Deodorization of lipase-interesterified butterfat and rapeseed oil blends in a pilot deodorizer

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A mixture of butterfat and rapeseed oil (7:3, wt/wt) was interesterified using immobilized lipase from Thermomyces lanuginosus at 50°C. The interesterified mixture was then deodorized at five temperatures (60-180°C) and three samples were withdrawn at 1, 2, and 3h. The operation was monitored by free fatty acid (FFA) content, peroxide value (PV), volatiles, and the sensory evaluation of the samples with respect to flavor and odor (most importantly the butter flavor and odor and the off-flavor and odor from butyric acid). ANOVA partial least squares regression analysis showed that deodorization time, and especially deodorization temperature, significantly affected the sensory properties and levels of volatiles, FFA and peroxides in the samples. The best compromise between removing undesirable off-flavors while maintaining the desirable butter flavor seemed to be obtained by using a deodorization temperature of 120°C for 2h. Response surface methodology analysis showed a significant effect of deodorization temperature and, to a lesser extent, deodorization time. The butter flavor and odor had an optimum at a deodorization temperature of approximately 100-120°C for 1-2h. These conditions are therefore recommended in order to remove the off-flavor and odor, while maintaining as much as possible of the attractive butter flavor and odor.

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