TRANSFORM FOR LIFE

THE SCIENCE

OF PHYSICAL TRANSFORMATION

DANIEL ALEXANDRA

BARTLETT

TEAM BODY PROJECT®

CONTENT GUIDE

THE SCIENCE OF PHYSICAL TRANSFORMATION

Book designed by R & W Media Limited.
Edited by Nichola Tyrrell, Jo Lightfoot and L. Staggs.
Photography by Lovelight Photography.

www. teambodyproject.com

INTRODUCTION TO SCIENCE

Weight loss is incredibly simple, so why the need for an explanation of the science of physical change?

While weight loss is a binary process, healthy, sustainable **fat** loss and muscle retention is less so, but still easy to implement if you understand the **laws** that surround it.

These are the laws anybody can apply to ensure results that are:

- Repeatable
- Predictable
- Sustainable

As a sports conditioning coach, I had a very simple task:

- To ensure the athlete made an exact weight by a specific date
- To ensure the athlete retained muscle and lost fat

This precise role removed the margin for error and forced me to let go of preconceived ideas and attach to the evidence-based methods that I have successfully used with hundreds of personal clients and thousands of people around the world.

Every person reading this book can apply these methods to their own body if they are willing to spend time to:

- Understand *The Science* behind this coaching method
- Practise *The Art* of compliance
- Develop a personal *Health Blueprint*

Transform for Life will provide you with every piece of information I have learned from coaching thousands of people, distilled into one short book. The more you understand how your body works, the more exciting you will find the journey you travel with it.

FUNDAMENTALS OF FAT LOSS

This chapter is more than a little 'sciencey' because it has to be.

Read the chapter as many times as you need to bring clarity to the fundamental processes at play when changing your body.

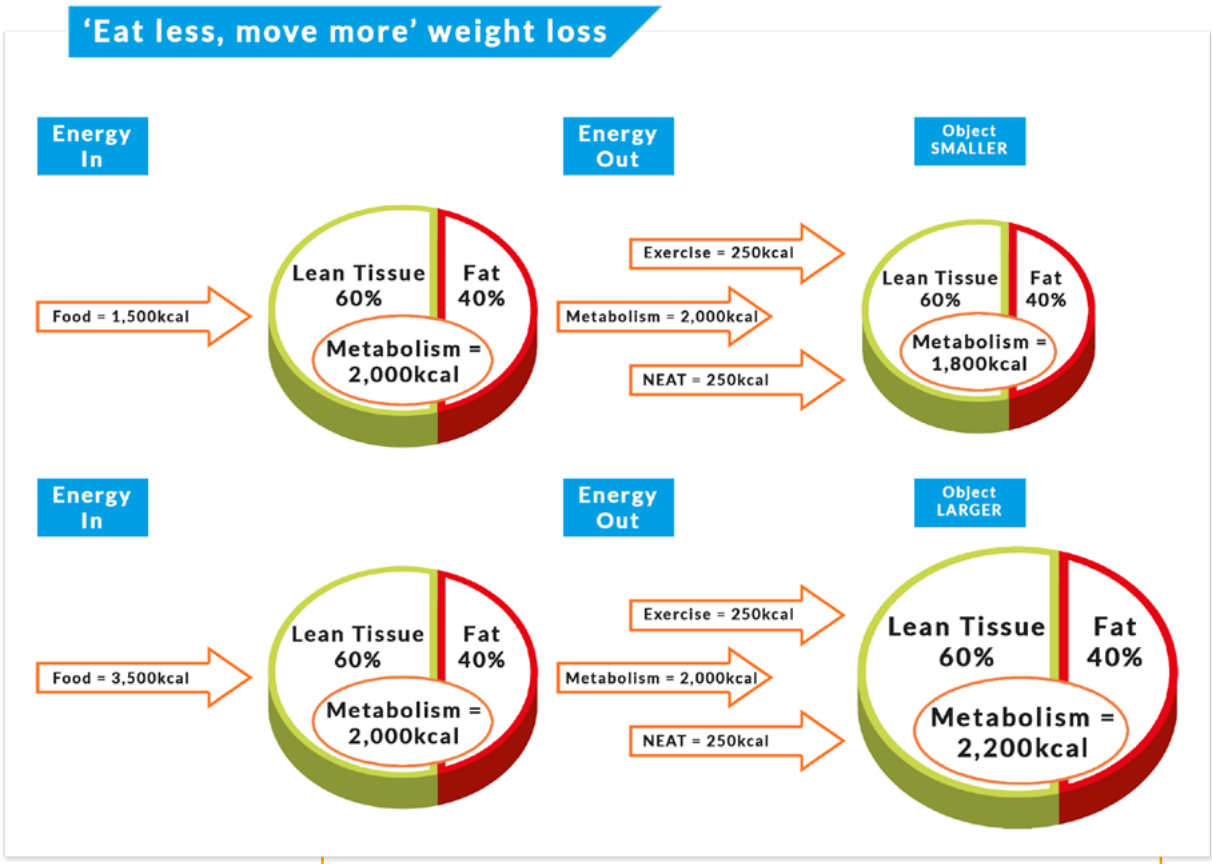
'Eat less, move more' provides more than a degree of truth but, as is often the case, this small amount of knowledge has been a very dangerous thing in the hands of marketers, dieters and professionals alike.

This chapter, and the entire *Transform for Life* method, will help you understand how to lose fat, build muscle and sustain a healthy metabolism.

Fundamental law of weight loss

Weight loss is incredibly simple. The amount of energy we consume is either less than or more than the amount we use. [1,2]

- If we consume fewer calories than we use, we lose total weight. [3]
- If we consume more calories than we use, we gain total weight.
  This is the fundamental law of 'weight loss'. The overall mass of an object is ruled by the total energy it consumes versus the total energy it burns.



If there is less energy consumed the object will get smaller.
If there is more energy the object will get larger.

Note 1: *Without any consideration of exercise, macronutrients or flux, the object changes size but the composition remains the same.*

Note 2: *The metabolism is slower the smaller the object is, as a smaller object requires less energy to exist.*

Calorie balance is the driving force behind weight loss.

Wrap this information up tight. Store it deep in your mind and remove all potential for doubt. It is not worth reading any more of this book until you have established this certainty.

Superfoods have lots of super qualities, but eat too much of them, you'll have an expanding waistline.

- Avocados may be packed with goodness, but they **do not** cause you to lose weight.
- Sugar has many negative effects on health, but it **does not** cause you to gain weight.
- Too **few** calories cause you to **lose weight**.
- Too **many** calories cause you to **gain weight**.

We cannot avoid this fact, regardless of the complexities that surround weight management discussed throughout this book.

Weight loss happens when we eat less than we burn.

Once we can establish this truth, we free ourselves to focus on more important matters, like **fat** loss, food **quality**, **body composition** and even the seemingly contradictory fact that not all **calories are created equal**.

Lily's Laws 1

Lily likes proven facts that help people achieve results.

Whenever Lily hears a universal law of change, she adds it to her list. If she hears nonsense she gets pretty upset, but fortunately that won't happen often here.

Anyway, Lily just found her **FIRST** universal law.

- **Calorie balance drives weight management.**

The basics of body composition

Just eating fewer calories is a binary solution to a complex problem with a number of consequences:

1. We may have lost as much **muscle** as we did **fat**. [4]
2. Chronic exposure to calorie deficits may cause negative changes to the metabolism. [5]
3. Chronic exposure to calorie deficits may cause you to feel tired, restricted and lacking in energy. [6]
4. All calories are not created equal (covered later in *Is a calorie a calorie?* Pages 44-51).

Any fat loss plan must be driven by a calorie deficit. However, subtle changes will make the difference between a positive overall experience versus a restrictive and difficult experience resulting in a body that remains too high in relative fat levels.

There are two fundamental caloric states we can be in:

Hypocaloric is a **calorie deficit** (less than baseline) and **hypercaloric** is a **calorie surplus** (more than baseline).

It is almost impossible to have an exact match of '**input versus output**', therefore you are always either:

A. **Catabolic** – this is a state in which your body breaks down tissue. This is the state in a calorie **deficit (hypocaloric)**.[7]

Or

B. **Anabolic** – a state in which your body builds and repairs. This is the state in a calorie **surplus (hypercaloric)**.[8]

Catabolic is a state of demolition. The body is destroying and breaking things down.

King Klong and Rob the Builder

When King Klong runs out of food he gets angry!

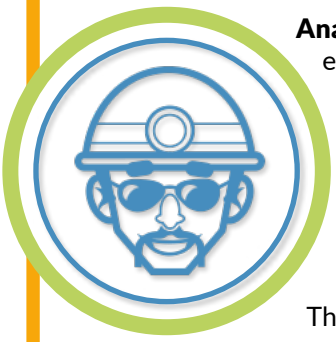
A **Catabolic** body sets Klong free.

Klong hates stored fat because he can't eat it, so he smashes it up and turns into food he can eat.

When you eat fewer calories than you are burning you set King Klong free, but remember, Klong gets bored after a while and starts looking for other stuff to smash. Like muscle. He hates muscle because he can't eat that either!

Maybe Klong isn't all that bad. Maybe he doesn't hate things. Maybe Klong just wants to smash things. Everything.

That's why we've got to put Klong back in his cage every now and then.



Anabolic is a building state run by chief builder Rob when you have enough food.

Sometimes Rob the Builder is understandably scared of King Klong, so Rob won't come out of hiding until Klong is safely back in his cage.

Rob just loves building and repairing muscle, but if he's never got any materials to build with, he has no choice but let things go to ruin.

Though, if he's got too many materials, he stores them in fat deposits.

If Rob has just enough of the right stuff and enough time to do it, he can adapt and repair wonderful muscular buildings!

If you treat Klong and Rob fairly, letting Klong out to smash some fat,
and letting Rob out to repair some muscle, you can build whatever you like, however you like.

If you overuse either of them, the results can be disastrous.

Together, these two processes make up your **metabolism**.[9]

Dieting culture features chronic calorie **deficits**, as calorie deficits result in **total** weight loss.

Calorie counting, *portion control*, *removal of processed foods*, *clean eating* and every variant of diet that evokes weight loss has identified a route to generating a deficit (**hypocaloric** state) and the catabolic, fat-burning environment it creates.

What most weight loss plans fail to explain is the following:

A. It is very unlikely you will build muscle in a **calorie deficit**.[10]

B. Chronic or long-term exposure to a **calorie deficit** will cause you to metabolise muscle.[11, 12, 13]

C. Long-term exposure to chronic **calorie deficits** can result in loss of energy, reduced brain function and a drop in baseline metabolic rate.[14, 15]

D. Rebound eating – the level and/or duration of restriction will drive the dieter towards excessive consumptions to compensate.[16, 17, 18]

This is important information to be aware of before placing yourself in a permanent caloric deficit.

The first goal of any fat loss method should be retention of muscle, as this lean tissue supports a stronger metabolism and improves insulin sensitivity.

Let's assess the different expectations you can have:

1. Calorie surplus, anabolic dominant

a) If you wish to **build muscle** you should be in a **calorie surplus** alongside a relevant exercise plan. [19, 20]

b) You will **gain fat** in a **calorie surplus** if you are not exercising and/or eating too high a ratio of low-quality foods.

Rob will only **build and repair** if he has sufficient calories to do so.

2. Calorie deficit, catabolic dominant

a) If you wish to **lose fat** you should be in a **calorie deficit** and exercising.

b) You may **lose muscle** in a **calorie deficit** if you are not exercising, eating a high ratio of low-quality foods or in a permanent deficit.

Klong only gets set free from his cage when he runs out of food.

- Your body does not want to build muscle or store fat in a hypocaloric, catabolic state as it does not have an excess energy balance to use.
- Your body does not want to break down muscle or fat in a hypercaloric, anabolic state as it already has enough energy.

The Flux

Flux is a period of **higher** calories, either individual days or entire weeks, to support **anabolic** repair and adaptation. [21]

If weight loss is your goal, you can aim to sustain an **absolute** calorie deficit but introduce a calorie flux to:

- Support muscle repair and retention.
- Avoid down regulation of metabolism.
- Keep energy levels and mental resilience high.
- Avoid cravings, emotional eating and loss of drive.
- Maximise **fat** loss.

Flux makes the difference between long-term success with healthy body composition rather than the short-term flat weight loss as promised by *ELMM (Eat Less, Move More)*.

In order to lose fat and build/retain muscle you will need to spend the majority of your time in calorie deficit, which will enable fat loss, but to retain and build muscle you will need to spend a shorter, but significant amount time in a calorie surplus.

This significant detail will transform your long-term weight management outlook.

Lily's Laws 2

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- **Flux is needed to support anabolic repair and adaptation**
- Calorie balance
- **Anabolic and catabolic flux**

Case study – Elena, 28

Elena had been exercising for 30 minutes a day and eating 1,200 kcal for 12 weeks. At first she had been losing weight, but it slowed down and she suspected she was losing muscle. She was feeling increasingly weaker as the days and weeks went on. Her compliance was slipping and she was no longer enjoying exercise.

Elena was eating less and moving more, but her flat calorie reduction was causing both fat and healthy tissue losses. She had expected to be building muscle, but her body was chronically exposed to a breakdown state.

Flat calorie reductions also impact long-term adherence, as an underfed body will not be an energetic, motivated one.

This physiological change has an influence on psychology and compliance.

By introducing two higher calorie, higher training days per week we were able to help Elena continue to lose weight while retaining and potentially building muscle, and help ensure weight loss was almost exclusively fat.

Previous diet:

- 1,200 calories 7 days per week (100% catabolic), chronic exposure to anabolic state.
- 6 days per week exercise.
- Total caloric intake - 8,400.
- Outcome - slowed metabolism and metabolic processes, less fat loss and more muscle loss, fatigue, loss of strength, cravings, struggles for willpower.

New diet:

- 1,200 calories 5 days per week, 1,500 calories 2 days per week (70% catabolic, 30% anabolic) small calorie flux.
- 4 days per week 30 minutes exercise, 2 days per week 30 minutes exercise + 15 minutes additional resistance.
- Total caloric intake - 9,000.
- Outcome - retained muscle, fat loss, improved strength, metabolic processes retained, high energy, less cravings, higher motivation.

This crucial change transformed Elena's results and the way she felt physically and psychologically throughout her health plan.

The 'excess fat' caveat

When you mobilise fat, you create energy for use. This new energy is released when we free the energy available within stored fat cells.[22]

If we can free energy whenever we mobilise fat, is it ever truly possible to be in a chronic hypocaloric state if you have over 100 lb of fat in stored, convertible energy available to mobilise?

The answer is, it depends.

If your pancreas is functioning well enough to release sufficient amounts of the hormones that mobilise or free fat cells, it is possible your body is in a cycle of creating usable calories from within its stores, and thus generating an anabolic, or building state, from within.

Note: *This would require Rob the Builder to not be scared of Klong. Think of Klong throwing fat down for Rob to use. This could happen, but equally it may not, sometimes Rob is just a coward.*

Note: *We look at this 'metabolic flexibility' in more detail in the next chapter – Carbohydrates and metabolic flexibility. (pages 23-28)*

As a rule, the more fat you have to lose, the longer you can stay in a deficit without worrying about losing muscle and potentially gaining fat, but nonetheless, some form of flux remains important to your long-term results.

