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Comparative Studies Of Drying Efficiency Of Selected Staple Food Crops In Ebonyi State

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This letter presents an experimental research design that was utilised to investigate the drying efficiencies of capsicum annum (hot pepper) and Abelmoschus esculentus (Okra) respectively. Abelmoschus esculentus belongs to the family – Malvaceae (Durazzo et al., 2018) while capsicum annum belongs to the family – Solanaceae (Soare et al., 2017). Okra (*Abelmoschus esculentus* L.) is a popular vegetable crop with very high nutritional importance, along with certain medicinal, therapeutic and pharmacological values, which makes it serve as good candidates in the use of a variety of industries such as food, pharmaceuticals, beverages, and medicines amongst others (Durazzo et al., 2018; Islam, 2019). Okra is an annual shrub that is widely cultivated in the tropical and subtropical parts across the globe and represents a major garden crop, as well as a farm crop (Elkhalifa et al., 2021). Okra and pepper are widely consumed globally and in Ebonyi State, Nigeria. Romdhane et al. (2020) opines that okra is very rich in important body nutrients such as: magnesium, folate, fiber, antioxidants, and vitamins C, K1 and A. In a related study by Liu et al. (2021), okra contributes significantly in the support of healthy pregnancy, heart health, and in the regulation of blood sugar, including serving as anticancer agents in the body. Peppers are very low in calories and are filled with excellent nutritional values. All varieties of pepper are good sources of vitamins A and C, potassium, folic acid, and fiber (Stoleru et al., 2023). Additionally, the spicy ones liven up bland food, making it more satisfying and palatable (Sanatombi and Rajkumari, 2020).The problem of drying these very important food crops in such a way that it will last for very long periods and still retain their nutritional values have remained an age-long problem to farmers and researchers.

The drying efficiency of pepper and okra were studied using open sun drying and solar dryer. The pepper and okra were carefully picked and neatly peeled into chips and washed thoroughly with clean table water that was procured from Aqua Rapha water companies in Nigeria. The pepper and okra were measured into two equal quantities using a sensitive weighing balance, and then placed in open mats for the drying using open sun drying (OSD), and the solar dryer respectively. The solar dryer was constructed from materials that were sourced locally from the local markets. For those placed in the solar dryer, appropriate flat cardboard sheet was placed to cover the surface area that the pepper and okra were spread on. The experiment lasted for more than 14 days. The drying efficiency of the okra and pepper from the two methods were then calculated using appropriate equations from the literature (Sharma et al., 2016). The results indicate that the drying efficiency of the two food crops (okra and pepper) that was processed through the solar dryer was able to loose their water content and dried up faster compared to those processed by the traditional open sun drying method. The average period required for those food crops to get dried properly for storage was less than 14 days for the ones dried using the solar dryer. For the drying done with the traditional open sun drying, it took more than 14 days for the okra and pepper to dry. Furthermore, there were indications of partial rot of the okra and pepper for the ones done in the open sun drying mode. Additionally, the pepper and okra that were dried from the solar dryer retained their neatness and colour compared to those dried using the open sun drying mode. The drying rates of the pepper, okra, and the solar dryer efficiency were obtained to be 0.25 kg/h, 0.30 kg/h, and 56.5 % respectively. These findings were in agreement with works of other authors in the literature (Yadav et al., 2023; Goud et al., 2022; Lakshmi, Muthukumar and Nayak, 2021).

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