

Investigation of soaking juice produced by ultrasound-assisted soaking of chickpeas

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Introduction

Chickpeas are highly nutritious, rich in protein, carbohydrates, fibre and micronutrients. According to several studies, they can play a beneficial role in glucose and insulin regulation and have positive impact on cardiovascular health. The by-products and waste generated in the production of chickpea products are a challenge for the food industry. Chickpea cooking water appears to be a promising substitute for animal-derived ingredients in some foods. Ultrasonic treatment can shorten the soaking time and influence the properties of the soaking water. In our study, the effect of ultrasonic treatment on dried chickpeas was investigated by measuring parameters such as color, pH, conductivity, dry matter content and Brix value.

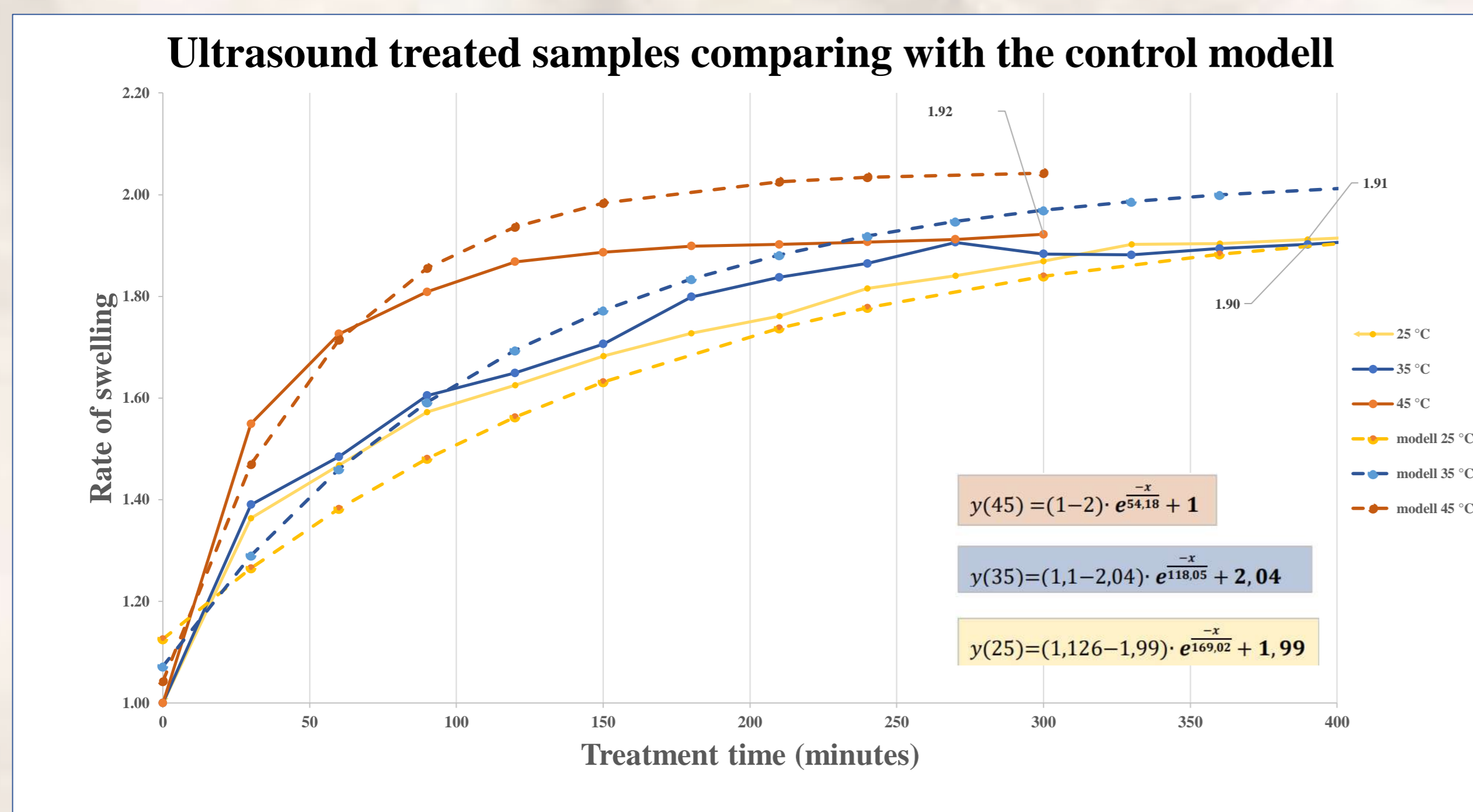
Aim

The aim of the study is to compare the soaking water of chickpeas at different temperatures and ultrasonic treatment in advance to reduce the soaking time.

