Energy Drink Consumption Rates and Influences in Extreme Sport Enthusiasts

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ABSTRACT

Background: Energy drink companies have embedded themselves in the extreme sport subculture, by sponsoring athletes and competitions, for example: The X Games, Formula 1, and Nitro Circus. However, health effects associated with energy drink consumption currently has limited documentation, and questions remain unanswered surrounding the effects of their sugar and caffeine content. There is limited data on energy drink consumption rates and even less concerning the drivers influencing their consumption in varying sectors of the population. Consequently, those who regularly watch or participate in these sports are repeatedly exposed to advertising for these products.

Objectives: The aims of this study were to:

1. Quantify energy drink consumption rates in extreme sport enthusiasts;
2. Examine reasons for energy drink consumption;
3. Investigate why people participate in or follow extreme sport and if these are drivers of energy drink consumption;
4. Investigate if, and how, advertising and sponsorship of extreme sports and/or athletes influences energy drink behaviour.

Methods: A 41-item, cross-sectional online questionnaire was developed through recommendations of electronic survey best practices, including a pre-test focus group. Distribution was conducted via social media, email, flyers, and word-of-mouth. An incentive was available for all respondents who completed the questionnaire to enter one or more of the four extreme sports prize draws. The questionnaire was available from 15 November 2016 to 21 February 2017.
**Results:** The questionnaire had a completion rate of 64%. Of the 248 included respondents (mean (SD) age 26.2 (8.2) y, 40.5% female), 57.9% indicated that they consumed energy drinks, with 25.5% of respondents consuming at least one energy drink per week. No significant differences were found between consumption in males and females ($p=0.307$). There was an inverse correlation between age and consumption rate, where for every year older, a respondent was 3.1% less likely to consume energy drinks ($p<0.05$). Additionally, an increase of weekly viewing of extreme sport, was correlated with a 31% increase in the odds of consuming energy drinks ($p<0.001$), however reported weekly viewing of energy drink advertising was not associated with increased consumption. Of those that participated in and followed extreme sports for an adrenaline rush, 61.6% and 80% consumed energy drinks respectively. The most commonly reported reasons for consuming energy drinks included: to keep awake, provide a lift/get up and go, or for refreshment and taste. The most common reason for not consuming energy drinks was concern for adverse health effects.

**Conclusion:** Extreme sport enthusiasts appear to have a higher energy drink consumption than university students, athletes and general population reported in other questionnaire studies. The consumption rates reported in this study may be influenced by the exposure of energy drink advertising towards those with an increased frequency of viewing extreme sports. Future research will be needed to confirm this finding, in a larger, more international sample.
This study was conducted by the candidate in the Department of Human Nutrition at the University of Otago, Dunedin, New Zealand, and supervised by Dr Tracy Perry and Associate Professor Nancy Rehrer.

The concept of the study was conceived by Associate Professor Nancy Rehrer. As part of the Master of Dietetic thesis requirement in 2016-2017, Conrad Goodhew designed and developed the methodology of the study with the assistance of the supervisors.

The Candidate was responsible for the following:

1. Writing the ethics application for the study;
2. Investigating questionnaire database options, attending an introductory University of Otago IT Qualtrics™ course, in addition to using online tutorials;
3. Developing the survey questionnaire including question design and methodology;
4. Building and designing the Qualtrics™ online questionnaire, including visual appearance and survey flow;
5. Developing, organising and conducting a questionnaire pre-test focus group, and making amendments to the final questionnaire based on focus group response;
6. Designing distribution methods including emails to give the recipients ease-of-access, especially where sports clubs and individuals were invited to take part and distribute the survey;
7. Utilising social media by producing and using Facebook™ and Instagram™ pages, in addition to contacting professional athletes directly via their social media sites to take part in and help distribute the survey;
8. Cleaning data collected from the questionnaire and determining whether respondents were considered extreme sports enthusiasts;
9. Conducting all descriptive analysis, including reports and cross-tabulation;

10. Determining descriptive data that required statistical analysis, including appropriate entry of data into an Excel spread sheet for Dr Jill Haszard (Biostatistician, Department of Human Nutrition) to transfer into Stata 14.2 (StataCorp, Texas). She was quoted: ‘Thanks for sending me a very well-structured spreadsheet with the additional info about the variables. It was a breeze to use and very much appreciated’;

11. Writing and revising this thesis.

The candidate presented aspects of these findings at a University of Otago, Human Nutrition undergraduate lecture, HUNT232 (Sport & Exercise Nutrition) on 25 May 2017, Dunedin, New Zealand.
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### List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUS</td>
<td>Australia</td>
</tr>
<tr>
<td>Ca&lt;sup&gt;2+&lt;/sup&gt;</td>
<td>Calcium</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>EUR</td>
<td>€, Euro currency</td>
</tr>
<tr>
<td>GmbH</td>
<td>Gesellschaft mit beschränkter Haftung (company with limited liability)</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>n</td>
<td>Number</td>
</tr>
<tr>
<td>NASCAR</td>
<td>The National Association for Stock Car Auto Racing</td>
</tr>
<tr>
<td>NZ</td>
<td>New Zealand</td>
</tr>
<tr>
<td>NZD</td>
<td>$, New Zealand Dollar</td>
</tr>
<tr>
<td>SD</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>QR</td>
<td>Quick response</td>
</tr>
<tr>
<td>™</td>
<td>Trade mark</td>
</tr>
<tr>
<td>U.S.</td>
<td>United States</td>
</tr>
<tr>
<td>USD</td>
<td>$, United States Dollar</td>
</tr>
<tr>
<td>UTC</td>
<td>Coordinated Universal Time</td>
</tr>
<tr>
<td>WHO</td>
<td>The World Health Organisation</td>
</tr>
<tr>
<td>y</td>
<td>Years</td>
</tr>
</tbody>
</table>
1 Introduction

Extreme sports contain an element of risk and produce an adrenaline rush that motivates athletes to push boundaries thought impossible. Coupled with the high level of skill that these athletes require, these sports are spectacularly exciting for viewers. In addition to the increase in social media platforms, YouTube™ and online streaming, access to follow these sports is literally just one click away. Thus, extreme sports have provided a lucrative market for product branding and advertising. Energy drinks have become embedded within extreme sports due to sponsorship of athletes and events.

Energy drinks first appeared in Europe and Asia in the 1960s. However, energy drink pioneers Red Bull™ established themselves in Austria in 1987, then in the U.S. in 1997. Their marketing strategies align with an ‘away from the norm’ lifestyle, that has revolutionised the energy drink industry visible today. In 2015, worldwide energy drink consumption rose 10%, to 8.8 billion litres, with Red Bull™ dominating the market having 30% of the global market share1,2. Red Bull™ increased their turnover from 5.90 billion EUR to 6.03 billion EUR the following year3,4. Energy drink consumption rates are reportedly greatest in male adolescents or young adults5,6, university students, and athletes7-15.

Red Bull™ has established itself as a well-known icon of the extreme sports culture and subcultures, creating a brand extension beyond that of the energy drinks themselves16. Due to the major cost to compete in extreme sports, athletes often seek financial sponsorship to gain success in their chosen sports, where energy drink companies have made the most of this marketing opportunity. There is evidence that subliminal advertising of Red Bull™ to high thrill-seeking individuals increases their intention to consume that energy drink17. Energy drink companies have taken advantage of this market due to the alignment of their products with the
thrill-seeking nature of extreme sports. It is unknown if this sponsorship influences energy drink consumption.

There is currently insufficient evidence surrounding the reasons driving consumption of energy drinks and whether participation in or following extreme sport has an influence on this. There are gaps in understanding energy drink consumption rates in extreme sports enthusiasts, reasons for use, and the benefits and negative effects these individuals get from consumption. In addition, there is a lack of understanding if reasons for being an extreme sports enthusiast, type of extreme sport participated in or followed, or advertising influences energy drink consumption. The main aim of this study was, therefore, to examine energy drink consumption in extreme sports enthusiasts and the factors that may or may not influence this.
2 LITERATURE REVIEW

The objective of this review is to examine literature on the following: energy drink consumption and the factors that influence the use of energy drinks; health effects of energy drinks and the possible ergogenic effects; the impact of marketing, endorsement, and sponsorship in traditional and extreme sport on consumers’ behaviour towards specific products or brands; and questionnaire development.

2.1 METHODOLOGY

The literature was sourced via online article databases: Scopus, SPORTDiscus, Medline (Ovid), Business Source Complete (EBSCOhost), and Google Scholar. The Bedraggled Daisy\(^{18}\) was used as a visual representation of how the keywords fit into the research aim (Appendix A). Keywords included: Energy drink, extreme sport, survey and/or questionnaire, focus group and/or pre-test, perception and/or consumption, sponsorship, athlete, follower. Additional keywords were used to assist in refining some searches: Enthusiast, exercise, exposure, marketing, advertising, endorsement, adults, adolescents, ergogenic aids. Searches were limited to papers published in English between the years 1987 and 2017. Furthermore, literature was derived from reference lists of relevant journal articles.

2.2 DEFINING EXTREME SPORT

‘The term ‘Extreme’ is a popular adjective used to describe a range of individualistic, adventure-type pursuits and sports with obvious elements of risk’ Booth and Thorpe 2007\(^{19}\).

‘Extreme Sport’ (often called adventure or action sport) can be perceived differently dependent on an individual as there is no universal definition\(^{20,21}\). Extreme sport athletes are motivated by the thrill, risk, and danger of participation in these sports\(^{19,22}\). Freestyle skiing, motocross, downhill mountain biking and big wave surfing are examples of extreme sports\(^{19,23,24}\). A classification consideration is needed to differentiate between an extreme or leisure sport, even
when the sports are similar. For example, surfing in general is often classified as extreme, however, there is a much greater risk of severe injury or death in big wave surfing (waves bigger than six metres), compared to recreational surfing (one to two metres) \(^{22,25}\). A more specific definition has come from Brymer 2005\(^ {24}\), who defined extreme sports as ‘activities where a mismanaged mistake or accident would most likely result in death’. In another definition, Cohen 2012\(^ {23}\) explained that an extreme sports participant is ‘subjected to unusual physical and mental challenges such as speed, height, depth or natural forces and where fast and accurate cognitive-perceptual processing may be required for a successful outcome’. This definition focuses on the physical skill needed to perform in a sport. Combining the risk of participation, in addition to the skill required to complete the task, this study defines ‘Extreme Sport’ as: ‘A sport in which a physical thrill, commonly known as an adrenaline rush, often takes place. Physical and mental challenges occur frequently requiring fast and accurate reactions. A mistake or accident may result in lifelong disability or death’\(^ {19,23,24}\).

### 2.3 Energy Drinks

#### 2.3.1 Definition

For the purpose of this review and this research, an energy drink is defined as: ‘a carbonated beverage that contains caffeine and other ingredients to increase the perceived energy and vitality for the consumer’. The Australia New Zealand Food Standard 2.4.6 defines an energy drink (formulated caffeinated beverage) as a ‘Non-alcoholic, water-based flavoured beverage which contains caffeine and may contain carbohydrates, amino acids, vitamins and other substances (including other foods) for the purpose of enhancing mental performance’\(^ {26}\). This indicates that caffeine is the only essential ingredient and that these beverages are designed to stimulate cognitive function and alertness, separating them from soft drinks and electrolyte beverages that claim to enhance performance.
2.3.2 Energy Drink Ingredients

Literature indicates there are similar, but not necessarily identical ingredients in energy drinks. In addition to caffeine, these include, but are not limited to: sugar\textsuperscript{9,27,28}, taurine\textsuperscript{9,28-33}, B vitamins\textsuperscript{27,29-32,34}, amino acids\textsuperscript{27}, guarana\textsuperscript{9,27-30,33,34}, glucuronolactone\textsuperscript{30,31}, minerals\textsuperscript{29,31}, sodium\textsuperscript{29}, and herbal products, such as; ginseng\textsuperscript{9,27,28,34}, gingko biloba\textsuperscript{27} and St John’s wort\textsuperscript{27}.

Major brands currently available in Australia and New Zealand include Red Bull\textsuperscript{™} (Austria), Lift Plus\textsuperscript{™} (NZ), Monster\textsuperscript{™} (U.S.), V\textsuperscript{™} (NZ) and Mother\textsuperscript{™} (AUS)\textsuperscript{34} (Table 2.1).

<table>
<thead>
<tr>
<th>Energy Drink\textsuperscript{a}</th>
<th>Available Sizes (mL)</th>
<th>Caffeine mg/250 mL</th>
<th>Sugar g/250 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Bull\textsuperscript{™} (sf, flv)</td>
<td>250, 330, 355 &amp; 473</td>
<td>80</td>
<td>27</td>
</tr>
<tr>
<td>V\textsuperscript{™} (sf, nat, flv)</td>
<td>250, 300, 330, 350, 500 &amp; 710</td>
<td>78</td>
<td>26.5</td>
</tr>
<tr>
<td>Lift Plus\textsuperscript{™} (sf, nat)</td>
<td>250, 355 &amp; 500</td>
<td>80</td>
<td>30</td>
</tr>
<tr>
<td>Mother\textsuperscript{™} (flv)</td>
<td>250 &amp; 500</td>
<td>80</td>
<td>25</td>
</tr>
<tr>
<td>Monster\textsuperscript{™} (flv)</td>
<td>500</td>
<td>80</td>
<td>28.5</td>
</tr>
</tbody>
</table>

The Australia New Zealand Food Standard 2.6.4 restricts ‘formulated caffeinated beverages’ to contain a maximum of 320 mg caffeine per litre (80 mg per 250 mL – similar to that of a standard coffee)\textsuperscript{26}. The American energy drink Cocaine\textsuperscript{™} was banned in New Zealand as it far exceeded this limit, containing 250 mg of caffeine per 250 mL, but is still available in other countries\textsuperscript{36}. There are no recommendations for caffeine intakes for the general population or athletes, however, adverse effects have been found in caffeine consumption greater than 400 mg per day\textsuperscript{37,38} (section 2.5.1 below).

In addition to caffeine, free sugar is another major component with common New Zealand brands containing more than 25 g per 250 mL serving (Table 2.1). ‘The term ‘free sugars’ refers to all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus the sugars that are naturally present in honey, syrups and fruit juices’\textsuperscript{39}. The WHO strongly recommends a daily free sugar intake of less than 10% of total energy intake.

\textsuperscript{a} sf: offers a sugar-free option, nat: offers a natural option, flv: offers alternative flavours
However, a conditional recommendation of less than 5% of energy intake, roughly 25 g (6 teaspoons), per day would reduce risks associated with high sugar consumption\textsuperscript{40}. Sugar-free energy drinks are also available on the market (Table 2.1). These sugar-free energy drinks contain artificial sweeteners (such as aspartame, sucralose and saccharin) in place of calorie-yielding sugar\textsuperscript{35}. Furthermore, energy drinks are also available in containers over 700 mL, which is almost three times the recommended serving (250 mL). In addition, ‘single use’ (not able to be resealed) cans are common in 500 mL quantities\textsuperscript{35}.

