Low Temperature and Low Humidity Drying: An alternative drying method for fruits and vegetables

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INTRODUCTION

Forced Draft Drying
A common preservation method used to prolong shelf-life of fresh produce such as fruits and vegetables.

Disadvantage
Use of high temperature adversely affects both of the products’ sensory and nutritional qualities.

Objective
Develop, apply, and validate other drying system which can help retain products’ sensory qualities and reduce loss of nutrients.

Compare conventional drying (forced draft with LTLH drying system

LTLH Drying
Low Temperature and Low Humidity drying uses desiccants to reduce drying air’s relative humidity. This enables dehydration at lower temperatures resulting in retained sensory and nutritional properties.
METHODOLOGY

VEGETABLE SELECTION
Vegetables high in Vitamins A & C such as carrots, cabbage and red bell pepper were selected.

WASH-CLEAN- PEEL-CUT
Samples were washed and cleaned prior to peeling and cutting.

BLANCHING
Vegetables were blanched for 3-4 mins. Blanching was done to improve colors of samples.

LTLH DRYING
Vegetables were dried for 6-7 hours at 50°C.

RESULTS

Figure 3. Comparison of vitamin contents of LTLH dried and Forced Draft dried fruits and vegetables

LTLH dried and Forced draft dried samples were subjected to physico-chemical, vitamin content, sensory and microbiological analyses.

✓ LTLH dried samples showed remarkable results in nutrient retention
CONCLUSION & RECOMMENDATIONS

LTLH dried fruits and vegetables can be healthier options and offer value-adding to local produce with higher nutrient retention and sensory acceptability.

LTLH dried fruits and vegetables can be easily transported, stored and handled due to its lightweight.

It can be used as food options during calamities due to its high nutritional content.

It is also recommended to try using LTLH dryer on other indigenous agricultural crops and use it as pre-cut ingredients in Filipino dishes.

RESULTS

Figure 4. Physico-chemical properties of dried fruits

Figure 5. Physico-chemical properties of dried vegetables

LTLH dried samples showed comparable results with Force Draft dried samples.

Sensory results showed that LTLH dried fruits and vegetables have a general acceptability of ‘7’ or like moderately.*

Figure 6. Sensory acceptability of LTLH dried fruits and vegetables

*Hedonic Test for Acceptability

LTLH dried samples are within safe microbial limits and thus, are safe for consumption.

Figure 7. Microbiological results of LTLH dried samples

Aerobic Plate Count <250 CFU/g
Yeast and Mold Count <100 CFU/g
E. Coli Count <1.8 MPN/g

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