

## MASTER'S THESIS

### A comparison of body density determinations using residual volume and total lung capacity in underwater weighing technique

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A Comparison of Body Density Determinations  
Using Residual Volume and Total Lung Capacity  
in Underwater Weighing Technique

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#### ABSTRACT

The purpose of this study was to compare the assessment of body volume (BV), body density (BD) and percent body fat (%BF) by underwater weighing technique (UWW) using two protocols-one involving the measurement of residual volume (RV) and the other involving the measurement of total lung capacity (TLC). Subjects were 31 Chinese male university students aged from 19 - 23 years old. Residual volume was measured on land with the subject in a seated position using oxygen dilution technique. Vital capacity (VC) was measured with the subject in a seated position. Total lung capacity on land was determined as the sum of RV + VC. The results indicated that BV, BD and %BF measured by UWW technique using the RV and TLC protocols were significantly different. The results did not support the previous findings that the TLC protocol could be used with acceptable validity in the determination of BV, BD and %BF. Moreover, in the present study, significant differences in BV, BD and %BF were found between the two protocols. Possible explanation for these was due to the overestimation of vital capacity when it was measured on land. On the other hand, both protocols were found to be reliable. The results supported previous subjective observations that the TLC protocol was perceived to be more comfortable for the subjects. Scale oscillation was also reduced with the TLC protocol.

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