Based on the current literature and recommendations, the caffeine content in a 250 mL energy drink is similar to standard coffee. However, the sugar levels are comparable to soft-drinks which can be detrimental to oral and weight health. Additionally, the option for a larger single serve container can increase sugar and caffeine consumption, which could have further health consequences.

2.4 MARKETING AND CONSUMER ATTITUDES

‘Energy drinks’ first appeared in Europe and Asia in the 1960s, with leading energy drink company Red Bull GmbH\textsuperscript{™} being established in 1987. Red Bull GmbH\textsuperscript{™} has defined the energy drink industry and has succeeded in building a brand ubiquitous in night life culture and extreme sports as well as making in-roads into traditional sports and media\textsuperscript{16}. Their aggressive marketing strategies laid the foundation for energy drinks seen today, with global sales continuing to grow\textsuperscript{30,32,41}.

2.4.1 Energy Drink Pioneers: Red Bull\textsuperscript{™} GmbH

‘We don’t bring the product to the people. We bring the people to the product’, Dietrich Mateschiz, Red Bull GmbH\textsuperscript{™} co-founder\textsuperscript{16}. Red Bull’s early marketing strategies focused on the influential, night-life enjoying, European generation X (generation after baby boomers) thus laying a foundation to create brand awareness for generation Y (those born after 1980). Marketing of Red Bull\textsuperscript{™} in sport started in Austria in 1991, with the creation of the Flugtag event\textsuperscript{42} (a Red Bull\textsuperscript{™} event that involves flying homemade gliders off a pier) where it seemed
that Red Bull’s intentions were to develop a brand prominent in the world of extreme and alternative sport. The Flugtag event aligned perfectly with the brand’s slogan ‘Red Bull gives you wings’\textsuperscript{16}. Red Bull\textsuperscript{TM} entered the U.S. market in 1997 using a ‘buzz’ marketing strategy, where, as of 2015, the U.S. market now contributes 52\% of its sales\textsuperscript{1}. As of 2006, 300 million USD was spent per year on sports marketing, with the sponsorship of over 500 extreme sports events and athletes, further strengthening Red Bull’s reputation in the extreme sports industry\textsuperscript{43}. In 2016, Red Bull\textsuperscript{TM} had a 6.03 billion EUR (9.16 billion NZD) turnover, which was an increase from 5.90 billion EUR the year before\textsuperscript{3,4}. Through establishing Red Bull as an icon of the extreme sports subculture, the brand has not only dominated the energy drink market, but has successfully aligned its marketing with extreme sports and gained a brand extension beyond that of energy drinks\textsuperscript{16}.

2.4.2 Sponsorship, Endorsement, and Advertising in Sport

Consumers’ attitudes towards TV commercials are becoming more negative, and attitudes towards online advertising (such as pop ups and spam) are extremely negative\textsuperscript{44}. Pyun and James 2011\textsuperscript{44} suggest that sponsorship during a sports event offers a large platform for many brands as sport encourages a positive attitude towards products, which influences purchase intentions\textsuperscript{45}. Furthermore, the credibility of a celebrity endorsement of a product can directly result in a positive or negative effect, depending on the credibility of the endorser themselves\textsuperscript{46}.

Sports brands are constantly finding new ways to ‘stand out from the crowd’. As an athlete, these marketing strategies can be overwhelming due to competing products making claims to support their training. It has been reported that an athlete’s choice is often inconsistent with science-based evidence, indicating the varying influence of marketing on their selection\textsuperscript{47}. Newland, Chalip 2012\textsuperscript{47} surveyed 699 triathletes, mean (SD) age 40.4 (10.2) y, and found that despite the fact the athletes valued scientific evidence, 59.4\% of the respondents would choose an electrolyte drink or water after exercise, instead of a carbohydrate-protein beverage (the optimal choice).
2.4.3 Marketing in Extreme Sport

It has been suggested that an increase in extreme sports participation is fast becoming a sign of modern times as people are looking for new ways to escape from the mainstream way of living\textsuperscript{20}. These extreme sports have created their own culture, producing a substantial adventure sports industry for equipment, tourism and specialist media\textsuperscript{20}. Extreme sports are considered unconventional and this creates an opportunity for energy drinks to align campaigns with this type of ethos\textsuperscript{48}. A study by Bustin, Jones 2015\textsuperscript{17} assessed the impact of Red Bull\textsuperscript{TM} subliminal advertising on 140 American adults (mean (SD) age 36.5 (12.8) y). Findings showed that subliminally exposing Red Bull\textsuperscript{TM} to high thrill-seeking individuals increased their intention to consume, but no difference was found in those that were low thrill-seekers\textsuperscript{17}. In support, Levin, Joiner 2001\textsuperscript{49} researched 81 participants and found that NASCAR\textsuperscript{TM} brand recall was greater for on-car advertising than for ad only advertising. Further, those that were bigger fans of NASCAR\textsuperscript{TM} would be more influenced by marketers’ activities\textsuperscript{49}. This highlights that advertising and sponsorship extreme sport has a large impact on consumer behaviour.

It was apparent that marketing and sponsorship of energy drinks influence consumer perception of a product. Companies aim to create a positive attitude towards their products, and subsequently influence purchasing intentions. In addition, there is an increased demand for sponsorship to support professional athletes as the cost to compete at the elite level is at a premium, and companies are using this opportunity to target a large platform of enthusiasts that follow these athletes. Red Bull’s marketing strategies have developed its brand as a well-known icon in extreme sports subculture, which has, in turn, revolutionised the energy drink industry we see today. It is evident that the influence of advertising and sponsorship in sport may affect athletes’ and followers’ perceptions and use of energy drinks.

2.5 Health Effects of Energy Drink Consumption

Marketing claims made about energy drinks typically state that energy drinks improve physical performance and stimulate cognitive function\textsuperscript{50}. The possible mechanism (or ingredient)
responsible for this effect is unclear, however, energy drinks have been found to improve both aerobic and anaerobic activities as well as cognitive function in athletes\textsuperscript{51-54}. In contrast, studies have documented adverse health effects related to energy drinks\textsuperscript{32,50}, raising the question if these beverages are safe for consumption.

2.5.1 Potential Adverse Effects of Energy Drinks

Adverse effects of energy drinks are often related to the main ingredient - caffeine. Caffeine intoxication is a clinical syndrome indicated in WHO’s International Classifications of Diseases (ICD-11) where symptoms include; anxiety, sleeplessness, insomnia, diuresis, gastrointestinal upset, increased heart rate and blood pressure, tremors, tachycardia, and in rare cases, death\textsuperscript{32,55}. Over the last eight years, medical documents and media have reported five heart attack fatalities in healthy male and females (16-28 y) related to caffeine in energy drinks\textsuperscript{56-59}. More recently a 16-year-old healthy male sustained a cardiac arrest and died due to the consumption of multiple caffeinated beverages, including a large energy drink, within two hours (estimated total intake \(\sim 434 \text{ mg} \) exceeding the daily recommendation of 400 mg)\textsuperscript{60}. In 2012, the U.S. Food and Drug Administration reported 31 hospitalisations, including a number of life-threatening cases, and five deaths related to energy drink reported incidences between 2009 and 2012\textsuperscript{61}. It was concluded that although these incidences were related to energy drink consumption, it was unknown if caffeine toxicity was caused by energy drinks alone, or in combination with other caffeine containing products. Further, if a person has underlying susceptibilities, they will be more prone to fatal consequence caused my caffeine, especially adolescents and young adults\textsuperscript{62,63}.

In addition to caffeine intoxication, energy drinks may be contributing to poor health outcomes similar to those seen with sugar sweetened beverage consumption. These include: obesity, type II diabetes mellitus, increased cardiovascular disease markers, poor oral health, and general quality of life\textsuperscript{64-68}. A severe case of an energy drink addiction (daily consumption of up to three energy drinks per day, for over three years) was reported by Stuff.co.nz\textsuperscript{69}. in
which a 28-year-old male lost half his teeth to tooth decay, stating ‘bits of teeth break off when you brush them’, as quoted in a video. In addition to sugar containing energy drinks, sugar-free options are available on the market. However, there was a lack of evidence for the safety of long term artificial sweetener consumption, as some studies suggest that artificial sweeteners in beverages may increase the risk of weight gain, type 2 diabetes, and cardiovascular disease\textsuperscript{70-72}. Moreover, artificially sweetened beverages may cause taste fatigue in habitual users, who subsequently adopt a poor diet due to an increased preference for sweeter foods\textsuperscript{70}.

Longitudinal studies, such as the New Zealand Adult Nutrition Survey\textsuperscript{73}, are crucial to assessing the long-term effects of energy drink consumption, whether it be evaluating the effect of caffeine, free sugar, artificial sugar replacement or a combination of ingredients.

### 2.6 Effect of Energy Drink Consumption on Performance

This section focuses on sports performance and energy drink consumption, and the effects of particular ingredients.

#### 2.6.1 Caffeine and Taurine as Ergogenic Aids

Caffeine is one of the main ingredients in energy drinks. Caffeine (from sources other than energy drinks) has been well documented as an ergogenic aid in sport, however, the exact mechanism is not well understood\textsuperscript{74}. The International Society of Sport Nutrition (ISSN) reported that caffeine improved anaerobic and aerobic sports performance, including increased time trial performance, improvements in high intensity exercise; and increased cognitive function\textsuperscript{75}. In addition to caffeine, taurine is also a common ingredient in energy drinks. Scientific studies show that taurine has performance enhancing benefits, such as facilitating Ca\textsuperscript{2+} dependent skeletal and cardiac muscle relaxation-contraction processes and antioxidant activity to protect cellular properties during exercise at a physiological level\textsuperscript{54,76-79}. However, there is minimal evidence that taurine enhances physical performance in sport-specific trials\textsuperscript{65,67}. The possible mechanism(s) of how taurine might affect exercise performance is unclear.
2.6.2 Energy Drinks as an Ergogenic Aid

As explained in Section 2.3.2 above, energy drinks contain a cocktail of ingredients where concentrations can vary between brands, making it difficult to determine which ingredient (or combination of ingredients) enhances performance. This section focuses on the effects energy drinks have on sports performance. In a randomised control trial of 13 elite male field hockey players with a mean age (SD) of 23.2 (3.9) y, the energy drink group (3 mg/kg caffeine), travelled 18.5% further at high intensity running (19.0-22.9 km/h, \( p=0.05 \)) and 38.1% further sprinting (>23 km/h, \( p=0.02 \)) than a placebo controlled group\(^{52}\). This was supported by another randomised controlled trial investigating the consumption of energy drinks (3 mg/kg caffeine) in 18 female soccer players (mean (SD) age 21 (2) y) during a simulated game. The energy drink group, as compared to placebo, increased average peak running speed (\( p<0.05 \)), total running distance covered (\( p<0.05 \)), and the number of sprinting bouts (>18.0 km/h, \( p<0.05 \))\(^{53}\).

This evidence was supported by a 2016 systematic review and meta-analysis (\( n=34 \) crossover randomised control trials published between 1998 and 2015) on the effect of energy drinks on physical performance\(^{51}\). Souza, Del Coso 2016\(^{51}\) concluded in 653 physically active healthy participants (505 male, mean age range 19–39 (one study 40+) y) that energy drinks: increased muscular strength and endurance (dynamic, concentric, isometric, \( p<0.001 \)); jumping tests (\( p=0.001 \)); endurance exercise tests (cycle or treadmill, \( p<0.001 \)); and sport-specific actions (in stimulated games, running, cycling and jumping, \( p<0.001 \))\(^{51}\). Furthermore, they reported that the increase in performance from energy drinks was associated with an increase in taurine dosage rather than caffeine. For every one mg increase in taurine, there was a 0.0001 increase in effect size (\( p=0.04 \)), however, this was not found for caffeine (\( p=0.21 \))\(^{51}\). There was some evidence to support taurine as the ingredient to significantly increase performance, but whether this was a combination with caffeine or other ingredients is unknown\(^{77}\).

In summary, current evidence supports a strong link between energy drink consumption up to 90 minutes prior or during activity and improved sports performance. However, the exact...
mechanism and which ingredients have this effect are still open to interpretation. To date, it is reported that caffeine and taurine are the main ingredients having this performance enhancing effect. Further research on the use of energy drinks as an ergogenic aid to elucidate this effect is required.

2.7 Trends in Energy Drink Consumption

In February 2010 there were 26 different types of energy drinks, from 13 different brands, available on the market in New Zealand\(^3\). In the 2008/09 Adult Nutrition 24-hour Recall Survey, only 3% of participants older than 15 y consumed at least one energy drink (n=138)\(^7\). In an Australian study, a computer-assisted telephone interview of 1,999 participants, with a mean (SD) age 45.9 (20.0) y, 13.4% reported that they had consumed at least one energy drink in the last 3 months\(^6\). Whilst a cross sectional online questionnaire of 1,922 participants, with a mean (SD) age 24.4 (6.7) y, found that 59% of respondents had consumed one energy drink in the last 12 months\(^8\).

Population consumption rates in these studies varied, however, with adolescents and young adults, particularly males, having the highest consumption of energy drinks. In the computer-assisted telephone Australian study, consumption was higher in the 18-24 y and 25-39 y age groups compared to 40 years or older (36.8%, 24.3%, and 5.2% respectively)\(^6\). It was also found that more males consumed energy drinks than females (17.8% and 6.02% respectively). Furthermore, a cohort study (n=2287), Project EAT-III by Larson, Laska 2015\(^5\), also found that more males than females consumed energy drinks (26.7% and 12.2% respectively, \(p<0.001\)).

Overall, the majority of studies that specifically addressed energy drink consumption were on university students. Energy drink users were defined as consuming at least one energy drink in the last 30 days or consuming on average one energy drink per month\(^12\)-\(^14\). High energy drink consumers were defined as those consuming energy drinks at least six times in the last 30 days, or at least one energy drink per week\(^81\).
Table 2.2 summarises consumption in university students from available studies. Current energy drink users range from 10.8% to 70.1% and high consumption ranged from 10% to 59.1%. Furthermore, five of the six studies that found differences between sex, reported a higher percent of males as larger consumers of energy drinks.

In addition to general population, energy drink companies often target athletes to encourage consumption of energy drinks as an ergogenic aid (see Section 2.6.2 above). Gallucci, Martin 2016 found that 28.3% of student athletes (n=58, ages 18-25 y) had consumed energy drinks in the last 30 days. The author also reported that half of these student athletes (n=29) used energy drinks to gain more energy. In another cross-sectional questionnaire survey, 15.3% of student athletes (mean (SD) age 22.5 (2.5) y) consumed energy drinks before participating in a sport or activity, and six percent used them after exercise.

In summary, young adults (particularly males) and sports people have a higher consumption rate of energy drinks. However, there may be discrepancies in these findings as there is no commonly accepted classification of how an energy drink consumer is defined.

2.7.1 Influences of Energy Drink Consumption

As energy drink consumption has dramatically increased over the last two decades, several factors have been highlighted impacting consumers’ choice to consume energy drinks. Taste has been found to be the most important factor when choosing to consume an energy drink. In addition, consumers are less likely to sacrifice taste for a healthy alternative.

