

KAJIAN EPIDEMIOLOGI MASTITIS SUBKLINIS PADA KAMBING PERANAKAN ETTAWA (PE) DI DAERAH ISTIMEWA YOGYAKARTA

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INTISARI

Mastitis subklinis pada kambing peranakan Ettawa (PE) merupakan penyakit yang merugikan secara ekonomi karena produksi susu berkurang. Tujuan penelitian adalah: 1) menyidik prevalensi dan faktor risiko penyebab mastitis subklinis pada kambing PE di DIY; 2) isolasi, identifikasi, dan karakterisasi fenotipik *Staphylococcus spp.* dan *E. coli* dari susu kambing PE mastitis subklinis di DIY; 3) mengetahui sensitivitas *Staphylococcus spp.* dan *E. coli* dari susu kambing PE mastitis subklinis di DIY terhadap beberapa antibiotika; 4) menyidik prevalensi dan faktor risiko *Staphylococcus spp.* resisten terhadap beberapa antibiotika dari susu kambing PE mastitis subklinis di DIY.

Identifikasi faktor risiko mastitis subklinis pada kambing PE menggunakan kajian lintas seksional dengan sampling tahapan ganda. Unit kajian dilakukan pada 314 ekor kambing PE laktasi dan 60 peternak di DIY dengan tingkat konfidensi 95%. Analisis epidemiologi dilakukan dengan deskriptif, asosiasi *bivariate* (χ^2 dan OR), dan pemodelan dengan regresi linier dan logistik serta *path way analysis*. *Staphylococcus spp.* dan *E. coli* diisolasi dan diidentifikasi secara biokimia. Karakterisasi fenotipik morfologi isolat *Staphylococcus spp.* dan *E. coli*, sedangkan koagulase dengan tabung reaksi, klumping faktor dengan *slide* aglutinasi, dan hemolitik dengan kultur pada media *blood* agar. Sensitivitas *Staphylococcus spp.* dan *E. coli* terhadap antibiotika dengan agar difusi. Identifikasi faktor risiko *Staphylococcus spp.* resisten terhadap antibiotika menggunakan kajian lintas seksional dengan sampling tahapan ganda. Unit kajian dilakukan pada 57 ekor kambing PE mastitis subklinis karena *Staphylococcus spp.* pada 35 peternak dengan tingkat konfidensi 95%. Analisis epidemiologi dilakukan dengan deskriptif, asosiasi *bivariate* (χ^2 dan OR), dan pemodelan dengan regresi linier dan logistik.

Hasil penelitian menunjukkan bahwa prevalensi mastitis subklinis di tingkat ternak 29,2% dan peternakan 58,3%. Faktor risiko mastitis subklinis di tingkat ternak yaitu *dipping* yang tidak dilakukan, kandang laktasi dicampur, produksi susu, air sumur untuk mencuci ambing, *parity* > 3, pancaran susu pertama tidak dibuang, ambing tidak dicuci, pemerah yang berganti-ganti, *litter size* > 1 ekor, umur laktasi 2-2,5 th, pakan rambanan, frekuensi pemerahan 1 kali / hari, sedangkan di tingkat peternakan yaitu peternak yang berpendidikan SD, peternak yang tidak mencuci tangan sebelum pemerahan, kondisi lantai kandang yang kotor, pelatihan peternak, dan pengalaman dalam beternak. Mastitis subklinis pada kambing PE disebabkan oleh *S. intermedius* 18,8%, *S. aureus* 17,8%, *S. epidermidis* 8,9%, *S. hycus* 5,4% dan *E. coli* 4,5%. *Staphylococcus spp.* koagulase positif terjadi pada *S. intermedius* 47,6%, *S. aureus* 40%, *S. epidermidis* 20%, dan *S. hycus* 16,7%, sedangkan koagulase negatif terjadi pada *S. hycus* 83,3%, *S. epidermidis* 80%, *S. aureus* 60%, dan *S. intermedius* 52,4%. *Staphylococcus spp.* klumping faktor positif terjadi pada *S. aureus* 40%, *S. epidermidis* 20%, *S. intermedius* 19%, *S. hycus* 16,7%, sedangkan klumping faktor negatif terjadi



