

**HORSE MANURE –
boon and bane
for farmers?**

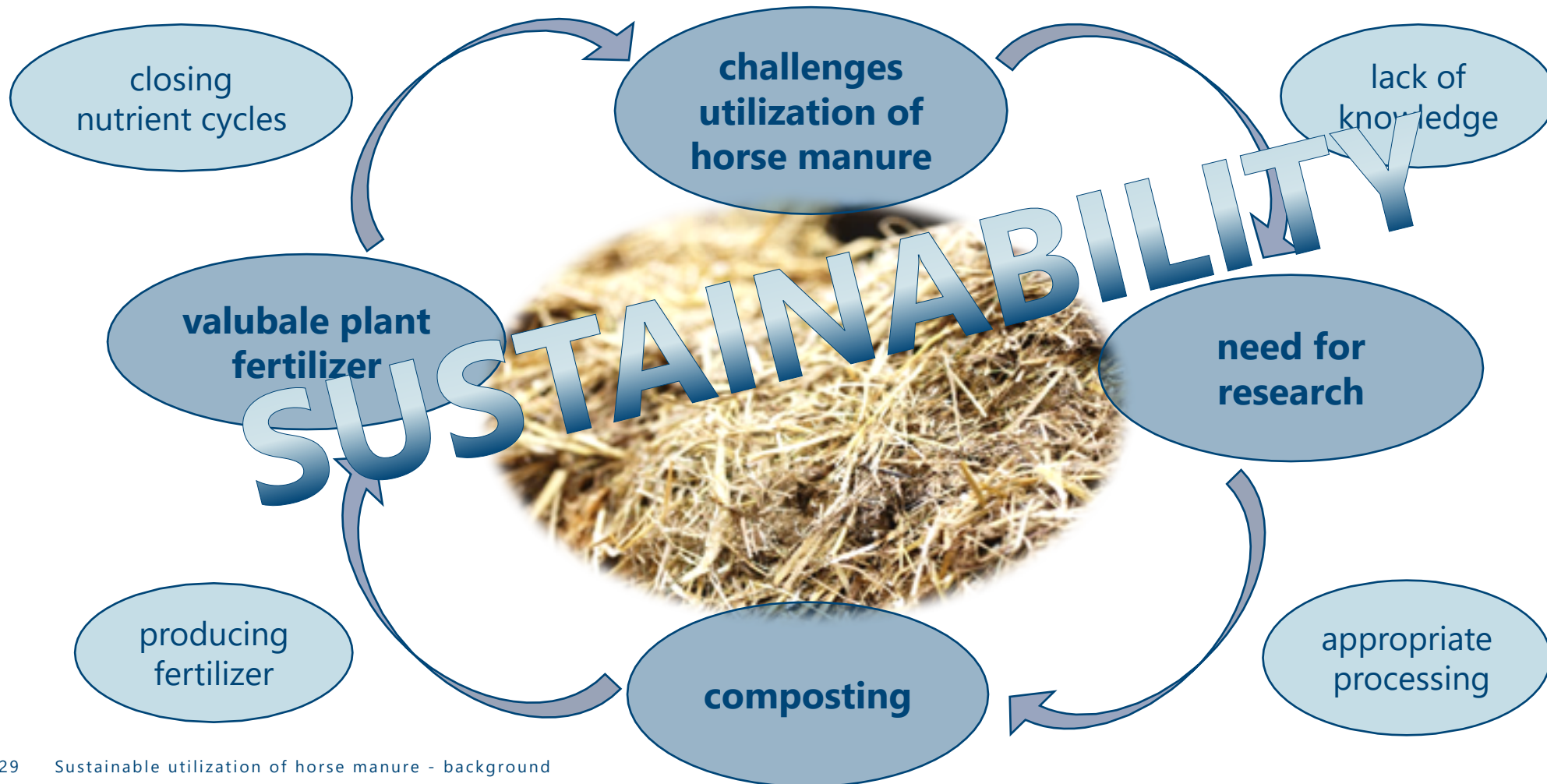
SUSTAINABLE UTILIZATION OF HORSE MANURE

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RELEVANCE



CHALLENGES OF UTILIZATION OF HORSE MANURE

- high amount horse manure
 - increasing requirements → limited storage capacity
 - limited or no agricultural land → no application possibility
- untreated horse manure not ideal as fertilizer especially not for grassland
 - containing high percentage of straw → slow microbial degradation
 - unclear hygienic status → risk of reinfection