Age is also a factor influencing energy drink consumption. A New Zealand quantitative study by Bunting, Baggett 2013, analysed three different age brackets (16-21 y, 22-28 y, 29-35 y) to determine differences in attitudes towards energy drinks. It was suggested that the youngest groups (16-21 y) were more influenced by peer pressure when deciding to consume energy drinks, compared to the older groups (22-28 and 29-35 y). It was concluded that health awareness may be present in any age, however, it is only in the group aged 29-35 y that awareness transitions to health consciousness and, therefore, seeking a healthier alternative.
Table 2.2: Summary of energy drink consumption in university students*.

<table>
<thead>
<tr>
<th>Study</th>
<th>n participants</th>
<th>Mean age or range (SD, y)</th>
<th>Current energy drink users</th>
<th>High energy drink consumers</th>
<th>Males that consumed Energy Drinks</th>
<th>Females that consumed energy drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pettit and Debarr 20117</td>
<td>136</td>
<td>18-24</td>
<td>70.1% (n=89)</td>
<td>59.1% (n=75)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Ballistreri and Corradi-Webster 20088</td>
<td>211</td>
<td>22.5 (2.25)</td>
<td>57.3% (n=121)</td>
<td>32.7% (n=69)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Malinauskas, Aeby 200714</td>
<td>496</td>
<td>21.5 (3.7)</td>
<td>51% (n=253)</td>
<td>n/a</td>
<td>42% (n=107)</td>
<td>53% (n=146)</td>
</tr>
<tr>
<td>Alsunni and Badar 20119</td>
<td>412</td>
<td>M: 21.4 (2.0) F: 21.2 (2.1)</td>
<td>45.6% (n=188)</td>
<td>12.6% (n=52)</td>
<td>54.6% (n=154)</td>
<td>26.1% (n=34)</td>
</tr>
<tr>
<td>Arpacii, Tosun 201010</td>
<td>153</td>
<td>M: 21.2 F: 22.6</td>
<td>40.5% (n=62)</td>
<td>20.9% (n=32)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Aslam, Mughal 201311</td>
<td>866</td>
<td>21.4</td>
<td>40.4% (n=350)</td>
<td>28.8% (n=249)</td>
<td>48.8% (n=122)</td>
<td>37.1% (n=228)</td>
</tr>
<tr>
<td>Reid, Ramsarran 201512</td>
<td>1994</td>
<td>&gt;19</td>
<td>38% (n=756)</td>
<td>10% (n=197)</td>
<td>39% (n=264)</td>
<td>32% (n=421)</td>
</tr>
<tr>
<td>Gallucci, Martin 201613</td>
<td>692</td>
<td>20.4 (1.42)</td>
<td>36.4% (n=252)</td>
<td>10% (n=69)</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Semih Uzundumlu, Sezgin 201615</td>
<td>260</td>
<td>M: 24.0 F: 22.7</td>
<td>10.8% (n=28)</td>
<td>n/a</td>
<td>18.1% (n=21)</td>
<td>4.9% (n=7)</td>
</tr>
</tbody>
</table>

*represent those that have indicated they have consumed energy drinks before (not necessarily 'current energy drink users').

n/a: Information was not available

Note: Tables are not included in the page count for an MDiet Thesis

Where SD was available
Energy drinks contain a range of stimulating ingredients which are designed to give the consumer a ‘boost of energy’\textsuperscript{50}. One survey of university students (n=496, mean age 21.5 y) found that over two thirds of participants used energy drinks due to insufficient sleep and to increase their energy (67\% and 65\%, respectively)\textsuperscript{14}. In addition, half of the participants used energy drinks when preparing for stressful events, such as exams or a deadline of major projects\textsuperscript{14}. The American College Health Association surveyed 94,806 university students and found that 28.5\% indicated insufficient sleep had impacted academic performance\textsuperscript{84}. Due to energy drinks possibly reducing sleep, this could impair academic performance, rather than improve it as intended by the consumer.

A cross-sectional analysis of the Project Eat-III cohort study reported that males and females who consumed energy drinks more than once per week had a high enjoyment in completing dangerous tasks compared to those who did not enjoy these tasks, e.g. sky diving, and bungy (\(p=0.03\) and \(p=0.01\) males and females respectively)\textsuperscript{5}. This was supported by Spierer, Blanding 2014\textsuperscript{85} who reported that university students with a high energy drink consumption (\(\geq\) three times per week) were more likely to engage in extreme sports than low energy drink consumers (\(\leq\) two times per week, \(p<0.05\)). Furthermore, Miller 2008\textsuperscript{81} had similar findings where undergraduate students who were high energy drink consumers (\(\geq\) six times per month) were more likely to engage in extreme sport than low consumers (\(\leq\) five times per month, \(p<0.01\)). Understanding the motive for consumption of energy drinks will aid in developing health strategies to prevent the negative health implications associated with energy drinks.

2.8 **Electronic Questionnaires**

Online surveys are becoming the most common and efficient means to gathering respondent data, especially for large participant numbers. This can be done by using an online questionnaire database, such as Survey Monkey™, Qualtrics™ or REDCap™. Questionnaire design involves developing questions that are unambiguous so respondents can successfully answer it truthfully.
Survey flow is also essential to reduce non-completion of participants using an adaptive questioning technique.

### 2.8.1 Question Design

Some issues associated with specific question development are related to potential problems caused by poor design\(^6\). These issues include: respondents understanding of the question asked; the mental process required to retrieve information; and how much information the respondent is willing to disclose.

Questions can be asked in a range of different formats, including open-ended, closed-ended and partially-closed-ended questions\(^87\). Open-ended questions allow respondents to express their answers without influence from other choice options. However, these open-ended questions require more effort for the respondent where they are more likely to leave these questions unanswered. In addition, there is an increased effort required for the investigator to code them\(^86\). Closed-ended questions can take the form of binary (yes/no), nominal (multi-choice answers with un-ordered answers), and ordinal (ordered answers, such as frequency of viewing) measurement\(^87,88\). Electronic surveys are useful in this respect as they contain a randomisation tool to reduce the tendency of respondents to select the first answers presented in multi-choice questions, where answers are displayed in a different order for participants\(^87\). Furthermore, the addition of an ‘other’ option turns a closed question into a partially-closed-ended question, in which best practices suggest, to keep the questionnaire short but allows for a wide range of answers from the respondent\(^87\).

Previous studies that evaluated energy drinks via a questionnaire and had questions available, were used to lay the foundation of this questionnaire design\(^6,9\)\(^-\)\(^11,89\). Examples included: ‘how often do you use energy drinks?’\(^89\); ‘what is the most common adverse/withdrawal effects of energy drinks?’\(^11\); and ‘had you ever searched about energy drinks?’\(^11\).
2.8.2 **Questionnaire Development**

Survey questions must be formatted in a logical order, with the most important questions first\(^\text{87}\). Furthermore, a visually appealing survey is important to encourage respondents to take part and complete it. Using images that the respondents can relate to, progress bars and consistency of design, such as design style and colour scheme, all add value for the respondent\(^\text{87,90,91}\). Adaptive questioning is also a useful tool when using online questionnaires. Adaptive questioning is structuring a questionnaire using skip and display logic to move through the questionnaire and only answer questions based on previous answers, preventing respondents from seeing questions that are not appropriate to them\(^\text{90}\).

2.8.3 **Pre-Testing**

The purpose of a focus group pre-test is to ensure respondents’ answers align with their internally generated answer, known as response process validity\(^\text{92}\). Willis 2015\(^\text{92}\) investigated the question appraisal system (QAS-2009), which covered eight major categories and 27 sub-categories. This method provided the investigators a structure to aid in conducting the pre-test and accurately identify potential problems with the draft questionnaire. Categories included: reading, instructions, clarity, assumptions, knowledge/memory, sensitivity/bias, response, and other problems the focus group had with the questionnaire. Further to this, feedback from a focus group that represents the target population is important as it will assist in formulating questions more concisely, which should translate to higher completion rates\(^\text{92}\).

2.8.4 **Incentives**

Incentives help to increase the number of respondents undertaking a survey questionnaire in addition to reducing selection bias (when a representative sample of the target population is not achieved)\(^\text{88}\). A Cochrane review\(^\text{91}\) reported that a non-monetary incentive (e.g. an Amazon gift card) increased response rates by 72% in e-questionnaires (OR 1.72, 95% CI 1.90 to 2.72).

In summary, adapting questions from previous papers to make it appropriate for our target audience; establishing a questionnaire flow; and, using incentives for the target population will
aid in increasing respondent numbers and completion rate, as well as obtaining answers that align with the respondents’ internal answers.

2.9 CONCLUSIONS

1. Energy drink brands are well established in extreme sports, as they align their marketing strategies with extreme sports to develop a positive relationship and association with extreme sport athletes and enthusiasts.

2. Serious medical implications, even death, have been related to caffeine intoxication, mainly in adolescents and young adults who were sensitive to caffeine.

3. Energy drinks may improve sports performance in athletes (increased muscular strength and endurance; improved endurance exercise tests; and increased time and distance at top speed long period (60-90 min) high intensity interval exercise, as experienced during team sports), however, the exact ingredient and mechanism related to the improvement are unknown.

4. Energy drinks are mostly used for an ‘energy boost’. Students often consume energy drinks during stressful times such as exams.

5. At a population level, energy drink consumption is moderate and individual consumption varies widely, however, certain groups, including, males, adolescents, students and those active in risk-taking behaviours, are most likely to have greater consumption.

6. There appears to be no research into sponsorship of extreme sport events, or athletes, and the influence this may have on energy drink consumption.
3 **Objective Statement**

In this paper, extreme sport enthusiasts are classified as people who either participate in, and/or follow, extreme sports. Based on the conclusions of the literature review and the lack of knowledge of energy drink use in extreme sports athletes, the aims of this study were to:

1. Quantify energy drink consumption rates in extreme sport enthusiasts;
2. Examine reasons for energy drink consumption;
3. Investigate why people participate in or follow extreme sport and if these are associated with energy drink consumption;
4. Investigate if, and how, advertising and sponsorship of extreme sports and/or athletes influences energy drink behaviour.
4 METHODS

The aim of this survey was to obtain information on energy drink consumption patterns and the reasons behind energy drink use in extreme sports enthusiasts. The timeline of the study is presented in Figure 4.1. The University of Otago Human Ethics Committee approved this study and online consent was obtained from the respondents prior to the study commencing (Appendix B-F).

<table>
<thead>
<tr>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
</tr>
</thead>
<tbody>
<tr>
<td>survey tool research</td>
<td>development</td>
<td>pre-test and focus group</td>
<td>final changes</td>
<td>distribution</td>
<td>analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 4.1: Study timeline: September 2016 to April 2017*

4.1 QUESTIONNAIRE DEVELOPMENT

Qualtrics™ was the survey tool of choice after conversations with the IT department at The University of Otago and Human Nutrition Department staff who had used a range of online survey tools. Qualtrics™ is an easy-to-use survey system with a wide range of design and formatting tools, both on a computer and mobile phone. Furthermore, descriptive data is easily analysed in Qualtrics™ with reporting and crosstabulation systems. A University of Otago IT Qualtrics™ course and online tutorials were participated in to best understand how the Qualtrics™ software could support and enhance this research. These tools were used to get the most out of our respondents, with minimal burden.
Questionnaires that focused specifically on energy drinks were assessed as part of the literature review. These studies provided examples for multiple choice questions and answers, that were then adapted for our target audience. Furthermore, literature was assessed to provide an insight specifically into question design, questionnaire development, pre-testing and incentives to determine best practices and get accurate answers from the respondents (see Section 2.8 above). In addition, the use of cognitive interviewing for focus group pre-testing was used to strengthen this studies questionnaire. Cognitive interviewing is an important tool to understand the questionnaire from the respondent’s perspective rather than the researchers.

1.1.1 Draft Questionnaire

A draft questionnaire was developed using questions that answered the studies aim. The draft questionnaire included closed-ended, open-ended and partially-closed-ended questions. Partially-closed-ended questions were common as they were multi-choice questions with an other (please specify) option. These were favourable as they both reduced the respondent burden and allowed for a wide range of answers, as there were no verified questionnaires for this type of research.

Skip and display logic was used in the questionnaire, which enabled the respondent to move around the questionnaire, based on previous answers (Appendix G). Skip logic would skip a section of questions if they were not appropriate for the respondent (based on their previous answers), and display logic would display one or two more questions to expand on a chosen answer. Questions that were required for skip or display logic were equipped with a force response, where the respondent would not be able to move to the next question without answering. Questions with skip logic were followed by a page break so respondents were unable to see what the upcoming questions were without answering. To demonstrate skip logic: respondents were asked if they participated in extreme sports. If they answered no, they would automatically skip all questions that expanded on extreme sports participation (Figure 4.2).
Methods

Figure 4.2: Snippet of the questionnaire flow (Appendix G) to show skip logic used in the questionnaire (red circle)

Figure 4.3: Snippet of the questionnaire flow (Appendix G) to show display logic used (red circle), in addition to a screenshot to show ‘in page’ display
Display logic would display questions to expand on the answer that respondents had chosen. Display logic could be displayed ‘in page’ so the respondent was able to see additional questions without having to move to another page. For example, if an individual responded with yes to ‘Do you have a preferred brand of energy drink?’, an additional question ‘What brand of energy drink do you prefer?’, would be displayed below to expand on the question asked (Figure 4.3). Carry forward logic was used in the draft questionnaire for respondents to rank multi-choice questions (total of four questions).

The draft questionnaire consisted of 36 questions, which included: demographic information (five questions); participation in extreme sports and reasons for this (five questions); following extreme sports, why they did so and frequency of watching (six questions); if they used energy drinks and reason for consumption (11 questions); frequency and side effects of energy drink consumption (three questions); energy drink knowledge (five questions); frequency of energy drink advertising (one question). An online consent form with an information sheet attached as a hyperlink was available before the start of the questionnaire (Appendix F, H). By using skip and display logic, respondents were not required to answer all 36 questions. Depending on the respondent’s answers, the number of questions presented was between 18 and 35. Where appropriate, lay language was used to assist the target population in understanding the question and answers.

Question order was not randomised due to skip and display logic. However, the multi-choice answers were randomised. For example, the question that asks, ‘Why do you watch and/or follow extreme sports? please choose those that apply:’ the answers appear in a different order for each respondent. For the partially-closed-ended questions, other (please specify) would always be the last answer available (example Figure 4.6 below).

