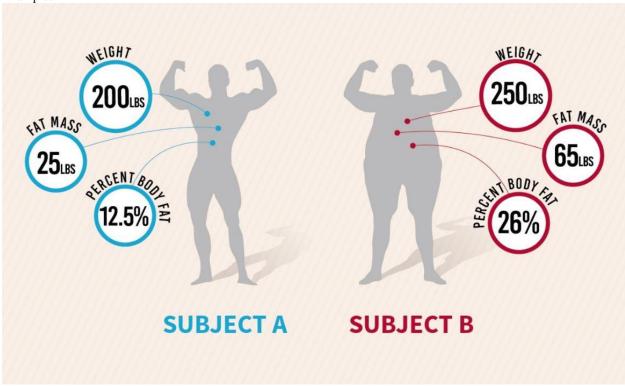# What is the InBody Challenge?

The InBody Challenge scoring system is designed to provide participants with an easy way of tracking changes in body composition over time and reward them for making positive changes. Rather than focusing solely on weight loss, the goal of this competition system is to reward individuals who improve their overall body composition by increasing their muscle mass and/or losing overall fat mass. The scoring system is devised to make the competition fair to all participants. By assessment of the amount of change (in lean or fat) in comparison to their starting level, this will allow all participants to be judged in a consistent fashion.

Example:

Subject A is 200lbs with 25lbs of FM (Fat Mass) (12.5%BF), while Subject B is 250lbs with 65lbs of FM (Fat Mass) (26%BF). Because Subject B has more starting Fat Mass than Subject A, it maybe much easier for Subject B to lose 10 pounds of body weight, putting Subject A at a distinct disadvantage in a more straightforward weight loss competition.

To compensate for any starting advantages, the InBody Challenge will choose a winner based on how significant the changes in body composition are for that specific individual and NOT take into account pure weight loss.

For example, if both Subjects A and B were to lose 10 pounds of body fat, they would effectively be tied in terms of pounds of weight loss, despite Subject A having to work significantly harder than Subject B due to having less overall body fat to lose. However, by taking into account the percentage of change relative to their starting points, Subject A made a much more significant change in their body composition. See below:

SUBJECT A

2.9% change
in positive direction

$$\frac{LBM_{BEGINNING} - LBM_{END}}{FM_{BEGINNING}} = \frac{175-180}{175} = 0.029$$

SUBJECT B

2.7% change
in positive direction

$$\frac{LBM_{BEGINNING} - LBM_{END}}{LBM_{BEGINNING}} = \frac{185-180}{185} = 0.027$$

Subject A would be rewarded for creating a greater change in body fat (40% vs 15.4%). What would happen if either Subject were to gain muscle? Muscle gain is considered positive change, but any gain would cause a subject to be heavier overall.

Let's assume Subject A gained 5lbs of LBM (Lean Body Mass), while Subject B lost 5lbs:

SUBJECT A

40% change
in positive direction

$$\frac{FM_{BEGINNING} - FM_{END}}{FM_{BEGINNING}} = \frac{25-15}{25} = 0.40$$

SUBJECT B

15.4% change
in positive direction

$$\frac{FM_{BEGINNING} - FM_{END}}{FM_{BEGINNING}} = \frac{65-55}{65} = 0.154$$

Because Subject A gained 5 pounds of LBM (positive change), this would counteract their fat loss for a net weight loss of 5 pounds. On the other hand, Subject B lost 5 pounds of LBM (negative change), adding to their fat loss for a net weight loss of 15 pounds. To determine a winner the Excel file will then add the percentage of changes s together to determine overall direction and amount of overall net change:

InBody

SUBJECT A = +40.0%FM + 2.9% LBM = +42.9% change

SUBJECT B = +15.4%FM - 2.7% LBM = +12.7% change

Despite only losing 5 pounds of body weight vs. Subject B's 15 pounds of weight loss, Subject A would win for showing the most positive change.

Using the provided calculator, you can calculate the score for each participant.

Input the participant's Lean Body Mass and Body Fat Mass from their Initial and Final Weigh-in's, then select calculate. The Total Challenge Score will then appear above the inputted data and can be recorded.

The results can then be organized based on the overall performance score to determine the winner with greatest overall improvement in body composition.

What the Calculator is doing:

LBM
Gain in lean: If the end LBM is greater than start, divide the change in mass by start (then multiply by 100 to convert to percent)

Loss of lean: If the end LBM is lesser than start, divide the change in mass by start (then multiply by 100 to convert to percent). **This will be a negative change.**

FM
Gain in FM: If the end FM is greater than start, divide the change in mass by start, then *make this number negative* (then multiply by 100 to convert to percent). **This will be a negative change.**

Loss in FM: If the end FM is lesser than start, divide the change in mass by start, then *make this number positive* (then multiply by 100 to convert to percent)