

# BOD POD® Body Composition Tracking System Analysis

## SUBJECT INFORMATION

NAME	Adam Gibbons
AGE	28
GENDER	Male
HEIGHT	74.8 in
ID_1	3000
ID_2	4444
ETHNICITY	General Population
OPERATOR	S. Harris
TEST DATE	January 28, 2005
TEST NUMBER	880

## TEST PROFILE

DENSITY MODEL	Siri
THORACIC GAS VOLUME MODEL	Measured

## BODY COMPOSITION RESULTS

% FAT	15.2	%
% FAT FREE MASS	84.8	%
FAT MASS	34.846	lb
FAT-FREE MASS	194.483	lb
BODY MASS	229.329	lb
BODY VOLUME	90.000	L
BODY DENSITY	1.111	kg/L
THORACIC GAS VOLUME	4.500	L

## OPERATOR COMMENTS

Recommend follow-up body comp analysis in 6 weeks.

## ENERGY EXPENDITURE RESULTS

Est. Resting Metabolic Rate (RMR) kcal/day	*Est. Total Energy Expenditure (TEE) kcal/day	Daily Activity Level
1500	1900	Sedentary
	2300	Low Active
	2500	Active
	2900	Very Active
	*Est. TEE = Est. RMR x Daily Activity Level	

*(See RMR Info Sheet for additional info)*

*Applies to adults ages 18 and older. Based on information from the Institute of Medicine (2002), Dietary Reference Intakes For Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, And Amino Acids, Part I, pp93-206. Washington, D.C., National Academy of Sciences.*

**Body Fat:** A certain amount of fat is absolutely necessary for good health. Fat plays an important role in protecting internal organs, providing energy, and regulating hormones. The minimal amount of "essential fat" is approximately 3-5% for men, and 12-15% for women. If too much fat accumulates over time, health may be compromised (see table below).

**Fat Free Mass:** Fat free mass is everything except fat. It includes muscle, water, bone, and internal organs. Muscle is the "metabolic engine" of the body that burns calories (fat) and plays an important role in maintaining strength and energy. Healthy levels of fat-free mass contribute to physical fitness and may prevent conditions such as osteoporosis.

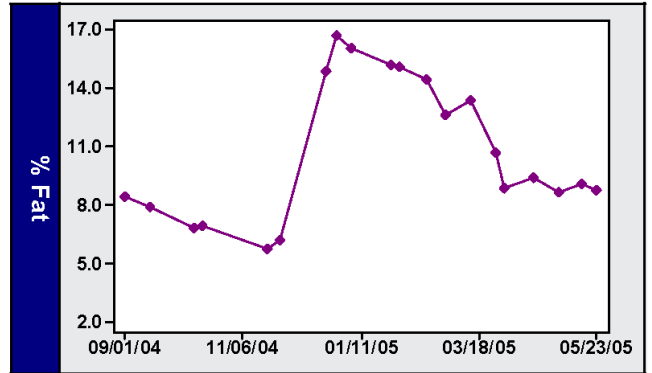
	BODY FAT RATING	MEN	WOMEN	EXPLANATION
<input type="checkbox"/>	Risky (high body fat)	>30%	>40%	Ask your health care professional about how to safely modify your body composition.
<input type="checkbox"/>	Excess Fat	21 – 30%	31 – 40%	Indicates an excess accumulation of fat over time.
<input checked="" type="checkbox"/>	<b>Moderately Lean</b>	<b>13 – 20%</b>	23 – 30%	<b>Fat level is generally acceptable for good health.</b>
<input type="checkbox"/>	Lean	9 – 12%	19 – 22%	Lower body fat levels than many people. This range is generally excellent for health and longevity.
<input type="checkbox"/>	Ultra Lean	5 – 8%	15 – 18%	Fat levels often found in elite athletes.
<input type="checkbox"/>	Risky (low body fat)	<5%	<15%	Ask your health care professional about how to safely modify your body composition.

