

**BODY COMPOSITION
AND
PHYSICAL PERFORMANCE**

Applications for the Military Services

Committee on Military Nutrition Research

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TABLE 6-1 Distribution of Sample by Gender, Age and Racial Grouping

| Age Group | Men (<i>n</i> * = 1,126) | | | Women (<i>n</i> = 265) | | |
|-----------|---------------------------|-------|----------|-------------------------|-------|----------|
| | White | Black | Hispanic | White | Black | Hispanic |
| 17-20 | 102 | 40 | 13 | 38 | 14 | 6 |
| 21-27 | 203 | 117 | 51 | 80 | 67 | 8 |
| 28-39 | 167 | 80 | 52 | 33 | 13 | 4 |
| 40+ | 228 | 14 | 59 | 2 | — | — |
| Total | 700 | 251 | 175 | 153 | 94 | 18 |

**n* = number of subjects

fitness test (2-mile run and sit-ups) were also collected by self-report. A preliminary description of this study was previously reported (Fitzgerald et al., 1986).

RESULTS

Body Composition and Performance Capacity Related to Age

The U.S. Army's BF standards are established according to age, using arbitrary age groupings set some years ago. Table 6-2 presents the mean plus or minus standard deviation (\pm SD) of the body composition variables, and Table 6-3 presents the corresponding values for performance variables for these established age groups. In this sample, percent BF and fat mass of men increased with age across all age groups while FFM was stable. Women's BF was not different between the first two age groups (17 to 20 and 21 to 27 years) but did increase in the third age grouping (28 to 39 years).

Maximal oxygen uptake decreased through the first three age groups in men, on an absolute basis, relative to body weight and relative to fat-free weight. In women, the decrease was clearly evident only on a body weight basis. Two-mile run time followed the same pattern as $\dot{V}_{O_2 \max}$ (per kg body weight). MLC also decreased as a function of increasing age in men, most prominently when expressed relative to body weight, but it was largely unaffected by age in the women's sample.

Performance Capacity in Relation to Body Composition

Figures 6-1 and 6-2 illustrate contrasting expressions of aerobic and strength capacity in their relationship to BF and FFM in men. The same

TABLE 6-2 Body Composition Variables by Gender and Age Groupings, Mean \pm SD

| | Age Group (years) | | | | | Total |
|--------------------|-------------------|-----------------|-----------------|----------------|-----------------|-------|
| | 17-20 | 21-27 | 28-39 | 40 | (n = 1,177) | |
| Men | (n = 165) | (n = 402) | (n = 341) | (n = 269) | (n = 1,177) | |
| Body mass (kg) | 73.2 \pm 9.2 | 73.3 \pm 10.7 | 79.1 \pm 12.7 | 81.1 \pm 9.8 | 77.1 \pm 11.4 | |
| Body fat (kg) | 11.6 \pm 5.5 | 12.8 \pm 6.3 | 17.6 \pm 7.6 | 18.9 \pm 5.6 | 15.4 \pm 7.1 | |
| Fat-free mass (kg) | 61.7 \pm 6.5 | 61.5 \pm 7.5 | 61.7 \pm 8.1 | 62.2 \pm 6.7 | 61.7 \pm 7.4 | |
| Body fat (%) | 15.4 \pm 5.9 | 16.7 \pm 6.7 | 21.6 \pm 7.0 | 23.1 \pm 5.3 | 19.4 \pm 7.0 | |
| Women | (n = 68) | (n = 173) | (n = 60) | (n = 2) | (n = 303) | |
| Body mass (kg) | 59.7 \pm 7.3 | 59.8 \pm 8.4 | 63.4 \pm 9.0 | — | 60.5 \pm 8.4 | |
| Body fat (kg) | 16.0 \pm 4.6 | 15.5 \pm 5.2 | 18.9 \pm 6.3 | — | 16.3 \pm 5.5 | |
| Fat-free mass (kg) | 44.0 \pm 4.4 | 44.3 \pm 5.2 | 44.6 \pm 5.2 | — | 44.3 \pm 5.1 | |
| Body fat (%) | 26.3 \pm 5.3 | 25.4 \pm 6.0 | 29.2 \pm 7.0 | — | 26.4 \pm 6.2 | |

*n = number of subjects