

THE



# GUIDE TO CALORIES

AWARENESS, INTAKE AND OUTPUT



[WWW.PG-FITNESS.CO.UK](http://WWW.PG-FITNESS.CO.UK)



## WELCOME TO OUR GUIDE TO CALORIES

The intention of this guide is to give you many of the tools required to increase awareness of calories, your caloric intake and how you would go about manipulating both the quality and quantity of them to fit with your own personal goals.

What we know right now from the simple fact you've picked up this guide is that your current habits and behaviours surrounding food don't align with the physical outcome you desire.

That goal could be centered around improvements to your physical composition, changes to your physical and cognitive performance or perhaps a combination of both.

The quality and quantity of energy you consume on a daily basis therefore becomes critical and by giving you a deeper understanding and clarity surrounding that source of fuel is a large step in the right direction.

We hope you enjoy.

A handwritten signature in black ink, appearing to read "Pete Gawtry", is positioned above the printed name.

Pete Gawtry  
Personal Trainer

# WHAT ARE CALORIES

Calories or kilocalories (k/cals) indicate the amount of energy in an item of food or drink.

This is the energy that once digested will provide us with the fuel we need to firstly maintain normal bodily functions such as breathing, digestion and regeneration and secondly, to fuel the exercise or activity we choose to do beyond that basal requirement. Depending on the source of the calorie it may also provide us with an array of critical nutrients such as dietary fibre, amino acids, antioxidants and dietary vitamins and minerals.

We obtain calories from three primary sources within our diets. What we term commonly as macronutrients. Each of which contains a given amount of energy per gram.

**Protein – Protein contain 4 k/cals per gram.**

**Carbohydrates – Carbohydrates also contain 4 k/cals per gram.**

**Fats – Fats contain 9k/cals per gram**

We also mustn't forget about alcohol for those of you that consume it. Alcohol is made through the fermentation and distilling of natural sugar or starch so also contains calories. 7k/cals per gram to be precise.

# ARE ALL CALORIES CREATED EQUALLY?

When it comes to the laws of thermodynamics the answer is yes.

A unit of energy is a unit of energy so when it comes to controlling and regulating someone's caloric intake for compositional purposes, the numbers count. This is when we can talk about calories in (what we consume) vs calories out (what we use) being the major determining factor in someone's compositional change.

At this stage it's good to understand the thermic effect of food (TEF). The thermic effect of food refers to the energy required for digestion, absorption, and disposal of a given nutrient following ingestion. In essence, we need calories to break down the energy in food.



Carbohydrates: 5 to 15% of the energy consumed



Protein: 20 to 35%



Fats: at most 5 to 15%

So if you were to consume 100 k/cals of Protein you would use up 20-35 k/cals digesting, absorbing and disposing of it.


Altering your body composition is a process that takes a fraction of your lifetime therefore foods devoid of critical nutrients are quite often negated in this process. You can in essence lose body fat by consuming anything you want provided the calories in are less than the calories being used.

It is, on paper, just a matter of managing energy balance.

The consumption of a high proportion of foods that are devoid of critical nutrients, the aforementioned dietary fibre, amino acids, antioxidants, dietary vitamins and minerals make managing energy balance much harder for a multitude of reasons which we will cover in the coming pages.

These types of foods are often termed as empty calories for the reason they have very little nutritional value outside of energy.





Foods that are processed are typically less filling than whole, unprocessed foods for the reason that it fails to meet many of the above characteristics or has even in some cases been stripped of them. Manufactured foods including alcohol have further empty calories added to them in the form of solid fats and sugars to make them more enjoyable.

This is why when you ask people what the foods they typically over-consume are, they will almost always contain high amounts of solid fats, added sugar such as sucrose or high-fructose corn syrup or a combination of both. This is why fats and sugars are often wrongly stigmatised and very loosely bracketed.

When hungry we will seek foods that have a high energy density (more calories) but low nutrient density (less nutrients) as they will fix the problem of immediate hunger and potentially low blood glucose much quicker. We will also tend to over-consume them because they have low satiety and a high degree of taste.

A 2000 k/cal diet using whole, unprocessed foods is much easier to maintain than one using processed variants. Due to the critical nutrients that will also be ingested your willingness and desire to 'move more' will also undoubtedly be increased.

