

Investigation of energy consumption in drying lemon balm (*Melissa officinalis L.*) using a solar tunnel dryer

Master Thesis in the Department of Agricultural Engineering

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Abstract

This study was conducted to investigate the energy consumption in drying lemon balm (*Melissa officinalis L.*) using a solar tunnel dryer.

The effect of the radiation is very restrictive for the herb especially the lemon balm. Using sunny and shadowy conditions energy consumption, quantity of oil extracted using distillation method and colour was investigated. In both the conditions there were no significant differences in energy consumption.

The average daily efficiency of collectors was found to be 52% and efficiency energy for whole tunnel dryer was 44 %. The colour of lemon balm was significantly different based on the subjective quality under sunny and shadowy condition.

Under the shadowy conditions the colour appearances of the lemon balm was good according to L*a*b* CIELAB system. However, the colour change cannot be analysed by human eyes. Amounts of oil quantity were obtained at different temperature.

The lemon balm oils were obtained using DAB-9 Kommentar method and were found to be in the range of 0.15 - 0.177% dry matter.