

PRODUKSI KOLOSTRUM ANTIVIRUS AVIAN INFLUENZA DALAM RANGKA PENGENDALIAN INFEKSI VIRUS FLU BURUNG

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ABSTRACT

PRODUCTION OF COLOSTRUM AGAINST AVIAN INFLUENZA VIRUS TO CONTROL BIRD FLU INFECTION

This experiment was conducted to study the prospect of bovine colostrum utilization to produce specific antibody as passive immunotherapy against avian influenza. Pregnant Frisian Holstein cows were injected with commercial killed *Avian Influenza* (AI) vaccine given double doses subcutaneously three times every two weeks. Prior to vaccination, the cows were given immunomodulator 0.1 mg.kg⁻¹ BW administered orally for three days. The animals then were injected by inactive H5N1 antigen without adjuvant intravenously to meet the dose of 10⁴ HAU. Blood samples were collected to detect anti AI antibody using *Enzyme Linked Immunosorbent Assay* technique. Colostral samples were analysed to detect antibody against AI using *Haemagglutination Inhibition* technique. IgG stabilities were tested against enzyme, pH, and spray dried processing with *inlet dan outlet* temperature of 140°C and 52°C, respectively. The colostral IgG efficacy on neutralizing H5N1 virus activity was determined *in vitro* (by using Serum Neutralization Test and protective titer measurement) and *in ovo* (challenge test by using Embryonic Chicken Egg). The result indicated that serum antibody against H5N1 was detected one week after the second vaccination. Titer of colostral antibody against H5N1 was high (2⁸). Biological activity of colostral IgG remain stable at pH 5-7 and after spraying-drying processing, but decreased after treatment by trypsin and pepsin enzymes. The neutralization test showed that the fresh and spray dried colostral IgG against H5N1 were able to neutralize 10⁷ EID₅₀ AI virus H5N1 with neutralization index of 1.1 and 1.0, respectively. In conclusion, pregnant Frisian Holstein cows injected with commercial killed *Avian Influenza* (AI) vaccine were able to produce colostral IgG against AI H5N1.

Keywords: avian influenza, bovine colostrum, IgG, passive immunotherapy

ABSTRAK

Penelitian ini dilakukan untuk mempelajari prospek penggunaan kolostrum sapi sebagai pabrik bahan biologis untuk memproduksi antibodi spesifik terhadap *Avian Influenza* untuk kepentingan imunoterapi pasif kasus flu burung. Induk sapi Frisian Holstein bunting diinjeksi subkutan dengan vaksin *Avian Influenza* (AI) (*killed vaccine*) H5N1 komersial, 2 dosis per ekor sebanyak 3 kali, dengan jarak antarvaksinasi 2 minggu. Sebelum vaksinasi, induk sapi diberi imunomodulator 0,1 mg.k⁻¹bb melalui oral selama 3 hari berturut-turut. Induk sapi kemudian diinjeksi intra-vena dengan antigen H5N1 inaktif tanpa adjuvan selama 3 hari berturut-turut dengan dosis 10⁴ MAU. Contoh darah dianalisis terhadap adanya antibodi anti-AI dengan teknik *Enzyme Linked Immunosorbent Assay*. Contoh kolostrum dianalisis terhadap adanya antibodi anti-AI dengan menggunakan *Haemagglutination Inhibition*. Stabilitas IgG diuji terhadap pH, enzim, dan proses *spray dried* pada suhu *inlet dan outlet* 140-52°C. Uji efikasi IgG kolostrum dalam menetralsasi aktivitas virus H5N1 dilakukan secara *in vitro* (menggunakan *Serum Neutralization Test* dan pengukuran titer protektif) dan *in-ovo* (dengan uji tantangan menggunakan embrio ayam dalam telur tertunas). Hasil pengamatan menunjukkan bahwa antibodi anti AI mulai terdeteksi di dalam darah 1 minggu setelah vaksinasi kedua. Titer antibodi anti-AI di dalam kolostrum cukup tinggi, yaitu 2⁸. Aktivitas biologis IgG anti AI tetap stabil pada pH 5-7 dan setelah prosesing *spray dried*, namun demikian menurun setelah perlakuan dengan pepsin dan tripsin. IgG anti AI di dalam kolostrum segar dan *spray dried* memiliki indeks netralisasi (IN) terhadap virus H5N1 masing-masing sebesar 1,1 dan 1,0. IgG anti AI H5N1 di dalam kolostrum mampu menetralsasi virus H5N1 dengan sempurna (100%) pada titer 2⁷. Dari hasil penelitian ini dapat disimpulkan bahwa induk sapi bunting mampu memproduksi IgG anti AI H5N1 di dalam kolostrum.

Kata kunci: flu burung, IgG, kolostrum sapi

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