

THE USE OF A NATURAL SEMI-SOLID FIBER SYRUP, MELTEC[®], FOR SUGAR REDUCTION IN SHORTBREAD COOKIES

Elena Vittadini^a, Fatma Boukid^b, Alessandro Carcelli^{bc}, Xinying Suo^a, Eleonora Carini^b

^a School of Biosciences and Veterinary Medicine, University of Camerino, Camerino (MC) Italy, ^b Department of Food and Drug, University of Parma, Italy, ^c HI-FOOD S.p.A., Parma, Italy

INTRODUCTION

Reduce sugar and increase dietary fibers consumption are two key factors of WHO policies for a healthier lifestyle. Dietary fibers other than for nutritional purpose can be used as bulking agent with a technological purpose in sugar reduced products.



MELTEC[®] Bulking agent ingredient

A clean label semi-solid fibre syrup based on chickpea and maize fiber with a "bulking" effect in substitution of sugar.

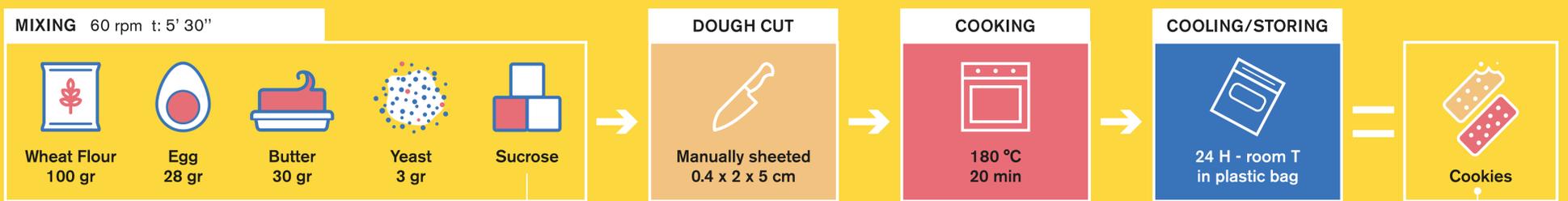


AIM OF THE STUDY

Substitute sugar in short bread cookies using MELTEC[®] as technological functional ingredient.

MATERIALS AND METHODS

MELTEC[®] was obtained by HI-FOOD S.p.A. (Parma, Italy), all other ingredients were purchased from a local supermarket.



Moisture Content: (MC, g of water/100 g of sample) measured by weight loss by drying in a forced air oven at 70°C to constant weight.

Water activity (a_w): measured at 25°C with an Aqualab 4 TE.

Hardness: Texture Analyzer (TA1 Texture Analyzer, AMETEK, USA) equipped with a 100 N load cell. Hardness (N) was evaluated by means of cutting test (at 2 mm/s, trigger force = 0.1 N) using a flat blade (FG/WBJ) and was measured as the maximum force at brake (N).

Colour: Minolta Colorimeter (CM 2600d, Minolta Co., Osaka, Japan) L^* , a^* , b^* . ΔE calculated using S100 as reference.

Sensorial Analysis: Acceptability test (texture, taste, flavour and overall acceptability) and a rapid profiling method check-all-that-apply (CATA) with 50 untrained judges.

