

INFLUENCE OF THE HYDRO-THERMAL TREATMENT OF RAPE-SEED ON THEIR PROCESSING AND ON OIL AND MEAL QUALITY

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ABSTRACT

The matter of studies was "double zero" rapeseed cultivated in Poland. An influence of technological conditions of seeds hydro-thermal treatment before their flaking on oil residue in extraction meal, glucosinolates content and quality of proteins in meals, as well as on sulphur and phosphorus content in obtained oils (pressed and extracted) was investigated.

INTRODUCTION

Breeding of a new, varieties of rapeseed, characterized by changed cellular structure and another chemical composition, has resulted in certain difficulties regarding their processing. During flaking the seeds were undergoing an excessive crumbling, that negatively affected pressing and extraction and resulted in a high oil content in meals.

Laboratory scale investigations upon hydro-thermal rapeseed conditioning prior to their crushing and further work up were accomplished (Rudzka et al., 1984; Rudzka, 1986; Rudzka et al., 1987), that allowed for establishing of technological parameters of the process and for designing (Jakubowski et al., 1987), and finally building an industrial plant for full scale operations.

This paper presents results of an industria scale research upon an influence of rapeseed conditioning prior to their processing upon characteristic parameters of manufactured oil and meal.

EXPERIMENTAL

Fig. 1. shows temperature distribution pattern on conditioner's shelves, as well as seeds temperature directly prior to their flaking.

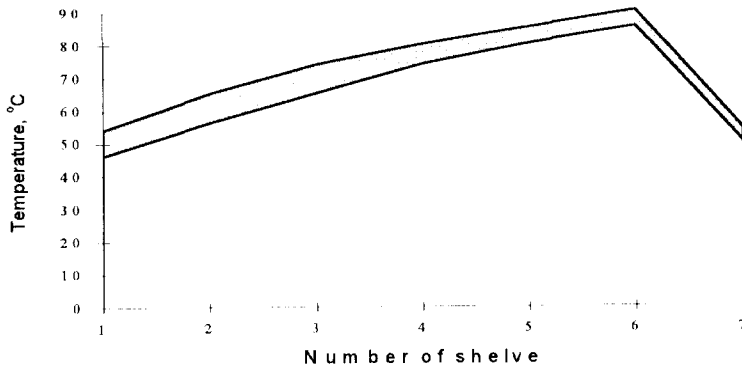


Fig. 1. Temperature distribution during hydro-thermal seeds treatment.

Seeds quality parameters changes prior and after their hydro-thermal treatment as well as meal obtained from their processing are presented in Table 1, and the oil quality parameters are presented in Table 2.

TABLE 1. Results of analysis of seeds and meal, raw and after the hydro-thermal treatment of whole seeds.

Specification	Sample	Content			Nitrogen Solubility Index, %
		Water, %	Oil, %	Glucosinolates, μ moles/ 1g oil free meal	
standard	seeds	6,5	43,0	21,3	42,3
	meal	11,1	3,4	12,0	21,3
after treatment	seeds	8,2	42,5	19,8	44,7
	meal	12,4	2,3	9,0	19,8

TABLE 2. Results of analysis of crude oil obtained from processing of raw and hydro-thermally treated seeds.

Specification	Sample of oil	Content, mg/kg		Acid value mg KOH/1 g
		Phosphorus	Sulphur	
standard	- pressed	250,3	0,8	1,3
	- extracted	665,4	2,0	1,9
after treatment	- pressed	174,0	0,9	1,2
	- extracted	728,7	2,4	1,8

As a result of the treatment, the oil content in meal was reduced by 1,1 % and the glucosinolates content by 25 % respectively, however, the nitrogen solubility index (NSI) has simultaneously decreased by a small fraction. Compared to the oil from a standard processing, the raw oils (both pressed and extracted) produced from conditioned seeds, were characterized by a slightly increased phosphorus content, with practically unchanged sulphur content and acid value.

REFERENCES

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