Martin MACDONALD

Knowing the maths of the situation

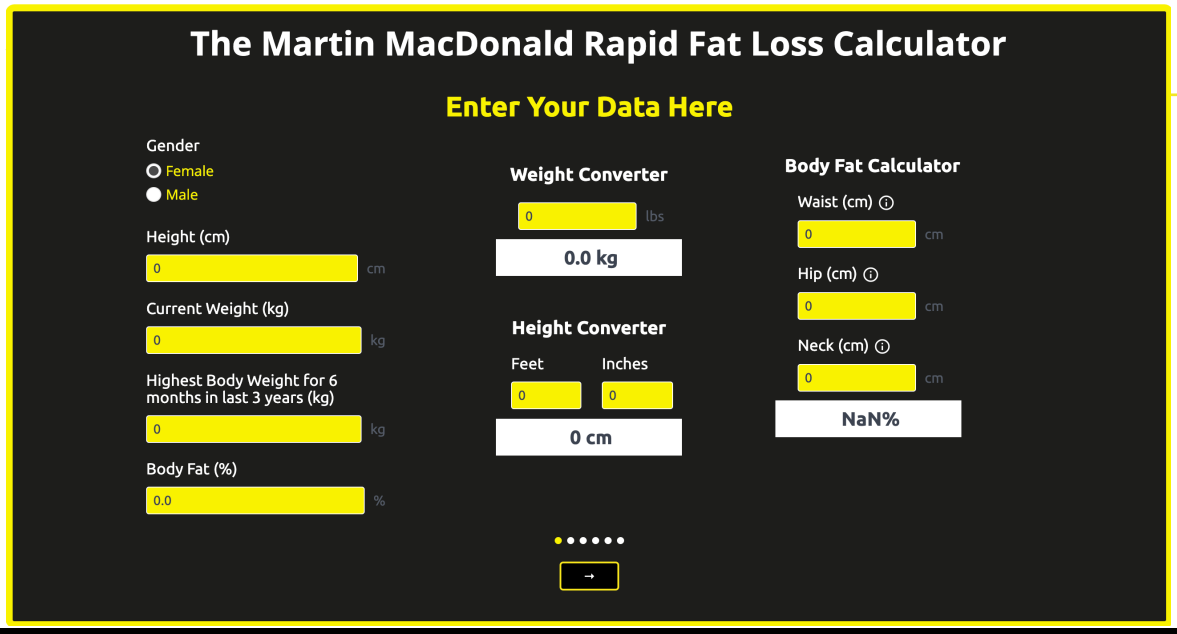
The Theory of Implementation

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)

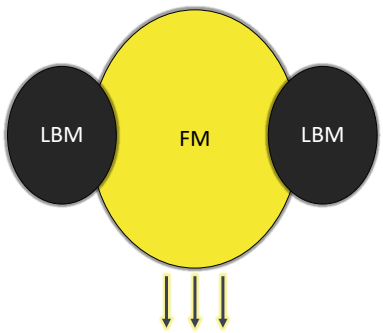
- Essentially, as we lose weight/fat, the amount of fat we can lose becomes exponentially smaller! This observation is where this entire knowledge base has come from!
- There is a limit on the energy transfer rate from the human fat stores and we have enough data to work this out!
  - Well, genius mathematicians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

$$\alpha \, \mathrm{d}f/\mathrm{d}t + \delta f = \varepsilon Q_{fd} - \mathrm{RMR}(\ell) - \delta \ell.$$



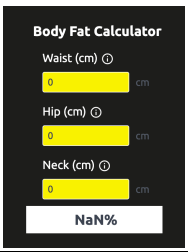
Determining the Calorie Deficit

- Graphical representation of how this works

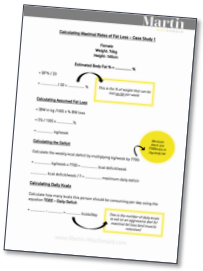


Estimating Body Fat %

- 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!**
- 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.**



Use the numbers to work out the weight loss

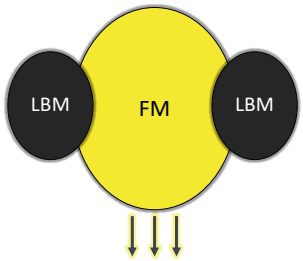


Time to Practice the Maths!

