# Canola: Process and Product Technology

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Canola, as an oilseed crop, and the oil derived from it have become very important components of the world fat supply. Interest in canola oil has increased significantly, especially in the last five years, mainly due to the realization that the fatty acid profile of this oil is nutritionally favorable.

Because of this interest, as well as the fact that canola/rapeseed is a relative newcomer to the world oilseed scene, a symposium on process and product technology was held at the 1992 Annual Meeting of the American Oil Chemists' Society in Toronto. The symposium was comprised of twenty presentations on various aspects of canola seed and oil processing and canola oil product technology. Five of these papers are published in this issue. One of the papers deals with a novel approach to canola seed extraction, three deal with various aspects of chlorophyll in canola oil and the last paper describes enzymatic rearrangements of canola oil with palm oil to obtain novel oil properties.

The first paper, "Enzyme-Aided *vs.* Two-Stage Processing of Canola: Technology, Product Quality and Cost Evaluation" by Sosulski and Sosulski, deals with the extraction of canola oil by pretreating the seed enzymatically and then pressing it in an expeller. No solvent is used. The aim of this work, which is ongoing, is to develop an extraction process that achieves acceptably low residual oil contents in the meal residue without the use of hexane or other solvent. Possible advantages of this approach include: the elimination of hexane in the extraction plant environment, process energy savings, a more digestible meal and improved crude oil quality. In the context of canola seed extraction, the elimination of hexane, because of the greater difficulty in desolventizing of canola meal as compared to soy meal, would be an additional advantage. Improvement in crude oil quality, such as reduced extraction of chlorophyll from the seed into the oil, would have obvious savings in downstream processing of oil.

The second paper is titled "A Laboratory Study of the Press Effect in Adsorptive Bleaching" by Henderson. The so-called "press effect" in edible oil bleaching is a well-known phenomenon. The paper investigates, for the first time, this effect with respect to chlorophylloid compounds in the bleaching of canola oil, which usually contain much higher concentrations of these compounds than other edible oils, and compares it with the behavior of the more common carotenoid compounds. Chlorophylloid compounds, because of their prooxidant activity in the presence of light, must be removed from oils in extremely low concentrations (<50 ppb). In the bleaching of canola oil, because of the relatively high concentration of chlorophylloids, this can be more difficult to achieve than with other oils. Adsorption on acid-activated clays is presently the only efficient means available in plant-scale processing to remove chlorophylloids. A good understanding of adsorptive bleaching is essential for an economical bleaching operation.

Suzuki and Nishioka's "Behavior of Chlorophyll Derivatives in Canola Oil Processing" also deals with chlorophylloid compounds in canola oil. The study investigates the chemical changes in chlorophylloid compounds that may occur during seed preparation, oil extraction, degumming and alkali-refining, and the differences in adsorptive properties of these compounds. It thus supplied valuable background information for the observation that crude oils of similar "green" color intensity can exhibit significantly different levels of bleaching difficulty. It also supplies valuable information on how to conduct the canola seed extraction and refining processes with a view to obtaining a more easily bleachable oil.

The fourth paper is on "Chemical Aspects of Chlorophyll Breakdown Products and Their Relevance to Canola Oil Stability" by Tautorus and Low. There are industry claims that deodorized oils derived from crude oil high in chlorophyll have poor oxidative stability. This study is an attempt to see if this is related to chlorophyll breakdown products left in the oil after processing. This type of investigation is difficult because of the complexity of factors affecting oil stability. The work done so far produced a number of significant observations on canola oil stability, but is not yet complete. Additional findings will be published in the near future.

The final paper is "Enzymatic Modification of Canola/Palm Oil Mixtures: Effects on the Fluidity of the Mixture" by Kurashige, Matsuzaki and Takahashi. The purpose of this investigation was twofold—to develop methodology for enzymatic interesterification of oils and to determine if interesterified mixtures of canola and palm oil would remain fluid at lower temperatures than simple blends. This is of interest for the production of liquid frying oils of good stability. It takes on added significance if *trans* isomers are to be avoided in frying fats.

*Ted Mag was the co-chairperson for the sessions on "Canola: Process and Product Technology" at the 1992 Annual Meeting of the American Oil Chemists' Society, held in Toronto, Canada.