Determining the proper concentration of commercial rosemary extract as a replacement for synthetic antioxidants during frying

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INTRODUCTION:

- Rosemary is a plant distributed all over the world with high antioxidant capacity.
- Proper concentration usage of this antioxidant was studied according to different works of literature ranging from 100 to 1000 ppm.
- Comparing the rosemary extract with BHT.
- Permitted amount of BHT based on European regulation is 200 ppm.
- Improving the stability of frying oils.

MATERIALS AND METHODS:

Materials:

- Commercial Rosemary Extract Obtained from leaves (Naturex containing carnosic acid and carnosol)
- Synthetic antioxidant, BHT

Methods:

- Scavenging of 1,1-diphenyl-2-picryl-hydrazil radical (DPPH)
- Total antioxidant activity (FRAP)
- Total phenolic content (TPC)
- Peroxide Value (PV)
- Free Fatty Acids (FFA)
- P-anisidine value (p-AV)
- TOTOX value

AIM:

- This study was performed to investigate the effectiveness of this extract based on the concentration (ppm) compared to the common synthetic antioxidant butylated hydroxytoluene (BHT) on retarding lipid oxidation of high oleic sunflower oil subjected to frying at 180 ± 2 ◦C for 15 batches of frying (each batch five minutes) till reaching total polar compounds of 24 to 27 %.

RESULTS:

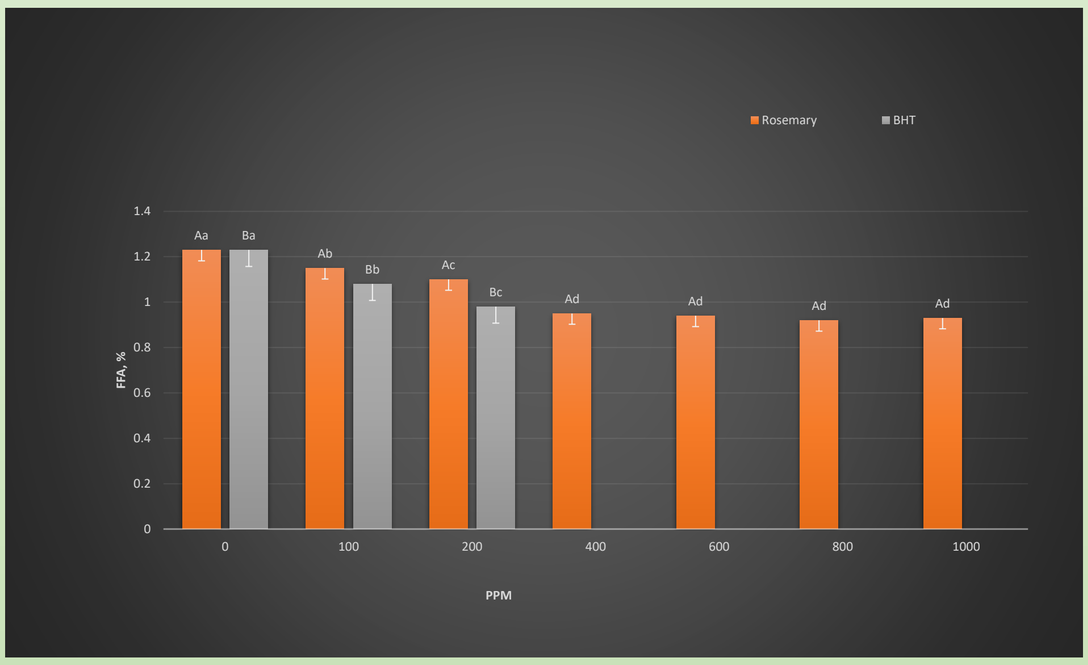

Fig 1. Effects of antioxidants concentration on FFA during frying

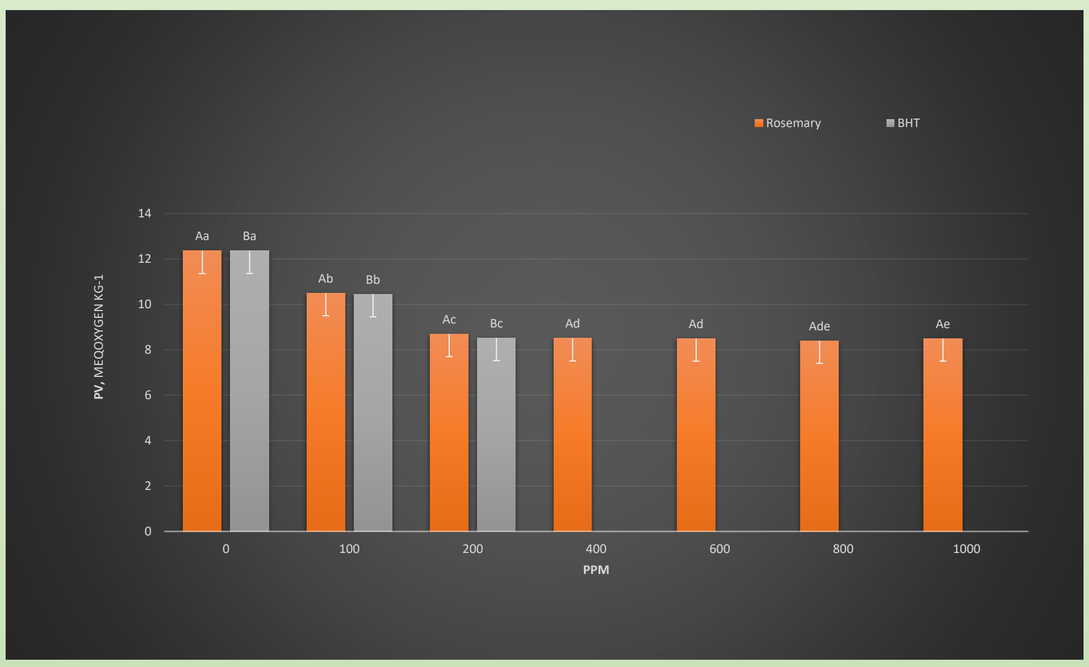

Fig 2. Effects of antioxidants concentration on PV during frying

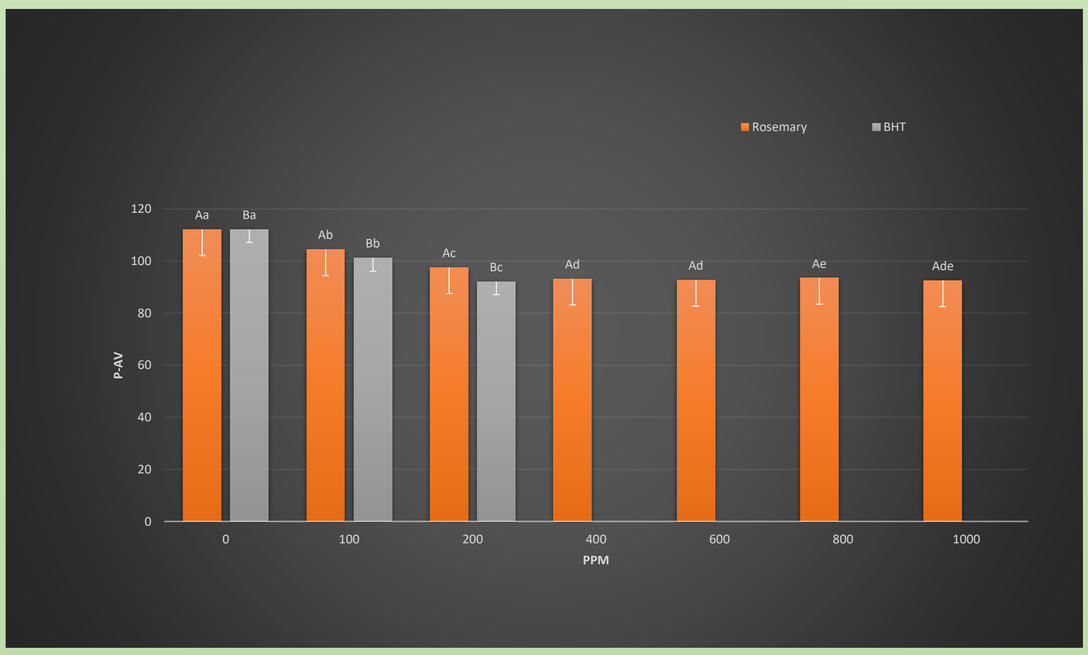

Fig 3. Effects of antioxidants concentration on p-AnV during frying

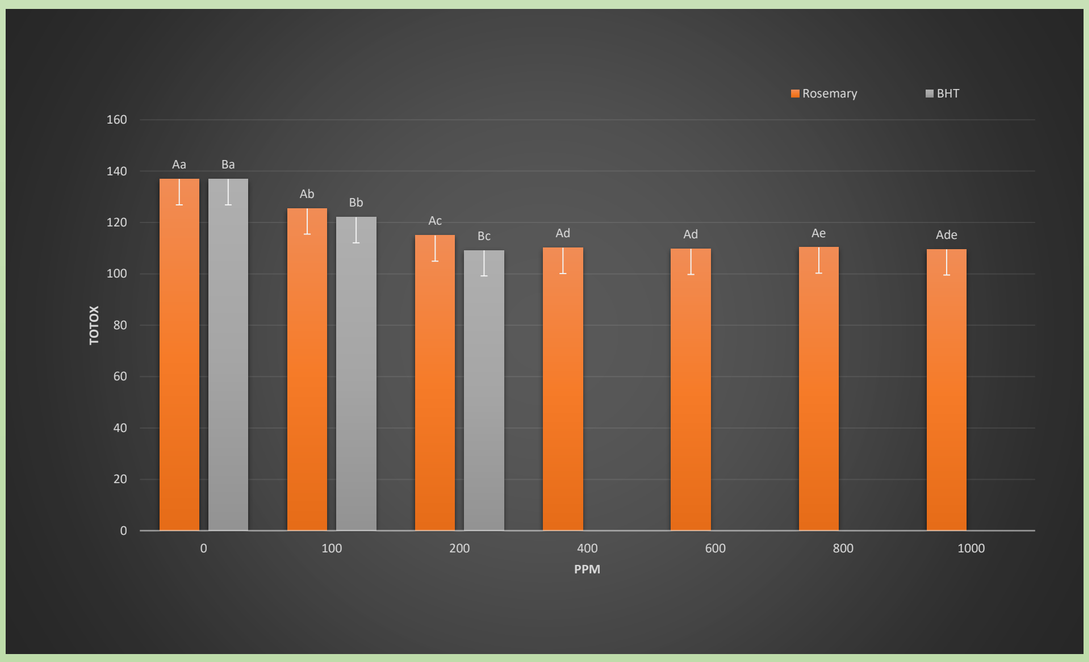

Fig 4. Effects of antioxidants concentration on TOTOX value during frying

CONCLUSION:

- As the changes in oxidative stability of oils were not significant after concentrations of 400 ppm, this amount seemed to be the proper concentration based on the progress of lipid oxidation during frying.
- Commercial rosemary extract can be used as a natural replacement of synthetic antioxidants in retarding frying oil oxidation.
- It was found that rosemary extract had high polyphenol contents and therefore high antioxidant capacity and high radical scavenging activity

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