Abstract. Beer is the most consumed alcoholic beverage worldwide. Both beer and wine are recognized since ancient times for their health benefits. Nowadays, these beverages are consumed for its sensory, social interaction, and recently even in culinary dishes. In addition, studies showed the benefits of beer moderate consumption on health. Beer is a low-alcohol beverage and also presents many nutritional properties outlined by its nutritional content rich in vitamins, minerals and antioxidants that come from the raw material (malt and hop). Wishing to attract as many niches of consumers, brewers tend to produce every year new and innovative beers. The purpose of this study was to develop the technology for an innovative special beer. The synchronous alcoholic fermentation of two different origin substrates – wort and grape must - was monitored and their composition was assessed in order to obtain special beer with superior sensory properties. Technological process was developed in the Winery Pilot Station of the UASVM Cluj-Napoca. Special beer was obtained by alcoholic fermentation of hopped dark wort with grape must from the autochthonous Feteasca neagra grapes variety. Second fermentation process was followed by the maturation (3 weeks at 5°C) in order to harmonize sensory qualities. The entire process was monitored considering fermentation and final products physicochemical parameters. The optimized ratio of the two fermentation substrates was of 2.5:3 on primary raw materials – beer wort and grapes must.

Keywords: special beer, grape must, fermentation

Introduction. Since ancient times beer and wine were associated with diet, being part of nation culture. Lately, were demonstrated many health benefits of moderate alcohol consumption to antioxidant capacity or cardiovascular diseases (Collin et al., 2013; Farcas et al., 2013; Mudura and Coldea, 2015; Sanna and Pretti, 2015; Wu et al., 2016).

Aims and objectives. The study proposed an approach for combining benefits of grapes and beer in order to create an innovative beverage.

Materials and methods. For producing must, autochtonous variety of grapes was used – Feteasca neagra, commonly used to obtain Romanian top quality wines. Three types of malt were used for wort preparation - pilsen, caramel and roasted. Hop pellets type 90 Magnum and Perle varieties, crop 2015 were purchased from Moragroind company (Targu Mures, Romania). Grapes were declustered and crushed, then were transferred to maceration tank. Maceration was conducted over a period of 7 days at a temperature of 14-17°C. At the end of this operation, pomace was subjected to pressing, and the must obtained was then transferred to the fermentation tank. Wort was produced in brewery pilot plant. The optimized ratio of the two fermentation substrates was of 2.5:3 on primary raw materials – beer wort and grapes must. The two substrates were inoculated with Saccharomyces cerevisiae yeast starter cultures Prime 10 (Essediele, Italy), at a dose of 20 g/hL. Alcoholic fermentation lasted 7 days at
15°C. Second fermentation process was followed by the maturation – storage for 3 weeks at 5°C - in order to harmonize sensory qualities. The entire process was monitored considering fermentation and final products physicochemical parameters. The sediment formed during the maturation in bottle was removed.

Sugar content was determined at the reception of grapes using a digital refractometer type DR201-95 (Kruss, Germany). Before each analyze, beer samples were filtered and freed of carbon dioxide by means of Erlenmeyer shaking flask. Fermentation process was monitored using Fermentostar analyzer (Funke Gerber, Germany) considering ethanol and total extract (Coldea et al., 2014). The measurement of pH was carried out using the pH meter type pH 315i (WTW GmbH, Weilheim). Total acidity was assessed by using common analytical method. All analytical measurements were performed in triplicate and the mean values were considered.

Results and Discussion. Sugar content of the blended two substrates was recorded as 185.2 g/L fermentesicrib extract. It was observed a delayed period (in the primary fermentation) for yeast accommodation in the medium. Fermentation grade registered a value of 90 % in day 13 of fermentation, when was recorded also the highest alcohol content – 10.05 % vol. alc. Analyses made on the final product are listed in Table 1.

Conclusion. Special beer was produced by using local grape must - variety Feteasca neagra. Chemical compounds were monitored during the fermentation process and in the final product. Innovative valorization of Feteasca Neagra grape must with application in brewing was presented.

REFERENCES