Profil fisiologi dan ekspresi gen termoregulator Sapi Bali (bos sondaicus) berdasarkan pengaruh cekaman panas di beberapa daerah di Indonesia = Physiology profiles and thermoregulatory gene expression of Bali cattle (bos sondaicus) by the effect of heat stress in Indonesia

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Abstrak

Kenaikan suhu global bumi hingga 2 0C memberi pengaruh nyata terhadap produktivitas sapi. Efek negatif kenaikan suhu global dapat dikurangi dengan mempelajari adaptasi hewan pada tingkat individu hingga gen. penelitian bertujuan untuk mempelajari respons fisiologi dan ekspresi gen termoregulator Hsp90 dan ATP1A1 sapi Bali di beberapa daerah di Inonesia. Pengumpulan data fisiologi, sampel darah sapi dn kondisi lingkungan dilakukan di Cipelang Kabupaten Bogor, Desa Lompo Tengah Kabupaten Barru, Desa Sumber Klampok Kabupaten Buleleng, dan Desa Telaga Bertong Kabupaten Sumbawa Barat. Sampel darah diambil dari vena jugularis untuk diisolasi RNA, lalu ditranskripsi balik menjadi cDNA yang kemudian dilanjutkan dengan proses qRT-PCR. Ekspresi gen dilakukan dengan metode komparasi deltas Ct dengn normalisasi oleh gen GADPH.
Analisis data fisiologi dan kondisi lingkungan dengan uji multivariate dan korelasi Pearson, sedangkan analisis ekspresi gen dengan uji Kruskal-Wallis. Suhu udara, kelembaban udara dan intensitas matahari di empat lokasi berbeda nyata p=0 , tetapi kecepatan angin tidak berbeda nyata p=0,056 , sehingga mempengaruhi perbedaan suhu kulit, suhu rektum, suhu tubuh dan laju pernapasan. Respons sapi terhadap cekaman panas dengan cara peningkatan suhu kulit, suhu rektum, suhu tubuh, laju pernapasan, peningkatan ekspresi gen Hsp90 dan ATP1A1. Rasio ekspresi gen Hsp90/GADPH dan ATP1A1/GADPH berbeda setiap lokasi penelitian karena dipengaruhi kondisi iklimnya.
.....Earth 39 s global temperature rise to 2 0C had a significant effect on the productivity of cattle. The negative effect of the global temperature rise can be reduced by studying the adaptation of animals at the individual level to the gene level. The research aimed to study the physiology response and gene expression of Hsp90 dan ATP1A1 on Bali cattle in some areas in Indonesia. The physiology profiles of cattle, blood samples and environmental conditions were collected from Cipelang, Lompo Tengah village, Sumber Klampok village and Telaga rtong village. Blood samples were taken from jugular vein to isolate RNA that was reverse transcribed info cDNA followed by qRT PCR process. Gene expression was performed by the comparative delta Cycle threshold Ct method which GADPH as internal control gene.
Analysis of physiological data and environmental conditions were done by multivariate test and Pearson correlation test, whereas gene expression analized by Kruskal Wallis test. Air temperature, air humidity and the light intensity at four locations were significantly different p 0, but the wind speed did not differ significantly p 0,056, thus affecting differences in skin, rectal and body temperature, and respiratory rae. Bali cattle responded to heat stress by increasing the skin, rectal and body temperatures respiratory rate, and upregulated of Hsp90 and ATP1A1 genes. The ratio of the genes expression of Hsp90 GADPH an ATP1A1 GADPH were difference each the study sites because it 39 s climatic conditions.