

Cardiovascular diseases and malignant neoplasms belonging to civilization diseases are the most common cause of death in Poland. Therefore the primary goal of the doctoral dissertation was to design and market confectionery products that can be part of a varied and balanced diet contributing to the fight against civilization diseases. The research focused in particular on the antioxidant and sensory properties of the designed confectionery products.

As part of the doctoral dissertation, cookies with rapeseed press cakes, white chocolate with powdered matcha green tea leaves and powdered moringa leaves, dark chocolates with elderberry extract, elderberry flower extract and chokeberry extract, gingerbread cookies in dark chocolate enriched with elderberry flower extract, with a filling containing elderberry juice concentrate were designed. In addition, the grinding process of ginger and nutmeg, which are used in gingerbread, production was optimized.

Several analytical methods, such as DPPH, ABTS, CUPRAC, FRAP and FC, were applied to determine the total antioxidant capacity (AC). However individual antioxidants (phenolic compounds, tocopherols, carotenoids) were analyzed using chromatographic techniques. The designed confectionery products were also subjected to sensory analysis to evaluate the possibility of introducing them to regular sale. In addition, a static model of the *in-vitro* digestive system was used to determine the bioavailability of dark chocolates enriched with extracts from elderberries, elderflowers and chokeberries, while scanning electron microscopy (SEM) was used to illustrate the effect of these extracts on the surface morphology of dark chocolates. The modified functional gingerbreads were tested also for anti-glycation properties.

All designed confectionery products were characterized by significant antioxidant properties. However, taking into account the sensory properties and the possibility of introducing them into regular production, the assumptions of this doctoral dissertation are best met by gingerbreads covered in dark chocolate with elderflower extract, with a filling containing elderberry juice concentrate with confirmed antioxidant properties and high overall acceptance level and high level of purchase intention. And it was this confectionery product that was introduced to the market. Consumption of this product due to its health-promoting properties, including antioxidant and anti-glycation properties, can potentially be an element of a varied and balanced diet, contributing to the fight against civilization diseases.