Separation Systems in Edible Oil Fractionation

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The fractionation process, especially dry fractionation, is being applied more and more on various feedstocks in the edible as well as non-edible industry. The ongoing developments of high performance crystallisers and more efficient separations systems has lead to an increasing application of this modification technology.

The worldwide success of Palm and Palm kernel oil, for example, is mainly a result of the dry fractionation process. Beside their use in a whole range of commodity oils and fats, these oils also have also become an excellent source for the production of speciality fats. Commodity fractions of Palm oil like Palm olein, Palm superolein and normal Palm stearin are obtained best in a cost-effective way by dry fractionation. Specialty fats, on the other hand, like CBR, CBS or CBE, are traditionally produced through selective fractionation, either in solvent, wet or in dry form. The introduction of high-pressure membrane filter presses as well as the development of high efficient crystallisers, has lead to a multifunctional fractionation technology with numerous applications.

Over the years, various separation systems have been developed and improved to separate the liquid from the solid fraction. Where the first fractionation processes made use of plate and frame filters, it was only till efficient continuous vacuum belt and drum filters were introduced, that the dry fractionation of especially palm oil became an industrial fact. Centrifuges were introduced in the wet fractionation process to improve separation of the liquid from the solids. But the major breakthrough came by the development of membrane filter presses. Today, modern dry fractionation plants operate with membrane presses up to 30 and even 50 bar pressure.

This move to more performance separation systems goes together with the introduction of new crystallisation technologies, to enable control of crystallisation under even more demanding conditions. Beside further developments in dynamic crystallisation, new controlled static crystallisation processes have been introduced in the oil fractionation market with success.

The presentation describes the features and advantages of the different separation and crystallisation technologies, and what can be expected in the fractionation process of tomorrow.