

# GENEINFORMED DNA DIET REPORT



REPORT ID  
16143310

CUSTOMER NAME  
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DATE CREATED  
December 14, 2023

*CONFIDENTIAL  
INFORMATION*



Dear Client,

Thank you for choosing GeneInformed to interpret your genetic data. This report provides nutrigenetic knowledge that will assist you in your weight control diet.

The following pages present your genetic analysis. Start by going over the results overview, written manually by the expert who reviewed your data. Next, look for your personalized advice, results and scientific evidence in the detailed test pages.

You are welcome to use our website for extended information on each of the tests and for an introduction to basic genetics, vocabulary and complementary analysis products.

We hope that this report will be an eye-opener and a tool for making the right decisions for your wellness.

For questions, remarks and for sharing your experience, please contact me at [erez@geneinformed.com](mailto:erez@geneinformed.com)

Sincerely,

*Erez Tsur,  
Population geneticist and epidemiologist*

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### Test Results

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## Table of Results

Trait	Gene	Common Result	Your Result	Impact
Protein Intake	<i>FTO</i>	TA	TA	Follow general recommendations
Fat Storage	<i>PPARG</i>	CC	CC	Normal fat storage rate
Fat Breakdown	<i>ADRB3</i>	AA	AA	Normal fat breakdown
Carb Diet	<i>PLIN1</i>	CC	CC	High-carb diet not beneficial
Emotional Eating	<i>MC4R</i>	TT	TC	Added risk for emotional eating
	<i>MC4R</i>	CC	CC	
Food Addiction	<i>ANKK1</i>	GG	TT	High risk for food addiction
Sweet Tooth	<i>TAS1R2</i>	TC	TC	Normal taste sensitivity expected
Bitter Taste	<i>TAS2R38</i>	GA	AA	Reduced taste sensitivity expected
Fat Sensing	<i>CD36</i>	AG	GG	Normal taste sensitivity expected
Fast Food Sensitivity	<i>FABP2</i>	CT	TT	High sensitivity to fast food
Resting Metabolic Rate	<i>ADRB2</i>	GG	GC	Normal response to calorie restriction

This report is designated for educational use only.  
 Consult your physician before making any changes in life following this analysis.

## Overview

Here is the essence of your genetic findings. Personalized advice and results in more detail can be found in the test pages below.

✓ **EMOTIONAL EATING**

When under emotional stress, people with similar genetic background as you not only overeat but they also conserve more of the excess energy, gaining more weight than others.

✓ **FOOD ADDICTION**

Vulnerability to food cues and unhealthy eating behaviors is expected. Craving for carbohydrates and fast food is more common among individuals with similar genetic make-up.

✓ **REDUCED SENSITIVITY TO BITTER TASTES**

Low sensitivity to bitter tastes and lowered sensitivity to some sharp taste food items is expected. In addition, this genetic set-up is associated with elevated levels of leptin, the hunger hormone.

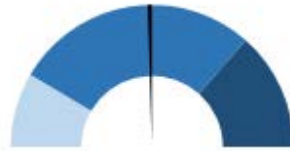
✓ **SENSITIVITY TO FAST FOODS**

You are more inclined to weight-gain by trans fatty acids and refined carbohydrates, commonly found in fast-foods.

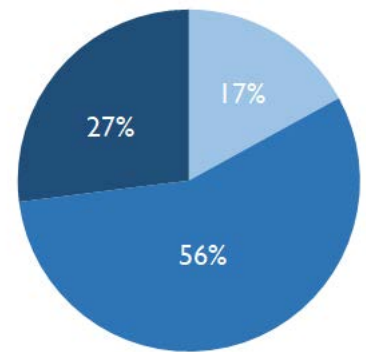
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## PROTEIN INTAKE



Any protein intake



56% of people share similar genetic makeup

Individuals carrying the alternative FTO makeup were found to be more hungry, more responsive to food cues and tend to snack more often. High-protein diet was found effective in promoting satiety, decreasing food craving and losing weight.

Higher physical activity levels were also found to attenuate this genetic tendency towards obesity.

### YOUR RESULTS

You carry both the risk allele and the normal allele of the FTO genetic marker. Studies conclude that there is **no risk addition for obesity for people with this genotype. Diet protein levels were not associated with obesity or appetite.**

Personalized protein intake can not be suggested based on your genetic analysis. **Follow the general recommendation for daily protein intake.**

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Some genetic set-ups lead to higher basal ghrelin levels and smaller reduction in ghrelin levels after meal. Ghrelin is a hormone secreted by the gastrointestinal tract when the stomach is empty, and received in the hypothalamus as a cue for hunger. High levels of ghrelin means elevated sense of hunger.