*Applies to adults ages 18 and older. Based on information from the American College of Sports Medicine, the American Council on Exercise, Exercise Physiology (4th Ed.) by McArdle, Katch, and Katch, and various scientific and epidemiological studies.*

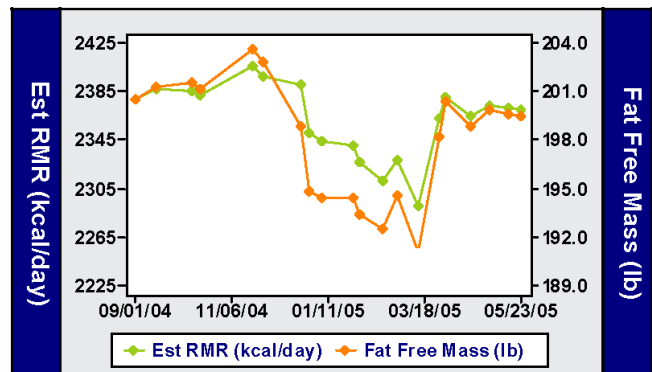
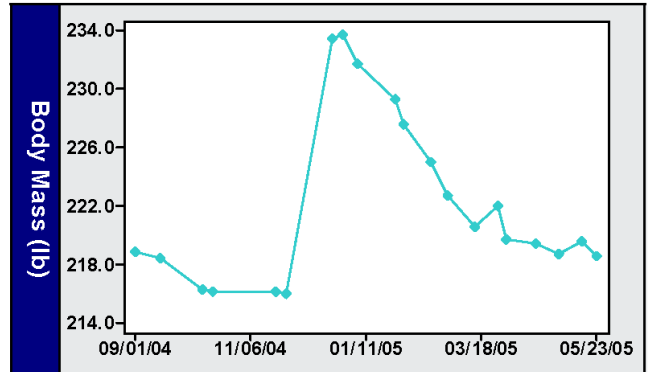
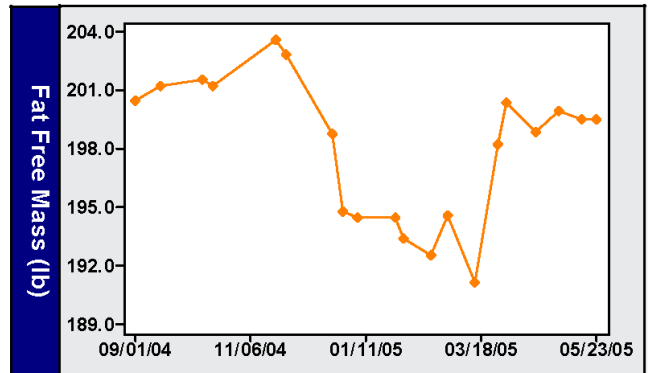
# BOD POD® Body Composition Tracking System Analysis

## SUBJECT INFORMATION

NAME	Adam Gibbons
AGE	28
DATE OF BIRTH	September 30, 1976
GENDER	Male
HEIGHT	74.8 in
ID_1	3000
ID_2	4444
ETHNICITY	General Population
OPERATOR	S. Harris
ANALYSIS DATE	June 1, 2005



Date (mm/dd/yy)	% Fat (%)	Fat Free Mass (lb)	Body Mass (lb)	Est RMR (kcal/day)
09/01/04	8.4	200.447	218.793	2379
09/15/04	7.9	201.267	218.456	2387
10/10/04	6.8	201.526	216.329	2386
10/15/04	6.9	201.165	216.079	2382
11/20/04	5.8	203.591	216.128	2406
11/27/04	6.1	202.804	216.062	2398
12/23/04	14.8	198.801	233.434	2390
12/29/04	16.7	194.810	233.738	2351
01/06/05	16.0	194.489	231.655	2344
01/28/05	15.2	194.483	229.329	2340
02/02/05	15.0	193.376	227.563	2326
02/17/05	14.4	192.500	224.953	2312
02/27/05	12.6	194.527	222.693	2328
03/14/05	13.3	191.103	220.535	2290
03/28/05	10.7	198.188	221.948	2363
04/01/05	8.8	200.352	219.772	2380
04/18/05	9.4	198.867	219.481	2365
05/02/05	8.6	199.877	218.769	2374
05/15/05	9.1	199.550	219.576	2372
05/23/05	8.7	199.507	218.522	2370
<b>Change</b>	<b>0.3</b>	<b>-0.940</b>	<b>-0.271</b>	<b>-9</b>



