

## EFFECT OF MILK THISTLE (*SILYBUM MARIANUM L.*) SEEDS POWDER ON QUALITY CHARACTERISTICS OF SPONGE CAKE

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Pastry products are often blamed for some content rich in sugars and lipids, and devoid of any biological value (vitamins, phenols, etc.), thus contributing to the development of pathologies such as obesity, diabetes, cardiovascular diseases, etc. In order to enhance the biological value of sponge cake, in this research, milk thistle (*Silybum Marianum L.*) seeds powder that are proven to have hepatoprotective effects due to the flavonolignans from their composition, especially Silymarin, was used to replace 5, 10, 15, and 20% of wheat flour in the sponge cakes formulations. The quality characteristics of sponge cake were studied in terms of sensory analysis, porosity, texture, volume, color parameters, total phenol content (Folin Ciocalteu reagent) and antioxidant activity (DPPH free radical scavenging).

The obtained results revealed that the sponge cake volume was significant affected by the addition of milk thistle seeds flour. The volume of sponge cake decreased from the average of 72.78 cm<sup>3</sup> for the control sample to 59.56 cm<sup>3</sup> for the sample with 20% milk thistle. This fact was also confirmed by the decreasing trend of the porosity (from 80.12% to 75.34% for the sample with 20% milk thistle incorporation) of the cake with the increase in the substitution level of wheat flour with milk thistle seed flour.

The inclusion of *Silybum Marianum L.* powder influenced the texture and crumb color of the baked sponge cakes. The harness and chewiness of baked cakes manifested an upward trend with increasing milk thistle powder levels, whereas the cohesiveness showed a reverse trend. For the crumb color the *L\** values decreased, while the *a\** and *b\** values increased, showing that darker, redder and yellower samples were obtained. However, the samples with 5 and 10 % addition were not significantly different.

Concerning phenols content and antioxidant activity, the results show that the milk thistle addition has a positive effect on the total phenols content by increasing it from 63.93 (control sample) to 121.94 mg GAE/g (sample with 20 % milk thistle). However, the highest antioxidant activity (49.37%) was recorded for the sample with 10% milk thistle, while for the sample with 15 and 20% it shows a downward trend, this is probably due to some compounds or interaction that have a pro-oxidant effect when milk thistle powder exceeds certain quantities.

The results of the sensory analysis pointed out that the replacement of wheat flour with up to 10% milk thistle powder in sponge cakes is satisfactory, the samples with 5 and 10 % milk thistle being the most acceptable.

**Keywords:** antioxidants, flour replacement, texture, color, sensory analysis

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