Protecting metabolism

The difference between a strong, fully functional metabolism and a 'weak' metabolism is estimated to be between 100 and 300 calories.[23]

A slowed metabolism through loss of muscle and protective adaptations is not drastic, but that does not mean it is not significant. Our metabolism naturally slows as we lose weight, so protecting our metabolism where we can is crucial.[24]

A smaller object has lower caloric requirements than a larger one and needs less energy; if you weigh less, you need less. Many people wonder why they stop losing weight on the same level of calories they were consuming when they started a new diet, but this is actually to be expected.[25]

Flat calorie reduction

	A: 200 lb (90 kg) man	B: 150 lb (68 kg) man
Workouts	6 x	6 x
Calories burned per workout	400 kcal	350 kcal
Total calories burned	2,400 kcal	2,100 kcal
Weekly Baseline Metabolic Rate	2,450 kcal x 7	1,950 kcal x 7
Weekly BMR + burn total	19,550 kcal	15, 750 kcal
Calories consumed	15,000 (2,142 per day)	15,000 (2,142 per day)
Weight loss	1-2 lb (0.45-0.9 kg)	0 lb

There is nothing wrong with the metabolism of the 150 lb (68 kg) man (person B), he just doesn't need as much energy because he doesn't have as much total mass.[26]

We can't avoid all slowing in the metabolism as we lose weight, but it is imperative we **protect** against making it slower than it has to be:

1. Ensuring we retain muscle through regular exercise and sufficient protein consumption.
2. Avoiding unnecessary adaptive changes to the metabolic rate.
3. Building additional muscle during anabolic states.

Muscle is three times more metabolically active at rest than fat. If we can retain muscle, build small amounts of muscle and ensure we are losing as close to 100% fat as possible, we not only support a healthier-looking body, but a more metabolically active one.

We can also avoid slowing of metabolic rate through the use of flux.[27, 28]

If we take the example of the person B we can see the difference a good approach can make.

The differences are not dramatic and would be difficult to note over a week or two. There is no drastic starvation mode, but rather a subtle flux that compounds to ensure long-term maintenance, higher energy, more emotional balance and continued progress are more achievable outcomes.

Our objective when we are losing weight and keeping it off is to mimic the outcome of person B.

	A: 150 lb man, high body fat	B: 150 lb man, low body fat
Daily caloric intake	1,830 kcal	1,830 kcal
Average metabolic rate	1,950 kcal	1,950 kcal
Additional muscle mass	-5 lb -20 kcal	+10 lb +40 kcal
Metabolic strength	Poor –50 kcal	Good +50 kcal
Current metabolic rate	1,880 kcal per day	2,040 kcal per day
Weekly difference	-1,120 kcal	+1,120 kcal
6 months weight difference*	0 lb	8 lb (3.6 kg)
12 month weight difference*	0 lb	16 lb (7.2kg)

** We use the slightly dated example of 3,500 kcal = 1 lb of body weight. This is not expected to be entirely accurate but is used as a guideline to provide an example of the difference small changes to metabolic rate and muscle retention makes to long-term weight loss.*

There are four key variables to consider within your own plan that are going to impact you:

1. How extreme your **calorie deficits** and **surpluses** are.
2. The length of time you spend in each of these states, or more importantly the **ratio** between one and the other.
3. How much and the type of exercise you do.
4. The macronutrient (carbohydrates, fat and protein) balance you choose.

How you can approach each of these for your own circumstances is covered in the *Transform for Life* journey.

Fundamentals of fat loss recap

Key points:

- A calorie deficit is imperative to overall weight loss.
- Permanent deficits result in potential muscle loss and slowed metabolism.
- A catabolic environment supports fat loss.
- An anabolic environment supports muscle repair and adaptation.
- Flux will help you retain muscle and metabolic strength.
- Flux ratios will be dependent on current body fat and weight.

Things to do:

- Calculate required calories.
- Build in flux days and weeks.
- Monitor weight loss against fat loss, either using measurements or with calipers.

Transform for Life – The Blueprint will help you set your calories and flux correctly.

CARBOHYDRATES AND METABOLIC FLEXIBILITY

Now we understand the basics of calorie balance and flux, we can start to look at the influence various macronutrients have on our health and physiques.

The truth about carbs

We are surrounded by conflicting information about carbohydrates and it can be difficult to understand the place they have in our overall health plans.

Let's bust a few myths before we break down the science.

1. Insulin does not make you gain weight. It has a large part to play in body composition, but no role in weight loss.[1, 2]
2. Carbohydrates are not good or bad. They are just macronutrients.
3. Fat doesn't make you fat, nor do carbs. Calories do.

All healthy diets include a balance of protein, fat and carbohydrates. However, a healthy balance for you may be very different from a healthy balance for me.

Lily's Laws 3

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- **Sufficient carbohydrates are needed in a healthy diet***

*Ketogenic diets (see *Popular diets*) are an exception to this rule.

Think of the body as a post depot

As mail (energy) comes in, different workers (hormones like **glucagon** and **insulin**) have different roles to ensure the mail gets to the right place (repair muscle, provide energy). The better trained your workforce (endocrine system) the more different types of mail your depot (**body**) can cope with.

With a poorly trained workforce, you can only accept certain types of mail (carbohydrates OR fat OR protein).

With an efficiently trained workforce, your body can cope with many different types of mail and confidently ensure they all arrive in the right place.

Our goal is to ensure your body can cope with all types of macronutrients, but it may need some training to get it there.

The transport hormones

Glucagon is a hormone that works alongside **insulin**. Both are released from the pancreas.

Insulin helps nutrients get INTO the cells and glucagon releases the stored nutrients OUT OF the cells, to be used as energy.

- It is glucagon that releases free fatty acids from your fat stores.[3]
- It is insulin that transports energy to the cells to be used.

A higher release of insulin is important if you wish to **build** muscle and a higher release of glucagon is important if you wish to **lose** fat.

Klong and Rob

Think of **glucagon** as the key that sets **Klong** free from his cage.

Think of **insulin** as the train that delivers building materials to **Rob**.

Since both building muscle and burning fat are important to long-term health success, we cannot neglect the importance of either.

Insulin and glucagon are never present at the same time. The pancreas either releases insulin in response to sugar, or releases glucagon in response to protein and fat or a fasted state.[4]

Note: *A fasted state is when the body has no readily available macronutrients of any type.*

The presence of insulin or glucagon is what determines whether food is used as building materials or stored as fat.[5, 6]

In an ideal world, your body would move effortlessly between these two pathways, insulin transporting amino acids into muscle cells to help repair, before switching to glucagon when carbohydrates are not available, freeing fat from cells to be converted into energy.

For *metabolically flexible* people, a balanced level of carbohydrates, fat and protein is all that is required to ensure the body is spending time building muscle and burning fat. Since both building muscle and burning fat are important to long-term health success, we cannot neglect the importance of either.

Insulin and glucagon are never present at the same time. The pancreas either releases insulin in response to sugar, or releases glucagon in response to protein and fat or a fasted state.[4]

Note: *A fasted state is when the body has no readily available macronutrients of any type.*

The presence of insulin or glucagon is what determines whether food is used as building materials or stored as fat.[5, 6]

In an ideal world, your body would move effortlessly between these two pathways, insulin transporting amino acids into muscle cells to help repair, before switching to glucagon when carbohydrates are not available, freeing fat from cells to be converted into energy.

For *metabolically flexible* people, a balanced level of carbohydrates, fat and protein is all that is required to ensure the body is spending time building muscle and burning fat.

However, the majority of people are more efficient at releasing insulin in response to carbohydrate consumption than releasing glucagon in response to lowered levels of blood sugar, and converting stored fat to energy. We call this being **carb adapted**.

As long as there is the possibility of insulin-based energy release, the body will not make much effort to switch to the glucagon fat-releasing pathway.

Rather than switch to glucagon energy release, your body will send urgent hunger signals via your brain to get more carbohydrate for energy release. People talk of the period, two weeks after reducing starchy carbohydrates, when these cravings subside. This is the point at which the body has adapted to the glucagon pathway.

A higher carbohydrate diet can block fat loss in an individual with poor glucagon response. As long as insulin is being released, the body has no reason to switch to glucagon and commence the process of freeing energy from fat cells for energy.

Klong and Rob

Carb adapted = The body is scared of releasing Klong from his cage and prefers to keep Rob busy.

Fat adapted = Klong is permanently on the rampage and Rob never gets a chance to build anything.

Metabolically flexible = Klong and Rob respect each other and work together effortlessly.

Case study – Aaron, 48

Aaron was confused when I first met him. A book he had read told him that he should eat a balance of carbohydrates. However, a personal trainer friend had told him that carbs were bad.

He had been caught between polarizing viewpoints and felt overwhelmed by the information.

"I was determined to make a change, but was frightened I would make the wrong choice. Should I cut out carbs or would that be bad for me? It's hard to follow through on a plan when you don't know what is right."

I asked Aaron about his food habits over the last few years. His high sugar and carb consumption alongside his pre-diabetic condition told me it was likely his body was not going to cope with high levels of starchy carbohydrates.

For the first six months of his diet, we tracked carefully, keeping him between 25% and 30% carbohydrates, including fibre and starches.

After six months, we started increasing his ratios of carbs and dropping his fat ratios. At this point we found his performance and muscle development started to improve rapidly.

After 12 months, and with 55 lb (25 kg) weight loss, Aaron was on a balanced diet of 40% carbohydrates, 30% fat and 30% protein while continuing to perform well and lose fat. He had developed metabolic flexibility and could enjoy a balanced diet.

Carbs were not and are not bad for Aaron, but their continued presence was preventing his body from making the necessary adaptations.

Factors that increase glucagon production include:

- Diets lower in sugar and starchy carbs
- Exercise
- Eating enough protein
- Fasting/reducing calories

Factors that decrease glucagon production include:

- Frequent meals
- High blood sugar
- Refined carbohydrates
- Sedentary behaviour

The pancreas of a metabolically flexible individual will be able to produce glucagon in the presence of carbohydrate consumption because their pancreas does not see one pathway as preferable to the other and will respond based on current nutrient availability.

Neither insulin nor glucagon are inherently bad, it is overexposure to one or the other that can cause some problems.

Knowing that muscle growth and retention is responsible for metabolic strength, performance and aesthetic appearance, even when fat loss is the goal, insulin remains an important component of any permanent health plan.

What we can learn

Consider your diet history.

- Have starchy carbohydrates been a mainstay of your diet?
- Do you binge on carbohydrates?
- Are your cravings carbohydrate-based?

You may be carb adapted and need to reduce carbs in the short-term to rebalance the way your body works and ensure fat loss.

A long-term goal is to have a balanced intake of carbohydrates, fat and protein, but training your body to switch energy systems by **temporarily** reducing carbohydrate ratios in the short-term is an effective strategy.

Conclusion

Carbohydrates are not bad, but they could be interfering with your fat loss goals right now.

We will help you find your correct carbohydrate ratios in the *Transform for Life – The Blueprint* section.

Carbohydrates and metabolic flexibility recap

Key points:

- Insulin transports energy to cells – both muscle and fat. Without insulin, building muscle is extremely tough.
- Glucagon helps mobilise fat for energy use, making it an important hormone.
- Carb adapted individuals may struggle to produce glucagon and therefore lose fat with higher carb diets.
- Neither carbs nor insulin are inherently bad, but they may be bad for your goals right now.
- Long-term expectations should include balanced carbohydrate levels for most people.

Things to do:

- Consider your diet history and whether lower carbs may be suitable.
- Choose a starting carbohydrate ratio accordingly.
- Monitor outcomes and update.

Transform for Life – The Blueprint will help you get the starting carbohydrate ratio right for you.

THE ROLE OF PROTEIN

If carbohydrates and fats provide us with energy, proteins provide us with building blocks to repair and build our muscles.

To achieve our health goals, sufficient protein consumption is essential.

The building blocks of life

Proteins are the building blocks of life. Everything we are and everything we will become is moulded with protein-infused bricks.

Protein builds and repairs muscle that supports a strong metabolism. [1,2]

Without adequate dietary protein, the body will resort to utilising protein from the retained pools within our muscles. For this reason, ensuring ample protein is available at all times is crucial when transforming our bodies.

Klong and Rob

When Rob notices the body isn't getting enough dietary protein, he shouts to Klong (from the safety of HQ) to start smashing down muscle cells instead of fat cells.

Klong likes smashing things, so he's happy to oblige. Even if he secretly thinks Rob is a goody two shoes.

Your protein baseline

Protein levels should not fluctuate much once we have found our baseline, and these levels will typically hold regardless of whether we are dropping or increasing calories.

While a sufficient level of protein is paramount for muscle retention and growth, an excess of protein provides very little benefit in exchange for numerous potential problems. [3]

Finding the correct levels of protein for you is one of the challenges you will face early on in creating your *Health Blueprint*.

Too little protein and you run the risk of losing muscle, too much and you run the risk of turning the excess into glucose via gluconeogenesis and storing it as fat.

Around 0.7-1.2 g of protein per pound (1.54-2.64g per kg) of body weight is a safe starting point, more with high levels of resistance training and less if your exercise levels are low.*

Lily's Laws 4

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- **Sufficient protein is needed to ensure muscle repair and adaptation**

* ***Note:*** *If you considerably increase your levels of resistance training or circuit training, you will also be increasing the demand on the body to repair/build muscle tissue and therefore also increasing the quantity of protein required.*

Conversely, if you reduce the amount of resistance and circuit training, it may be worth considering reducing your protein consumption, but again, only by a small amount.

Protein and calorie deficits

An incremental increase in **relative** protein in a calorie deficit is useful in almost all instances. The increase in relative protein is created through **protecting** the protein intake as calories drop rather than by increasing the total protein levels.

Example:
You can see that while the **ratio** of protein changes from 30% to 40% in the lower calorie diet, the **absolute** amount of protein remains at 0.8 g per pound (1.76 g per kg) of body weight.

Macronutrients based on a 2,000 kcal diet with sufficient protein in 190 lb (86 kg) female:

Macronutrients	Calories	Ounces/Grams	% ratio
Proteins	**600 kcal**	**5 oz / 150 g***	**30%**
Fats	600 kcal	2 oz / 67 g	30%
Carbohydrates	800 kcal	7 oz / 200 g	40%

* 0.8 g of protein per pound (1.76 g per kg) of body weight.

Weight loss (hypocaloric) macronutrients based on 1,600 kcal diet with sufficient protein in 190 lb (86 kg) female:

Macronutrients	Calories	Ounces/Grams	% ratio
Proteins	**600 kcal**	**5 oz / 150 g***	**40%**
Fats	500 kcal	2 oz / 55 g	30%
Carbohydrates	500 kcal	4 oz / 125 g	30%

* 0.8 g of protein per pound (1.76 g per kg) of body weight.

When we move our bodies into a calorie deficit, the first action is to protect our protein intake. In a deficit, we are better to go above our protein ratio than go below our ratio and risk muscle loss.

This is for two reasons:

1. When in a caloric deficit, the body will convert excess or unneeded protein into glucose for energy via a process called gluconeogenesis.[4]

2. Protein has a higher thermic effect than carbohydrates, contributing to calorie deficit goals.

Note: *While a person with higher levels of fat has lower demands for total macronutrients, as they have more retained energy to convert, there remains an equal demand for proteins needed for repair and adaptation.*

Case study – Mark, 39

Mark was becoming frustrated by his loss of strength, relative to his weight loss. He had lost around 20 lb (9 kg) and had a further 80 lb (36 kg) he wanted to lose, yet didn't want to continue to feel weaker as time went on. Despite his weight loss and regular training, he was not happy with the shape his body was taking on.

