¹⁸ Deepa Arya, op.cit, p. 3-4.

and human well-being but is limited by the freedom of others to get healthy. Everyone has the right to use science and technology to produce food that is beneficial to themselves and everyone, but that should not be done by violating other people's right to health.

Under the constitution, the use of biotechnology for food based on the principles of the right to health is regulated in the law as follows.

1. Law Number 12 of 1992 concerning Plant Cultivation System.
2. Law Number 16 of 1992 concerning Animal, Fish and Plant Quarantine.
3. Law Number 8 of 1999 concerning Consumer Protection.
4. Law Number 39 of 1999 concerning Human Rights.
5. Law Number 29 of 2000 concerning Protection of Plant Varieties.
6. Law Number 21 of 2004 concerning Ratification of the Cartagena Protocol On Biosafety.
7. Law Number 31 of 2004 concerning Fisheries as amended by Act Number 45 of 2009 regarding Amendments to Law Number 31 of 2004 concerning Fisheries.
8. Law Number 4 of 2006 concerning Ratification of the International Treaty on Plant Genetic Resources for Food and Agriculture (International Agreement Regarding Plant Genetic Resources for Food and Agriculture).
9. Law Number 18 of 2009 concerning Animal Husbandry and Health.
10. Law Number 32 of 2009 concerning Environmental Protection and Management.
11. Law Number 36 of 2009 concerning Health.
12. Law Number 13 of 2010 concerning Horticulture.
13. Law Number 18 of 2012 concerning Food.
14. Law Number 3 of 2014 concerning Industry.
15. Law Number 23 of 2014 concerning Regional Government.
16. Law Number 39 of 2014 concerning Plantations.
17. Law Number 6 of 2018 concerning Health Quarantine.

These various laws contain various aspects of the use of biotechnology for food based on the principle of the right to health, including regulations on the development of plants with biotechnology, protection of food consumers resulting from the use of biotechnology, the rights to utilize science and technology regarding biotechnology, the right to food, the right to health, and biotechnology for animal and estate crops.

Under the law, the use of biotechnology for food based on the right to health is regulated in the implementing regulations of the law consisting of government regulations and administrative regulations as follows.

1. Government Regulation Number 69 of 1999 concerning Food Labels and Advertisements.
2. Government Regulation Number 102 of 2000 concerning National Standardization.
3. Government Regulation No. 28/2004 concerning Food Safety, Quality and Nutrition.
4. Government Regulation Number 21 of 2005 concerning Biological Safety of Genetically Engineered Products.
5. Government Regulation Number 17 of 2015 concerning Food Security and Nutrition.
6. Presidential Regulation Number 39 of 2010 concerning the Biosafety Commission for Genetically Engineered Products.
7. Presidential Regulation Number 83 of 2017 concerning the Strategic Policy for Food and Nutrition.

Various government regulations and administrative regulations regulate multiple aspects of the use of biotechnology for food including food labels, food standardization, food safety resulting from the use of biotechnology, strategic food policies, and agencies that deal with food safety issues resulting from biotechnology utilization.

Regulation of the use of biotechnology for food based on the principles of the right to health with a sectoral model has various weaknesses—first, conflicting norms. Sectoral regulations with multiple types of rules are challenging to avoid overlapping arrangements between one rule and another. Second, conflicting norms cause difficulties for their implementation by authorized institutions. Third, conflicting standards make it difficult for businesses in the food sector using bit technology. Fourth, conflicting norms make it difficult for consumers of genetically modified food to sue business actors. Fifth, conflicting norms make it difficult for law enforcement if violations occur.

In order to resolve the weaknesses in the regulation of the sectoral model, legal reform is carried out. Based on the Attachment of Law Number 17 of 2007 concerning the Long-Term Development Plan 2005-2025, the legal reform covers three things. First, reforming the legal substance, both written and unwritten laws to form better national legislation following the development needs and aspirations of the people. Second, perfecting the legal structure more effectively. Third, the involvement of all components of society who have high legal awareness to support the establishment of the aspired national legal system.

