EVALUATION OF DIFFERENT TYPES OF BEER QUALITY AND CONSUMERS’ SAFETY

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Abstract

In the context of high consumption of different types of beer and given the consumer demand regarding the food safety, the purpose of this study was represented by the quality control of these products using physicochemical methods. The data revealed information regarding pH value, alcohol content, carbon dioxide content, value of the original, real and present extract, energetic value and foam quality determination. The results showed an uniformity of data from lots of the same sort, which proved a core in applying of the quality management system. In conclusion, it can be said that products obtained in the studied unit meet quality requirements imposed by applicable standards and consumption of these products presents no risk of physicochemical nature.

Key words: beer, food safety, quality, physicochemical analyse.

INTRODUCTION

Beer was discovered thousands of years ago and became a very often consumed beverage for its refreshing and pleasant taste, but also as a reason to relax, meet with friend and social interaction (Walton, 2006).

A moderate beer consumption of around 330 millilitres per day for women and two beers for man brings a real benefit for health, reducing the risk of diabetes, osteoporosis and cardiovascular disease (Banu et al., 2011).

It is considered that consumption of beer and wine are more beneficial than drinking sparkling wine or distilled beverages (Tăpăloagă, 2012).

In this context, this paper presents an analysis of 3 different types of beer and quality parameters and legislative requirements.

MATERIALS AND METHODS

The material was represented by 40 samples of two types of pale lager, divided into 2 groups for each type, depending on the time of sampling and 10 samples of flavoured beer who have undergone physical and chemical analyzes, respectively measuring of pH, alcohol content, carbon dioxide content, value of the original, real and present extract (Anton Paar method), energetic value and foam quality determination (Hartong method). The sampling scheme is shown in Table 1.

<table>
<thead>
<tr>
<th>Type</th>
<th>Group 1</th>
<th>Group 1</th>
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<tbody>
<tr>
<td>Type 1 pale lager</td>
<td>10 samples</td>
<td>10 samples</td>
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<tr>
<td>Type 2 pale lager</td>
<td>10 samples</td>
<td>10 samples</td>
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<tr>
<td>Type flavored beer</td>
<td>10 samples</td>
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RESULTS AND DISCUSSIONS

Taking into account the fact that for the 2 types of pale lager were obtained a large number of results, we presented the average for each type of analyse. For the flavoured type, the results were presented for each sample.

Regarding the quality of the type 1 pale lager for both groups (group 1.1 and 1.2), all results are within the limits imposed by the standard, the pH should be between 4.1 to 4.4, with average obtained 4.34 (figure 1), alcohol content had an average value of 4.94% compared to limits of 4.3 to 5.8% (figure 1) concentration of CO₂ varied between 5.1% and 5.5%, the average value being 5.5% (figure 1).

The maximum value of original extract imposed by producer is 11,25˚P, which means that the analyzed beers were within the limits with an average of 11.04 ˚P, the real extract should be between 3.56 and 3.47˚P, the studied beers have an average of 3,46˚P, the present extract has a value of 1.65˚P, being the limits imposed by the manufacturer (figure 2).
The time of destruction of foam had an average value of 264 sec compared to 250 sec minimum value and the energy value was within the standard product, with an average of 165.5 kcal (figure 3). As regards quality assortment 2 for both groups of lager (group 2.1 and 2.2), all results were within the limits imposed by the standard, the pH had an average of 4.32, alcohol an average value of 4.97% and CO₂ concentration was 5.5 (figure 1). Original extract value should be maximum 11°P which means that the analysed beers were within the limits set by legislation with an average of 10.95 °P, real extract should be between 3.56 and 3.47°P, the studied beer fitted the standard with an average of 3.45, the present extract had a value of 1.67 °P, being the limits imposed by the producer (figure 2). The time of destruction of foam had an average value of 265 sec reported to 250 sec minimum value, and energy value falled within the standard product, with an average of 166 kcal (figure 3).

For flavoured beer, all results are within the limits imposed by the standard, the pH should be between 2.85-3.15, with an obtained average value of 2.98, the alcohol concentration had an average of 4.97% between the limits of 4.3 to 5.8%, the concentration of CO₂ varied between 5.2 and 5.6%, with an average of 5.44% (figure 4).