We found that less than 20% of his total calories were coming from protein sources.

With the five days a week of intense training Mark was doing, this was not nearly sufficient to rebuild his muscles, let alone build new muscle.

I explained to Mark that because he had a high level of stored fat, I had less concern about his energy balance from energy substrates (carbohydrates and fats) than I did from protein.

A lower ratio of dietary protein, paired with high levels of training, had created an environment where his body had been forced to mobilise stored protein. In other words, he was losing muscle instead of fat.

By liberally increasing his dietary protein to 40%, reducing carbs by 15% and fats by 5%, we were able to ensure his body had sufficient protein for repair and therefore any mobilised sources would be those suitable for energy use.

After this protein update, we tracked his fat loss and noted almost 100% of his weight loss was from unwanted fat sources over an eight-week period.

In the case of an individual who wishes to lose fat, the optimum outcome is the conversion of the pool of retained fat into energy, alongside the retention of muscle.

To do this, we **must** have sufficient dietary protein for repair, otherwise the retained amino acids in our muscles could be converted for use.

When an individual in a calorie deficit has a higher fat percentage, the levels of protein in the diet can be considerably more liberal, as the excess protein will be converted into glucose and burned as fuel.

In the leaner individual, higher levels of protein **must** be supported by a higher level of fat and carbohydrates. In this instance we recommend **smaller** calorie deficits to avoid risking muscle loss.

Regardless of these details, anybody who is exercising **and** in a **calorie deficit** should have a proportionately higher level of total dietary protein to maximise fat loss and muscle retention. I have rarely seen examples where less than 30% protein (0.7 g per pound or 1.54 g per kg of body weight) is optimal for fat loss in a calorie deficit.

Protein and calorie surpluses

When in a calorie surplus, the demands on protein are less as the total availability of carbohydrates and fats are higher. Carbohydrates act in a protein-sparing manner, allowing the available dietary protein to be used for building new tissue and/or repairing old tissue rather than as an alternative energy source.[5]

In this calorie surplus, 'leftover' calories will typically be the ones that are most difficult to utilise for energy, which are protein. The 'leftover' protein-based calories will be sent to work building new muscle.[6]

This is why carbohydrates, rather than proteins, are increased when moving into a calorie surplus.

In a calorie deficit some of our dietary protein will inevitably be converted into glucose for energy. On the other hand, in a calorie surplus, thanks to higher availability of carbohydrates and fats, the majority of our dietary protein can work exclusively on repairing and building new muscle.

Protein availability

Some researchers believe the **total** amount of protein you consume is less important than a consistent **availability** of protein in the diet.[7]

There is ongoing and inconclusive debate over how much dietary protein we can actually utilise in any given day, and the only thing established with certainty is that this number is not the same for everybody. However, there can be no doubt about the need for a consistent availability of sufficient dietary protein for repair and adaptation.

Klong and Rob

Rob can only do so much building and repairing. He's not magic.

Whenever Klong is safely in his cage and Rob comes out, Rob works as hard as he can, but he can only do so much. If he has surplus protein, he may send the excess off to be converted into energy for other purposes (he may be bright enough to hold some back, but then again he may not be!).

When he comes back to work again, the excess protein from before has been used, so if no new protein has arrived, he sits around doing nothing, or worse, asks Klong to smash some muscles.

All Rob really wants is enough protein to do his job every time he has to do it. You can help out by eating a little protein with every meal.

This is why a plant-based diet can work exceptionally well, even when the total amount of protein is not as high as in meat eating diets.

Most vegans and vegetarians understand the importance of including protein sources in every meal and snack to ensure muscle retention and fat burn.

'Good' versus 'bad' protein availability

Good protein availability

Meal	Protein	Availability
Breakfast	0.7 oz (20 g)	Good
Snack	0.7 oz (20 g)	Good
Lunch	1.1 oz (30 g)	Good
Snack	0.7 oz (20 g)	Good
Dinner	1.1 oz (30 g)	Good
Total	4 oz (120 g)	Moderate

Bad protein availability

Meal	Protein	Availability
Breakfast	0.2 oz (5 g)	Poor
Snack	0 oz	Very poor
Lunch	3 oz (75 g)	Too high
Snack	0.35 oz (10 g)	Good
Dinner	2.1 oz (60 g)	Too high
Total	5 oz (150 g)	High

In the first example we see lower total protein but even availability throughout the day, ensuring that whenever the body needs protein, it is available.

In the second example we see higher total protein, but less even availability throughout the day.

This could force the body to metabolise muscle even though the total amount throughout the day is sufficient. How much does this matter? You will get a different answer depending on who you ask; I prefer to play it safe and ensure sufficient protein throughout the day.

Protein availability versus meal frequency

When it comes to weight loss we have a battle we are continuously fighting.

Ensuring fat loss while protecting against muscle loss

On the one hand, if we continue to feed our body at regular intervals with energy-rich food, we may never force it into the catabolic, glucagon-releasing environment required to free fat cells for energy use. Never feeling hungry means our body may never need to locate alternative energy sources.

On the other hand, if we don't ensure we are providing the body with sufficient protein for repair, we run the risk of muscle loss.

Ensuring the meals and snacks you do have are filled with sufficient protein is your first line of attack, your strongest defence and your greatest ally in improving your body composition.

The role of protein recap

Key points:

- Protein is a building material. We cannot repair and build without it.
- Exercise increases the demands on protein.
- Consuming a protein excess is more of a concern in hypercaloric states than hypocaloric states.
- In order to safeguard current muscle, higher relative protein becomes more critical the further into a hypocaloric state you go.
- Consistent protein availability is potentially as important as total protein consumption.
- The vast majority of protein consumed will be for repair. Even in a surplus, your body is only capable of building very small amounts of muscle. Upping protein considerably once you have established a dietary minimum is at best pointless and at worst detrimental.

Things to do:

- Consume protein with every meal.
- Consume higher **relative** protein levels when in a hypocaloric deficit.
- When increasing calories, increase carbohydrate or fat levels NOT protein levels **unless** you have reason to believe your protein levels are too low **or** you are increasing resistance training.
- Aim for between 0.7-1.2 g of protein per pound (1.54-2.64g per kg) of body weight.

Transform for Life – The Blueprint will help you set your starting protein levels.

FATS AND RATIOS

Fat is essential.

- It is an alternative and usable form of energy, both as dietary and stored fat.
- It is essential to fight inflammation.
- It is crucial for brain function.
- It is critical for protecting your vital organs.

In the 1970s and 80s, much like carbohydrates are now, fats were demonised, yet we've come to understand how important they are to our existence.

Protein is essential for building and repair, carbohydrates are essential for providing energy, and fat is essential for fighting inflammation, brain function, protecting vital organs and as a potential energy source.

We need all three.

Lily's Laws 5

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- **Sufficient fat is needed for brain function, immunity and protection**

The question is not whether we need them, but how much of each we need, and why?

Fat or carbohydrates?

Insulin is often blamed for weight gain because it is responsible for carrying excess energy to be stored in fat cells.

This is the most shocking example of 'shooting the messenger' you are ever likely to hear.

A person gains weight because they eat an excess of calories, the insulin is simply the mail guy.

Without an excess of calories you cannot gain weight. Insulin is not responsible.

It doesn't matter how much insulin you release, if you are in a calorie deficit, your body cannot gain any weight.

However, when it comes to body composition there is more to consider than just the amount of calories we consume. Your macronutrient ratio will play a role in how much **fat** your body loses.

Knowing that protein is essential for repairing muscles, and levels should remain relatively stable, we are left with a question to answer.

What percentage of our dietary calories should come from fat and how much from carbohydrates?

Higher fat or higher carbs?

Lowering carbohydrates results in a drop in insulin and a rise in glucagon.[1]

Glucagon is needed for freeing stored fat for use and insulin is needed for storing fat. If we look at it from this simple vantage it would seem obvious that dropping carbohydrates would make sense, but we need to look further.

Energy from fat is made available through a longer process of emulsification via digestive processes in the stomach, pancreas and gall bladder.

Once this process is complete, fat is available to be used for specific roles that **only** fat can complete, while any excess is made available for conversion to energy.

Many tissues, including your muscles, can use fatty acids for energy, but your **brain can't convert fatty acids** to fuel (unless you enter ketosis, at which point your liver produces ketones – covered in *Popular diets* - pages 67-80).[2]

The brain is a pretty important organ, so if you lower carbohydrates to the extent that your body does not have sufficient usable energy to fuel brain function, your body will simply convert stored or dietary protein into glucose instead.[3]

This process will release insulin and block glucagon production:

A. Negating the supposed benefits of lower dietary fat by releasing insulin anyway.
B. Using dietary protein that was meant to repair and regenerate.
C. Running the 'worst case scenario' risk of metabolising muscle for energy.[4]

This is not to say lowering carbohydrate ratios and raising fat ratios is a bad idea, just that removing carbohydrates and increasing fat will not mean you remove insulin from the equation entirely, and even if you do, it may not be positive.

Note: *We avoid this worst case scenario by ensuring we have macronutrient minimum at all times.*

Whether you have lower carbohydrates or lower fats should be based on numerous factors and is dependent on your current circumstances, goals and even body type. This is all covered in *The Blueprint – Getting started with nutrition*.

Having minimum levels of both fat and carbohydrates is crucial to your long-term function. Beyond this, the fat-to-carbohydrate ratio you consume can be based on the following chart:

Carbs/Fats Ratios

Factor	Ratio change
Fat loss as a goal	Carbs down ↓ fats up ↑
Performance as a goal	Carbs up ↑ fats down ↓
Muscle building as a goal	Carbs up ↑ fats up ↑
Current body fat high	Carbs down ↓ fats up ↑
Current body fat low	Carbs up ↑ fats down ↓

The benefits of lower carb ratios:

- A higher ratio of the fat-burning hormone glucagon is released, meaning more fat should be burned.
- A lower ratio of the fat-storing hormone insulin is released, meaning less fat should be stored.

The benefits of lower fat ratios:

- The brain has sufficient usable energy from carbohydrates to feed the brain and retain dietary protein for repair and adaptation rather than conversion to glucose.
- The body produces enough insulin to be anabolic and build new tissue.
- Performance and energy levels when exercising are better.

Fat and carbohydrate ranges

When you are looking to lose fat as your goal, neither fat nor carb intake should drop below 25% or go above 50%.

Baseline protein in any calorie deficit would rarely be recommended at less than 30% of total calorie intake, leaving you with the remainder to distribute across your energy macronutrients.

Available variable ratio for fat loss goal

- Baseline minimum consumption (fat and carbs): 25% each.
- Minimums total (fat and carbs combined): 50% Protein minimum: 30%+.
- Available variable range: up to 20% (less if protein is higher).

Not enough to make or break your results but enough for you to play with.

Positives and negatives of macronutrient

If you eat just the **minimum of 25% carbohydrates**:

Negatives

- Your performance may suffer.
- You may feel demotivated and tired.

Positives

- You will release more glucagon and may burn a higher percentage of stored fat.
- If you are carb adapted it will help you become metabolically flexible.

If you eat just the **minimum of 25% fats**:

Negatives

- You may release too much insulin, theoretically limiting fat loss.
- You may have more cravings.

Positives

- Your performance should be better.
- You should have more dietary-available protein for use on muscle repair (less need for gluconeogenesis).

What you have hopefully concluded by this point, is:

1. There is no right answer to which ratio of fats and carbs you should use beyond meeting your minimum requirements on all macronutrients.[5]

2. There are other factors more important and influential to your overall results than small variables on your macronutrients.

However, just because it is not as significant as other factors, it doesn't mean we should neglect it; the closer we get to reaching our goals, the more important these factors will become.

The following three examples highlight how we can change our macronutrients very slightly, throughout the week, dependent on our specific goals.

Examples of sensible **macronutrient ratios** based on a 1,500 calorie intake.

1. High protein ratio

This ratio would be suitable on days when you have a higher percentage of resistance training and your priority is muscle repair.

Macronutrients	Calories	Ounces/Grams	% ratio
Proteins	600 kcal	5.3 oz (150 g)	40%
Fats	450 kcal	1.7 oz (50 g)	30%
Carbohydrates	450 kcal	3.9 oz (112.5 g)	30%

2. High fat / low carb ratio

This ratio you may be suitable for days when you are not training and want to limit excess insulin and promote glucagon production.

Macronutrients	Calories	Ounces/Grams	% ratio
Proteins	525 kcal	4.6 oz (130 g)	35%
Fats	600 kcal	2.3 oz (67 g)	40%
Carbohydrates	375 kcal	3.3 oz (94 g)	25%

3. High carb / low fat ratio

This ratio may be better suited to days when you are training hard and need extra carbohydrates for energy.

Macronutrients	Calories	Ounces/Grams	% ratio
Proteins	525 kcal	4.6 oz (130 g)	35%
Fats	375 kcal	1.4 oz (41 g)	25%
Carbohydrates	600 kcal	5.3 (150 g)	40%

Try a ratio:

1. If it works (lose fat, feel good, train well) stick with it.
2. If it doesn't work (don't lose fat, don't feel good, train badly) change it.

None of these ratios would have a dramatically different impact on body composition provided you remain in your calorie deficit, however, as you get closer to your final goal, small differences such as these can become crucial.

All of the above ratios are effective to achieve results, when paired with the key body composition factors and sufficient hydration.

Lily's Laws 6

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- **Drink enough water**

Other points around fats

Essential fatty acids

Omega 6 and **omega 3** are essential fatty acids because our body cannot synthesise them, so they have to be ingested.[6]

Provided you are eating a good balance of fats you should not be too concerned, but vegans often need to pay particular caution to omega 3 and sometimes find supplementation can be helpful.

How much fat can you consume at once?

Some people feel sick when they eat high levels of fat, others follow ketogenic diets of 70% or more fat and some people don't even have a gall bladder.

This is where personalisation comes in and why you must not assume any rule is true for you until you have tried it yourself.

Types of fats

There are three types of good dietary fats we need and one we should try to avoid.

Monounsaturated fats and **polyunsaturated** fats are found in nuts, seeds and oils – these can be around two thirds of our fat source.

Saturated fats can be found in oils and animal products. There is nothing wrong with saturated fats, the problem is they often make up too high a proportion of our diet. Provided they don't make up more than one third of our fats, they are perfectly healthy.

Trans fats found in fried, baked and snack foods are not considered good for our health and should be consumed in small quantities only. They raise the risk of heart disease, raise cholesterol and contribute to insulin resistance. These should be avoided as much as possible.[7]

Does the ketogenic diet work for fat loss?

If your solitary focus is fat loss, a ketogenic diet, where your fat is raised to above 70%, can help you lose fat at a fairly rapid pace.

Fast fat loss is one reason why ketogenic diets have become a popular solution.

A ketogenic diet replaces carbs with dietary fats. People often believe that they are following a ketogenic diet, but fail to get anywhere near the 70% minimum fat levels required to correctly follow this protocol.

This elimination of carbs, along with a relatively low level of protein, largely removes the hormone insulin, replacing it with the glucagon production. Provided you are in a caloric deficit, you can be confident you are burning a proportion of fat because glucagon is the hormone responsible for freeing fats from their cells to use for energy.

