

THE WET PRESERVATION OF CHLORELLA BIOMASS

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Introduction and aim

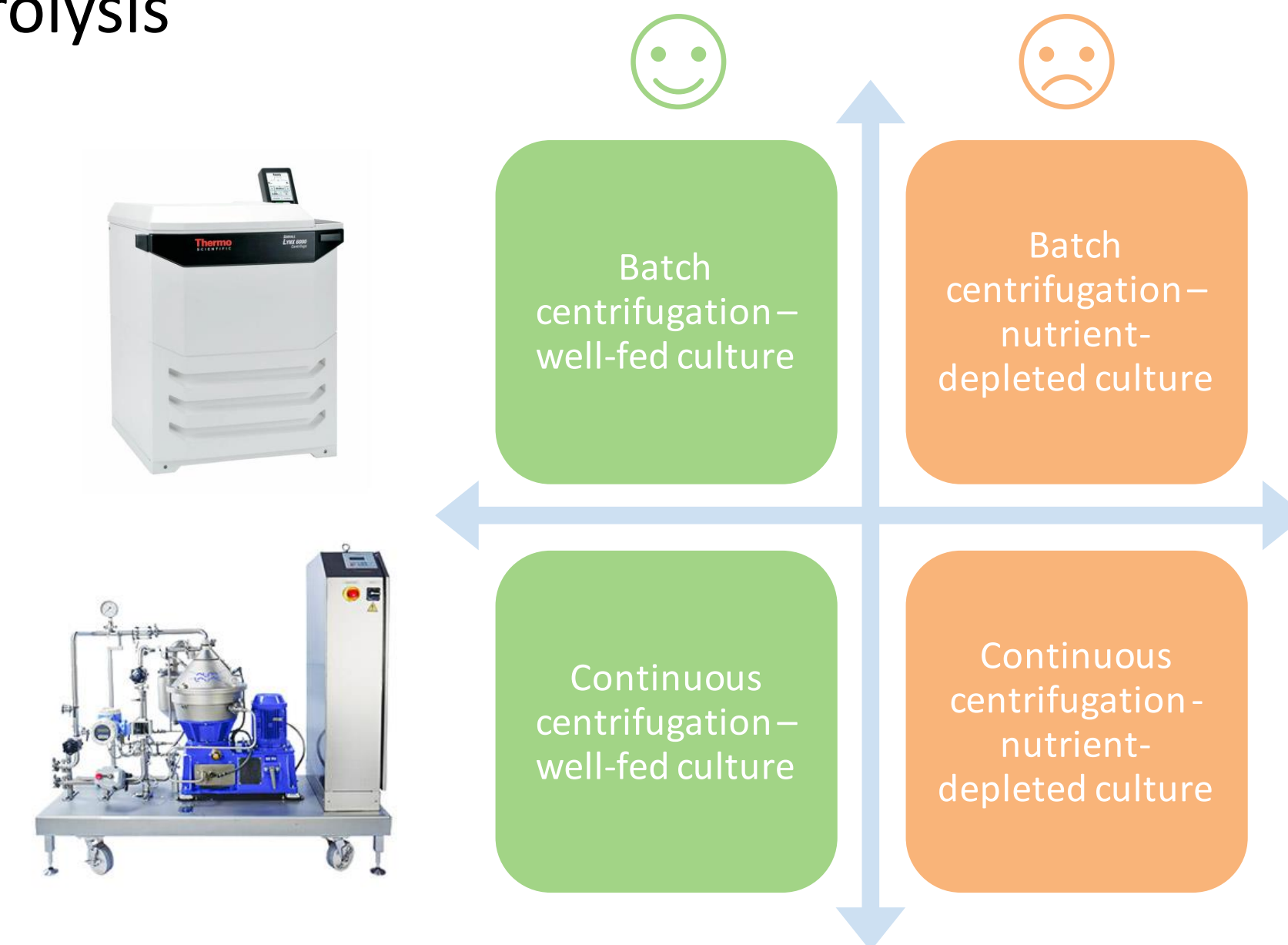
Wet preservation of algae allows to bridge the time period between algae harvest and processing. The aim of this work was to study the wet preservation of *Chlorella* biomass and to understand the effect of harvesting method and the culture's status on algae quality during preservation.

Materials & methods

Chlorella was either well fed until harvest time or received no nutrients during the last week before harvest. Both batches were harvested by either continuous centrifugation or by batch centrifugation in the laboratory. In the latter case, algae will experience less shear forces than during continuous centrifugation. As a result, four different algae concentrates were obtained and these were stored for 14 days at 8°C.

