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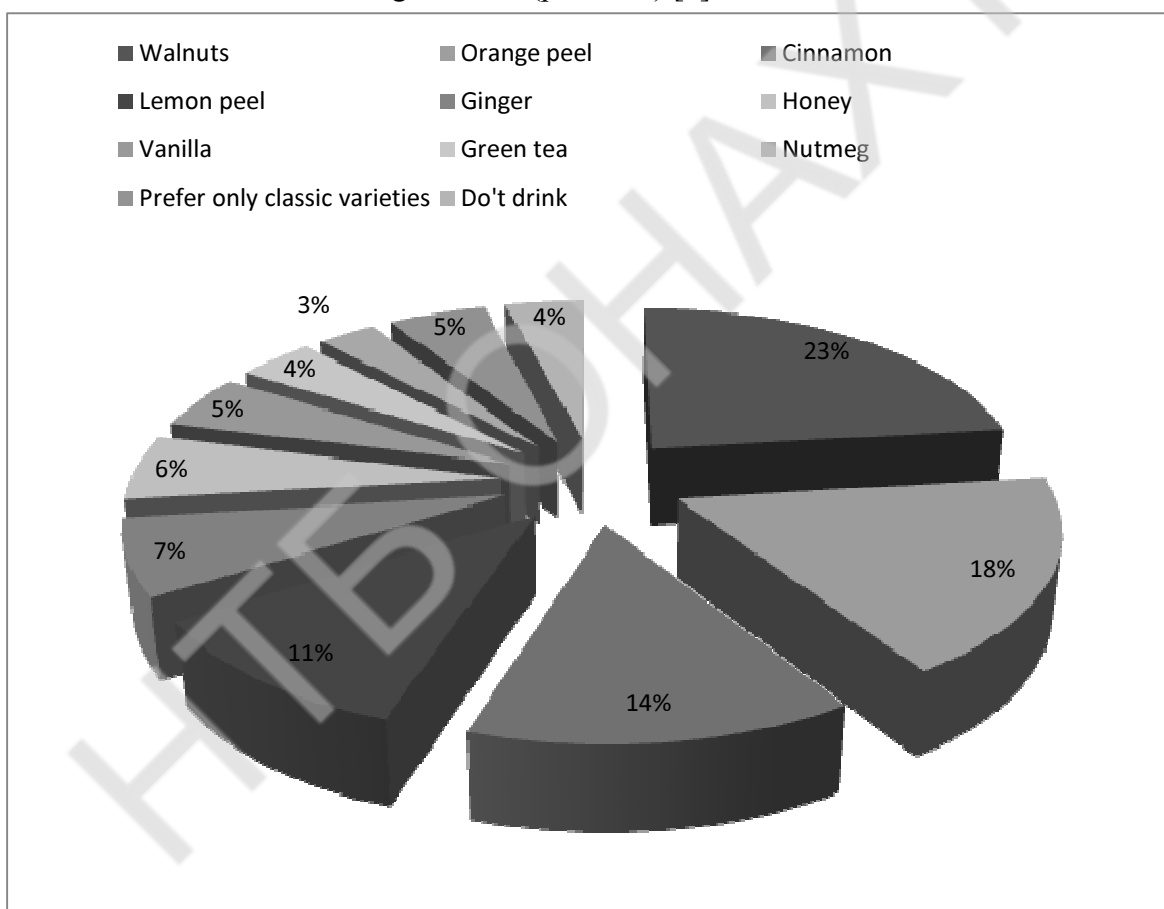
РОЗДІЛ 2

**ХІМІЧНІ, ФІЗИЧНІ ТА МАТЕМАТИЧНІ МЕТОДИ  
ДОСЛІДЖЕННЯ ПРОЦЕСІВ ТА АПАРАТІВ**

## TECHNOLOGICAL ASPECTS OF IMPLEMENTING NON-TRADITIONAL INGREDIENTS IN BEER RECIPE

**Dasha Hnatovskaya, Master, faculty of wine & nanobiotechnologies  
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Use of non-traditional raw materials of vegetable origin in the beer industry can not only expand the range of mini-breweries and large factories, but also improve the quality and physiological properties of the drink. On the basis of Odessa national academy of food technologies was developed recipe of walnut beer with using amniotic walnuts skins and explores the properties of triticale as a perspective unmalted raw materials. In the first case, the addition of the original plant raw material allowed to increase the stability of the beer, the second - to reduce cost and improve the mashing process. But the modern consumer demanding quality and delicious product, that has non-standard properties. That is why advisable to start the development of varieties of beer with ginger, cinnamon and citrus peel, based on the data of marketing research (picture 1) [1].



**Picture 1 – The results of market research to select new components of beer**

The results of research work were the selected original ingredients for the recipe of lemon- ginger light beer, and dark – orange-cinnamon beer. But to the vegetable raw materials make special requirements, as any contravention of treatment regimes can lead to the destruction of biologically active and nutrients. This affects on the physiological and organoleptic properties of the finished beverage. To determine the stage of entry each type of unconventional materials previously explore all chemical composition, the most valuable substances and their characteristics (Table 1) [2].

