



## Effects of pomegranate nutritional additives on the dynamics of VOC and odorants emissions from calves manure

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Recent approaches in cattle nutrition introduce Mediterranean fruits wastes that carry antioxidant activities, which may affect animal health as well as manure properties.

**The objective was to investigate the effect of pomegranate nutritional additives on odorous VOC emissions from calves manure before and after weaning.**

# Methodology



Pomegranate waste



Pomegranate extract



25-100 ml daily in in milk (top)  
4% of dry food (bottom)



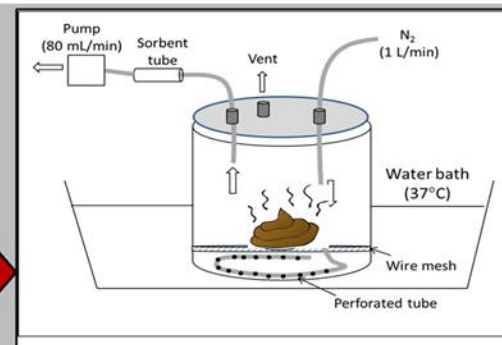
Feces sample



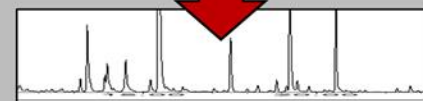
Feces samples



Incubation in aluminum covered jars  
(28C°; 0, 7, 14, 30 d)



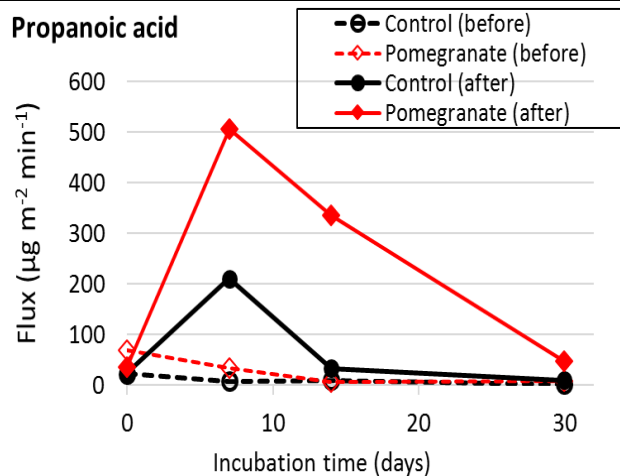
Flux chamber (collecting VOC on thermal desorption tubes)



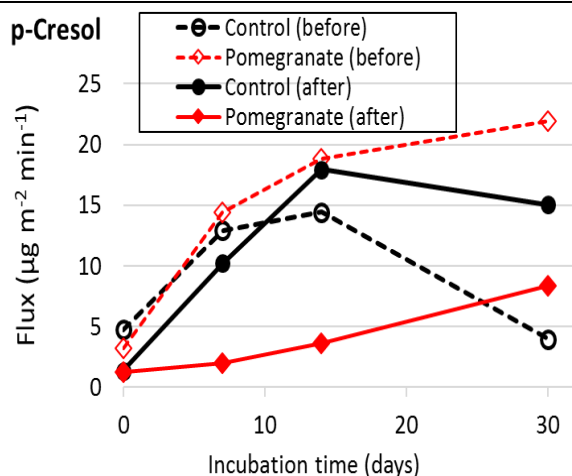
Thermal desorption GC-MS

# Dynamics of selected odorous VOC

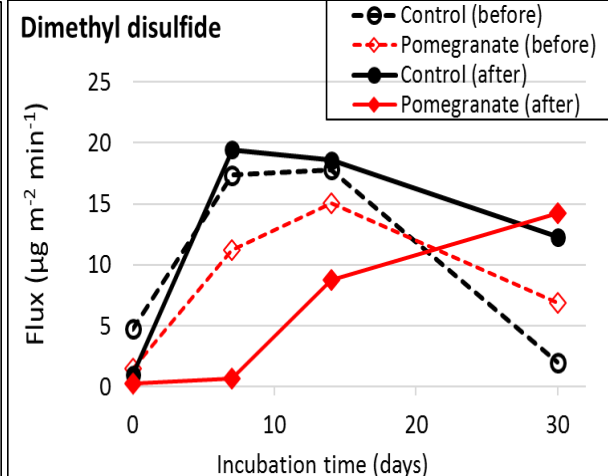
Propanoic acid



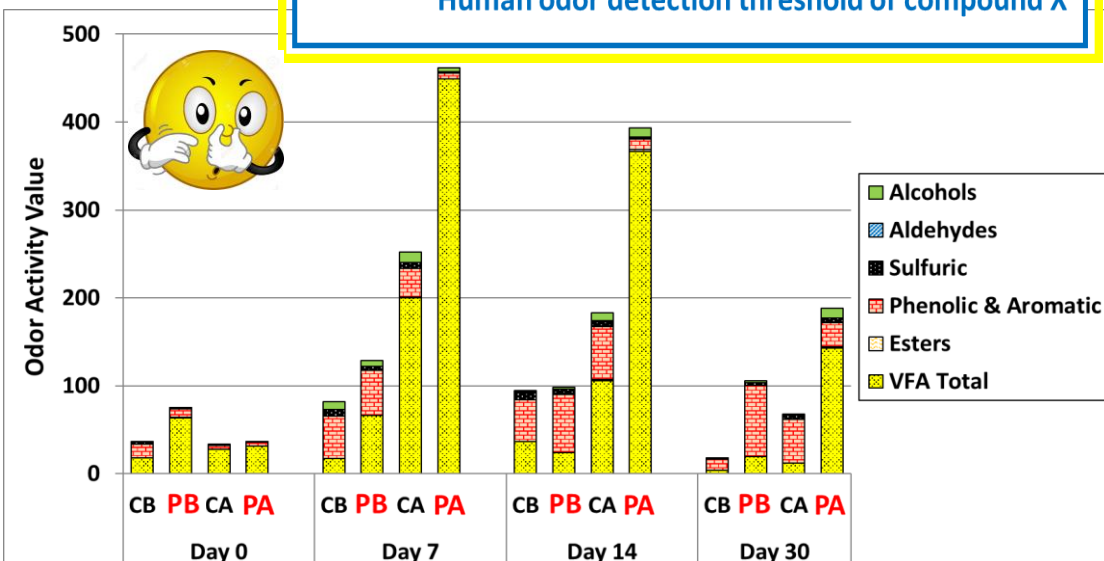
p-Cresol



Dimethyl disulfide



$$\text{OAV} = \frac{\text{Concentration of compound X}}{\text{Human odor detection threshold of compound X}}$$



## Conclusions

Pomegranate additives significantly increased the emissions of VFA and the total potential odor annoyance associated with calves manure. This effect should be considered while introducing this diet.