Studi of antibiotic residue (oxytetracycline) on broiler chicken in Parepare traditional market

Rasbawati¹*, Irmayani¹

Department of Animal Science, Faculty of Agricultural, Animal Science and Fisheries, Muhammadiyah University of Parepare, Jln. Jenderal Ahmad Yani Km 6 Lapadde, Parepare, South Sulawesi 91113, Indonesia

*Email correspondence: rasbawati@gmail.com

Abstract. Oxytetracycline is a group of spectrum antibiotics the most widely used in chicken farms, both with sub-therapeutic doses for prevention against diseases, growth and production drivers eggs and efficient use of feed, as well as with therapeutic doses for the purpose of treating the disease. The aim of this study to find out the description of the presence of tetracycline antibiotic residues in broiler chicken sold in Parepare traditional market. The type of research used is descriptive research; samples were taken using the total sampling method to obtain a sample of 18 from 6 sellers. Sample examination was carried out by the Bioassay method to find out there the absence of oxytetracycline residues on broiler chicken. The result of this study showed that of the 18 samples of broiler chickens not containing residues of oxytetracycline antibiotics; in this case, it has a negative indication. The conclusion of this study is that broiler chicken sold in the traditional Parepare market is still considered safe for consumption.

1. Introduction

Poultry meat is one of the good sources of animal protein because it contains essential amino acids that are complete and in a balanced number of comparisons. In addition, poultry meat is preferred by consumers because it is easily digested, acceptable to the majority of people [1]. The demand for chicken meat is growing rapidly along with the high level of consumption of chicken meat by the community. Based on 2017 statistical data, the average consumption of broiler chicken in Indonesia per capita of 0.124 Kg [2] increased from consumption in 2016 which was only 0.111 Kg, broiler chicken consumption increased by 1.3%. However, the increase in demand has not been in line with improving quality, especially in terms of food security and health.

Antibiotics have been widely used in the field of animal husbandry including chicken farming, both with therapeutic doses for treatment of diseases and with sub-therapeutic doses to spur growth and efficiency of feed use, which can ultimately increase livestock productivity. One of the widely used antibiotics is oxytetracycline; because in addition to its relatively cheap price, oxytetracycline is a broad-spectrum antibiotic, effective against gram-positive and negative bacteria, mycoplasma, spirochete and rickettsia [3], so it can be used to prevent and treat various chicken diseases such as Chronic respiratory disease, Infectious coryza, Fowl cholera, Infectious synovitis and Necrotic [4]. However, administration of antibiotics has a negative impact, namely the presence of residues

Food from animals containing antibiotic residues has the potential to endanger the health of consumers, whose potential hazards can be classified into three aspects, namely toxicological,
microbiological, and immunopathological. Now the danger of the microbiological aspects of antibiotic residues gets more attention because antibiotic residues in animal-origin foods have the potential to cause antibiotic-resistant pathogenic bacteria to consumers [5] [6]. Residues can cause resistance if they still have antibacterial activity. Therefore the antibacterial activity of the residue becomes very important and needs attention in determining the potential danger of residues in food from the animal origin [7]. This study aims to evaluate the presence of oxytetracycline residues in broiler chickens sold in the traditional market of Lakessi in Parepare so that they can provide an overview of the safety of chicken meat for consumption.

2. Materials and Methods

2.1 Stage of research

The type of research used is descriptive research, this research was conducted in three stages; the first stage is the field observation process. The second stage is sampling in each population. The population in this study was the total amount of broiler chicken sold by six broiler traders in the Traditional Market Lakessi Parepare. The sample in this study was broiler chicken meat taken from each broiler chicken trader, amounting to 6 traders. The third stage is testing samples with the bioassay method in the laboratory to detect the presence of oxytetracycline antibiotic residues. This research was conducted in July 2018.

2.2 Research procedure

The process of sample preparation starts with the selection of fresh chicken samples, washing, cutting the chicken parts used for testing the level of analysis, namely the liver. The process of refining the sample using a blender for ease when testing the level analysis. Sampling is done three times.

3. Result and Discussion

Based on the residual analysis, results obtained are presented in Table 1.

| No | Sample | Indication |
|----|--------|------------|
| 1  | Sample 1 | Negatif    |
| 2  | Sample 2 | Negatif    |
| 3  | Sample 3 | Negatif    |
| 4  | Sample 4 | Negatif    |
| 5  | Sample 5 | Negatif    |
| 6  | Sample 6 | Negatif    |
| 7  | Sample 7 | Negatif    |
| 8  | Sample 8 | Negatif    |
| 9  | Sample 9 | Negatif    |
| 10 | Sample10 | Negatif    |
|11  | Sample11 | Negatif    |
|12  | Sample12 | Negatif    |
|13  | Sample13 | Negatif    |
|14  | Sample14 | Negatif    |
|15  | Sample15 | Negatif    |
|16  | Sample16 | Negatif    |
|17  | Sample17 | Negatif    |
|18  | Sample18 | Negatif    |

Based on the results of the research in Table 1 above, it can be seen that from 18 samples of broiler chicken meat containing no residues of oxytetracycline antibiotics, in this case, it has a negative indication. This does not rule out the possible causes of the absence of residues from broiler
chicken meat sold in the Parepare traditional markets because the broiler chicken meat comes from large types of farms that have implemented Good Agriculture Practices (GAP), so that the resulting chicken meat is free from residue.

