

The Effect of Deodorization on the Refined Oil Quality and Distillate Composition

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The increasing refined oil quality criteria is an important challenge for the edible oil processing industry. In the past, the quality of refined oils was evaluated by standard quality parameters such as a low residual FFA content, a high oxidative stability, a light color and a neutral odor and taste. Today, high quality food oils must have a low level of *trans* fatty acids, a high amount of natural antioxidants, low levels of polymeric and oxidized triglycerides and virtually no contaminants (pesticides, polycyclic aromatic hydrocarbons, dioxins and polychlorinated biphenyls).

At the same time, maximum reduction or valorisation of side-streams such as deodorizer distillate becomes more important to improve the overall profitability of the refining process.

As usually the last stage in the refining process, deodorization has an important effect on the overall refined oil quality and distillate composition. The last decade, increased attention has therefore been paid to the optimization of the deodorizing process conditions and the development of improved deodorizing technology.

New (dry condensing) vacuum systems capable of reaching a very low operating pressure in the deodorizer (1.5 mbar) were introduced. This innovation allows a reduction of the deodorization temperature without affecting the stripping efficiency in a negative way. Unwanted thermal degradation (e.g. formation of *trans* fatty acids and polymeric triglycerides,...) is minimized further by introduction of the dual temperature concept. Deodorizers operate at different temperatures to reach the best compromise between required residence time for deodorizing (at low temperature) and heat bleaching and final stripping at high temperature (for a short period). Packed column sections can be introduced as efficient strippers for heat sensitive oils (e.g. cocoa butter, fish oil, olive oil,...).

The development of a new type of scrubber operating at two different temperatures (Dual condensation concept) allows the production of deodorizer distillates with a unique composition and higher value.