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Microbial-Resistance Contaminant in Chicken Meat from Local Market in South Jakarta, Indonesia

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A B S T R A C T

Antibiotic-resistant pathogenic bacteria contamination has been found in chicken meat products. Chicken meat is obtained from a local market in South Jakarta, Indonesia. Identification of bacteria in was done using conventional methods with selective media and biochemical tests. Furthermore were carried out using vitek2 compact to confirmation identification and pattern of antibiotic resistance. The results obtained 1 isolate *Enterococcus faecalis*, 1 isolate *Proteus mirabilis* and 3 isolates *Escherichia coli*. 1 isolate *E. Coli* was resistant to the antibiotics ampicillin, sulbactam, ciprofloxacin and trime-thoprim/sulfamethoxazole. *P. mirabilis* was resistant to tigecycline and nitrofurantoin, while *E. faecalis* was resistant to erythromycin, quinupristin/dalfopristin, and tetracycline. Based on the results of the study, it is very important to choose a seller who is clean and always cooks chicken meat until it is cooked to inhibit the growth of bacteria.

Introduction

Hygiene and sanitation are still problems that many developing countries face. An unhealthy environment can be a source of infectious diseases and the breeding of pathogenic bacteria. Bacterial growth in the poor environment can also contaminate a poultry sold in local markets. Bacteria that grow on chicken meat will not be seen, because the meat is indistinguishable from healthy. Pathogenic bacteria in poultry meat have been reported several times (Wardhana *et al.*, 2021). It is feared that some bacteria have become resistant to antibiotics.

Antibiotic-resistant bacteria can cause serious health problems. In addition to influencing health problems; Bacterial contamination can also reduce the marketability of a food commodity (Kumar *et al.*, 2022). Based on these problems, it is necessary to conduct research to determine the contamination of several pathogenic bacteria in poultry products. This study was conducted to determine the contamination of *Salmonella*, *Escherichia coli*, and

Staphylococcus aureus contamination in chicken sold in local markets in District South Jakarta, Indonesia. *Salmonella* and *Escherichia coli* bacteria are still contaminants that are often found in poultry products; and there are still many cases of infection due to these two bacteria. The aim of research is to identification pathogen and its antibiotic resistance pattern.

Materials and Methods

Sample

Samples of whole chicken meat were collected from the traditional market in South Jakarta. Samples were put in sterile plastic and transported using an ice box. Samples are immediately analyzed to reduce the risk of contamination and bacterial growth during transport to the laboratory.

Preparation of chicken meat

Samples of chicken meat as 25 g were dissolved in 225 mL buffer phosphate water and then microbiological analysis was carried out on *Salmonella*, *Escherichia coli*, and *Staphylococcus aureus* based on the standard methods.

Analysis of pathogenic microbial contamination and antibiotic resistance

Identification of pathogenic bacteria using standard methods based on conventional methods (with 3 replicated) and followed by Vitek-2 compact instrumentation as confirmation and to determine the presence of antibiotic-resistant pathogenic bacteria.

Results and Discussion

Five isolates of pathogenic bacteria were present in the tested samples. This is shown in conventional tests using selective media followed by biochemical tests. Bacterial identification was carried out using the Vitek 2 compact which also displayed a pattern of antibiotic resistance. *Escherichia coli* was the main contaminant found, followed by *Proteus mirabilis* and *Enterococcus faecalis*. *E. coli* and *P. mirabilis* are Gram negative bacteria, while *E. faecalis* is Gram positive (Klaharn *et al.*, 2022). This indicates that the tested sample contains many contaminants that can be harmful to health.

Hemolysis test showed that the three types of bacteria were pathogenic. *E. coli* and *E. faecalis* were able to partially lyse red blood cells (alpha), and *P. mirabilis* was able to completely lyse red blood cells (beta).The data showed in table 1.Our results did not find contamination of *Salmonella* and *Staphylococcus aureus*. The three types of pathogenic bacteria was found can cause infection with clinical symptoms of diarrhea which can be fatal (Dhartiben *et al.*, 2022). These three types of bacteria are also resistant to antibiotics (data are shown in Tables 2 and 3). From three isolates of *E. coli*; there was only 1 isolate that was resistant to antibiotics. Antibiotic-resistant bacteria can exacerbate symptoms and make treatment difficult.

