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## The use of lyophilization in the process of obtaining apple chips

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**Abstract:** Lately, freeze-dried fruits are beginning to take over the processed fruit markets by modern preservation methods, such as lyophilization - freeze drying. Chips made from different varieties of apples are starting to attract more and more consumers of dehydrated fruit. Applying modern technologies in obtaining apple chips, superior quality products can be obtained, in terms of appearance and the aromatic compounds they contain. In the conducted experience, the varieties 'Pinova' and 'Golden Delicious' were used, which were subjected to lyophilization at a temperature of  $-60^{\circ}\text{C}$  for 24 hours. After lyophilization, the rehydration capacity of the chips was monitored, which in the 'Pinova' variety showed 95.45% rehydration capacity, being highest value.

### • Introduction

The sphere of use of lyophilization has also significantly expanded in the animal and vegetable food industry, where the results of the application of this method seem to give full satisfaction to the consumers' requirements. Indeed, this process proved to be superior, compared to the industrial methods still used [18].

Lyophilization means the process of rapid drying of substances, by sublimation of water in a vacuum, after prior freezing [2].

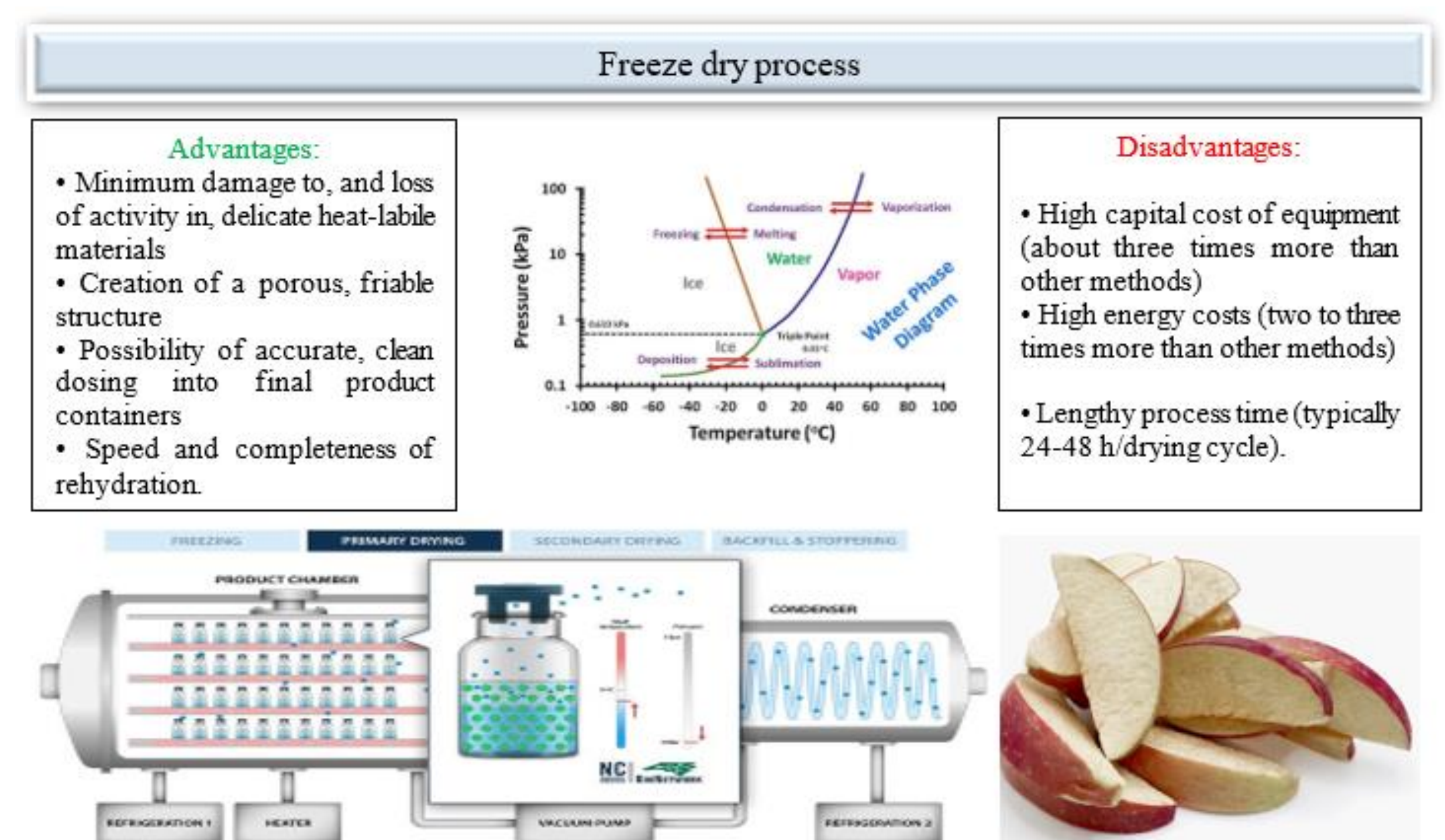
As demand for nutritious, shelf-stable snacks grows, freeze-dried fruits, especially apple chips, have become popular in the processed fruit market. Lyophilization, or freeze-drying, is a sophisticated dehydration technique favored for its ability to preserve the sensory and nutritional qualities of heat-sensitive foods.

