frontiers FOR YOUNG MINDS

HUMAN HEALTH
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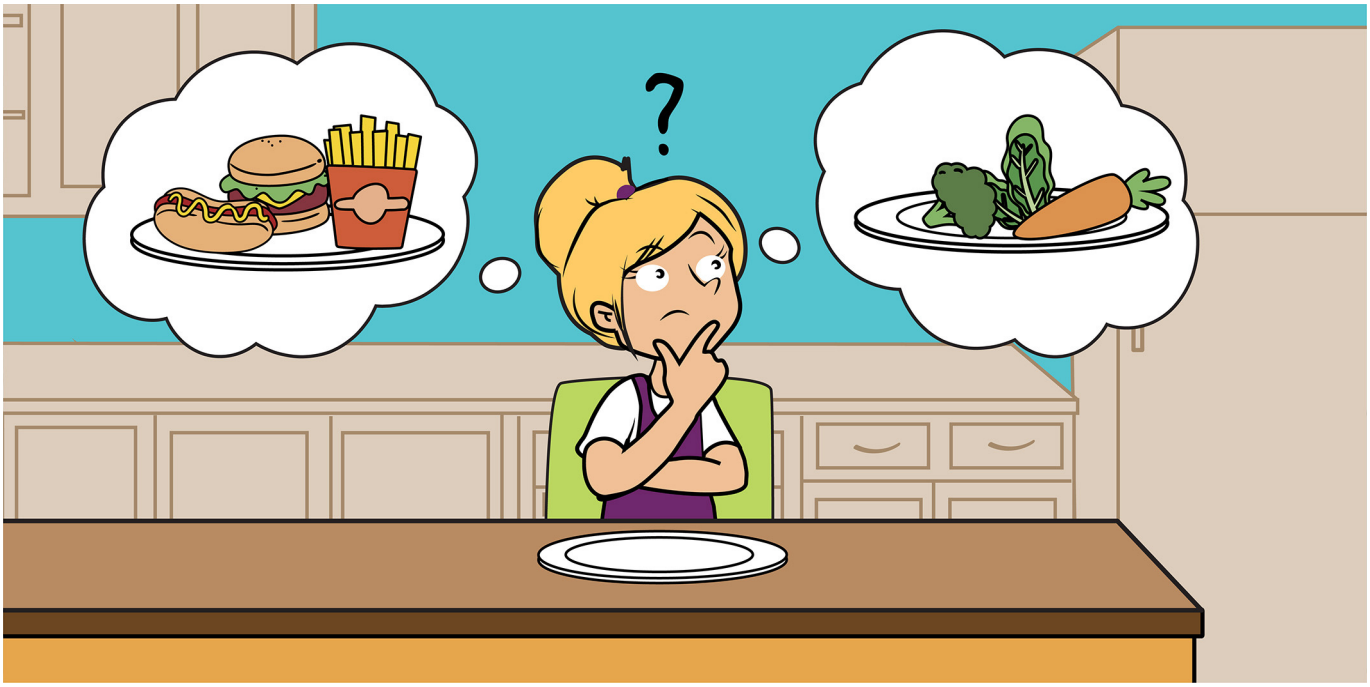

THE IMPACTS OF JUNK FOOD ON HEALTH

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YOUNG REVIEWERS

CRESCENT GIRLS SCHOOL

AGES: 15–16

Energy-dense, nutrient-poor foods, otherwise known as junk foods, have never been more accessible and available. Young people are bombarded with unhealthy junk-food choices daily, and this can lead to life-long dietary habits that are difficult to undo. In this article, we explore the scientific evidence behind both the short-term and long-term impacts of junk food consumption on our health.