The original extract value must be 1,75-12,05°P which means that beers analysed within the limits set by an average of 11.38 °P, the real extract should be between 5.55 and 5.85°P, the studied beer fitted the standard with an average of 5.59°P, the present extract had a value of 4.25°P, being within limits imposed by the producer (figure 5). The time of destruction of foam had an average value of 129 seconds compared to 125 seconds minimum value, and energy value was within the product standard, with an average of 155 kcal (figure 6).
to 5.8%, the concentration of CO2 varied an average of 4.97% between the limits of 4.3 to 5.8%. The alcohol concentration had an average value of 2.98, with limits between 2.85-3.15, with an obtained average of 3.45 between both groups of lager (group 2.1 and 2.2), all of which means that the analysed beers were within the limits imposed by the producer (figure 5). The time of destruction of foam had an average value of 10.95 seconds compared to 129 seconds, real extract˚P, being within limits imposed by the producer (figure 2). The energy value was within the product standard, with an average of 165.5 kcal (figure 6). From data analysis we can observe that there are not significant differences between the two types of pale lager. Also, there are fairly significant differences between pale lager and flavoured beers with lower values for all parameters for the second category. In conclusion, it can be said that the products obtained in the studied unit meet the quality requirements imposed by legislative standards and consumption of these products presents no risk of physicochemical nature.

CONCLUSIONS

The technological flow for pale lager and flavoured beer comply with the majority of the studied literature, with minor variations that give the originality of the products (Banu, 2001, Hlatkly, 2013, Kunze,1996). There is a uniformity of data from lots of the same sort, which proves the applying accordingly of the quality management system. From data analysis we can observe that there are not significant differences between the two types of pale lager.

In conclusion, it can be said that the products obtained in the studied unit meet the quality requirements imposed by legislative standards and consumption of these products presents no risk of physicochemical nature.

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EXPERIMENTAL MEDICINE
FORMULATION, PREPARATION AND CHEMICAL ANALYSIS OF PURIFIED DIETS FOR LABORATORY MICE AND RATS

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Abstract
The aim of this study was the preparation and determination of the main chemical parameters for 5 purified diets for laboratory mice and rats: 2 diet for maintaining and growth/breeding animal colonies and 3 diets for inducing metabolic disorders (atherosclerosis, diabetes type II and obesity). Diet recipes for maintenance and growth are the classic recipes and diets that induce metabolic syndromes attempts to replicate human food behaviour with unidirectional nutrition (excess cholesterol, excess fructose and excess fat). For all chemical parameters were established limits values necessary to achieve the aims pursued by manufacturing these diets. Diets were prepared in our laboratory. To all diets were made the following measurements for determining the gross chemical composition: protein, fat, fibres, ash, dry matter and cholesterol for atherosclerosis induced diet. It was also calculated gross energy. For comparison purposes, similar diets were purchased from a specialized company, diets that were analysed for the same chemical parameters in the same specialized laboratory. The results showed that the values of the analysed parameters were within the limits set by recipes and compared to acquired diets the values of most parameters are close to having a coefficient of variation lower than 10. The results allow the transition to the next phase of that study, respectively the administration of purified diets in mice and rats and in achieving the induction of metabolic syndromes.

Key words: purified diets, metabolic syndromes, gross chemical composition.

INTRODUCTION
Research of mechanisms for different morbid entities based on experimental models take increasingly higher in this research field. There are searched and established experimental models for understanding and treat some metabolic diseases, oncology diseases, toxicology, etc. The study of mechanisms of generation and development of pathologic entities such as diabetes or atherosclerosis concern broad categories of researchers from nutritionists to physiologists, pathologists, biochemists, etc.

At the same time, the expenses that mankind are assumed to understanding, preventing and combating these entities are very high. Along with human medicine, the veterinary one is increasingly involved in the study of these pathological entities providing appropriate experimental biological material more increasingly demanding by specialists, along with important contributions to the knowledge of their development mechanisms.

In procedures applied to animals, natural diets are the most used. They contain plant and animal various origin ingredients, have high palatability, are appreciated by animals, have high availability in the commercial market and are very cheap. Nevertheless due to the number of ingredients, different producers for each of these ingredients and higher variability in terms of nutritional value of each ingredient, successive batches of natural diets are very different regarding main chemical parameters (Savenije et al., 2010).

Studies on the induction of metabolic syndromes may not have the expected results because of the type of administered diet. Thus, the hypertensive effect of excessive NaCl dietary was diminished by the presence of genistein (soy phytoestrogens subclass) in rat diet trying to induce hypertension (Cho et al., 2007). Soy isoflavones have been shown also that can reduce serum cholesterol and triglycerides (Bakhit et al., 1994; Carroll et al. 1996) and can prevent the development of hepatosteatosis (Ascencio et al., 2004).

In studies on inducing obesity was observed that in rats fed with fat rich diets, but using soy as a protein source, the weight gained is less and body fat less than in rats fed with diets high