

# Influence of Partial Drying on Oil Uptake & Quality Attributes of French Fries

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**Abstract:** Today's customers are looking for non-fat or low-fat containing products. One of the methods to reduce oil absorption in fried products is partial drying before frying. In this study, influence of partial drying (10 min, 20 min, 30 min) on oil absorption and quality attributes of three potato cultivars (Agria, Satina, kenebek) was evaluated. Our results revealed that in Agria, partial drying leads to an increase in oil absorption compared with non-dried sample ( $p < 0.05$ ). In kenebek, partial drying reduced the oil absorption and improved the texture and color of the produced French fries ( $p < 0.05$ ). Similar results were observed with Satina as with kenebek. In all three varieties, partial drying increased the dry matter, color quality and required cutting force of the French fries ( $p < 0.05$ ).

**Key words:** French fries, partial drying, oil absorption.

## 1. Introduction

Potato (*Solanum tuberosum*) is a tetraploid plant which belongs to Solanum species and Solanaceae family. This crop with a world production of 400 million ton is the most important agricultural crop after wheat, corn, and rice[1]. It can be used as a fresh product, animal feed, or can be processed into starch, powders, and fried products (e.g., chips and French fries). French fries are potato pieces with cross section of  $1 \times 1 \text{ cm}^2$  and 6-7 cm length, which are fried in hot oil[2].

Deep fat frying is a dry-cooking process which is mainly immersing food pieces in hot vegetable oil[3]. It is extensively used in the preparation of flavored foods with internal wet, soft texture and a tender and crispy crust[4]. During the frying process, physical, chemical and organoleptical properties of food are changed. The main goal of deep fat frying is to

maintain the food flavor inside a tenderized and crispy crust[3]. Quality attributes in fried products includes dry matter content, oil content, color, and texture. There are many factors affecting the quality of fried products such as potato variety, frying temperature, frying time, and pre-frying treatments (partial drying, blanching and coating)[5].

Oil content is one of the important quality attributes in fried products. Fried potato products with low oil content have a hard and unfavorable texture. On the other hand, high oil consumption is not cost-effective for manufacturers and products with high oil content are fatty and sometimes tasteless[6]. Today, consumers are looking for food products with lower oil content; therefore it is important to find the ways that can reduce the oil content of fried products.

Oil absorption during deep fat frying is controlled by some parameters including oil quality, frying temperature and time, food composition (e.g., its moisture content, porosity), pre-frying treatments (partial drying and blanching), coating and food size[5, 7-10].

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