pada *S. hycus* 83,3%, *S. intermedius* 80,9%, *S. epidermidis* 80%, dan *S. aureus* 60%. *Staphylococcus spp.* hemolitik tipe α terjadi pada *S. aureus* 5%, *S. intermedius* 4,7%; hemolitik tipe β terjadi pada *S. intermedius* 66,7%, *S. epidermidis* 50%, *S. aureus* 40%; dan tidak hemolitik terjadi pada *S. hycus* 100%, *S. aureus* 55%, *S. epidermidis* 50%, dan *S. intermedius* 28,6%. Isolat *E. coli* semuanya tidak hemolitik. *Staphylococcus spp.* resisten ampisilin terjadi pada *S. epidermidis* 70%, *S. intermedius* 66,7%, *S. aureus* 55%, dan *S. hycus* 33,3%. *Staphylococcus spp.* resisten cefoksitin terjadi pada *S. hycus* 16,7%, *S. aureus* 5%, *S. intermedius* 4,8%, sedangkan *S. epidermidis* semuanya sensitif. *Staphylococcus spp.* resisten eritromisin terjadi pada *S. epidermidis* 40%, *S. intermedius* 38%, *S. aureus* 25%, dan *S. hycus* 16,7%. *Staphylococcus spp.* resisten gentamisin terjadi pada *S. epidermidis* 20%, *S. intermedius* 19%, *S. aureus* 10%, sedangkan *S. hycus* semuanya sensitif. *Staphylococcus spp.* resisten neomisin terjadi pada *S. intermedius* 14%, *S. aureus* dan *S. epidermidis* 10%, sedangkan *S. hycus* sensitif. *Staphylococcus spp.* resisten oksasilin terjadi pada *S. hycus* 16,7%, sedangkan *S. aureus*, *S. intermedius*, dan *S. epidermidis* sensitif. *Staphylococcus spp.* resisten oksitetrasiklin terjadi pada *S. epidermidis* 50%, *S. intermedius* 23,8%, *S. aureus* 20%, dan *S. hycus* 16,7%. *Staphylococcus spp.* resisten penisilin G terjadi pada *S. intermedius* 81%, *S. epidermidis* 50%, *S. hycus* 50%, dan *S. aureus* 45%. *Staphylococcus spp.* resisten sulfametoksazol terjadi pada *S. epidermidis* 90%, *S. hycus* 66,7%, *S. aureus* 65%, dan *S. intermedius* 47,6%. Isolat *E. coli* 100% resisten terhadap ampisilin dan sulfametoksazol. Antibiotik multidrug resisten (AMR) pada *S. aureus* 35%, *S. hycus* 33,3%, *S. epidermidis* 30%, dan *S. intermedius* 23,8%. Prevalensi *Staphylococcus spp.* resisten terhadap antibiotika di tingkat ternak 9,11% dan peternakan 30%. Faktor risiko *Staphylococcus spp.* resisten terhadap antibiotika di tingkat ternak antara lain kambing PE yang pernah sakit mastitis, berumur ≥ 5 tahun, dan diberi pakan tambahan atau *feed additive*, sedangkan di tingkat peternakan adalah peternak yang mengobati sendiri saat kambing PE sakit, peternak yang mengenyam pendidikan sampai tingkat SMP, lama beternak 6-10 th, dan peternak yang pernah mengikuti pelatihan.

Hasil penelitian dapat disimpulkan faktor risiko ternak dan peternakan berperan terhadap mastitis subklinis pada kambing PE di DIY. Penyebab mastitis subklinis pada kambing PE di DIY sebagian besar *Staphylococcus spp.* berkarakter koagulase negatif, klumping faktor negatif, tidak hemolitik, dan sebagian resisten terhadap beberapa antibiotika.

Kata kunci: Mastitis subklinis, kambing PE, faktor risiko, *Staphylococcus spp.*, antibiotika

STUDY EPIDEMIOLOGY SUBCLINICAL MASTITIS ON ETTAWA CROSBREAD GOAT (PE) IN YOGYAKARTA SPECIAL REGENCY

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ABSTRACT

Subclinical mastitis in Ettawa crosbread goat (PE) is an economically harmful which reduce the milk yield. The purpose of these study was to: 1) investigate the prevalence and identification of risk factors wich influence the occurence of subclinical mastitis; 2) isolation, identification, and phenotypic characterization of *Staphylococcus spp.* and *E. coli*; 3) sensitivity of *Staphylococcus spp.* and *E. coli* that causes of subclinical mastitis towards several antibiotics; 4) investigate the prevalence and identify of risk factors for *Staphylococcus spp.* resistant to several antibiotics.

