

KOHORT STUDY ON HIGHLY PATHOGENIC AVIAN INFLUENZA AND FINANCIAL FEASIBILITY ANALYSIS OF INTENSIVE AND NOMADIC DUCK SYSTEM IN PURBALINGGA

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Abstract

Ducks is a very interesting economic commodity to develop. Ducks in Purbalingga Regency mostly use a wandering/nomadic system. The intensive duck maintenance system is not popular because of the community's perception of the need for greater initial investment, although it is safer from diseases than the nomadic system.

This study aims were to calculate the prevalence, incidence and risk factors for HPAI in nomadic and intensive ducks, and to calculate business viability financially. This cohort study involved 21 intensive duck farmers and 28 nomadic duck farmers who were chosen randomly. The study was conducted for eight months. Each farmer was taken 5 samples of ducks which were chosen by judgment to take serum and cloaca swabs. The serum tested with the agglutination inhibition (HI). The cloaca swab was tested with real time reverse transcription polymerase chain reaction (rRT PCR). Sampling was collected three times (March, July and October 2019). The feasibility of business investment uses the NPV, BCR and IRR methods with the assumption of a maintenance cycle of 6 months per period and continued by sensitivity analysis.

The results showed that the prevalence of HPAI in nomadic ducks for three observations was 50%, 52% and 31.25%, respectively. The prevalence of HPAI in intensive ducks for three consecutive observations was 28.6%, 22.22% and 5.88%. The incidence of HPAI in intensive farming for 8 months (0.4 cases) is not different from the incidence in nomadic duck farms (0.43 cases). Risk factors associated with disease events in the end of the study were education (X^2 3.94, RR 5, $P < 0.05$), vaccine history (X^2 9.9 RR 1.1 $P < 0.05$), and the nomadic breeding system (X^2 4.3 RR 6.03, $P < 0.05$). The results of the business feasibility analysis show the value of BCR 1.04, NPV 71,656,250.33 or 22%, IRR 74,55 in intensive duck business. Nomadic duck business has a BCR value of 1.84, NPV 159,172,672.88 and IRR 112.60. The results of the sensitivity analysis with the assumption of 1) Decrease in egg production by 10%; 2) Decrease in the selling price of eggs by Rp. 200 / egg and

3) Increase in livestock health costs by 100% showed that the intensive duck business system is more sensitive to changes in decreased of egg production and decreased of egg price than the nomadic system. This research proves that the intensive and nomadic duck system is economically feasible to be a business investment, in terms of animal health the nomadic system has a high risk of contracting HPAI so that intervention and disease control strategies are needed.

Keywords: Tegal ducks, risk factors, nomadic, Avian Influenza, business feasibility

KAJIAN KOHORT *HIGHLY PATOGENIC AVIAN INFLUENZA* DAN ANALISIS KELAYAKAN FINANSIAL SISTEM PEMELIHARAAN ITIK INTENSIF DAN MENGEMBARA DI PURBALINGGA

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Intisari

Itik merupakan komoditas ekonomi yang sangat menarik untuk dikembangkan. Beternak itik di Kabupaten Purbalingga sebagian besar menggunakan sistem mengembara. Sistem pemeliharaan itik intensif tidak diminati peternak karena persepsi masyarakat tentang perlunya investasi awal yang lebih besar, walaupun lebih aman dari penyakit dibandingkan sistem umbaran.

Penelitian ini bertujuan menghitung prevalensi, insidensi dan faktor risiko penyakit HPAI pada itik mengembara dan itik intensif, serta menghitung kelayakan usaha secara finansial. Kajian kohort digunakan dengan mengambil responden 21 peternak itik intensif dan 28 peternak itik mengembara yang dipilih secara acak sederhana. Penelitian dilakukan selama delapan bulan. Dari masing-masing peternak dipilih 5 sampel itik *by judgement* untuk diambil serum dan swab trakea/kloaka. Serum kemudian diuji dengan hambatan aglutinasi (HI). Sedangkan swab kloaka diuji dengan *real time reverse transcription polymerase chain reaction* (RT PCR). Pengambilan sampel dilaksanakan tiga kali (Maret, Juli dan Oktober 2019). Kelayakan investasi usaha digunakan metode *Net Present Value* (NPV), *Benefit Cost Ratio* (BCR) dan *Internal Rate of Return* (IRR) dengan asumsi siklus pemeliharaan selama 6 bulan per periode dan analisis sensitivitas.

Hasil penelitian menunjukkan bahwa prevalensi HPAI pada itik mengembara selama tiga kali pengamatan masing-masing adalah 50%, 52% dan 31,25%. Prevalensi HPAI pada itik intensif selama tiga kali pengamatan secara berurutan adalah 28,6%, 22,22% dan 5,88%. Insidensi pada peternakan intensif selama 8 bulan (0,4 kasus) tidak berbeda dengan insidensi pada peternakan itik mengembara (0,43 kasus). Faktor risiko yang berasosiasi dengan kejadian penyakit adalah pendidikan (χ^2 3,94, RR 5, $P < 0,05$), riwayat vaksin (χ^2 9,9 RR 1,1 $P < 0,05$) dan sistem beternak mengembara (χ^2 4,3 RR 6,03, $P < 0,05$). Hasil analisis kelayakan usaha dengan asumsi skala usaha 500 ekor dan memperhitungkan biaya investasi menunjukkan nilai BCR sebesar 1,04, NPV Rp 71,656,250.33 dan IRR 74,55% pada usaha itik intensif. Usaha itik mengembara dengan nilai BCR 1,84, NPV Rp 159,172,672.88 dan IRR 112,60%. Hasil analisis sensitivitas dengan asumsi 1) Penurunan produksi telur sebanyak 10%; 2) Penurunan harga jual telur sebesar Rp 200,-/butir dan 3) peningkatan biaya kesehatan ternak 100% menunjukkan sistem usaha itik intensif lebih sensitif terhadap

perubahan produksi telur dan penurunan harga telur dibandingkan sistem mengembara. Penelitian ini membuktikan bahwa sistem beternak itik intensif dan mengembara layak secara ekonomi untuk menjadi investasi usaha, dari segi kesehatan hewan sistem mengembara mempunyai risiko tinggi tertular HPAI sehingga diperlukan intervensi dan strategi pengendalian penyakit.

Kata kunci : Itik Tegal, faktor risiko, mengembara, Avian Influenza, kelayakan usaha

