

Bacterial Resistance to Antibiotics Increases


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In June the world was shocked with the advent of Escherichia coli bacteria that has claimed 26 lives in Germany and 1 in Sweden. Due to the spread of the bacteria, 3,235 cases have been reported in Germany, 72 of whom suffer from hemolytic uremic syndrome, a life-threatening disease because it destroys kidneys and nervous system. The E. coli Bacteria identified as enterohaemorrhagic E. coli (EHEC), which contains genes resistant to antibiotics. "Today the case of bacterial resistance to antibiotics is increasing. Some of the harmful bacteria that threaten human survival could avoid any antibiotics that doctors use in the treatment," said Prof. Dr. M. Kuswandi Tirtodiharjo, S.U., M. Phil., Apt. when inaugurated as Professor at the UGM Faculty of Pharmacy, Thursday (22/12) in the Senate Hall of UGM.

Data in 2010 showed 79% of E. coli strains are resistant to ampicillin, whereas 30% of strains resistant to ciprofloxacin. In the year 1999-2000 in the United States there is 43% case of infection by S. aureus resistant to methicillin. Some harmful bacteria, such as Mycobacterium tuberculosis and Pseudomonas aeruginosa, are resistant to antibiotics. "Bacterial Resistance to antibiotics causes infectious disease mortality rate to increase again," he explained.

In a speech entitled *Strategy to Handle Bacteria Resistant to Antibiotics*, Kuswandi delivers that bacterium receives resistant gene from animals. Most of the use of antibiotics is actually not for treating infectious diseases in humans, but for other purposes. In America, antibiotics are used every year up to 13 to 15 million kilograms, and of that number only 20% are used for human treatment. Meanwhile, the rest is used for agricultural purposes and livestock, not for treatment. "This is the beginning of the inappropriate use of antibiotics that cause the occurrence of disease transmission from animals to humans," he explained.

Antibiotics are usually used as additives in food animals, preservatives of food from animal, mixing ingredients in the processing of semen for artificial insemination and to soak the eggs that will be hatched. The uncontrolled use of antibiotics in livestock will lead to a number of disadvantages, such



as hypersensitivity, super-infection, bacterial resistance to antibiotics, impaired balance of floral bacteria in the digestive tract and antibiotic residues in food from animals. "The presence of drugs residues including the antibiotics in foods, including meat, will cause the rejection of meat by importing countries. Therefore, it is recommended not to use antibiotics for food preservation," said the man born in Purwokerto, February 8, 1951.

Resistant gene is also derived from a spontaneous mutation, microbes that produce antibiotics, and global travel. Resistant gene can also be derived from the environment. U.S. Geological Survey results showed 22% of river water contains a number of antibiotics that can make the bacteria become resistant. According to the Professor, there are a number of attempts that can be taken to prevent or prolong the emergence of bacteria resistant to antibiotics. Some of them are to control infected patients and monitor the use of antibiotics, monitoring the use of antibiotics in agriculture and farm animals, giving a combination of antibiotics for the treatment of infections as well as antibiotic combination with the compound that attacks the biochemical mechanisms that lead to resistant bacteria.

Kuswandi added that to destroy the bacteria resistant to antibiotics can be done by producing a vaccine to fight against the bacteria. In this strategy, a vaccine contains bacterial proteins that can pump antibiotics out of bacterial cells. Through the vaccine, a person's body will develop an immune response against resistant bacteria and, consequently, the bacteria will be destroyed. In addition, the strategy to use bacteriophage/bacteria virus, isolating medicine from plants and creating a reverse synthetic antibiotic are believed to prolong the appearance of resistant bacteria.

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