

## Detection of Antibiotics Residue in Broiler Carcass

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**ABSTRACT:** Antibiotics have long been used in poultry industry and its wide application was because the medicine are readily available at the markets. The research of antibiotics residues detection in broiler carcass was conducted from February 1 to March 31, 1994. Fifty samples of broiler's breast and thigh tissues from 5 local markets (Bogor, Kebon Kembang, Ramayana, Gembrong and Cumpok) were used in this experiment. Residue of antibiotics was determined

using microbiological method. In this test *Bacillus Stearothermophilus* Strain Donk (NCTC 10339, ATTC 12980, NCIB 8923, BCC 611) was used. From 50 samples of breast and thighs tissues being studied, it was found that 12 samples of breast tissue (24%) and 7 samples of thigh tendon (14%) contained an antibiotic. The results of an interview with the broiler breeders and medicine sellers indicated that most widely used type of antibiotic was ampicillin.

Keywords: Broiler Carcass, Antibiotic Residues Detection

### Introduction

Antibiotic have long been used in poultry industry. The widely using of antibiotic was supported by the availability of these medicines with adequate quality and readily available. There are several objectives of antibiotic utilization in poultry industry, among others as feed additive in order to enhance and increase food efficiency and as medication and disease prevention. Unproper antibiotic utilization by the breeders, however, often caused unnecessary lost, i.e causing resistancy, besides, when mixed with cattle feed may result residues in tendon tissue, liver and kidney. Antibiotic residues will occur when the medicine was added to cattle feed at higher content during a prolonged period of time, which will accumulate or medicines accumulation (Halimah, 1982). Up to 1980, the utilization of antibiotic for the purpose of therapy and feed additives had not been arranged and controlled. It was not until the issuance of the regulation regarding the production, distribution and utilization of the medicines, which contained in the Decree of the Minister of Agriculture number 539, 1977, Decision of the Directorate General of Animal Production number 107, 1979, Jo number 179, 1980 and number 108, 1979 re classification and control of medicines for cattle, the production, distribution and utilization of medicines in Indonesia being arranged and controlled (Dirjen Peternakan, 1988).

### Materials and Methods

The research was conducted from February 1 to March 31, 1994 using broiler' breast and thighs tissues samples obtained from 5 selected markets in Kodya Bogor with the total 50 samples from five sampling at every market.

The testing bacteria was *Bacillus Stearothermophilus* strains from nutrient gel. The bacteria strains from four nutrient gel tubes were inserted by using an ose to a 375 ml nutrient gel under 40-45°C, then homogenized and poured into water heater under 50°C, for 20 minutes. They were then poured into petry dish each of 15 ml and allow them to freeze. The medium was then ready to use or store in a refrigerator with as long as 7 days of maximum utilization. The breast and thigh tissues were minced then strained with muslin. The water was extracted, a sterile disk paper with a diameter of 10 mm then inserted into the testing medium, every petri dish containing of 4 disc papers consisting of 2 tissue samples namely of breast and thigh tendons, one positive control and one negative control. The positive control derived from free antibiotic tissue added with 0.005 Iu/ml penicilline. The negative control was obtained from free antibiotic tissue, namely from non-pedigree chicken breed traditionally which have never been fed with antibiotic. The petri dish which contained the samples to be examined was incubated at 55°C for

8-12 hours. If the sample contained an antibiotic, an edging zone around the disc paper would occur.

**Results and Discussion**

In this research, a preliminary research was made to obtain a proper method, especially in preparing the testing medium. The gel difusion method as applied in this research was often used to determine an antibiotic residues, as it was faster, more sensitive and inexpensive. Table 1 showed the

results of antibiotic residues detection research on broiler's carcass.

From the examination of 50 breast and thigh tissue samples made in random order with 71 broiler carcass sellers at 5 markets in Kodya Bogor, it was found that 12 samples (24 %) of breast tissue and 7 samples (14 %) of thigh tissue contained antibiotics. While the extent of zone formed during the examination of antibiotic residues in breast and thigh tissues, was shown in Table 2.

Table 1. Result of antibiotic residue detection on broiler's breast and thigh tissues in Kodya Bogor

No	Repetition Location	Total Seller	1		2		3		4		5	
			D	P	D	P	D	P	D	P	D	P
1.	Pasar Bogor	12	+	-	-	+	-	-	-	-	-	+
2.	Ps. Kebon Kembang	39	+	-	-	-	+	+	+	-	+	+
3.	Psr. Ramayana	8	-	-	-	-	+	-	+	-	+	+
4.	Psr. Gembrong	5	-	-	-	-	-	-	-	-	+	+
5.	Psr. Cumpok	7	-	+	-	-	+	-	+	-	+	-

D Breast tissue  
P Thigh tissue  
+ Antibiotic residues exist  
- No antibiotic residue exist

Table 2. Extent of bright zone formed in samples containing antibiotics (mm)

No	Repetition Location	1		2		3		4		5	
		D	P	D	P	D	P	D	P	D	P
Extent of Bright Zone Formed											
1.	Pasar Bogor	+	-	-	+	-	-	-	-	-	+
		12			11						14
2.	Pasar Kebon Kembang	+	-	-	-	+	+	+	-	+	+
		12				13	12	13		13	15
3.	Pasar Ramayana	-	-	-	-	+	-	+	-	+	+
						12		14		13	13
4.	Pasar Gembrong	-	-	-	-	-	-	-	-	+	+
										13	13
5.	Pasar Cumpok	-	+	-	-	+	-	+	-	+	-
			11			13		12		14	

D Breast tissue  
P Thigh tissue  
+ Antibiotic residues exist  
- No antibiotic residue exist

Table 3. Percentage of positive antibiotic residues from each market in Kodya Bogor

No	Location	Breast			Thigh Tissue		
		Total Sample	Sample (+)	(%) Sample (+)	Total Sample	Sample (+)	(%) Sample (+)
1	Pasar Bogor	5	1	20	5	2	40
2	Pasar Kebon Kembang	5	4	80	5	2	40
3	Pasar Ramayana	5	3	60	5	1	20
4	Pasar Gembrong	5	1	20	5	1	20
5	Pasar Cumpok	5	3	60	5	1	20

From the results of the interview with breeders and medicines seller, it was found that generally the widely used of type of antibiotic was ampiciline. Table 3 shown the positive percentage of antibiotic residues from each market.