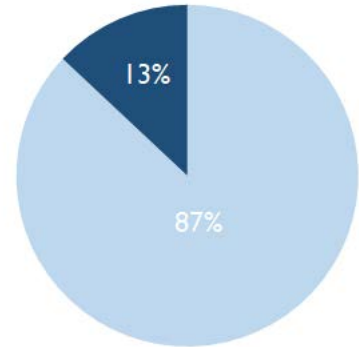
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**General advice for protein intake is 15% to 20% of total daily calories. Use this online calculator for recommendations based on the Dietary Reference Intakes (DRIs):**  
<https://fnic.nal.usda.gov/fnic/dri-calculator/>

## FAT STORAGE



Average fat storage



87% of people share similar genetic set-up

Some people are less efficient in storing dietary fat. Eating more fat can surprisingly help such individuals in reducing weight and feeling more satiated.

### YOUR RESULTS

Your genotype is associated with average fat storage ability. This common genetic set-up is relatively sensitive to high fat diet.

Follow the general recommendation and limit **fat intake to 60 grams a day, or 570 calories (28% of daily calorie intake)**. Eat more fat-free foods, such as whole grains, legumes, vegetables and fruits. Choose lean meat, lean fish, shellfish, low-fat dairy products, seitan, etc. **Eat less than 20 grams of saturated fats (180 calories, 9% of daily calorie intake)** to help in losing weight.

Saturated fats can be found in high-fat dairy products like cheese, whole milk, cream, butter, and ice cream, fatty meats, the skin and fat of poultry, lard, palm oil, coconut oil. **Replace saturated fats with PUFA** (Polyunsaturated Fatty Acids). Make sure you eat at least 160 calories of PUFA fats, which are 18 grams, or 8% of daily calorie intake.

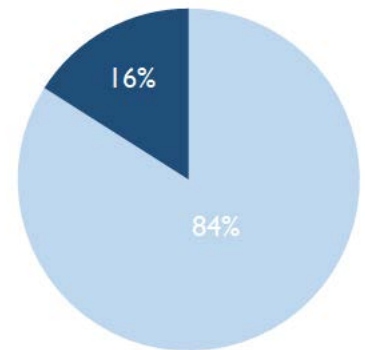
• • •  
PPARG is one of the well-studied “thrifty genes”. The common form of the gene is efficient in storing the excess calories we eat. The less common variant leads to a less active form of the PPARG protein,

• • •  
**Boost your PUFA with nuts and seeds such as flaxseeds, chia seeds, sunflower seeds, pumpkin seeds, walnuts, fish oil and fatty marine fish. Use plant-based oils such as soybean oil, corn oil, wheat germ oil, safflower oil canola oil.**

## FAT BREAKDOWN



Normal fat breakdown



84% of people share similar genetic makeup

It's a well-known fact that sedentary lifestyle promotes obesity and related disease. It is less known that some people have additional genetic predisposition to gain weight when not active. Carriers of the variant form of the ADRB3 gene have three times more risk for obesity when living sedentary lifestyle.

### YOUR RESULTS

Your genotype is associated with **normal ability to trigger fat breakdown, and with good ability to lose weight by training.**

Adopt a 3 days per week, 75 minutes high-intensity resistance training (i.e. weight bearing of 6-8 repetitions at 70%-80% maximum of single repetition load).

In addition to exercising, make sure you stand, walk and climb stairs every time you get a chance, during work hours and at home. These easy activities add up!

• • •

Sedentary lifestyle is a major risk factor for heart disease, diabetes, cancer, and obesity. Individuals with additional genetic predisposition to gain weight are advised to get active. Follow this simple rule: be active more than half the time you spend sitting.

