

FREE AMINO ACIDS AND PEPTIDES IN RAPESEED  
AND RAPESEED PROTEIN CONCENTRATE

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INTRODUCTION

The results presented here constitute a part of the research into protein changes in rapeseed protein during production of protein concentrate. Comparison of the peptides and free amino acids content in rapeseed meal and protein concentrate was the aim of this investigation.

MATERIALS AND METHODS

Free amino acids and peptides were extracted from rapeseed meal with 80% ethanol and 1% trichlore-acetic acid respectively (1). Peptides were separated out free amino acids with a column of Sephadex gel chelated with copper ions (2). Free amino acids were measured using the amino acid analyzer (Jeol, Japan). Peptides were determined by means of paper chromatography and high voltage electrophoresis method (3).

RESULTS AND DISCUSSIONS

The contents of the free amino acids in rapeseed meal and protein concentrate are presented in Table 1. In rapeseed meal fourteen free amino acids were found. The total amount of these amino acids was 24.11  $\mu$ mol per g of the meal. The amount of acidic amino acids was 62.10% of total free amino acids content. Thirteen free amino acids were determined in protein concentrate. In comparison to the meal, the aspartic acid was missed. Protein concentrate contained only 4.93% of acidic amino acids in the free amino acids fraction. The amount of other free amino acids increased 3-12 times. The content of ammonia also increased.

The electrophoregrams of the acidic, basic and neutral peptides of the rapeseed meal and protein concentrate are presented in Fig. 1 and 2. Five neutral peptides and neither acidic nor basic peptides were found in rapeseed meal. On the contrary, in the protein concentrate four basic, two acidic and five neutral peptides were determined. Participation of the peptides, free amino acids and ammonia nitrogen in non-protein nitrogen was 7.23; 13.33; respectively and 0.44 percentage for protein concentrate.

TABLE 1

CONTENTS OF FREE AMINO ACIDS IN RAPESEED MEAL AND  
 RAPESEED PROTEIN CONCENTRATE ( $\mu\text{mol/g}$ )

Amino acid	Rapeseed	Concentrate
Lysine	0,31	2,32
Histidine	0,05	0,10
Arginine	trace	0,39
Aspartic acid	2,77	-
Glutamic acid	12,20	1,09
Proline	trace	1,20
Glycine	0,24	0,77
Alanine	0,79	2,16
Valine	0,54	1,27
Methonine	0,23	0,66
Isoleucine	0,12	0,84
Leucine	0,14	1,90
Tyrosine	0,20	0,19
Phenylalanine	0,12	1,49
Ammonia	6,40	8,73
Total	24,11	22,11

FIG. 1

ELECTROPHOREGRAM OF ACIDIC AND  
 BASIC PEPTIDES OF THE PROTEIN  
 CONCENTRATE

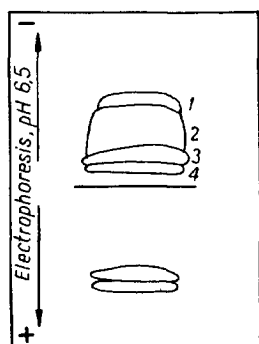
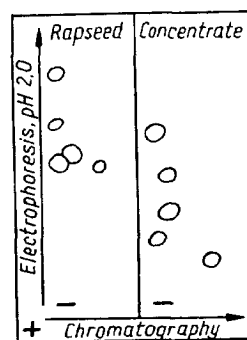


FIG. 2

ELECTROPHOREGRAM OF NEUTRAL PEP-  
 TIDES OF THE RAPESEED MEAL AND  
 PROTEIN CONCENTRATE



CONCLUSIONS

1. About 3-12 times increase of basic and neutral amino acids content and aspartic acid decrease as well as about 12 times decrease of glutamic acid content occur during the production of protein concentrate from rapeseed.
2. The higher amount of free amino acids and neutral and basic peptides in the protein concentrate is the effect of protein hydrolysis during the technological process.

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