INTRODUCTION

The world is currently facing an **obesity** epidemic, which puts people at risk for chronic diseases like heart disease and diabetes. Junk food can contribute to obesity and yet it is becoming a part of our everyday lives because of our fast-paced lifestyles. Life can be jam-packed when you are juggling school, sport, and hanging with friends and family! Junk food companies make food convenient, tasty, and affordable, so it has largely replaced preparing and eating healthy homemade meals. Junk foods include foods like burgers, fried chicken, and pizza from fast-food restaurants, as well as packaged foods like chips, biscuits, and ice-cream, sugar-sweetened beverages like soda, fatty meats like

OBESITY

A disorder where too much body fat increases the risk of health problems.

PROCESSED FOOD

A raw agricultural food that has undergone processes to be washed, ground, cleaned and/or cooked further.

DISCRETIONARY FOOD

Foods and drinks not necessary to provide the nutrients the body needs but that may add variety to a person's diet (according to the Australian dietary guidelines).

bacon, sugary cereals, and frozen ready meals like lasagne. These are typically highly **processed foods**, meaning several steps were involved in making the food, with a focus on making them tasty and thus easy to overeat. Unfortunately, junk foods provide lots of calories and energy, but little of the vital nutrients our bodies need to grow and be healthy, like proteins, vitamins, minerals, and fiber. Australian teenagers aged 14–18 years get more than 40% of their daily energy from these types of foods, which is concerning [1]. Junk foods are also known as **discretionary foods**, which means they are "not needed to meet nutrient requirements and do not belong to the five food groups" [2]. According to the dietary guidelines of Australian and many other countries, these five food groups are grains and cereals, vegetables and legumes, fruits, dairy and dairy alternatives, and meat and meat alternatives.

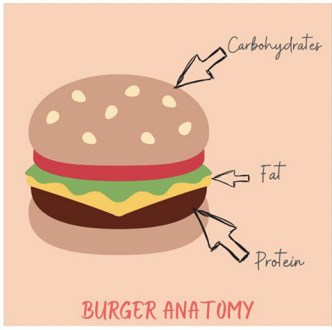
Young people are often the targets of sneaky advertising tactics by junk food companies, which show our heroes and icons promoting junk foods. In Australia, cricket, one of our favorite sports, is sponsored by a big fast-food brand. Elite athletes like cricket players are *not* fuelling their bodies with fried chicken, burgers, and fries! A study showed that adolescents aged 12–17 years view over 14.4 million food advertisements in a single year on popular websites, with cakes, cookies, and ice cream being the most frequently advertised products [3]. Another study examining YouTube videos popular amongst children reported that 38% of all ads involved a food or beverage and 56% of those food ads were for junk foods [4].

WHAT HAPPENS TO OUR BODIES SHORTLY AFTER WE EAT JUNK FOODS?

Food is made up of three major nutrients: carbohydrates, proteins, and fats. There are also vitamins and minerals in food that support good health, growth, and development. Getting the proper nutrition is very important during our teenage years. However, when we eat junk foods, we are consuming high amounts of carbohydrates, proteins, and fats, which are quickly absorbed by the body.

Let us take the example of eating a hamburger. A burger typically contains carbohydrates from the bun, proteins and fats from the beef patty, and fats from the cheese and sauce. On average, a burger from a fast-food chain contains 36–40% of your daily energy needs and this does not account for any chips or drinks consumed with it (Figure 1). This is a large amount of food for the body to digest—not good if you are about to hit the cricket pitch!

A few hours to a few days after eating rich, heavy foods such as a burger, unpleasant symptoms like tiredness, poor sleep, and even hunger can result (Figure 2). Rather than providing an energy boost, junk foods can lead to a lack of energy. For a short time, sugar (a type



Nutrients	Avg Qty/ Serve
Energy (kJ)	2930
Protein (g)	39.7
Fat, total (g)	39.5
Saturated Fat (g)	18.8
Carbohydrate (g)	44.5
Sodium (mg)	1150

Figure 1

Figure 1

The nutritional composition of a popular burger from a famous fast-food restaurant, detailing the average quantity per serving and per 100 g. The carbohydrates of a burger are mainly from the bun, while the protein comes from the beef patty. Large amounts of fat come from the cheese and sauce. Based on the Australian dietary guidelines, just one burger can be 36% of the recommended daily energy intake for teenage boys aged 12–15 years and 40% of the recommendations for teenage girls 12–15 years.

of carbohydrate) makes people feel energized, happy, and upbeat as it is used by the body for energy. However, **refined sugar**, which is the type of sugar commonly found in junk foods, leads to a quick drop in blood sugar levels because it is digested quickly by the body. This can lead tiredness and cravings [5].

