

## Knowing the maths of the situation The Theory of Implementation

### Why Can't You Just Fast/Eat Super Low Kcals?

*"The ability of the FM to provide whatever energy is required by the FFM is possibly restricted by the rate limited biochemical reactions of the energy transfer processes." – Alpert (2005)*

- ④ Essentially, as we lose weight/fat, the amount of fat we can lose becomes exponentially smaller! This observation is where this entire knowledge base has come from!
- ④ There is a limit on the energy transfer rate from the human fat stores and we have enough data to work this out!
  - Well, genius mathematicians like Alpert can work it out:

$$\alpha df/dt + \delta f = \varepsilon Q_{fd} - \text{RMR}(\ell) - \delta \ell.$$

## The Martin MacDonald Rapid Fat Loss Calculator

### Enter Your Data Here

Gender

☐ Female

☒ Male

Height (cm)

0 cm

Current Weight (kg)

0 kg

Highest Body Weight for 6 months in last 3 years (kg)

0 kg

Body Fat (%)

0.0 %

#### Weight Converter

0 lbs

0.0 kg

#### Height Converter

Feet

Inches

0 0

0 cm

#### Body Fat Calculator

Waist (cm) ⓘ

0 cm

Hip (cm) ⓘ

0 cm

Neck (cm) ⓘ

0 cm

NaN%

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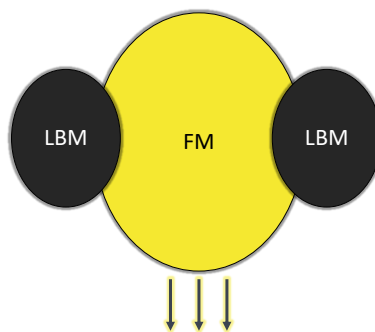
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## Determining the Calorie Deficit

④ Graphical representation of how this works



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## Estimating Body Fat %

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
❶ Ideally, you would have an accurate measurement e.g. DEXA


- But even this has limitations!
  - Try to make things as consistent as possible e.g. don't CHO or water load prior to getting measured!


❷ All other methods are fraught with methodological issues...

- My recommendation is to use a Body Fat calculator if no DEXA available
  - BIA? Nope. Skinfolds? Nope. BodPod? Nope. Nope. Nope. Nope.

**Body Fat Calculator**

Waist (cm)   
 cm

Hip (cm)   
 cm

Neck (cm)   
 cm

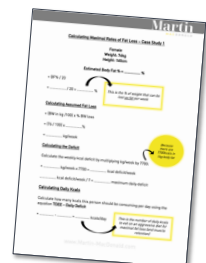
**NaN%**

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## Use the numbers to work out the weight loss



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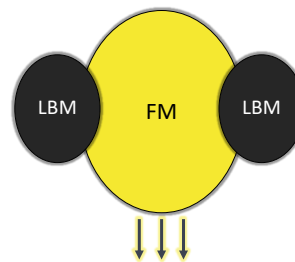


## Time to Practice the Maths!

- ❶ Complete your worksheet to work out the theoretical maximal rate of fat loss using the following case study

### Case Study 1

- ❶ Female
- ❶ Weight: 76kg
- ❶ Height: 165cm
- ❶ Waist: 94cm
- ❶ Hips: 104cm
- ❶ Neck: 38cm



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## Case Study 1 Workings

- ❶ Step 1 – Obtaining a BF%!
  - USING THE CALCULATOR

Case Study 1

- ❶ Female
- ❶ Weight: 76kg
- ❶ Height: 165cm
- ❶ Waist: 94cm
- ❶ Hips: 104cm
- ❶ Neck: 38cm

A diagram illustrating body composition. It features a central yellow circle labeled 'FM' (Fat Mass). To its left and right are two smaller black circles, each labeled 'LBM' (Lean Body Mass). Below the central yellow circle are three downward-pointing yellow arrows, indicating a process or flow.