# ENERGY & NUTRIENT DENSITY

## ENERGY DENSITY

is the amount of energy, as represented by the number of calories, in a specific weight of food.

Energy-dense foods have a large number of calories per serving and tend to include foods that have a high sugar content, are high in fat and have a low water content.

These should play a smaller part in your diet.

An example of a food with high energy density is ice cream. Ice cream has lots of calories from the sugar and fat that fit into a small serving size but also bundles of taste. Spinach in comparison has a low energy density because there are only a few calories in a whole plateful of spinach yet not a great deal to satisfy the taste buds.

## NUTRIENT DENSITY

is the amount of dietary fibre, complex carbohydrates, amino acids, antioxidants and dietary vitamins and minerals again represented by the number of calories, in that weight of food. To use the same example, the spinach is packed full of nutrients yet the ice cream has very little.

Packing a diet with a higher proportion of nutrient dense food with a lower ratio of energy ultimately gives you a diet that can satisfy both hunger and taste whilst sustaining an intake of calories relative to your goals.



# WHAT YOU NEED TO CONSIDER



WHEN IT COMES TO THE FOOD YOU REGULARLY CONSUME YOU NEED TO CONSIDER THE FOLLOWING:

## TASTE

The sense of taste is one of the most important human senses

The experience of flavour of food or drink, arises from the integration of multiple sensory cues, including odour, taste, temperature, and appearance.

The food and drink we consume need to be perceived as appealing and not just as satiating; taste quality is therefore critical in any type of long term dietary compliance.

Sensory pleasures from the taste of foods have been shown to be a major determinant of food intake: Foods that satisfy taste contribute not only to greater eating experience, but also to a greater sense of satiation and satiety.

Research indicates that in addition to a food's nutritional composition, its taste, smell, texture, temperature, colour and appearance all affect its impact on satiety.

The first challenge we have here is that a large amount of manufactured and processed foods, inclusive of alcohol have further empty calories added to them in the form of sugars and solid fats to make them more enjoyable, the level of satiety lowers whilst energy density increases. All reviewed studies have shown that there is an increase in intake as palatability increases.

The second challenge is that many people lack the culinary skills required to enhance the appeal and taste of the foods they prepare therefore food convenience is a factor and one that must be catered for.

## SATIETY

Satiety is the term used to explain the feeling of fullness and suppression of appetite that happens after eating a specific food or combination of food. Food with a high level of satiety will help prevent overconsumption because, well, it makes you feel full.

Filling foods, or foods with a high level of satiety tend to have one or more of the following characteristics:

**HIGH IN PROTEIN:** Research shows us that of all the macronutrients, protein is the most satiating.

Consumption of protein also has a positive impact on the levels of several hormones that impact satiety.

**HIGH IN FIBRE:** Fibre provides bulk and slows down digestion and the emptying of the stomach. This in turn helps you feel fuller for longer.

**HIGH IN VOLUME:** Some foods contain a lot of water or air. This may help with satiety as well. These are typically foods with a lower energy density

**LOW IN ENERGY DENSITY:** This means that a food is low in calories for its weight. Foods with a low energy density are very filling. They typically also contain a lot of water and fibre, but are low in fat. Soups, stews, pasta and rice, and foods that are naturally high in water and fibre, such as fruit and vegetables.

# UNDERSTANDING ENERGY EXPENDITURE

In the balancing act of managing our energy intake vs energy expenditure it's important you understand what contributes to your output.

## COMPONENTS OF TOTAL DAILY ENERGY EXPENDITURE (TEE)

Throughout the course of a day you can bracket your expenditure into two different types.

### Resting energy expenditure and BMR

This accounts for more than 60% of your total energy expenditure. Even when resting, your body utilises energy (calories) by performing basic functions to sustain life, such as breathing, circulation, the processing of nutrients and cell regeneration. This is known as your basal metabolic rate or BMR.

### Non-resting energy expenditure.

This is made up of three components.

