Body composition of Royal Marine recruits during 32 weeks of military training

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Royal Marine (RM) recruit training is acknowledged to be one of the most physically arduous military programmes in the world. Young men (16–33 years) undergo 32 weeks of intense training, where physical, mental and professional capabilities are continuously assessed. Body composition may play an important role in the ability to cope with the training load, thus influencing training outcome. The aim of this study was to examine the effect of changes in body composition on training outcomes and is part of an on-going programme of research being undertaken by the Institute of Naval Medicine examining the dietary intake, nutritional status and bone health of RM.

RM recruits commencing training at the Commando Training Centre Royal Marines, Lympstone, Devon, were given an initial study brief, after which 545 recruits from eleven Troops consented to participate. Body mass, height and anthropometric measurements (skinfolds and girths) were taken at the start, middle and end of training. Skinfolds were measured at eight sites (i.e. bicep, tricep, sub-scapular, supraspinale, iliac crest, abdominal, thigh and calf) in accordance with best practice,[1] and percent body fat was estimated[2].

The changes in anthropometric data during RM training are presented in the table below. The lightest 10% of recruits (<63.8 kg) gained the most body mass (4.1 ± 1.7 kg), while the heaviest 10% (>84.6 kg) decreased in body mass (-0.9 ± 3.7 kg) over the 32 weeks. A recruit had an increased chance of successfully completing training if, at the start of training, he had a body mass of 65 kg or more (compared with lighter recruits odds ratio (OR) = 1.3); a BMI between 21–28 kg.m^{-2} (compared with recruits with a BMI outside this range, OR = 1.3); or estimated body fat between 7 and 15% (compared with recruits with body fat outside this range, OR = 1.3).

The link between body composition and training outcome highlights the importance of optimising nutritional intake to maximise training success.

Stage of training	Mass (kg)		BMI (kg.m^{-2})		Sum of 8 skinfolds (mm)		Body fat (%)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Start (*n* 545)	74.1	8.0	23.7	2.1	69.1	21.1	11.6	2.9
Middle (*n* 354)	77.3	7.2	24.5	1.8	71.5	15.6	12.0	2.2
End (*n* 263)	77.2	7.0	24.5	1.8	70.0	13.4	12.1	2.0

1. Lohman TG, Roche AF, Martorell R (editors) (1988) *Anthropometric Standardisation Reference Manual*. Human Kinetics: Champaign, IL, USA.
2. Durnin JVGA & Womersley J (1974) Body fat assessed from total body density and its estimation from skinfold thickness: measurements on 481 men and women aged from 16 to 72 years. *Br J Nutr* **32**, 77–97.