



## Sensory and physical-chemical characterization of some range of beers from the Romanian market

Corina I. Megyesi<sup>1</sup>, Nicoleta G. Hădărugă<sup>1</sup>, Ariana B. Velciov<sup>1</sup>, Laura Rădulescu<sup>1</sup>, Adrian Riviș<sup>1</sup>, Gabriel Bujancă<sup>2</sup>, Alexandru Rinovetz<sup>1</sup>,  
Despina Bordean<sup>2</sup>

<sup>1</sup>Department of Food Science, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119, 300645 – Timișoara, Romania

<sup>2</sup>Department of Food control and expertise, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119, 300645 – Timișoara, Romania

**Abstract:** Beer is the first alcoholic drink consumed by humans, and the recipe for its manufacture is one of the oldest in human history. Beer is rich in nutrients such as calcium, phosphorus, potassium or zinc. This abundance is due to the fact that it is made of plants: barley, wheat and hops. It is a drink beneficial to the health of the human body (if it is consumed in adequate quantities), the soluble fibers in beer helping to prevent constipation and improve digestion.

The aim of the study was to perform a sensory characterization of two types of blonde beer, purchased from the Romanian market. This involves a sensory evaluation, but also a centralization of the results from a group of tasters. Also, a physical-chemical characterization of the two types of beer was carried out, determining the alcohol concentration, total acidity and mass fraction of CO<sub>2</sub>.

### • Introduction

Thousands of years ago beer was discovered and today it is often consumed by people because of its refreshing and pleasant taste, especially as a reason for social interaction, disconnection or relaxation.

Beer, as it is known nowadays, cannot be produced without barley. All attempts to artificially reconstruct the wort starting from recognized ingredients and then using yeast for alcoholic fermentation resulted in a drink distinctly different from beer. When raw materials other than barley malt are used in beer production, such as unmalted grains, other sugary or amylase raw materials, it is important that barley malt is at least 50% of the total forming raw materials of extract.

Beer, from a chemical point of view, is a colloidal system with the main components: water, ethyl alcohol and malt extract. In addition to these, beer also contains a series of chemical compounds that enrich the nutritional value of the product.

### • Material and method

From the sensory point of view, 2 varieties of blonde beer were subjected to analysis: BB1 and BB2, obtained from the Romanian market. Sensory evaluation was performed by a group of 10 tasters (male and female), aged between 22 and 57 years, with no sensory evaluation experience. Samples provided to the panel were labeled with random numbers according to a Williams Latin Square design. The following sensory attributes were evaluated: appearance, foam, color, aroma and taste.

Later, the beer samples were also subjected to physical-chemical analyses, namely: determination of alcohol concentration (based on the relative density, determined with the pycnometer), determination of total acidity (by the titration method with a NaOH solution) and determination of carbon dioxide (by titration) (according to STAS 4230-68).

### • Results and discussions

The figures below show the results obtained from the sensory analysis of the two types of beer - BB1 and BB2.

