Effects of olfactory exposure to twelve Essential Oils (EOs) on behavior and health of cows with subclinical mastitis

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CONTEXT & AIM

Compared with clinical mastitis, the **subclinical form of mastitis** (SM) is more prevalent and thought to cause more **economic losses** to the dairy industry. **Antibiotics** are the primary treatment for this disease. Given their **disastrous effects** including residues and the increased resistance to some pathogens, novel **alternative approaches** based on plant aromatherapy and phytotherapy have garnered significant interest to treat SM. Nevertheless, their effectiveness against this disease remains a subject of intense scientific debate. This study aims first to record observations of cows' behavior towards an **olfactory exposure to EOs** and determine if such route of approaches is effective against SM.

EXPERIMENTAL DESIGN

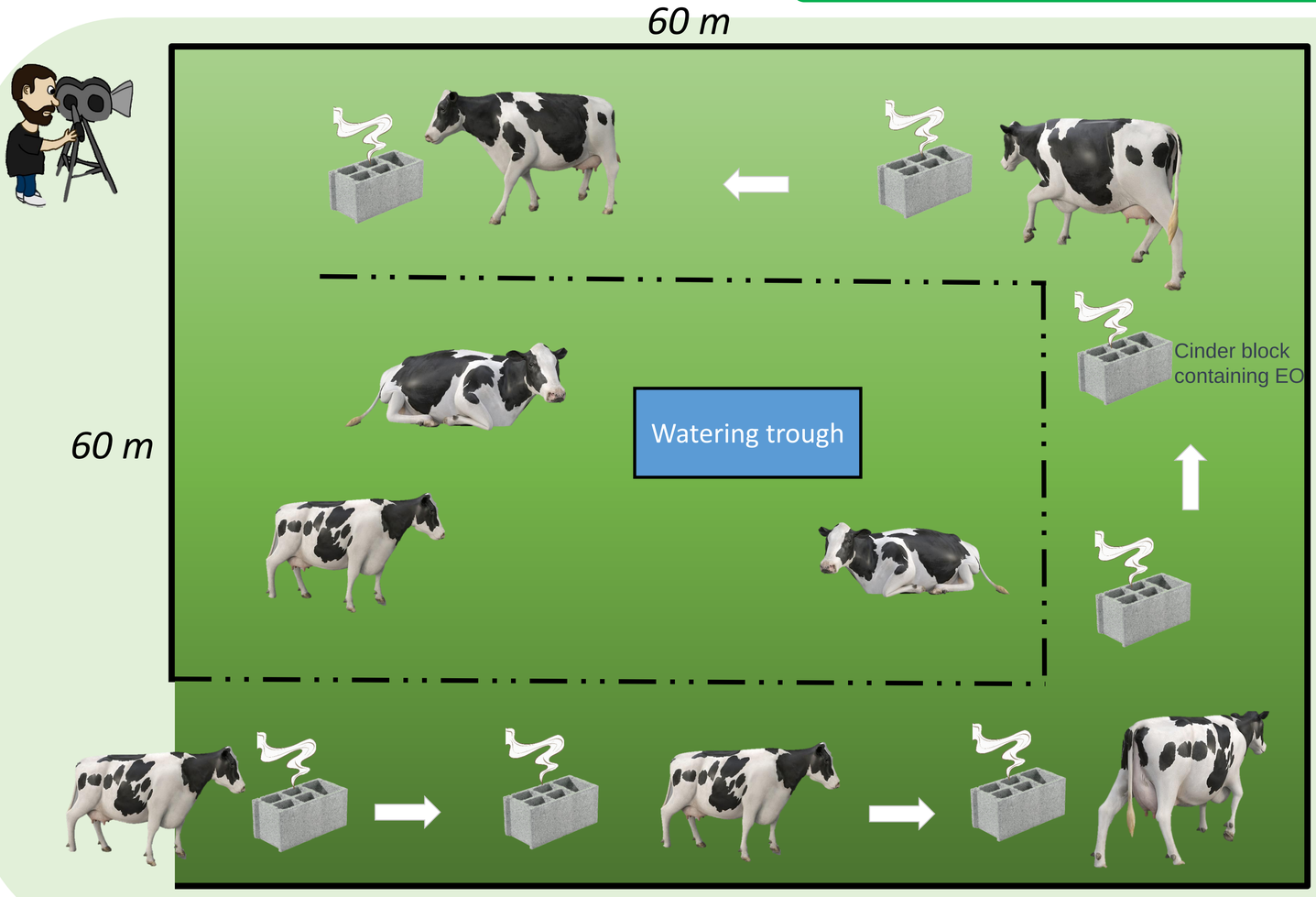

Illustration of Behavioral Observation of Cows

➢ Protocol

- 29 Holstein cows including 19 with SM were exposed during 2 consecutive days for 2 hours to 12 Eos (8 chemical families) distributed into 12 cinder blocks
- EOs' position were modified on day 2

➢ Sampling and Analysis

- Blood, milk sampling and nasal swab
- Measurement of milk somatic cell count (SSC), nasal bacteriological composition and blood cortisol level

