

## Determination of trans fatty acid in adipose tissue of obese individuals

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Epidemiological studies have confirmed a strong association between obesity and cardiovascular disease, hypertension, hyperlipidemia, some types of cancer, type 2 diabetes. A predominantly upper-body fat distribution is an important risk factor for the metabolic complications of obesity, especially when it is associated with increased visceral fat. Dietary fat is the primary determinant of excess body fat, but evidence is compelling for the greater importance of types of fat. Recently, the elaidic acid (C18:1t9), isomer trans of the oleic acid, was related to dietary risk factors of coronary heart disease, development of cancer and insulin resistance. The purpose of this study was to quantify the trans fatty acid (TFA) in several distinct anatomic fat depots: subcutaneous, retroperitoneal and visceral. The adipose tissues (15 g) of obese individuals or not (BMI >40 Kg/m<sup>2</sup>, BMI <30 Kg/m<sup>2</sup>, respectively) were obtained by surgery. Lipids were extracted according to Folch *et al*, saponified and esterified. Methyl fatty acids (FAME) were quantified by ATR-IR spectroscopy. ATR quantization was based on the measurement of the integrated area under 966 cm<sup>-1</sup>. A calibration plot of area vs. percentage trans-FAMEs was generated for mixture of methyl elaidate in methyl oleate. The correlation coefficient was 0.9994. TFA averages found in the subcutaneous, retroperitoneal and visceral fat was 6%, 6,4% and 8,7% respectively, and there was no difference in both groups (obese or not). However, TFA depot in the visceral fat was higher than others fat tissues and statistically significant (p<0.001). Our values of TFA content in all fat depots are higher than others countries (3-4%). These levels of TFA in adipose tissue presumably reflect differences in the intake of TFA by various populations. The types of dietary FA may be a major culprit in the current epidemic of obesity. During lipolysis of visceral fat, FA was released directly to the liver. Therefore, elaidic acid can be associated with metabolic risk factors for obesity (FAPERGS, UFRGS, PUC-RS)