Title

Evaluation of DNA isolated from human milk with a low-cost commercial kit using four methods

Authors

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Abstract

Objectives

Techniques for extracting high quality DNA are necessary for downstream qPCR analysis to detect adulteration in purchased and donated human milk. Previous studies have optimized DNA isolation methods that yield high quality DNA which can be used for downstream applications such as species contribution analysis of milk in order to maintain food quality and safety standards. Our research objective is to evaluate a lower cost commercial DNA isolation kit using four methods for use with human milk in order to detect adulteration with bovine milk by qPCR.

Design

Methods

In this study, human milk was collected from volunteer participants and later prepared for mtDNA isolation. The human milk samples were separated into 4 groups and were used to evaluate 4 DNA extraction procedures; unmodified, both protein and fat removed, only fat removed, and only protein removed.

Instruments

Milk samples were centrifuged at 4^{o} C to fractionate the milk for removal of fat and/or protein. DNA was isolated from each group using Omega Bio-tek's EZNA Blood DNA Mini Spin Kit. UV/VIS spectroscopy was used to determine DNA yield and purity using the NanoDrop 2000 at 260 nm, 260/280 nm, and 260/230 nm.

Results

Statistical analysis by ANOVA and Games-Howell pairwise comparison of results showed there was no significance between methods in regard to purity for qPCR utilization or amount of DNA yielded.

Conclusions

The lower-cost Omega Bio-tek kit successfully isolated human milk DNA from fractionated and unfractionated samples in quantities acceptable for downstream applications. However, the purity of DNA was not high enough for qPCR application.

Conflicts of Interests

None

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