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Ability of dairy proteins to reduce capsaicin-induced oral burning pain and possible clinical implications

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Introduction and Aim

- Burning mouth syndrome (BMS): Idiopathic chronic orofacial pain disorder (1)
- Capsaicin used for experimental pain studies to replicate BMS symptoms (2)
- Milk reduces capsaicin-induced burning pain in the oral cavity (3)

Aims:

- Investigate if milk proteins can relieve capsaicin-induced oral burning pain
- Investigate association between daily capsaicin consumption and sensitivity towards capsaicin

Statistics

- Normality check (quantile-quantile plots)
- Spearman's rank correlation coefficient for association between frequency of capsaicin consumption and sensitivity towards capsaicin
- Analysis of variance (repeated measurements) to analyse QST data and to analyse effect of rinsing on the burning sensation and unpleasantness

Results (Part 1)

Maximum intensity: Highest self-reported score for capsaicin-evoked unpleasantness/burning before rinsing

Duration: Time period after rinsing until no unpleasantness/burning is reported

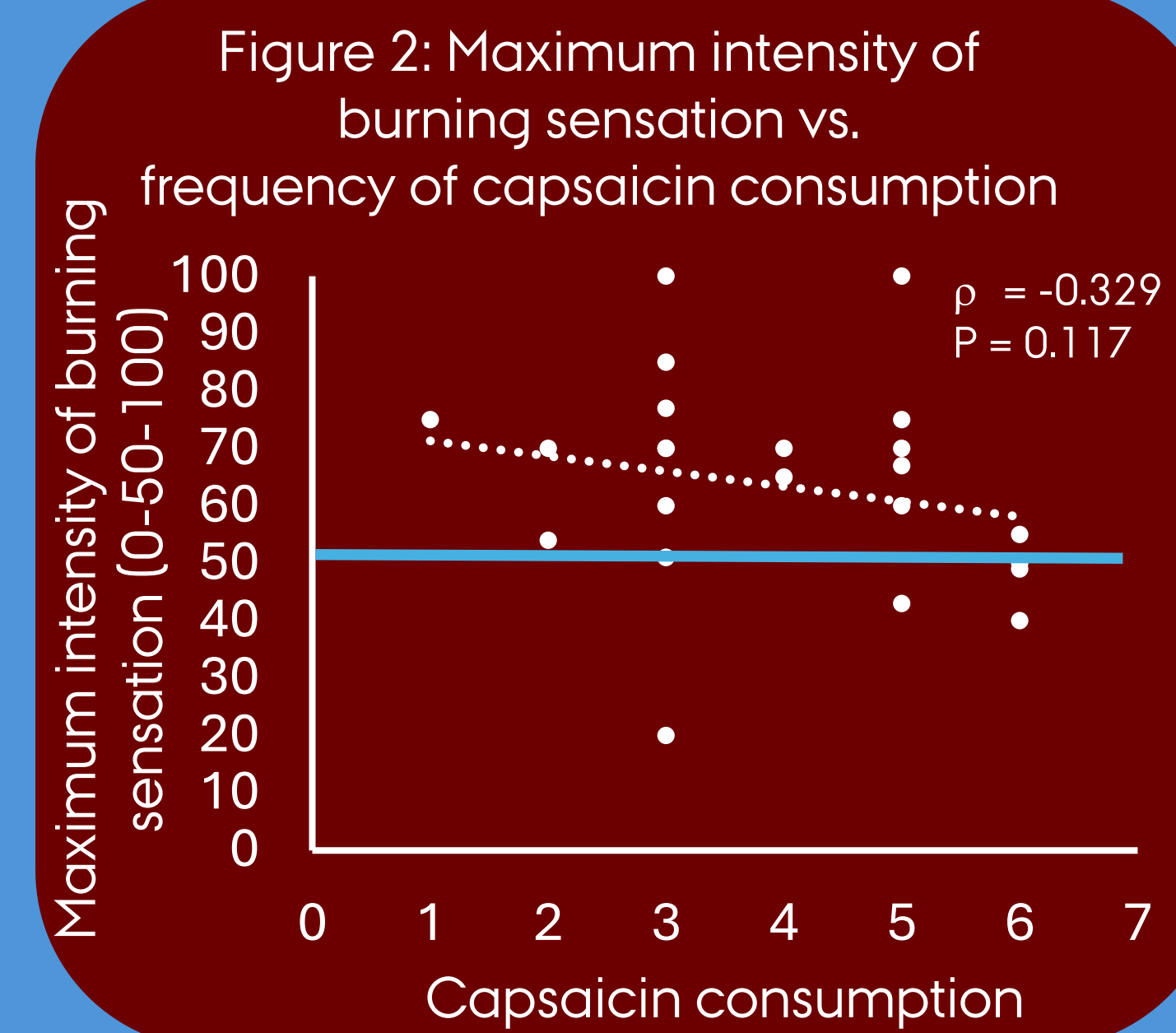
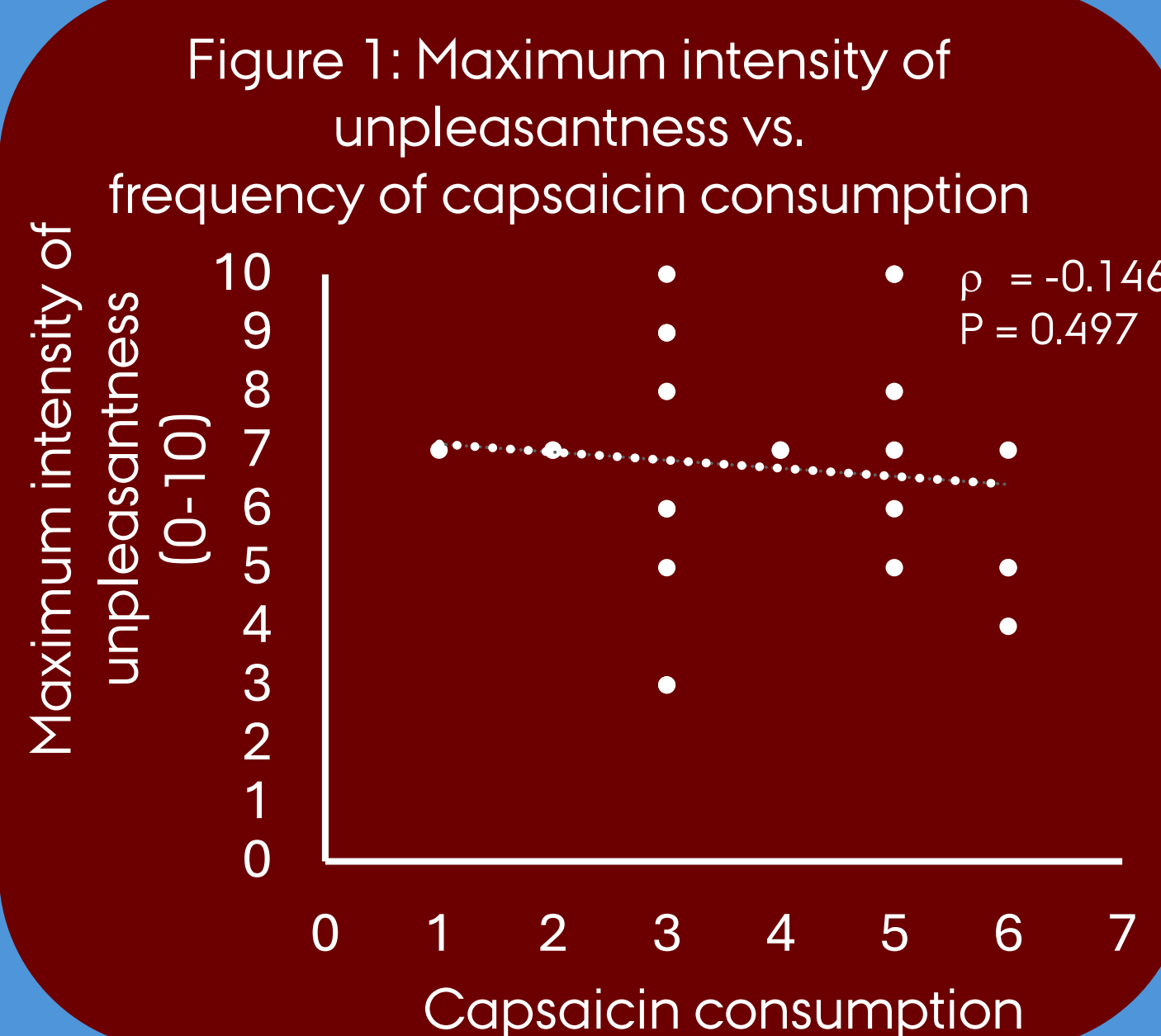