Using Qualtrics survey flow, recipients were also able to be removed from the survey if they did not meet the study requirements (Appendix G). First, if a respondent indicated they ‘do not agree’ with the consent form, they would be redirected to a message that said: Thank
you for considering our survey, unfortunately, you do not agree with the consent form. If you would like to come back and try the questionnaire at a later date, feel free to click on the same link you used to enter before. If there are any complications, please contact energydrinksurveyotago@gmail.com. Secondly, a respondent was removed from the survey if he/she did not meet the criteria. This included being under the age of 18 y; and if the respondent clicked no to both the ‘Do you participate in extreme sports?’ and ‘Do you follow extreme sports?’ questions, indicating they were not extreme sports enthusiasts. The respondent would be removed from the survey with a message saying: Thank you for taking part in our survey. Unfortunately, you do not meet the criteria to move further. We thank you for your time. Investigators did not specify why the respondent was removed as this would give them an opportunity to change the answer that prevented them from getting into the prize draw. If a respondent was removed, this would happen within a maximum of seven questions.

4.1.1 Questionnaire Display Design

Visually, the questionnaire had to be appealing to the respondent to create a sense of conversation. A Qualtrics™ theme was used to give the questionnaire a casual feel and prevent the respondent feeling like they were being interrogated. The Qualtrics themes vary dependent on background picture, text style used and visual structure of the survey. Figure 4.4 to 4.7 below show a portion of the questionnaire flow and how respondents would view the survey both on a computer or a mobile device. Demographic questions used a slide bar for age, and a range of multiple-choice open and closed questions (Figure 4.4). Figure 4.5 shows an open-ended question where the recipient could indicate the extreme sport they participated in, where this would be then decided in analysis whether this sport was considered extreme under the definition in Section 2.2. Piped text was used in the following questions, where it would give the questionnaire a sense of conversation, further emphasising a relaxed feel (Figure 4.6 and 4.7).
Figure 4.4: Slide bar and closed-question, and open-question

Figure 4.5: Open-ended question for extreme sports participation

Figure 4.6: Partially-closed-ended question and the use of piped text
Figure 4.7: Ranking of a multiple-choice question

Figure 4.6 shows an example of a partially-closed-ended question with *other (please specify)* available as an answer. Respondents would then be asked to rank these options in the next question (Appendix H).

4.1.2 Questionnaire Pre-testing

Pre-testing a questionnaire is recommended to increase response process validity (see Section 2.8.3). The question appraisal system for focus group pre-testing (QAS-2009) was used, as explained in Willis 2015\textsuperscript{92}. Seven extreme sport enthusiasts were recruited on Facebook\textsuperscript{TM} (social media) to take part in a one hour focus group to pre-test the questionnaire and provide feedback and discussion. This focus group was approved by the University of Otago Ethics Committee (Appendix C), for which the respondents were provided an information sheet and signed consent prior to the start of the focus group (Appendix E). As an incentive, respondents received a $20 supermarket voucher at the end of the focus group. Note taking was done by both the observer and interviewer to provide back-up information. In addition, a voice recording of the focus group was taken.

Overall, feedback from the focus group indicated that the questionnaire was quick and easy, simple, and had good flow. Minor changes were made based on focus group
recommendations (see Section 4.1.2.1 below), that were to minimise respondent burden and, hence, enhance accuracy of answers.

### 4.1.2.1 Final Amendments

The main recommendations taken from the focus group, and in consultation with investigators, are described below (detailed recommendations are presented in Appendix H, along with a final questionnaire screenshot in appendix I):

1. Members of the focus group reported that they did not read the information sheet. It was important they read this as part of ethical requirements. In the draft questionnaire, the information sheet was available via an external link at the bottom of the consent form. In the final questionnaire, the respondent had to scroll through and view an invitation sheet and information sheet before they got to the consent form.

2. The focus group indicated that a definition for extreme sport should be included before extreme sports questions. This was added before the question ‘Do you participate in extreme sports?’. In addition, a definition for energy drinks was also provided. This was to help differentiate between other drinks, mainly electrolyte sports drinks. Both definitions had been sourced from the literature, using appropriate wording that was unambiguous, such that respondents could understand the definition.

3. When asked to write which extreme sport(s) they participated in or followed, an open-question was provided. For example, ‘Please specify the extreme sport(s) you participate in?’. The focus group suggested a list of extreme sports should be established with an other (please specify) question, representing a partially-closed-ended question. The final questionnaire, thus, was altered to include a list of extreme sports the investigators had identified which was located under the extreme sport definition and made it easy for respondents to choose (Figure 4.8). An ‘other’ option was also available where investigators could decide if the ‘other’ extreme sport a respondent indicated was in fact
considered extreme, upon analysis of the data. A list of 42 sports were established as multi-choice answers, plus the other (please specify) option (see Section 4.4.2 below).

![List of extreme sports as the respondents could see them](image)

**Figure 4.8: List of extreme sports as the respondents could see them**

4. The focus group suggested that the ranking of answers in multi-choice questions did not add value to the study, in fact, it increased respondent burden and time to complete the questionnaire. Ranking of the multi-choice answers was removed from the questionnaire.

5. The focus group did not consider YouTube™ as social media, instead, saw it as a viewing platform. Furthermore, the focus group suggested that social media icons/logos should be used in the social media questions, rather than words. Both of these changes were made in the final questionnaire.

6. Investigators thought respondents would not want to indicate which energy drink brands they consumed. However, the focus group suggested that they would like to indicate the
brand of energy drink they preferred to consume, if they had a preference. This question was added, but, the respondent was not required to answer this question to move further.

7. It was found that indicating the ingredients of an energy drink was a burden on the focus group, with members using Google™ because they ‘wanted to get it right’. The related question was removed as it did not reflect accurate answers of energy drink knowledge and did not add value to answering the research aim.

8. The focus group suggested that a question should be added for where respondents had seen energy drinks being advertised, as this could add information on why people may consume energy drinks, and was subsequently included in the questionnaire.

9. Based on the focus group recommendations, additional multi-choice answers were provided throughout the questionnaire, as well as improved wording so respondents could understand both questions and answers.

10. The focus group was used to ensure survey flow was working correctly. This included testing skip and display logic, as well as piped text. There was a small complication with the piped text when indicating the extreme sports participated in, however, this was amended when respondents indicated the sports as a partially-closed-question. Skip and display logic worked well according to the focus group.

Following the focus group recommendations, the investigators had a meeting to finalise the questionnaire, where the changes above were accepted. Furthermore, location questions were added. As this was an international questionnaire, an indication of the distribution range, in addition to how respondents found or sourced the survey would be useful for future research in the same area.

The final questionnaire consisted of 41 questions which included (Appendix I): demographic information (five questions); participation and reasons for participation in extreme sport (five questions); following extreme sport, reasons for following and frequency
(six questions); if respondents used energy drinks and reason they do/do not consume (eight questions); frequency of energy drink consumption and side effects (five questions); advertising of energy drinks (four questions); energy drink claims and energy drink research (four questions); and location information (four questions). Online information sheets, a consent form and prize draw contact information were also included (Appendix J). By using skip and display logic, respondents were not required to answer all 41 questions. Depending on respondents’ answers, the number of questions presented was between 19 and 40.

4.1.2.2 Questionnaire Setting

An anonymous link, with no password, was used for respondents to access the survey, as it was unable to track identifying information. There was no time restriction to complete the survey, however, if the respondent exited, they were not able to continue from where they finished. The questionnaire tracked internet protocol (IP) addresses but did not restrict respondents from accessing the survey more than once. This was for two reasons. Firstly, it would prevent multiple respondents from the same household to gain access to the questionnaire. And secondly, once a respondent exited the survey, whether on purpose or by accident, they would not be able to re-enter. If a survey was taken twice by the same person, IP addresses and demographic information would be identical and removed before analysis.

‘Next’ and ‘Back’ navigation was repeated on every page, where respondents could review their answers prior to submitting and change their answers using a ‘Back’ button. The questionnaire took 5-10 minutes to complete, with a progress bar at the top of every page indicating how far they were through the survey from 0% to 100%, as seen in Figure 4.4 to 4.7.

Upon completion of the questionnaire, a respondent was thanked and reminded of the prize draw. If respondents did not want to go into the prize draw, they would be redirected to a pop up that thanked them for completing the questionnaire and also provided the investigator’s contact information if they changed their mind about the prize draw, or if they would like to obtain results of the survey. Respondents that wanted to go into the prize draw would be
automatically redirected to another questionnaire, via an anonymous hyperlink, where they would enter their contact details and which prize draw they would like to enter. This enabled the respondent’s questionnaire answers to remain anonymous. Once they had entered the prize draw, a thank you message appeared including the draw they had entered and contact details of the investigators if they wished to receive results of the study.

Once the questionnaire was live, ‘Do you want to start the survey’? was added due to the number of people that clicked on the anonymous link but did not complete the survey. If they did not want to participate in the survey then, respondents would be removed. The results of the questionnaire and contact information were password protected and stored online within the investigators Qualtrics™ account, to which only they had access.

4.2 Extreme Sport Criteria

Upon discussion between the investigators, a list of 42 specified extreme sports was established under the definition described in Section 2.2. There was also an other (please specify) option which gave the respondent and opportunity to indicate an extreme sport that was not on the list. Upon analysis, the investigators would then determine if the ‘other’ sport was considered extreme as defined in this study.

Parkour/free running, skateboarding and freestyle surfing were examples of sports that people listed under ‘extreme sports’, however, they did not meet the extreme sports criteria in this study. During these sports, you can sustain a significant injury, however, the sports were too similar between participating in an ‘extreme’ way compared to recreational, and could not guarantee the respondent to be truly an extreme sports enthusiast. For example, someone may consider themselves a surfer who rides the white wash (broken wave), where it is highly unlikely to receive significant injury, but surfing waves greater than six metres is, hence why big wave surfing has been specified (see Section 2.2). The decision whether to include parkour/free running or not was difficult, however, free runner Mark Toorock explained that injuries in parkour were rare as respondents rely on what they can control, e.g. hands and feet,
compared to other sports where there is less control of the environment, e.g. icy surfaces in snowboarding or skiing. This set the basis of inclusion criteria which considered if an accident were to occur, whether there would be a significant risk of serious injury or death. Factors that determined whether a sport was extreme or not included the speed a person was traveling, as well as the skill level required to adapt quickly to a change in the environment. Increased speed in an accident would greatly increase the risk of serious injury or death, which could increase the thrill-seeking endeavour of the person competing. Ultimate Fight Club was included in the study as Monster energy drink was a major sponsor of the sport with a large fan base. See Section 4.4 below, which identifies the 42 extreme sports available as an answer, in addition to the other (please specify) options included in the analysis.

4.3 DISTRIBUTION

The cross-sectional online questionnaire was valid between 0000h 15 November 2016 to 1700h 21 February 2017 (UTC). The end date was extended from 1 February 2017 as uptake was slow and analysis was not starting until 27 February 2017. This was approved by the Ethics Committee (Appendix D). A questionnaire distribution strategy was established to visually represent a mind-map of respondent targets (Figure 4.9). To enable easy contact, the candidate’s email address was listed on the invitation, information sheets and embedded in the questionnaire itself (Appendix F). Invitation sheets were adapted to include a QR code (Figure 4.10) which were distributed around the University, at extreme sport clubs and other sporting venues across New Zealand. An email was also developed on MailChimp™ which added structure and an improved visual appearance to distribute invitation sheets. Invitations were sent to extreme sports clubs and individuals, and were also encouraged to be passed on to other extreme sport athletes.

Facebook™ and Instagram™ accounts were established to target a wider audience. On Facebook™, the page and posts could be sponsored (paid boosting) which enabled the page to facilitate more clicks on the survey link embedded in the page. The Facebook™ page had 316
likes. The page described the study aim, the prize draws the respondents could be entered in upon completion, and provided a link to the questionnaire. Professional extreme sport athletes were messaged through their public profile pages inviting them to take part in the questionnaire, and it was requested that they pass it onto colleagues and other athletes. In addition, an information sheet inviting individuals to participate in the survey was posted on public Facebook™ ‘Buy and Sell’ groups which have a high number of members. An Instagram™ extreme sport profile was also created (26 followers). Extreme sport pictures were posted on Instagram™ with an invitation to participate in the survey, via a link to the survey in the biography section. Pictures could be shared from Instagram™ to Facebook™ and vice versa through linked accounts. Any pictures shared on Facebook™ or Instagram™ were downloaded for free from Pixabay™ where no attribution was required under the Creative Commons Law (CC0 1.0).
4.3.1 **Incentives**

Contingent incentives were used to motivate extreme sport enthusiasts to take part in and complete the questionnaire (explained in Section 2.8.2). Upon completion of the questionnaire, the respondents could enter one or more of four prize draws. Contact details would be required for entry, but would not be linked to their questionnaire answer to allow for anonymity. There were four separate prize draws available for respondents that completed the survey, they included:

1. A $300 USD Amazon.com Gift Card.
2. A double VIP Nitro Circus Tickets (Invercargill, NZ – 04/2/17)
3. A double VIP Nitro Circus Tickets (Tauranga, NZ – 11/2/17)
4. An AJ Hackett International Bungy (your choice of one of the following locations: Cairns, Australia; Macau, China; Sochi, Russia; Normandie, France; Sentosa, Singapore).

The prizes were drawn by Dave Scott (University of Otago Proctor) and overseen by Kerry Fraser (Executive Assistant) using an online randomiser tool. For each prize draw, the Proctor was supplied with a list of respondents that were entered into each prize draw, with a number randomly assigned to each person, using Excel’s randomiser equation function. The Nitro Circus tickets for Invercargill and Tauranga were drawn on 10 January 2017 (before the questionnaire closed so respondents had time to organise travel). The winning numbers were 12 and 47 respectively. The Amazon.com voucher and AJ Hackett International Bungy prizes were drawn on 22 February 2017. Winning numbers for these were 145 and 80 respectively.
Unfortunately, the respondent with the number 80 of the bungy jump was unable to travel in the near future and was happy for the prize to be redrawn. This redraw was done on 7 March 2017, and the winner was number eight.

4.4 Identifying Extreme Sport Extreme Sport Enthusiasts

Our target audience was extreme sport enthusiasts who participated in and/or followed extreme sports, defined in Section 2.2. They could either just participate, just follow or both. If respondents did both, they would be analysed in both ‘participate in’ and ‘follow’ categories (Table 4.1). This was because respondents were asked the ‘Please specify the extreme sport(s) you participate in’ and ‘In which extreme sports do you follow?’ questions separately, as the extreme sports they participate in could be different to the sports they follow.

Table 4.1: Respondents categorised into ‘participating in’ and ‘following’ extreme sport

<table>
<thead>
<tr>
<th>Do you <strong>participate in</strong> extreme sports? ‘YES’</th>
<th>Do you <strong>follow</strong> extreme sports? ‘YES’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in this analysis: Respondents that just participate in extreme sport (do not follow) <strong>AND</strong> Respondents that both participate in and follow extreme sport</td>
<td>Included in this analysis: Respondents that just follow extreme sport (do not participate) <strong>AND</strong> Respondents that both participate in and follow extreme sport</td>
</tr>
<tr>
<td>Next: ‘Please specify the extreme sport(s) you <strong>participate in</strong>’. Choose those that apply.’</td>
<td>Next: ‘Please specify the extreme sport(s) you <strong>follow</strong>. Choose those that apply.’</td>
</tr>
</tbody>
</table>

4.4.1 Analysing Those that Selected an Other (Please specify) Extreme Sport

Respondents were required to indicate which extreme sports they *participate in* and/or *follow* from a list of 42 sports for each question (see Section 4.4.2 below). In addition to the list there was an *other (please specify)* option where respondents could indicate an extreme sport not on the list. If the respondent indicated a sport that was considered extreme, that sport and associated answers were categorised into the major extreme sport groups (Section 4.4.2 below). For example, if a respondent indicated they participated in downhill longboarding, they were added to the *non-motor sports* category. The ‘other’ extreme sports that were indicated by respondents, and that were considered ‘extreme’ upon the discretion of investigators, and
therefore included in analysis were: downhill long boarding, bouldering, rock climbing and alpine mountaineering. Appendix K, Table 9.1 and 9.2, show the process of adjusting other extreme sports specified by respondents.