Materials and methods

Commercially available dried chickpeas were soaked in tap water, assisted by ultrasonic treatment. Our aim was to double the moisture content of the chickpeas, whereas this is the industrial practice in the production of canned chickpeas. Different temperatures (25°C, 35°C, and 45°C) were used during the soaking process with ultrasonic treatments. The weight of the samples was measured every 30 minutes to determine how long it takes to double the chickpeas' initial mass. Ultrasonic baths were utilized for the treatments at specific temperatures. Color measurements were performed using a spectrophotometer in the CIE-Lab* tristimulus coordinate system. pH, conductivity, dry matter, and brix measurements were also performed during the experiment.

Results

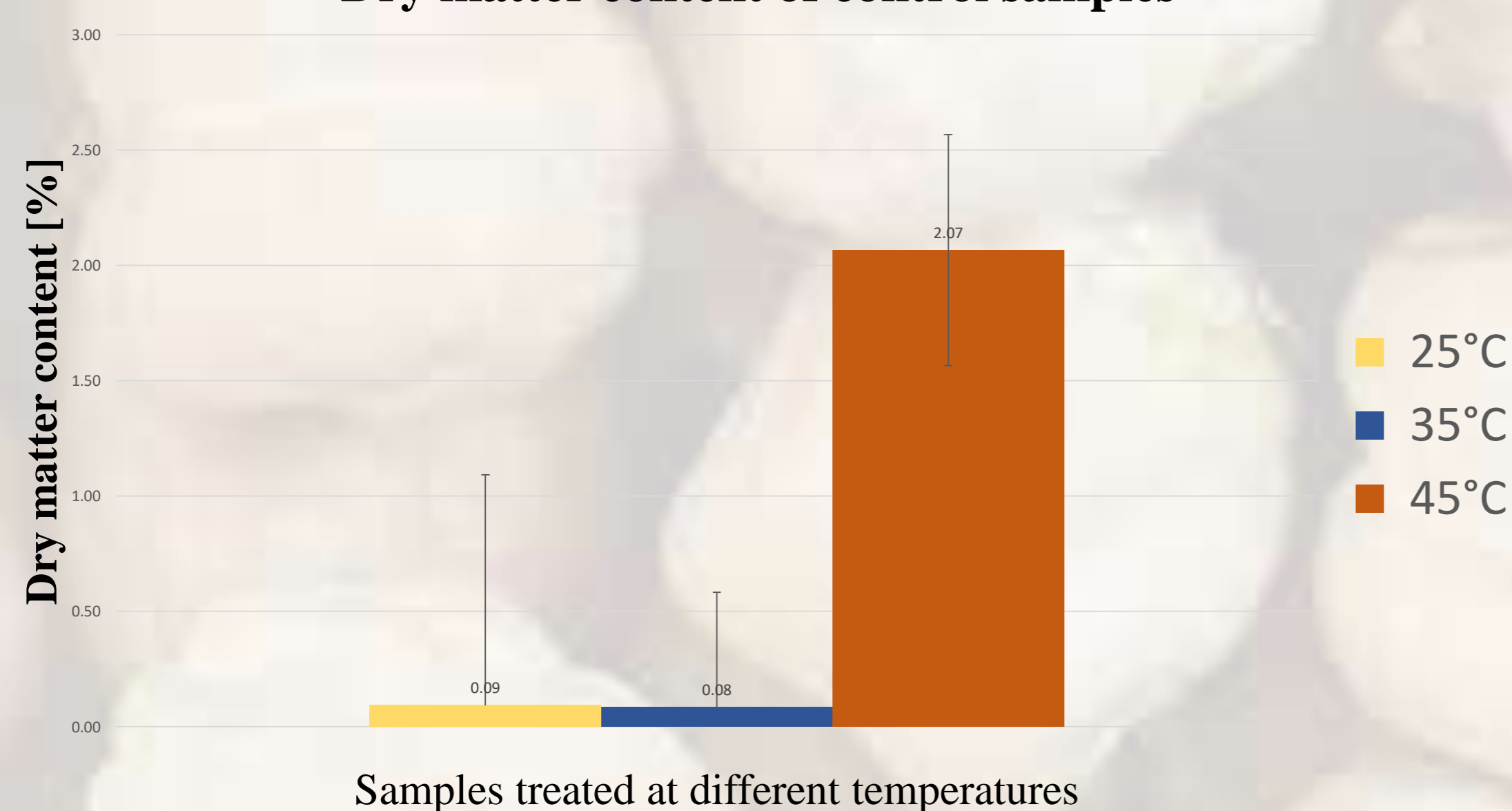


Color measurements

