DEVELOPMENT OF A NUTRITIONAL BASIS FOR NAVAL FEEDING

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The Royal Australian Navy's current basis for feeding sailors is financial. A sum of money, known as the Daily Victualling Allowance is made available for each sailor to be fed. This basis does not address nutritional needs.

Navy was concerned about the possible nutritional consequences of using a financial basis for feeding. Consequently, we were tasked to investigate current nutrient intakes and energy expenditure levels, and to devise a nutritional basis for Naval feeding.

To achieve this, studies of food intake (FI) and energy expenditure (EE) were conducted on representative cohorts of Naval recruits, sailors at a large shore base and on submariners during a short voyage. A study was also conducted of the EE of sailors in a small surface vessel.

FI of sailors at the large shore base was measured by direct weighing of food consumed by each subject. In the other studies FI was estimated by food disappearance.

FI was converted to kJ of intake and the proportions of total energy derived from the macronutrients protein, fat, carbohydrate and alcohol were determined using a nutritional database based on the NUTTAB tables of the Commonwealth Department of Community Services & Health.

EE was estimated by at least one of the following methods:

(i) Factorial (Fac) whereby a record is made of activities and the energy cost of each activity has been determined by indirect calorimetry;

(ii) Food Intake/Energy Balance (Int/Bal) whereby EE=FI minus change in body energy (as measured with skinfold calipers);

(iii) The Doubly-Labelled Water (DLW) Technique of Schoeller et al. (1986).

The results for FI and EE are shown in the table.

Subjects	Mean FI (kJ/person/day)	Mean EE (kJ/person/day)		
		Fac	Int/Bal	DLW
Recruits	15600	14100	14000	-
Shore Base	13400	-	13200	13800
Surface Vessel	-	-	-	18000
Submarine	14500	-	11400	11500

At the large shore base, fat contributed 35% of total energy intake - a result which is in line with current nutrition recommendations. However, Naval recruits and submariners were deriving 44% and 45% respectively of their energy from fat.

A nutritionally based ration scale was devised providing 14,500 kJ as the basic entitlement for sailors with sedentary occupations. Protein:Fat:Carbohydrate ratio is 18:30:52. This scale includes a margin of about 10% to allow for inevitable wastage. Supplements of 15%, 30% and 50% of the basic scale were suggested to be appropriate for slightly, moderately and extremely active groups respectively.

SCHOELLER, D.A., RAVUSSIN, E., SCHUTZ, Y., ACHESON, K.J., BAERTSCHI, P. and JEQUIER, E. (1986). Am. J. Physiol. 250 (Regulatory Integrative Comp. Physiol. 19), R823-R830.

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