Conclusions

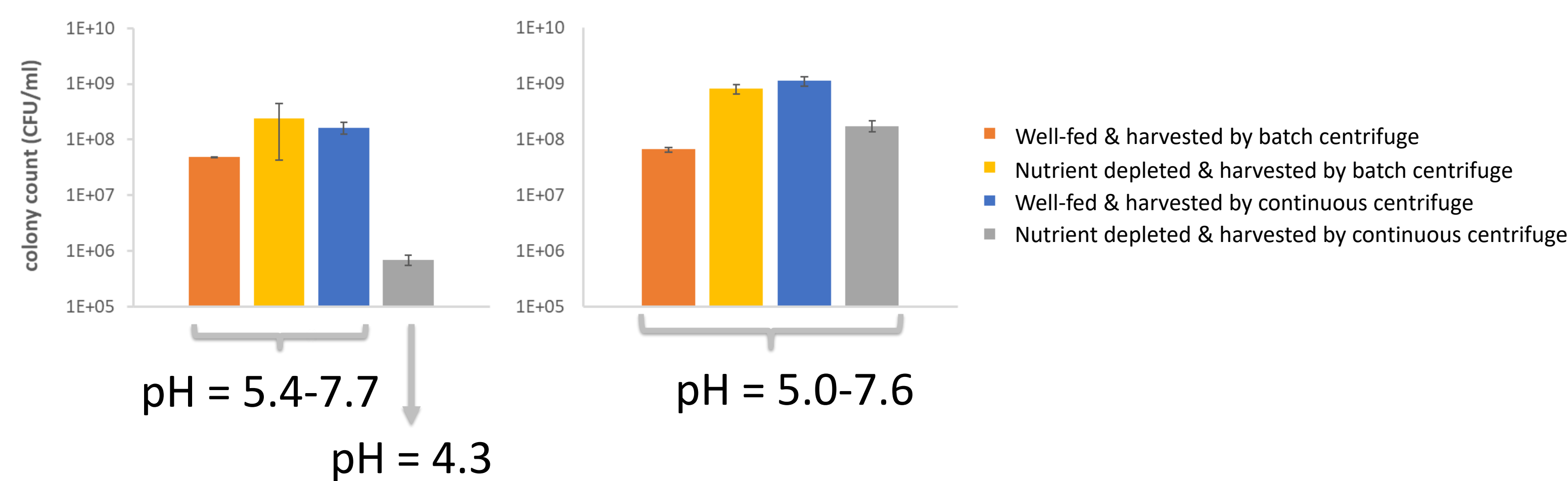
- Nutrient depletion before harvest by continuous centrifugation and a co-occurring pH drop decreased the total microbial count of fresh *Chlorella* biomass but this difference disappeared after 14 days of storage.
- The culture's nutrient status affected the degree of lipid hydrolysis



Results

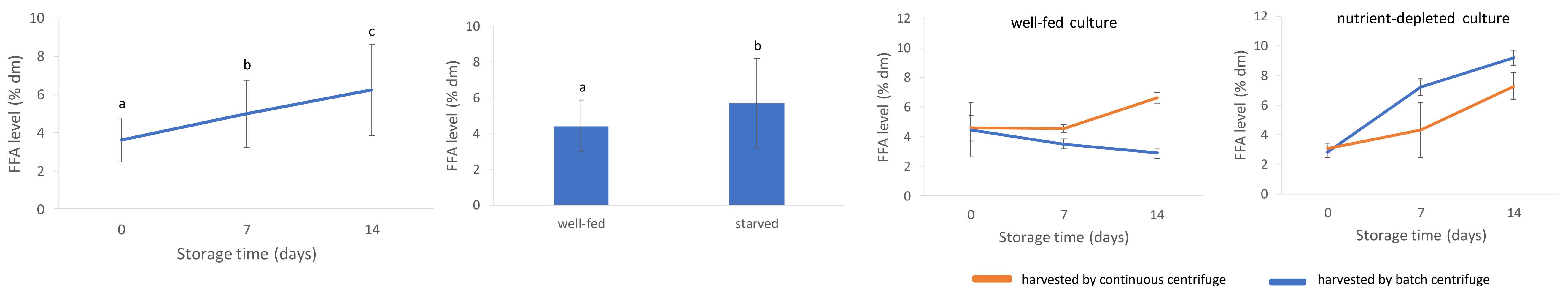
Impact on total microbial count

The microbial load was evaluated by plate counting at the start and at the end of the preservation period. The lowest number of micro-organisms was observed for the nutrient-depleted concentrate immediately after harvest by continuous centrifugation. This was probably due to the low pH of this batch, which limits the growth of most micro-organisms.



Impact on lipid content and lipid hydrolysis

Lipid levels remained rather constant for all storage conditions. The concentration of free fatty acids (FFA) increased during storage and was higher for the nutrient-depleted culture. The harvest method interacted with the impact of storage and culture status on FFA levels.



Impact on fermentation metabolites

Low-molecular-weight organic compounds were detected in all algae batches with concentrations depending on both the culture's nutrient status and the harvest method. Acetic acid was abundant in suspensions harvested by batch centrifugation (10-20 mg/l) and also ethanol (about 10 to 50 mg/l). Lactic acid was present in high concentrations in nutrient-depleted *Chlorella* harvested by continuous centrifugation (60-120 mg/l) but much less in the well-fed culture harvested by continuous centrifugation (< 20 mg/l).