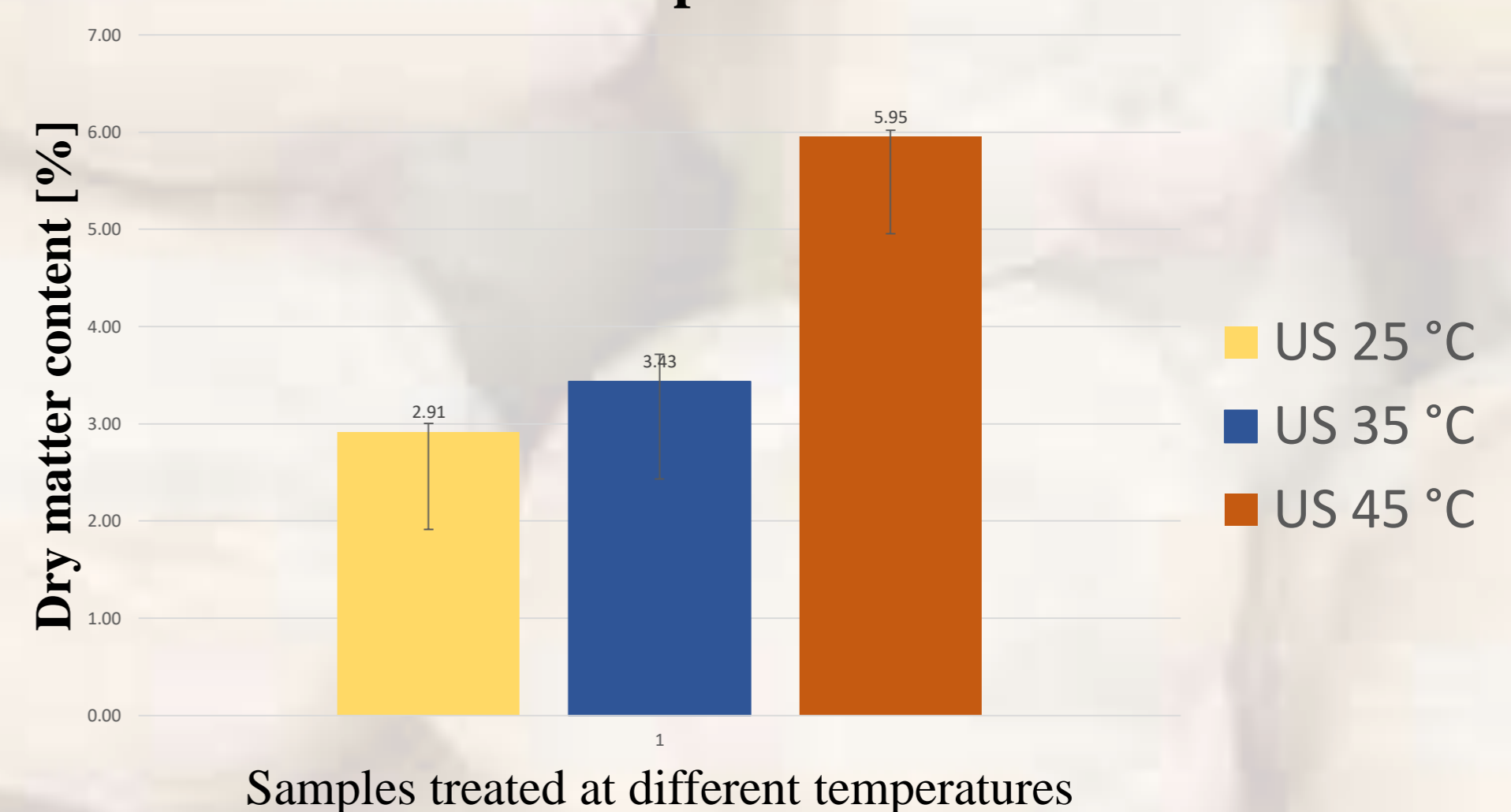
Control	L*	a*	b*	ΔE
25 °C	91,14	-0,80	10,41	13,48
35 °C	83,36	-0,42	12,69	20,87
55 °C	57,59	2,50	27,50	50,55

Ultrasound treated	L*	a*	b*	ΔE
25 °C	51,36	2,34	25,82	55,07
35 °C	56,87	1,75	927,65	51,40
55 °C	44,34	4,12	34,92	65,76

Dry matter content of control samples



Ultrasound treated samples at different temperatures



Conclusion

Significant difference was found between the dry matter contents of the control and the ultrasound-treated samples, suggesting that ultrasound releases more water-soluble substances from the chickpeas during soaking. The hydration of dry chickpeas is a time-consuming step in food processing, but our results suggest that soaking time can be reduced by using ultrasonic treatments or higher temperatures.

References

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