

## Fat Loss

### Introduction

Fat loss is something that most of us are aspiring to – whether we are sedentary or sporty, having lower body fat mass means:

- Less cardiovascular disease
- Lower cancer rates
- Better cardiovascular fitness through improved power:weight ratio
- Better mobility
- Better functional ability

Loss of body fat requires two factors to be optimised:

1. An energy deficit (ie a lack of food entering the system)
2. Appropriate activity

This article aims to give usable advice on combining an activity and nutrition strategy for yourselves or your clients.

### The physiology of exercise and calorie burn

As we exercise, we derive energy from either carbohydrate sources that are stored in our body (muscles and liver), or from fat sources that are stored in our body (adipose tissue). The balance of fuel we use depends on the intensity with which we are exercising. At lower intensities, fat is always our first preference, as overall it yields a higher amount of energy compared to carbohydrate (just over double – 9kcal v 4kcal). As exercise intensity increases, we tend to use carbohydrates in preference to fat as carbohydrate oxidation is quicker and therefore the energy is more readily available.

If total calories burned is the 'golden fleece' for weight loss, then utilising fat to exercise, with its higher energy yield, would seem the obvious source of energy. Our natural disposition to utilise fat at low exercise intensities has also led us to believe that optimal fat loss occurs at low exercise intensities, the 'fat burning zone'. However, the advent of many High Intensity Interval Training (HIIT) programmes and metabolic training protocols has opened a door to different routes to lean-ness.

### Training for fat loss

#### High Intensity Interval Training exercise (HIIT)

HIIT training is a combination of very intense work periods, followed by as-short-as-possible rest periods. A typical example would be the 'Tabata' protocol that involves a work period of 20 seconds, followed by a rest period of 10 seconds repeated 8

times. To be most effective, HIIT training work periods should be supra-maximal, ie, much harder than a sustainable effort.

Although high intensity exercise predominantly uses carbohydrate as a fuel source, it does have an effect on the body that has been shown to cause a huge difference to body fat measurements. The effect is called 'Excess Post-Exercise Oxygen Consumption' (EPOC). EPOC increases the amount of energy consumed during the body's restorative processes post exercise – and the best part, the energy is mainly obtained from fat stores! EPOC has been shown to increase calorie consumption 9-fold over lower intensity training despite a lower energetic cost of exercise. This may equate to as much as 300 kcals over a 24 hour period.

Due to its low time cost, HIIT has proven popular with client's that are pushed for time and require the best 'bang for their buck'.

### **Low Intensity Steady State exercise (LISS)**

Despite HIIT's popularity and obvious energy-use benefits, there is no escaping the fact that long bouts of low intensity exercise – between 50-70% of maximal effort, are an effective way to burn many calories and the vast majority of them from fat stores! An additional benefit to low intensity exercise, is that the more we do of it, the more 'fat adapted' we become – meaning that we build our ability to utilise fat as a fuel, which in turn may help us to stay leaner.

The lower intensity of LISS training also means that this form of exercise may be undertaken more frequently than high intensity exercise; essentially meaning that over a given time period, more 'work' can be done, eliciting a higher calorie consumption.

The usual stumbling block to LISS training as a method of fat loss is time cost. The rate of calorie burn per hour, combined with the relative lack of EPOC caused by LISS mean that many hours of exercise must be accrued in order to burn sufficient calories to lose fat,

### **'Metabolic' resistance training**

If fat-loss rather than weight loss is the goal, then there is a hugely beneficial role for resistance training in a client's programme. Resistance training will; increase heart rate for sustained periods of time, increasing the energetic cost during the time exercising. Increase EPOC during restoration and hypertrophy. Plus, increased muscle mass will offer greater future calorie burn by increased Basal Metabolic Rate (BMR) as well as 'metabolic resilience' (the ability to cope with sporadic increased calorie consumption).

Resistance training however does require knowledge of exercise techniques and also may cause periods of muscle soreness that limit training frequency.

