SOME TECHNOLOGICAL TREATMENTS FOR RODUCING HIGH QUALITY OLIVE OIL AND ITS UTILIZATION IN SOME DAIRY PRODUCTS

By

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B.Sc. Agric. Sc. (Food Technology), Ain Shams University, 2002
M.Sc. Agric. Sc. (Food Science and Technology), Ain Shams University, 2009

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ABSTRACT

Mohamed Fawzy Mahmoud Mohamed Al-Okaby: Some Technological Modifications for Producing High Quality Olive Oil and its Utilization in Some Dairy Products. Unpublished Ph.D. Thesis, Department of Food Science, Faculty of Agriculture, Ain Shams University, 2015.

Olive oil is gaining a growing interest because of its beneficial effects on human health and hence olive oil production is spreading worldwide. As a result, technical improvements in olive oil extraction process are continuously under study. Therefore, this investigation was carried out to study the effect of extraction systems (pressing and 2-phase centrifugal systems) and addition of different levels of coadjuvants (citric acid, talc powder, calcium carbonate and common salt) on oil yield, quality characteristics, fatty acid profile, total polyphenols, and oxidative stability of two olive oil (Olea europaea L.) varieties, Koroneiki and Coratina.

The results showed that the 2-phase centrifugal system achieved better oil yield and extractability than pressing system. However, Koroneiki olive oil extracted by pressing system exhibited higher total phenols content, oxidative stability and sensorial score than that extracted by 2-phase system. Parameters legally established (acidity, peroxide value, K_{232} and K_{270}) to measure the level of quality and fatty acid composition of the virgin olive oil extracted from the two varieties were inside the range reported by the Egyptian Standard for virgin olive oil.

The use of different coadjuvants significantly improved the oil extraction yield from Koroneiki and Coratina fruits. Common salt at 2.0% allowed a higher oil yields from Koroneiki and Coratina varieties (13.58, 13.15%, respectively) than the controlled extraction without coadjuvants

(10.19, 8.70%, respectively), with similar recovery yields when using the more expensive talc powder (13.65, 13.18%, respectively).

Physicochemical quality parameters of the olive oil were not significantly affected by the use of these coadjuvants. However, the addition of common salt significantly ($p \leq 0.05$) increased total phenols content, oxidative stability and sensorial score from both varieties compared to control oil. It can be concluded that small amounts of common salt will be of great value for commercial production of olive oil for allowing most of the oil to be extracted with high quality and stability.

The possibility of improving the stability of Koroneiki olive oil during six months of storage at room temperature by using different packaging materials (light and brown PET bottles, light and brown glass bottles, tin plate and Tetra-brik Aseptic®) and conditioner gas (air and nitrogen) was also investigated. Results showed that the best packaging material for olive oil storage was Tetra-brik and tin plate containers which exhibited higher oxidative stability and quality attributes and lesser changes in fatty acid profile followed by brown PET and brown glass bottles. Finally, the use of nitrogen as conditioner gas in the headspace of olive oil helped to avoid the deterioration of olive quality.

Furthermore, the feasibility of using high quality olive oil for manufacture of some functional dairy products (modified butter blend and labneh) was studied. The results showed that replacing of 10% butter oil with olive oil led to improve the organoleptic properties of modified butter blend and increased the levels of unsaturated fatty acids which improve the nutritional quality and oxidative stability of the blends. Also, labneh manufactured by using 1.0% olive oil was the best treatment compared to the reference sample in its chemical, microbiological and sensory properties.

Key word: Virgin olive oil; Extraction system; co-adjuvant aids, Extraction efficiency; Fatty acids; olive oil quality; Phenolic compounds; Oxidative stability; Storage conditions; Dairy products; Modified butter blend; Labneh.

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CONTENTS

LIST OF TABLES