After a period of time, the pancreas secretes ketones into the bloodstream, which are able to support fat-fueled brain function and other processes in the absence of blood sugars.[8]

However, ketogenic diets are not without their problems. They are considered to be potentially dangerous for certain populations, especially, but not limited to, diabetics and those with liver or kidney problems.

Our stance is to look for longer, more sustainable habits, but the ketogenic approach can be useful if it suits the individual.

We cover ketogenic diets in a little more detail in *Popular diets*. (pages 67-80)

Fats and ratios recap

Key points:

- Fat is crucial for our immune system, brain function and organ protection.
- Fat ratios should be higher if fat loss is the overall goal.
- Carb ratios should be higher if performance is the overall goal.
- No macronutrient ever needs to be lower than 25% for overall health.
- No macronutrient needs to be higher than 50% for overall health.

Things to do:

- Consider your goals and preferences.
- Try different ratios on high training days to low training days.
- Listen to your body and be flexible with your ratios over time.

Transform for Life – The Blueprint will help you get the starting carbohydrates right for you.

IS A CALORIE A CALORIE?

The scale DOESN'T **know how much better you feel and how much energy you have.**

The scale can give you one piece of information and one piece of information only. Your calorie balance.

The scale can tell you whether you have burned more calories than you have consumed or consumed more calories than you have burned.

The scale doesn't know how strong you are, or how great it feels to use your hard-earned muscles.

The scale doesn't know how you can now climb a flight of stairs without being out of breath, or run with your children in the park.

The scale doesn't know about the wonderful way your body is responding to the healthy foods you are eating.

The scale doesn't know how much better you feel and how much energy you have.

The scale doesn't know about the new-found efficiency in your lungs or the extra power that bounds within your every heartbeat.

The scale can tell you whether you have burned more calories than you have consumed or consumed more calories than you have burned.

That is all the scale knows.

No factor is more important than calorie balance for weight loss, but that does not mean all calories are created equally.

Thermodynamics applied to the human body is a different beast from thermodynamics applied in a Petri dish. Different types of calories behave differently within our body, creating vastly different outcomes.

At its simplest level, creating a calorie imbalance explains why we gain weight, but calorie **type** explains **why** we might choose to eat more calories in the first place.

Calories and the satiety factor

The hormone **ghrelin** is responsible for telling you when you are hungry, and the hormone **leptin**, is responsible for telling you when you are full.

An overall focus on non-processed foods will bring these hormones into balance and make judging fullness and hunger an easier experience, but beyond this, some calories just make us feel fuller than others.[1]

Calorie density looks at the amount of calories per pound and grades the food based on the quantity of calories per pound of food. Calorie density is considered to be strongly, although not absolutely, linked to satiety.[2]

Calorie dense foods:

Food	Calories per pound
Oils	4,000
Nuts and seeds	2,500 – 3,500
Sugars and highly processed carbs	1,500 – 2,000
Breads	1,000 – 1,400
Fish, meats and poultry	400 – 900
Beans and lentils	300 – 750
Potatoes, yams and rice	300 – 600
Fruit	150 – 400
Vegetables	50 – 200

What does this mean?

If you could 'stomach' half a pound of oil it would add up to 2,000 kcal.

The same 2,000 kcal would be up to 40 pounds of food in vegetables.

To eat 2,000 kcal of oils would take you less than a minute, whereas to eat 2,000 kcal of vegetables would take you most of the day.

The increased thermic effect (covered later in this chapter) required through digestion, chewing and continuously lifting the fork when eating vegetables would be significant in this extreme example, but the main difference would actually be on hunger.

The vegetables take up lots of **volume** in the digestive tract, literally filling the stomach, whereas the oil, despite being heavy on calories, takes up very little space in the digestive tract, leaving our stomach feeling empty.[3]

Even when ignoring the quite significant difference in thermogenesis, the person consuming oil would almost certainly end up eating considerably more calories than the person eating vegetables based on the lack of satiety and fullness they would experience in comparison.

How important is calorie density to your results?

Calorie density and satiety has a place and a part to play in physical change but it is less important than calorie balance and macronutrient ratio.

If you decided weight loss was your only goal and everything else was irrelevant, calorie density would serve you well for a time, but a pure focus on calorie density with no consideration given to macronutrients could end up causing nutritional deficiencies and stalling results.

However, there are lessons to be learned:

- Sugars and processed foods offer little nutritional benefits or calorie density.
- Loading your plates with vegetables is always a good idea.

Lily's Laws 7

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- Drink enough water
- **Eat plenty of vegetables**

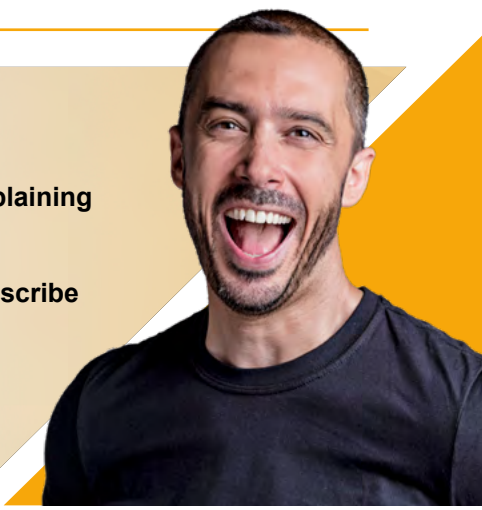
The thermic effect of food

Hot food

The thermic effect of food can be hard to explain. For several minutes I'd been trying to get the concept over to my dad, explaining the delicate interplay between food, heat and metabolism.

Confident I'd got the concept across to him, I asked him to describe it back.

"Son," he said in his thick Cockney brogue, "don't you tell me about the thermic effect of food. I've been eating Vindaloos since before you were born."



Some calories are not equal when it comes to energy balance.

The thermic effect of food measures how the different digestion and metabolising processes of nutrients impact energy expenditure.

Foods travel through different metabolic processes that have varying levels of efficiency. The metabolic processes for protein are less efficient than those for carbs and fats – positive in the context of thermogenics!

If we compare an 1,800 kcal diet with a high protein ratio against an 1,800 kcal diet with a low protein ratio, we can see the difference the higher protein (more thermic) diet has on our overall calorie balance.

Comparison of thermic effect*

	40% high protein	Thermic effect	25% low protein	Thermic effect
Protein	720	180	450	112
Fat	630	19	630	19
Carbs	450	34	720	54
Total calories	1,800	1,800	1,800	1,800
Calories after thermogenesis		1,567		1,615

**Based on the following thermic effects: protein 25%, carbs 7.5%, fats 3%*

The difference to total calorie intake based on a high protein diet is around 50 kcal.

Is this number worth pointing out? Yes.

Should this impact your decision of how much protein to eat? No.

High protein diets have a metabolic advantage, but this advantage is not sufficient to conflict with our personal preferences and goal-based requirements.

Calorie absorption

The amount of calories we consume is not always the amount of calories we absorb and use.[4, 5]

There are numerous processes involved in the digestion of food; the harder it is to digest food, the less likely we are to extract 100% of the calories from it.

Processed foods are particularly easy for our bodies to digest, therefore we are more likely to absorb and use a higher percentage of calories from them.

Unprocessed, whole foods have a higher fibre and nutrient density and are harder to digest, making it likely that we absorb a lower percentage of calories from them.

Since cooking is a process – foods that are eaten raw are also less likely to be 100% absorbed than foods that are cooked.

Without wanting to paint too vivid a picture, if you don't utilise the calories that go 'in' they still get 'out' again, in the form of excretion. This can, understandably, make the 'in versus out' calculation a little confusing.[6]

It is also the reason some people claim 'clean eating' is more effective for weight loss. 2000 kcal of 'clean' food may result in fewer calories absorbed than 2000 kcal of non 'clean' foods. More on this is available in *Popular diets*.

On top of this, some people absorb more calories than others.

If you and I both ate a 150 kcal egg, it is unlikely both of us would extract 150 kcal of energy from the egg. Perhaps I would absorb 135 kcal and you would absorb 130 kcal.

Despite eating the same amount of food, we can absorb different amounts of calories from that food.

What does this mean? A lot and not very much at all. In fact, it is far more likely to cause you to eat not enough than to eat too much.

When should you worry?

Losing more than 2 lb of weight per week would be a red flag, as would loss of energy, motivation and increased stress levels. If you are maintaining or gaining weight, your absorption levels are not a concern.

If you are losing too much weight, losing energy or feeling uncharacteristically weak, you should eat a higher level of calories than would otherwise be recommended and/or reduce your levels of training.

Provided you are eating a high enough ratio of quality foods, consuming sufficient protein and other macros and regularly exercising, absorption, although impacting, should not be a huge concern for weight or fat loss. You can reduce your levels of absorption by increasing your quantity of whole unprocessed and raw foods – this is a good idea, but wouldn't be recommended in isolation and for the sole purpose of reducing absorption.

Because of factors such as variable absorption, calories in versus calories out cannot be a perfect equation, but it is still the best equation – unless you live in a science laboratory you can never know exactly how many calories you've consumed, absorbed and burned, but over time you can paint a very accurate picture, regardless of important, but secondary factors like absorption rate.

Nutrient quality

The nutrient quality of a food is the amount of vitamins, minerals, fibre and micronutrients within a food.

200 kcal of white bread is not the same as 200 kcal of brown rice, despite having almost identical properties from a macronutrient perspective.

	White bread	Brown rice
Calories	200	200
Carbs	40 g	40 g
Protein	6 g	6 g
Fats	2 g	2 g
Sodium	360 mg	10 mg
Sugar	3 g	1 g
Dietary fibre	1.2 g	4 g

From a calorie and energy perspective, the two products are identical, so when we consider weight loss they are the same, but beyond the obvious increase in sodium, there are two key differences:

1. Dietary fibre is almost 3 g higher in the brown rice.
2. Sugar is 2 g higher in the white bread.

Dietary fibre is important for digestive health alongside numerous other health reasons and most of us don't get enough of it. Dietary fibre slows down the process of digestion, meaning the energy available is distributed more evenly with the brown rice.

On the other hand, sugar digests more rapidly, creating insulin spikes and more readily available glucose. When the body has the deadly combination of insulin and oversupply of available glucose, fat cells become the dumping ground, regardless of whether you are in a surplus or a deficit.

While this example is only a small portion of each product, if this type of decision was made continuously:

- Fat levels would increase
- Insulin sensitivity would decrease
- Hunger would increase
- Satiety would decrease

The vitamins, minerals and micronutrients in the foods we eat are essential in creating health and reducing chances of disease. By limiting processed foods and focusing on a diet that is high in vitamins and minerals we improve every aspect of our health.

Lily's Laws 8

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- Drink enough water
- Eat plenty of vegetables
- **Limit processed food intake**

Glycemic index and glycemic load

The glycemic index (GI) is a value assigned to foods based on the speed at which they cause increases in blood glucose levels.[7]

Foods low on the glycemic index release glucose at a slower and more even rate. Foods high on the glycemic index release glucose at a much faster rate.

Low GI foods tend to assist with fat loss, while high GI foods will release energy for recovery after exercise, so one is not better, just used differently.

The more even release of glucose in low glycemic foods is particularly useful in keeping blood glucose under control, but to understand the complete effect a food has on blood sugar, you need to understand how quickly the food causes glucose to enter the bloodstream, as well as how much glucose it will deliver.

Glycemic load does that.

Watermelon, for example, has a high glycemic index (80). But a serving of watermelon has so little carbohydrate (6 g) that the glycemic load is only 5.

A glycemic load of 10 or below is considered low; 20 or above is considered high.

You can find out more about where foods stand in glycemic load and glycemic index in the *International tables of glycemic load and glycemic index*.

Conclusion

Foods that have been processed and refined tend to have:

- Higher sugar per ounce/gram
- Higher salt per ounce/gram
- Lower fibre per ounce/gram
- Lower minerals per ounce/gram
- Lower vitamins per ounce/gram

So, while 2,000 kcal from processed foods has the same, or very similar impact on our total weight as 2,000 kcal from nutrient-rich, fibre-dense foods, the outcome will be very different:

- Higher risk of most diseases
- Higher percentage of body fat
- Lower percentage of muscle mass
- Increased hunger
- Decreased satiety
- Less energy
- Less motivation

Nearly every diet, from low fat to ketogenic, universally agrees that the calories we consume from highly processed foods are not as good for us as the calories within whole foods.

For weight loss, there is calories. For everything else, there is food quality.

If overall weight, and even fat loss, is your goal, your starting point **must** be calorie balance, but this remains an incomplete picture.

Not considering food quality will impact **why** you are eating too much, your motivation as well as energy levels.

Quality calories will increase energy, improve mental state and build muscle tissue while reducing total levels of fat and overall chance of disease.

Bad calories, from processed, unnatural sources will have almost the exact opposite effect.

Do not, however, make the mistake of thinking that **every** food you eat must be nutrient dense and whole, because while theoretically this is healthy, it can be a dangerous line of thinking.

Clean eating is a concept that suggests some foods are 'dirty', when they are not.

Banning foods because they are dirty, with little or no nutrient quality or health benefits will simply cause us to overeat them when the dam of will power finally breaks.

Let's face it, some people like things a little dirty!

All diets should have a predominance of healthy foods, and the higher the healthy food ratio, the better the overall health and outcomes, but beyond this you can decide how much of your diet should be nutrient dense whole foods, and how much of your diet should be foods you eat, for no better reason than **you enjoy** them.

And no more justification is needed than that.

Is a calorie a calorie recap

Key points:

- Not all calories are created equal.
- Some calories make you feel full by filling the digestive tract.
- Protein has a higher thermic effect than other macronutrients.
- No dietary protocol promotes a high ratio of processed and refined foods.
- A higher percentage of calories from processed foods are absorbed.
- Processed foods have less fibre, vitamins and minerals.
- A minimum of 70% of foods should be whole foods.

Things to do:

- Consider your goals and personal preferences.
- Decide on a healthy food ratio that works best for you.
- Listen to your body and be flexible with your ratios over time.

Transform for Life – The Blueprint will help you get the right healthy food ratio for you.

UNDERSTANDING EXERCISE

If foods are the building blocks we use to create our body, then exercise is the builder (yes, Rob) we use to shape it and decide how these building blocks are used.

All movement is exercise. Walking the dog, standing up from the couch, running for the bus and even lifting your mug to your lips is exercise.

Below is a simple reminder of the role of calories versus other factors:

Weight loss =	Body composition (fat loss and muscle) =
Amount of calories burned	**Type** of exercise undertaken
Amount of calories consumed	**Type** of calories consumed

Focused exercise such as resistance training and HIIT training is important because:

A. **Body composition**: Lifting weights and working hard with cardio requires a more muscular and lean physique than just walking. The body adapts and evolves based on relevant stimuli.[1]
B. **The requirement for balance**: An intelligent workout plan reduces imbalances and potential for injuries.
C. **Accelerated calorie burn**: We achieve more in a shorter amount of time.[2]

Understanding how to get the most from exercise and what exercise to do will maximise both the effectiveness and speed of evolution your body will experience.

Compliance, compliance, compliance

Whether you decide to exercise for 25 minutes a day six times a week, or 45 minutes a day six times a week should be based on your capacity to maintain rather than your desire for results.