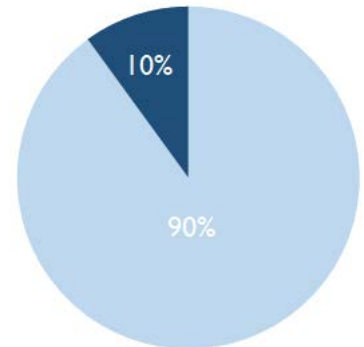
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**Not into weight bearing?  
Check the exercise appendix  
for more training suggestions.**





Normal response to carbs



90% of people share similar genetic makeup

The PLIN1 gene encodes for perilipin, a protein that encircles the lipid droplet in the fat cells. By allowing access to the droplets, this protein regulates lipid storage and breakdown. Carriers of certain variations in PLIN1 exhibit a unique response to carbohydrate intake, significantly impacting their BMI and waist circumference and dependent on carbohydrate-to-fat ratio.

• • •  
Perilipins surround the lipid droplet in the adipocyte (fat cell). These proteins control lipid storage and lipolysis (fat breakdown). Individuals with low perilipin1 levels are more sensitive to diabetes and obesity when their fat intake is high.



## YOUR RESULTS

You are carrying the normal PLIN1 variant. Your perilipin activity in adipocytes is expected to be normal. Ratio of fats to carbohydrates in your diet is not a factor in losing weight.

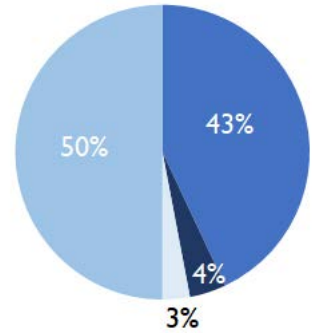
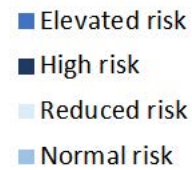
**Advantage for high-carb diet was not found.** Follow the general recommendation for daily intake of carbohydrates.

**Complex carbohydrates can be found in whole grain wheat, oats, rice, and starchy vegetables like potatoes, beans and peas.**

## EMOTIONAL EATING



Elevated risk



43% of people share similar genetic makeup

When under emotional stress, people carrying MC4R variants not only over-eat, they also conserve more of the excess energy and gain more weight than others.

### YOUR RESULTS

You carry one copy of the gene variant that was found associated with lowered satiety and stronger appetite. In individuals carrying this genetic set-up and who are overweight, emotional eating plays a major role in weight gain. **Individuals with this genotype gain more BMI when under stress**, in comparison to individuals without the variant form. Higher preference for fatty foods was also associated with this genotype. Among children, it was found that liking of salty foods have an added effect on weight gain. Adopt healthy eating behaviours to reduce snacking. Develop strategies to avoid snacking and over-eating following bad mood or stress.

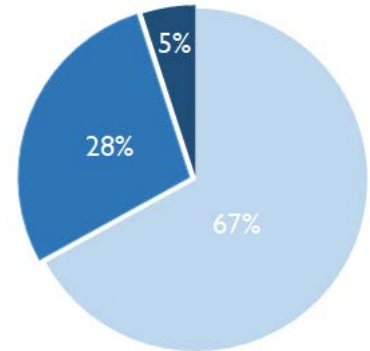
The MC4R gene is well-known for its role in the regulation of energy balance. It is also widely expressed in stress-regulatory brain regions. This double role makes that gene a link between our metabolism and our habits of eating as an emotional response.

**Learn how to cope with emotional eating. Read appendix 'A' at the bottom of your report.**

**Eat 5 regular meals a day, including breakfast. Avoid salty snacks with high fat content. Eat fiber rich and high-volume-low-calorie foods. Reduce stress in your life. Exercising is beneficial both for stress reduction and for losing weight.**



High risk



5% of people share similar genetic makeup

Some people carry genetic variations that alter brain signaling by dopamine and may over-stimulate their response to food cues. Affected individuals tend to crave more, especially for carbohydrates and fast food.

## YOUR RESULTS

Greatly reduced availability of dopamine D2 receptors is expected.

This level of dopamine receptors is associated with **high risk for food addiction. Individuals with this genotype tend to show more vulnerability to food cues, unhealthy eating behaviors and greater craving for carbohydrates and fast food.** Individuals with this genetic set-up show, on average, lower success rates in maintaining diet and exercise regimes.

In case you are over-weight and find it hard to lose weight, you need to focus on reducing uncontrollable eating, especially fast food. Consider professional assistance to overcome your genetic tendency for food addiction. Try the satiety promoting methods suggested at the appendix of this report.

• • •  
The “feel-good” chemicals running in our brain in response to palatable food may override signals of satiety, resulting in overeating. This compulsive behavior is a result of enhanced dopamine signaling, over-activating the reward circuit in midbrain.