If a respondent indicated an other (please specify) sport that was not considered extreme, their answers were adjusted accordingly. If a respondent did not participate in any other extreme sport apart from ‘other’ they would be considered as not participating in extreme sports, and the same if they followed a sport that was not considered ‘extreme’. If respondents indicated they participated in a sport that was not extreme, and did not follow extreme sports, they were not considered extreme sport enthusiasts, therefore, they did not meet the criteria for the study and were removed from analysis. This exclusion also applied to those that followed a sport not considered ‘extreme’, Appendix L. Other extreme sports indicated by respondents that were not considered extreme included: waka ama, tai boxing, surfing (freestyle), skateboarding, roller derby, abseiling, mixed martial arts, parkour, free-running, equestrian, karting, crossfit, bungy jumping, and boxing.

4.4.2 Categorisation of Extreme Sports for Analysis

The respondents who indicated they participated in or followed extreme sports were categorised into six major groups (Table 4.2). For example, if a respondent followed snowboarding, big wave surfing, v8 supercars and wakeboarding, the recipient would be classified into following snow sport, motor sport and water sport. Furthermore, as the respondent indicated they followed two water sports (e.g. big wave surfing and wakeboarding), he/she would only be categorised into the water sport category once. This was the same in all other extreme sport groups. Snow and water sports were considered to be anything associated with snow or water, respectively. Motor sports were considered to be any sports that required a motor (apart from snow-cross as that was considered a snow sport). Air sports were sports that had significant airborne components. Freeclimbing and bouldering/rock-climbing were added to this group as they pose a great risk of participants falling a significant height. Non-motor sports were considered to be
other land sports without a motor, such as *downhill mountain biking* and *BMX*. Ultimate fight club was categorised independently.

**Table 4.2: Extreme sport categorisation for analysis**

<table>
<thead>
<tr>
<th>Please specify the extreme sport(s) you <strong>participate in</strong>. Choose those that apply:</th>
<th>Please specify the extreme sport(s) you <strong>follow</strong>. Choose those that apply:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Snow Sports</strong></td>
<td><strong>Snow Sports</strong></td>
</tr>
<tr>
<td>Ski jumping</td>
<td>Ski jumping</td>
</tr>
<tr>
<td>Skiing - snow (big mountain)</td>
<td>Skiing - snow (big mountain)</td>
</tr>
<tr>
<td>Skiing - snow (freestyle)</td>
<td>Skiing - snow (freestyle)</td>
</tr>
<tr>
<td>Snowboarding (big mountain)</td>
<td>Snowboarding (big mountain)</td>
</tr>
<tr>
<td>Snowboarding (freestyle)</td>
<td>Snowboarding (freestyle)</td>
</tr>
<tr>
<td>Snow-cross (snowmobile) (racing)</td>
<td>Snow-cross (snowmobile) (racing)</td>
</tr>
<tr>
<td>Skiing - snow (speed)</td>
<td>Skiing - snow (speed)</td>
</tr>
<tr>
<td>Snow-cross (snowmobile) (freestyle)</td>
<td>Snow-cross (snowmobile) (freestyle)</td>
</tr>
<tr>
<td>Alpine mountaineering*</td>
<td>Alpine mountaineering*</td>
</tr>
<tr>
<td><strong>Non-Motor Sports</strong></td>
<td><strong>Non-Motor Sports</strong></td>
</tr>
<tr>
<td>BMX (big jump/freestyle)</td>
<td>BMX (big jump/freestyle)</td>
</tr>
<tr>
<td>BMX/Mountain bike (dirt jump)</td>
<td>BMX/Mountain bike (dirt jump)</td>
</tr>
<tr>
<td>Mountain bike (downhill)</td>
<td>Mountain bike (downhill)</td>
</tr>
<tr>
<td>Mountain bike (freestyle/big air)</td>
<td>Mountain bike (freestyle/big air)</td>
</tr>
<tr>
<td>Downhill longboarding*</td>
<td>Downhill longboarding*</td>
</tr>
<tr>
<td><strong>Water Sports</strong></td>
<td><strong>Water Sports</strong></td>
</tr>
<tr>
<td>Kayaking (white water expedition)</td>
<td>Kayaking (white water expedition)</td>
</tr>
<tr>
<td>Kiteboarding (freestyle)</td>
<td>Kiteboarding (freestyle)</td>
</tr>
<tr>
<td>Surfing (big wave)</td>
<td>Surfing (big wave)</td>
</tr>
<tr>
<td>Wakeboarding (freestyle)</td>
<td>Wakeboarding (freestyle)</td>
</tr>
<tr>
<td>Water skiing (speed)</td>
<td>Water skiing (speed)</td>
</tr>
<tr>
<td>Windsurfing</td>
<td>Windsurfing</td>
</tr>
<tr>
<td><strong>Motor Sports</strong></td>
<td><strong>Motor Sports</strong></td>
</tr>
<tr>
<td>Drifting</td>
<td>Drifting</td>
</tr>
<tr>
<td>F1 racing (inc. WEC)</td>
<td>F1 racing (inc. WEC)</td>
</tr>
<tr>
<td>Motorbike (enduro quadbike)</td>
<td>Motorbike (enduro quadbike)</td>
</tr>
<tr>
<td>Motorbike (hard enduro)</td>
<td>Motorbike (hard enduro)</td>
</tr>
<tr>
<td>Motorbike (track racing)</td>
<td>Motorbike (track racing)</td>
</tr>
<tr>
<td>Motocross (freestyle)</td>
<td>Motocross (freestyle)</td>
</tr>
<tr>
<td>Motocross (racing)</td>
<td>Motocross (racing)</td>
</tr>
<tr>
<td>NASCAR</td>
<td>NASCAR</td>
</tr>
<tr>
<td>Rally (e.g. WRC)</td>
<td>Rally (e.g. WRC)</td>
</tr>
<tr>
<td>Rally (enduro)</td>
<td>Rally (enduro)</td>
</tr>
<tr>
<td>Speedway</td>
<td>Speedway</td>
</tr>
<tr>
<td>Super bike</td>
<td>Super bike</td>
</tr>
<tr>
<td>Supercars (e.g. V8)</td>
<td>Supercars (e.g. V8)</td>
</tr>
<tr>
<td>Supercross</td>
<td>Supercross</td>
</tr>
<tr>
<td>Touring car racing</td>
<td>Touring car racing</td>
</tr>
</tbody>
</table>
Please specify the extreme sport(s) you participate in. Choose those that apply:

<table>
<thead>
<tr>
<th>Air Sports</th>
<th>Air Sports</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE jumping</td>
<td>BASE jumping</td>
</tr>
<tr>
<td>Flying (aerobatic)</td>
<td>Flying (aerobatic)</td>
</tr>
<tr>
<td>Flying (racing)</td>
<td>Flying (racing)</td>
</tr>
<tr>
<td>Hang gliding</td>
<td>Hang gliding</td>
</tr>
<tr>
<td>Paragliding</td>
<td>Paragliding</td>
</tr>
<tr>
<td>Skydiving</td>
<td>Skydiving</td>
</tr>
<tr>
<td>Wingsuit</td>
<td>Wingsuit</td>
</tr>
<tr>
<td>Free climbing</td>
<td>Free climbing</td>
</tr>
<tr>
<td>Bouldering/Rock climbing*</td>
<td>Bouldering/Rock climbing*</td>
</tr>
</tbody>
</table>

Ultimate Fight Club

Please specify the extreme sport(s) you follow. Choose those that apply:

*Indicated as other (please specify) by the respondent.

4.5 **Statistical Analysis**

A completion rate of over 84% of survey questions finished was deemed acceptable for a single survey to be included in the analyses. Answers surrounding how the survey was found and the location of the respondent were not required for the survey to be seen as complete and valid. These answers would not have added any additional value to support the main aims of this survey and, as such they were considered bonus questions. Completion rate was calculated by the number of completed responses (more than 84%) divided by the total number of respondents who clicked on the anonymous link.

Descriptive analysis (mean, standard deviation and percentages) was obtained through Qualtrics™ using the report system available on the Qualtrics™ website. Cross-tabulation was also used via Qualtrics™, to compare between two variables in the data. In addition, multiple-choice answers were able to be merged. This was used to categorise extreme sports, education answers and reasons for participating in extreme sports. If a respondent chose multiple answers, they would only be counted once within the merged group. Cross-tabulation could be exported to Excel and percentage frequency data was calculated. Data was then cleaned to include/remove the answers from respondents who were not considered extreme sport followers or participants (explained in Section 4.4.1 above). Percentages were calculated by taking the
number of respondents that clicked on an answer, and dividing this by the number of respondents that answered that question, regardless of whether a respondent was able to choose one or more answers. Energy drink consumption rates were always calculated within groups to better represent energy drink consumers, as it was not influenced by the total number of respondents who answered that question.

The majority of the data was descriptive, however logistic regression models were generated using Stata 14.2 (StataCorp, Texas) for differences in energy drink consumption relating to age, gender, frequency of extreme sport viewing and energy drink advertising. Pearson correlation coefficients were calculated in Excel to assess the relationship between an energy drink consumer’s current age, and the age they began consuming energy drinks. All statistical comparisons were 2-tailed, and p-values less than 0.05 were considered statistically significant.
5 Results

Not all respondents answered all questions, thus, results presented are from respondents that answered each specific question. Some questions had multiple answers of which respondents could choose more than one. As a result, percent of respondents choosing a specific answer does not necessarily add up to 100%.

5.1 Respondents

5.1.1 Completion Rate and Location

Overall, 394 respondents clicked on the anonymous link where 252 completed the questionnaire (answering $\geq 84\%$ of the questions presented meant that a survey was considered completed, see Section 4.5) indicating a completion rate of 64.0%. One hundred and twenty-five individuals were considered non-respondents due to; not wanting to complete the survey ($n=5$) and had not completed enough of the survey ($n=120$). Seventeen respondents did not meet the inclusion criteria because they were under the age of 18 years of age ($n=2$) and were not an extreme sport enthusiast ($n=15$). These respondents were subsequently removed from the questionnaire via survey flow (Appendix L).

Following initial analysis, five further respondents were excluded from the survey as they: Indicated sports that were not extreme in an other (please specify) extreme sport ($n=2$); indicated Powerade as an energy drink ($n=2$); and completed the survey twice ($n=1$). Of those respondents included in the analysis, 72.4% ($n=178$) found the survey via social media (Appendix M, Table 9.3). The location of each respondent at the time of completion is displayed in a heat map (Figure 5.1).
5.1.2 **Respondent Characteristics**

Demographic characteristics of the 247 respondents are displayed in Table 5.1. The mean (SD) age was 26.2 (8.2) years (range 18–73 y) and most of the respondents had completed some higher education beyond secondary school (n=209/246, 85%). One person did not answer the education question and seven had not completed high school. For current employment status, over two thirds of the respondents were in paid employment with 25 of them also studying. Sixty six percent of respondents identified themselves as New Zealand European or Australian European, 23% as European and 17% as Maori or Pacific Islander. Other ethnicities of respondents included American (n=4, 1.6%), East/South East Asian (n=2, 0.8%) and Hispanic (n=1, 0.4%).

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*a Picture attribution: By several/unknown authors from Wikipedia/Commons*
Table 5.1: Respondent demographics

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>147</td>
<td>59.5</td>
</tr>
<tr>
<td>Female</td>
<td>100</td>
<td>40.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 24</td>
<td>147</td>
<td>59.5</td>
</tr>
<tr>
<td>25 - 34</td>
<td>65</td>
<td>26.3</td>
</tr>
<tr>
<td>35 - 49</td>
<td>27</td>
<td>10.9</td>
</tr>
<tr>
<td>50+</td>
<td>8</td>
<td>3.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education^a</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed secondary education</td>
<td>131</td>
<td>53.3</td>
</tr>
<tr>
<td>Completed undergraduate (or higher) degree or diploma</td>
<td>108</td>
<td>43.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupation^b</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid employment</td>
<td>175</td>
<td>71.3</td>
</tr>
<tr>
<td>Student</td>
<td>88</td>
<td>35.6</td>
</tr>
<tr>
<td>Unemployed</td>
<td>9</td>
<td>3.6</td>
</tr>
<tr>
<td>Professional athlete</td>
<td>6</td>
<td>2.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnicity^c</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ/AUS European</td>
<td>164</td>
<td>66.4</td>
</tr>
<tr>
<td>European (other than above)</td>
<td>59</td>
<td>23.8</td>
</tr>
<tr>
<td>Maori</td>
<td>29</td>
<td>11.7</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>14</td>
<td>5.7</td>
</tr>
</tbody>
</table>

5.1.3 Categorisation of Respondents into Extreme Sports

To be included in the survey, respondents had to declare whether they participated in and/or followed extreme sports. If they indicated no to both questions, they were excluded from data analysis. Respondents could both participate in and follow extreme sports. However, for analysis, these respondents were categorised into both participated in and followed. Separate questions were asked to specify ‘the extreme sport(s) participate in’ and ‘extreme sport(s) followed’ (see Section 4.4).

^a Those included ‘in the completed secondary education’ had completed high school and some post-secondary education, but had not completed an undergraduate degree or higher.

^b Respondent could choose multiple answers.

^c Respondent could choose multiple answers.
Fifty-five percent (n=137) of the respondents indicated that they participate in extreme sports and 92.7% (n=229) indicated they followed extreme sports. Furthermore, 48.2% (n=119/247) of respondents both participated in and followed extreme sports. Extreme sports were organised into six major categories and displayed in Table 5.2. Fourteen individuals who participated in extreme sport indicated that they were sponsored, with only two sponsored by an energy drink company.

Table 5.2: Extreme sports categories participated in or followed

<table>
<thead>
<tr>
<th>Extreme sport categories*</th>
<th>Participated in (n=137)</th>
<th>Followed (n=229)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow Sports</td>
<td>72</td>
<td>113</td>
</tr>
<tr>
<td>Non-Motor Sports</td>
<td>68</td>
<td>100</td>
</tr>
<tr>
<td>Water Sports</td>
<td>67</td>
<td>121</td>
</tr>
<tr>
<td>Air Sports</td>
<td>43</td>
<td>77</td>
</tr>
<tr>
<td>Motor Sports</td>
<td>37</td>
<td>140</td>
</tr>
<tr>
<td>Ultimate Fight Club</td>
<td>7</td>
<td>90</td>
</tr>
</tbody>
</table>

5.2 ENERGY DRINK CONSUMPTION PATTERNS

This section examines energy drink consumption patterns in extreme sport enthusiasts in relation to gender, age, education, and occupation.

