

SUMMARY

Although apple pomace is a cheap, easily available post-production raw material, its current applications rarely take into account pro-health character of this heterogeneous plant mixture. Taking into account that apple pomace provides nutritionally valuable food matrix, this lack of interest could be explained mostly by ignorance of food producers on this subject. Therefore, undertaking studies on the enrichment of various gluten and gluten-free products with apple pomace seems to be fully justified.

The research material consisted of gluten and gluten-free products with different contents of apple pomace, whole or ground.

The aim of the study was to determine the effect of different levels of dried apple pomace on the content of pro-health compounds, such as polyphenols and dietary fiber in various food products (gluten-free bread, corn snacks, corn-rye snacks, gluten and gluten-free biscuits, wheat pasta) and to estimate the antioxidative potential of the above-mentioned products. Furthermore, the aim was to determine the effect of different levels of apple pomace on the organoleptic assessment of the abovementioned products, taking into account their physical characteristics as well as their nutritional composition. The above comprehensively considered physical and functional characteristics, as well as nutritional and pro-health value will determine the consumer attractiveness and acceptability necessary for commercialisation of innovative food products. The final aim of the study was an attempt to indicate which of the innovative products obtained with apple pomace will be the most beneficial both in terms of consumer attractiveness and pro-health value.

It was found that apple pomace is a valuable concentrate of pro-health compounds, i.e. dietary fiber, and other bioactive components from the group of polyphenols, especially flavonoles, flavan-3-ols, phenolic acids and a unique dihydrochalcone - phlorizin, therefore their use can be directed at the biofortification of both gluten-containing and gluten-free cereal products.

The highest level of apple pomace in the above products contributed to the maximum increase of total fibre and its fractions: soluble and insoluble and total polyphenols, flavonoids, anthocyanins, phenolic acids, flavonoids, flavan-3-ols and dihydrochalcones, as well as to the increased antioxidant potential of final products. There was no clear tendency to increase the content of basic nutrients with growing share of apple pomace in the products, as it was generally observed in the case of pro-health compounds (dietary fiber and phenolic compounds), which should be explained by the composition of formula blends, which mainly determines the amount of nutrients in final products.

There was also no clear relationship between the level of apple pomace in the analysed products and their texture (hardness). On the other hand, the share of apple pomace in extruded products highly affected their functional properties, because expansion was reduced proportionally to the applied level of pomace in comparison to control, which also resulted in

an increase of density of the products. Water binding capacity of all extrudates with apple pomace (both whole and ground) was lower in comparison to control samples, as opposed to solubility, much higher in products with apple pomace. In general, however, sensory analysis showed that apple pomace in each of the analysed products contributed to the improvement of their sensory evaluation.

It should be noted that in the group of gluten-free products the most beneficial were extrudates with 20% of apple pomace, followed by gluten-free bread with 15% of pomace, and among gluten products - corn-rye extrudates with 40% of apple pomace in terms of antioxidant content, antioxidant potential and nutritional value, as well as physical characteristics guaranteeing consumer acceptability.

To sum up, apple pomace as a complex of endogenous pro-health ingredients, a cheap and easily available off-product in fruit processing, may constitute a raw material for biofortification of both gluten and gluten-free cereal products, thus setting out a new strategy for the development of the use of this type of off-products.

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