Determination of Estrus Phase in Cattle Using Electronic Nose

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Abstract	The timing of artificial insemination relies on estrus behavioral observation. The problem, however, is that not all cattle show signs of estrus significantly, so the accuracy of insemination is not accurate. Recently, determination of estradiol levels as an indicator of estrus is performed by observation of physical signs and ELISA which is expensive and time-consuming. In order to solve these problems, an estrus detector tool was constructed as called an Electronic Nose (eNose). The aim of this study was to determine whether the stage of estrus can be detected using eNose. The sample used in the study was the urine of Ongole Crossbred cattle (PO) derived from an adult female who had BCS between 3-4, maintained in Kuwang, Sleman district, Yogyakarta. The urine samples were collected shortly before injection of dinoprost as an estrous synchronization material and repeated when cattle were on estrus. After applying unsupervised pattern recognition of principal component analysis (PCA), it can be found that the two-dimension (2D) score plot showed 96.1% accounted, while that of threedimension (3D) score plot showed 98.9% of the variance in the data set. Thus, the eNose is very prospect used as a detector estrus in cattle. Furthermore, our eNose has been able to distinguish between estrus and non-estrus clearly.
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