Figure 1 and 2: No statistically significant association was observed between the self-reported frequency of capsaicin consumption and the maximum intensity of perceived unpleasantness or burning sensation caused by capsaicin ($p \leq -0.146$, $P \geq 0.117$)

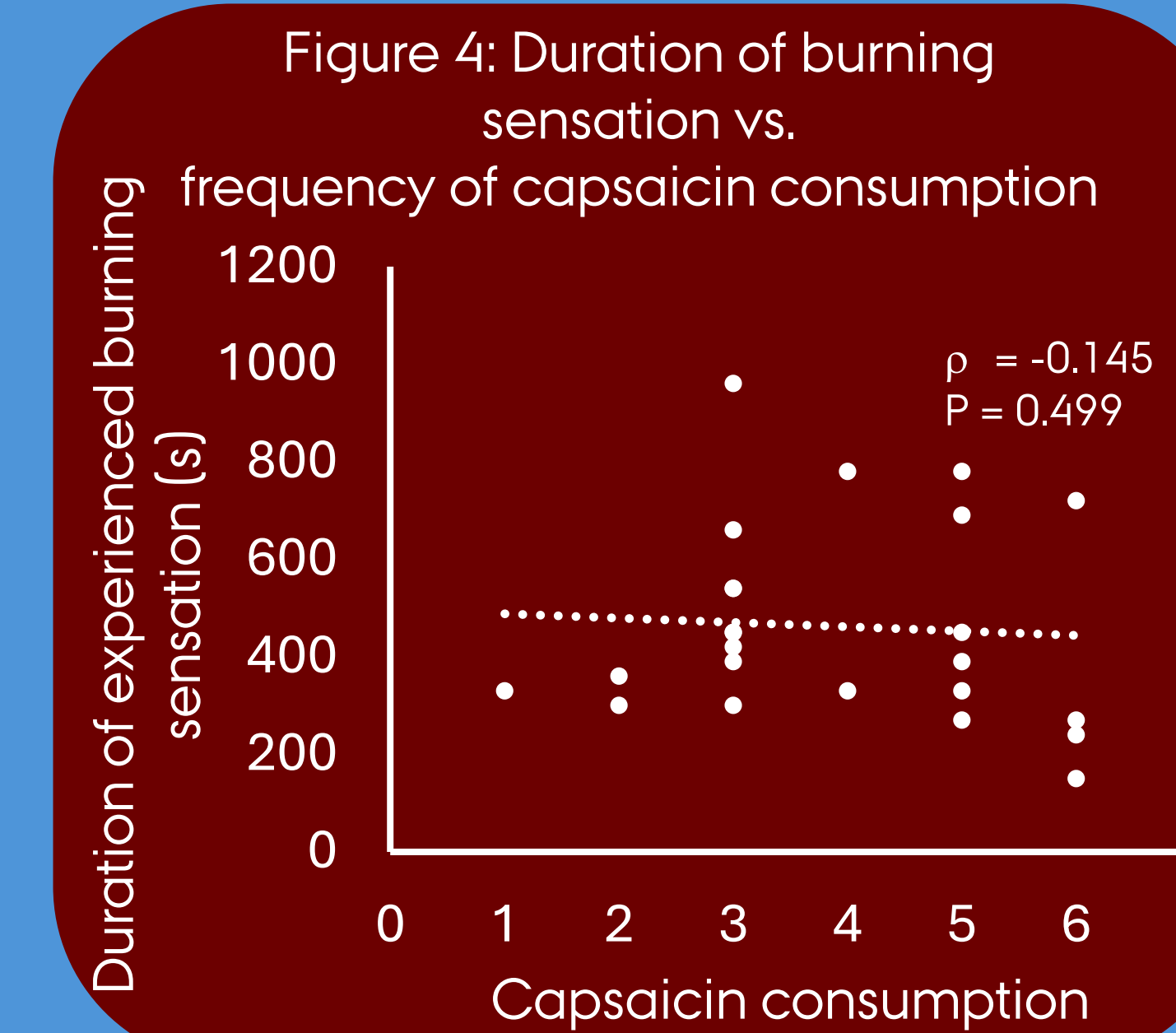
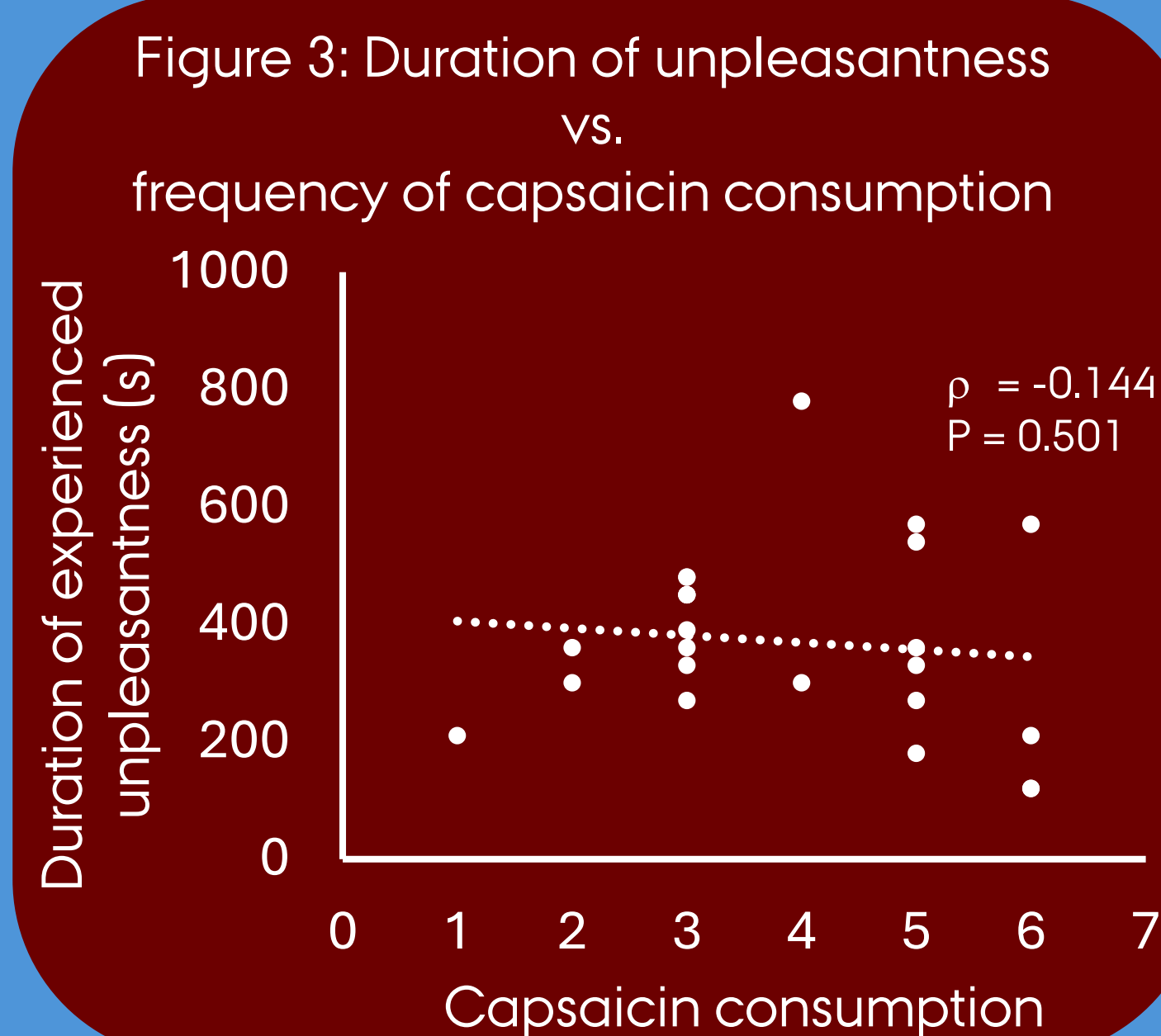