Variants of the DRD2/ANKK1 genes may over-stimulate our response to food cues. Individuals affected tend to crave more, especially for carbohydrates and fast food.



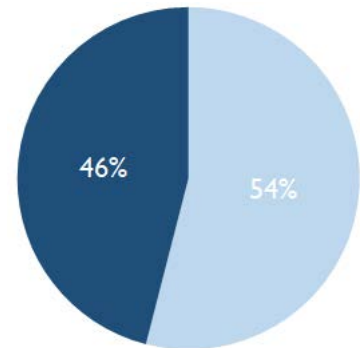
Try the satiety promoting methods suggested at appendix 'B' of this report.



## SWEET TOOTH



Lower risk



54% of people share similar genetic makeup

Sweet taste perception is affected by age, sex, obesity, age of first exposures to sweet, culture and more. In addition, sweet taste sensitivity has a strong genetic factor. Individuals with decreased sweet perception like more sugar in their food.

### YOUR RESULTS

Individuals with your genetic makeup tend to have **good perception of sugary tastes**. This is associated with **lower risk for over-consumption of sugars**. Obese Individuals with this genotype tend to eat relatively fewer carbohydrates, but also less fruit and fewer fibers in their diet.

Despite your natural tendency, your genetics may be overrun by your sugar consumption habits, or by over-weight. It would be relatively easier for you to improve sugar sensitivity and get accustomed to less sugar in your food. Losing weight would have similar effect.

• • •  
Low perception of a taste not only affects our preference towards certain foods, but also alters our metabolism.

Variations in the taste receptor genes give rise to differential taste perception.

This may act to affect food intake, mediated through the glucose-sensing receptors expressed in taste buds, gastrointestinal tract, pancreas, and hypothalamus.

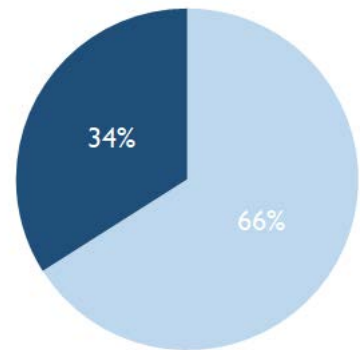


**Avoid sweet drinks and juices.**

**Consider replacing empty calories with fruit, whole grains and vegetables. Fibers promote satiety, plus other health benefits.**



High risk



34% of people share similar genetic makeup

Carriers of two copies of the risk variant (homozygotes) of the TAS2R38 gene tend to be less sensitive to bitter tastes. Studies found that such genetic setup is associated with overeating, high BMI, less satiety and abnormal leptin hormone levels which promote sense of hunger.

## YOUR RESULTS

Your genetic makeup is associated with lower density of bitter taste sensors on tongue and gastrointestinal tract.

Individuals with similar genetic set-up are characterized by **low sensitivity to bitter tastes and lowered sensitivity to some sharp taste food items.**

In addition, plasma leptin levels are mostly higher than average among people with your genetic set-up. Leptin is a hormone that promotes hunger. As a result, **tendency towards overeating was found** among genotype carriers.

In case you are overweight, promote eating habits that will help you feel satiated. Check appendix A. for some advice.

One more thing. Since individuals with this genetic set-up tend to drink more alcohol (and coffee), you may want to drink less beer to lose weight.



The TAS2R38 gene encodes for a taste receptor sensitive to bitter compounds, found in Brassica vegetables (broccoli, cauliflower, Brussels sprouts), green tea, sharp foods, alcohol and coffee. This receptor is present at the fungiform papillae as part of the tongue's taste buds, and at the gastrointestinal tract.

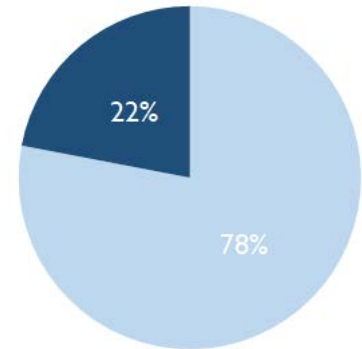


**On top of being calorie-dense, alcohol drinks promote storage of fats and carbs.**

**To avoid weight gain, reduce drinking, eat less when drinking, and substitute beer with wine or hard alcohol such as vodka, gin, rum, tequila and whiskey.**



Normal risk



78% of people share similar genetic makeup

Individuals with low oral sensitivity to fat taste find it hard to discriminate between high-fat and low-fat food contents, tend to have higher preferences for added fats, oils, and spreads, and are more likely to overeat and become obese.