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## Calorie consumption during and post exercise

The following diagram shows an approximation of the number of calories that may be used during an hour and a typical duration session of HIIT, LISS and Resistance training. Please note that exact calorie consumption will depend upon many factors including:

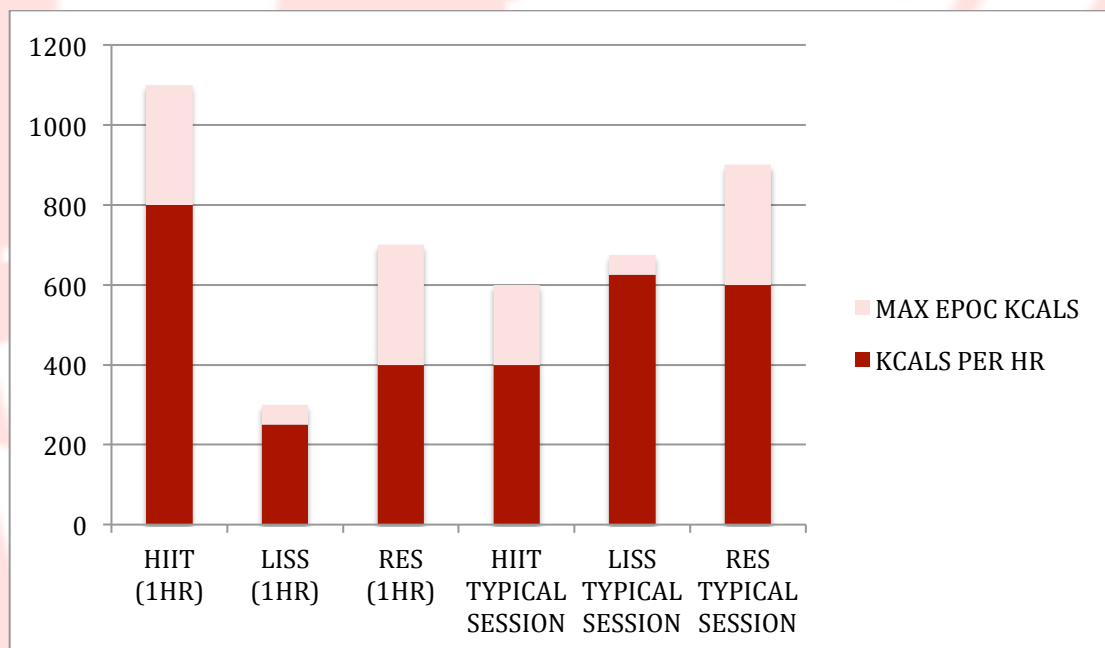
- Exact exercise modality
- Intensity
- Duration of work v rest
- Client's gender, age, bodyweight/composition
- Fitness level of client
- Many other factors!

A typical session was deemed to be:

HIIT – 30 mins of rowing or running, done at high intensity with with short work periods interspersed with recovery periods.

LISS – 150 mins of steady state walking.

Resistance training – 90 mins of high rep/low weight endurance training.



## Exercise guidelines

- HIIT training is intensive and requires building up to slowly. Introduction of HIIT too early may frighten off a client!

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- HIIT is so intensive that it may cause fatigue to limit the frequency with which training can be undertaken. Less frequency of training may mean lower weekly calorie burn.
- LISS training for fat loss requires as many hours to be accumulated training as possible. Realistically, for this form of training to be most effective, training hours should run close, if not exceed, double figures.
- High volumes of LISS training may cause repetitive strain or overuse injuries.
- High volumes of LISS training may cause immune dysfunction if adequate rest and nutrition strategies are not incorporated.
- Resistance training should be progressively built up in order to not cause injury.
- Resistance training causes Delayed Onset Muscle Soreness and this should be reflected in programming. DOMS may be a limiting factor in exercise frequency, thus limiting weekly energy expenditure from this form of exercise.
- Energy cost of resistance training is proportional to the load and repetitions lifted. A compromise must be reached which maximises overall volume of training.

