

BRIEF COMMUNICATIONS

COMPOSITION OF THE FATTY ACIDS AND TRIACYL-
GLYCEROLS OF WHEAT GERM FLAKES

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UDC 665.335.91

Wheat germ is enriched with biologically active substances [1], among which 12-13% consists of lipids [2]. There is no information in the literature on the composition of the fatty acids and the structure of the triglycerides (TAGs) of wheat germ from the cereal growing in Central Asia.

We have studied the composition of the lipids of two samples of wheat flakes (ground wheat germ) grown in the Central Asian region. The raw material for investigation was obtained from the Karshi flour-milling combine: sample I — the first variety; sample II — the second variety. To preserve their native state, the lipids were extracted by cold pressing. Fatty acid compositions were determined by GLC [3] (Table 1). The position distribution of the acyls in the TAGs was found with the aid of pancreatic lipase [4].

The results that we obtained (Table 1) show that both samples lacked the 12:0 and 14:0 and the 20:1 and 22:1 acids that are present in trace amounts and in amounts of 1.2-3.7%, respectively, in known varieties of wheat growing in Russia. This is possibly due to the different climatic conditions of the growth of the plants.

The total lipids of sample I were more enriched with saturated acids, and those of sample II with unsaturated acids. It must also be mentioned that there was more oleic acid in the 2- position of the TAGs of sample I than in II, and, conversely, 7.5% more linoleic acid in the 2- position in sample II than in I.

TABLE 1. Fatty Acids of Wheat Germ Flakes, % GLC

Acid	Sample 1		Sample 2	
	Total lipids	2-position	Total lipids	2-position
16:0	28.8	14.0	22.3	13.3
16:1	Tr.	-	Tr.	-
18:0	1.5	-	0.7	-
18:1	13.2	27.8	12.6	21.0
18:2	53.8	58.2	59.6	65.7
18:3	2.7	-	4.8	-
Sat.	30.3	14.0	23.0	13.3
Unsat.	69.7	86.0	77.0	86.7

TABLE 2. Type Compositions of the
Triacylglycerols, % by weight

Type*	Sample	
	I	II
SSS	1.9	1.0
S ₂ U	18.4	11.6
SU ₂	45.6	41.3
UUU	34.1	46.1

*S) saturated; U) unsaturated.

Bukhara Technological Institute of the Food and Light Industries. Translated from *Khimiya Prirodnikh Soedinenii*, No. 2, pp. 237-238, March-April, 1996. Original article submitted April 22, 1995.

From the fatty acid composition we calculated the type compositions of the TAGs (Table 2). At the same total concentration of unsaturated acids in the 2- position of the TAGs of both samples, in sample I the central position contained more of the 18:1 and less of the 18:2 acid. The wheat germ acids were enriched with diunsaturated-monosaturated and triunsaturated TAGs, with the SU₂ type predominating in sample I and UUU in sample II, which determines their high biological value.

The results that we have obtained differ from those present in the literature [5]. Among the TAGs of wheat growing in the European part of the Russian Federation the amounts of the UUU, P₂U, and PU₂ types are lower, and there is none of the S₃ type.

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