

# Physicochemical and microbiological characteristics of sugar beet fibers

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## INTRODUCTION

Sugar beet fibers are derived from sugar beet pulp after extraction of sucrose. These fibers are specific because of their balanced ratio of soluble and insoluble fibers, small amount of lipids and sugars and low energy value. All this contributes to their physicochemical characteristics and allow better compounding with other ingredients in product in which they are added. As a part of functional product, sugar beet fibers provide excellent physiological benefits to human body. The aim of this investigation was the determination of physicochemical and microbiological characteristics of sugar beet fibers for application in bread production.

## METHODS

After the extraction the sugar beet fibers were dried by chamber drying at 55, 65 and 75°C. After the drying, fibers were grounded. In the dried grounded samples chemical composition were determined: total (TDF), soluble (SDF) and insoluble (IDF) fiber content, ash and protein content. Evaluation of color, water holding capacity (WHC), water activity, total number of bacteria, number of aerobic and anaerobic bacteria, yeasts and molds.

## RESULTS

Total dietary fiber content is about 75%, regardless of drying temperature. Sample dried at 55°C had the highest lightness, L\*=71. In all samples water activity was under limit value (0.6) and presence of spore-forming aerobic and anaerobic bacteria was determined. Drying temperatures have impact on water holding capacity, which is in range of 488% to 524%.

## CONCLUSION

In sugar beet pulp dominate insoluble fiber. WHC of sugar beet fibers is temperature dependent. Based on the obtained results, drying of sugar beet fibers at 55°C is recommended.



Fig. 1 Determination of dietary fibers



Fig. 2 Spore-forming bacteria growth

Fig. 3 Total, insoluble and soluble fiber content

Parameters, % d.m. basis	Sugar beet fibers		
	55 °C	65 °C	75 °C
Total dietary fibre (TDF)	74.5	75.6	74.9
Insoluble dietary fibre (IDF)	60.6	60.9	61.8
Soluble dietary fibre (SDF)	13.9	14.7	13.1
Soluble/insoluble fibre ratio	0.23	0.24	0.21
Ash	3.1	3.4	3.5
Protein	11.9	12.0	12.3

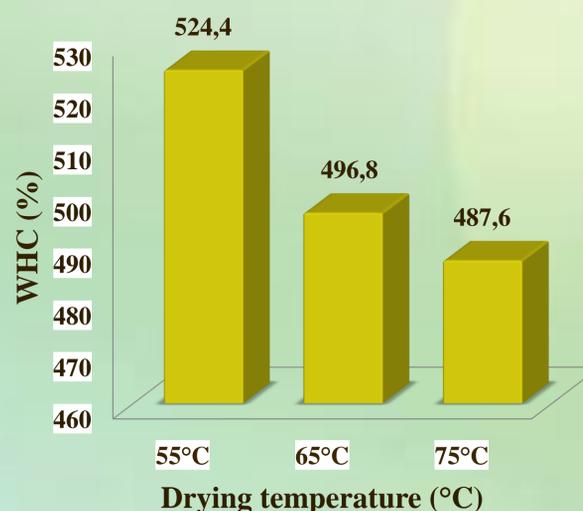


Fig. 4 Water holding capacity (WHC) of sugar beet fibers

Fig. 5 The number of microorganisms found

Microorganisms	Sugar beet fibers		
	55 °C	65 °C	75 °C
Dilution	10 <sup>-2</sup>	10 <sup>-2</sup>	10 <sup>-1</sup>
Total number of bacteria	0	0	4
Spore-forming aerobic bacteria	6	0	80
Spore-forming anaerobic bacteria	0	0	6
Yeasts and molds	0	0	-