

Reviewer's report

Title: A randomised cross-over trial in healthy adults assessing the effect of emulsification on fatty acid and triacylglycerol absorption from an omega-3 rich oil mixture.

Version: 1 **Date:** 12 October 2006

Reviewer: Huiling Mu

Reviewer's report:

General

In this paper, the absorption of fatty acids in the form of oil or emulsion was investigated in a single meal study, fast absorption of n-3 PUFA was observed from the emulsion. It has been documented previously that fine emulsions can result in improved efficiency of lipases because larger surface area makes the lipids more accessible to hydrolysis by lipases. Even though the topic is not new, this study provides further documentation about importance of the physical properties of ingested fat, especially for the n-3 PUFA. The discussion was also properly based on the results and literatures. However, more information should be provided for the method section, regarding the subjects such as average ? SD for age. More details about the diet should be provided, such as energy% of fat in the diet, how the meals were prepared regarding the 30 ml oil mixture or the emulsion, which oils were used for the oil blend.

The title needs to be more specific. For instance it could be "Improved absorption of omega-3 fatty acids in healthy adults by pre-emulsification".

The importance of this study should be addressed clearly in the background section.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

The authors should check the calculation and units for lipid data. They are very different from values observed normally in human plasma.

To determine patient's BMI-related health risk, BMI between 27 and 30 means moderate health risk. BMI 25-29.9 is defined as grade 1 obesity (moderate overweight) by WHO. The authors need to give the average ? SD for BMI. If the BMI values were too high, they also need to point out why they chose these subjects.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Background

The emulsified droplets in the stomach contain diacylglycerols instead of monoacylglycerols because of the selectivity of pre-duodenal lipases.

Methods

1. Which kind of on-column injection was used? Normally on-column injection needs to start with low temperature (cold trap) and the initial column temperature should be lower than the boiling point of the solvent. Therefore I wonder how the chromatograms look like when the initial temperature was 170C.
2. Which internal standard was used? It should be mentioned in the method.
3. How long time was used for the acid-catalyzed methylation?
4. More information about the diet should be provided as mentioned previously.
5. Were equal amount of rice or pasta provided for the participants and how much?

Results

1. Table 1, which fatty acids are included in "others"?
2. Figure 1, the y-axis should be ?TAG. Similarly the y-axis for figure 2 and 3 should be correctly labelled.
3. SEM should be shown in the figure 3.

4. Figure 2 and figure 3 should be in the same scale in order to avoid misunderstanding.
5. Figure 3 B shows that the level of linoleic, oleic and palmitic acids was lower than the baseline level at the end of the experiment. Were the differences significant? Can you explain the effect?
6. The figure text and symbols should be larger and readable.

Discussion

The contribution of endogenous fatty acids should be considered.

Discretionary Revisions (which the author can choose to ignore)

What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.