(See Body Composition and BOD POD, and RMR Info Sheets for additional info)

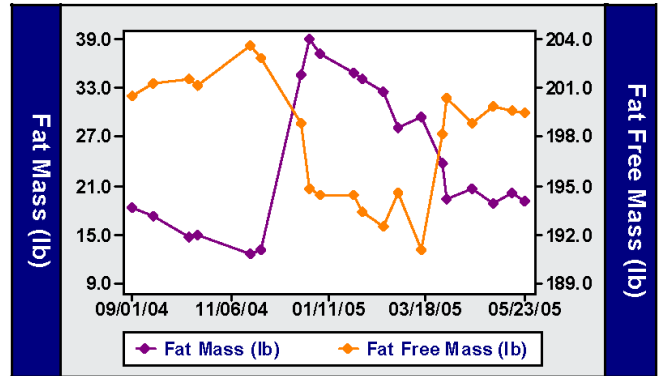
## OPERATOR COMMENTS

Body comp history over 9-month period.

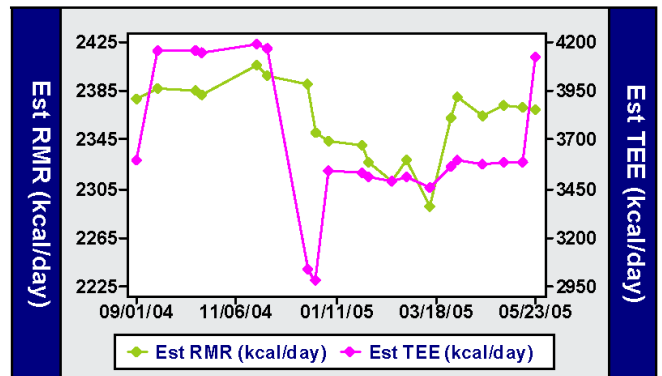
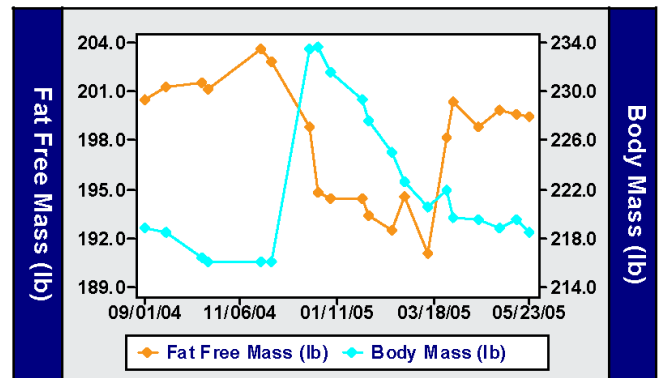
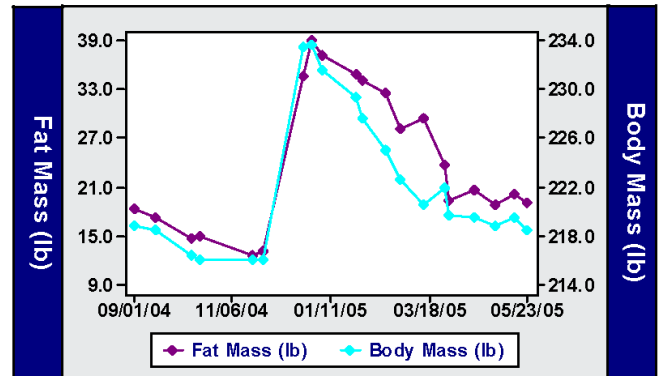
# BOD POD® Body Composition Tracking System Analysis

## SUBJECT INFORMATION

NAME	Adam Gibbons
AGE	28
DATE OF BIRTH	September 30, 1976
GENDER	Male
HEIGHT	74.8 in
ID_1	3000
ID_2	4444
ETHNICITY	General Population
OPERATOR	S. Harris
ANALYSIS DATE	June 1, 2005



