

Prevalence and Risk Factors *E. coli* in Subclinical Mastitis in Ettawa Crossbreed Goat (PE) in Special Region Yogyakarta

Widodo S

Assessment Institutes for Agricultural
Technology of Yogyakarta,
Yogyakarta, Indonesia
widodo.suwito@yahoo.com

Widagdo S N

Faculty of Veterinary Medicine
Gadjah Mada University, Yogyakarta,
Indonesia.

Andriani

Research Institute Veterinary Science
Bogor, Indonesia.

Abstract— Subclinical mastitis in Ettawa Crossbreed goat (PE) in special region Yogyakarta (DIY) which caused by *E. coli* can be economic loss because decrease the milk production. The purpose of these study was to determine prevalence and risk factors *E. coli* in PE goat subclinical mastitis in DIY. A total of 314 PE goat lactation sample from 60 PE goat farm in DIY was tested subclinical mastitis with California Mastitis Test (CMT). The risk factors subclinical mastitis in PE goat which caused by *E. coli* were written on questionnaire sheet. Bivariate analysis Chi-square (χ^2), odds ratio (OR), and relative risk (RR) were used to determination risk factors which contribution in PE goat subclinical mastitis by *E. coli*. Isolation and identification *E. coli* by conventional bacteria based on biochemical. The prevalence *E. coli* in PE goat subclinical mastitis is 4.5% with risk factors the udder no wash before milking ($\chi^2 = 15.61$; OR = 3.27), no given feed after milking ($\chi^2 = 13.61$; OR = 2.53), dirty the cage floor ($\chi^2 = 10.91$; OR = 2.03), no hand wash before milking ($\chi^2 = 8.22$; OR=1.83), and udder wash with harm water before milking ($\chi^2=16.35$; OR=0.25).

Keywords— Risk factor, *E. coli*, subclinical mastitis, ettawa crossbreed goat (PE)

I. INTRODUCTION

Ettawa crossbreed goat (PE) is typical goat that milk production in special region Yogyakarta (DIY). The high of goat milk yield is expectation for farmer, because it's price expensive than cow milk. In DIY market, the price of goat milk is reach about Rp 20.000 until 30.000 / liter. It's caused by goat milk for health consume in some community especially in sufferer of respiratory disease. Goat milk can be used sufferer of respiratory disease such as asthma, tuberculosis, and increase stamina [1]. Moreover, goat milk can be used health maintain body and good to young and old consume [2]. The goat milk has advantages protein content about 3.6%, while cow's milk 3.2%, and goat milk has good source of minerals, calcium, and phosphorus for infant growth [3].

The high of goat milk yield is expectation for some PE goat farmer in DIY. It's no within reach if PE goats fell ill subclinical mastitis. Subclinical mastitis in PE goat was no

show clinical symptom, so the farmer only feel the decrease of milk yield. Impact of subclinical mastitis in goat was reduce the milk yield about 37-60% [4]. Some researchers were reported that the common of subclinical mastitis in goats were caused by Staphylococci and Streptococci, whereas *E. coli* is rarely. Meanwhile, the research [5] was inform that *E. coli* much more found in goat milk from subclinical mastitis. Therefore, the purpose of these study was to determine prevalence and risk factors *E. coli* in PE goat subclinical mastitis in DIY.

II. MATERIAL AND METHODS

A total of 384 PE goat farmer, being lactation, no symptoms illness, stay at individual, and communal cage, were using in these study. These study was used cross-sectional study to determine prevalence and risk factors *E. coli* which affect the subclinical mastitis PE goat in DIY. The sample size PE goat was calculated using the formula $n = 4PQ/L^2$ [6]. The sampling method was carried out in multiple stages by giving a population proportional weight (probability proportional to size) with the district as the primary sampling unit.

Determination of subclinical mastitis in PE goat based on California Mastitis Test (CMT). Goat was called subclinical mastitis if CMT test positive 2 (++) or 3 (+++) [7]. Isolation and identification bacteria from PE goat subclinical mastitis was done by enrichment in the peptone water buffer medium (BPW) (BPW; Oxoid Ltd., Basingstoke, United Kingdom) [8].