## YOUR RESULTS

Individuals with your genetic makeup have normal expression of the CD36 gene.

**Normal sensitivity to fat taste, texture and fat content is expected.**

You carry no added genetic risk for obesity through low perception of fat taste.

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Fat is the most energy dense of the nutrients, containing over twice the energy per gram than carbohydrates and proteins.

Fat is often overconsumed in the Western diet, and this is linked with obesity and related metabolic diseases.

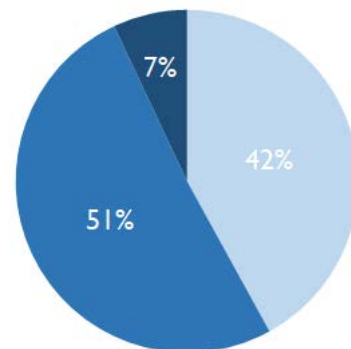
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Studies have found that in less than 4 weeks on low-fat diet, you can significantly increase your fat taste sensitivity, regardless of genotype.

## FAST FOOD SENSITIVITY



High sensitivity to fast food



7% of people share similar genetic makeup

Variants of the FABP2 gene promote fatty acid uptake from the intestines and increased synthesis of fats. This effect is intensified with high intake of trans fatty acids and refined carbohydrates, commonly found in fast-foods.

### YOUR RESULTS

Your FABP2 genotype promotes **efficient absorption of saturated fats and storage of refined carbohydrates**. Individuals with this set-up are **highly sensitive to weight-gain, diabetes and dyslipidemia when eating fast food**, rich in saturated fats and refined carbs. Obese individuals in particular are advised to cut down on fast food and processed foods.

Daily consumption of trans fats should be limited to to less than 1% of energy intake (2 grams of trans fats a day, on a diet of 2000 calories).



Trans-fat source is mostly from industrial partially-hydrogenated vegetable oils, found in refrigerated dough, baked goods shortenings and frostings, snacks, deep fried foods, creamers and margarine.

Refined carbs include sugars and processed grains. They have been stripped of almost all fiber, vitamins and minerals, and for that they are known as "empty" calories. They are digested quickly, and their high glycemic index spikes blood sugar and risk for diabetes.



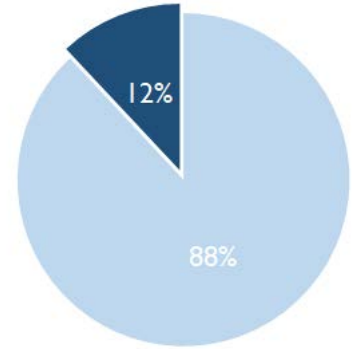
**Cut back on white flour, white bread, white rice, pastries, sodas, snacks, pasta, sweets, breakfast cereals and added sugars.**



## RESTING ENERGY EXPENDITURE



Normal REE



88% of people share similar genetic makeup

Individuals with the less common ADRB2 set-up are very good at conserving energy. They have lower basal metabolic rate, and spend less energy for conducting small amounts of activity. On top of that, their conserving mechanisms promote an even more economic metabolism when calorie consumption drops (as in calorie restriction diet).

### YOUR RESULTS

Your genetic set-up is associated with **normal energy expenditure in rest state.**

You can further elevate your energy expenditure by exercising. Regular exercise not only burns calories during training, it also elevates your Resting Energy Expenditure. It means that your everyday metabolism burns more calories and help you lose weight even while resting.

Exercise at least three days a week on a regular basis to enjoy this effect.



Resting Energy Expenditure (REE) is the energetic cost that our body uses while resting. It accounts for 60% to 75% of the total calories we burn each day. That is why any increase in resting energy expenditure is extremely important to weight-loss effort. Even small, incremental amounts of energy expenditure, like standing up instead of sitting down, can add up.



