
FACT SHEET

ENZYMATIC NEUTRALIZING

Traditionally free fatty acids (FFA) in fish oil have been removed by alkaline refining. In the traditional process the free fatty acids in the oil are converted into water soluble soaps. The soaps are then separated from the oil in a centrifuge, washed with water followed by separation on a centrifuge.

Unfortunately, soaps are excellent emulsifiers and tend to emulsify parts of the oil in the process. This oil is then discarded together with the soaps (soap stock). This loss of product can be substantial and correlates with the amount of FFA. The loss of product for an oil containing 5% FFA will typically be in the range 12 – 15% depending on the oil quality and process equipment.

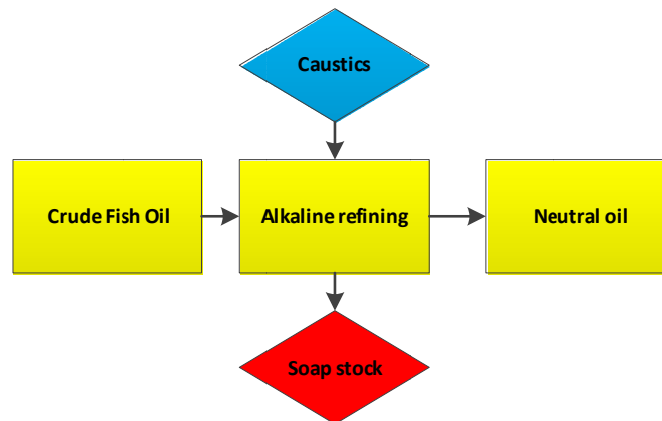


Figure 1 Alkaline refining

To reduce the loss of valuable oil in the alkaline refining step, it is crucial to reduce the initial FFA content in the oil by other means before treating the oil with caustics.

APC has in collaboration with Novozymes® developed a new process for enzymatic removal of free fatty acids in oils. The process can be performed either as a continuous or as a batch process and can be readily retrofitted in existing plants.

The process reduces the amount of FFA in the oil by esterifying the free fatty acids into glycerides. The FFA thus not removed in the process, but converted into product. The glycerides formed are indistinguishable from the natural occurring glycerides already found in the oil. The oil is thus not rendered in any way.

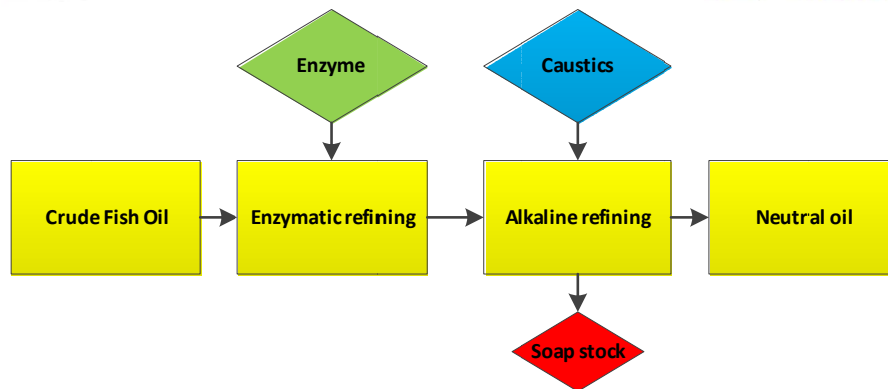


Figure 2 Enzymatic neutralization and alkaline refining

Enzymatic neutralization can reduce the FFA content in the oil to less than 1%. The process is most efficient when reducing the highly acidic oils to 1 – 3% FFA.

When an enzymatically refined oil is alkaline refined, the loss of oil in soap stock will be drastically reduced. The amount of soap stock formed will also be reduced consequently.

Example: If enzymatic neutralization is applied to an oil containing 5% FFA, reducing the FFA to 2.5%, the yield in the subsequent alkali refining process will be improved by approx. 5 %. That means additional 50 kg of product per ton refined. The process improves the quality and value of the bulk of the fish oil.

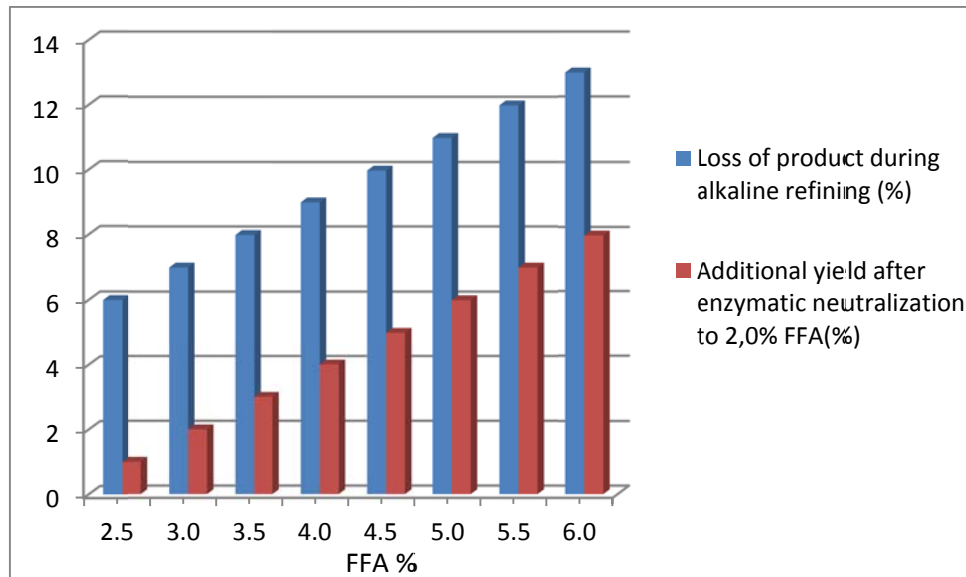


Figure 3

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