

How many SizeUSA subjects meet Body Fat percentage guidelines?

By Elizabeth White, [TC]²

Readers may recall that the 2012 February [TC]² newsletter included an [article on waist circumference](#) guidelines. In a similar way, this article will compare guidelines for body fat percentage to those of the SizeUSA subjects. Numerous reports identify the growing issue of obesity among the US population and the [2007-2008 NHANES study](#) estimates that the prevalence of overweight and obesity in adults is over 60%. However, the guidelines for determining whether someone is at risk for becoming obese continue to change.

Like waist circumference, [body fat percentage](#) is another obesity risk factor guideline. However, there is some controversy on the appropriate percentages to use because of individual variations in fat distribution, age, gender, and fitness level. It is also difficult to explain the [meaning of body fat percentages](#). The US Army has researched ways to [calculate body fat](#), to [compare different measurement methods](#), and to [determine appropriate percentages](#). The definition used in the [Department of Defense Document 1308.1](#) for body fat is included on page 6 in Enclosure 1:

E1.1.3. Body Fat. The body is composed of fat and fat-free mass (which includes body water, bone mineral, proteins, glycogen, and other minerals). "Body fat" is expressed as "a percentage of total body weight." Total body fat is composed largely of stored fat and a small amount of "essential" fat, which makes up cell membranes, nerve sheaths, and structural fat padding vital structures.

[TC]² has used the Army formulas and definitions to calculate the percentage of body fat for the corresponding subjects (by age and gender) participating in SizeUSA. When comparing the age groups, there is some discrepancy. The SizeUSA subjects were grouped by age category such that the individual subjects' ages are not available for sorting. However, the age groups most closely aligning with the [Army age groups](#) were queried. Following is a table that compares the age groups for the Army and SizeUSA.

| Age Group | |
|-----------|---------|
| Army | SizeUSA |
| 17-20 | 18-25 |
| 21-27 | |
| 28-39 | 26-35 |
| 40 + | 36-45 |
| | 46-55 |

Age Group Comparison

Limits for the most stringent and most liberal body fat percentages are outlined in the [Department of Defense Document 1308.3](#). The most stringent target for all males is 18% with 26% for all females. The most liberal target for all males is 26% with 36% for all females. Individual maximum guidelines for males and females by age group are noted in the following chart.

| Males | | Females | |
|-----------|----------|-----------|----------|
| Age Group | Body Fat | Age Group | Body Fat |
| 17-20 | 26% | 17-20 | 32% |
| 21-27 | 26% | 21-27 | 32% |
| 28-39 | 28% | 28-39 | 34% |
| 40 + | 30% | 40 + | 36% |

Maximum DoD Body Fat Percentages by Gender and Age Group

The SizeUSA subjects were grouped using the following criteria for body fat percentages.

| MALES | | | | FEMALES | | | | | |
|-----------|---------|------------------------------------|---|----------------------------------|-----------|---------|------------------------------------|---|----------------------------------|
| Age Group | | % Body Fat (Stringent Lower Limit) | % Body Fat (from Stringent Lower Limit to Army Upper Limit) | % Body Fat (Liberal Upper Limit) | Age Group | | Body Fat % (Stringent Lower Limit) | % Body Fat (from Stringent Lower Limit to Army Upper Limit) | % Body Fat (Liberal Upper Limit) |
| Army | SizeUSA | | | | Army | SizeUSA | | | |
| 17-20 | 18-25 | 18 | 18-26 | 18-26 | 17-20 | 18-25 | 26 | 26-32 | 26-36 |
| 21-27 | | | | | 21-27 | | | | |
| 28-39 | 26-35 | 18 | 18-28 | 18-26 | 28-39 | 26-35 | 26 | 26-34 | 26-36 |
| 40 + | 36-45 | 18 | 18-30 | 18-26 | 40 + | 36-45 | 26 | 26-36 | 26-36 |
| | 46-55 | | | | 40 + | 46-55 | | | |

Army and DoD Query Limits for Body Fat Percentage by Gender and Age Group

Notice that for males in the two older age groups, the upper limits (28%, 30%) are higher than the liberal upper limit (26%) cited in DoDD1308.3. This is reversed for females such that younger female age groups have an upper limit (32%, 34%) less than the liberal upper limit (36%).