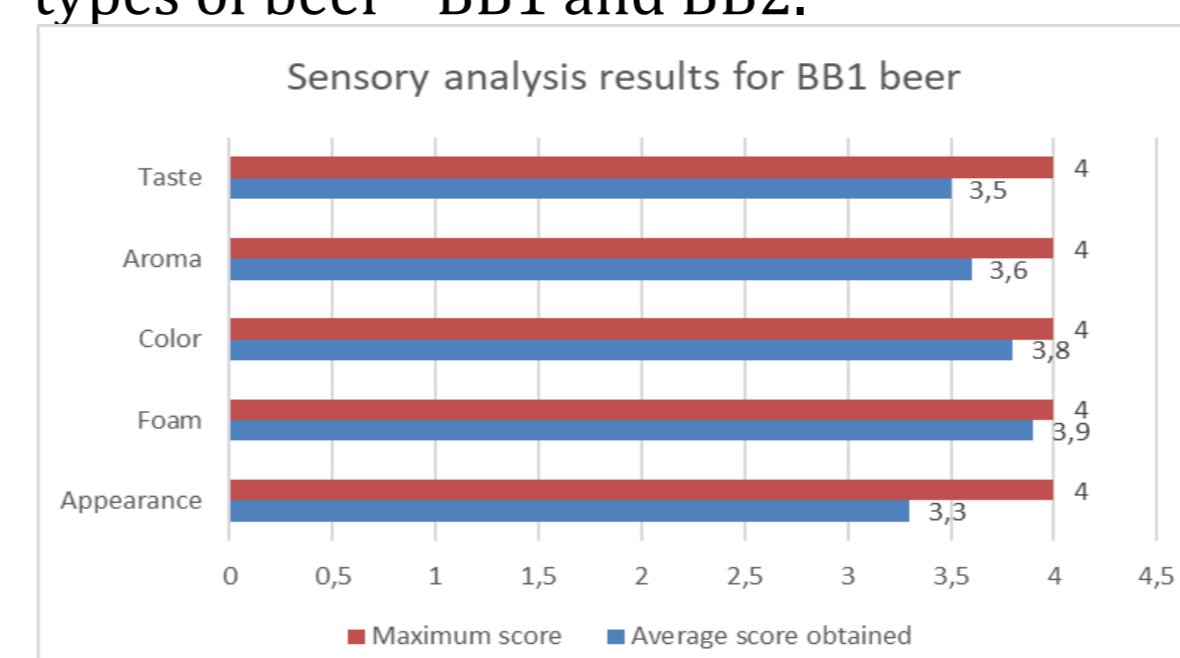


Figure 1. Graphic representation of sensory analysis for the BB1 beer sample

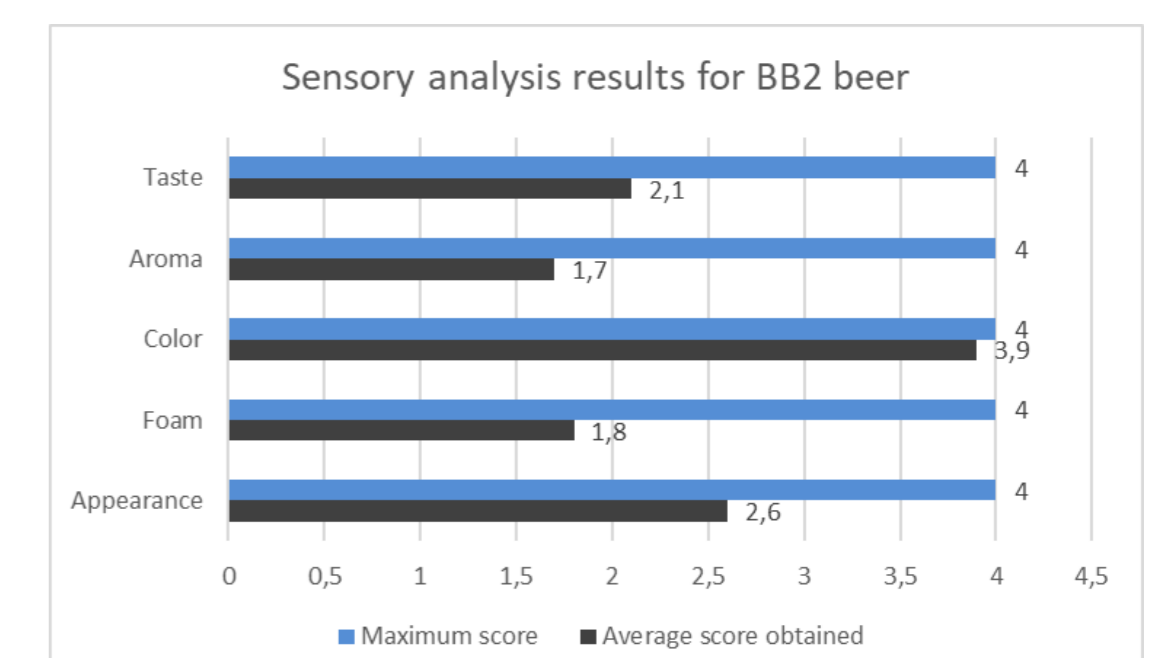


Figure 2. Graphic representation of sensory analysis for the BB2 beer sample

Following the sensory analyzes carried out, we can conclude that the beer with the highest score, namely 3.62 points, in the sensory profile analysis, is BB1 beer. When the beer is poured into the tilted glass, the foam is three cm thick, it is consistent and creamy with small bubbles of carbon dioxide and persists for about 5 minutes, leaving a lacy white mark on the glass. The color of the beer is golden with a strong smell corresponding to the assortment. The taste after the first sip is strongly bitter and aromatic, at the end it leaves a sweet taste with hints of vanilla. In terms of appearance, the beer is clear, without impurities and we can observe the presence of fine bubbles of carbon dioxide that persist.

### • Conclusions

The researchers concluded that moderate beer consumption may be associated with a lower risk of heart disease, improved blood sugar control, stronger bones and a reduced risk of dementia. However, excessive alcohol consumption has opposite effects.

Regarding the alcohol concentration, for both types of analyzed beer, the values obtained coincided with the values displayed on the product labels (6.6% for BB1 beer, respectively 4.6% for BB2 beer), the minimum value accepted by STAS for blonde beer being 3.6%. The total acidity recorded for BB1 beer was 3.2 cm<sup>3</sup> NaOH solution per 100 cm<sup>3</sup> beer, and for BB2 beer 2.7 cm<sup>3</sup> NaOH solution per 100 cm<sup>3</sup> beer, both types falling below the maximum accepted value of 3.5 cm<sup>3</sup> NaOH solution per 100 cm<sup>3</sup> of beer. The values determined for the mass fraction of CO<sub>2</sub> for the 2 types of beer analyzed were: 0.47 g per 100 cm<sup>3</sup> beer for BB1 beer, respectively 0.51 g per 100 cm<sup>3</sup> beer for BB2 beer. The minimum value accepted by STAS for this characteristic is 0.34 g per 100 cm<sup>3</sup> of beer.