5.2.1 Demographic Differences in the Energy Drink Consumption Rates

Of the 247 respondents, 57.9% (n=143) were energy drink consumers and 25.5% (n=63) were high energy drink consumers (at least one energy drink per week). Slightly more males (60.5%, n=89/147, p=0.307) consumed energy drinks than females (54.0%, n=54/100), however, of those males and females that consumed energy drinks, 42.7% and 46.3% respectively (p=0.674) would drink one or more per week. These values did not reach statistical significance and it was concluded there was no difference in consumption between genders. Additionally, 62% of consumers chose the standard (sugar containing) energy drink, with a higher percentage

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* Categorised extreme sports from a total of 42 options plus other (please specify).
of females (24.1%) opting for the sugar-free energy drink version than males (16.9%), however no significance was obtained.

There was an association with age and energy drink consumption. For every year older, the odds of consumption were 3.1% lower (OR 0.969; 95% confidence interval [CI], 0.941 to 0.999; \( p=0.044 \)). Furthermore, respondents had their first energy drink at mean (SD) age of 16.4 (4.06) years (range 8-35 y, Figure 5.2). There was a correlation between current age and age of first energy drink (\( r=0.68, p<0.001 \)).

![Figure 5.2: Age of first energy drink consumption and current age (n=136)](image)

There were large educational status differences in consumption. Firstly, all the respondents (n=7) that did not complete high school consumed energy drinks. Secondly, of those that completed high school (including those that had not completed an undergraduate degree), 64.1% (n=84) consumed energy drinks. And finally, of those respondents with higher education (had completed an undergraduate degree or higher), 48.1% (n=52) consumed energy drinks. There was little difference in consumption rates in different occupations. Consumption
was similar between different occupations, with over half of each group consuming energy
drinks: 58.0% (n=102/176) in paid employment; 59.1% (n=52/88) of students; 66.7% (n=6/9)
of those unemployed; and 50% (n=3/6) of the professional athletes.

5.3 **RESPONDENT BEHAVIOUR TOWARDS ENERGY DRINKS**

This section reports findings on why extreme sports enthusiasts consume energy drinks, the
side effects of energy drinks, brand preference, and, why some respondents do not consume
energy drinks.

5.3.1 **Understanding Those That Consume Energy Drinks**

Table 5.3 identifies reasons for energy drink consumption and reported side effects. Over half
of the consumers indicated that they used energy drinks for the following reasons: to help keep
them awake; for a get up and go; and refreshment or taste. Forty-five consumers used them for
sport or activity performance, with 64.4% (n=29/45) of them using energy drinks before sport
or activity. Sleep disturbance and jittery/shaking were reported as the two most common side
effects of energy drink consumption.
### Table 5.3: Reasons for energy drink consumption in those that consume (n=143)

<table>
<thead>
<tr>
<th>Reasons for energy drink consumption(^a)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helps to keep me awake</td>
<td>74</td>
<td>51.7</td>
</tr>
<tr>
<td>Need a lift or get up and go</td>
<td>72</td>
<td>50.3</td>
</tr>
<tr>
<td>Refreshment/taste</td>
<td>68</td>
<td>47.6</td>
</tr>
<tr>
<td>Helps with long distance driving</td>
<td>52</td>
<td>36.4</td>
</tr>
<tr>
<td>When partying</td>
<td>50</td>
<td>35.0</td>
</tr>
<tr>
<td>Increases energy for physical activity or sport</td>
<td>45</td>
<td>31.5</td>
</tr>
<tr>
<td>Aids you to study or complete a major project</td>
<td>41</td>
<td>28.7</td>
</tr>
<tr>
<td>I get it for free</td>
<td>19</td>
<td>13.3</td>
</tr>
<tr>
<td>Stress relief</td>
<td>13</td>
<td>9.1</td>
</tr>
<tr>
<td>Coffee replacement(^*)</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Addiction(^*)</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>For weight loss purposes</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>It was advertised</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

\(^a\)Indicated in the ‘other (please specify)’ section.

### Table 5.4: Side effects of energy drinks in those that consume (n=143)

<table>
<thead>
<tr>
<th>Energy drink side effects in consumers(^b)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep disturbance</td>
<td>65</td>
<td>45.8</td>
</tr>
<tr>
<td>Jittery or shaking</td>
<td>58</td>
<td>40.8</td>
</tr>
<tr>
<td>Dehydration</td>
<td>34</td>
<td>23.9</td>
</tr>
<tr>
<td>Headaches</td>
<td>29</td>
<td>20.4</td>
</tr>
<tr>
<td>Fatigue</td>
<td>26</td>
<td>18.3</td>
</tr>
<tr>
<td>Have trouble focusing on tasks</td>
<td>15</td>
<td>10.6</td>
</tr>
<tr>
<td>Vomiting, nausea and abdominal pain</td>
<td>10</td>
<td>7.0</td>
</tr>
<tr>
<td>Reduced accuracy of movement</td>
<td>6</td>
<td>4.2</td>
</tr>
<tr>
<td>Muscle stiffness and aches</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Increased heart rate(^*)</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>No adverse effects</td>
<td>47</td>
<td>33.1</td>
</tr>
</tbody>
</table>

\(^b\)Indicated in the ‘other (please specify)’ section.

\(^a\) Respondent could choose multiple answers.
\(^b\) Respondent could choose multiple answers.
The typical amount consumed in a serving is indicated in Figure 5.3 (Left). Of those that consumed energy drinks, 65.7% (n=94/143) reported having a larger serving than the recommended one standard energy drink (250 mL) in a sitting. Furthermore, 75.5% (n=108/143) of consumers indicated they preferred a specific brand. All but one participant specified their preference. V™ and Red Bull™ were the most popular energy drink brand, with Lift Plus™, Monster™, Mother™ and Rockstar™ also indicated as minor preferences (Figure 5.3: Right). Additionally, over three quarters of respondents (86.0%, n=92/107) consumed a specific brand of energy drink because of the taste. In contrast, 13.1% (n=14/107) consumed a specific brand because it was used to sponsor an extreme sports event that they participated in or followed and 2.8% (n=3/107) consumed that brand because their favourite sports person was sponsored by it. Interestingly, the respondents that were sponsored by an energy drink company did not consume energy drinks.

![Figure 5.3: Left: Typical amount consumed (n=143). Right: Brand preference (n=107)](image-url)
5.3.2 Understanding Those That Avoid Energy Drinks

One hundred and four (42.1%) respondents indicated that they did not consume energy drinks. The most common reason for avoiding energy drinks was because respondents perceived them as unhealthy (Table 5.5). This was not a multi-choice option. Instead, 42 respondents indicated an answer in the other (please specify) section which was then categorised in this group. These answers included: ‘I think they are unhealthy’; ‘too much sugar’; ‘believe there are healthier options’; and ‘it is junk food’. Wanting to avoid caffeine, don’t like the taste, and weight gain were other most frequently cited reasons for respondents avoiding energy drinks (Table 5.5).

<table>
<thead>
<tr>
<th>Reasons to avoid energy drinka</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived as unhealthy*</td>
<td>42</td>
<td>40.4</td>
</tr>
<tr>
<td>I try to avoid caffeine in general</td>
<td>39</td>
<td>37.5</td>
</tr>
<tr>
<td>I don't like the taste</td>
<td>36</td>
<td>34.6</td>
</tr>
<tr>
<td>Weight gain</td>
<td>30</td>
<td>28.8</td>
</tr>
<tr>
<td>I don't like the feeling it creates after consumption</td>
<td>23</td>
<td>22.1</td>
</tr>
<tr>
<td>I lose sleep when I use it</td>
<td>17</td>
<td>16.3</td>
</tr>
<tr>
<td>It makes me shake and/or tingle</td>
<td>13</td>
<td>12.5</td>
</tr>
<tr>
<td>It makes me dehydrated</td>
<td>9</td>
<td>8.7</td>
</tr>
<tr>
<td>I get headaches after consumption</td>
<td>8</td>
<td>7.7</td>
</tr>
<tr>
<td>It gives me vomiting, nausea and/or abdominal pain</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>I get chest pains and/or heart problems after consumption</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Costly</td>
<td>2</td>
<td>1.9</td>
</tr>
</tbody>
</table>

*Indicated in the other (please specify) section.

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a Respondent could choose multiple answers.
This section examined why respondents associate themselves with extreme sports and how this may relate to energy drink consumption.

### 5.4.1 Energy Drink Consumption in Extreme Sport Categories

Table 5.6 explains the frequency of energy drink consumption within extreme sport categories. Multiple extreme sports could be chosen by respondents, so consumption rates were analysed within categories. Of those respondents that participated in extreme sport, 57.7% (n=79/137) consumed energy drinks, with consumption highest in *Ultimate Fight Club*, followed by *Water* and *Motor Sports*. Furthermore, of those respondents who followed extreme sport, 57.2% (n=131/229) consumed energy drinks, with the highest consumption rates in *Ultimate Fight Club, Air* and *Snow Sports* categories.

<table>
<thead>
<tr>
<th>Extreme sport categories⁹</th>
<th>Participated</th>
<th>Followed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow sport</td>
<td>42</td>
<td>58.3</td>
</tr>
<tr>
<td>Non-motor sport</td>
<td>38</td>
<td>55.9</td>
</tr>
<tr>
<td>Water sport</td>
<td>40</td>
<td>59.7</td>
</tr>
<tr>
<td>Motor sport</td>
<td>22</td>
<td>59.5</td>
</tr>
<tr>
<td>Air Sport</td>
<td>12</td>
<td>27.9</td>
</tr>
<tr>
<td>UFC</td>
<td>5</td>
<td>71.4</td>
</tr>
</tbody>
</table>

### 5.4.2 Energy Drink Consumption and Frequency of Extreme Sport Viewing

There were no differences found between energy drink consumption between the different extreme sports categories. However, there was an association between energy drink consumption and the frequency of extreme sports viewing (Figure 5.4). For every weekly increase in the frequency of watching, the odds of consuming energy drinks were 31% higher (OR 1.31; 95% CI, 1.13 to 1.52; p<0.001).

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⁹Categorised extreme sports from a total of 42 options plus other (please specify).
It is important to acknowledge that 92.1% (n=211/229) of those who followed extreme sport did so online. This was either on YouTube™, social media and/or other websites indicating a high use of online streaming to view extreme sports. Sixty seven percent (n=154/229) also followed extreme sports on television, in addition to 24.9% (n=57/229) who would go to an event.

5.4.3 Reasons for Participating in and Following Extreme Sports

All respondents that indicated they participated in (n=137) and/or followed (n=229) extreme sports were asked to choose one or more reasons why. Appendix M, Table 9.4 indicates why respondents participated in or followed extreme sports, and if they were energy drink consumers.

Most respondents that participated in extreme sports did so because they enjoyed participating in these sports (86.1%, n=118/137) and for an adrenaline rush (62.8%,

* p/w – per week
Sixty-two percent (n=53/86) of those that participated in extreme sports for an 
*adrenaline rush*, were energy drink consumers. Respondents that indicated they participated in 
extreme sports because they *had been brought up with the sport*, and/or *had a close family or 
friend also participated* reportedly had the highest energy drink consumption. Two-thirds of 
these respondents consumed energy drinks (66.7%, n=40/60).

The majority (93.9%, n=215/229) of respondents followed extreme sport because they 
were *exciting to watch* with 58.1% (n=125/215) of this sample consuming energy drinks. Only 
35 (15.3%) of those that followed extreme sports did so for an *adrenaline rush*. Interestingly, 
within this group, 80% (n=28/35) consumed energy drinks.

### 5.5 Advertising of Energy Drinks

The last objective of this study was to determine the frequency of energy drink advertising and 
if this influenced consumption. All respondents (n=247) answered information on advertising, 
regardless of whether they consumed energy drinks or not. One respondent stated that: *'Energy 
branded drinks, seem to have found a niche in advertising, that has allowed them to be 
broadcast almost anywhere at any time. This includes bumper stickers, merchandise, kids toys etc’."

Recipients were asked to assess how often they saw energy drink advertising. Of all 
respondents (n=247), 36.8% reported having seen *daily* advertising of energy drinks, 17.4% 
reported *4-6 times per week*, 23.5% reported *2-3 times per week*, 11.7% reported *once per week* 
and 10.5% reported *occasionally*. Figure 5.5 shows energy drink consumption rates in relation 
to the frequency of energy drink advertising. For every weekly increase in energy drink 
advertising, the odds of consuming energy drinks were 3.2% lower, but this was not significant 
(OR 0.978; 95% CI, 0.884 to 1.081, p=0.662).
However, the odds of high consumption (drinking energy drinks more than once per week) increased by 14.3% for every increase in one viewing of energy drink advertisement per week (OR 1.14; 95% CI, 1.01 to 1.30; \( p=0.042 \)). Appendix M, Table 9.5, shows where the respondents (n=246) have seen energy drink advertising from one or more multiple choice answers. Similar to the viewing of extreme sports, energy drink advertising was most frequently seen online through social media, websites, and YouTube™ (81.3%, n=200/246). Furthermore, energy drink advertising was observed by 76.8% (n=189/246) of the respondents at a local shop, 72.8% (n=179/246) while watching extreme sport and 66.3% (n=163/246) on television. Of the 179 respondents that saw energy drink advertising during extreme sports, it was most commonly seen during Motor Sports (81.0%, n=145/179).

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\( ^{a} \) p/w – per week
5.6 **KNOWLEDGE AND INFORMATION OF ENERGY DRINKS**

All respondents (n=247) were asked what claims and warnings they had heard about energy drinks (Table 5.7). Over two-thirds of the respondents indicated that they agree with claims that energy drinks give you extra energy and that they are not appropriate for pregnant and lactating women, or children. Of the 245 that responded to the question, 33.9% of respondents (n=83/245) had searched for information on energy drinks. Fifty-three (64.0%, n=53/83) of those that searched for this information consumed energy drinks. Most of the information searched surrounding energy drinks was done online (90.4%, n=75/83), whereas, only 32.5% (n=27/83) did so from an academic journal or book. Furthermore, 70% (n=19/27) of those that obtained information from an academic journal or book consumed energy drinks.