Sample contained pathogenic bacteria and were resistant to antibiotics. Cleanliness of the environment and the seller is one of the important keys to avoid infection with pathogens. In addition, the cooking process must be carried out until it is cooked can inhibited pathogenic bacteria.

Table.1 Microorganisms detection with conventional methods

Selective Media	colony	indole	motility	MR	VP	citrate	TSIA	haemolysis
Eosin Methlen Blue Agar	metalic shine	+	+	+	-	-	+/+g	alpha
Bismuth Sulphite Agar	blackish	-	+	+	-	+	+/+ H_2S	beta
Mac Conkey Agar	uncoloured	-	+	+	-	+	+/+ H_2S	beta
Manitol Salt Agar	yellow	+	-	+		-	+/+	alpha

Table.2 Identification of Gram negative microorganisms and antibiogram using vitek 2 compact analyzes

Microorganisms	amp	sul	pip	cef	ctz	ctx	cfp	atn	ert	mer	ami	gen	cip	tig	nit	tri
***Escherichia coli* 1**	r	r	s	s	s	s	s	s	s	s	s	s	r	s	s	r
***Escherichia coli* 2**	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
***Escherichia coli* 3**	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
Proteus mirabilis	s	s	s	s	s	s	s	s	s	s	s	s	s	r	r	s

Note: r:resistance; s:sensitive; amp:ampicilin; sul:sulbactam; pip:piperacillin/tazobactam; cef:cefazolin; ctz:ceftazidime; ctx:ceftriaxone; cfp:cefepime; atn:aztreonam; ert:ertapenem; mer:meropenem; ami:amikacin; gen:gentamicin; cip:ciprofloxacin; tig:tigecycline; nit:nitrofurantoin; tri:trimethoprim/sulfamethoxazole

Table.3 Identification of Gram positive microorganisms and antibiogram using vitek 2 compact analyzes

Microorganisms	benz	amp	gen	strep	cip	lev	ery	qui	lin	van	tet	tig	nit
Enterococcus faecalis	s	s	s	s	s	s	r	r	s	s	r	s	s

Note: r:resistance; s:sensitive; benz:benzylpenicillin; amp:ampicillin; gen:gentamicin high level; strep:streptomycin high level; cip:ciprofloxacin; lev:levofloxacin; ery:erythromycin; quin:quinupristin/dalfopristin; lin:linezolid; van:vancomycin; tet:tetracycline: tig:tigecycline; nit:nitrofurantoin

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References

Dhartiben, B. K., Aparnathi, K. D., Zhao, Y.-G., Cai, M.-Q., Chen, X.-H., Pan, S.-D., Yao, S.-S., & Jin, M.-C. (2022). Pathogenic Biota of Wastewater of Ganja. *International Journal of Current Microbiology and Applied Sciences*, *11*(6), 297–303.

Klaharn, K., Pichpol, D., Meeyam, T., Harintharanon, T., Lohaanukul, P., & Punyapornwithaya, V. (2022). Bacterial contamination of chicken meat in slaughterhouses and the associated risk factors: A nationwide study in Thailand. *PLoS ONE*, *17*(6 June), 1–14. https://doi.org/10.1371/journal.pone.0269416

Kumar, M. K., Bhuvaneshwari, G., Neelusree, P., & Sciences, T. (2022). Efficacy Testing of Bacteriocin against Multidrug Resistant Pseudomonas aeruginosa. *International Journal of Current Microbiology and Applied Sciences*, *11*(05), 102–108.

Wardhana, D. K., Haskito, A. E. P., Purnama, M. T. E., Safitri, D. A., & Annisa, S. (2021). Detection of microbial contamination in chicken meat from local markets in Surabaya, East Java, Indonesia. *Veterinary World*, *14*(12), 3138–3143. https://doi.org/10.14202/vetworld.2021.3138-3143

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