Date (mm/dd/yy)	Fat Mass (lb)	Fat Free Mass (lb)	Body Mass (lb)	Est RMR (kcal/day)	Est TEE (kcal/day)
09/01/04	18.347	200.447	218.793	2379	3592
09/15/04	17.189	201.267	218.456	2387	4153
10/10/04	14.803	201.526	216.329	2386	4152
10/15/04	14.914	201.165	216.079	2382	4145
11/20/04	12.536	203.591	216.128	2406	4186
11/27/04	13.258	202.804	216.062	2398	4173
12/23/04	34.633	198.801	233.434	2390	3059
12/29/04	38.929	194.810	233.738	2351	3009
01/06/05	37.166	194.489	231.655	2344	3539
01/28/05	34.846	194.483	229.329	2340	3533
02/02/05	34.187	193.376	227.563	2326	3512
02/17/05	32.453	192.500	224.953	2312	3491
02/27/05	28.167	194.527	222.693	2328	3515
03/14/05	29.432	191.103	220.535	2290	3458
03/28/05	23.760	198.188	221.948	2363	3568
04/01/05	19.420	200.352	219.772	2380	3594
04/18/05	20.614	198.867	219.481	2365	3571
05/02/05	18.892	199.877	218.769	2374	3585
05/15/05	20.026	199.550	219.576	2372	3582
05/23/05	19.015	199.507	218.522	2370	4124
<b>Change</b>	<b>0.669</b>	<b>-0.940</b>	<b>-0.271</b>	<b>-9</b>	<b>532</b>



(See Body Composition and BOD POD, and RMR Info Sheets for additional info)

## OPERATOR COMMENTS

Body comp history over 9-month period.



## Body Composition and the BOD POD

### Q. How accurate is the BOD POD?

- A. Research studies at major universities have established the outstanding accuracy, safety and speed of the BOD POD. Before the BOD POD, the most accepted method was underwater weighing (the “dunk tank”). BOD POD and underwater weighing usually agree within 1% body fat for adults and children. Other methods, such as skinfold calipers, bioelectric impedance, and dual energy x-ray absorptiometry, have been shown to be much less accurate. BOD POD accuracy is also increased because of its easy test process.

	Accuracy	Speed	Safety	Populations*
<b>BOD POD</b>	*****	*****	*****	*****
Dual Energy X-Ray	***	***	**	**
Underwater Weighing	*****	*	***	**
Bioelectric Analysis	*	*****	***	****
Skinfold Calipers	*	***	*****	****

\*Populations - refers to the ability of the method to assess body composition among a wide range of populations, including the elderly, obese, children, and those with disabilities.

### Q. What BOD POD test-retest variation can be expected?

- A. Research studies have shown the BOD POD to be very precise, with average test-retest variation within 2% body fat. Therefore, a small test-retest variation is normal. Compliance with BOD POD test protocol will also insure the accuracy and precision of the measurement, so it is important to be relaxed, still, and avoid talking or coughing during the test.

### Q. How do I lose my excess body fat?

- A. The most effective way to shed excess fat is to combine sensible exercise with healthy dietary choices. Research shows this to be the most successful approach in the long run. Keep in mind that each pound of fat has a caloric value of 3,500 calories. If you combine 250 calories worth of exercise each day, along with reducing your food intake by 250 calories, this will add up to a 500 calorie-per-day deficit. Over seven days, you would lose a pound of fat. However, you should never consume less than 1,200 calories per day, and you should consult your physician before beginning any weight loss and/or exercise program.

### Q. How do I increase my lean muscle mass?

- A. The best way to increase muscle is through resistance training. Healthy and vigorous muscles are consistent with good health, as muscles support the activity of the body and burn calories.

### Q. How can the BOD POD be used in my weight loss program?

- A. Consider working with a trained health care or fitness professional. They can review your BOD POD test results and design a program to help you achieve your goals. Be sure to retest in the BOD POD regularly so you will know if you are progressing towards your goal!

### Q. Are there any age-specific body fat standards?

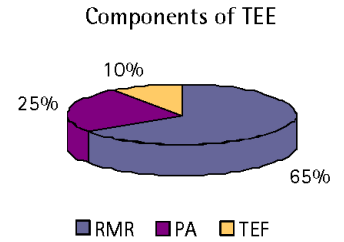
- A. Research has shown that a moderate, natural increase in body fat with age occurs in many individuals. To account for this natural increase, % fat values provided in the Body Fat Rating table on the BOD POD test print-out sheet should be viewed as recommendations for adults 18 years and older, with the values being adjusted upwards by possibly 3–5% fat for older adults.

