Significant Findings

- The male goat exhibited enurination behaviour when encounter estrus female.

- The increased protein and reduced lipid concentration coupled with high concentration of lignoceric acid favors the estrus detection. In addition, faecal concentration of estrogen and progesterone would be useful for non-invasive estrus detection in goats.

- Transition in the urinary and faecal volatiles was recorded along with the endocrinological status during estrous cycle. The estrus-specific urinary compounds were identified as Tetradecanol, n-Pentadecanol, 3-Methylene tridecane, 2-Ethyl-1-dodecene and in faeces the estrus-specific compounds includes two anti-oxidants.

- The estrus urine sample revealed the specific presence of 25 kDa protein which was absent during pro-estrus and diestrus. The protein has shown to be matched with Complement component C3, in which the expression was under the control of estrogen.

- Castrated male goat contains more number of volatile compounds with two fatty alcohols which may be contributed by the increased fat mass during castration. In protein analysis, prepubertal goats excrete more proteins which is presumably due to the intake of high protein from milk and reduced filtration capacity of the kidney.

- The histology, volatile and protein analysis positively support the cornual gland as a major scent gland in goat and the compounds it synthesize may involve in buck odor production.
Conclusion

Findings of the present study in biochemistry aspect from female and male goats concluded that the change in internal physiology (endocrine changes) has been reflected in the excretion. A comprehensive transition of urinary and faecal volatiles across the estrous cycle was reported for the first time and these volatiles are speculated to act as estrus signals to attract conspecifics and therefore could be utilized for the development of non-invasive estrus markers in goat. Further, the intact male specific volatiles of urine and cornual gland could be further validated for its estrus synchronizing ability. Overall, this fundamental data would be better choice in concerning the improvement of goat production.