

Seroprevalensi Pasca Vaksinasi Penyakit Mulut dan Kuku Serotipe O, Kajian Lintas Seksional Dan Analisa Spasial Pada Sapi Dan Kambing Di Kabupaten Tanah Laut Provinsi Kalimantan Selatan

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Intisari

Penyakit Mulut dan Kuku (PMK) disebabkan oleh virus *Foot Mouth Disease* (FMDV) merupakan merupakan penyakit hewan yang cepat hewan menular, dan menimbulkan kerugian ekonomi yang besar. Indonesia mengalami wabah PMK pada Mei 2022, sejak dinyatakan bebas tanpa vaksinasi tahun 1990. Pemerintah Indonesia menetapkan program vaksinasi sebagai salah satu bentuk upaya penanganan PMK nasional. Penelitian ini dilakukan untuk mengetahui keberhasilan dan seroprevalensi pasca vaksinasi PMK di Kabupaten Tanah Laut, Kalimantan Selatan dan menganalisis faktor-faktor yang mempengaruhi keberhasilan vaksinasi. Metode penelitian adalah analitik observasional dengan pendekatan kajian lintas seksional. Sampel adalah serum sapi dan kambing yang sudah divaksin 30 hari sebelumnya, selanjutnya sampel diuji serologis dengan ELISA SP serotipe O, dan dianalisis dengan *chi square* (X^2), *odd ratio* (OR), *relative risk* (RR), *attributable fraction* (AF), *population attributable fraction* (PAF), regresi logistik dan analisa spasial (*average nearest neighbour* dan *densitas kernel*). Hasil penelitian menunjukkan seroprevalensi kekebalan terhadap penyakit PMK di Kabupaten Tanah Laut sebesar 98,01% pada kambing dan 92,86% pada sapi. Faktor hospes yang berpengaruh pada pembentukan antibodi pasca vaksinasi PMK pada sapi adalah Ras sapi madura (OR = 7,4586), jenis biosekuriti segregasi (OR = 2,306), sistem pemeliharaan (OR = 2,125), jenis biosekuriti desinfeksi (OR = 2,033), Status gizi BCS 3 (OR = 2,023), biosekuriti (OR = 0,575), status gizi BCS 2 (0,273), dan sumber air minum dari sungai (OR = 0,222). Faktor hospes yang berpengaruh pada kambing adalah kepadatan ternak lebih dari 20 ekor, pakan, sumber air minum dari danau, adanya biosekuriti, jenis biosekuriti segregasi (OR = 278,947), umur (OR = 77,837), jenis kelamin (OR = 11,716), ras (OR = 0,04), kepadatan ternak 1-5 ekor dan sumber air minum dari sumur (OR = 0,004). Faktor vaksin dan vaksinasi yang berpengaruh pada pembentukan antibodi pasca vaksinasi PMK pada sapi adalah vaksinasi ke-2 (OR = 6,134), jarak vaksin booster 1-2 bulan (OR = 3,401), jenis vaksin (OR = 3,148), vaksinasi ke-1 (OR = 0,163), belum booster (OR = 0,163), pengambilan sampel kurang dari 1 bulan (OR = 2,032), dan lebih dari 3 bulan (0,300). Nilai *overall classification*, model faktor hospes pada sapi memiliki sensitivitas 77%, dan spesifisitas 45%, pada kambing sensitivitas 95% dan spesifisitas 81%. Model faktor vaksin dan vaksinasi memiliki sensitivitas 94% dan spesifisitas 31%. Analisa spasial menunjukkan pola mengumpul (*clustered*) (Z score = -22,989565 ; p -value = 0,000000), dan estimasi densitas kernel konsentrasi paling padat ada pada kecamatan Bati-Bati, Tambang ulang, Pelaihari, Takisung, Panyipatan dan Batu Ampar. Penelitian ini membuktikan bahwa seroprevalensi kekebalan kambing memiliki nilai lebih tinggi jika dibandingkan dengan Sapi. Faktor yang mempengaruhi pembentukan antibodi vaksinasi PMK pada sapi adalah ras, status gizi, kepadatan ternak, sistem pemeliharaan, sumber air minum, adanya biosekuriti, jenis vaksin, dan jumlah vaksinasi, jarak booster dan waktu pengambilan sampel. Faktor yang berpengaruh pada kambing adalah ras umur, jenis kelamin, kepadatan, paka, sumber air minum, dan jenis biosekuriti

Kata kunci : penyakit mulut dan kuku, monitoring, seroprevalensi, vaksinasi

Seroprevalence of O Serotype Foot and Mouth Disease Vaccination, Cross-Sectional Study and Spatial Analysis of Cattle and Goats in Tanah Laut District, South Borneo Province

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Abstract

Foot and Mouth Disease (FMD) caused by the Foot Mouth Disease (FMDV) virus is an animal disease that spreads quickly and causes huge economic losses. Indonesia has experienced an FMD outbreak in May 2022, since it was declared free without vaccination in 1990. The Indonesian government has established the vaccination program as a form of national FMD management. This study was conducted to determine the success and post-vaccination seroprevalence of FMD in Tanah Laut District, South Borneo and to analyze the factors that influence the success of vaccination. The research method is observational analytic with a cross-sectional study approach. Samples were sera of cows and goats that had been vaccinated 30 days before, then were tested serologically with ELISA SP serotype O, and analyzed by chi square (χ^2), odds ratio (OR), relative risk (RR), attributable fraction (AF), population attributable fraction (PAF), logistic regression and spatial analysis (average nearest neighbor and kernel density). Host factors that affect the formation of antibodies after PMK vaccination in cattle are Madura cattle race (OR = 7.4586), type of biosecurity segregation (OR = 2.306), maintenance system (OR = 2.125), type of biosecurity disinfection (OR = 2.033), BCS nutritional status 3 (OR = 2.023), biosecurity (OR = 0.575), BCS nutritional status 2 (0.273), and drinking water sources from rivers (OR = 0.222). Host factors that affect goats are livestock density of more than 20 heads, feed, drinking water sources from lakes, presence of biosecurity, type of biosecurity segregation (OR = 278,947), age (OR = 77,837), sex (OR = 11,716), race (OR = 0.04), livestock density of 1-5 heads and drinking water from wells (OR = 0.004). Vaccine and vaccination factors that affect the formation of antibodies after PMK vaccination in cattle are the 2nd vaccination (OR = 6.134), booster vaccine 1-2 months apart (OR = 3.401), type of vaccine (OR = 3.148), 1st vaccination (OR = 0.163), not yet booster (OR = 0.163), sampling less than 1 month (OR = 2.032), and more than 3 months (0.300). The overall classification value, the host factor model in cattle has a sensitivity of 77% and a specificity of 45%, in goats a sensitivity of 95% and a specificity of 81%. The vaccine and vaccination factor model has a sensitivity of 94% and a specificity of 31%. Spatial analysis shows a clustered pattern (Z score = -22.989565 ; p-value = 0.000000), and the estimated density of the densest kernel concentrations is in the Bati-Bati, Mine Repeat, Pelaihari, Takisung, Panyipatan and Batu sub-districts Ampar. This study proves that the immune seroprevalence of goats has a higher value when compared to cattle. Factors that influence the formation of FMD vaccination antibodies in cattle are race, nutritional status, livestock density, rearing system, drinking water source, presence of biosecurity, type of vaccine and number of vaccinations, booster distance and sampling time. Factors that affect goats are race, age, sex, density, clothing, source of drinking water, and type of biosecurity

Keywords: foot and mouth disease, monitoring, seroprevalence, vaccination