

10. Analysis of gluten-free grain crops

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Introduction. Every year, the demand for gluten-free products is growing exponentially. This presents technologists with the task of expanding the assortment of this product segment. One of the ways is the use of non-traditional crops.

Materials and methods include analytical approaches to information evaluation.

Results. The most common gluten-free crops include buckwheat, rice and corn. Although the analysis of scientific literature shows that scientists are increasingly turning to the so-called non-traditional gluten-free raw materials. In particular, research was conducted on the technologies of gluten-free flour confectionery and bread based on sorghum, beans, pearl barley, amaranth and millet.

It has been established that a plant grown in harsher climatic conditions without agricultural care will have significantly higher vitamin content. This is due to the fact that by accumulating these substances, the plant increases its resistance to negative external factors (climate, pests). In addition, it was established that the content of certain substances in its composition varies depending on the variety of the plant. Therefore, it is advisable to conduct an analysis of different varieties of millet as a gluten-free raw material.

Common millet varieties zoned in Ukraine include: Veselopolyanske 176, Kyivske 87, Myronivske 51, Start, Kharkivske 31, Kharkivske 57, Sonyachne, Lilove, Syavo, etc.

So, let us consider the chemical composition of the five most common selected varieties of millet grown in Ukraine.

Table – Chemical composition of millet from millet grain of different varieties

Nutrient content, %	Varieties of millet				
	Slobozhanske	Vitrylo	Korolivske	Kostyantynivske	Kozatske
Protein	9,66	10,28	11,54	10,49	9,89
Fat	1,33	1,37	0,94	1,06	1,01
Mono- and disaccharides	1,36	1,75	1,43	1,45	1,54
Starch	66,9	67,5	65,0	68,7	68,1
Cellulose	0,72	1,22	0,78	1,15	1,36
Organic acids	0,13	0,20	0,17	0,15	0,17
Ash	1,04	1,25	1,75	0,98	1,19

Therefore, from the data given in the table, it can be seen that all varieties of millet have a high fiber content. In particular, the record holder is the "Kozatske" variety. However, in terms of protein content, this variety is somewhat inferior to such varieties as "Korolivske", "Konstyantynivske" and "Vitrylo". Ash content characterizes the total amount of mineral substances. However, to characterize the product as functional, a more detailed chemical analysis of the mineral composition of millet is necessary.

Conclusions. Having analyzed the chemical composition of modern varieties of millet grown in Ukraine, the following conclusions can be drawn: millet is a source of dietary fiber, protein and minerals. It is relatively low in fat and high in starch. As a summary, we can assume that wheat flour is a promising raw material for creating functional gluten-free products. "Kostyantynivske" can be considered as the best variety among those analyzed. This variety itself has a relatively balanced composition of nutrients.