Figure 3 and 4: No statistically significant association was observed between the self-reported frequency of capsaicin consumption and the duration of capsaicin-induced unpleasantness or burning sensation ($p \leq -0.144$, $P \geq 0.499$)

Results (Part 2)

- First 3 minutes after rinsing: No difference between sessions ($P \geq 0.772$)
- Duration: Overall, no difference between sessions ($P \geq 0.117$)

Session	Unpleasantness	Burning sensation
Casein	328.8 ± 35.6	435.0 ± 36.0
Whey	325.0 ± 32.2	405.0 ± 30.7
Water (control)	370.0 ± 32.0	462.5 ± 41.9

Table 1: Duration (in seconds) of perceived capsaicin-evoked unpleasantness and burning sensation (± standard error of the mean)

- No significant differences in sensitivity towards fixed thermal (5, 40, 45 and 50°C) and mechanical (64, 128 and 256 mN) stimuli between sessions ($P \geq 0.053$)
- No changes in sensitivity towards 5°C cold stimuli within sessions ($P = 0.915$)
- Heat sensitivity increased after capsaicin exposure and after rinsing compared with baseline ($P < 0.001$) (*). Decrease after rinsing compared with after capsaicin exposure ($P < 0.001$) (#) (Figure 5)
- Mechanical sensitivity increased after capsaicin exposure and after rinsing compared with baseline ($P < 0.001$) (*) (Figure 6)

