

INFLUENCE OF THE HYDRO-THERMAL TREATMENT OF DOUBLE-ZERO
RAPESEEDS MAH-181 /JANTAR/ AND BOH-283 ON THE OIL RECOVERY

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INTRODUCTION

Double-zero rapeseeds "Jantar" and BOH-283 grown in Experimental Stations of Plant Breeding and Acclimatisation Institute /Krzyżaniński, 1984/ are characterised by high oil contents about 47%, and very low contents of erucic acid. The glucosinolates are present in traces.

It was observed during the laboratory /Rudzka, 1985, 1986/ and industrial investigations, that the oil recovery from these seeds is more difficult as that from the formerly cultivated varieties. This study was made to modify the preliminary seeds treatment before oil extraction, especially the heat treatment. It was stated, that the suitable hydro-thermal treatment facilitates the oil recovery.

MATERIALS AND METHODS

For this study the rapeseeds of three varieties were used, namely double-zero varieties "Jantar" and BOH-283 and lowerucic acid variety "Janpol".

The analytical data of these seeds are given in table 1.

Table 1

Analytical data of the rapeseeds used

Variety	Contents /%/				
	Water	Oil ^{x/}	Erucic acid in oil	ITC	ACT
Jantar	7,6	46,3	0	0,04	traces
BOH-283	6,1	47,8	0	0,04	traces
Janpol	5,5	39,6	9,2	0,78	0,69

x/ dry basis

All analyses were executed according to the Polish Analytical Standards. The extractivity test T_{ex} was made by 10 minute extraction the flaked seeds with percolation of petroleum ether in the strongly standardised conditions. The result is given as a percent of the total oil contents.

Hydro-thermal treatment of the seeds was made in a 4 dm³ steel container equipped with a advices to introduce the live steam and to evacuate the condensed water and vapors. During the steaming the temperature of 100°C was achieved in 40 sec. The flaking of the seeds was made using two-roller laboratory mill. The rolls were 57 mm long and 70 mm in diameter.

The hydro-thermal treatment was made within 3,5 and 10 minutes at 100°C. Material treated was taken from reactor and it was dried and crushed, then the extracion test was made.

RESULTS AND DISCUSSION

Extractivity of the oil from flakes of rapeseeds depends on many parameters, among others on the humidity of the crushed rapeseeds. In Fig. 1. the influence of the humidity of the crushed seeds of the investigated varieties over the oil extractivity of flakes, measured with T_{ex} , but without the hydro-thermal treatment is given.

We can see, that in the whole range of the humidity studied, the double-zero seeds are more resistant to oil extraction than the seeds of low erucic acid variety "Janpol". It is interesting that the extraction optimum for double-zero rapeseeds is shifted to higher humidity.

In Fig.2. the effect of the hydrothermal treatment of the seeds on the extractivity of oil from rapeseeds is given. The influence of the hydro-thermal treatment on the extractivity of oil from different varieties of rapeseeds is not the same. By low - erucic seeds "Janpol" no improvement was found, but in both doublezero varieties much better extractivity after the hydro-thermal treatment was observed. At the same time the tendency to the shifting the optimum of the extractivity towards the lower humidity was observed in comparison with non treated seeds.

CONCLUSION

The hydro-thermal treatment of the double-zero rapeseeds treated at last for 5 minutes at 100°C improves significantly the extractivity of the oil.

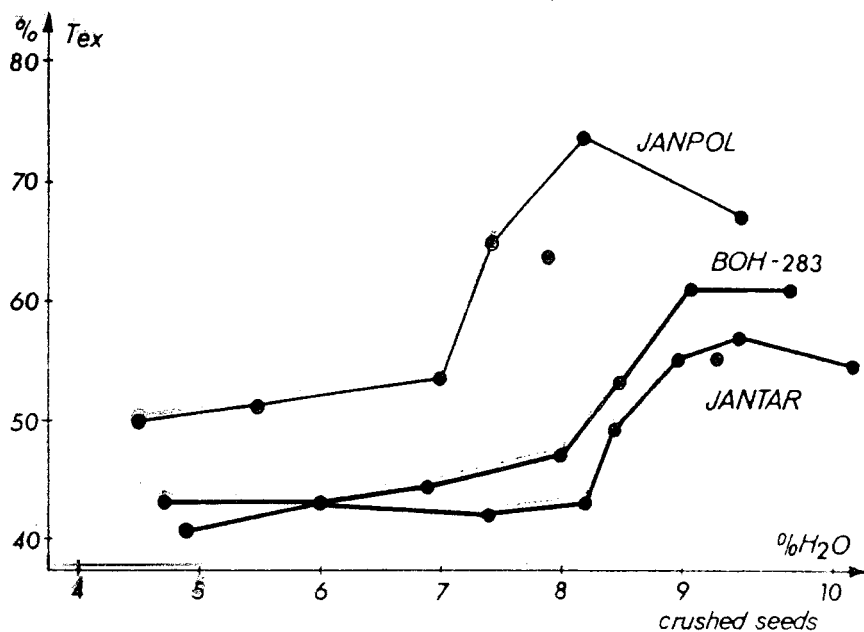


Fig. 1

Influence of the humidity crushed rapeseeds on the oil extractivity from flakes without hydro-thermal treatment.

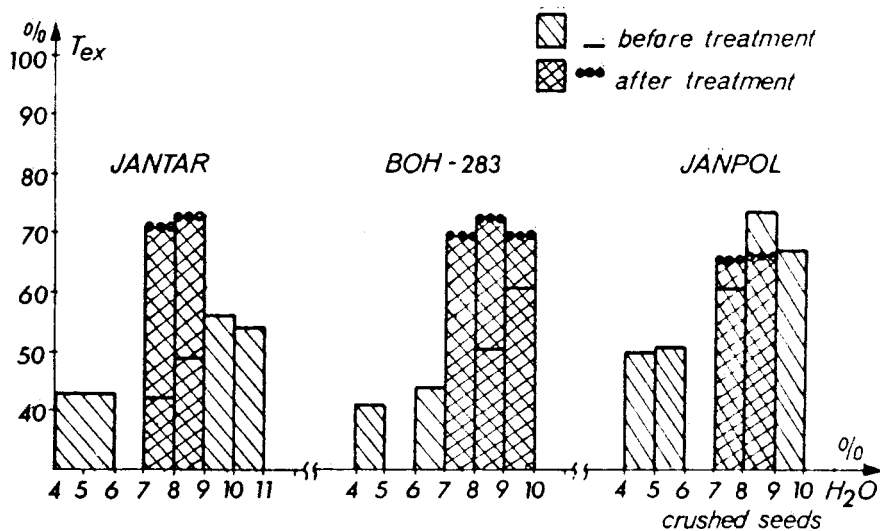


Fig. 2

The effect on the hydro-thermal treatment of the seeds on the extractivity of oil from rapeseeds.

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