Drying of Strawberries with Infrared Dryer

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Abstract

In this study, two strawberries varieties (Camarosa and Festival) were dried with infrared energy.

- Separated pieces were dried at working temperatures of 60, 70 and 80°C by a laboratory scale infrared dryer.
- Drying time of Camarosa variety was longer than festival variety.
- Drying rate was effected by drying temperature and the highest drying rate was determined at the drying temperature of 80°C.
- The highest amounts of total phenolics for both varieties were obtained at drying temperature of 80°C. The lowest titratable acidity for both varieties was obtained at drying temperature of 80°C.

Materials and Methods

Plant Material

In this study, ‘Camarosa’ and ‘Festival’ strawberry cultivars, grown soilless culture under the protected cultivation, were harvested at commercial maturity at the private company, Antalya, Turkey.

Infrared Dryer

In this study, infrared dryer and moisture analyzer equipment (OHAUS MB25 Basic Moisture Analyzers, Germany) transmitting electromagnetic radiation in the range medium to shortwave infrared radiation (radiator) was used as drying equipment (Fig. 1).

Results and Discussion

- The drying time was calculated to reach the safe moisture content of 16% (w.b.) and found as 508, 280 and 246 min for Camarosa variety and 536, 304 and 290 min for festival varieties at drying temperatures of 60, 70 and 80°C, respectively (Fig. 2 and 3).
- Drying time of Camarosa variety was longer than Festival variety.
- Temperature has significant effect on the drying rate of samples and the highest drying rate was determined at the drying temperature of 80°C.
- While the highest total phenolic content was obtained in infrared drying at 70°C for both cultivars, the total soluble solid content, titratable acidity and pH values were reached their highest values at drying temperature of 60°C for ‘Strawberry Camarosa’ and 70°C for ‘Strawberry Festival’.
- When the colour parameters L* were compared, it was stai the same as fresh sample for ‘Strawberry Camarosa’ and decreased for ‘Strawberry Festival’ after drying process.
- While the a* and b* values were close to the fresh samples for drying at 80°C for ‘Strawberry Festival’, the a* and b* values were close to fresh samples at 60 and 80°C for ‘Strawberry Camarosa’.

Conclusions

The two strawberry cultivars (‘Strawberry Camarosa’ and ‘Strawberry Festival’) at the initial moisture content of 90.44% (w.b.) and 91.37% (w.b.) were dried to the safe moisture content of 16% (w.b.) in between 508 and 246 min and 536 and 290 min at drying temperatures of 60, 70, and 80°C, respectively. As results, drying time of ‘Strawberry Camarosa’ was longer than ‘Strawberry Festival’. Drying rate was effected on the drying temperature and highest drying rate was determined at the drying temperature of 80°C. Highest total phenolic content was obtained in infrared drying at 70°C for both samples. The total soluble solid content, titratable acidity and pH values were reached their highest values at drying temperature of 60°C for ‘Strawberry Camarosa’ and 70°C for ‘Strawberry Festival’.