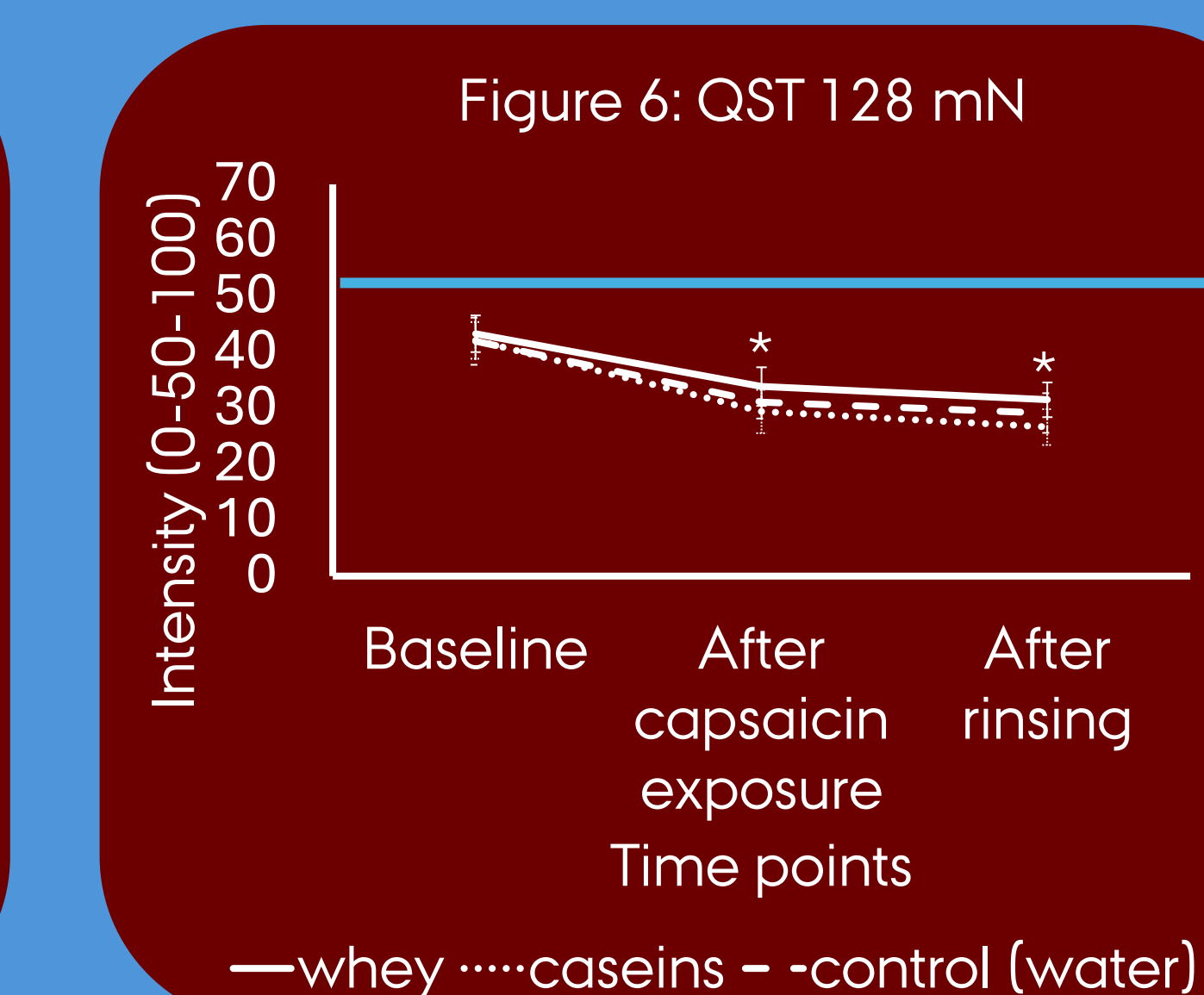
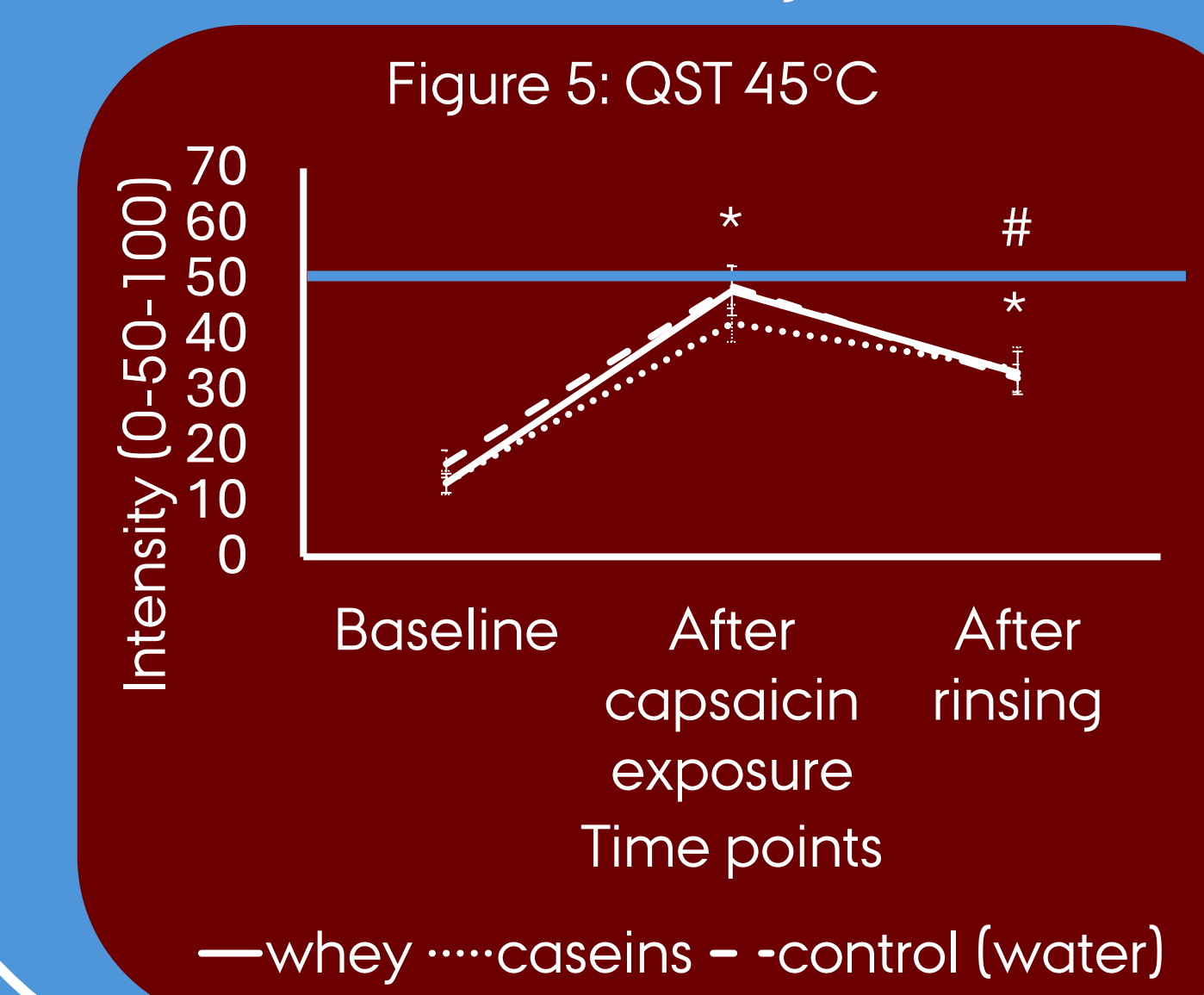