➢ Cows' Behavior

- Time spent to smell EOs

RESULTS

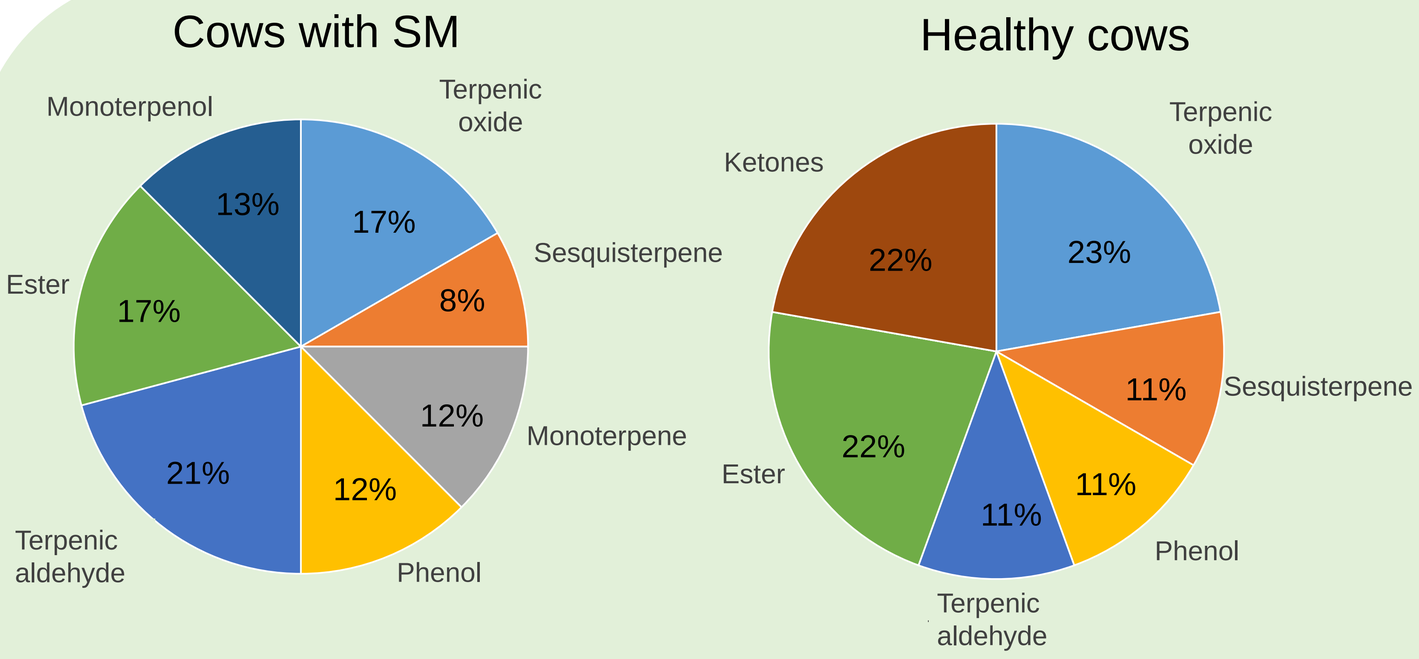

Figure 1 : Distribution of chemical families of EOs smelled by the 2 groups of cows

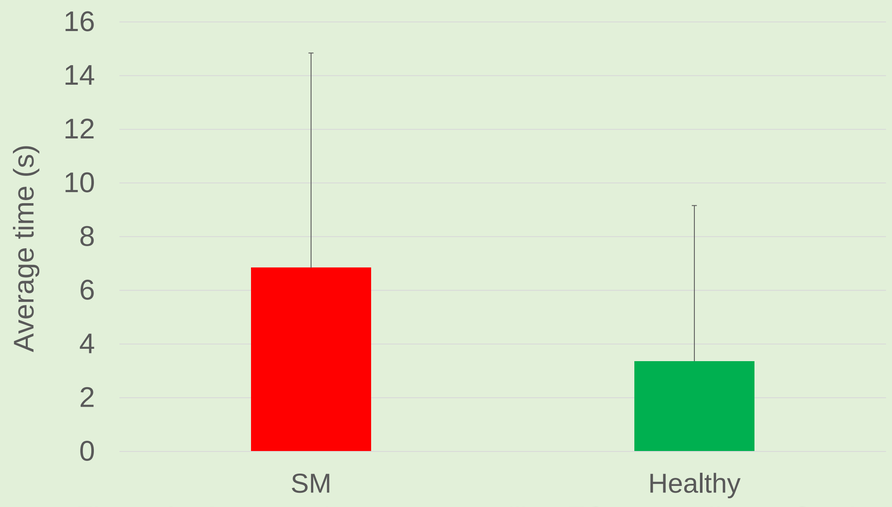

Figure 2 : Average time spent smelling EOs according to Cow's health status

1. EOs' families Monoterpenol and monoterpene are exclusively sensed by cows with SM, whereas ketone family are exclusively sensed by healthy cows

2. Cows with SM show greater interest to EOs than healthy cow ($P<0.05$).

3. While no significant differences were observed for SCC, milk composition, and bacteriology, there was a significant increase ($P<0.05$) in blood cortisol levels following exposure to EOs for all cows

CONCLUSION

These preliminary results demonstrate that cows with SM show more interest in EOs without any direct effect on their health status. Studies are underway to determine the chemical nature of the most attractive EOs to which SM cows were attracted and their direct effectiveness. Further studies are needed before making any recommendation regarding EOs olfactory exposure route to treat SM in dairy cows.