➡ low demand for horse manure and potential high cost for disposal!

NEED FOR RESEARCH

- no general guidelines for horse farms how to deal with their horse manure best
- few current studies on different utilization possibilities of horse manure
- sporadic studies regarding the influence of composting of horse manure on
 - improvement of nutrients availability
 - pathogens
 - active ingredients of wormers

AIM

- examination of different utilization possibilities of horse manure with focus on
 - storage capacity
 - nutrient availability
 - hygienic parameters



➔ **practical solutions and general recommendations for a sustainable use of horse manure**

STRUCTURE

- duration: three years
- work packages with a different focus
 - decomposition of pasture residues
 - horse manure in biogas plant
 - **composting of horse manure**



Source: own pictures

RESEARCH DESIGN

- trials
 - six weeks
 - summer and winter months
- four differently treated muck heaps
 - muck heap 1: untreated (control)
 - muck heap 2: 1x chopped
 - muck heap 3: 1x chopped + 1x relocated
 - muck heap 4: 2x chopped



Source: own pictures

RESEARCH DESIGN - SAMPLES

- monitoring of
 - volume reduction
 - dry matter
 - temperature
- influence of composting process on
 - nutrients
 - pathogens (salmonella and parasites)
 - active ingredients of wormers

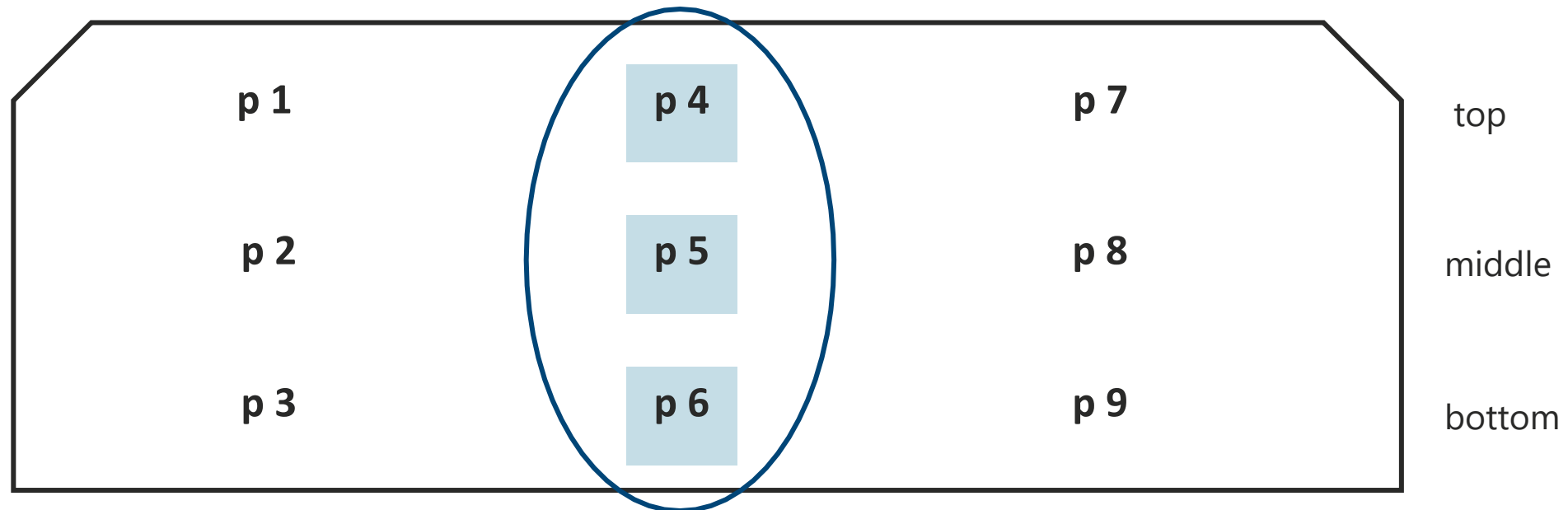


Source: own pictures

FIRST RESULTS

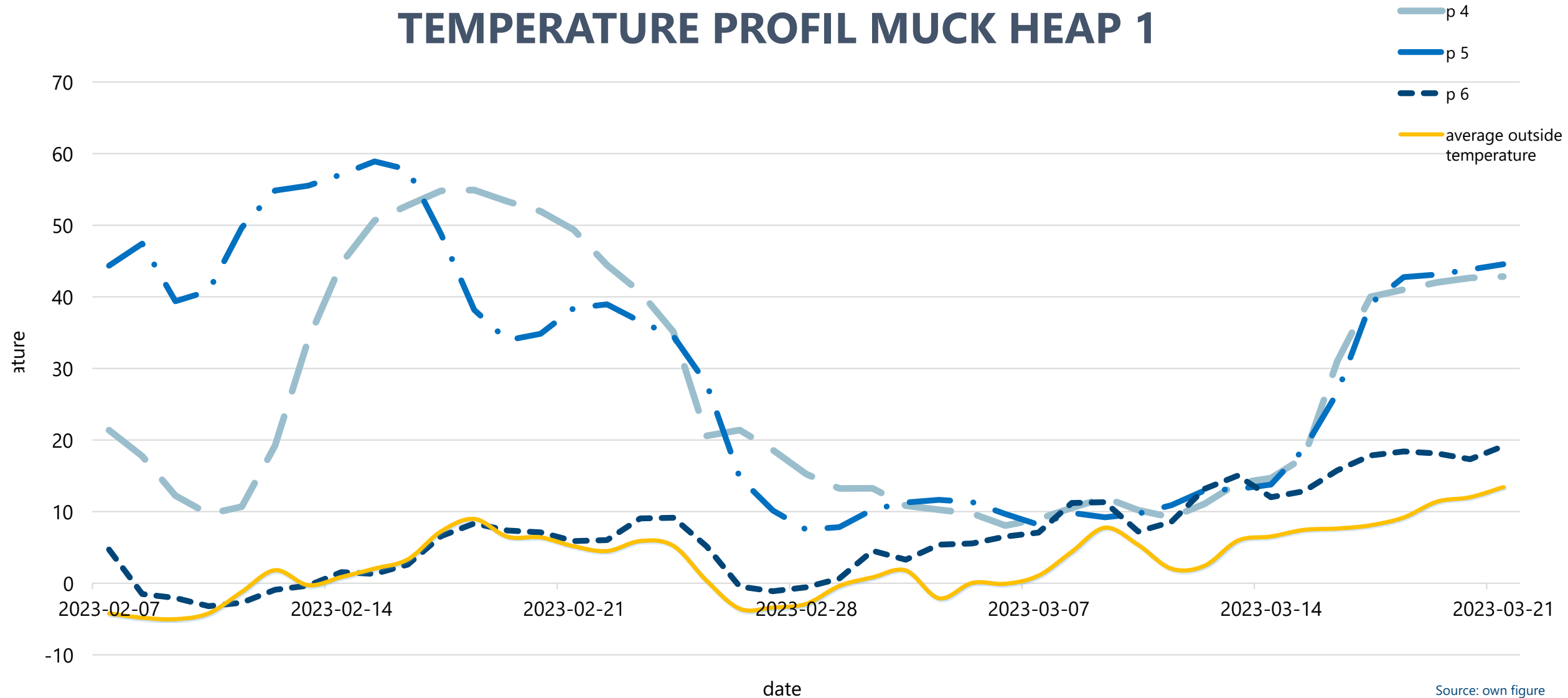
- muck heap 1
 - untreated
- muck heap 3
 - 1x chopped + 1x relocated