Figure 5 and 6: Sensitivity towards 45°C and 125 mN

Conclusion

- No association between self-reported capsaicin consumption frequency, the intensity and the duration of experienced unpleasantness or burning sensation
- Proteins alone cannot explain milks pain relieving effect. A synergistic effect between constituents may exist

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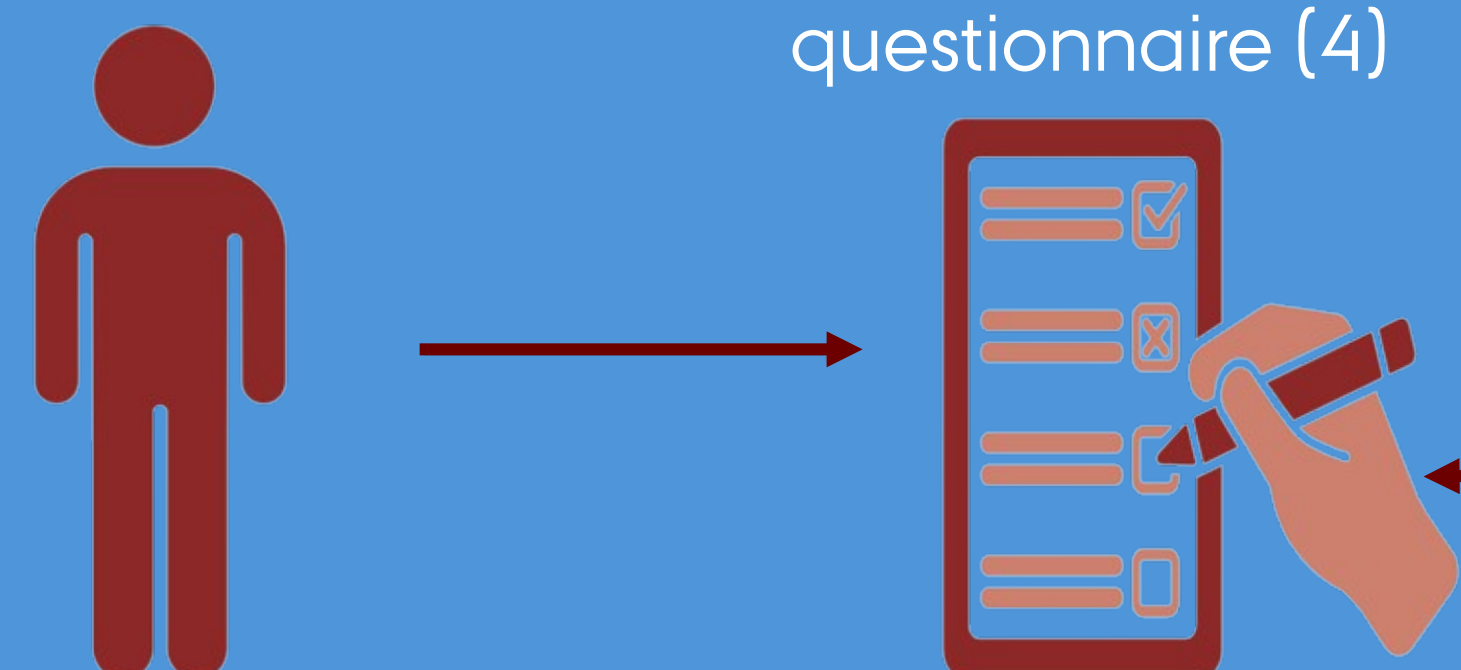
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Part 1