## Conclusion

All methods of training may be beneficial for fat loss. The key is to find a long-term, sustainable approach that combines each method.

## Nutrition to support exercise for fat loss

Given that carbohydrate and fat are the two energy sources to fuel our exercise, it is important to note how the presence (or not) of these two in the body affect each other, along with what other factors may have a role in how each is used:

- If carbohydrate is circulating in the body, then there is an increased likelihood that fat will not be used as a fuel source.
- If carbohydrate is not circulating in the body, then there is an increased chance that fat will be used as a fuel source.
- Stress hormones such as cortisol and adrenaline encourage the use of fat as a fuel
- The presence of insulin in the bloodstream causes the storage or use of carbohydrate as a fuel.

## Fuelling for HIIT

Fuelling HIIT training with carbohydrate sources would have the advantage of increasing the intensities and overall workloads with which the training could be undertaken. This would increase the effect of EPOC and overall, likely have the result of increased fat utilisation and energy expenditure despite the increased in-exercise calorie consumption. Of course, care should be taken not to over-fuel!

## **Fuelling for LISS**

If fat loss is the intended goal of a LISS training session, then it is possible and preferable for pre/in/post-exercise calorie consumption to be minimised if not brought to zero. The body will naturally utilise fat stores as the preferred energy source during the exercise and also for EPOC.

## **Fuelling for resistance training**

Uptake of carbohydrate pre/in-exercise for resistance training may again increase total training volume and therefore lead to greater EPOC and thus overall calorie use.

## **Depleted state training (fasted state)**

Training in a depleted state (ie no carbohydrates circulating) has been shown to maximise fat utilisation as a fuel source. This effect can be seen with as little as 5 days fasted state training. This training also causes physiological/hormonal/enzymatic changes to our systems that pre-dispose us to utilising fat as a fuel source – ‘fat adaptation’. This may help us stay leaner. Depleted state training therefore has a real use in fat-loss strategies and programming.

Risks of depleted state training include:

- During a prolonged calorie deficit, muscle mass may be lost. Therefore increased protein consumption should be considered to minimise atrophy.
- High intensity exercise performance may be impaired. Even 1-2 days after carbohydrates have been re-introduced into a diet, capacity for carbohydrate utilisation is impaired.

## **Supplementation for fat loss**

Caffeine – is a stimulant and has a thermogenic effect (ie, increases calorie consumption).

Cocoa – Reduces blood lipid profile.

Carnitine – Increases fat utilisation in cells, increases recovery ability and increases testosterone levels (helping to improve body composition).

Apple-cider vinegar – May aid in improving blood lipid profiles.

Chilli – Increases energy expenditure and fat utilisation, whilst decreasing the effect of insulin, lowering fat storage post-meal.

Cinnamon – Has a similar effect to chilli.

Yerba-mate – Has been shown to lower obesity levels.

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Grapefruit – Opposes insulin-induced fat storage and increases fat breakdown.

Black pepper – is a powerful anti-oxidant that can mediate the effect of fat utilisation for energy.

## Conclusion

Nutritional strategies should support your exercise modality:

- Carbohydrate consumption should be minimised/excluded for LISS training and include but moderated for higher intensity training.
- Protein intake should be increased to approximately 1.8g per kilo bodyweight through depleted state training.
- Supplementation may help to reap the rewards of all of your clients' hard work!

## Putting it all together

Programming an activity and nutrition strategy tends to be an evolutionary process for every individual. We all respond uniquely to different forms of training and different diets. One size does definitely not fit all! Whatever strategies you implement, the key is to observe its effects, to review them on a regular basis. Ultimately, it is essential to respond to and adapt to the client's ever-changing requirements.

Finally, the process should be controlled yet fun. Your clients are accountable to you and this means you are in a position of trust. Keep your clients motivated with positive reinforcement, education and celebration of successes!