

# FATTY ACID ETHYL ESTER CONCENTRATIONS AFTER ADMINISTRATION OF DIFFERENT DOSES OF ETHANOL

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## INTRODUCTION

Non-oxidative metabolites of ethanol could be useful to monitor have been proposed as biomarkers of exposure to alcohol due to its longer half-lives and are useful to monitor and facilitate the detection of relapses, due to its longer half-lives Few studies have assessed concentrations of fatty acid ethyl esters (FAEEs) after controlled administration of wide range of alcohol doses in both genders. The objective was to assess the time-course of FAEEs concentrations for men and women after experimental ethanol administration.

## METHODS

A single blind clinical trial was conducted in 53 healthy volunteers (32 men and 21 women), with previous experiences of recreational drunkenness. The subjects received one of 4 different doses: 20 g, 40 g, 60 g and 80 g of ethanol (vodka Absolut). Only men received 80 g. Study variables included total FAEEs blood concentrations (palmitic + oleic + linoleic + stearic + arachidonic acid ethyl esters) and blood alcohol concentrations (BAL).

## BLOOD ALCOHOL CONCENTRATIONS (BAL)

The volunteers had a mean weight of 71.84 Kg and 61.54 Kg for men and women respectively and the BMI were 22.7 kg/m<sup>2</sup> and 22.67 kg/m<sup>2</sup> respectively. The mean age was 23 years for both genders. All of them consumed ethanol regularly (1.88 Standard Units/day). BAL were detected until 10 h after administration for higher doses while FAEEs were detected until 24 h after consumption. As expected, ethanol concentrations increased in a dose-dependent manner except for high dose (Figure 1). Gender differences (women higher concentrations) statistically significant differences were found when doses were adjusted to weight. (Figure 3).

Fig1

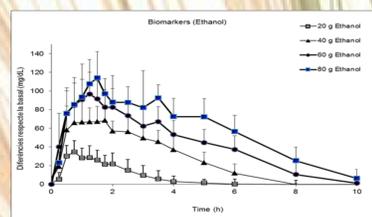


Fig 2a

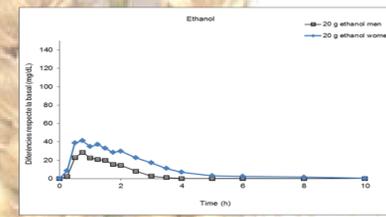


Fig 2b

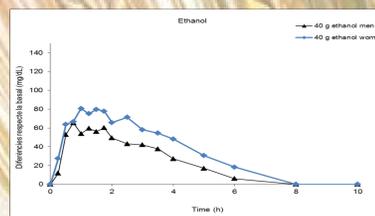
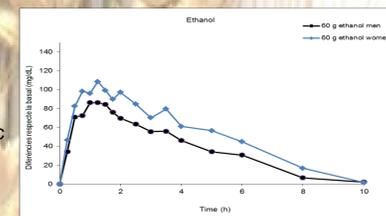


Fig 2c



Differences between genders for each dose Fig[2a].Fig. [2b]. Fig[2c].Fig. [3].

Fig 3

	numDF	denDF	F-value	p-value
(Intercept)	1	392	1135.785	0.000
Gender	1	45	10.110	0.003
Dosage	3	392	117.285	0.000
Time	8	392	154.497	0.000
Dosage × Time	24	392	8.714	0.000

## Fatty acid ethyl esters (FAEEs)

Time-course of total FAEEs blood concentrations (differences to baseline) depending on the dose administered are shown in Figure 4. Although total FAEE concentrations in women were slightly higher than in men for lower doses (Fig5a, Fig5b, Fig5c) no statistically significant differences were found in area under the curve of concentrations (AUC 0-10h) when doses were adjusted to weight. The predominant FAEE was palmitic acid ethyl ester (Figure 6a).

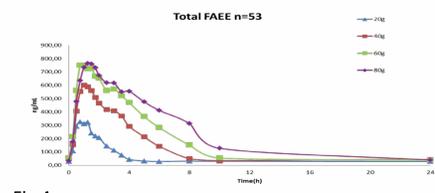


Fig 4

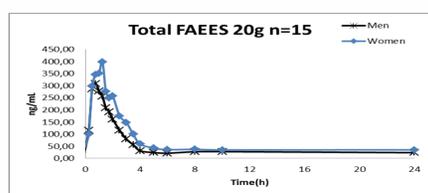


Fig 5a

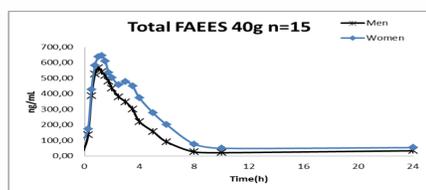


Fig 5b

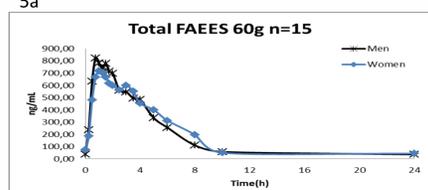


Fig 5c

Differences between genders for each dose Fig[5a].Fig. [5b]. Fig[5c].

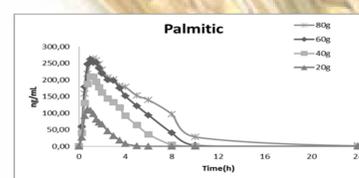


Fig 6a

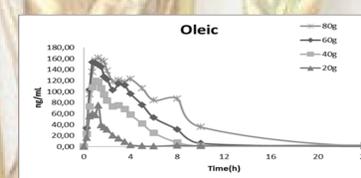


Fig 6b

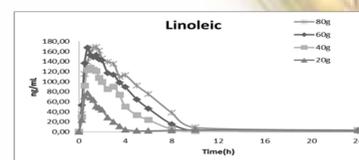


Fig 6c

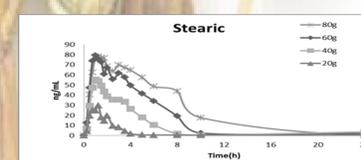


Fig 6d

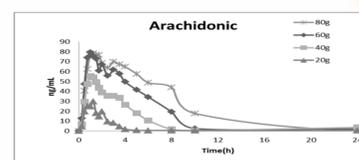


Fig 6e

Differences between doses for each FAEE Fig[6a].Fig. [6b]. Fig[6c]. Fig[6d].Fig. [6e].

## CONCLUSION

All different FAEEs increase with ethanol administered dose. Significant differences between doses were found for palmitic, linoleic and stearic acid ethyl ester. No differences were found for linoleic and arachidonic acid ethyl ester.

FAEEs can be detected for at least 12 hours therefore they are more useful than alcohol to detect acute alcohol consumption.

Significant gender differences were found in alcohol but not in total FAEEs blood concentrations.

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