Participants: 24

Capsaicin consumption questionnaire (4)

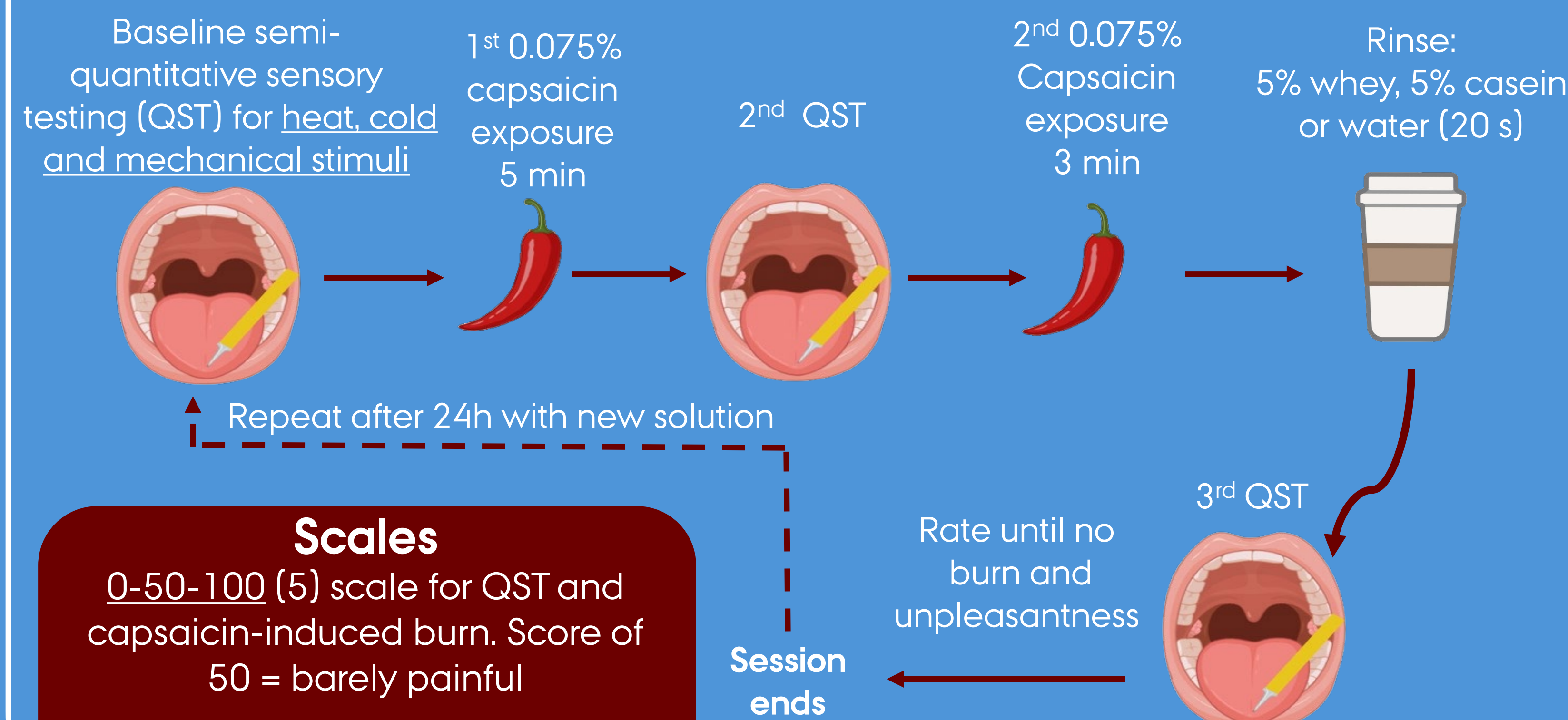


Methods

Frequency of consumption of food causing burning sensation or tingling in the mouth:

- Once a year or less
- Less than once a month
- 1-3 times per month
- Once a week
- 3-4 times per week
- Once a day
- More than once a day

Part 2



Scales

0-50-100 (5) scale for QST and capsaicin-induced burn. Score of 50 = barely painful

0-10 numerical rating scale for capsaicin-induced unpleasantness

Session ends

Rate until no burn and unpleasantness