The primary data was collected by interview with PE goat farmer based on questionnaires and observation of livestock and PE goat farm location. The data analysis was done by descriptive and bivariate Chi-square (χ^2) [9].

III. RESULTS

Subclinical mastitis in PE goat was detected by CMT. The result of CMT from PE goat was presented in Table 1.

TABLE 1. CALIFORNIA MASTITIS TEST (CMT) IN DIY PE GOAT

Total of farmer PE goat	Total of PE goat	CMT test		Prevalence (%)
		Normal	Subclinical Mastitis	
60	384	272	112	29,2

Isolation *E. coli* from PE goat subclinical mastitis was presented in Table 2.

TABLE 2. ISOLATION *E. COLI* FROM IN DIY PE GOAT SUBCLINICAL MASTITIS

Total PE goat farm	Total PE goat subclinical mastitis	Isolation <i>E. coli</i>		Prevalance (%)
		Negative	Positive	
28	112	107	5	4,5

Association between *E. coli* in PE goat subclinical mastitis with milking management were presented in Table 3

TABLE 3. ANALYSIS CHI-SQUARE (χ^2), P-VALUE, AND ODDS RATIO (OR) LIVESTOCK VARIABLE WITH *E. COLI* IN PE GOAT SUBCLINICAL MASTITIS

No	Variabel	(χ^2)	P- value	OR
1	Udder no wash before milking	15.61	P=0.006*	3.27
2	No given feed after milking	13.61	P=0.035**	2.53
3	Floor dirty cage	10.91	P=0.043*	2.03
4	No hand wash before milking	8.22	P=0.025*	1.83
5	Udder wash with warm water	16.35	P=0.029*	0.25
8	Replace the milker	7.61	P=0.183 ^{ns}	-
9	Litter size	5.07	P=0.479 ^{ns}	-
10	Lactation age	4.28	P=0.369 ^{ns}	-
15	Body condition score	0.06	P=0.814 ^{ns}	-
16	Weaning age	0.02	P=0.089 ^{ns}	-

* significant (P<0.05), ^{ns} no significant (P>0.05)

IV. DISCUSSION

Prevalence subclinical mastitis in PE goat is 29.2% and still lower when compared in some country such as Israel 35-71%, Bangladesh 44.59%, and Tanzania 76,7% [10];[11];[12]. Some researcher were stated that prevalence subclinical mastitis in goat about 19.4-47.0% [13];[14];[15].

The difference subclinical mastitis in goat may be caused by management distinction maintenance from each PE goat farm. The research [16] showed that the high of case subclinical mastitis in goat was caused by lack of cleanliness when milking. It's causes bacteria or other microbes to grow and develop. Furthermore, the bacteria was infect the udder.

Faeces and urine are source of *E. coli* in PE goat subclinical mastitis. *Escherichia coli* is bacteria which use indicator to the level hygiene in the milking farm or milk procesing [17]. Prevalence *E. coli* in DIY PE goat subclinical wastitis is 4.5%. These research was almost same with [5] that *E. coli* from PE goat subclinical mastitis in Sleman distric is 4%. The prevalence *E. coli* in DIY PE goat subclinical mastitis was greater than the result of the research [15] and [18] which are only 1.6%. It's may be caused by the PE goat raising system in DIY is traditional, whereas in the other country is more modern.

The udder no wash before milking was causes *E. coli* subclinical mastitis 3.27 greater than wash the udder before milking. The PE goat was no given the feed after milking has potential 2.53 *E. coli* subclinical mastitis. The same condition if the dirty cage floor is potential to *E. coli* subclinical mastitis amount of 2.03. Meanwhile, the milker with no wash hand is potential to *E. coli* subclinical mastitis 1.83 rather than the milker washing hand. Washing the udder with warm water was decrease *E. coli* subclinical mastitis 0.23 rather than use with well water. It's caused by that warm water no cantaminan with other pathogen such as *Pseudomonas sp* and *E. coli*. The water that contamination *Pseudomonas sp* and *E. coli* when used to wash the udder causes clinical or subclinical mastitis [19]. Based on the research showed that prevalence *E. coli* in PE goat subclinical mastitis was 4.5% with risk factors the udder no wash before milking, no give feed after milking, dirty the cage floor, no hand wash before milking, and udder wash with harm water before milking.

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