

## The impact of adding oat proteins on the physicochemical properties of yogurt

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### Abstract

This research investigates the influence of incorporating oat protein concentrate (OPC) into yogurt on its physicochemical, sensory and structural properties during 21 days of storage at 4°C. The yield and percentage of OPC were assessed at different pH. The highest yield (77%) and protein content (79%) were observed at pH 10, while lower percentages were noted at pH 5 (59% yield, 74% protein content). Samples of yogurt with different OPC concentrations were made: 0% (control), 0.3%, 0.6%, and 1%. The results indicated that both OPC levels and storage periods significantly influenced ( $p \leq 0.05$ ) parameters. The pH value of all samples decreased during storage, while acidity increased. The 1% OPC yogurt maintained higher pH and showed lower acidity (0.96%) compared to the control (1.06%). Water holding capacity (WHC) decreased in all treatments, with the 0.6% OPC group having the lowest WHC (45%) after 21 days. Syneresis increased over time but remained lower in the OPC-treated especially in the 1% OPC (14%) compared to control (22%). Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM) showed that OPC enhanced structural integrity and functional group stability in yogurt. Of the formulations, the 1% OPC sample demonstrated the most stable texture during storage, whereas the 0.6% OPC sample scored the highest sensory evaluation, especially for flavor, texture, and overall acceptability. In conclusion, adding OPC, especially at 0.6%–1%, can improve yogurt's quality, stability, and attractiveness to consumers during cold storage.

**Keywords:** Chemical functional properties, Lactic acid fermentation, Milk fortification, Oat protein.