side view of muck heap



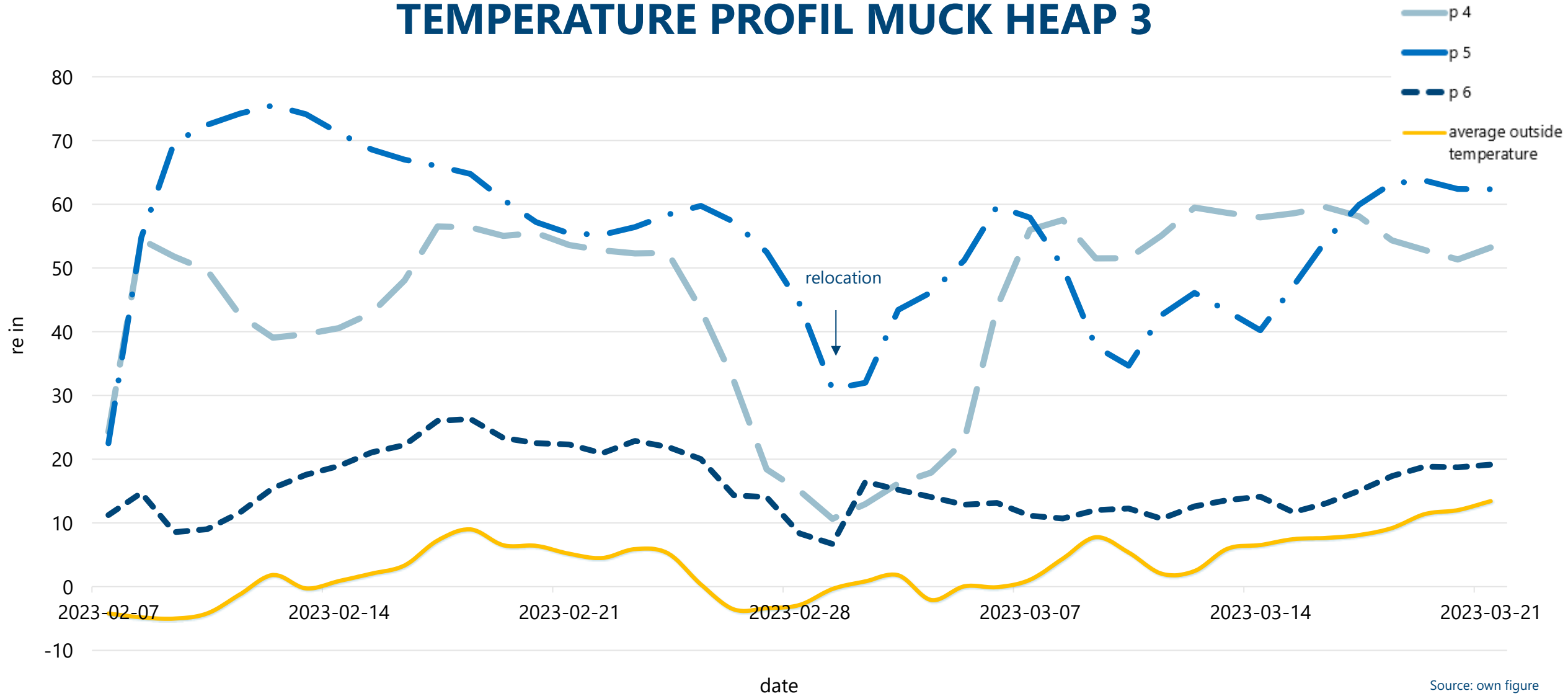
Source: own figure

TEMPERATURE PROFIL MUCK HEAP 1



Source: own figure

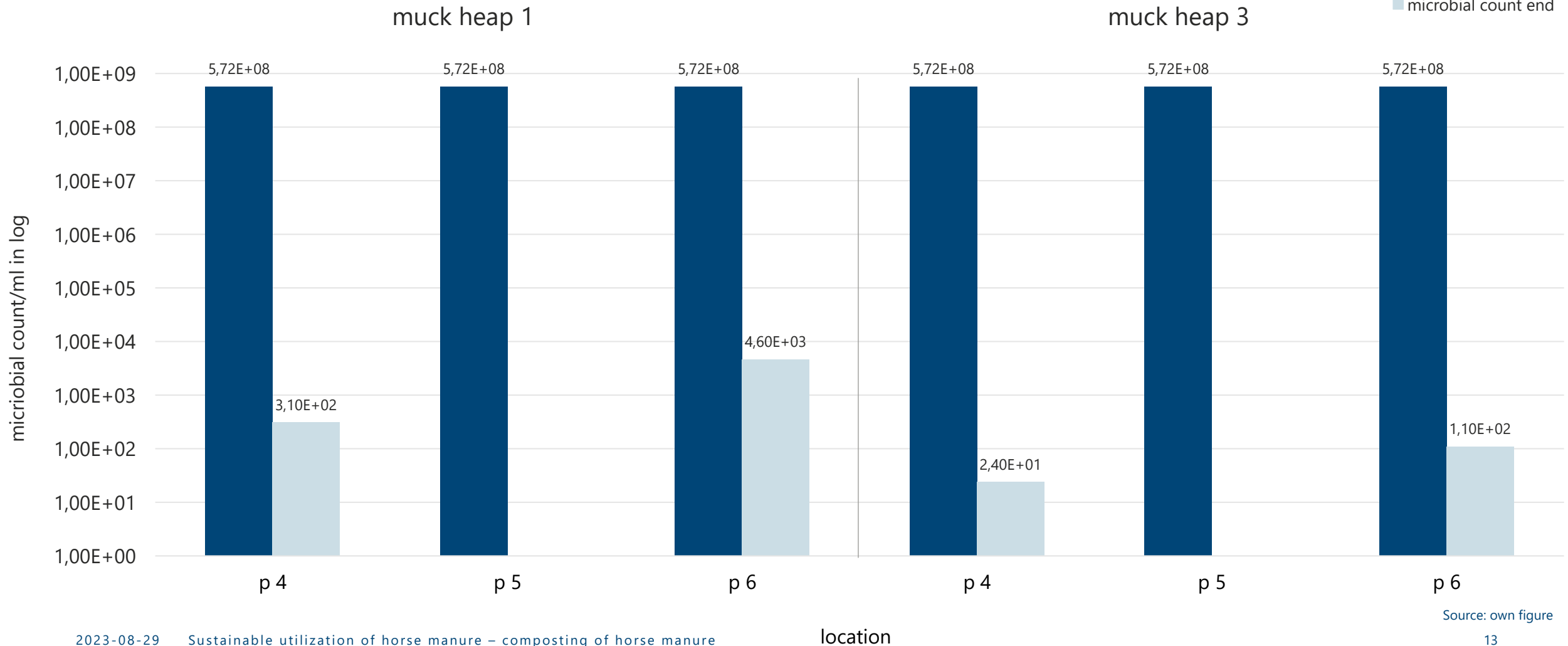
TEMPERATURE PROFIL MUCK HEAP 3



Source: own figure

REDUCTION OF SALMONELLA WINTER TRAIL

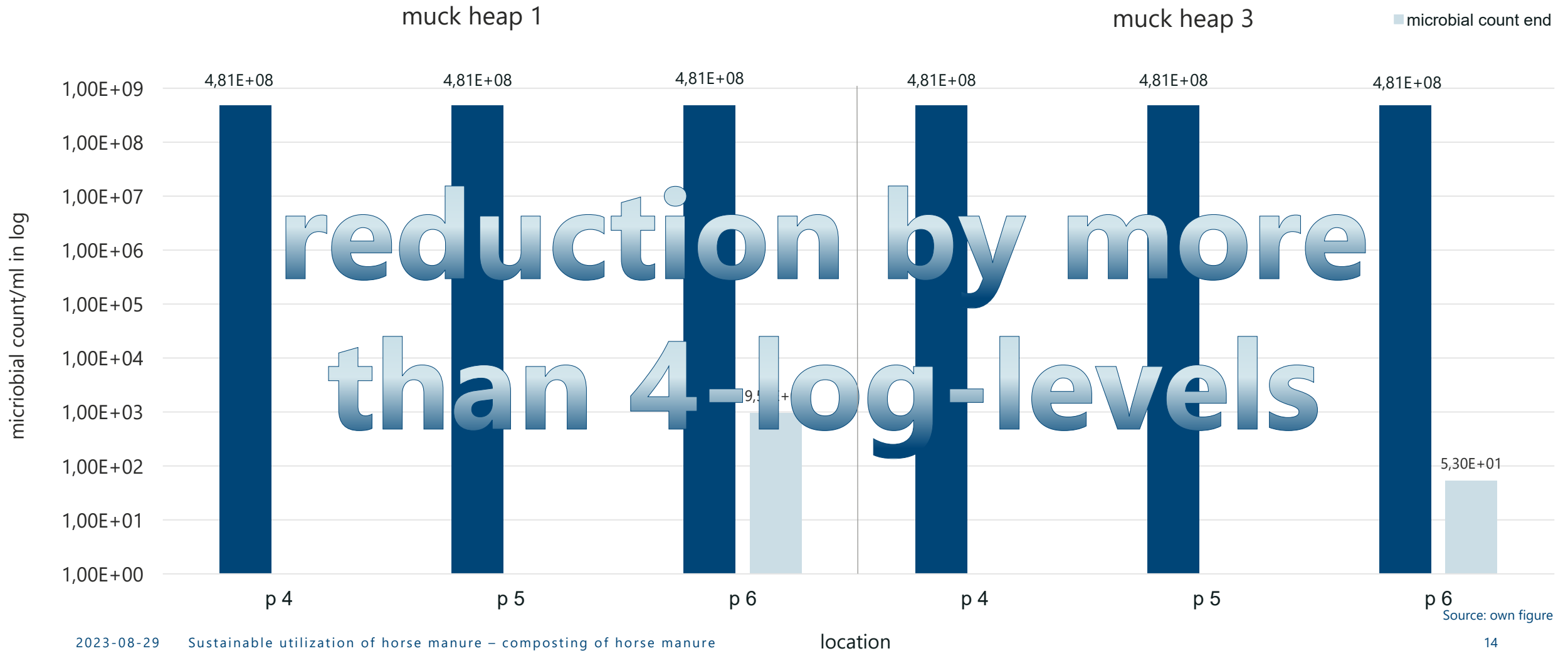
■ microbial count start
■ microbial count end



REDUCTION OF SALMONELLA SUMMER TRIAL

■ microbial count start

■ microbial count end



PRELIMINARY CONCLUSIONS

- temperature
 - temperatures over 75 C° degrees in the center of chopped muck heaps possible
 - temperatures in areas near the ground follow the ambient temperatures
 - higher temperature level in chopped heaps
- impact on pathogens
 - significant reduction of salmonella → sanitation
 - correlation between sanitation and temperature
 - relocation muck heap

PRELIMINARY CONCLUSIONS

- storage capacity
 - significant volume reduction due to chopping before composting ($\approx 55\%$)
 - further reduction of volume through composting process
- dry matter
 - highly variable
 - influenced by multiple factors
 - watering of muck heap might be necessary

➡ further trials are required to verify the first results and to confirm the preliminary conclusions!