*Table 5.7: Claims and warnings heard about energy drinks (n=247)*

<table>
<thead>
<tr>
<th>Energy drink knowledge</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>It gives you extra energy</td>
<td>186</td>
<td>75.3</td>
</tr>
<tr>
<td>It is not appropriate for pregnant or lactating women</td>
<td>179</td>
<td>72.5</td>
</tr>
<tr>
<td>It is not appropriate for children</td>
<td>178</td>
<td>72.1</td>
</tr>
<tr>
<td>It can cause sleep disturbance</td>
<td>151</td>
<td>61.1</td>
</tr>
<tr>
<td>Helps with sporting performance</td>
<td>114</td>
<td>46.2</td>
</tr>
<tr>
<td>Increases concentration and memory recall</td>
<td>63</td>
<td>25.5</td>
</tr>
<tr>
<td>It can increase the speed and accuracy of decision-making</td>
<td>62</td>
<td>25.1</td>
</tr>
<tr>
<td>I haven't heard or read anything about energy drinks</td>
<td>3</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* Respondent could choose multiple answers.
6 DISCUSSION

This research was conducted to investigate energy drink consumption in extreme sport enthusiasts and is the first survey to evaluate this demographic in this way. In addition, it was intended to assess factors that influence energy drink consumption, such as reasons for intake and the effect of advertising and sponsorship. An important finding was that energy drink consumption is high in extreme sport enthusiasts, with 57.9% of respondents indicating they were consumers. Reasons for energy drink consumption use were: to help keep awake, need a lift and refreshment/taste. Surprisingly, a reported increase in advertising exposure was not associated with an increased energy drink consumption rate. However, there was a positive correlation between extreme sport viewing frequency and energy drink consumption rates. This could indicate that exposure of advertising during extreme sports (e.g. branded clothing, equipment etc.) influences consumption of energy drinks in those who watch these events.

6.1 RESPONDENTS ENERGY DRINK CONSUMPTION

In the present study, 394 respondents clicked on the questionnaire link, 64% completed more than 84% of the survey (considered sufficient completion for analysis). Four completed questionnaires were removed during analysis, and 248 respondents were included in the results. Age of respondents ranged from 18 to 73 y, mean of 26 y, and 40.5% were female. It is important to note that the studied population is highly educated.

As hypothesised, of the respondents in the current study, 57.9% indicated they were ‘energy drink consumers’, in addition to 25.5% of the sample classified as high consumers (≥ one energy drink per week). In the existing literature, nine studies specifically addressed energy drink consumption with a questionnaire, however, only university students were assessed in these groups. Compared to the present study, Pettit and Debarr 20117 was the only existing study with higher energy drink consumption. This study has reported 70% of respondents consumed energy drinks in the last 30 days, and 59% consumed at least one in the
last week. However, this study was limited to 18 to 24 year old university students who have documented higher energy drink consumption rates. In addition, Ballistreri and Corradi-Webster 2008 found that 57.3% of Argentinian student athletes (n=221, mean age 22 y) reported consuming energy drinks in the last 30 days, however, they also had a low mean age. Seven other studies reported lower energy drink consumption rates in university students ranging from 11% to 51% of the sample surveyed.

Energy drink consumption appears to be affected by age. In the current research, the older a respondent was, the less likely he/she was to consume energy drinks. This result supports findings by Pennay, Cheetham 2015 who concluded that younger sub groups (18–24 years) were more likely to consume energy drinks than those who were older (≥25 years). Interestingly, in the current study, energy drink consumption rates were similar between males and females. This contrasts with past findings that strongly suggest males are more likely to consume energy drinks due to risk-taking tendencies and marketing towards sport performance, however, extreme sport enthusiasts are considered risk takers and therefore no difference between genders were found. It is also important to note the difference in cultures compared to previous energy drink surveys. The present study contributes to this body of knowledge, indicating that extreme sport enthusiasts are amongst the highest energy drink consumers, however, age, rather than gender, influences consumption rates, and needs to be considered when comparing demographics.

6.2 Advertising and Thrill-Seeking Behaviours

Energy drinks are very prevalent in extreme sports where they are now icons of the subculture. Major companies such as Red Bull™ and Monster™, support extreme sport athletes in competing at a high-level through individual sponsorship, where logos are seen on clothing, sports equipment, and event equipment (e.g. half-pipe). It was expected that exposure to advertising and marketing would be associated with energy drink consumption. Surprisingly,
in the current study, there was no correlation between reported energy drink advertisement viewing and energy drink consumption rates. Further, it was also hypothesised that athletes sponsored by energy drinks would have high consumption, however, of the two sponsored athletes who completed the survey, neither consumed energy drinks at all. Unexpectedly, it was not the increase in consciously perceived advertising (that an individual was aware of) that was correlated with consumption; but rather, just watching extreme sports. This could be indicative of the effect of advertising, via sponsors branding on clothing, equipment etc as almost three-quarters reported seeing energy drinks advertised during an extreme sport event. This is the most novel and important finding in this study. For every weekly increase in extreme sports viewing, there was a 31% increase in energy drink consumption rates. In addition, enthusiasts that were brought up with extreme sports were more likely to consume energy drinks, suggesting that long-term exposure to extreme sports could be a factor that increases the likelihood of energy drink consumption.

This finding is supported by Bustin, Jones 2015\textsuperscript{17} who found that subliminal exposure to Red Bull\textsuperscript{TM} to individuals who had a sensation in thrill-seeking, such as extreme sport enthusiasts, were more likely to consume this energy drink. These findings demonstrate the effect that advertising has on extreme sport enthusiasts, where these individuals may or may not be consciously aware of the exposure, however, it is still affecting their behaviour.

Larson, Laska 2015\textsuperscript{5}, Spierer, Blanding 2014\textsuperscript{85}, and Miller 2008\textsuperscript{81} have all reported a relationship between energy drink consumption and participation in risk taking behaviours, such as extreme sports. As expected, the energy drink consumption rates were higher in those who participated in, or followed, extreme sports for an ‘adrenaline rush’. It is unknown if this is due to similar psychological or physiological responses when getting a thrill from being an extreme sports enthusiast and the stimulatory effect of consuming an energy drink. However, as previously mentioned, influence could be effected by the marketing of these beverages towards individuals with thrill seeking tendencies. Nevertheless, the current study supports the
theory that individuals with increased thrill-seeking behaviours, in addition to repeated exposure to extreme sports, are more likely to consume energy drinks.

6.3 Reasons for Energy Drink Consumption

With energy drink consumption high among extreme sport enthusiasts, it is important to understand why this demographic consume. Not surprisingly, the top reasons for energy drink consumption were to keep them awake and need a lift. This was consistent with Malinauskas, Aeby 2007\textsuperscript{14} who found that university students consumed energy drinks due to having insufficient sleep and to increase energy. This aligns with part of the current study’s definition of energy drinks, which was a perceived increase in energy and vitality for the consumer. Other reasons for consuming energy drinks included refreshment and/or taste, which was also why respondents chose a particular brand of energy drink. A Turkish study indicated that 67.5\% of respondents consumed energy drinks for taste\textsuperscript{10}. This could be problematic as Verbeke 2006\textsuperscript{83} found that consumers were less willing to sacrifice the taste of foods and beverages for a healthy alternative, indicating that if someone consumes energy drinks for taste, it could be harder to influence them to choose a healthier option.

6.4 Reasons for Energy Drink Avoidance

It is worth noting that the main reason for non-consumption of energy drinks was that respondents perceived them as unhealthy. This response was not included as a multi-choice answer as investigators hypothesised that side effects would be the main discouraging factor of energy drink consumption. However, respondents indicated that energy drinks were unhealthy in the other (please specify) response, indicating some level of general health awareness. This was in contrast to Aslam, Mughal 2013\textsuperscript{11} who reported that ‘no specific reason’ and ‘awareness of its side effects’ were the top reasons medical students (n=866) avoided energy drinks.
6.5 **Strengths of the Study**

This study was the first to specifically examine energy drink consumption in extreme sport enthusiasts. Furthermore, this research adds to the lack of literature that assesses energy drink consumption in a broader population rather than specifically in university students.

The Qualtrics™ online questionnaire was designed with best practice methods by using an electronic survey where skip and display logic plus piped text personalised the survey for the respondent. Further, a combination of open-, closed- and partially-closed-ended questions were used to allow for respondents to expand on their answers, whilst also only showing questions that applied to them\(^87\). In addition, most important questions were asked first, which also aligns with electronic questionnaire best practice\(^87\). Using a web-based questionnaire was efficient, for both investigators and respondents, as there was no need for the respondent to travel, or need to mail the questionnaire. The survey could be done anywhere or anytime and was available on a mobile device. Furthermore, all results were embedded online and were directly exported to Excel for analysis, which reduced transcription errors.

Conducting a pre-test focus group was vital to aid the development of and enhance the questionnaire. This questionnaire was not validated as this was the first time it was used; however, pre-testing was useful to clarify questions which, in turn, ensured accurate responses from respondents. Furthermore, having a clear definition of both extreme sport and energy drinks was crucial to clarifying what this study was investigating, as there may be uncertainty around the actual definition of extreme sport. An extreme sports list was established by the investigators using partially-closed-ended questions, where an option was provided for respondents to indicate sports they viewed as extreme.

Social media distribution was useful as electronic access to social media aligns well with accessing and completing an online survey. The greatest proportion of respondents found the study via social media, which allows for exponential distribution. Furthermore, including
relatable incentives was part of best practice for increasing completion rates, as suggested by Edwards, Roberts 2009.91.

6.6 LIMITATIONS OF THE STUDY

Questionnaire limitations that warrant consideration include the classification of an energy drink consumer, length of the questionnaire, invitation title, distribution range and the disadvantages of using an online questionnaire.

The question which determined if a respondent was an energy drink consumer was do you consume energy drinks? (Yes, No). There was no time frame or frequency specified to distinguish how frequently they had been consuming energy drinks, which would then categorise them into the energy drink consumers category or not. For example, respondents may have consumed an energy drink in the last six months, however, did not consider themselves as ‘consumers’. In addition to this, two respondents indicated Powerade™ as their preferred energy drink brand, possibly reflecting a misunderstanding of the energy drink definition displayed to participants.

The number of questions a respondent could answer was between 19 and 40, however, it has been recommended that questionnaires should be restricted to 25 questions or less, as longer surveys are less likely to be completed88. This may have potentially increased respondent burden and, therefore, inaccurate results.

The title that was used for distribution was ‘Energy Drink Survey’. Although the target audience of extreme sport enthusiasts was clearly stated in the invitation and information sheet, potential respondents may have been discouraged by the title thinking it was a questionnaire for energy drink consumers. An ‘Extreme Sports Survey’ title would have been more appropriate. Furthermore, this study looked at international consumption of energy drinks in extreme sport enthusiasts, however, most respondents were currently in New Zealand and Australia. This sample did not achieve global representation of extreme sports enthusiasts and consumption patterns could differ internationally.
Sampling and access are two major issues with online questionnaire surveys\textsuperscript{87,98}. Very little is known about the respondents, apart from their basic demographic variables, but even this could be inaccurate. Furthermore, those who do not have access to the internet would not be able to complete it, and, e-invitations could be considered spam\textsuperscript{98}.

### 6.7 Conclusions

This study examined energy drink consumption in extreme sports enthusiasts and factors that influenced this use. Energy drink consumption is high in extreme sport enthusiasts. Although the sponsored athletes in this study did not consume energy drinks, sponsorship in extreme sports may influence consumption for those that participate in or follow these sports. The current study found that an increase in the frequency of following extreme sports was associated with increased energy drink consumption, where advertising during extreme sport is widespread due to logos on athletes clothing and/or sports equipment, and viewers may or may not be consciously aware of exposure.

This research adds vital information to the limited existing literature that is available on energy drinks. In addition to providing evidence on a demographic that has not been previously assessed, the present findings suggest that this sector of the population may be particularly susceptible to increased energy drink consumption due to these brands embedding themselves within extreme sports subculture. Generalisation of the present results to all populations may not be accurate, due to the relatively small sample, largely from within New Zealand, and limitations in terms of demographics.

### 6.8 Recommendations for Future Research

Given the results of this study, and the influence of energy drink sponsorship and advertising in extreme sport, further research in this area is warranted and should focus on the following:

1. Development of a recognised definition for extreme sports, in addition to defining an energy drink consumer;
2. Emphasising international distribution of surveys to better understand energy drink consumption in extreme sport enthusiasts worldwide;

3. Investigating extreme sport athletes sponsored by energy drink companies and the influence this may have on consumption;

4. Conducting qualitative research in extreme sport enthusiasts to better understand factors influencing energy drink consumption, especially thrill-seeking behaviours.
7 **APPLICATION TO DIETETICS**

Specific brands of energy drinks have, in recent years, become aligned with extreme sports. At the same time, there has been a steady increase in energy drink consumption with the highest intakes reportedly in young adults (specifically males) and athletes. Interestingly, there have been no reports on rate of energy drink consumption in extreme sports enthusiasts, nor reasons why people like to consume or the influences that impact consumption. This study therefore attempted to address this gap in knowledge. The findings from the current study can be linked to dietetic practice in the following ways:

1. Understanding the individuals that are most at risk of energy drink consumption;
2. Determining the reasons why an individual may, or may not, consume energy drinks;
3. Understanding the external factors that influence an individual to consume energy drinks.

Dietetic practice is to make decisions that improves health and wellbeing of an individual, or population, through optimal dietary habits and physical activity. Therefore, knowing the at-risk group for energy drink consumption, and some of the drivers behind this, will assist in offering alternatives that align with a person’s needs or wants. This study’s group was highly educated, so using an education approach may not be appropriate when working with this population. It will be useful for sports dietitians working with high performance extreme sports athletes, especially adolescents and young adults who have thrill-seeking tendencies, to understand the drivers behind consumption and those most at risk of consumption.

In regard to applying this to my future dietetic practice, I have gathered many skills during this research process. Having an opportunity to conduct a literature search and gather credible-peer reviewed information, followed by analysis and presentation of these findings, have been essential for developing my ability to think critically, and form evidence-based opinions and conclusions. In addition, I now have acquired the skills to use Qualtrics™. I can now design,
pretest and implement an electronic questionnaire, followed by an analysis and interpretation of data. I see myself being able to use this tool in the future to gather information from large groups of athletes to help fill gaps of knowledge in the sport dietetic area.

Ultimately, a dietitian needs to understand and conduct research, which will be vital to answer important questions that may come up in daily practice. It is essential to upskill and stay informed with the latest findings then apply this knowledge in our field of practice. The data we obtain from our research, whether it be a literature review or conducting studies, will be able to help inform dietetic practice in a positive and constructive way.
REFERENCES


70. Swithers SE. Artificial sweeteners produce the counterintuitive effect of inducing metabolic derangements. Trends in Endocrinology and Metabolism 2013;24(9):431-41.


89. Murad H, Rafeeq M. Pattern of use and awareness of contents, benefits and adverse effects of energy drinks among university students in Rabigh, Saudi Arabia. Biomedical Research (India) 2016;27(2):458-64.


