LASER ABLATION OF FRUIT AND VEGETABLES

I. N. Panchev[1], D. D. Dimitrov[2], L. N. Genchev[1]
[1]University of Food Technologie , Plovdiv, Bulgaria
[2]LADEK-Ltd, Plovdiv, Bulgaria
Correspondence contacts: **ivanpanchev@hotmail.com**

ABSTRACT

This work considers the possibilities for peeling fruits and vegetables by treatment with a CO_2 laser. It was found that for the fruits under study the laser ablation provided an efficient peeling of the materials while preserving the organoleptic properties, such as freshness, naturalness, and texture. As a result of the treatment, a number of aroma substances were released, as well as plant cells, which could be used in the production of edible food coatings - an alternative to emulsion produced biopolymer films.
After laser treatment of citrus fruit (oranges and lemons), the fruits were peeled and pectin was extracted from the peels by means of a classical type of extraction in HCl water solution. The pectins obtained were studied for yield, degree of esterification, polyuronic content, molecular weight, gel strength and other physico-chemical prop-erties. It was found that in all samples the laser pretreatment of the materials led to an increase in the pectins yield, gel strength and purity, at an insignificant reduction of its molecular weight and degree of esterification.

The molecular (meanviscosimetric) weight of the pectic macromolecules was calculated from the equation of Mark-Houwink

$[\eta] = K.M^{\alpha}$ as both the constants and

$K = 9{,}55.10^{-2}$ $\alpha = 0{,}73$

Table 1
Experimental results on the yield and physicochemical properties of pectin from oranges and lemons

Sample	Treatment	Pectin yield %	Purity %	DE %	$[\eta]$ dlg^{-}	M_{η}	GS_{0} TB
Thin-skinned lemons	Control Laser ablated	8,9 10,8	86,2 90,1	61,4 59,2	2.62 2.62	93 000 93 000	240 255
Thick-skinned lemons	Control Laser ablated	13,0 16,2	88,8 91,2	64,7 61,2	3.32 2.31	133000 78 000	270 280
Oranges 1	Control Laser ablated	9,0 12,0	77,4 80,1	58,4 56,2	1.16 1.39	31 000 39 000	225 230
Oranges 2	Control Laser ablated	9,1 11,6	78,4 81,3	59,0 56,8	1.17 2.32	32 000 79 000	240 250
Oranges 3	Control Laser ablated	13,1 16,5	77,9 80,2	65,2 65,0	4.33 4.52	186000 197000	270 285

COMPARISON OF THE ANTIOXIDANT ACTIVITY IN BERRIES AND FRUIT PRODUCTS MADE FROM BERRIES

Gilingerné Pankotai Mária,Varga Zsuzsa, Pálfi Erzsébet,
Weisman Anabella Valeria
Semmelweis University, Faculty of Health Sciences, Budapest, Hungary
Department of Dietetics and Nutritional Sciences
H-1088 Budapest, Vas u. 17., Fax:+36-1-486-480; gilingerne@se-etk.hu

ABSTRACT

Berries (raspberry, blueberry, blackberry, black and red currant, gooseberry, etc.) are one of the popular group of fruits. They contain pigments in a big