Risk factors subclinical mastitis in PE goat was done identification with questionnaire in cross sectional study design with multiple stages sampling. The unit study was done in 314 PE goats lactation, 60 farmer with 95% confidence level. The epidemiological analysis was done by descriptive, asociation bivariate (χ^2 and OR), linear regression and logistic modeling with path way analysis. *Staphylococcus spp.* and *E. coli* were isolated based on biochemistry. Phenotypic characterization such as morfology *Staphylococcus spp.* and *E. coli* while coagulase with tube reaction, clumping factor with slides agglutination, and haemolytic with culture in blood agar. The antibiotic susceptibility against *Staphylococcus spp.* dan *E. coli* with agar diffusion. The data was analysis with descriptive. Identification of risk factor *Staphylococcus spp.* which antibiotic resistance use cross sectional study design with multiple stages sampling. The unit study was done in 57 PE goat with subclinical mastitis by *Staphylococcus spp.* in 35 farmer with 95% confidence level. The data analysis was using descriptive univariate, *chi-square* (χ^2) and *odds ratio* (OR) bivariate, multivariate with logistic and linear regression.

These study showed that prevalence of subclinical mastitis in livestock level is 29.2%, while in farm is 58.3%. Risk factors of subclinical mastitis in livestock level are no dipping, mixed the lactation cage, milk production, well water for udder wash, parity >3, no dischard first milk ejection, no wash the udder, change the milker, litter size > 1, lactation age 2-2.5 old, rambanan feed, milking frequency over one time every day, while in farm level is farmer who has elementary education, the farmer don't wash hand befeore milking, dirty cage floor conditions, training farmer, and experience in raising the livestock. Subclinical mastitis in PE goat was caused by *S. intermedius* 18.8%, *S. aureus* 17.8%, *S. epidermidis* 8.9%, *S. hycus* 5.4% and *E. coli* 4.56%. *Staphylococcus spp.* with coagulase positive was occurred in *S. intermedius* 47.6%, *S. aureus* 40%, *S. epidermidis* 20%, and *S. hycus* 16.7%, while coagulase negative was occurred in *S. hycus* 83.3%, *S. epidermidis* 80%, *S. aureus* 60%, and *S. intermedius* 52.4%. *Staphylococcus spp.* with clumping factor positive was occurred in *S. aureus* 40%, *S. epidermidis* 20%, *S. intermedius* 19%, dan *S. hycus* 16%, while clumping factor negative was occurred in *S. hycus* 83.3%, *S. intermedius* 80.9%, *S. epidermidis* 80% and *S. aureus* 60%. *Staphylococcus spp.* with α haemolytic type was occurred in *S. aureus* 5% and *S.*



intermedius 4.7%; with β haemolytic type was occurred in *S. intermedius* 66.7%, *S. epidermidis* 50%, and *S. aureus* 40%; none haemolytic 100% in *S. hycus*, 55% in *S. aureus*, 50% in *S. epidermidis* and 28.6% in *S. intermedius*. The *E. coli* isolate from PE goat subclinical mastitis 100% is none haemolytic. Ampicillin resistance was occurred in *S. epidermidis* 70%, *S. intermedius* 66.7%, *S. aureus* 55%, and *S. hycus* 33.3%. Erythromycin resistance was occurred in *S. epidermidis* 40%, *S. intermedius* 38%, *S. aureus* 25%, and *S. hycus* 16.7%. Oxytetracycline resistance was occurred in *S. epidermidis* 50%, *S. intermedius* 23.8%, *S. aureus* 20%, and *S. hycus* 16.7%. Penicillin resistance was occurred in *S. intermedius* 81%, *S. epidermidis* 50%, *S. hycus* 50%, and *S. aureus* 45%. Sulfamethoxasol resistance was occurred in *S. epidermidis* 90%, *S. hycus* 66.7%, *S. aureus* 65%, and *S. intermedius* 47.6%. All *E. coli* isolates were done resistance 100% against ampicillin and sulfamethoxasol. Antibiotic multidrug-resistance (AMR) was occurred in *S. aureus* 35%, *S. hycus* 33.3%, *S. epidermidis* 30%, *S. intermedius* 23.8%. Prevalence *Staphylococcus spp.* antibiotic resistant in livestock level is 9.11% and 30% in farm. Risk factors for *Staphylococcus spp.* antibiotic resistant in the livestock level are PE goat has never mastitis, age ≥ 5 year, and given the additional feed or feed additives, while at the farm level are farmers who treat themselves when PE goat sick, farmer who has education up to junior high school, 6-10 year old breeder, and farmer who has attended training.

These research showed that risks factor in livestock and farm have a role in the subclinical mastitis PE goat in DIY. Subclinical mastitis in PE goat in DIY was caused by *Staphylococcus spp.* mostly with character negative coagulase, clumping factor, non haemolytic and several antibiotic resistance.

Key word: Subclinical mastitis, PE goat, risk factor, *Staphylococcus spp.*, antibiotica