Consistency is always the most important aspect of long-term results, so creating long-term sustainable habits should always drive your decisions.

Any training routine is 100% better than no training routine.

Exercise type ratios

Exercise ratios have so many permeations it is impossible to say what the correct balance is, but if we start from a good point, we can work backwards based on personal goals.

The following recommendation is an approximate balance and roughly what the majority of our workout plans are based on.

- 35% resistance workouts (including circuit-based dumb-bell resistance within PT (cardio and resistance circuit) and bodyweight resistance such as squats, lunges and presses included in some cardio workouts).
- 45% cardio (including HIIT, steady cardio, boxing).
- 20% mobilization/Pilates/active recovery.

As a rough guide, in a 6-workout week this would be:

- 2 x absolute cardio workouts.
- 2 x cardio/resistance hybrid workouts.
- 1 x resistance dominant workout.
- 1 x mobilization/Pilates workout.

Let's take a look at the different training types, why we do them, and when we should do more of them.

Note: *While ratios can change based on goals and preferences, we always recommend participation in all exercise types.*

Why exercise for weight loss?

If creating calorie deficits along with good macronutrient ratios and healthy foods are the key factor for fat loss, why bother exercising?

Heart rate raising **exercise** is essential for optimal fat loss/muscle repair.[3]

Not specifically cardio, resistance, swimming, running or any other method but **any** exercise that raises the heart rate.

Exercise creates an environment for our body to utilize protein substrates to rebuild muscle tissue and convert stored fat into energy for use.

1. ALL exercise provides sufficient stimulus to encourage this state.
2. Without surplus calories for a 'muscle building' environment, the additional 'muscle building' benefits of resistance training are less important.
3. With exercise as the key driver of creating a fat-burning and muscle-repairing environment, and both resistance AND cardio providing sufficient physiological stimulus to support this, the choice of which should be done more to lose fat/weight should be based on other factors.

If we neglect exercise in a calorie deficit, we will not stimulate the metabolic process of tissue repair and fat mobilization, therefore any weight loss will almost certainly be a higher percentage of muscle.[4, 5]

This is why exercise is so important.

Lily's Laws 9

Good news! Lily just found a **NEW** universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- Drink enough water
- Eat plenty of vegetables
- Limit processed food intake
- **Exercise to stimulate muscle growth and fat loss**

Why cardio training?

Klong

Klong loves it when you do cardio.

You deplete glucose, setting him free from his cage to go on a fat-smashing frenzy!

Why is it that people looking to lose fat require a higher proportion of cardio?

Calories burned

Cardio, especially HIIT or interval training, burns more calories than resistance training.

While burning calories should never be **the** reason for exercise (food intake and even NEAT – see *The Importance of NEAT* – will invariably be the most important aspects of a calorie deficit) as a choice of training based around an ultimate desire to create an overall calorie reduction, cardio always wins.[6]

Resistance versus Cardio for weight loss

	Duration	No. of workouts	Workout kcal	Weekly kcal	Annual* kcal	Annual weight loss**
Resistance training	45 minutes	6	291	1,750	84,000	24 lb (11 kg)
Cardio training	45 minutes	6	416	2,500	120,000	34 lb (15 kg)
Difference						10 lb (4.5 kg)

*48 weeks training per year.

**3,500 kcal = 1 lb (0.45kg) in body weight. This is a slightly dated calculation, but is used to provide indicative values.

The chart explains the initial reason cardio deserves a slightly higher ratio than resistance training when weight and fat loss is the goal.

This is not suggesting cardio is better than resistance, because it is not. Resistance training has significant long-term benefits around metabolism, muscle definition and strength.

Note: *In a caloric surplus, resistance training deserves a higher ratio for its muscle building qualities and whenever we flux our calories we should take this factor into account and increase our resistance training ratio.*

Other factors

There are three reasons cardio leads our recommended ratios, extending beyond aesthetics:

1. **Cardio equates to a longer, healthier life**. Cardio gives you the heart, lung, hormonal and circulatory benefits that improve and lengthen your life.[7]
2. **Cardio is the queen of compliance**. The endorphins and other feel-good hormones you release keep you coming back.[8]
3. **Cardio and mental health**. Cardio is proven to have a significant positive effect on depression, anxiety and other mental health conditions.[9]

Increase cardio training ratios if:

- You want to lose fat as your primary goal.
- You want to increase lung capacity.
- You want to release endorphins.
- **You prefer cardio training** (compliance, compliance, compliance!).

Why resistance training?

When we place sufficient tension through muscle fibres to break them down, the body will repair and rebuild them in a process called **adaptation**.

Resistance training forces our body into this state.

Resistance training with good form also increases bone density and helps prevent osteoporosis as well as increasing our baseline metabolic rate. [10]

Increase resistance training ratios if:

- You want to build muscle.
- You want a stronger metabolism.
- You want to change your body shape.
- You have a specific area of your body you want to work on.
- You want to improve your posture.
- You prefer resistance training (compliance, compliance, compliance!).

Note 1: *While you can increase resistance training ratios, we would never recommend entirely replacing cardio or mobilization.*

Note 2: *Any time you increase your resistance training significantly, you should increase protein intake.*

You can learn more about resistance training in our *Exercise Handbook*, by visiting the following link: **teambodyproject.com/additional-resources/**

Why mobilization workouts?

Mobilization type workouts have a far different role to play in your overall health in that they support all other types of exercise and daily activities by improving:

- Core stability
- Posture
- Muscle engagement
- Mobility
- Flexibility

People who take part in mobilization workouts are more likely to stay free from injury and improve performance in all other workout types.

Mobilization is the ultimate long-term gain exercise type.

Nobody who has ever followed a mobilization plan has regretted it.

Increase mobilization training ratios if:

- You want to improve posture.
- You want to improve flexibility.
- You want to increase mobility (strength through a range of motion).
- You want to develop better core strength.
- **You prefer mobilization training** (compliance, compliance, compliance!).

Training intelligence

Workouts do not change your body, **you** do. Workouts are the map you need to follow to reach your destination.

While 'just' working out will achieve good results, developing training intelligence will speed up and even transform your outcomes within the same time frame.

An intelligent approach to exercise will have a significant impact on the results you achieve.

1. Quantity and quality of muscle tissue.
2. Increase or decrease calories burned and fat utilized.
3. Widen range of motion and minimize injuries.

Intensity

Let's take a look at the overall intensity we can apply to any workout.

Intensity levels

1. **Going through the motions (LOW effort)**

Turning up, completing the movements (with use of gravity and safe momentum) and getting it done. Going through the motions is a fine way to train some of the time, certainly in the early part of your exercise journey.

Compliance is the leading predictor of results, making turning up more important than anything else within this manual.

For all the science and precision, turning up every day is the number one predictor of long-term success.

2. **Doing it! (MEDIUM effort)**

You're not taking it easy, but you're not taking it to the limit either. This is where most of your workouts will probably be.

3. **Taking it to the limit (HIGH effort)**

This is the effort given when you push everything off the scale, out of the park. Every pain barrier is breached with every rep, and every set drained and executed for every last ounce of benefit.

Intensity is the overall effort you put into a workout.

Not every workout should be completed at level 3. In fact, this would be considered a bad rather than a good thing. Intelligence is the balance between intensity levels.

Tension

Tension drives results with resistance training.

Set quantities, rep speeds, weights (or load) and total reps are designed to vary, increase, decrease and influence the type of tension your muscles experience.

Without placing muscles under tension, you are just moving your muscles and ligaments around the joint. This is great for mobilization and activation, but if you want to improve the tone, strength or shape of your muscles you will need to force adaptation by applying tension to break the muscles down.[11]

Continuous tension overloads the working muscles and forces the body to adapt.

Rob

When muscle is broken down, Rob comes and builds it back stronger and better. If it's not broken, Rob won't fix it!

So break it!

Muscular engagement

During resistance workouts you must learn to keep your muscles under tension through both the **concentric** (against gravity) and more importantly **eccentric** (with gravity) part of the movement.

Think of a press up.

By bending your elbows and going towards the ground you are being assisted by gravity, meaning this part of the movement could actually happen with no effort. You could literally fall through the eccentric part of the movement with gravity assisting you.

Slowing this movement down by controlling and engaging the muscle to work against gravity is imperative for best results.

We call this eccentric control. You can either engage your muscles to fight against gravity through the movement to generate results or you can allow gravity to do the work for you and give the eccentric half of your resistance results away.

The drive up against gravity (concentric) requires muscular effort, so there is always a forced contraction, but an additional focus on muscle engagement remains important to maximize engagement and tension and minimize momentum.

Important: Whenever you are confused which part of the movement is concentric and which part of the movement is eccentric, simply consider which part of the movement is **against** gravity and which part is **with** it.

Understanding how to use your muscles correctly during movements, how to dial up intensity on cardio and how to move between effort levels, combine to create **training intelligence**.

Once you have developed training intelligence, every workout, regardless of difficulty level, changes depending on how you approach it.

Example:

On a day when you are feeling a little fatigued you have a few options:

- A high level workout at 1 – **low effort**
- A medium level workout at 2 – **medium effort**
- A low level workout at 3 – **high effort**

I find the least personal benefit and sense of satisfaction from choosing a high level workout at effort level 1 and the most benefit from a low level workout executed at level 3, but every choice has a place.

On the other end of the scale, never underestimate the benefits of a level 1 or 2 workout completed with excellent muscle control and tension with level 3 effort.

Of course, the most difficult workout would be high level with level 3 effort, but developing the intelligence to understand what the intention behind the workout is on any given day will produce more diverse and enjoyable results.

Rest and active recovery

How long should I exercise per week?

As a guideline, between 150 minutes (20 minutes per day) and 450 minutes (60 minutes per day) of focused exercise per week is recommended.

Twenty minutes of exercise a day is sufficient to change your physiological environment to a fat burning/muscle building one. This is why we can expect great results from shorter durations of exercise.

So what is the difference between exercising for 20 minutes and 45 minutes?

1. **Calories**. The less you exercise you do, the more consideration you have to give to the amount of food you consume.
2. **Progress**. Your fitness levels, strength and other benefits will not happen as quickly.
3. **Speed of fat loss**. Since the body has less exercise-induced muscle damage, it also has less need for protein substrates and therefore less need to mobilize fat as a fuel resource.

What if you decide to exercise for MORE than 450 minutes a week (around 60 minutes a day)?

At up to 60 minutes per day you will be in a more consistently positive metabolic environment, with a higher calorie burn and a good speed of both progress and fat loss.

However, your body has a limit (that will vary from person to person) on the amount of protein it can synthesize for repair and the amount of fat it can mobilize for energy per week.

For this reason, beyond 60 minutes of exercise, you will experience negligible gains, and would require additional calories in order to support your additional training without losing muscle.

Unless you have specific performance goals, like training for a marathon or competing in sport, training beyond 450 minutes per week will simply increase your food bill and increase your risk of overtraining.

Exercise spread

We have a preference for your total exercise being spread over the week, based on two factors:

1. The psychological habit benefits of daily training.
2. The physiological metabolic benefits of daily training (fat burning/muscle building environment).

Training for 90 minutes twice a week is great if it fits your lifestyle, but it falls short on the above points when compared to 30 minutes, five times a week.

Active recovery versus sedentary recovery

Some people do very well on sedentary rest whereas others thrive on active rest.

Active rest is any gentle exercise-based activity on a rest day. Some people find the physiological benefits of active rest are more positive than sedentary rest, alongside experiencing the psychological benefit of doing something.

A light swim, a meandering bike ride, a gentle workout or a brisk walk would be good examples.

Sedentary rest should be self explanatory. Put your feet up for a well-earned break! Just as many, if not more people find the physiological and psychological benefits of total rest to be greater than active rest.

There is no difference in long-term results, regardless of the type of rest you choose, so choice should be driven by compliance and personal preference.

What we strongly recommend against is no rest. In any given seven day period a minimum of one day should not include intensive exercise.

Note: *Active rest should NOT be calculated in your total exercise time.*

Longer planned rests

Having a week or two off for total rest a couple of times a year is fine, provided compliance is returned to, but equally there is no specific benefit to having long breaks from movement-based activity.

While extended total rest from exercise has no specific benefits, it is important to take your foot off the gas every couple of months with a period of less challenging workouts.

You cannot keep pushing your body, week after week, and expect it to continue making progress.

We recommend a week of lighter exercise every 6-8 weeks to prepare your body for the planned progress ahead.

These lighter periods will also help you avoid forced rests through overtraining or injury.

Understanding exercise recap

Key points:

- Exercise is essential for fat burning and muscle building.
- Cardio burns the most calories and also offers other health benefits.
- Resistance encourages muscle growth and superior repair.
- Mobilization reduces injuries and improves performance.
- Training intelligence – intensity and time under tension improve results.
- Planned rest times are important.

Things to do:

- Decide on an exercise plan that supports your goals.
- Practise the tension and intensity principles.
- Build in rest times.

Transform for Life – The Blueprint will help you choose the right exercise programme for your fitness levels and goals.

THE IMPORTANCE OF NEAT

Non-Exercise Activity Thermogenesis (NEAT) is activity beyond your focused exercise and natural metabolism. It's a combination of your normal daily activity, your posture and your general movement – anything that uses energy beyond deliberate exercise and your baseline metabolic rate (BMR).

While people do have BMR differences, research indicates that the variance in resting metabolic rate from person to person is small (up to 300 kcal between the fastest and slowest metabolisms in people of similar height and weight and without thyroid conditions).[1]

On the other hand, research shows the difference in NEAT is estimated to be between 200 and 500 kcal and even as high as 2,000 kcal in exceptional circumstances.

NEAT matters a lot. How many steps you walk, what you do when the adverts come on the telly, whether you take the stairs or the lift, how you fill your break times at work, what activities you do with the kids, how much you fidget, what you do when your train is running late.

If you're trying to lose weight, NEAT could be factored in as an essential part of your daily activity. NEAT is not spontaneous in the majority of the population, it needs to be planned like everything else.

An extra 250 kcal from NEAT alongside an extra 250 kcal from your work out means you have burned an additional 500 kcal. That's 3,500 kcal a week, which could equates to around 1 lb of body weight.

To improve your NEAT:

- Buy a tracker
- Make good choices
- Be active

Moderate versus Low NEAT over 12 weeks:

	Person 1	Person 2
NEAT	Moderate NEAT +500 kcal per day	Low NEAT +250 kcal per day
Calorie intake	1,500 kcal	1,500 kcal
Exercise	30 minutes = 250 kcal	30 minutes = 250 kcal
Weekly difference	1,750 more burned	1,750 less burned
12 week weight difference	Lost 6 lb (3 kg) more than person 2*	Lost 6 lb (3 kg) less than person 1*

*assuming 3,500 kcal = 1 lb in body weight

The difference between a low and a moderate level of NEAT over 12 weeks was 21,000 kcal.

In terms of food that would be:

- 50 cheeseburgers (400 kcal)
- 100 bags of potato chips (210 kcal)
- 400 slices of bread (52 kcal)

In terms of exercise it would be:

- 84 cardio workouts (30 minute sessions)
- 150 Pilates workouts (30 minute sessions)

NEAT is a **very** important aspect of your overall health plan that can make the difference between long-term success and long-term struggle.

Factor it in!

