Wholegrain ZP flours of differently colored maize kernels as macro- and micronutrient-rich ingredients of food

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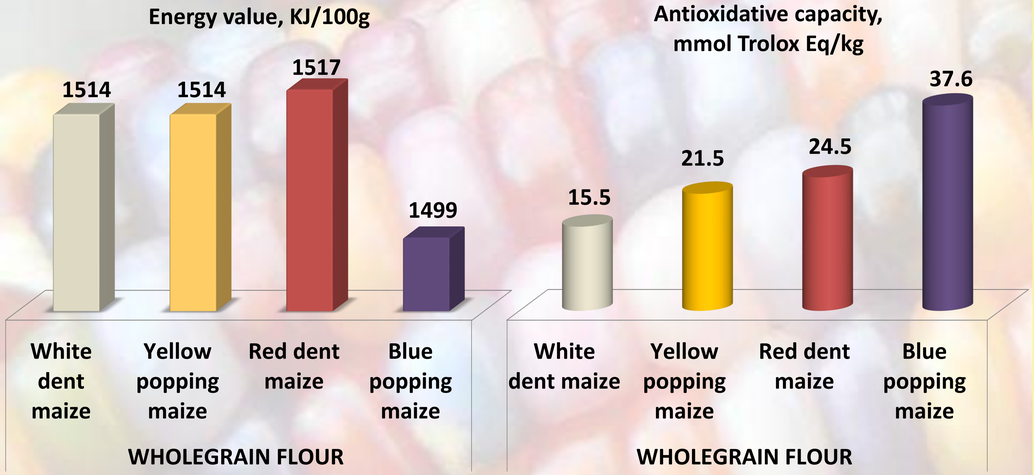
Introduction

Dietary preferences have changed considerably worldwide in recent years because of the increasing awareness about the strong relationship between nutrition and human health. Dietary fiber, proteins, and bioactive phytochemicals, which could be either incorporated into the diet or be a part of the food itself, can be the source for gaining long-term health benefits. Wholegrain gluten-free flour produced from differently colored maize grains can be an excellent choice for improving life quality by exhibiting some desirable health benefits and preventing nutrition-related diseases.

Methods & Objectives

Four commercial wholegrain flours made from differently colored kernel maize genotypes produced in Maize Research Institute were used in this study. Values of major chemical components as well as mineral nutrients, antioxidants and some vitamins of wholegrain flours obtained from white dent maize hybrid, yellow popping maize hybrid, red dent maize variety and blue (purple) popping maize population are presented. Chemical analyses were performed by standard AOAC methods, and micronutrients were determined according to Žilić et al (2012). The aim of this study was to examine the chenical composition of differently colored maize kernel wholegrain flours in order to asses and compare their nutritional potentials.

Results



	WHOLEGRAIN MAIZE FLOUR			
	White dent	Yellow popping	Red dent	Blue popping
Protein, %	9.1	11.0	8.5	12.2
Carbohydrates, %	68.9	67.1	69.1	61.3
Total sugar, %	1.7	1.2	1.7	2.2
Fiber, %	6.9	7.1	7.3	10.4
Lipids, %	4.0	3.5	3.8	4.5
SFA, %	0.6	0.5	0.5	0.8
MUFA,%	0.9	1.2	1.2	1.3
PUFA, %	2.5	1.8	2.0	2.4

SFA- Saturated fatty acids; MUFA- Monounsaturated fatty acids; PUFA - Polyunsaturated fatty acids

	WHOLEGRAIN MAIZE FLOUR			
	White dent	Yellow popping	Red dent	Blue popping
Antocyanins , mg CGE/kg	/	/	22.5	910.00
Carotenoids, mg CGE/kg	/	26.5	/	/
Tocopherols, mg/kg	36	41	/	/
Niacin (B3), mg/100g	12.5	10.10	/	/
Potassium (K), mg/100g	356	294	299	346
Magnesium (Mg), mg/100	138	119	110	109
Sodium (Na), g/100g	<10	<10	<10	42.2
Iron (Fe), mg/kg	28.4	19.4	15.4	22.1
Zinc (Zn), mg/kg	22.9	17.3	15.2	16.0
Copper (Cu), mg/kg	1.25	1.25	1.59	1.23
Manganese (Mn), mg/kg	5.93	7.58	3.63	8.07

Conclusions

All flours had high fiber content which ranged from 6.9 to 10.4%. Yellow popping maize flour contained 11.0% of protein, which makes it a good source of this valuable nutrient. High level of anthocyanins was determined in blue popping maize flour (910.00 mg CGE/kg).Yellow popping maize flour also had high content of carotenoids (26.5 mg CGE/kg), of which β-carotene is essential for the synthesis of vitamin A in humans. All of the above mentioned properties are what makes these wholegrain ZP maize flours high quality food ingredients for a well-balanced diet and wholesome nutrition with many potential health benefits.

References & Acknowledgements

References

Žilić S, Serpen A, Akillioğlu G, Gökmen V, Vančetović J (2012): Phenolic compounds, carotenoids, anthocyanins, and antioxidant capacity of colored maize (*Zea mays* L.) kernels. *Journal of Agricultural and Food Chemistry*, 60: 1224-1231.

Acknowledgments

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