

01. INTRODUCTION & AIM

- Forensic taphonomy includes methods of post-mortem interval (PMI) estimation with one method focusing on gross anatomical changes. These changes are observed using the Total Body Score (TBS) [1].
- Numerous factors such as temperature and humidity effect the rate of decomposition.
- Limited research is however available on the effects of rehydration and therefor the aim of this study was to assess the effects of rehydration on the rate and pattern of decomposition using a pig model.

02. MATERIALS & METHODS



- Deployment of 12 pig carcasses (*Sus scrofa*)
- Scoring of TBS using the method by Keough et al. [2], specifically for pig models (Figure 1)
- Artificial rehydration with 10L of prepared water during advanced decomposition stage
- Continue scoring of TBS until stasis was reached



Figure 1: Regions of the body, including the head and neck (dotted line), trunk (solid line) and limbs (dashed line) assessed to establish the TBS following guidelines as set out by Keough et al. [2].

03. RESULTS

- Rehydration increased the TBS values after stasis (Figure 2) and appeared to create greater cadaver decomposition islands (CDI) around the carcasses compared to the control samples (Figure 3).
- Post-rehydration insect activity was revived while it ceased in the control samples. When rehydration occurred naturally, changes in skin colour was noted along with a distinctive increase in hide beetle colonisation.
- When the soil below the carcasses was rehydrated by indirect rehydration (rain), a recolonisation of hide beetles was also observed for all carcasses during advanced decomposition.

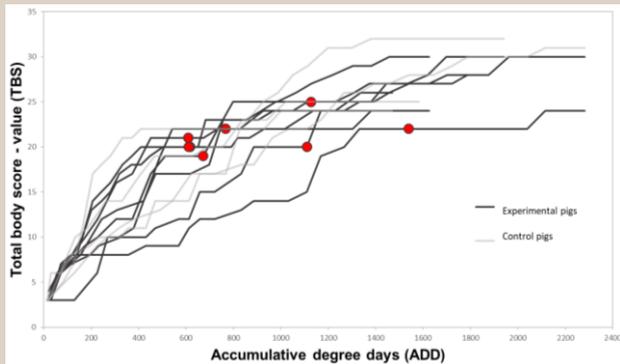


Figure 2: Comparison of rate of decomposition between all control (grey lines) and all experimental (black lines) pigs by plotting TBS against accumulative degree days (ADD). Red dot represents the rehydration event.

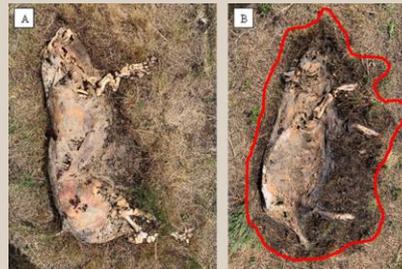


Figure 3: **A)** Control pig 2 on PMI 108 days (2115ADD), and **B)** experimental pig 4 on PMI 108 days (2115ADD), post-rehydration displaying a greater CDI (dark stain on ground surrounding the carcass outlined in red).

04. DISCUSSION & CONCLUSIONS

- Rehydration was observed to extend the decomposition process and re-attract beetle activity, as proposed by Myburgh et al. [3]
- The exclusion of rainfall/rehydration events may result in the inaccurate estimation of PMI, due to the “stagnant” period of decay being hidden/overlooked and resulting in a shorter PMI estimation than actually PMI.
- Results from the current study suggests consideration of rainfall when estimating PMI and when developing new methods, to increase the accuracy of both.
- Larger sample groups are needed to increase the robusticity of the findings and allow for statistical analysis on the rate of decay.
- Further investigations are needed to investigate the effect of various amounts of rainfall as well as the duration thereof.

References

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