**THANK YOU VERY
MUCH FOR YOUR
ATTENTION!**

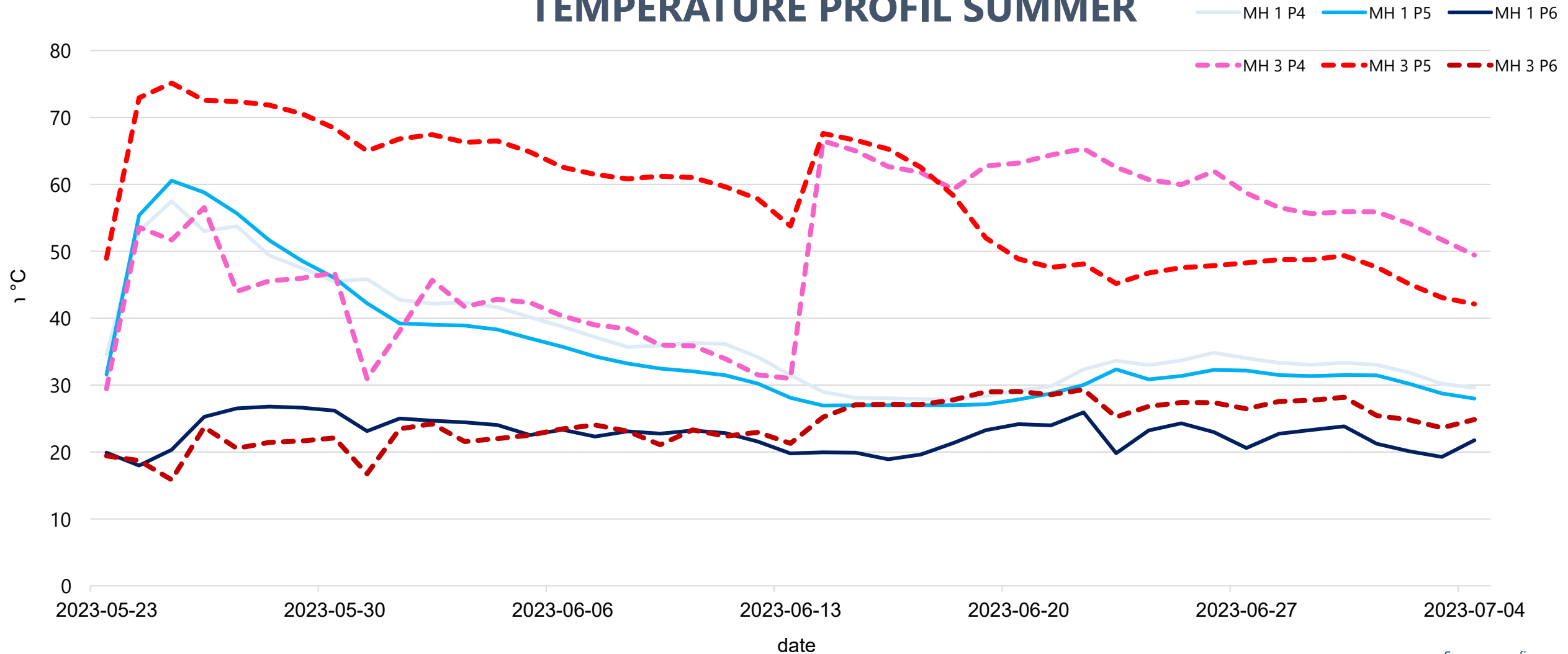


TIME FOR YOUR QUESTIONS!

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TEMPERATURE PROFIL SUMMER



Source: own figure

COMPOSTING

- Advantage
 - reduction of storage and transport volume
 - microbial disintegration
 - high temperatures → important for sanitation

But:

- chopping before composting
- relocate heap
- watering heap if necessary