**Vigorous activities to stimulate your metabolism include walking briskly for two miles or riding a bike uphill. See appendix for more training ideas**



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### WEIGHT-LOSS STRATEGIES APPENDIXES

#### APPENDIX A. SENSE OF SATIETY

Here are some useful tips on how to promote satiety feeling. It is hard to change lifetime habits, so keep trying, and consider asking friends and family to help with the following steps:

- Leave cooking pots and pans away from the table
- Sit down to a nice place setting - use place mats and napkins
- Use a small side/salad plate.
- Be aware how many times you refill your plate
- Take smaller bites
- Put utensils or sandwich down between bites
- Aim for eating meals in 20 minutes or more. 20 minutes are needed for satiety signals to leave your stomach and reach the brain.
- Socialize during eating
- Focus your senses on flavor, texture, and smell

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Eat ingredients that promote sense of fullness:

- Fiber and whole foods absorb water and expand in the stomach. Good fiber sources include oatmeal, beans, whole grain foods, nuts, and most fruits and vegetables.
- Fruits and vegetables contain a lot of water and not much calories. Put ready-to-eat fruits, vegetables and salad on the table, and in the fridge.
- Drink soups

Eating behaviors:

- Plan eating occasions to prevent overeating.
- Sit instead of stand when you eat
- Don't do anything else (watch TV, read) when you're eating; instead, eat with soft music or good company
- Choose a consistent place for meals that is conducive to a good eating experience (not in front of the TV, not in your bedroom)
- Avoid eating at your desk, or at least move work out of the way
- Set guidelines for yourself: for example, no food in bed, no drive-through meals in the car, etc.

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### Reduce snacking:

- Make fruits and vegetables visible on the counter or on your workspace
- Put candy dishes or cookie jars in the cupboard
- Avoid tempting aisles (bakery, for example) in the grocery store
- Don't shop on an empty stomach
- Change your route if necessary to avoid vending machines
- Drive routes that avoid fast-food temptations

### Social eating:

- When you eat with others, pace yourself after a slower eater - try to be the last to finish a meal

### Decrease amounts:

- Wrap items in foil instead of plastic so you don't have a visual cue when you open the fridge/cupboard
- Buy smaller portions of meats and don't cook a whole box of pasta
- Put leftovers away immediately or freeze them for another meal

### Activity:

- Distract thoughts of food and desire to snack by cognitive activities and playing.
- Exercise. It reduces hunger, while burning the calories.

## DNA DIET

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### APPENDIX B. EMOTIONAL EATING

Emotional eating can be a direct result of not being conscious of what or why you're eating. Therapists call this unconscious eating. Unconscious eating is when you're done with your meal and you continue to pick at it, slowly eating the remaining portion that you intended to leave behind. It can also be putting peanuts or crackers or any other food in your mouth, just because it's in front of you.

Your first step is to develop awareness to the when's, and then the why's of the times you eat for comfort. Try to remain mindful of what and when you are eating.

- Adopt eating behaviors to reduce snacking.
- Develop strategies to avoid snacking and over-eating following bad mood or emotional stress.
- Eat 5 regular meals a day, including breakfast.
- Avoid salty snacks with high fat content.
- Eat fiber rich and high-volume-low-calorie foods.
- Reduce stress in your life.
- Exercising is beneficial both for stress reduction and for losing weight.

## DNA DIET

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### APPENDIX C. EXERCISE

For the average person, physical activity contributes 20-30% to the body's total energy output.

To measure the intensity of a physical activity, we use the Metabolic Equivalent Task (MET) method. This value is compared to the resting energy expenditure. One MET is the energy expended at rest, two METs indicates the energy expended is twice that at rest, three METs is triple the resting energy expenditure, etc.

#### **Physical activities and energy expenditure, in METs per hour**

<b>Activity</b>	<b>METs/hr</b>
Rest	1.0
Walking slowly, less than 2 mph	2.0
Gardening, light	2.0
General house cleaning	3.0
Walking briskly, 3 mph	3.3
Heavy yard work or gardening	4.0

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Climbing stairs	4.0
Bicycling, casual, less than 10 mph	4.0
Dancing (ballet or modern)	4.8
Snorkeling	5.0
Mowing the lawn with hand mower	5.5–6.0
Shoveling snow	6
Strenuous hiking	6–7
Rowing or kayaking	6–8
Skiing, downhill	6–8
Bicycling, 10–16 mph	6–10
Aerobic calisthenics	6–10
Singles tennis	7–12
Swimming, crawl, slow	8.0
Running, 8 mph	13.5

\*Taken from Harvard Health Publishing, Harvard Health School. Published: December, 2009

A light blue circle containing the word "DISCLAIMER" in a dark blue, uppercase font.

DISCLAIMER

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