### NEAT or non-exercise activity thermogenesis.

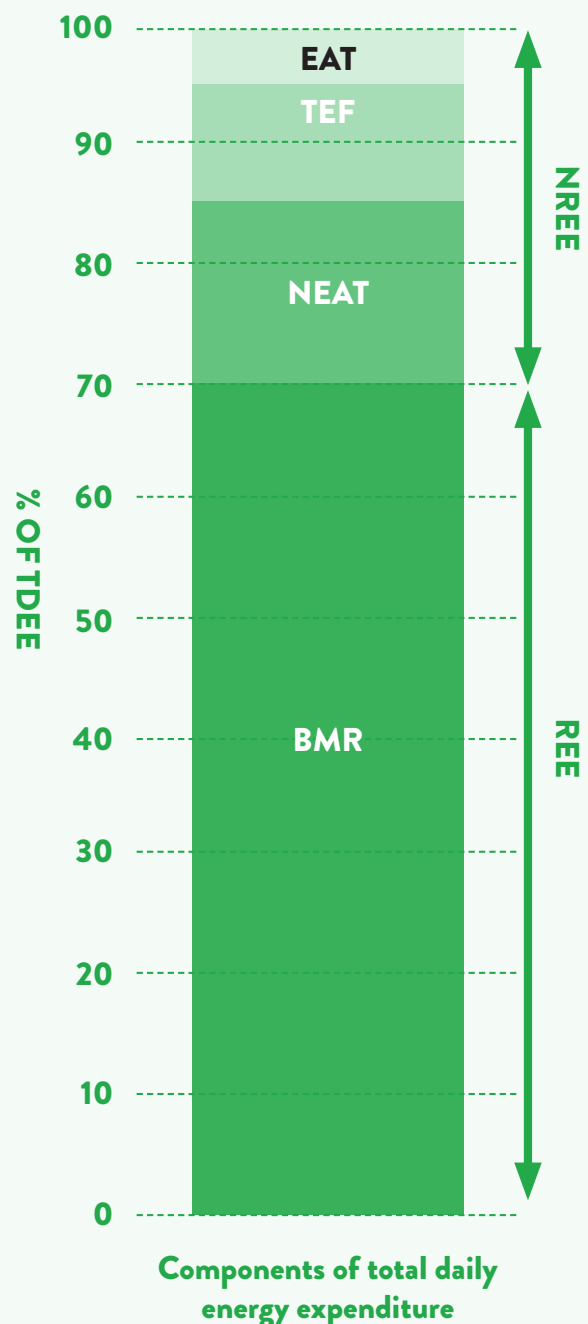
NEAT is the energy expenditure we have walking, standing, climbing stairs, fidgeting and maintaining and changing posture. Anything outside of formally planned or structured exercise falls under this category.

### EAT or Exercise Activity Thermogenesis

EAT is defined as planned, structured, and repetitive physical activity with the objective of improving health. Doing sport or going to the gym falls under this category. NEAT accounts for much more energy expenditure than EAT therefore habitual daily activity and movement can contribute hugely to improving energy balance.

### TEF or Thermic effect of Food

As previously mentioned, this relates to the amount of energy required to digest, absorb and store food.



# UNDERSTANDING FOOD LABELS



<b>Nutrition Facts</b>	
8 servings per container	
<b>Serving size</b>	<b>1 cup (68g)</b>
<b>Amount per serving</b>	
<b>Calories</b>	<b>370</b>
<b>% Daily Value*</b>	
<b>Total Fat</b> 5g	<b>7%</b>
Saturated Fat 1g	<b>5%</b>
Trans Fat 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 150mg	<b>6%</b>
<b>Total Carbohydrate</b> 48g	<b>15%</b>
Dietary Fiber 5g	<b>14%</b>
Total Sugars 13g	
Includes 10g Added Sugars	<b>20%</b>
<b>Protein</b> 12g	
Vitamin A 10mcg	20%
Vitamin C 1mg	100%
Vitamin D 1mcg	50%
Vitamin E 2mcg	100%
Riboflavin 5mcg	75%
Folic Acid 200mcg	60%
Thiamin 2mcg	35%
Vitamin B12 5mcg	100%
Zinc 7mg	50%
Biotin 300mcg	100%
Calcium 50mcg	25%
Phosphorus 90mcg	90%
Magnesium 400mcg	100%
Chromium 75mcg	80%
Potassium 5g	100%

\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

All nutrition information is provided per 100 grams of the product and often, it will also be presented per portion of the food product too. It is generally best to calculate the macronutrient percentages using the per 100 grams values as the suggested portion may not be reflective of the serving size you choose, and you may end up consuming more than you had planned or realised.

