



THE HIGH QUALITY NAKED OAT CULTIVARS FOR FUNCTIONAL FOOD

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Pedigree of naked oat cultivars



Cultivar	Year of registered	Pedigree
Levsha	1999	Selection from cultivar Tibor (VIR-14024)
Aldan	2005	Astokr 17 (VIR-13680) X Rhea (VIR-12133)
Murom	2006	Tibor (VIR-14024) X Nave (VIR-13898)
Pomor	2007	Caesar (VIR-11663) X Nuprime (VIR-11630)
Taidon	2008	Caesar (VIR-11663) X Nuprime (VIR-11630)
Gavrosh	2011	Aldan X (Borris (VIR-11840) X Уснех (VIR-11278))

The preliminary study and selection of initial material performed at the N.I. Vavilov Institute, and the breeding carried out at the Kemerovo Agricultural Research Institute using the material selected at the former institution, have resulted in creation of a number of naked oat cultivars, which are registered in the State Register of Breeding Achievements of the Russian Federation.



Oat (*Avena sativa* L.) is one of important cereal crops in Russia. The greater part of oat grown in the country is represented by the husked oat cultivars, however, a trend of creating naked cultivars is taking shape. The cultivars of naked oat differ from the husked ones by the absence of husk and presence of some positive traits. Due to the absence of husk, grain of these cultivars can be directly used by the food and mixed feed industries. Along with high grain productivity, the naked oat cultivars demonstrate high qualities of grain, which transform this crop from grain forage into a source of food, functional and dietary products for humans. In addition to the traditional grain quality indicators as the content of protein, lysine and starch, the content of oil and fatty acids ratio, as well as the content of β -glucans, tocopherols, a complex of vitamins and a wide range of antioxidants (avenanthramides included) become priority indicators of a promising cultivar.



All of the named cultivars are no inferior to the husked ones in terms of productivity and considerably surpass them in respect of biochemical parameters. The cultivars Pomor and Taidon have a higher content of protein in the kernel (17-18%); cvs. Murom and Pomor contain up to 60-62% of starch, and cvs. Murom, Pomor and Taidon showed an increased content of oil in the kernel, which is over 8-9%. The content of the oleic acid (18:1) in oil in kernels of cv. Murom is comparable with that in sunflower oil; cv. Pomor shows the highest content of linoleic acid (18:2), while cv. Taidon has the highest quantity of linolenic acid. In addition to the determined biochemical substances, the preliminary data show that these cultivars have a higher content of β -glucans and, presumably, an increased content of antioxidants in the kernel. Besides, all of these cultivars are medium resistant to the majority of leaf fungal diseases and are only slightly susceptible to smut, as well as to *Fusarium* head blight and accumulation of mycotoxins in grain.

Agronomic characters of naked oat cultivars

№ of VIR catalogue	Cultivar	Test weight, g	Haskness, %	1000 grains weight, g	Protein content, %	Starch content, %	Oil content, %
15014	Levsha	550	8,1	32,8	15,8	48,4	7,1
15115	Aldan	530	1,0	24,5	15,9	59,8	6,8
15116	Murom	570	2,9	29,1	16,5	60,2	8,7
15117	Pomor	580	2,1	29,1	17,0	62,5	8,3
15183	Taidon	580	0,5	30,7	18,1	56,5	9,8
15439	Gavrosh	610	0,7	26,5	16,6	-	-



Fatty acids composition of naked oat cultivars

Название сорта	Fatty acids composition, %								
	14:0	16:0	16:1	18:0	18:1	18:2	18:3	20:0	20:1
Pomor	1,4	18,5	0,0	1,7	31,4	42,2	0,3	0,1	4,4
Murom	0,3	17,2	0,0	1,7	41,4	37,5	1,5	0,0	0,2
Aldan	1,5	18,5	0,2	2,7	33,5	39,1	2,5	0,1	1,6
Levsha	1,5	27,9	0,5	4,8	25,6	39,0	0,1	0,1	0,3
Taidon	2,5	21,9	0,9	3,5	24,1	38,7	3,8	0,0	4,5

All of these varieties possess antioxidant and anti-inflammatory functions; they stimulate the immune system and prevent the development of cardiovascular diseases thanks to the high content of β -glucans and antioxidants.

Therefore, all of the presented naked oat cultivars show improved agronomic traits, unique biochemical characters, dietary properties, and can be used by the food industry for producing functional foods.