*Based on information from the American College of Sports Medicine, the American Council on Exercise, Exercise Physiology [4<sup>th</sup> Edition] by McArdle, Katch and Katch, and various scientific and epidemiological studies.*

# Estimated Resting Metabolic Rate

## What is Resting Metabolic Rate (RMR)?

Your RMR (kcal/day) represents the minimum energy your body needs to support its basic physiological functions, including heartbeat, breathing, maintaining body temperature, and all of the numerous biochemical reactions required to keep you alive. In essence, it is the amount of energy that the body uses at rest. Your daily Total Energy Expenditure (TEE, kcal/day) consists of three components: *RMR*, *Physical Activity (PA)*, and *Thermic Effect of Food (TEF)*. Of these three, RMR is the largest contributing component of TEE at around 60–70%.

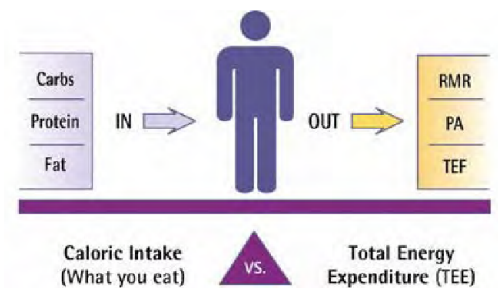


## How can I find out my RMR?

Due to the strict protocol and technical difficulties associated with obtaining an accurate measurement of RMR, prediction equations have been developed to estimate RMR based on parameters more easily measured. Research studies indicate that prediction equations which account for both fat and fat-free mass provide the most accurate estimates of RMR. Therefore, the equation of Nelson et al (*Am J Clin Nutr* 56:848–56, 1992), which includes accurately measured fat-free and fat mass as predictors, will provide a reliable and accurate estimation of your RMR. This equation is also useful in tracking changes in estimated RMR that occur with a change in either fat-free or fat mass.

## Why do I need to know my RMR?

Most of us understand that weight management depends upon the energy balance equation: the amount of energy you put into your body (your caloric intake) versus the amount of energy you expend (your TEE). The way to lose body fat is to maintain a negative energy balance. This is accomplished by reducing caloric intake, increasing TEE or, preferably, a combination of both. Your RMR is dependent primarily on the fat-free part of your body, and accounts for the vast majority of your TEE. So to improve your overall fitness, it is critical to know your RMR.



- ▶ **Changes in estimated RMR can be used to influence changes in your body composition.** If you lose body fat and replace it with muscle, you should see a steady increase in your RMR. Having your RMR monitored throughout a weight management program can help you track improvements in your muscle mass, thus optimizing your fat loss and fitness/nutrition program strategy.
- ▶ **Estimated RMR can be used to provide an estimation of your TEE, which can help manage your daily caloric intake.** While RMR is generally 65% of your TEE, the level of your physical activity can add significant variability to the actual percentage. For this reason, your daily activity level, selected from the activity chart below (*Institute of Medicine, DRI, pp93–206, 2002*), should be used in the estimation of TEE.

$$\text{Estimated TEE (kcal/day)} = \text{Estimated RMR (kcal/day)} \times \text{Daily Activity Level}$$

DAILY ACTIVITY LEVEL	MALE	FEMALE	DESCRIPTION
SEDENTARY	1.28	1.24	Mostly seated or standing daily living activities; no exercise or other leisure activities.
LOW ACTIVE	1.51	1.52	Light exercise and leisure activities (i.e., walking 50 minutes per day at 3 mph or golfing 40 minutes per day).
ACTIVE	1.74	1.74	Moderate exercise and leisure activities (i.e., cycling moderately 75 minutes per day or playing tennis 90 minutes per day).
VERY ACTIVE	2.08	2.07	Heavy manual labor job or heavy exercise and leisure activities (i.e., jogging 75 minutes per day or playing basketball 60 minutes per day).

## Who should not use the estimated RMR or TEE?

Estimated RMR or TEE **should not** be used for children < 18 years old, pregnant or lactating women, or individuals in which metabolism may be affected by disease or medication.