**‘ENERGY’** – the amount of energy in a food or drink is measured in calories. On food labels, the calorie content is given in kcals and kJ, which are short for kilocalories and kilojoules. Kilojoules are the metric measurement of calories.

**‘CARBOHYDRATES’** – Carbohydrates are made up of three components: fibre, starch, and sugar. This statistic is inclusive of all three types. Fibre and starch are complex carbs, while sugar is a simple carb. Depending on how much of each of these is found in a food determines its nutrient quality and nutrient density. Look for foods with more starch and more fibre.

**‘SUGARS’ – ‘OF WHICH SUGARS’** refers to how much of the carbohydrate content of the food or drink comes from sugars (the rest being from starch). ‘Total sugars’ is declared on food labels, this could include both the sugars naturally present in whole fruit and milk. This requires a look at the ingredient list to help ascertain if this is added or part of a component ingredient.

**‘FAT’** – this includes different kinds of fat - both saturated fat and unsaturated fat. By looking at ‘of which saturates’ you can calculate how much of both make up the total. Most solid fats are high in saturated fats and/or trans fats and have less monounsaturated or polyunsaturated fats.

**‘PROTEIN’** – this is the total protein content of the food. Not only is protein hugely satiating but the body needs protein to grow and repair itself.

**‘SALT’** – The term ‘salt’ on food labels includes all the sodium in a food. While most sodium comes from salt (sodium chloride), some can be naturally occurring in food. It can also come from raising agents and additives.

## SERVING SIZE AND SERVINGS PER CONTAINER

– This gives you an insight into the foods energy density by offering the weight of a single serving (g) alongside the number of servings in the container. The serving someone may choose to use may not be reflective of the proposed serving size.

Per serving, per 100g and % RI

# OTHER USEFUL INFORMATION YOU MIGHT NEED

Above are the values that are legally required. You may also find useful values for:

## FIBRE

Fibre helps to keep our digestive system healthy and helps to prevent constipation.

Your daily target is 30g of fibre per day. Remember that nutrient dense and filling foods have loads of fibre typically.

## STARCH

Starchy foods are a good source of energy and the main source of a range of nutrients in our diet. As well as starch, they contain fibre, calcium, iron and B vitamins. Wholegrain varieties of starchy foods and potatoes – particularly when eaten with their skins on – are good sources of fibre.

## MONO/POLY-UNSATURATED FATS

These are what are deemed as 'healthier' fats and should be incorporated into your daily eating patterns.

### Monounsaturated Fat

Sources of monounsaturated fat include:

- Avocados
- Almonds, cashews and peanuts
- Cooking oils made from plants or seeds like canola, olive, peanut, soybean, rice bran, sesame and sunflower oils.

### Polyunsaturated fat

Sources of polyunsaturated fat (both omega-3 and omega-6)

- Fish
- Tahini (sesame seed spread)
- Linseed (flaxseed) and chia seeds
- Soybean, sunflower, safflower, and canola oil, and margarine spreads made from these oils
- Pine nuts, walnuts and Brazil nuts.

## POLYOLS

Polyols, also called sugar alcohols, are used as food ingredients to replace sugar in many sugar-free and reduced-calorie foods and beverages. In some people, excessive consumption of polyols may cause gastrointestinal distress.

## VITAMINS OR MINERALS.

If the food has what would be deemed as a significant contribution of vitamins or minerals it can be listed and if the food is fortified (extra nutrients added) these also need to be listed.

## INGREDIENT LISTS

Food labels will also have a list of ingredients found in the product. Ingredients are listed from greatest to smallest by weight, so the main ingredients in the packaged food will always be listed first.