**Body Fat Calculator**

Waist (cm) ①  
94.0 cm

Hip (cm) ①  
104.0 cm

Neck (cm) ①  
38.0 cm

**38.0 %**

**Body Fat % Calculator**

Gender  
☐ Female  
☐ Male

Current Weight (kg)  
76.0 kg

Height (cm)  
165.0 cm

Body Fat (%)  
38.0 %

Weight Converter  
0.0 kg

Height Converter  
0 cm

Body Fat Calculator  
Waist (cm) ①  
94.0 cm

Hip (cm) ①  
104.0 cm

Neck (cm) ①  
38.0 cm

Result  
38.0 %

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## Case Study 1 Workings

Estimated Body Fat % = 38%

$$= \text{BF\%} / 20$$

$$= \dots 38\% \dots / 20 = \dots 1.9 \dots \%$$

*This is the % of weight that can be lost as fat per week*

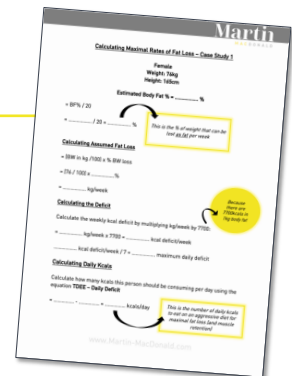
### Calculating Assumed Fat Loss

(BW in kg/100) x % weekly BW loss

$$(76 / 100) \times \dots 1.9 \dots$$

$$= \dots 1.444 \dots \text{ kg/week}$$

*This is the amount of weight that can be lost per week*



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## Case Study 1 Workings

### Calculating the Deficit

Calculate the weekly kcal deficit by multiplying kg/week by 7700

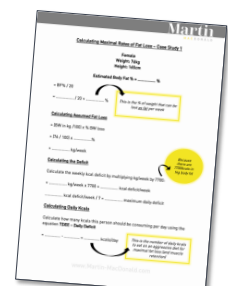
$$= \dots 1.444 \dots \text{ kg/week} \times 7700 = \dots 11118.8 \dots \text{ kcal deficit/week}$$

$$\text{Weekly kcal deficit} / 7 = \dots 1588.4 \dots \text{ maximum daily kcal deficit}$$

*Because there are 7700kcal in 1kg body fat!*

### Theoretical Fat Loss

Maximum Daily Deficit (Kcal)	Weekly Deficit Aim (Kcal)	Fat Loss /wk (kg)
1588	11119	1.44



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## Case Study 1 Workings

### Calculating Daily Kcals

#### Client Stats to Estimate TDEE

Average Steps / Day: 10,000

Activity outside of steps: Sedentary

Average hours sleep/day: 7

**Enter Your Activity**

Average steps per day?  
10000

Outside of steps, how active are you? ⓘ  
Sedentary

Average hours asleep per day?  
7

**Calorie Needs Calculator**

Fat Mass	Lean Body Mass	Estimated TDEE
28.9 kg	47.1 kg	2122

Progress: 1 of 5 steps

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## Case Study 1 Workings

### Calculating Daily Kcal Intake

= TDEE - Daily Deficit

= TDEE - 1588

= 2122 - 1588 = 534kcal

This is the number of daily kcals to eat on an aggressive diet for maximal fat loss but perhaps not muscle retention or health

**Theoretical Fat Loss**

Maximum Daily Deficit (Kcal)	Weekly Deficit Aim (Kcal)	Fat Loss /wk (kg)
1588	11119	1.44

WL Rate Preference (& Risk Adversity)  
Kinda Fast (Max Muscle Mass Retention)

Body Weight (kg)	Total Body Fat (%)	Fat Mass (kg)	Deficit/ Day	Daily Calories	Kg/ Week
76.00	38.0	28.9	1588	534	1.44
74.6	36.8	27.4	1509	581	1.37
73.2	35.6	26.1	1434	626	1.30

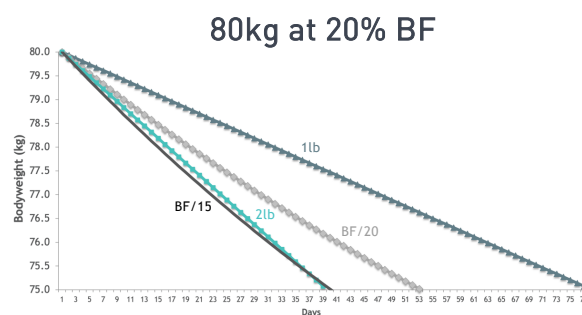
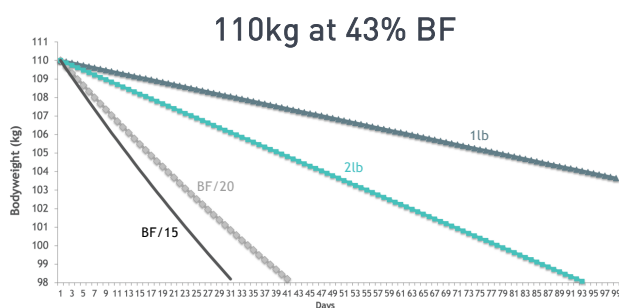
Progress: 1 of 5 steps

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## A Quick Comparison of Rates of Fat Loss

❶ BF/15 vs BF/20 vs 2lb vs 1lb



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