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EXAMINATION OF TECHNO-FUNCTIONAL PROPERTIES OF CHICORY (*Cichorium intybus* L) ROOT FLOUR AS A POTENCIAL INGREDIENT OF FUNCTIONAL FOOD

Jovanka G. Laličić-Petronijević[1]*, Milica S. Stevanović[1], Mirjana A. Demin[1], Biljana B. Rabrenović[1], Dragana M. Paunović[1], Aleksandra L. Ćirković[1], Lazar D. Pejić[1]

[1]Faculty of Agriculture, University of Belgrade, Belgrade, Serbia

** Corresponding author: jovankal@agrif.bg.ac.rs*

Introduction

Chicory (*Cichorium intybus* L.) has been used for hundreds of years as a herbal remedy for many diseases due to its health-promoting properties that include anti-inflammatory, anticarcinogenic, antimicrobial, and antioxidative attributes. The chicory root is known as the major source of inulin, a dietary fiber with prebiotic effect, and also contains other phytochemicals such as coumarins, flavonoids, sesquiterpene lactones, tannins, alkaloids, vitamins, minerals, and volatile oils. However, the use of chicory root is limited due to its bitter taste, which can be reduced by various treatments.

Aim

The aim of this study was to examine the techno-functional properties (moisture content, water holding capacity, oil holding capacity, swelling capacity, bulk density, solvent retention capacity) of chicory root flour, both treated and untreated, as well as those of composite flours made of its mixtures with wheat flour.

Material and Method

Raw flour obtained by grinding dried chopped chicory root and flour treated to reduce bitterness were used. Treatment was performed by heating (140ºC for 30 min), and by heating and mixing with 10% honey and 10% sunflower oil. Composite flours made by combining of both chicory root flours with wheat flour in the proportion of 1%, 2,5% and 5% were tested as well. The moisture content was determined by standard ICC method (No. 109/1), and SRC by AACC method 56-11. Other techno-functional properties were determined according to the methods described by *Zlatanović et al.* (2019).

Table 1. Results of the techno-functional characteristics of examined flours

Parameters		WF	C	C1	C2	Composite flours								
						M1	M2	M3	M4	M5	M6	M7	M8	M9
M (%)		**10,73**	7,46	5,76	4,61	10,70	10,68	10,67	10,65	10,61	10,58	10,57	10,48	10,42
WHC (g/g)		0,66	4,31	4,03	3,22	0,74	0,73	0,72	0,84	0,83	0,81	0,88	0,87	0,84
OHC (g/g)		0,70	1,61	1,78	1,22	0,71	0,71	0,70	0,73	0,74	0,71	0,76	0,77	0,72
SWC (mL/g)		2,96	8,12	7,78	6,75	3,02	3,00	2,98	3,08	3,06	3,00	3,21	3,12	3,09
BD (g/mL)		0,50	0,22	0,20	0,22	0,50	0,50	0,50	0,50	0,50	0,50	0,40	0,40	0,40
SRC (%)	W	58,7	289,3	268,2	207,2	60,4	59,3	55,8	57,7	57,5	55,8	62,6	61,4	58,1
	LA	104,6	269,0	249,2	198,9	99,2	103,4	97,4	96,0	96,2	95,5	91,9	90,6	90,2
	SC	67,7	293,0	261,6	213,0	70,9	71,2	73,6	73,0	70,4	69,9	74,9	72,2	74,1
	S	83,1	398,5	369,4	294,4	91,4	85,3	83,7	86,2	86,2	83,7	87,2	84,4	84,2

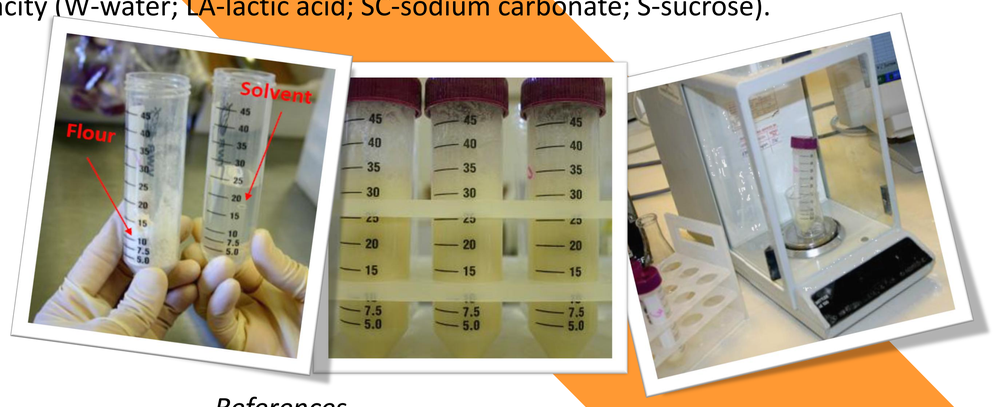
Legend

Flours: WF-wheat flour; C-raw chicory root flour; C1- thermally treated raw chicory root flour; C2- thermally treated raw chicory root flour + 10% of honey + 10% of sunflower oil; M1-99% WF+1% C; M2-99% WF+1% C1; M3-99% WF+1% C2 ; M4-97,5% WF + 2,5% C; M5-97,5% WF + 2,5% C1; M6-97,5% WF + 2,5% C2; M7 – 95% WF + 5% C; M8- 95% WF + 5% C1; M9- 95% WF + 5% C2.

Parameters: M – moisture content; WHC – water holding capacity; OHC – oil holding capacity; SWC- swelling capacity; BD – bulk density; SRC – solvent retention capacity (W-water; LA-lactic acid; SC-sodium carbonate; S-sucrose).

Results and discussion

Almost all investigated parameters were found to be more increased in chicory flour than in wheat flour, with exception of moisture content and bulk density (Table 1). Also, the presence of chicory flour, treated and untreated, led to an increase in the values of all tested factors in composite flours.



Conclusion

The obtained results can provide a general indication of the rheological and baking behavior of the dough from raw, treated or composite flours when a low degree of substitution is intended to be used to develop new confectionery and bakery products with added value.

Acknowledgements

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