Using the first three ingredients gives us a good idea of the constituents of a product but in many cases you will need to understand some of the names better:

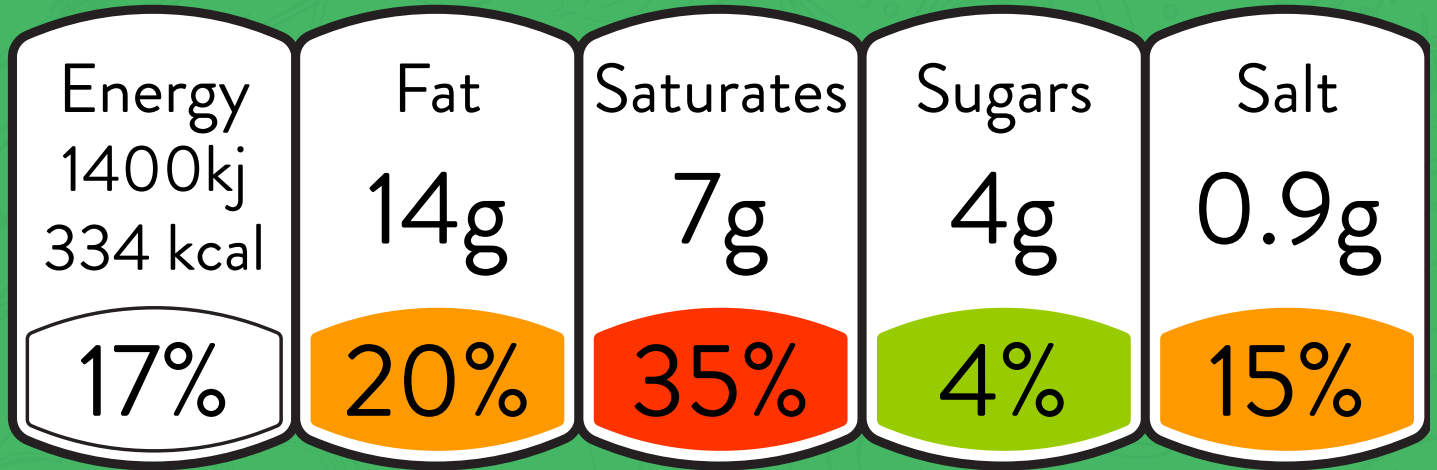
These are other names you may find for added fats and sugars:

Animal fat/oil, beef fat, butter, chocolate, milk solids, coconut, coconut oil/milk/cream, copha, cream, ghee, dripping, lard, suet, palm oil, sour cream, vegetable shortening.

### Other names for added sugar:

Dextrose, fructose, glucose, golden syrup, honey, maple syrup, sucrose, malt, maltose, lactose, brown sugar, caster sugar, maple syrup, raw sugar, sucrose.

# THE TRAFFIC LIGHT SYSTEM



Found on the front of products, the traffic light system is a voluntary government scheme. Using a combination of colour coding and nutritional information it enables the consumer, at a glance, to see whether it is high (red), medium (amber) or low (green) in fat, saturated fat, salt and sugars, and how much energy (calories and kilojoules) it provides.

It also provides a percentage of an adults reference intake.

This information will be written per 100g/100ml, per portion or both.

When comparing foods, selecting a majority of amber and green in your diet typically means that nutrient density and satiety are both increased per unit of consumed energy.

Pay close attention however to the serving size as it can be misleading in some cases.

## FAT

High in fat: more than 17.5g of fat per 100g  
Low in fat: 3g of fat or less per 100g

## SATURATED FAT (SATURATES)

High in saturates: more than 5g of saturates per 100g  
Low in saturates: 1.5g of saturates or less per 100g

## SUGARS

High in sugars: more than 22.5g of total sugars per 100g  
Low in sugars: 5g of total sugars or less per 100g

## SALT

High in salt: more than 1.5g of salt per 100g  
Low in salt: 0.3g of salt or less per 100g

# HOW CAN WE HELP?

## HOW MANY CALORIES DO I NEED?

Calculating your energy requirements, especially when you are trying to lose or maintain weight is important. We will more than happily assist you with ascertaining your daily energy requirements.

## ACQUISITION & CREATION OF FOOD

For many people food will be acquired in different ways. Statistics tell us that if you were born after 1976 there is a high likelihood you don't cook much. Presenting you with an array of recipes and combinations of food to create yourself could be only part of a solution.

Not only do you perhaps lack the skills to create it but also the skills to make what you prepare tasty and therefore part of a sustainable plan.