REFINED SUGAR

Sugar that has been processed from raw sources such as sugar cane, sugar beets or corn.

Fiber is a good carbohydrate commonly found in vegetables, fruits, barley, legumes, nuts, and seeds—foods from the five food groups. Fiber not only keeps the digestive system healthy, but also slows the stomach's emptying process, keeping us feeling full for longer. Junk foods tend to lack fiber, so when we eat them, we notice decreasing energy and increasing hunger sooner.

Foods such as walnuts, berries, tuna, and green veggies can boost concentration levels. This is particularly important for young minds who are doing lots of schoolwork. These foods are what most elite athletes are eating! On the other hand, eating junk foods can lead to poor concentration. Eating junk foods can lead to swelling in the part of the brain that has a major role in memory. A study performed in humans showed that eating an unhealthy breakfast high in fat and sugar for 4 days in a row caused disruptions to the learning and memory parts of the brain [6].

LONG-TERM IMPACTS OF JUNK FOODS

If we eat mostly junk foods over many weeks, months, or years, there can be several long-term impacts on health (Figure 2). For example, high **saturated fat** intake is strongly linked with high levels of bad cholesterol in the blood, which can be a sign of heart disease. Respected research studies found that young people who eat only small amounts of saturated fat have lower total cholesterol levels [7].

SATURATED FAT

A type of fat commonly eaten from animal sources such as beef, chicken and pork, which typically promotes the production of "bad" cholesterol in the body.

Frequent consumption of junk foods can also increase the risk of diseases such as hypertension and stroke. Hypertension is also known as high blood pressure and a stroke is damage to the brain from