### • Material and method

Two varieties of apples were used in the study: Golden Delicious and Pinova. The biological material was harvested from the orchard of the University of Agricultural Sciences and Veterinary Medicine in Cluj-Napoca.

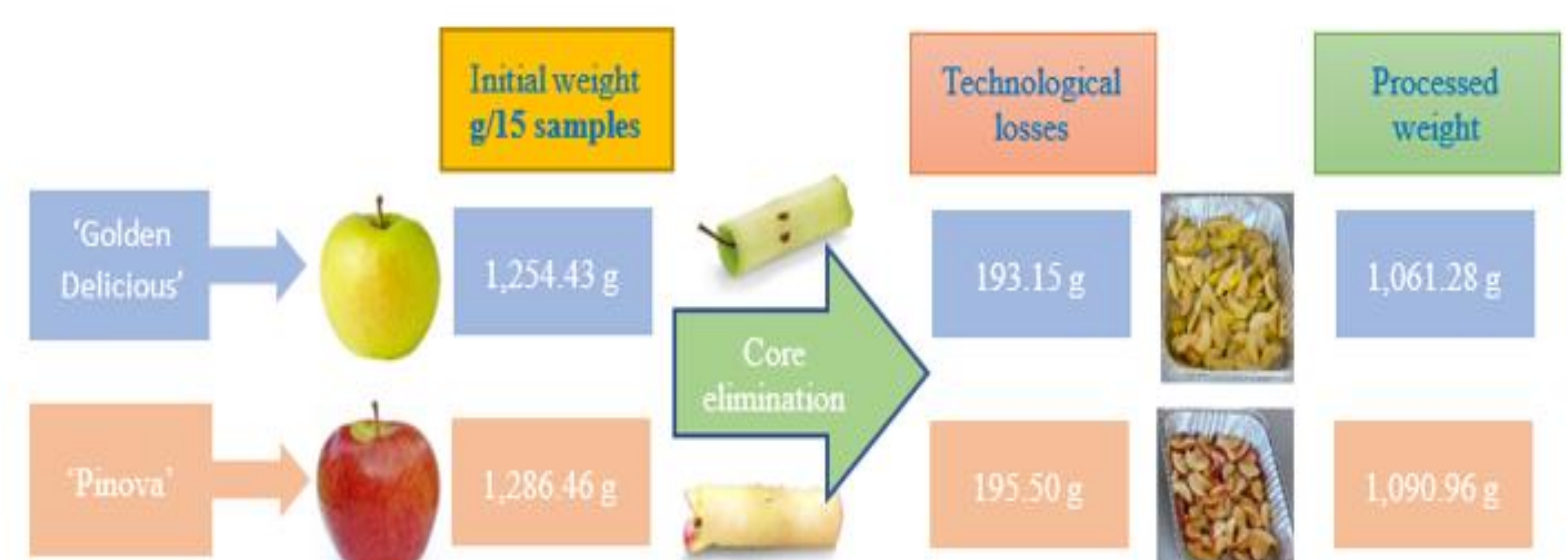


FREEZE  
DRY



### • Results and discussions

The losses recorded during the preparation of the raw material for processing were 15.20% for the 'Pinova' variety and 15.39% for the 'Golden Delicious' variety.



### • Conclusions

→ both varieties analysed are suitable for obtaining apple chips;  
→ the very high rehydration capacity of both varieties, highlighting a superior quality product.