Subconscious NEAT

A seldom discussed but crucial factor in weight management is the different effects higher and lower food consumption has on certain body types/people and NEAT*. [2]

Ectomorphs – Ectomorphs have smaller bone structures and longer limbs. The increased 'speed' of an ectomorph's metabolism is less to do with BMR and more closely linked with increased NEAT. An ectomorph may often struggle to gain weight because they subconsciously 'move more' when they eat more calories. While it may seem that an ectomorph has a faster metabolism, often what they have is an insatiable need to burn what they consume.

Endomorphs – Endomorphs have a larger bone structure, with shorter limbs. This body type is considered by some to have higher propensity to gain weight.

Additional calories consumed do not result in an additional 'need' to burn off calories, making weight gain common. Furthermore, when fewer calories are consumed, endomorphs may subconsciously 'move less'. Creating the false belief that the metabolism is too slow.

This is why tracking NEAT is so important.

Ectomorphs (or some people) = Eat more, move more. Eat less, move the same.
Endomorphs (or some people) = Eat less, move less. Eat more, move the same.

Visit pages 179-80 in *The Blueprint* for more information on body types.

*Body types is a somewhat controversial area. There are understandable points of contention around whether the body type itself is a relevant factor in influencing subconscious NEAT (or anything else for that matter).

However, there is no doubt that subconscious NEAT itself is an important factor, regardless of your body type and whether this influences your choices - NEAT must always be factored in.

Lily's Laws 10

Good news! Lily just found a NEW universal law of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- Drink enough water
- Eat plenty of vegetables
- Limit processed food intake
- Exercise to stimulate muscle growth and fat loss
- **NEAT is an important aspect of your metabolic rate**

The importance of NEAT recap

Key points:

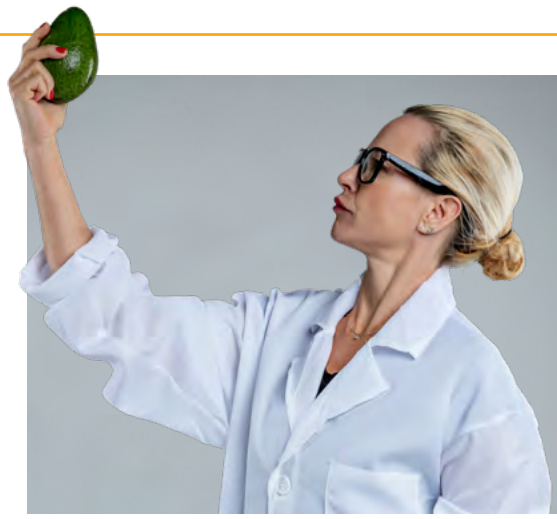
- NEAT is the activity we do beyond focused exercise.
- It is not catabolic so can be increased with confidence.

Things to do:

- Buy or download a tracker.
- Find out how much NEAT you do.
- Increase levels to help you achieve a calorie deficit.

Transform for Life – The Blueprint will help you choose the right amount of NEAT.

POPULAR DIETS



Every year, it seems there is a new popular diet that everybody is trying.

Rule 1 of nutrition: If a diet is in fashion, probably don't follow it.

What looks stylish today, looks dated tomorrow. The classics stay around for the long haul, which is why I can still wear my flares.

The nutrition classics of macronutrient balance, calorie control, plenty of vegetables and limiting processed foods never go out of fashion.

That is not to say that popular diets can't be effective, but if you are going to follow one, do so with your eyes open.

Clean eating

A few years ago, a number of celebrities and fitness professionals put their weight behind a concept that became known as **clean eating**.[1]

This concept was paired heavily with the idea of **superfoods** – foods with a higher than average nutrient density – and the idea that sugar was responsible for pretty much everything, from weight gain to global warming and rising taxes.

What is clean eating?

Clean eating is the consumption of foods that are whole and unprocessed. An easy way of identifying a clean food is checking if it fits into one of the following categories:

- It flew (like a bird)
- It ran (like a pig or chicken)
- It swam (like a fish)
- It fell or was picked (like an apple or a coconut)
- It grew (like a potato or a turnip)

Most will consider that grains, like rice, oats and quinoa are clean but some will not. Overall the closer to the original state the food is, the cleaner it is.

Example: unprocessed meats like chicken breast, are considered to be cleaner than processed ones, like chorizo.

Dirty foods would be foods that have been processed or refined in any way. The more refined or processed they are, the dirtier they are.

Note: *I know, I know, 'dirty' foods sound so naughty and exciting.*

These include:

- Most breakfast cereals
- White bread, pasta and rice
- Confectionary
- Processed meats
- Pastries, potato chips and cookies

Of course, any sensible person will tell you that no food is dirty and no food is clean. Some foods have higher fibre, less sugar and more nutrients. Some foods support our health and some foods, eaten in large amounts, can be damaging to our health.

They aren't clean or dirty, although a part of me wishes they were.

Benefits of clean eating

When viewed in the context of weight loss and transformative health, clean eating offers a few specific benefits **if** it can be adhered to:

- High fibre content
- High nutrient value
- Lower requirement for tracking due to superior hunger signalling, low calorie density and increased fibre content

The most interesting of these is the lower requirement for tracking. In my experience, those who adhere to a 100% clean eating protocol have less need for tracking than those who do not. They do, however, still need to take baths. Clean eating does not extend to overall hygiene.

Should I follow clean eating?

A diet that is high in trans fats, sugars and salt and low in fibre and nutrients is bad news for your health and weight, which is why any sensible dietician or nutritionist recommends a predominance of calories from healthy sources.

While there are proven health benefits to ensuring a minimum of 70% of food comes from healthy sources, there is no evidence to suggest that complete elimination of dirty foods creates additional benefits.

People who have no interest or desire to eat processed foods or drink alcohol and do not wish to spend any time tracking intake can consider clean eating as a solution to weight management.

In my experience, there are very few people who would find this to be practical or desirable.

It is better to take all food into account and create a health plan based around eating a predominance of healthy foods in context with your goals, emotional eating habits and tastes.

Benefits of clean eating

- Very healthy
- Tracking becomes less important

Problems with clean eating

- Can cause an unhealthy relationship with food
- Difficult to maintain for most people

Important: Is sugar addictive?

The science on sugar has historically been clear.

Sugar does not have the *physiological* addictive properties of cocaine, nicotine or alcohol, nor does it have the severe withdrawal symptoms that would be experienced when refraining from these substances. [2]

On the other hand, I have witnessed sugar to have stronger *psychologically* addictive qualities than almost anything else. Some people have an overwhelming dependency on sugar to numb emotions, cope with difficult situations or change the way they feel.

On top of this, neuroscientists have recently shown that sugar leads to the release of dopamine and overconsumption leads to tolerance so increasingly large levels are required to experience the same dopamine effect. This would seem to mimic some of the hallmarks of drug addiction.[3]

It is understandable that those who consider themselves 'sugar addicts' often see the best solution to avoid it at all costs.

The problem with this ultimate solution is that it has a less than 1% long-term success rate as any reintroduction of sugar to the diet is perceived as failure and triggers uncontrollable rates of consumption.

My personal challenge has historically been sugar. I would spend months abstaining from sugar, only to succumb to outrageous binges the moment a tiny morsel of sugar passed my lips, playing '*With or Without You*' on full volume to let the sugar know exactly how I felt about our relationship.

Despite some substantial evidence to the contrary, I felt convinced it was physiological and I was addicted it.

Breaking the negative sugar cycle

Certain foods with sugar in them taste **really** good. There is nothing wrong with eating food for reasons that extend no further than enjoyment of taste. Refined sugar has no nutritional benefits that cannot be obtained from healthier sources, but that does not mean it shouldn't be consumed, simply that it shouldn't be consumed in excess.

Getting caught up in whether it is or isn't a physiological addiction is not particularly useful, so we need to look towards the information that can support us in change.

1. **Less than 1% of people successfully live without sugar for the rest of their lives.**

Very few people will successfully abstain from sugar for life. If we seek this route we set ourselves up for failure. Therefore, declaring ourselves to be physiological addicts that must abstain entirely has no benefit regardless of whether it is true.

2. **Many people who perceive themselves as sugar addicts are eating reasonable levels of sugar within a healthy diet.**

I can include myself in that statistic. I have witnessed many thousands of people successfully break the sugar cycle. Whether they were caught by psychological or physiological addiction is far less relevant than whether they can break it.

And they can.

How to break the sugar cycle

If you are a sugar addict, the greatest challenge you will have in your diet will be eating sensible amounts of it.

The longer you live without sugar, the greater the propensity for uncontrollable rebound consumption.

This proven system has been used to break the sugar cycle many times:

1. A short period of total abstinence

You won't be surprised to learn that total elimination in the long-term is a bad idea, but short-term abstinence to reset tolerance, insulin levels and take control of the sharp end of emotional eating habits is beneficial. This can last anywhere between two and six weeks.

2. Reintroduction of sugar

When you feel ready, it's time to take consideration of foods you want to consume in the longer-term and introduce them in smaller quantities and at times you decide you will eat them.

Many people are frightened of reintroducing sugar, but if the reintroduction is not planned and prepared for, one of two things will happen:

Emotional reintroduction

Sugar gets reintroduced to the diet in an emotional way and the pattern of emotional consumption of sugar resumes.

Relaxed reintroduction

Sugar gets reintroduced at a time when you are relaxed and unprepared for the dopamine. You roll back into Binge Town.

By reintroducing sugar to your diet on **your** terms, you are reshaping your relationship with sugar and teaching yourself that you can have healthy amounts.

3. Letting go of isolated incidents

Some people experience isolated incidents when they binge on sugar the same way some people come home after a very difficult day and drink a bottle of wine. This does not make them alcoholics.

Having an incident does not make you an addict, it makes you human and vulnerable to the ups and downs of life in the same way as everybody else. If this happens it is not important. What is important is that you do not allow sugar binges to become habits.

By following this plan, over time you will develop a healthy relationship with sugar that is directly in line with your personal long-term goals.

Vegan

What is Vegan?

A vegan diet is the exclusion of all animal products, including cheese and eggs. This has become an increasingly popular dietary approach in the last few years.

My wife, Alexandra, is vegan. I would like to be vegan but struggle without any animal products, so instead consume as few as I can. I eat fish twice a week and eggs twice a week.

I am a vegan who eats fish. And eggs. This actually makes me not vegan. Don't tell anybody!

We do not claim that a vegan diet is the **best** diet for health. Although there are benefits, which we will discuss below, there are challenges too. With a few observational exceptions linked to certain types of cancers and other diseases, there are no benefits you can get from a vegan diet that you cannot get from an alternative diet. We choose to eat vegan (yes, yes I know, I'm not vegan) because we believe it is possible to eat a healthy diet without animal products and this is important to us, ethically.

Our personal choice and preference towards being vegan has nothing to do with overall health and we certainly don't fly around the world, emitting large amounts of carbon into the atmosphere, explaining to people that eating vegan is better for the environment.

Benefits of eating vegan

A good vegan diet, especially one that is high in plant-based foods, scores very well on satiety factors, as vegetables and fruits especially are voluminous and take up plenty of space in the digestive tract.

Vegan foods are also packed full of nutrients, vitamins and minerals, scoring very highly on nutrient density. I have found that many vegans struggle to eat **enough** calories, which could be seen as a benefit in the short-term (and a problem in the long-term – what do you reckon, Rob?).

The potential health benefits of vegan diets are exciting, including reported observational improvements around heart health, reduced cancer risks, improved kidney function and reduced chances of Alzheimer's.[4,5]

As current studies have been observational, conclusive studies to confirm that a vegan diet is causing these effects simply don't exist. There is no way of knowing if it is other lifestyle factors that vegans share, such as being more likely to exercise or less likely to eat high levels of processed foods, smoke or drink alcohol, that are behind these benefits. Regardless, a good vegan diet is an excellent choice from an overall health perspective, and provided protein is consumed correctly and supplementation is considered for any potential deficiencies, this is a diet that can help you lose weight and be healthy.

Problems with eating vegan

A good vegan diet needs to be carefully planned and considered. Poorly planned vegan diets often present with nutrient deficiencies. People who succeed with a vegan lifestyle in the long-term have a solid understanding of the diet and how to ensure it works for them. This diet is not a magic bullet.

Vegans can be more at risk of having low levels of vitamin D, vitamin B12, omega 3s, iron, calcium and zinc, although most of this would be associated with poor quality vegan foods. A vegan diet is only good if you eat high quality vegan foods. If you eat a predominance of junk vegan foods it is every bit as bad as any other diet and a poorly planned vegan diet can be **very bad** indeed.

The heart benefits, reduced cancer risks and other benefits are associated with eating high nutrient foods in exactly the same way a non-vegan diet is. In most instances vitamin B12, D vitamins and omega 3s are recommended to supplement a vegan diet.

Should I follow a vegan diet?

There is no strong reason you shouldn't, but on the other hand there is no strong reason you should. The overall health benefits of a good vegan diet stem from the same key points that all healthy protocols share.

Lily's Laws

Lily wants to remind you of the universal laws of change.

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- Drink enough water
- Eat plenty of vegetables
- Limit processed food intake
- Exercise to stimulate muscle growth and fat loss
- NEAT is an important aspect of your metabolic rate

If you don't like meat, fish or animal products or find it important for you ethically not to eat animal products this is an excellent diet to follow.

If you love eating animal products, this is a dreadful diet. For you.

Benefits of eating vegan

- Plenty of promises around reducing disease.
- Low energy density/high nutrient density.
- Animal welfare and environmental benefits.

Problems with eating vegan

- Can be as bad as any other diet.
- Needs work to get it right.
- Can cause deficiencies very easily.

The ketogenic diet

The Kettle-genic diet

The Ketogenic diet is not to be confused with the Kettle-genic diet, a popular diet in Great Britain on building sites, industrial estates and offices.

Those following the Kettle-genic diet insist on having the kettle on at all times, drinking eight or more cups of tea a day. This harmful fad diet can potentially cause excess biscuit consumption.

What is it?

A ketogenic diet is a diet that places the body into a state called ketosis, whereby fats are burned instead of carbohydrates for use as energy. A ketogenic diet requires the consumption of high amounts of fat, adequate amounts of protein, and very low amounts of carbohydrates.

Important note: *A ketogenic diet is not the same as a high-protein diet, where un-utilized protein can go through a process called gluconeogenesis, converting protein to glucose and preventing ketosis.*[6]

How it works?

Once the body is depleted of stored glucose and glycogen, it transports fat into the liver and produces ketones that can be used for energy, even for tasks that would normally be the preserve of carbohydrates, like brain function.

There is usually a difficult period in this diet prior to the body releasing ketones and after stored glucose and glycogen is depleted. However, once this is broken through, the body will be functioning perfectly well in the absence of insulin and glucose.

A high level of circulating glucagon and low levels of insulin make this diet **very** effective at targeting fat stores for energy.

From a simple weight-loss perspective a ketogenic diet is very effective.

Note: *If you are going to follow a ketogenic diet, do it properly.* ***You must eat at least 70% fat.***

Problems with eating a ketogenic diet

The ketogenic diet promises faster fat loss results than most other diets, but there are drawbacks.

At least 95% of people cannot sustain this diet in the long-term.

You may be one of the 5%, and for this reason I would never suggest that you shouldn't try it. If you decide to, please do seek alternative advice from your doctor or a dietician to check you have no conditions that would contraindicate it.

This diet is NOT advised within *Transform for Life* recommendations.

