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Weight Loss
A Review of the Scientific Research

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Calories

The fundamental determinant of body weight is caloric balance.

Weight = calories consumed – calories expended

0.45 kg (1 pound) = 3,500 calories
Carbohydrate = 4 calories/gram
Protein = 4 calories/gram
Fat = 9 calories/gram

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Calories

If someone runs 5 km/day (~30 min) for 5 days/week, he/she expends 1,700 Calories/week (~68 Calories/km).

Therefore, it will take 2.1 weeks to lose 0.5 kg (1.1 pounds), assuming none of the expended calories are replaced.

- 1 240 ml glass of apple juice = 110 Calories
- 1 240 ml glass of 1% milk = 120 Calories
- 1 slice of wheat bread = 70 Calories

Once you become fat, it's very hard to become thin!

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Why People Gain Weight

Carbs
Protein
Fat

muscle & liver glycogen/blood glucose
tissue repair/structure building
cell membranes/stored energy
insulation/organ protection

fat

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Person A
eats clean diet
exercises little to none

Person B
eats mediocre diet
exercises a lot

What's going to happen after 6 months?
After 5 years?

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Research Evidence: WEIGHT LOSS

- Sustained weight loss occurs at rate of 0.2-0.9 kg (½-2 lbs)/week
- Interventions including educational & counseling sessions, group workouts, & supervised workouts are more effective for weight loss.
- To lose weight, diet (cutting calories) is more important than exercise; to keep weight off, exercise is more important than diet.

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Research Evidence: NUTRITION

Diet alone causes greater weight loss than exercise alone, and diet + exercise causes greater weight loss than either diet or exercise alone.

Diet has greater impact than exercise on initial weight loss.

The exact macronutrient composition doesn't matter as much as total number of calories consumed.

Low Fat?

High Protein?

Gluten Free?

High Carb?

Low Carb?

Paleo?

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Research Evidence: EXERCISE

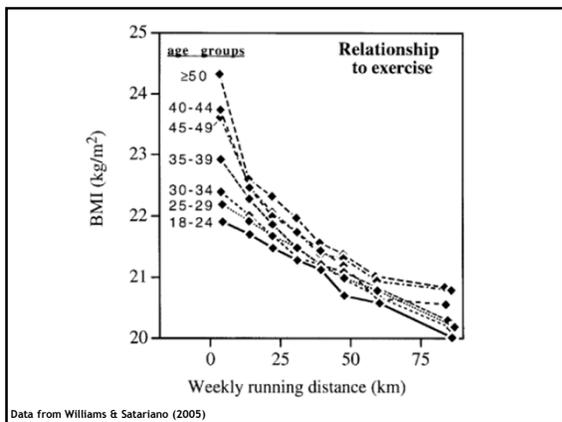
Amount of aerobic exercise is closely linked to body weight. More exercise = lower BMI & body circumferences.

Aerobic exercise causes many adaptations (e.g., increases mitochondria, aerobic enzymes, fatty acid binding proteins, carnitine transferase) that result in becoming a better fat-burning machine.

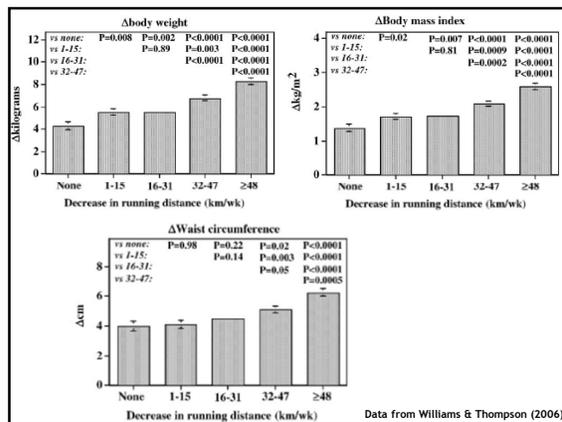
Exercising >250 minutes/week is needed for significant weight loss & for weight maintenance.

Weight regain is related to decreases in physical activity during weight loss.

