

# HIGH HYDROSTATIC PRESSURE EXTRACTION (HHPE) OF FLAVONOIDS FROM FREEZE-DRIED RED GRAPE SKIN AS WINEMAKING BY-PRODUCT

Topic 5 - Food quality, food safety, sustainability, consumer behaviour and policy

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## INTRODUCTION

Winemaking by-products, such as grape pomace, are an inexpensive and rich source of phenolic compounds with well recognized health benefits. Recent studies showed that innovative technologies, such as high pressure processing, has the potential to enable the greater yield of target phenolic compounds compared to existing technologies. Hence, high hydrostatic pressure extraction (HHPE) has proven to effectively shorten the extraction time, improve the mass transfer rate, and enhance solvent permeability in cells as well as secondary metabolite diffusion.

## OBJECTIVES

The optimal operating conditions for the HHPE of flavonoids from freeze-dried red grape skin pomace (cv. Teran) have been investigated. The aim was to obtain extracts with high flavonoid recovery and high antioxidant capacity.

## METHODS / DESIGN

Extractions were carried out in methanol at different polarity (30,50 and 70%,v/v), under various pressures (300,400 and 500 MPa) during 3, 6.5 and 10 min. The total flavonoids (TF) were measured spectrophotometrically by using the AlCl<sub>3</sub> colorimetric assay and quercetin as calibration curve. FRAP method were used for assaying the antioxidant capacity (AC) and ascorbic acid as calibration curve.

## RESULTS

Solvent	Polarity (%)	t (min)	P (MPa)	T (C°)	TF (mg QE/g)	Solvent	Polarity (%)	t (min)	P (MPa)	T (C°)	FRAP (mg AAE/g)	
Ethanol	30	3	300	22	1,97±0,89	Ethanol	30	3	300	22	553,11±59,76	
			500		1,91±0,94				500		561,09±46,97	
		10	300	1,92±0,92	10			300	521,17±114,90			
			500	1,74±0,66				500	565,41±85,46			
	50	6,5	400	26	1,80±0,07	50	6,5	400	26	708,09±17,30		
	70	3	300	30	1,74±0,81	Ethanol	70	3	300	30	528,25±91,38	
			500		2,02±0,89				500		570,96±24,50	
		10	300	1,76±0,92	10			300	566,58±28,94			
			500	1,78±0,99				500	523,24±10,79			
	Methanol	30	3	300	22	1,47±0,72	Methanol	30	3	300	22	409,10±92,47
				500		1,32±0,63				500		411,10±65,09
			10	300	1,41±0,74	10			300	427,83±79,90		
500				1,25±0,44	500				428,62±71,70			
50		6,5	400	26	1,24±0,00	50	6,5	400	26	538,86±12,14		
70		3	300	30	1,41±0,36	Methanol	70	3	300	30	414,32±118,74	
			500		1,52±1,02				500		393,01±139,48	
		10	300	1,24±0,67	10			300	419,38±101,23			
			500	1,33±0,68				500	534,36±10,79			

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## CONCLUSIONS

HHPE provided effective method for TF extraction from red grape skin as winemaking by-product thus could have potential application benefits in industry.