

Language adviser: Kryvonos I.A., Senior Teacher of the Department of Foreign Languages, Dmytro Motornyi Tavria State Agrotechnological University

INNOVATIVE BREWERY TECHNOLOGY WITH CARAGENAN ADDITION

Prasolov D.S., *Lohtur2001@gamil.com*
Dmytro Motornyi Tavria State Agrotechnological University

Ukraine is culturally and botanically very diverse: with deserts, forests, steppes, high zonation - a lot of climatic conditions are due to the large territory. There is something around us that we can use almost every season. Therefore, we can and should use all this botanical diversity that is around us - in the products of our cuisine and in brewing.

Beer in the world saved whole countries from epidemics, served as a nutrient for many people, a method to relax after a hard day. As well as cheese, wine and bread, beer - this was what the technology was honed.

As we know in the manufacture of beer there are many factors that can affect the quality of the product. One of these factors is to properly clean the wort and do so without much resource consumption. Clarification of wort, technological operation of primary winemaking, aimed at separating the dispersed phase from the liquid. It is carried out in order to remove suspended particles, wild microflora, colloids, oxidizing enzymes from the wort.

Beer is low-alcohol carbon dioxide-saturated tonic frothy drink is obtained by fermenting hopped wort with brewer's yeast.

The beer production technology consists of

- malt mashing
- boil the wort
- fermentation at a wort temperature of 18 to 22 °C
- maturation of beer [4].

Most breweries use a hydrocyclone. Hydrocyclone is a wort is pumped at a relatively high speed into the hydrocyclone (whirlpool). Due to the centrifugal force, heavy particles settle to the bottom and gather along the radius of the hydrocyclone in a cone, where they remain lying. Moreover when using a hydrocyclone, a lot of energy is lost and as can be seen it is not profitable. But we suggest using not only one hydrocyclone but also carrageenan [3, 5].

Carrageenan is a polysaccharide derived from some species of red algae. The structural units of these biopolymers are the monosaccharides D-galactose and 3,6-anhydrogalactose, which are linked by α -1,3 and β -1,4-glycosidic bonds. Carrageenans contain from about 15% to 40% of sulfuric acid residues and have an average molecular weight of more than 100 kJ. There are several types of carrageenan: λ , κ , ι , ϵ , μ , which contain from 22 to 35% of sulfuric acid residues. Only three types of carrageenan are actively used in the food industry: λ , κ , ι . As a brightening agent is used kappa carrageenan, high molecular weight with a strong negative charge. Carrageenan is added to the hot wort 15-20 minutes before the end of cooking. Proteins contained in malt have a positive charge. Thus, positively charged proteins interact with negatively charged carrageenan molecules to form fast-growing solid particles. These particles precipitate. Protein binds to carrageenan so tightly that it is not destroyed and filtered completely [1, 2].

Thus, it can be concluded that the use of carrageenan is an inexpensive and highly effective way to lighten beer. When we need to lighten the wort, we can combine hydrocyclone and carane. When we combine we can reduce energy consumption. When we filter we will need less energy. But carane is not recommended for dark beer.

In general, beer is a very important product around the world, both economically and nutritionally.

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WASTE SORTING IN UKRAINE

Raikov D.S., daniilraikov.form@gmail.com

Dmytro Motornyi Tavria State Agrotechnological University

The problem of insufficient waste recycling is a global issue. Today, the entire world community is concerned about environmental pollution. According to some reports, every inhabitant of the planet leaves 1 ton of garbage per year.

The purpose of the article is to investigate the national pollution problem in Ukraine and suggest the ways of solving it using the simple waste sorting technique.

In Ukraine, the waste separation method is partially used, but not all regions are yet engaged in waste processing program. Many people do not understand why they need to sacrifice their time and money sorting waste if they are already paying enough for its disposal.

We want to consider the pros and cons of this problem.

Pros of garbage sorting:

- Separating waste can reduce environmental damage
- Re-processing is profitable
- Less waste - less junkyards

Cons of garbage sorting:

- High upfront capital costs
- Recycling sites are always unhygienic, unsafe and unsightly
- Products from recycled waste may not be durable
- More energy consumption and pollution

Garbage is always harmful to the environment. If it is not being recycled, it pollutes water and soil, it can be dangerous to birds and animals, and also destroys local ecosystems. Environmental damage can be significantly reduced if the hazardous and non-hazardous waste is not mixed together.

Therefore, separate collection of waste and its subsequent correct disposal is the most responsible way of handling garbage.