Abstract

In the latest period of time the people’s interest for natural products without synthetic dyes, with benefits to the human body has significantly increased. Chocolate is widely consumed all over the world. The pleasure derived from the consumption of chocolate is accompanied by a whole range of effects on the human health, which may explain their attractiveness. One of the objectives of this research was to extract dyes from various plants (fruits and vegetables) and incorporating them in white chocolate. In order to characterize the new product, several physicochemical analyses were conducted (moisture, dry matter, ash content, total extract and acidity). Also the consumer perception was followed by conducting a sensory analysis. The new product can be placed in the free synthetic dyes category.

Keywords: chocolate milk, natural dyes, sensory parameters

Introduction. Chocolate products are the most important products of candy that are popular, especially with children, and well known as a source of energy in addition to its high nutritional value. The popularity of this food appears to be mainly due to its potential to arouse sensory pleasure and positive emotions (Macht and Dettmer, 2006). There is an important dietary component manufactured from a mixture of powder cocoa, cocoa butter, sugar, milk, emulsifiers and stabilizers and other ingredient depending on the type of chocolate (Gatade, et al., 2009). It is packed with vitamins, nutritionally valuable minerals and antioxidants, but the most notable of all these are caffeine and theobromine with benefic effects on skin, central nervous system, circulatory system and many other benefits. The physical properties, rheological behaviour and sensory perception of chocolate are influenced largely by its processing technique, particle size distribution and ingredient composition (Torbica, et al., 2014).

Central to sensory character is continuous phase lipid composition, which influences mouth feel and melting properties (El-kalyoubi, et al., 2011).

Aims and objectives. A growing number of natural food dyes are being commercially produced, partly due to consumer concerns surrounding synthetic dyes. Colour is important to attract consumers before they consume a product. This research aims to assess the addition of natural dyes and its impact on the organoleptic characteristics of chocolate bar homemade. To achieve the proposed goal, the content in dry matter %, moisture %, acidity %, soluble extract %, ash % and sensory parameters were determined for the analyzed samples.

Materials and methods. Dyes extraction was made from black grapes, beets, red cabbage, spinach and carrots. Chocolate was made from sugar, milk, butter and vanilla. The protocol used for dry matter, moisture and ash was based on AOAC Official Method. Moisture content was
determined by drying in an oven at 103°C±2°C for 3 hours, the experiment being repeated until the weight was constant. The samples were cooled in a desiccator for one hour and weighed (AOAC, 2000). Dry matter was calculated from moisture as the complement of 100% original content. Ash was determined by ashing at 550°C-600°C until white ash. The titration method was used in which the total acidity of the sample is neutralized with NaOH in the presence of an indicator (Tofană and Mureșan, 2012). The soluble extract was determined by evaporating 20 ml filtered from the sample on a steam bath and transfer to 103 ºC air oven and dry for 2, 30 hours, after was cool in a desiccator and weigh (Tofană and Mureșan, 2012). For the sensory analysis a simple hedonic scale with a small number of points (from 1 to 4 with 1- i don’t like it and 4 - i like it very much) was used in order to evaluate the first impression, the aspect, the flavour, the texture, the taste and the smell of the samples of chocolate with natural dyes added.

Results and Discussion. Five natural colors were extracted with water from plant sources (carrots, beetroot, red cabbage, spinach and black grapes) and incorporated in white chocolate bar. Chocolate bar are solid at ambient temperatures (20-25°C) and melt at the oral temperature (37°C) giving a smooth suspension of solid particles milk fat. Some physicochemical analyses of products were determined, as moisture (2-3%), dry matter (97-98%), ash content (1.78-2%), total extract (35-46%) and acidity (0.40-1 g % malic acid). All samples are in agreement with the ranges published in literature (Tofană and Mureșan, 2012). According to the sensory analysis results, the aspect, taste and flavour were appreciated by scoring higher the samples with dyes than simple white chocolate. Also, the most appreciated chocolate bar was that with natural dye from beetroot, its colour was pal red.

Conclusions. The new product can be placed in the free synthetic dyes category. Moreover, the sensory analysis showed that the natural dyes improved the aspect of the chocolate. The next step in our future researches is to use powder alternatives instead regular liquid food colouring for a better texture.

References