The results of this study are in line with the research by [8], [9] and [10]. The absence of antibiotic residues is due to broiler breeders already understanding the appropriate use of the drug withdrawal time and the right dose of the drug [11] Whereas in the study of [12] and [13] there were still positive samples containing tetracycline antibiotic contamination in several regions of 4.1% and 4.17%. The tetracycline group is only allowed as an animal medicine and is not included in the list of permitted feed additives in Indonesia, but because the price is low compared to antibiotics which are allowed to be feed additives, the tetracycline group is also widely used as a feed additive [14]. Although most breeders already know the rules for using antibiotics, according to [15] breeders tend to prioritize the safety of chickens from disease attacks rather than considering residues of antibiotic drugs in chickens. This is likely to antibiotic residues in chicken meat, although in small amounts.

Because of the many negative effects of antibiotic residues on health, the provisions of the Maximum Residue Limit (BMR) in livestock products (meat, milk, and eggs) are made for each antibiotic based on [16]. By knowing the BMR from a food product from livestock, it can be determined the safety limit of the product if consumed by humans. The BMR of each antibiotic is different, for example, the tetracycline BMR in livestock products is 0.1 ppm, but the residual contamination limit for the liver is not included.

4. Conclusions

Based on the results of the study, no residues of oxytetracycline antibiotics contained in broiler chickens were sold in the traditional market Lakessi, Parepare.

5. References

[1] Yashoda Yashoda K, Sachindra N, Sakhare P, RAO DN. 2001. Microbiological quality of broiler chicken carcasses processed hygienically in a small scale poultry processing unit. Journal of food quality 24 (3):249-259
[2] Central Bureau of Statistics (BPS). 2017. Average per capita consumption per week of several kinds of important foodstuffs, 2007-2017. Central Bureau of Statistics. https://www.bps.go.id (Accessed August 17, 2018)
[3] Plumb, D.C. 1999. Veterinary Drug Handbook. Iowa State University Press, Ames
[4] The Merck Veterinary Manual. 1979. A Hand Book of Diagnosis and Therapy for the Veterinarian. 5th Ed. Merck and Co., Inc., Rahway, N.J.
[5] Stainhart, C.E., M.E. Doyle dan B.A. Cochrane. 1996. Food Safety 1996. Marcel Dekker, Inc., New York
[6] Baynes, R.E., R. Lyman., K.L. Anderson and C.F. Brownie. 1999. A preliminary survey of antibiotic residues and viable bacteria in milk from three Caribbean Basin Countries. J. Food Prot. 62:177180
[7] Hintono, A., Astuti, M., Wuryastuti, H. and Rahayu E. S .. 2007. Oxytetracycline Residue and Antibacterial Activity in Eggs from Oxytetracycline Chickens with Therapeutic Doses Through Drinking Water. J.Indon.Trop.Anim.Agric. 32 [1] March 2007
[8] Wijaya, MR. 2011. Antibiotic residues in chicken and beef meat from traditional markets in West Java Province. Bogor. Essay. Faculty of Veterinary Medicine, Bogor Agricultural University, Bogor
[9] Consalesius, AN, Annytha, IRD, Diana, AW. 2014. Assessment of Tetracycline Residues in Broiler Meat, Kampung Chickens and Suspended Laying Hens for Sale in Kupang City. J of Veterinary Studies Vol.2 No. 2: 175-181. ISSN: 2356-4113
[10] Yulianti, NT, Ariyani, N, Nurhidayah, Nugraha, E. 2016. Study of Tetracycline and Penicillin Antibiotic Residues in Broiler Chicken Meat, Liver, Intestine and Lungs in 13 Provinces in Indonesia. Bulletin of Animal Medicine Quality Testing No.25 of 2016
[11] Donkor, ES. 2011. Investigation into the risk of exposure to antibiotic residues contaminating meat and egg in Ghana, Food Cont 22:869-873
[12] Werdiningsih, S, Patriana, U, Ariyani, N, Ambarwati, Nugraha E. 2013. Assessment of Tetracycline Residues in Thighs, Liver and Chicken Eggs in Several Provinces in Indonesia. Bulletin of Quality Testing for Animal Medicine No. 19 of 2013. Center for Quality Testing and Certification of Animal Medicine. Bogor
[13] Marliana N, Zubaidah E, Sutrisno A. 2015. Effect of Antibiotics on Cultivation of Residue Presence in Broiler Meat and Liver of People's Livestock. J of Anim Sci 25 (2): 10-19
[14] Murdiati, TB, Bahri, S. 1991. Patterns of antibiotic use in chicken farms in West Java, possible relationships with residual problems. Proceedings of the Scientific Congress to 8 Indonesian Bachelor of Pharmacy Associations. Jakarta
[15] Iyo. 2015. Farmers, bacterial and antibiotic diseases. Infovet Online Magazine. (http://www.majalahinfovet.com / 2018/9 / breeder-disease-bacteria-and.html) Accessed on September 3, 2018
[16] Indonesian national standards 01-6366-2000. Maximum limit of microbial contamination and limits maximum residue in food ingredients of animal origin