The science on whether or not a ketogenic diet can work in the long-term seems to be getting stronger. Followers will insist it is great, where opponents will insist it is harmful, but again, we need to look beyond the science and towards the compliance.

1. **Sustainability**: Most people cannot follow this diet in the long-term.
2. **Restrictive**: It seriously limits choice.
3. **Performance**: High-intensity workouts become much harder.
4. **Muscle growth**: Protein synthesis in the absence of insulin is much slower.

Conclusion

The ketogenic diet stands in direct opposition to some of our recommendations, but it can be effective. However, for most people, there are more balanced ways of achieving long-term results.[7]

When people ask if a ketogenic diet can work, my answer is usually yes, but there is almost certainly a more sustainable, individual and balanced way for you to approach transformative nutrition. Most diets are successful for the same reasons.

Lily's Laws

Lily won't let go of this now!

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- Drink enough water
- Eat plenty of vegetables
- Limit processed food intake
- Exercise to stimulate muscle growth and fat loss
- NEAT is an important aspect of your metabolic rate

Benefits of the ketogenic diet

- Promotes fat loss
- Can be positive for those with insulin sensitivity and sugar 'addiction'
- Often removes large amounts of processed foods by default

Problems with the ketogenic diet

- Poor performance
- Low compliance
- Highly restrictive
- Poor muscle growth

Intermittent fasting

What is intermittent fasting?

Intermittent fasting is fasting applied intermittently. Yup, it does exactly what it says on the tin.

It is the opposite of the 'little and often' approach since it is more focused on longer periods without food alongside larger portions when we are eating. We could call fasting *more food, less often* but that isn't as marketable as intermittent fasting, so nobody does.

This *more food, less often* approach may be skipping one meal a day, having whole days with no meals or any number of varying durations of 'fast' and 'feast' in between.

There are three main ways people approach fasting:

1. Meal skipping

Skip a predetermined amount of meals in a week with the ultimate goal of eating fewer calories. Example: Skip breakfast every day.

2. Total day fasting

Limit your calories to approximately 500 kcal on fasting days and avoid exercise on these days.

3. Shrink the eating window

Reverse the amount of time in your day to include eight hours of eating time and 16 hours of fasting time (usually paired with specific exercise-led nutrient timing and fasted cardio).

Benefits of intermittent fasting

When fasting, we deplete the body of glucose and stored glycogen within the muscles and start the process of releasing glucagon and freeing fat for energy from stores.[8]

Provided you are not exercising on fasting days this could be positive. If you do exercise on a fasting day, Rob won't have any materials to work with. So it's probably best you don't.

In some ways flux is a less extreme version of the intermittent fasting protocol. Intermittent fasting creates an overall calorie deficit, with the deficit being created in fasting periods, rather than in a more steady way.

For some people this is a more convenient method of creating an overall calorie deficit.

On top of this, there are benefits unique to fasting beyond caloric reduction:

- It teaches discipline.
- You learn hunger management.
- It develops craving control.
- It helps us understand the difference between physical hunger (body hunger) and psychological hunger (appetite), covered in the *Emotional eating guide* (pages 128-137) in *The Art of Change* section.

Problems with intermittent fasting

Despite what some may say, intermittent fasting does not allow you to escape the fundamental rules of health and weight management.

Any suggestion that provided you have fasting days you can eat whatever you want the rest of the time, is not accurate.

There are potential issues with fasting too:

- **Sleep**: Many people report poor sleep on fasting days.
- **Muscle loss**: With such low calorie amounts, the body can start raiding muscle stores to convert to energy (Klong gets bored when he's free for too long).
- **Energy**: Fewer calories means fewer nutrients which can mean less energy.

Some people experience all of the above problems, some experience none. As always, the only way you will know is by trying it yourself.

Compliance is another factor to consider. For some people, staying compliant on fasting days is impossibly hard and this would rule it out immediately.

Conclusion

Net calorie deficit, macronutrient balance, regular exercise and a predominance of high quality food will always remain the priority for health and long-term weight management.

Fasting does not allow us to circumvent the laws of thermodynamics, it simply provides us with a different method of creating calorie balances and imbalances.

The initial choice as to whether intermittent fasting is right for you is best based on the following factors:

- Whether it is easier for you to implement within your lifestyle and circumstances.
- Whether you find it easier to miss meals than count calories or track portions (after a baseline is established).
- Whether you find fasting easier to comply with than other methods of health management.

Positives of fasting

- Teaches good hunger management and craving control.
- Promotes glucagon release and fat loss.
- Can be a simple method of creating a calorie deficit.

Negatives of fasting

- Many people report poor sleep on fasting days.
- With such low calorie amounts, the body can start raiding muscle stores to convert to energy.
- Less calories, means less nutrients which can mean less energy on fasting days.
- For some people, the compliance on fasting days is impossibly hard.

Paleo diet

The Paleo diet is a modern diet requiring the exclusive consumption of foods presumed to have been the only foods consumed by early humans during the Paleolithic era.

Suggested make up of a standard Paleo diet (there are variants):

- 55% of daily calories from seafood and lean meat, evenly divided.
- 15% of daily calories from each of fruits, vegetables, and nuts and seeds.
- No dairy, almost no grains, no added salt, no added sugar.

This diet is usually particularly high in protein, which makes it different from the ketogenic diet, which is high in fat.

Benefits of a Paleo diet

As is consistent with all healthy diets, the main benefits come from an increased amount of vegetables, quality proteins and fats and a reduction in processed foods.

This is a standard theme in many diets and is also true of the Paleo diet, which is simply a brand attached to a way of eating fewer processed foods, higher amounts of vegetables and specifically the elimination of grains which were not available in the Paleolithic era. The benefits of this healthy diet are based on consistent factors, regardless of what it is called.

Problems with the Paleo diet

Knowledge of ratios of animal and plant foods in the diets of early humans is circumstantial and highly debatable, making the theory behind this diet questionable at best. However, the theory behind the diet is somewhat irrelevant as the diet itself is healthy, with similar components to the Mediterranean diet.

There are potential deficiencies in vitamin D and calcium, but this is avoidable with a sensible approach. The main problem with the Paleo diet, like clean eating, is the restriction it places on the participant. Making certain foods contraband creates feelings of guilt based on unsubstantiated evidence suggesting that consumption of grains or any processed foods is responsible for disease. Processed foods usually have lower nutritional density, higher sugar, higher trans-fat and higher sodium levels and this makes them less healthy than non-processed foods. Eating them in high levels is proven to be bad for your health; eating small amounts is not.

Conclusion

The concept behind this diet is based on unsubstantiated evidence but the diet is good.

Is it sensible to increase the amounts of fruits and vegetables and reduce quantities of domesticated grains? On balance, it probably is and for certain autoimmune diseases, such as celiac, it can be a very important dietary change.

Is it sensible to reduce processed foods in our diets? Yes.

Is this the way Paleolithic populations ate? I don't know. I imagine they ate whatever they could get their hands on, including mud, beetles and stinging nettles if they were hungry enough.

Were Paleolithic populations healthier than we are now? I have no idea, but then nor does anybody else.

Once again, if the overall make-up of the Paleo diet suits your palate, lifestyle and goals, there is nothing to suggest it is not a good diet to follow. You can call it whatever you like. Including Paleo. If you want a real caveman diet, I've got a lovely slug and nettle soup on the boil. Provided we don't tell Lily about the 'theory' behind this diet, I'd say she would like it.

Lily's Laws

- Calorie balance
- Anabolic and catabolic flux
- Sufficient carbohydrates
- Sufficient protein
- Sufficient fat
- Drink enough water
- Eat plenty of vegetables
- Limit processed food intake
- Exercise to stimulate muscle growth and fat loss
- NEAT is an important aspect of your metabolic rate

Positives of the Paleo diet

- High protein levels for muscle repair
- Lots of vegetables and fruits
- Limiting on processed foods

Negatives of the Paleo diet

- Highly restrictive

Popular diets conclusion

The YOU diet

If you choose to eat a diet with a predominance of processed foods with an understanding of the associated health consequences, you can do so. Regardless of how many 'bad' foods you are eating, if you control your calorie intake, you can still manage your weight, although managing your body composition will be much trickier.

Conversely, if you choose to eat a diet that eliminates an entire source or type of food, you could do this too. Provided you understand and feel comfortable with any potential consequences that permanent restrictions may produce, there is nothing to suggest this would not be the best method for you.

In my experience, 99% of people find success sits somewhere between these two extremes. Food is not good or bad, clean or dirty. It is just food. Some foods can protect against disease and some foods can contribute to it. Some foods are highly nutritious and some foods are full of trans fats, sugars and sodium.

Transform for Life will help you create a diet that works for you, in line with your goals, your ethics, your preferences and your compliance capabilities.

This is the only diet that matters.

By tracking and measuring how we are responding, both psychologically and physiologically, to foods and exercise, we can adapt accordingly.

The variables – macronutrient ratios, healthy food ratios, calorie quantities, flux ratios, exercise quantity and type – will vary from person to person; there is no right answer.

Find your own **Goldilocks zone** where your desired results pair with a diet and exercise routine that is both sustainable and enjoyable for you.

This is the **YOU** diet.

If you want to call it the *'Dirty Diet'* you have my absolute approval.

THE LAWS OF CHANGE

All living organisms must continuously consume and break down food to survive. Food supplements us with the raw materials we need.

While **catabolism** is constantly breaking down our muscle tissue and fat, **anabolism** is constantly building new muscle and hopefully, a little less fat.

This never-ending process is the function of our metabolism. It never stops.

In your lifetime you will synthesise around 990 lb (450 kg) of protein.

If you weighed 165 lb (75 kg), that would mean you entirely rebuild yourself, from scratch, six times.

This opens an exciting door of opportunity – through food and exercise you can rebuild your body to be a healthy one.

Yet in the process of getting healthy we become so focused on the breaking down fat that we forget building is an important element too.

The fundamentals we have discovered in these chapters can be applied to our own body to create the personal *Blueprint* for our health. Through these fundamentals we can:

1. Get rid of unwanted, ineffective and unhealthy fat (with Klong).
2. Build healthy, lean muscle tissue (with Rob).
3. Have more energy, feel better and change our lives.

Below I have outlined the fundamentals of change that should be followed to ensure sustainable results.

Then I have outlined the secondary laws of change that while important, can be seen on a sliding scale of application.

Fundamentals of physical change

Law 1: To lose weight you must be in a calorie deficit (hypocaloric)

Whether this deficit is created by fewer calories or more exercise, this law is absolute. If you are not in a deficit, you will not lose weight.

If weight loss is your goal, your blueprint must focus around this singular concept. Every other law is based around the quality (body composition) and sustainability (compliance and metabolic factors) of your weight loss.

Note: *To gain weight you must be in a calorie surplus (hypercaloric).*

Law 2: Calorie flux; chronic exposure to calorie deficits will compromise anabolic processes

On the one hand, we must have a calorie deficit if we want to lose weight, but on the other hand we need to ensure our body is releasing hormones and has sufficient protein substates to repair and improve healthy tissue. We manage rebuilding within an absolute deficit through calorie flux.

Law 3: Forced adaptation through exercise

Exercise places your body in 'fat burning and muscle building' mode. The body evolves based on stimulus. If you want to lose fat and not muscle, exercise is essential.

Law 4: Food quality and hydration

A predominantly 'healthy' ratio of foods will support your results. Eat plenty of vegetables and stay hydrated.

Try and keep your ratio of healthy food as high as you can while ensuring you are enjoying your meals.

Law 5: Compliance rules them all

If we presented the first four laws to an android, it would achieve entirely predictable results every time. Humans are not so compliant; this is what makes us interesting but also what makes us less predictable.

Every food you eat, every workout you do and every method you implement relies on your ability to be compliant with it in the long-term. The compliance factor permeates through every page of this book and should be infused into your *Blueprint*.

- 95% compliance on an 80% 'good' plan gets incredible results.
- 50% compliance on a 100% 'perfect' plan gets no results.

Be consistent, not perfect.

Weight loss and baseline body composition factors are impacted by primary laws of physical change. Specific results and outcomes are impacted by the secondary laws.

Secondary laws are very important to your physical improvements, but the extent to which they matter is variable and your application of them negotiable.

If you want to have visible abs and a very toned body, you will need to pay closer attention to them than if you want to lose a little weight and live a balanced lifestyle.

When it comes to secondary laws, it is imperative you line up your expectations with your behaviour.

You cannot expect the same results eating 70% healthy foods and exercising for 20 minutes a day as you can when eating 95% healthy foods and exercising for 60 minutes a day.

Secondary laws of physical change

Law 1: Macronutrient ratio

You will need a minimum level of protein to ensure muscle retention, especially in a deficit.

Carbohydrate tolerance will be varied and higher ratios could promote fat storage, but support energy and performance.

Higher fat ratios promote glucagon production but could compromise performance.

Your ideal ratio will change over time and depend on your goals. The only way to know which ratio is right for you is to try it.

Law 2: Type and quantity of exercise

A. Cardio will promote a higher calorie burn, putting a larger dent in your deficit (as well as offering heart, lung and emotional benefits).
B. Resistance will promote muscle repair and adaptation. Progressive overload will keep the evolution cycle moving forwards.
C. Raise your NEAT.

Law 3: Satiety and calorie density

Eating foods that make you feel full and satisfied will make controlling your overall caloric intake much easier.

There are many ideas and concepts beyond these laws that you will learn both in this book and on your journey. I call these 5%ers – small details that matter.

Implementing the fundamental laws of change alongside the secondary laws of change will be the key to unlocking your lifelong journey of health.

Yet the science is only half the battle. In order for the science to work, we need to make sure we do it.

This is why we need *The Art of Change*, and that is where we are going next.

Endnotes – Fundamentals of Fat Loss

[1] Payne P. R. and Dugdale A. E. "A Model for the Prediction of Energy Balance and Body Weight." Annals of Human Biology, 4 (1977):525–535.

[2] Payne P. R. and Dugdale A. E. "Mechanisms for the Control of Body-Weight." Lancet, 309 (1977):583–586.

[3] Hall K. D. "What is the Required Energy Deficit per Unit Weight Loss?" International Journal of Obesity, 32 (2008):573–576.

[4] Dugdale A. E. and Payne P. R. "Pattern of Lean and Fat Deposition in Adults." Nature, 266 (1977):349–351.

[5] Janssen I., et al. "Effects of an Energy-Restrictive Diet with or without Exercise on Abdominal Fat, Intermuscular Fat, and Metabolic Risk Factors in Obese Women." Diabetes Care, 25 (2002):431–438.

[6] Marniemi J., et al. "Metabolic Changes Induced by Combined Prolonged Exercise and Low-Calorie Intake in Man." European Journal of Applied Physiology and Occupational Physiology, 53 (1984):121–127.

[7] Mäestu J., et al. "Anabolic and Catabolic Hormones and Energy Balance of the Male Bodybuilders During the Preparation for the Competition." Journal of Strength and Conditioning Research, 24 (2010):1074–1081.

[8] Tipton K.D. and Ferrando, A.A. "Improving muscle mass: response of muscle metabolism to exercise, nutrition and anabolic agents." Essays in Biochemistry, (2008) 85-98.

