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Buddy the Elf's Health Problems

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Abstract

In the 2003 Christmas film 'Elf', Buddy is a human who grew up in the North Pole believing that he was an elf. He is seen to survive on an elf's diet, which appears to contain mainly foods high in sugar, and low in other nutritional groups. This paper compares his daily intake, based on what is seen in the film, to the recommended daily intake (RDI) for an average male. It was found that in the day shown in the film, Buddy consumed 413% of the recommended amount of sugar and under consumed fats, fibre and protein by 19%, 45% and 45% of the RDI respectively. If this diet is followed long term, Buddy is likely to have detrimental health problems including digestive issues, weight loss, low energy and muscle weakness.

Introduction

Buddy the Elf, from the popular Christmas film 'Elf' [1], is seen throughout the film to consume mainly high-sugar foods. Although he is seen to keep to an Elf's four main food groups; candy, candy canes, candy corn and syrup, his diet is likely to have adverse effects on his health. As Buddy is actually a human, this paper compares Buddy's intake of foods to an average male's recommended daily intake (RDI), and discusses the effects that this may have on his health.

There is a website [2] that calculated that Buddy consumed 8075 kcal during the film. This was based on extrapolations from what he was seen to eat, for example they assume Buddy drinks hot cocoa three times a day. This paper differs as it investigates Buddy's nutritional intake based on the meals he is seen to consume in the film, assuming that he consumes the same meal for lunch as he does for dinner, and not including snacks. In addition, the website made different assumptions on portion size, where in this paper they were based on what was seen in the film.

Diet

During the film, Buddy is seen to consume two main meals; breakfast and dinner. For breakfast; 150g spaghetti, 50g Hershey's chocolate sauce, 20g mini marshmallows, 34 smarties and 50g chocolate pop tarts. For dinner; 150g spaghetti, 160g Bolognese sauce, 300g maple syrup and 2L Coca-Cola. The

amounts of each ingredient are based upon what is seen in the film and standard suggested serving sizes. Assuming that Buddy consumes the same meal for lunch as he does for dinner, therefore three meals in the day, his nutritional intake for the day was calculated (Table 1). This was compared to the RDI for an average male, which is applicable as Buddy is a human [3].

	Buddy's daily intake	Average male RDI	Percentage of RDI consumed by Buddy
Energy (kcal)	2769	2500	111%
Fat (g)	18	95	19%
Of which saturates (g)	8	30	27%
Carbohydrates (g)	624	300	208%
Of which sugars (g)	496	120	413%
Fibre (g)	11	24	45%
Protein (g)	25	55	45%
Salt (g)	2	6	35%

Table 1 – Buddy the Elf's daily intake compared to the recommended daily intake of an average male.

Health Implications

As shown in Table 1, Buddy does not consume the amounts recommended for an average male, the closest being his consumption of 111% his recommended daily energy intake. Although this

would not have too much of a negative effect on Buddy's health, the large overconsumption of certain food groups, and under-consumption of others, would.

The most significant would be his intake of 413% of his recommended sugar intake. This, if done on a regular basis and not utilised as energy via extreme exercise, would result in all of the excess being stored as glycogen in the liver. Although the health problem usually associated with high sugar intake is diabetes, this condition is not directly caused by excess consumption of sugar [4]. Type 2 diabetes is more likely if an individual is overweight, therefore Buddy's sugar intake is not likely to directly cause diabetes. However, his weight gain if his excess sugar is stored in the liver could indirectly lead to the condition.

His high sugar intake in the long term could also result in permanent damage to eyes, kidneys, nerves and blood vessels [5]. However, in the short term, this vast intake of sugar would give rise to high blood sugar levels (hyperglycaemia) which can lead to increased blood pressure, tiredness, blurred vision, thirst and frequent urination [6].

The frequent urination is caused by the high blood concentrations of glucose osmotically drawing intracellular fluid into the bloodstream, to try to stabilise the glucose levels [5]. It is also caused by the kidneys being unable to reabsorb fluid at high blood sugar concentrations, and therefore releasing fluid more often [6]. The frequent urination is also what causes the increased thirst, as it causes dehydration which is detected by osmoreceptors in the hypothalamus.

This would result in weight loss, rather than weight gain as may be expected, especially in combination with his lower than recommended fat and protein intakes (Table 1). Due to the fluid loss, weight would be lost, and there may be very little fat storage as glycerol in adipose tissue (if only 19% of the daily recommended intake is consumed) to utilise for energy when needed.

Further to this, his low protein intake (45% of the daily recommended intake) over time could lead to muscle dystrophy as his muscles would begin to be broken down for energy, and his protein levels would not replenish them. His low fibre intake (45% of the daily recommended intake) would lead to digestive issues and possible cardiovascular issues [7].

Conclusion

If Buddy's diet was as portrayed in the film long-term, his excess sugar consumption (413% of the RDI) paired with his under-consumption of fats, fibre and protein (19%, 45% and 45% of the RDI respectively) would have detrimental effects on his health. His body would be trying to regulate his blood glucose levels, as well as a deficiency in fat, protein and fibre. He would have very little energy, low weight due to low fat stores, high blood pressure, permanent nerve and kidney damage, digestive issues and muscle weakness.

Although Buddy's body may be able to consume these foods in these quantities on rare occasions, if consumed long term it is unlikely his body would be able to function well. This suggests that the elves may have bodies that require different nutrient intakes, however as Buddy is actually a human he would not be able to live on this diet.

References

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