Effect of amount of citric acid on the heat bleaching during deodorization

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Dry degumming is the most common way of palm oil refining, consisting in the addition of 0.1 % concentrated phosphoric acid, and after a short retention time, about 1 or 2 % of bleaching earth is added under vacuum at a temperature of 80-120 °C. After a suitable contact time, the spent bleaching earth is removed by filtration. Citric acid can also be used to replace phosphoric acid. In this work, the effect of citric acid addition on refined palm oil quality, especially color and elements content, was evaluated. Crude palm oils were bleached using under 105°C, 30 min and 50 mmHg. Two types of bleaching earth were tested, one natural (NBE) and one acid-activated (ABE), being Pure Flo B80 and Tonsil Optimum 210 FF. Citric acid was added in two different levels, 0.09 and 0.27 % (w/w). After bleaching, a deodorization step was performed at 260 °C, 3 mbar, 1.5 % steam and 60 minutes. It can be noted that phosphorus removal decreases with the amount of added citric acid for both bleaching earths, but the decrease is more significant with NBE. Regarding iron content, the difference seems not to be significant when using the same type of BE. In the case of ABE, the use of more citric acid leads to a lower colour after bleaching but a higher colour after deodorization. In the other hand, when NBE was used, more citric acid leads to a higher colour after bleaching and a lower colour after deodorization.