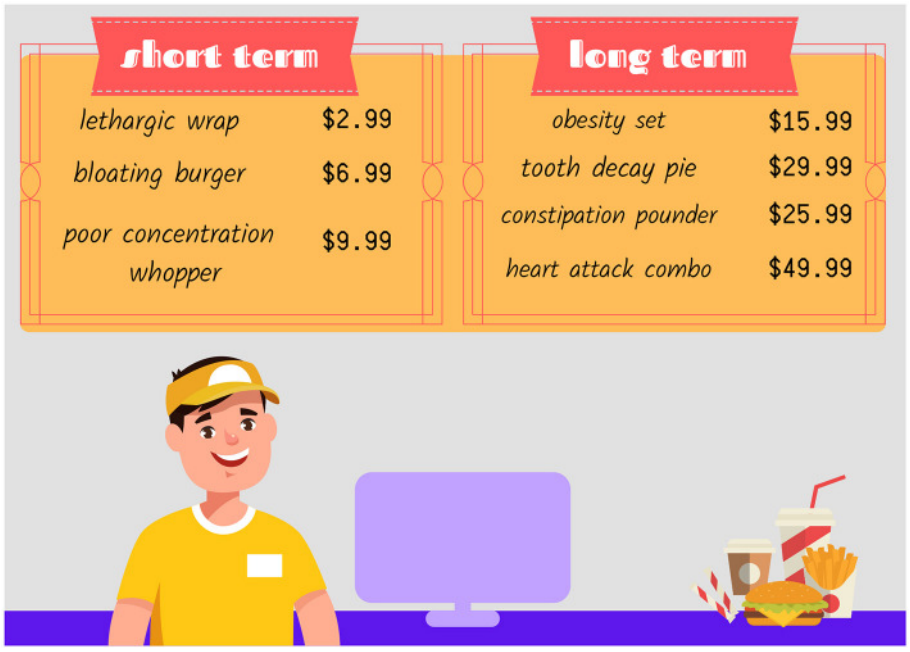


Figure 2

Figure 2

The short- and long-term impacts of junk food consumption. In the short-term, junk foods can make you feel tired, bloated, and unable to concentrate. Long-term, junk foods can lead to tooth decay and poor bowel habits. Junk foods can also lead to obesity and associated diseases such as heart disease. When junk foods are regularly consumed over long periods of time, the damages and complications to health are increasingly costly.

reduced blood supply, which prevents the brain from receiving the oxygen and nutrients it needs to survive. Hypertension and stroke can occur because of the high amounts of cholesterol and salt in junk foods.

DOPAMINE

A hormone that is released when the brain is expecting a reward and is associated with activities that generate pleasure, such as eating or shopping.

Furthermore, junk foods can trigger the "happy hormone," **dopamine**, to be released in the brain, making us feel good when we eat these foods. This can lead us to wanting *more* junk food to get that same happy feeling again [8]. Other long-term effects of eating too much junk food include tooth decay and constipation. Soft drinks, for instance, can cause tooth decay due to high amounts of sugar and acid that can wear down the protective tooth enamel. Junk foods are typically low in fiber too, which has negative consequences for gut health in the long term. Fiber forms the bulk of our poop and without it, it can be hard to poop!

TIPS FOR BEING HEALTHY

One way to figure out whether a food is a junk food is to think about how processed it is. When we think of foods in their whole and original forms, like a fresh tomato, a grain of rice, or milk squeezed from a cow, we can then start to imagine how many steps are involved to transform that whole food into something that is ready-to-eat, tasty, convenient, and has a long shelf life.

For teenagers 13–14 years old, the recommended daily energy intake is 8,200–9,900 kJ/day or 1,960 kcal–2,370 kcal/day for boys and

7,400–8,200 kJ/day or 1,770–1,960 kcal for girls, according to the Australian dietary guidelines. Of course, the more physically active you are, the higher your energy needs. Remember that junk foods are okay to eat occasionally, but they should not make up more than 10% of your daily energy intake. In a day, this may be a simple treat such as a small muffin or a few squares of chocolate. On a weekly basis, this might mean no more than two fast-food meals per week. The remaining 90% of food eaten should be from the five food groups.

SUMMARY

In conclusion, we know that junk foods are tasty, affordable, and convenient. This makes it hard to limit the amount of junk food we eat. However, if junk foods become a staple of our diets, there can be negative impacts on our health. We should aim for high-fiber foods such as whole grains, vegetables, and fruits; meals that have moderate amounts of sugar and salt; and calcium-rich and iron-rich foods. Healthy foods help to build strong bodies and brains. Limiting junk food intake can happen on an individual level, based on our food choices, or through government policies and health-promotion strategies. We need governments to stop junk food companies from advertising to young people, and we need their help to replace junk food restaurants with more healthy options. Researchers can focus on education and health promotion around healthy food options and can work with young people to develop solutions. If we all work together, we can help young people across the world to make food choices that will improve their short and long-term health.

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CONFLICT OF INTEREST: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

YOUNG REVIEWERS

CRESCENT GIRLS SCHOOL, AGES: 15–16
We are a group of enthusiastic students with a strong passion for science. We were eager to discover new insights as we embarked on our journey as Young Reviewers and we grew to be fascinated by the process of reviewing articles. We also had the opportunity to enhance our critical thinking and widen our perspectives by sharing our views with a scientist. We had a fruitful journey as this reviewing process has enabled us to explore something out of our curriculum. Together we are Andrea, Frances, Harini, Yici, Kai Sheann, Keerthi, Dhaarani, Leia, Tansy, and Dharshana.

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