**Table 1 - Properties of unconventional plant components for new sorts of beers**

<b>Beer ingredient</b>	<b>The active substances and their usefulness</b>	<b>The optimum temperature and time of treatment</b>
Ginger	Ginger is the eastern spice. Using ginger root powder. Ginger reduces inflammation, normalizes the temperature and pressure, increase immunity. Dzhindzherols contained in the plant, prevent the emergence and development of cancer cells. Spice give the finished drink a refreshing taste and aroma.	5-30 °C, no more 48 hours
Citrus peel	Zest is a strong antibacterial agent. Vitamin C, in combination with a number of essential oils allows you to fight viral diseases, as well as other pathogenic microflora.	10-35 °C, no more 24 hours
Cinnamon	Cinnamon is normalizes heart rate and boosts immunity. Prized for cinnamon oil, which have specific organoleptic and physico-chemical properties. Ideal for dark beers.	80-105 °C, no more 5-7 minutes

According to the results of Table 1, it is possible to draw conclusions about the stage, making each plant component. Dzhindzherols in ginger can withstand long-term treatment only, if the temperature does not exceed 30 °C. Therefore, it is advisable to make a water-alcohol extract of spices in the fermentation stage, about a day before the start of fermentation. The citrus peel (such as lemon and orange) special value is vitamin C. It is not a heat-labile and has a temperature of over 35 °C shows the first signs of degradation. Moreover, citrus oils can quickly evaporate. Therefore, the extract is added to the wort to the fermentation stage and about 24 hours before the end of the process. As for the cinnamon, it is one of the few plant components exotic origin that not only withstands high temperatures, but also «need» them. Only at temperatures above 80 °C, all active and cinnamon flavors are extracted and transformed into a soluble state. Hydroalcoholic extract is added to the wort with hop cooking stage together with the precipitate. Duration of high temperature treatment should not exceed 7 minutes [3].

Following the development of formulations and professional tasting obtained beers can be implemented in production on the mini-breweries Odessa region. Diversification will attract customers and will allow the brewing Odessa enter the European level.

Scientific director – PhD, assistant professor Irina Melnik

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## **ANALYSIS THE FEATURES OF THE APPLYING OPTICAL TECHNOLOGIES IN THE DESIGN OF ACCESS NETWORKS**

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The development of optical technologies in the 21st century has led to the need of reducing costs and improving the quality of existing and planning networks. The growing number of users imposes increasingly large demands on networks. Operators have to seek solutions through new technologies and experimental solutions. One such promising and Emerging Technologies is a PON (Passive Optical Network). The essence of PON technology is that reception transmitting module between the central node OLT (optical line terminal) and remote subscriber nodes ONT (optical network terminal) creates a completely passive optical network PON. In the intermediate nodes are placed passive optical splitters – compact devices that do not require energy consumption and maintenance. One OLT receiver module can transmit information of many consumer devices ONT. The number of ONT, OLT connected to each other, can be as large as your budget allows, power and maximum speed depends on reception transmitting equipment.

Passive optical network are shared among many subscribers environment because of the OLT operates TDM (Time Division Multiplexing) and by ONU – TDMA (Time Division Multiple Access – division multiple access time). This downward flow (we call them flow from ONU to OLT) is transmitted at a wavelength of 1490nm and rising (flow from ONU to OLT) – at a wavelength of 1310nm. This is done in order to leave place for CATV (analog TV), which also can be sent to the tree PON subscriber. Transmitters CATV broadcast at a wavelength of 1550nm or 1310nm, but GEAPON equipment manufacturers took 1310nm wavelength for UpStream, to maximize reducing the cost of client devices (lasers emitting at a wavelength of 1310nm much cheaper lasers emitting at a wavelength of 1550 nm) [1].

After analyzing the trends of communications services, it should be noted, that the most relevant service "tomorrow" will – broadband access to the Internet. This service allows you to implement a large package of other services that characterizes most capacious marketing program Triple Play. It provide's a high level above the designating services and building advanced communications network, based on new technologies. All technology can provide a number of general trends – they are based on All-IP networks, closely integrated with QoS, support high speed (more than 10 Mbps per subscriber). This was achieved mainly through systems (algorithms, methods) redistribution. They can provide various kinds of the same quality as a dial-up systems without losing the main benefits of packet networks – high density download link [2].

The urgent task are analysis, research and development of methods of designing networks based on optical access lines. During the research were considered different types of optical technologies and topologies. Overall analysis of such technologies has helped to understand the principles of construction of access networks based on optical technology, choice principles topology to gather material for "universal" methods of improving the efficiency of designing access networks.

Scientific Supervisor – PhD Svetlana Sakharova

ВПЛИВ ВОЛОГОСТІ НА ФІЗИКО- МЕХАНІЧНІ ВЛАСТИВОСТІ НАСІННЯ ЛЬОНУ Царенко К.С., Гришко С.Ю. ....	81
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