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**UDC 633.171:581.16**

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## CHANGES IN THE FATTY ACID COMPOSITION OF MILLET GRAIN DURING ITS STORAGE

Millet grain is characterized by valuable biochemical and medicinal properties. One of the problems of using millet flour in the food industry is its very short storage period due to the rapid "aging" of the grain, which leads to the so-called rancidity of millet and millet flour [1]. It is known that during the storage period of millet grain or products of its processing (groats of millet, millet flour) changes occur in their biochemical composition, organoleptic properties deteriorate, and an unpleasant smell appears. One of the reasons is that during the storage of grain, millet or millet flour, the acid value of the oil increases, which is associated with increased lipase activity. Such millet cannot be used for food purposes. Another reason for organoleptic changes in millet during storage, according to scientists, is a change in the quantitative composition of fatty acids in it [2, 3]. In Ukraine, this issue has not been studied practically on common sorghum (*Panicum miliaceum L.*).

In order to determine the biochemical changes in millet grain that occur during the storage period and that negatively affect grain rancidity, millet grain grown in 2010, 2015 and 2020 was used. The fatty acid composition of the grain, the total oil content and the acid value of the oil were studied on variety Kharkivske 57, which was the national standard of Ukraine from 1987 to 2014. The seeds were stored at a temperature of 20°C in the dark. Determination of total fat content, acid number of oil, fatty acid composition of grain was carried out according to generally accepted methods.

As the results show, one of the reasons for the "obsolescence" of grain in 10 years is the oxidation of fat and an increase in the level of the acid number of the oil. The most destructive biochemical processes began to occur after five years of grain storage. The total fat content in Kharkivske 57 grains did not change significantly during 10 years of storage: in 2020 it was 4.38%, in 2015 – 4.27%, and in 2010 – 4.03%. But after five years of storage, fat oxidation occurred more intensively. From 2020 to 2015, the total fat content decreased by 0.11%, and from 2015 to 2010 – by 0.25%. In 2020 the acid number of millet oil was 5.10 mg of KOH/100 g of substance, in the grain of the 2015 year – increased practically by 2 times – 9.53 mg of KOH/100g of substance, and the acid number of grain oil of the 2010 year harvest increased by only 1.09 mg of KOH/100g of substance compared to 2015 year. The content of the fatty acid composition of millet oil was studied by 11 fatty acids: linoleic > oleic > palmitic > stearic > linolenic > lignocerine > eicosane > palmitoleic > behenic > eicosene > myristoleic. The fatty acid composition of Kharkivske 57 millet grain oil was characterized by the highest content of linoleic (63.24±0.19%) and oleic acids (23.86±0.12%). Palmitic, stearic, and linolenic acids were respectively (6.86±0.07%), (3.09±0.03%), and (1.33±0.03%) in the grain. Other fatty acids had a content from (0.81±0.04%) to (0.04±0.01%). No significant changes were observed in the quantity and quality of fatty acids in Kharkivske 57 millet oil during grain storage. The amount of palmitic acid increased by 0.61%, stearic acid – by 0.1%, and linolenic acid – by 0.18% during 10 years of storage. And the content of oleic acid decreased by 0.76%. In millet grain, eicosanoic acid increased by 0.34%, behenic acid by 0.06%, lignoceric acid by 0.09%, and linoleic acid decreased by 2.01%. During storage, the most oxidation in millet grain occurs in myristoleic, oleic and linoleic acids.

Thus, for cereal purposes, millet grain should be used for up to five years of storage.

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