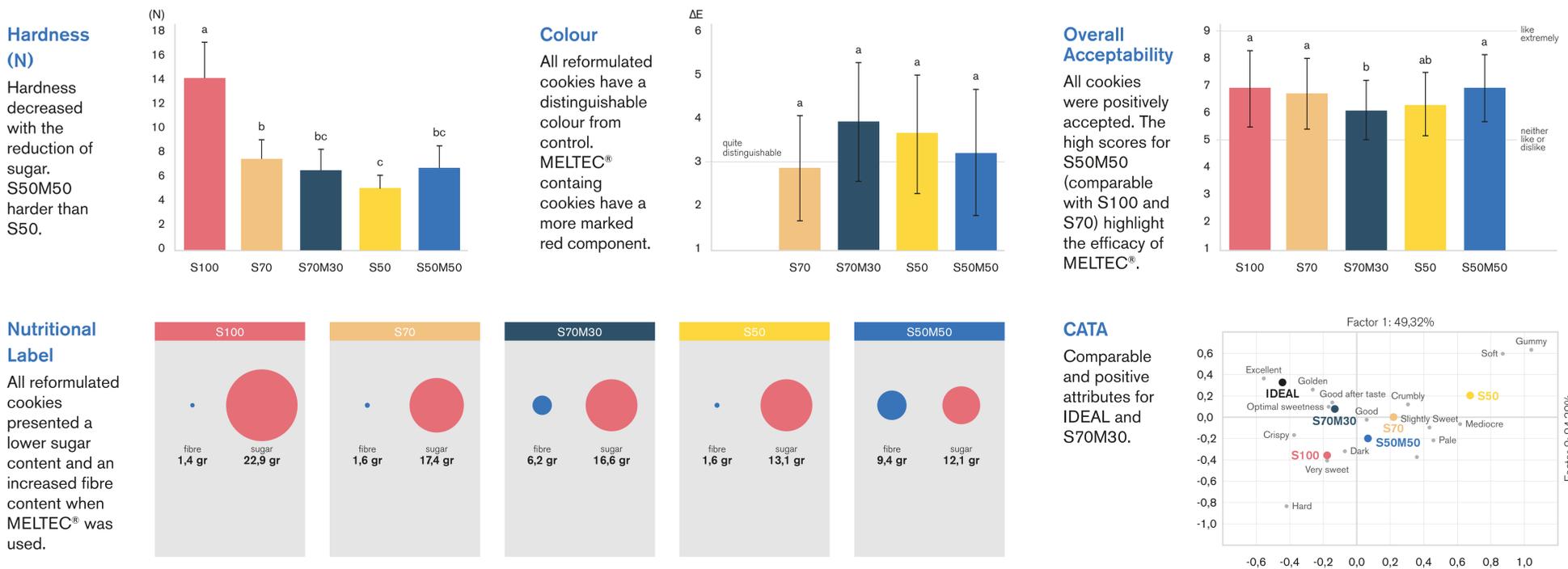
Nutritional Label: macronutrient calculated on the basis of European Institute of Oncology database and using the nutritional information reported in the technical data sheet for MELTEC[®]. Energy values calculated using the energy factors reported in the EU Regulation on labelling of food products (Regulation (EU) No 1169/2011).

Statistical Analysis: One way analysis of variance (ANOVA). Correspondence analysis method used for CATA questionnaire.

Sucrose	MELTEC [®]	Cookies
40 gr	-	S100 Sucrose 100
28 gr	-	S70 Sucrose 70
28 gr	12 gr	S70M30 Sucrose 70, Meltec 30
20 gr	-	S50 Sucrose 50
20 gr	20 gr	S50M50 Sucrose 50, Meltec 50

RESULTS

Water activity and moisture content were in the range 0.26-0.34 and 3.5-5.5 g H₂O /100 g sample, values in accordance for the product category.



CONCLUSIONS

MELTEC[®] has partially preserved the structure of the sugar reduced cookies and has enhanced their nutritional and consumer acceptability.

MELTEC[®] containing cookies were very higher in fibre than control and their structure was partially preserved as observed by hardness values. All reformulated cookies had all a colour distinguishable from the control with the MELTEC[®] containing products having a more marked red component. Sensory analysis revealed that cookies in which sugar has been reduced with MELTEC[®] presented a better consumer outcome than cookies in which sugar has been simply reduced.

References

- Azaïs-Braesco, V., Sluik, D., Maillot, M., Kok, F., Moreno, L. A. (2017). A review of total & added sugar intakes and dietary sources in Europe. *Nutrition Journal*, 16, 6.
- Guideline: Sugars intake for adult and children. Geneva: World Health Organization, 2015.
- Hutchings, S. C., Low, J. Y. O., Keast, R. S. J. (2018). Sugar reduction without compromising sensory perception. An impossible dream? *Critical Reviews in Food Science and Nutrition*.
- European Institute of Oncology, Food composition database for epidemiological studies in Italy [Online]. (2015). Available: <http://www.bda-ieo.it> [24 July 2020].