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

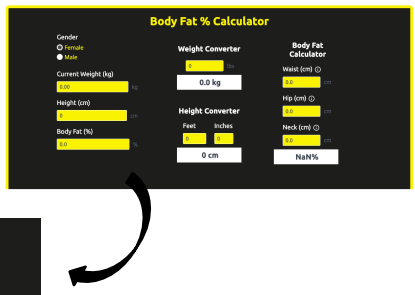
Case Study 1

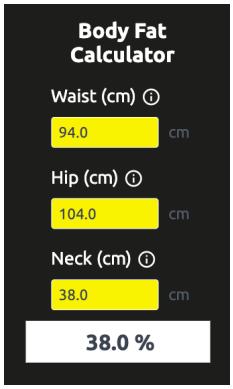
- Female
- Weight: 76kg
- Height: 165cm
- Waist: 94cm
- Hips: 104cm
- Neck: 38cm



Case Study 1 Workings

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





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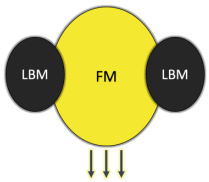
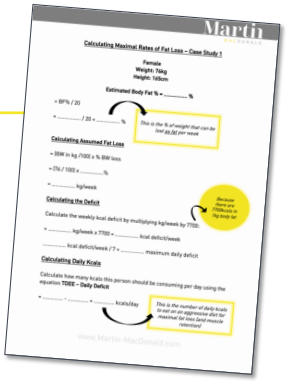


Case Study 1 Workings



Estimated Body Fat % = 38%

= BF% / 20

= ..38%.. / 20 = ..1.9.. %

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) x ..1.9..

= ..1.444.. kg/week

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

Case Study 1 Workings

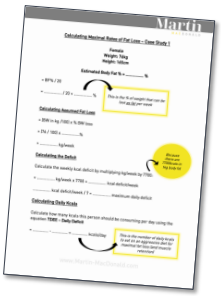
Because there are 7700kcals in 1kg body fat!

Calculating the Deficit

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

= ..1.444.. kg/week x 7700 = ..11118.8.. kcal deficit/week

Weekly kcal deficit / 7 = ..1588.4.. maximum daily kcal deficit



Theoretical Fat Loss

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

Case Study 1 Workings

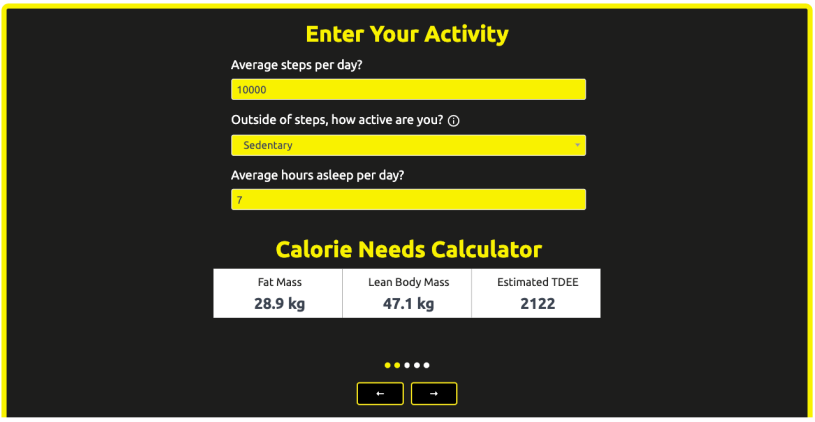
Calculating Daily Kcals

Client Stats to Estimate TDEE

Average Steps / Day: 10,000

Activity outside of steps: Sedentary

Average hours sleep/day: 7



Case Study 1 Workings

Calculating Daily Kcal Intake

= TDEE – Daily Deficit

= TDEE - 1588

= 2122 – 1588 = 534kcals

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

A Quick Comparison of Rates of Fat Loss

BF/15 vs BF/20 vs 2lb vs 1lb