Results from using the limiting criteria are shown in the following table.

| MALES | | | | | | | |
|--------------|---------|------------------------------------|-----------------------------------|--|--------------|----------------------------------|---|
| Age Group | | % Body Fat (Stringent Lower Limit) | % Subjects Below Stringent Limit* | % Body Fat | % Subjects * | % Body Fat (Liberal Upper Limit) | % Subjects (from Stringent Lower Limit To Liberal Upper Limit)* |
| Army | SizeUSA | | | from Stringent Lower Limit to Army Upper Limit | | | |
| 17-20 | 18-25 | 18 | 71.78 | 18-26 | 19.67 | 19.67 (same as previous) | |
| 21-27 | | | | | | | |
| 28-39 | 26-35 | 18 | 49.88 | 18-28 | 38.88 | 18-26 | 34.63 |
| 40 + | 36-45 | 18 | 37.09 | 18-30 | 53.72 | 18-26 | 44.42 |
| | 46-55 | | 26.93 | | 60.68 | | 48.30 |

| FEMALES | | | | | | | |
|----------------|---------|------------------------------------|-----------------------------------|--|--------------|----------------------------------|---|
| Age Group | | % Body Fat (Stringent Lower Limit) | % Subjects Below Stringent Limit* | % Body Fat | % Subjects * | % Body Fat (Liberal Upper Limit) | % Subjects (from Stringent Lower Limit To Liberal Upper Limit)* |
| Army | SizeUSA | | | from Stringent Lower Limit to Army Upper Limit | | | |
| 17-20 | 18-25 | 26 | 60.92 | 26-32 | 13.91 | 26-36 | 20.94 |
| 21-27 | | | | | | | |
| 28-39 | 26-35 | 26 | 38.92 | 26-34 | 24.24 | 26-36 | 29.02 |
| 40 + | 36-45 | 26 | 29.78 | 26-36 | 30.82 | 30.82 (same as previous) | |
| | 46-55 | | 25.09 | | 29.56 | 29.56 (same as previous) | |

*% subject columns refer to the % of subjects within a SizeUSA age/gender group

Results for Body Fat Percentage Query within Army and DoD Guidelines by Gender and Age Group

For males, there is a high percentage (almost 72%) of the lowest age group below the stringent lower limit. Females are not far behind with almost 61% for the lower age group. At this stringent lower limit, fewer female and male subjects meet this body fat percentage as age increases.

Between the stringent lower limit and the Army upper limit, over half of the male subjects meet the guidelines for the upper age groups. Most of the remaining males in the lower age groups meet the guidelines. A quarter or third of the female subjects are able to meet this guideline at the different age groups. There are some subjects who have body fat percentages higher than either the Army upper or liberal upper limits.

| MALES | | | FEMALES | | |
|-----------|---------|----------------------------------|-----------|---------|----------------------------------|
| Age Group | | % Subjects Above All Guidelines* | Age Group | | % Subjects Above All Guidelines* |
| Army | SizeUSA | | Army | SizeUSA | |
| 17-20 | 18-25 | 8.55 | 17-20 | 18-25 | 18.14 |
| 21-27 | | | 21-27 | | |
| 28-39 | 26-35 | 11.25 | 28-39 | 26-35 | 32.06 |
| 40 + | 36-45 | 9.19 | 40 + | 36-45 | 39.40 |
| | 46-55 | 12.38 | | 46-55 | 45.35 |

*% subject columns refer to the % of subjects within a SizeUSA age/gender group

Results for Body Fat Percentage Query Above Guidelines by Gender and Age Group

Fewer males than females fail to meet the standards for each age group. The number of female and male SizeUSA subjects with higher body fat percentages appears to increase with age, especially for females, although this increase has not been validated with all [research studies](#).

More SizeUSA subjects meet the body fat percentage guidelines than meet the [waist circumference guidelines](#) at levels much lower than the 60% quoted at the beginning of this article! However, that does not necessarily mean that these subjects are less susceptible to obesity. Comparing an individual's body fat percentage or waist circumference to current guidelines does not absolutely predict obesity or assure avoidance of obesity. A more accurate and complete assessment relies on consideration of other variables such as those contained in the [NHLBI Obesity Education Initiative publication The Practical Guide: Identification, Evaluation, and Treatment of Overweight and Obesity in Adults](#).

Elizabeth White assists and instructs companies in the use of product development tools through [TC]² seminars and consulting services. Sizing and measurement methods are basic topics within the Pattern Development, Grading for Fit, How to Build a Tech Pack, and Fit for Retailers: Pants seminars. Gratitude is expressed to David Bruner and Dave Woronka of [TC]² for assistance with SizeUSA measurement extraction.

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