PROCESSING OF HULL-LESS BARLEY AND NAKED OATS INTO FOOD PRODUCTS

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Groats and cereal products, along with bread, are traditional food products and represent a significant part of the human consumption. Due to balanced amino acid composition, presence of vitamins and minerals, dietary fiber most types of groats can be classified as dietary products. In the modern structure of nutrition human cereal products take about 20...30 % of the total consumption of grain products.

The promising and the most common cultivars of naked oats and hull-less barley grown in our country were selected for the researches. Two samples of naked oats cultivars «Salomon» and Samuel were cultivated in Ukraine in 2016...2018 years. Cultivar of hull-less barley «Achilles» was cultivated in Odessa region, Ukraine in 2016...2018 years.

Structure of processing hull-less barley and naked oats in combined products was developed which includes grain cleaning stage, grain water heat treatment, pearling, sorting of pearling products, pearled groat water heat treatment, mixing, flaking, drying, control of end products.

Due to differences in the characteristics especially the form of grain primary processing of hull-less barley and naked oats are carried out without fractionation on two parallel lines. Grain is cleaned of impurities and if necessary (grain moisture less than 12%) are sent to the water heat treatment stage where its humidify with heated to 60 ° C water to a moisture content less than 14% and sent to pearling.

Pearling stage for both cultures carried on the basis of intensive abrasion. Found that pearling of hull-less barley and naked oats one flow at a soft modes allows to obtain pearled groats high nutritional value - high protein and β-glucans, while value of ash content not significantly increase. Therefore, for the production of mixed products with high nutritional value pearling stage expected to conduct using one system. Thus softening of the regime is achieved by reducing the angular velocity of pearling discs 20- 18 m/s.

As a result of pearling of hull-less barley and naked oats grain formed a mixture consisting of whole pearled groats, particles of crushed kernels and husking bran.

For its separation and removal of whole pearled groats the mixture at the first stage is sent to plansifter where conduct removal of particles of

crushed kernels and husking bran.

On sorting stage plansifter set sieves 1,8-1,6×20 mm overtail of witch removed whole pearled groats, passage of this sieve are a mixture of particles of crushed kernels and husking bran. Separation of which conducted at sieves № 080-060 mm by passage of this sieve obtained husking bran, by overtail – particles of crushed kernels. Whole pearled groats additional control to the residues of husking bran by passage of through a system of air separators.

On the next stage at producing of mixed groats conduct mixing of pearled groats of hull-less barley and naked oats in given mass fraction and send mixture to water heat treatment stage. The aims of this stage are reducing microbial contamination on surfaces of groats and provision of product characteristic organoleptic properties. At this time conducted researches has shown that for the production of products with high nutritional value is also necessary to soften modes of water heat treatment.

Given this the mixture of pearled groats of hull-less barley and naked oats sent to steamer of periodic action where it steamed with vapor pressure of 0.05-0.15 MPa for 2-4 min.

This mode ensures minimal loss of protein and β-glucans there is no browning of groats which is typical for more hard modes of water heat treatment while by organoleptical characteristics – odor and taste the resulting product fully complies the traditional products.

After steaming groats are sent to drying. The given technological operation expediency in dryers with temperature drying agent of 40-60 oC which will also reduce the effect of temperature on changes in the biochemical composition of groats. Groats dried to moisture of 12-14% and sent to the control which conducted on one system of air separators where conduct removal of residues of husking bran. Before packing groats are required for control in magnetic separators.

For the production of a mixture of flakes whole pearled groats after pearling sent to water heat treatment. This stage in the production of flakes carried out by a combined structure of cold and hot conditioning the main purpose is to provide plastic properties of groats. Before steaming pearled naked oats groats moistening to 15-17 % and sent to tempering for 2-3 hrs, hull-less barley pearled groats moistening to 20-22 % and tempering for 2-4 hrs.

After that, in a given mass fractions carried out forming of mixture which is sent to steaming. Before flaking the mixture is steamed in the vapor pressure of 0.10-0.15 MPa for 4-5 min and tempering 7-9 min. Flaking conducted at flaking machine on ribbed rolls which provides the

formation of microcracks on the surface of flaked groats and allow accelerate cooking time of the resulting product. Obtained mixture of flaked groats by organoleptical characteristics fully complies the traditional products.

To removed particles of crushed kernels and husking bran which are formed in small quantities at flaking mixture of flaked groats sieved. Sifting is carried out in plansifter while by overtail of sieve 1,4×20 mm obtained flaked groats, which sent for further processing, by passage of this sieve and overtail of sieve № 063 carried out removal of particles of crushed kernels, by passage of sieve № 063 carried out removal of husking bran. Flaked groats dried at belt dryer at temperature of drying agent 40-60 °C to moisture content of 13-14%. After this flaked groats sent for magnetic control and packaging.

ВИКОРИСТАННЯ УЛЬТРАЗВУКУ В ТЕХНОЛОГІЯХ ПЕРЕРОБКИ ДИКОРОСЛОЇ СИРОВИНИ

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Мета досліджень: удосконалення технологічних процесів переробки дикорослої сировини.

Основні матеріалі досліджень. Для України дикорослі плоди та ягоді є перспективною сировиною у зв'язку з тим, що вони збагачені біологічно активними речовинами, мають відносно високе пристосування до місцевих умов, імунітет до багатьох захворювань, тому дають найбільш стабільні врожаї у порівнянні з культурними рослинами. Однак, незважаючи на всі позитивні характеристики дикорослих плодів ті ягід, їх переробка не є масовим виробництвом.

З іншого боку використання, наприклад, лише дикорослих яблук, які містять значну кількість пектинових речовин, вуглеводів, переважно фруктозу та порівняно мало вітамінів, органічних кислот, несе окремі технологічні недоліки – колірна гама харчових виробів з яблук досить ненасичена і естетично несприятлива. Вирішення цієї проблеми можливе завдяки поєднанню різних видів дикорослої сировини. Тому важливою задачею є використання дикорослих плодів і ягід, які є важливим природним ресурсом для розширення