The existence of residues in carcass was caused by the introduction of antibiotics to life chicken which was made by Intra Muscular injection to breast and thigh tendons, if considered from the effect of the withdrawal time the chickens should have not be slaughtered for commercial purpose, as they have not reached seven days after the introduction of antibiotics, which obviously seen in the presence of antibiotic residues in breast and thigh tissues. Most of the chicken meat being consumed had no antibiotic which can dissolved in methanol solvent, so that the chemical residues, such as antibiotic was relatively small.

The presence of residues from other medicines or chemical compounds are greatly affected by pharmacokinetic process of the concerned medicines or compounds namely the process experienced by a compound if introduced to the body orally (Wirjosuharto, 1990).

The medicines fed to an animal, was absorbed by the intestine wall and enters to the blood circulation. The medicine then interacts with the animal body. There are two interactions, first the medicine interacts with the body in the form of the medicine effect, the second was the body interaction against the medicines or the body liquid handle such exogen compound so as not to continously active, by excreting the medicine from the body (Dirdjosudjono and Susapto, 1992).

From examining, the broiler's carcass and results of interview with the sellers it was found that

the presence of antibiotic residues was affected by some reasons among others are: 1. The broilers being marketed, after examined, were taken from the same farms or breeders, in which the antibiotic being introduced was overdosage or the chickens were prematurely slaughtered, so that increasing the possibility of antibiotic residues presence. 2. The breeders were not carefully considered the withdrawal time of the medicines, namely the period required until the residues reduced up to below tolerance limit. 3. The antibiotics added to feed additive, breeders were not properly formulate the ration between the antibiotics and the cattle feed. It was in accordance with Halimah (1982), who cited that the antibiotics residues would occur if such medicine was added to the cattle feed under lower or higher degree, and was fed for quite a long time, which caused accumulation. Residues are the compound found in cattle feed, with low dosage intentionally or accidentally. Such residues may come in the form of medicine residues, micotoxine residues, heavy metal or other toxic compound, it can be of original compound or master compound with its metabolite production (Murdiati and Bahri, 1994). The medicine will usually be absorbed from its point of intake to the body, carried in blood circulation and spread-out to the entire body, both in terms of original compound which has not altered or bond with protein plasma. The compound present in blood or other body liquids has the balance with the compounds in the body tissue, in which the medicine was expected to provide therapeutic or toxic effect.

According to Booth (1982), the application of antibiotics in animal husbandry tends to yield residues in tissue due to: 1. Not adhering the withdrawal time stated. 2. Antibiotics utilization was

meant to cover clinical symptoms of ill animal before slaughtered. 3. Introduced illegal antibiotics or not adhering administration procedure.

The withdrawal time (the time when the medicines vanished from body) was the period needed by antibiotic residues to reach or below ambient concentration (Jackson, 1980). This period also indicates the interval between withdrawal time of the antibiotic through to the time when animal can be slaughtered. The withdrawal time depends on the form and dosage of the antibiotics, cattle species and method of introduction. The difference was vary from several hours to several weeks. The secretion speed of each antibiotic should be considered to obtain a safe limit (Allison, 1984). The presence of antibiotics in cattle feed in considerable amount will disturbed the consumers. The antibiotic residues which exceeded the ambient limit in food will caused the following: The antibiotics and its metabolic or degradation products will possibly works as toxic against the liver and kidney, it may caused minor and local allergic responses. Poisoned reaction was usually caused by streptomycin, tetracycline and chloramphenicol. The obvious symptoms are nerve symptom, blood formation disorder, liver disorder, kidney disorder and sight disorder. The said poisoned symptoms are, of course, can be clearly seen if the antibiotic introduced in considerable amount (Kelwein, 1989).

In order to reduce the presence of residues, the production process should be controlled appropriately. Starting from a good farming business and the introduction of proper medicine according to the dosage stated, prior to the slaughter time it was necessary to take into account the withdrawal time.

Currently, a residues control team was already established in Indonesia, which was expected to play its role in the government policy making, in term of animal husbandry products control as from the raw material processing, the distribution and consumers. (Wiriyosuharto, 1990).

### Conclusion and Suggestion

From the research it can be concluded that:

1. From the examination of 50 samples of breast and thigh tendon tissues it was found that 12 samples (24%) of breast and 7 samples (14%) of thigh tendon were positively contained antibiotic.
2. The result of interview with the medicine sellers and broiler breeders in Kodya Bogor indicated

that the most widely used antibiotics was ampicillin.

3. Almost all of the broiler carcass marketed was free from antibiotic residues, due to appropriate medicine application.

It was suggested to conduct a research on the withdrawal time of antibiotic introduced to the said broilers, so that it was expected can provide a clear information to the breeders concerning the withdrawal time of every antibiotic blood smear being used.

Since some issues and technical constraints are still exist in the method of examination of antibiotic residues, it was expected to conduct further research to obtain a more precise, faster, and more economical method.

Extention was required for the breeders in particular and community which related to the procurement of original cattle feed, so as to yield a safe products for the society.

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