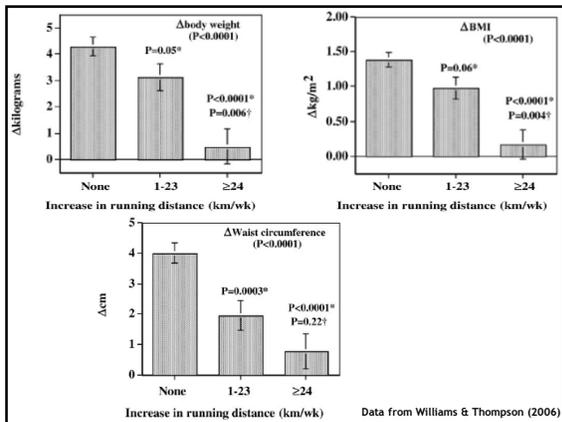
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Empirical Evidence: EXERCISE

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Empirical Evidence: EXERCISE



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Research Evidence: GENETICS

500 Adopted Children

Adoptive Parents Biological Parents

Children's body weight was highly correlated with weight of biological parents but not with weight of adoptive parents, even though biological parents were not raising them.

93 pairs of identical twins raised apart in separate homes

154 pairs of identical twins raised together in same home

Body weights of identical twins were highly correlated whether twins were raised together or apart.

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Research Evidence: GENETICS

Genes/heredity account for 55%-85% of variation in people's body weight. Our genetic code contains the blueprint for our body type.

Environment only plays a role in obesity in that it enables those obesogenic genes to be expressed.

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Empirical Evidence: GENETICS



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What To Do?

You only have to run on the days you eat.

Burn big-time calories and eat fewer calories during the day.

Develop workout program that focuses on big calorie-burning exercise, strength training to maintain or increase muscle mass, & specific calorie-controlled, nutrient-dense diet.

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Weight Loss Workouts

Go Long:

- 1-2 hours @ 65-70% max heart rate
- weight-bearing & large muscle mass
- stimulate mitochondrial synthesis & promote depletion of stored carbohydrates (glycogen)
- muscles "learn" how to use fat more effectively

Go Hard:

- 4-6 x 3 min at 95-100% max heart rate with 2 min active recovery
- 8-12 x 30 seconds fast with 1 min active recovery
- burn lots of calories & elevate post-workout metabolic rate

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Weight Loss Workouts

Circuit Training:

combine cardiovascular exercise & weight training
keep moving between exercises
10 stations, alternating 30 sec cardio, 30 sec weight training
large muscle groups

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Weight Loss Myth 1

DiETING is the best way to lose weight.

Expending more calories than you consume through daily exercise together with cutting calories is the best way to lose weight *permanently*.

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Weight Loss Myth 2

Low-carb diets are better for weight loss.

Although low-carb diets can result in initial quick weight loss, it is not a sustainable strategy because you need to exercise to keep the weight off, and carbohydrate is the muscles' preferred fuel during exercise. Also, from a biochemical standpoint, you need an adequate supply of carbs for fat to be burned effectively because fat burns in the flame of carbohydrate.

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Weight Loss Myth 3

There's a magical combination of foods or a specific diet that is most effective for weight loss.

There is no scientific evidence that one particular diet works better than any other. There's no magic diet. All diets, if they limit calories and are combined with exercise, work if you follow and stick with them.

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Weight Loss Myth 4

Abs are made in the kitchen.

Muscles are made by training them.

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Weight Loss Myth 5

You have to exercise in your fat-burning zone to burn fat and lose weight.

There is no such thing as a fat burning zone. While only a minimal amount of fat is used at higher intensities, the number of calories used per minute and total number of calories expended are much greater than when at a lower intensity, so the amount of fat used is also greater. What matters is the *rate* of energy expenditure rather than the percentage of energy expenditure derived from fat. *You don't have to use fat when you exercise to lose fat from your waistline.*

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Weight Loss Myth 6

Eating multiple small meals throughout the day rather than 3 large meals is better for weight loss.

Studies on meal frequency do not support that it enhances the caloric cost of digestion, total energy expenditure, or resting metabolic rate, or that it plays a significant role in decreasing body weight or body composition. For weight loss, it seems that eating a specific number of calories in 3 meals or in 6 meals doesn't matter.

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