The legal reform of the use of biotechnology for food based on the principles of the right to health is carried out by harmonizing the law and adding new unregulated provisions. Legal harmonization is a type of legal unification in the form of regulatory assessment or policy coordination.¹⁹ Harmonization of the law in the way of policy coordination to avoid confusion and overlapping in the implementation of various sectoral laws and regulations. The primary legal alignment includes the authority to issue licenses, licensing procedures, and administrative law enforcement, both supervision and administrative sanctions.

New provisions that did not exist before including the regulation of the right to food, the right to health, the right to know, and the obligation to provide information. The provision of the right to food is needed based on the consideration that this right has been recognized as a human right in various international legal documents such as the Universal Declaration of Human Rights 1948, International Covenant on Economic, Social and Cultural Rights, Convention on the Elimination of All Forms of Discrimination against Women, and the Convention on the Rights of the Child in which there is no explicit regulation in the constitution or Law No. 39 of 1999 concerning Human Rights. To ensure legal certainty and justice for food rights that are recognized as human rights must be regulated in the constitution and regulated in more detail in Law No. 39 of 1999 concerning Human Rights.

The right to health must be regulated in the constitution based on the consideration that this right has also been recognized as a human right in various international legal documents such as the 1946 Constitution of the World Health Organization, Universal Declaration of Human Rights 1948, International Convention on the Elimination of All Forms of Racial Discrimination, Covenant International Committee on Economic, Social and Cultural Rights, and the United Nations Convention on the Rights of the Child. The right to health is currently regulated at the level of the law, namely Law No. 36 of 2009 concerning Health while the constitution governs the right to health services which is only part of the right to health.

The right to know is a fundamental right for genetically modified food consumers. The consumer has the right to know about the food product they choose about the ingredients used, the manufacturing process, and the risks to health. Based on this knowledge consumers will determine whether to buy and consume or not on a particular food product resulting from the use of biotechnology. The right to know for consumers is emphasized given that genetically modified food producers are business corporations whose primary purpose is to seek profits. The right to know to prevent these corporations from producing and selling genetically engineered food for the sole purpose of pursuing benefits.

¹⁹ George A. Zaphiru, Harmonization of Private Rules Between Civil and Common Law Jurisdictions, *The American Journal of Comparative Law*, Vol. 38, 1990, p. 71.

The right to know for consumers is the obligation of business actors who produce and sell genetically engineered food to fulfil them. Liability means something that must do and this is a legal obligation which means it is not implemented or failure to carry out the responsibility will have legal implications. Business actors who do not carry out their duties can be forced by law to carry out their responsibilities or provide compensation if consumers suffer losses.

Results

Utilization of biotechnology for food has been carried out based on the principles of the right to health using the instrument of Safety Certificate and Food Circulation Permit. By law, genetically modified food products that already have a Safety Certificate and a Food Circulation Permit mean that they have fulfilled the principles of the right to health unless proven otherwise later.

The Indonesian legal instruments regulate the use of biotechnology for food based on the principle of the right to health in a sectoral manner that is scattered from various laws and regulations starting from the 1945 Constitution of the Republic of Indonesia, laws and delegation regulations. Rules in different laws and regulations include the development of plants with biotechnology, protection of consumers of genetically engineered food, human rights to utilize science and technology regarding biotechnology, the right to food, the right to health, and biotechnology for animals and plantation crops.

The legal reforms that regulate the use of biotechnology for food based on the principles of the right to health are carried out by harmonizing the law in the form of policy coordination to avoid confusion and overlapping in its regulation and implementation. Legal reforms also cover the control of the right to food, the right to health, the right to know, and the obligation to provide information for business actors producing and/or trading genetically engineered food supplemented with administrative sanctions in related laws.

Suggestion

Businesses that produce and/or trade-in genetically modified food products must have a Safety Certificate and Food Circulation Permit as proof that the products manufactured and / or traded are safe for consumption and do not cause harm to health and as a form of respect for the right to health as a human right.

Implementing laws and regulations on the use of biotechnology for food based on the principles of the right to health must coordinate with each other to avoid overlapping authority, primarily related to the issuance of permits in the use of biotechnology for food.

Government to reform legislation related to the use of biotechnology for food based on the principles of the right to health by harmonizing the law and regulating the right to food, the power to health, the right to know, and the obligation to provide information supplemented with administrative sanctions on changes or replacement of legislation in the future.

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