If you do possess those skills, great, we will happily provide you with ideas and recipes to make your diet more satiating, nutritionally dense and in alignment with your goals.

If you don't we will also assist you with the acquisition of food. Taking into consideration where you eat, when you eat, who you eat with, the time you have to eat, your budget and where you get your food from.

We will help you with the planning and logistics of whichever approach or approaches you choose to adopt.

Contact us for more details.



**“ YOU DON'T  
CREATE HABITS  
FROM STOPPING  
DOING THINGS.**

**YOU  
CREATE  
HABITS  
BY  
STARTING  
DOING  
THINGS!**

**”**



#### References

- Burton-Freeman, B. (2000). Dietary Fibre and Energy Regulation. *The Journal Of Nutrition*, 130(2), 272S-275S. doi: 10.1093/jn/130.2.272s
- Chung, N., Park, M., Kim, J., Park, H., Hwang, H., & Lee, C. et al. (2018). Non-exercise activity thermogenesis (NEAT): a component of total daily energy expenditure. *Journal Of Exercise Nutrition & Biochemistry*, 22(2), 23-30. doi: 10.20463/jenb.2018.0013
- Clark, M., & Slavin, J. (2013). The Effect of Fiber on Satiety and Food Intake: A Systematic Review. *Journal Of The American College Of Nutrition*, 32(3), 200-211. doi: 10.1080/07315724.2013.791194
- Glickman, N., Mitchell, H., Lambert, E., & Keeton, R. (1948). The Total Specific Dynamic Action of High-Protein and High-Carbohydrate Diets on Human Subjects. *The Journal Of Nutrition*, 36(1), 41-57. doi: 10.1093/jn/36.1.41
- Halton, T., & Hu, F. (2004). The Effects of High Protein Diets on Thermogenesis, Satiety and Weight Loss: A Critical Review. *Journal Of The American College Of Nutrition*, 23(5), 373-385. doi: 10.1080/07315724.2004.10719381
- Halton, T., & Hu, F. (2004). The Effects of High Protein Diets on Thermogenesis, Satiety and Weight Loss: A Critical Review. *Journal Of The American College Of Nutrition*, 23(5), 373-385. doi: 10.1080/07315724.2004.10719381
- Lejeune, M., Westerterp, K., Adam, T., Luscombe-Marsh, N., & Westerterp-Plantenga, M. (2006). Ghrelin and glucagon-like peptide 1 concentrations, 24-h satiety, and energy and substrate metabolism during a high-protein diet and measured in a respiration chamber. *The American Journal Of Clinical Nutrition*, 83(1), 89-94. doi: 10.1093/ajcn/83.1.89
- Mattes, R., Hollis, J., Hayes, D., & Stunkard, A. (2005). Appetite: Measurement and Manipulation Misgivings. *Journal Of The American Dietetic Association*, 105(5), 87-97. doi: 10.1016/j.jada.2005.02.029
- Oesch, S., Degen, L., & Beglinger, C. (2005). Effect of a protein preload on food intake and satiety feelings in response to duodenal fat perfusions in healthy male subjects. *American Journal Of Physiology-Regulatory, Integrative And Comparative Physiology*, 289(4), R1042-R1047. doi: 10.1152/ajpregu.00039.2005
- Paddon-Jones, D., Westman, E., Mattes, R., Wolfe, R., Astrup, A., & Westerterp-Plantenga, M. (2008). Protein, weight management, and satiety. *The American Journal Of Clinical Nutrition*, 87(5), 1558S-1561S. doi: 10.1093/ajcn/87.5.1558s
- Rolls, B., Bell, E., & Thorwart, M. (1999). Water incorporated into a food but not served with a food decreases energy intake in lean women. *The American Journal Of Clinical Nutrition*, 70(4), 448-455. doi: 10.1093/ajcn/70.4.448
- Sørensen, L., Møller, P., Flint, A., Martens, M., & Raben, A. (2003). Effect of sensory perception of foods on appetite and food intake: a review of studies on humans. *International Journal Of Obesity*, 27(10), 1152-1166. doi: 10.1038/sj.ijo.0802391
- Starchy foods and carbohydrates. (2019). Retrieved 3 September 2019, from <https://www.nhs.uk/live-well/eat-well/starchy-foods-and-carbohydrates/>