[9] DeBerardinis and R.J., Thompson, C. B. "Cellular Metabolism and Disease: What Do Metabolic Outliers Teach Us?" Cell, 148 (2012) 1132:1144

[10] Kreitzman S. N. "Factors Influencing Body Composition During Very Low-Calorie Diets." American Journal of Clinical Nutrition, 56 (1992):217S–223S.

[11] Bopp, M. J., et al. "Lean Mass Loss Is Associated with Low Protein Intake during Dietary-Induced Weight Loss in Postmenopausal Women." Journal of the American Dietetic Association, 108 (2008) 1216:1220.

[12] Hagopian K., et al. "Long-Term Calorie Restriction Reduces Proton Leak and Hydrogen Peroxide Production in Liver Mitochondria." American Journal of Physiology Endocrinology and Metabolism, 288 (2005):E674-E684.

[13] Asami D. K., et al. "Effect of Aging, Caloric Restriction, and Uncoupling Protein 3 (UCP3) on Mitochondrial Proton Leak in Mice." Experimental Gerontology, 43 (2008):1069–1076.

[14] Tomiyama, A.J., et al. "Low Calorie Dieting Increases Cortisol." Psychosomatic Medicine, 72 (2010) 357-364.

[15] Rosenbaum M., et al. "Long-Term Persistence of Adaptive Thermogenesis in Subjects Who Have Maintained a Reduced Body Weight." American Journal of Clinical Nutrition, 88 (2008):906–912.

[16] Howard C.E. and Porzelius L.K. "The Role of Dieting in Binge Eating Disorder: Etiology and Treatment Implications." Clinical Psychology Reviews, 19 (1999): 25-44.

[17] MacLean P. S., et al. "Peripheral Metabolic Responses to Prolonged Weight Reduction That Promote Rapid, Efficient Regain in Obesity-Prone Rats." American Journal of Physiology – Regulatory, Integrative and Comparative Physiology, 290 (2006): R1577-R1588.

[18] Maclean P. S., et al. "Biology's Response to Dieting: The Impetus for Weight Regain." American Journal of Regulatory, Integrative and Comparative Physiology, 301 (2011): R581–R600.

[19] Helms and E. R., Aragon, A. A., Fitschen, P.J. "Evidence-based Recommendations for Natural Bodybuilding Contest Preparation: Nutrition and Supplementation." Journal of the International Society of Sports Nutrition, 11 (2014).

[20] Longland, T.M., et al. "Higher Compared with Lower Dietary Protein During an Energy Deficit Combined with Intense Exercise Promotes Greater Lean Mass Gain and Fat Mass Loss: a Randomized Trial." American Journal of Clinical Nutrition, 103 (2016): 738 -746.

[21] Davoodi S. H., et al. "Calorie Shifting Diet Versus Calorie Restriction Diet: A Comparative Clinical Trial Study." International Journal of Preventive Medicine 5, (2014): 447-456.

[22] Ravussin E., et al. "Energy Expenditure Before and During Energy Restriction in Obese Patients." American Journal of Clinical Nutrition, 41 (1985): 753–759.

[23] Doucet E., et al. "Evidence for the Existence of Adaptive Thermogenesis During Weight Loss." British Journal of Nutrition, 85 (2001): 715–723.

[24] Connolly, J., Romano and T., Patruno, M. "Effects of Dieting and Exercise on Resting Metabolic Rate and Implications for Weight Management." Family Practice, 16 (1999): 196–201.

[25] Weigle, D.S. "Contribution of Decreased Body Mass to Diminished Thermic Effect of Exercise in Reduced-Obese Men." International Journal of Obesity, 12 (1988): 567–578.

[26] Rosenbaum M., et al. "Long-Term Persistence of Adaptive Thermogenesis in Subjects Who Have Maintained a Reduced Body Weight." American Journal of Clinical Nutrition, 88 (2008): 906–912.

[27] Kresta, J. Y., et al. "Effects of Diet Cycling on Weight Loss, Fat Loss and Resting Energy Expenditure in Women" Journal of the International Society of Sports Nutrition, 7, Supp 1 (2007): 21.

[28] Correia-Oliveira, C. R. et al. "Strategies of Dietary Carbohydrate Manipulation and Their Effects on Performance in Cycling Time Trials." Sports Medicine, 43 (2013): 707-719.

Endnotes – Carbohydrates and Metabolic Flexibility

1 Rorsman P. and Braun M. "Regulation of Insulin Secretion in Human Pancreatic Islets." Annual Review of Physiology, 75 (2013): 155–179.

2 Henquin J.C. et al. "Hierarchy of the Beta-Cell Signals Controlling Insulin Secretion." European Journal of Clinical Investigation, European Journal of Clinical Investigation, 33 (2003): 742-750.

3 Ramnanan C. J., et al. "Physiologic Action of Glucagon on Liver Glucose Metabolism." Diabetes, Obesity and Metabolism, 13 (2011): S118-125.

4 Cooperberg, B. A. and Cryer, P.E. "Insulin Reciprocally Regulates Glucagon Secretion in Humans." Diabetes, 59 (2010): 2936–2940.

5 Kelley D. E. "Skeletal Muscle Fat Oxidation: Timing and Flexibility Are Everything." Journal of Clinical Investigation, 115 (2005): 1699-1702.

6 Kelley D. E., et al. "The Effect of Non-Insulin-Dependent Diabetes Mellitus and Obesity on Glucose Transport and Phosphorylation in Skeletal Muscle." Journal of Clinical Investigation 97 (1996): 2705-2713.

Endnotes – The Role of Protein

1 Meredith C. N., et al. "Dietary Protein Requirements and Body Protein Metabolism in Endurance-Trained Men." Journal of Applied Physiology, 66 (1989) 2850-2856.

2 Fontana L., et al. "Effect of Long-Term Calorie Restriction with Adequate Protein and Micronutrients on Thyroid Hormones." Journal of Clinical Endocrinology and Metabolism, 91 (2006): 3232-3235.

3 Phillips S.M., Moore, D.R. and Tang, J.E. "A critical examination of dietary protein requirements, benefits, and excesses in athletes." International Journal of Sports Nutrition and Exercise Metabolism, 17 (2007): S58-76.

4 Shultz, Y. "Protein Turnover, Ureagenesis and Gluconeogenesis." International Journal for Vitamin and Nutrition Research, 81 (2011): 101-7.

5 Dulloo A. G. and Samec S. "Uncoupling Proteins: Their Roles in Adaptive Thermogenesis and Substrate Metabolism Reconsidered." British Journal of Nutrition 86 (2001): 123–139.

6 Khan M.A., Gannon M.C. and Nuttall F.Q. "Glucose Appearance Rate Following Protein Ingestion in Normal Subjects." Journal of the American College of Nutrition 11 (1992): 701–706.

7 Hoffman, J.R., Falvo and M.J. "Protein – Which is Best?" Journal of Sports Science & Medicine, 3 (2004): 118–130.

Endnotes – Fats and Ratios

1 Wang, Y., et al. "Transcriptional regulation of hepatic lipogenesis", Nature Reviews Molecular Cell Biology, 16 (2015): 678-689.

2 Gómez-Pinilla, F. "Brain Foods: the Effects of Nutrients on Brain Function." Nature Reviews in Neuroscience, 9 (2008): 568-578.

3 Veldhorst M.A., Westerterp-Plantenga M.S. and Westerterp K.R. "Gluconeogenesis and Energy Expenditure After a High-Protein, Carbohydrate-Free Diet." American Journal of Clinical Nutrition, 90 (2009): 519-526.

4 McCarthy J.J., Esser and K.A. "Anabolic and Catabolic Pathways Regulating Skeletal Muscle Mass." Current Opinion in Clinical Nutrition and Metabolic Care, 13 (2010): 230–235.

5 Vergnaud, A.C., et al. "Macronutrient Composition of the Diet and Prospective Weight Change in Participants of the EPIC-PANACEA Study." PLoS One 8 (2013): e57300.

6 Simopoulos, A. P. "The importance of the ratio of omega-6/omega-3 essential fatty acids." Biomedicine and Pharmacotherapy, 56 (2002): 365-379.

7 Iqbal, M.P. "Trans Fatty Acids – A Risk Factor for Cardiovascular Disease." Pakistan Journal of Medical Sciences, 30 (2014): 194-197.

8 Dashti, H.M., et al. "Long-Term Effects of a Ketogenic Diet in Obese Patients." Experimental & Clinical Cardiology, 9 (2004): 200-205.

Endnotes – Is a calorie a calorie

1 Klok M.D., Jakobsdottir S. and Drent M.L. "The Role of Leptin and Ghrelin in the Regulation of Food Intake and Body Weight in Humans: A Review." Obesity Reviews, 8 (2007): 21-34.

2 Duncan, K.H., Bacon, J.A and Weinsier, R.L. "The Effects of High and Low Energy Density Diets on Satiety, Energy Intake, and Eating Time of Obese and Nonobese Subjects." American Journal of Clinical Nutrition, 37 (1983): 763-767.

3 Stelmach-Mardas, M. et al. "Link Between Food Energy Density and Body Weight Changes in Obese Adults." Nutrients. 8 (2016): 229.

4 Traoret, CJ, et al. "Digestion and energy balance". International Journal of Obesity. (2008)

5 Guangchang Pang et al "Energy intake, metabolic homeostasis, and human health" Food Science and Human Wellness 2014

6 Hall, K.D. "Predicting metabolic adaptation, body weight change, and energy intake in humans". Am J Physiol Endocrinol Metab (2010)

7 Jenkins D.J., et al. "Glycemic index of foods: a physiological basis for carbohydrate exchange." American Journal of Clinical Nutrition, 34 (1981): 362–6.

Endnotes – Understanding exercise

[1] Morton J.P., et al. "The exercise-induced stress response of skeletal muscle, with specific emphasis on humans." Sports Medicine, 39 (2009): 643-662.

[2] Donnely, J.E. "Position Stand: Appropriate Physical Activity Intervention Strategies for Weight Loss and Prevention of Weight Regain for Adults." Medicine & Science in Sports & Exercise, 41 (2009): 451-471.

[3] Willis, L.H., et al. "Effects of Aerobic and/or Resistance Training on Body Mass and Fat Mass in Overweight or Obese Adults." Journal of Applied Physiology, 113 (1985): 1831-1837.

[4] Grundy, S.M., et al. "Roundtable Consensus Statement: Physical Activity in the Prevention and Treatment of Obesity and its Comorbidities." Medicine & Science in Sports & Exercise, 31 (1999): 1493-1500.

[5] Ross, R., Janssen, I. "Is Abdominal Fat Preferentially Reduced in Response to Exercise-Induced Weight Loss?" Medicine & Science in Sports & Exercise 31 (1999): S568-S572.

[6] Hagan, R.D., et al. "The Effects of Aerobic Conditioning and/or Caloric Restriction in Overweight Men and Women." Medicine & Science in Sports & Exercise. 18 (1986):87-94.

[7] Myers J., et al. "Exercise Capacity and Mortality Among Men Referred for Exercise Testing." New England Journal of Medicine, 14 (2002): 793-801.

[8] Craft, L. L., Pernas, F. M. "The Benefits of Exercise for the Clinically Depressed." Clinical Psychiatry 6(2004): 104-111.

[9] Sharma, A., Madaan, V., Petty, F.D., "Exercise for Mental Health." Primary Care Companion Journal of Clinical Psychiatry. 8 (2006):106.

[10] Westcott, W.L. "Resistance Training is Medicine: Effects of Strength Training on Health." Current Sports Medicine Reports. 11 (2012): 209-16.

[11] Burd, N.A., et al. "Muscle Time Under Tension During Resistance Exercise Stimulates Differential Muscle Protein Sub-Fractional Synthetic Responses in Men." Journal of Physiology, 590 (2012): 351-362.

Endnotes – The importance of NEAT

[1] Levine, J.A., "Non-Exercise Activity Thermogenesis (NEAT)." Best Practice & Research: Clinical Endocrinology & Metabolism, 16 (2002): 679-702.

[2] Christian von Loeffelholz "The Role of Non-exercise Activity Thermogenesis in Human Obesity". Department of Clinical Nutrition, June 5, 2014.

Endnotes – Popular diets

[1] McCartney, M. "Margaret McCartney: Clean eating and the cult of healthism" British Medical Journal, 354 (2016): i4095.

[2] Westwater, M.L., Fletcher, P.C., Ziauddeen, H. "Sugar Addiction: the State of the Science." European Journal of Nutrition, 55 Supp 2 (2016): 55-69.

[3] Neurosci Biobehav Rev. 2008; "Evidence for Sugar Addiction: Behavioral and Neurochemical Effects of Intermittent, Excessive Sugar Intake." Nicole M. Avena, Pedro Rada, and Bartley G. Hoebel*

[4] Jacobsen, M.F. "Six Arguments for a Greener Diet: How a More Plant-Based Diet Could Save Your Health and the Environment". (Washington, DC: Center for Science in the Public Interest, 2006).

[5] Arun Swaminathan and Gregory A. Jicha"Nutrition and prevention of Alzheimer's dementia".
Front Aging Neurosci. 2014.

[6] Hashim, S.A., VanItallie, T.B. "Ketone Body Therapy: from the Ketogenic Diet to the Oral Administration of Ketone Ester." Journal of Lipid Research, 55 (2014): 1818-1826.

[7] Dashti, H.M., et al. "Long-Term Effects of a Ketogenic Diet in Obese Patients." Experimental & Clinical Cardiology, 9 (2004): 200-205.

[8] Roger Collier; 185(9): "Intermittent fasting: the science of going without". Jun 11 (2013): 109-4451.

ABOUT THE AUTHORS

Team Body Project founders Daniel and Alexandra Bartlett are married and live in West London with their 3 children.

They blend Alexandra's expertise in Pilates, mobilisation and nutrition with Daniel's expertise in fitness, weight management and personal development to create a complete health product.

Team Body Project has reached over 20 million people worldwide and their website www.teambodyproject.com currently has over 11,000 active members.

They have spoken on multiple aspects of health at FTSE 500 companies and host popular health events globally.

As passionate opponents of unsubstantiated diets promising easy outcomes, they advocate a lifestyle based method that includes evidence based exercise and nutrition plans.

Everything they do is infused with their message of personal empowerment, development and self confidence.

They both enjoy a glass of wine, good food and excellent company.

HEALTH, EXERCISE AND DIET DISCLAIMER

The health, fitness and nutritional information in this book is for educational purposes only. The use of any information provided in this book is entirely at your own risk.

You should not rely on the information in Transform for Life as a substitute for professional medical advice, diagnosis, or treatment. If you have any concerns or questions about your health, you should always consult with a physician or other health-care professional. Do not disregard, avoid or delay obtaining medical or health related advice from your health-care professional because of something you may have read in this book.

You should consult your doctor/physician or other health care professional before starting this or any other health and fitness program to determine if it is right for your needs. This is particularly true if you have a history of high blood pressure or heart disease, or if you have ever experienced chest pain when exercising or have experienced chest pain in the past month when not engaged in physical activity, smoke, have high cholesterol, are obese, or have a bone or joint problem that could be made worse by a change in physical activity. Do not make any changes to your diet or exercise plan if your physician or health care provider advises against it.

If you experience faintness, dizziness, pain or shortness of breath at any time while exercising you should stop immediately.

Developments in medical research may impact the health, fitness and nutritional advice that appears in this book.

No assurance can be given that the advice contained in this site will always include the most recent findings or developments with respect to the particular material.