APPENDICES
APPENDIX A: BEDRAGGLED DAISY

Limit
- Within the last 30 years
- English

Additional Keywords
- Ergogenic Aids
- Adults
- Adolescents

Good information on ED and surveys

Quantitative or Qualitative analysis?
APPENDIX B: ETHICS APPLICATION

Reporting Sheet for use ONLY for proposals considered at departmental level

UNIVERSITY OF OTAGO HUMAN ETHICS COMMITTEE
APPLICATION FORM: CATEGORY B

(Departmental Approval)

1. University of Otago staff member responsible for project:
   Assoc. Prof. Dr. Nancy Rehrer

2. Department/School:
   School of Physical Education, Sport and Exercise Sciences; Dept. of Human Nutrition,

3. Contact details of staff member responsible:
   Email: nancy.rehrer@otago.ac.nz
   Phone: 64 3 479 9128

4. Title of project:
   Attitudes and consumption of energy drinks in extreme sport enthusiasts

5. Indicate type of project and names of other investigators and students:

<table>
<thead>
<tr>
<th>Staff Research</th>
<th>X</th>
<th>Names</th>
<th>Dr. Tracy Perry</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Student Research</th>
<th>X</th>
<th>Names</th>
<th>Conrad Goodhew</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Level of Study (e.g. PhD, Masters, Hons)</th>
<th>Masters (MDiet)</th>
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<table>
<thead>
<tr>
<th>External Research/Collaboration</th>
<th>Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institute/Company</td>
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1
6. When will recruitment and data collection commence?  
November 14, 2016  

When will data collection be completed?  
February 1, 2017  

7. Brief description in lay terms of the aim of the project, and outline of the research questions that will be answered (approx. 200 words):

The aim of this study is to assess the attitudes and consumption of energy drinks and the influence of athlete sponsorship in extreme sports. We will use a questionnaire designed to determine the rate of consumption and perception of energy drinks in extreme sports. Questions will cover demographic information, frequency of participation in extreme sports, frequency and volume of energy drink use and perceived effects on performance and/or every day activities. The questionnaire also aims to evaluate the impact that sponsorship has on the perception and consumption in extreme sports enthusiasts. This project is being undertaken as part of Conrad Goodhew’s Master of Dietetics.

8. Brief description of the method.

The project will be conducted using Qualtrics, a website that hosts online questionnaires. The questionnaire will be pre-tested by 5-10 local people that fit the description of our target audience (See PDF of questions attached.) The focus group will be audio-taped and transcribed anonymously. Only the researchers will have access to the audio and transcription where any personal information will be destroyed at the conclusion of the study. Minor amendments may be made after this pre-testing.

The participants will be both athletes and non-athletes who follow or participate in extreme sports. For recruitment, athletes will be contacted using their public social media pages and/or extreme sports websites. (See invitation below.) We will invite these athletes to participate in our questionnaire through an online survey link. We will also ask these athletes to share our questionnaire on their social media pages so other athletes and followers can also access the questionnaire. We will continue to recruit by word of mouth. Locally, we will contact extreme sports shops and clubs, such as: bike shops, snow and mountaineering clubs, and provide questionnaire access to the members by email or social media. The questionnaire will take approximately 5 minutes to complete, with an added incentive to go into a prize draw. At the end of the questionnaire the participant will be redirected to another page where contact information is required for entry into the prize draw. This information will not be linked to the participant’s questionnaire answers.
Reporting Sheet for use ONLY for proposals considered at departmental level

Only Dr Nancy Rehrer, Dr Tracy Perry and Conrad Goodhew will have access to the results. Any electronic spreadsheets containing identifiable information will be password protected, and deleted at the completion of the project.

Invitation to the participants:

Dear (name of participant)

We are inviting you to participate in an online survey which will take approximately 5 minutes to complete. The survey is designed to investigate the relationship between extreme sports and energy drinks. If you are over the age of 18 and an extreme sport enthusiast, you are able to go into a prize draw once you complete the survey.

The prize draw includes:
- A $300 USD Amazon Gift Card
- Double VIP Nitro Circus Tickets (Invercargill, NZ – 04/2/17)
- Double VIP Nitro Circus Tickets (Tauranga, NZ – 11/2/17)
- An AJ Hackett International Bungy (your choice of one of the following locations: Cairns, Australia; Macau, China; Sochi, Russia; Normandie, France; Sentosa, Singapore).
  - Please note that Sentosa, Singapore is under construction and the ticket will be available once this is open. See the AJ Hackett website for more information.

Nitro Circus Tickets will be drawn 7th January 2017, and the other prizes will be drawn at the end of the survey – 1st February 2017.

Please be assured that your answers will remain anonymous. Only the researchers will have access to the survey answers. Only contact information will be asked if you would like to go into the prize draw, after which your contact details will be deleted.

Providing information through this online survey is taken as an indication of voluntary consent to participate. To participate click on this link (or copy and paste it into your browser.)

https://otago.au1.qualtrics.com/SE/?SID=SV_9tqvygi7s1xZDSZ

Yours Sincerely,

Conrad Goodhew
Master of Dietetics Candidate
Email: gooco0431@student.otago.ac.nz
9. **Disclose and discuss any potential problems:** (For example: medical/legal problems, issues with disclosure, conflict of interest, safety of the researcher, etc)

One possible problem could be if an energy drink sponsored athlete were to complete this survey – as some questions could negatively impact the brand or athlete. To minimise this risk, the questionnaires will be anonymous. Data will only be available to the student researcher and two supervisors.

*Applicant’s Signature:* .................................................................

*Name (please print):* Nancy J Rehrer

*Date:* October 13, 2016

*The signatory should be the staff member detailed at Question 1.*

**ACTION TAKEN**

☐ Approved by HOD
☐ Approved by Departmental Ethics Committee
☐ Referred to UO Human Ethics Committee

*Signature of **Head of Department:*** .................................................................

*Name of HOD (please print):* .................................................................

*Date:* .................................................................

**Where the Head of Department is also the Applicant, then an appropriate senior staff member must sign on behalf of the Department or School.**

**Departmental approval:** I have read this application and believe it to be valid research and ethically sound. I approve the research design. The research proposed in this application is compatible with the University of Otago policies and I give my approval and consent for the application to be forwarded to the University of Otago Human Ethics Committee (to be reported to the next meeting).

**IMPORTANT NOTE:** As soon as this proposal has been considered and approved at departmental level, the completed form, together with copies of any Information Sheet, Consent Form, recruitment advertisement for participants, and survey or questionnaire should be forwarded to the Manager, Academic Committees or the Academic Committees Administrator, Academic Committees, Rooms G22, or G26, Ground Floor, Clocktower Building, or scanned and emailed to either gary.witte@otago.ac.nz, or jane.hinkley@otago.ac.nz.
APPENDIX C: ETHICS APPROVAL

Assoc. Prof. N Rehrer
School of Physical Education, Sport and Exercise Sciences
Division of Sciences
46 Union Street West

Dear Assoc. Prof. Rehrer,

I am again writing to you concerning your proposal entitled “Attitudes and consumption of energy drinks in extreme sport enthusiasts”, Ethics Committee reference number D16/365.

Thank you for the email from Conrad Goodhew on 4 November 2016, providing your revised documentation. Thank you for updating the dates relating to the prize draw and the Nitro Circus events (taking place in 2017). Thank you for advising that there will be a pre-test of the questionnaire, which will involve participants taking the questionnaire and then participating in a focus group (audiotaped). Pre-test participants will be reimbursed with a $20 grocery voucher. Thank you for providing the information sheet and consent form for participants in the pre-test. We note that the dates for recruitment have been extended.

Your proposal continues to be fully approved. If the nature, consent, location, procedures or personnel of your approved application change, please advise me in writing. I hope all goes well for you with your upcoming research.

Yours sincerely,

[Signature]

Mr Gary Witte
Manager, Academic Committees
Tel: 479 8256
Email: gary.witte@otago.ac.nz

c.c. Professor D G Booth Dean School of Physical Education, Sport and Exercise Sciences
APPENDIX D: ETHICS AMENDMENT APPROVAL

Assoc. Prof. N Rehrer  
School of Physical Education, Sport and Exercise Sciences  
Division of Sciences  
46 Union Street West

9 March 2017

Dear Assoc. Prof. Rehrer,

I am again writing to you concerning your proposal entitled “Attitudes and consumption of energy drinks in extreme sport enthusiasts”, Ethics Committee reference number D16/365.

Thank you for providing a copy of your letter advising that the dates for data collection required to be extended to the end of February, both because the student researcher had been away at an internship, and to allow time for more participants to be included. This amendment is approved.

Your proposal continues to be fully approved. If the nature, consent, location, procedures or personnel of your approved application change, please advise me in writing. I hope all goes well for you with your upcoming research.

Yours sincerely,

[Signature]

Mr Gary Witte  
Manager, Academic Committees  
Tel: 479 8256  
Email: gary.witte@otago.ac.nz

[cc: Professor D G Booth  Dean  School of Physical Education, Sport and Exercise Sciences]
APPENDIX E: FOCUS GROUP PRE-TEST CONSENT FORM AND INFORMATION SHEET

EXTREME SPORT AND ENERGY DRINKS
QUESTIONNAIRE FOCUS GROUP PRE-TEST
INFORMATION SHEET FOR PARTICIPANTS

Thank you for showing an interest in this focus group. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part, there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?

The aim of the project is to determine the consumption and perception of energy drinks, and how these are influenced, in both extreme sport athletes and those who follow or watch extreme sports. This project is undertaken as part of Conrad Goodhew’s thesis requirements for a Master of Dietetics.

What types of Participants are being sought?

We are seeking individuals, both male and female, ≥18 years of age, who participate in extreme sports or follow and watch extreme sports to participate in a questionnaire focus group pre-test. You will be reimbursed with a $20 grocery voucher for your time.

What will Participants be asked to do?

Should you agree to take part in this project, you will be asked to complete a short online questionnaire before the focus group. The questionnaire includes questions regarding the personal use of energy drinks, perceptions of energy drinks and what influences usage. The questionnaire will take ~5 minutes to complete. You will then attend a focus group about your thoughts on the questionnaire including what was good and what could be improved. The focus group will take 45-60 minutes.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself.

What data or information will be collected and what use will be made of it?

The questionnaire questions will include:

- Personal Information (e.g. age, gender, and ethnicity)
- Participation in or following/watching extreme sports.
- Quantity and frequency of energy drink consumption, if any.
- Perceived effects of energy drink consumption have on performance and/or everyday activities.
- Factors that influence your use of energy drinks.
You will be part of a focus group that will be evaluating the questionnaire. The focus group will be audio taped and transcribed anonymously. Only the researchers will have access to the audio and transcription where any personal information will be destroyed at the conclusion of the study.

This information will help determine energy drink usage in extreme sports and factors which influence this. This will form part of a Master of Dietetics research project. Those who have access to the raw data are the three researchers, Dr Nancy Rehrer, Dr Tracy Perry, and Conrad Goodhew. Results of the focus group will be available for participants upon request.

The data collected will be securely stored in such a way that only the researchers will be able to gain access to it. Data obtained as a result of the research will be retained for at least 5 years in secure storage. Any personal information held on the participants may be destroyed at the completion of the research even though the data derived from the research will, in most cases, be kept for much longer or possibly indefinitely. The compiled results of the project may be presented at a conference and published in a journal. No individual results will be published or otherwise made public.

**Can Participants change their mind and withdraw from the project?**

You may withdraw from participation in the project at any time throughout completing the questionnaire without any disadvantage to yourself.

Conrad Goodhew  
MDiet Candidate  
Dept. of Human Nutrition  
Email: goocho31@student.otago.ac.nz

Dr Nancy Rehrer  
School of Physical Education  
Email: nancy.rehrer@otago.ac.nz  
Phone: 64 3 479 912

Dr Tracy Perry  
Department of Human Nutrition  
Email: tracy.perry@otago.ac.nz  
Phone: 64 3 479 750

This study has been approved by the Department stated above. However, if you have any concerns about the ethical conduct of the research you may contact the University of Otago Human Ethics Committee through the Human Ethics Committee Administrator (ph 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.
EXTREME SPORT AND ENERGY DRINKS
QUESTIONNAIRE FOCUS GROUP PRE-TEST
CONSENT FORM FOR PARTICIPANTS

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

1. My participation in the project is entirely voluntary;

2. I am free to withdraw from the project at any time without any disadvantage;

3. Personal identifying information (e.g. audiotapes and contact information) will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years;

4. This project involves an open questioning technique. The general line of questioning will be focused on the answers to the questionnaire. The precise nature of the questions which will be asked have not been determined in advance but will depend on the way in which the interview develops. The interviewer will be making no judgment on any answers provided. In the event that the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind;

5. You will be reimbursed with a $20 grocery voucher for your time;

6. The results of the project may be published and will be available at the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

..........................................................  ..........................................................
(Signature of participant)                     (Date)

..........................................................
(Printed Name)
EXTREME SPORT AND ENERGY DRINKS
QUESTIONNAIRE FOCUS GROUP PRE-TEST
FACEBOOK INVITATION

My name is Conrad Goodhew and I am conducting a questionnaire for my Master of Dietetics thesis (University of Otago). The title of the project is “Attitudes and Consumption of Energy Drinks in Extreme Sport Enthusiasts.”

Before the release of the questionnaire, I am pre-testing the survey and organising a focus group to ensure it is suitable for our target audience, both extreme sport athletes and those that watch or follow extreme sport but do not necessarily participate in these sports. I require a focus group of 5-10 participants, male and female, from a range of extreme sports.

The focus group criteria:

- Over 18 years of age;
- Participate in and/or watch extreme sports;
- Are available 6pm Wednesday 9th November for approximately 45-60 minutes at the University;
- To complete the online questionnaire prior to the focus group;

In return, you will be provided with a $20 supermarket voucher for your time.

Please, private message me if you are interested and would like to participate. Thank you.
APPENDIX F: QUESTIONNAIRE INFORMATION SHEET, CONSENT FORM AND INVITATION SHEET

Reporting Sheet for use ONLY for proposals considered at departmental level

Reference Number: D16_365 (02/11/16)

EXTREME SPORT AND ENERGY DRINKS
INFORMATION SHEET FOR PARTICIPANTS

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part, there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?

The aim of the project is to determine the consumption and perception of energy drinks, and how these are influenced, in both extreme sport athletes and those who follow or watch extreme sports. This project is undertaken as part of Conrad Goodhew’s thesis requirements for a Master of Dietetics.

What Types of Participants are being sought?

We are seeking individuals, both male and female, ≥18 years of age, who participate in extreme sports or follow and watch extreme sports to participate in our study.

All completed questionnaires by participants that meet the criteria will have an opportunity to go into a draw to win:

- A $300 USD Amazon Gift Card
- Double VIP Nitro Circus Tickets (Invercargill, NZ – 04/2/17)
- Double VIP Nitro Circus Tickets (Tauranga, NZ – 11/2/17)
- An AJ Hackett International Bungy (your choice of one of the following locations: Cairns, Australia; Macau, China; Sochi, Russia; Normandie, France; Sentosa, Singapore).
  o Please note: Sentosa, Singapore is under construction and the ticket will be available once this is open. See the AJ Hackett website for more information.

What will Participants be asked to do?

Should you agree to take part in this project, you will be asked to complete a short online questionnaire regarding personal use of energy drinks, your perception of energy drinks and what influences your usage. The questionnaire will take ~5 minutes to complete. The questionnaire will be anonymous; however, your full name and email will be required for entry to the prize draw. This will not be linked to your answers.
Please be aware that you may decide not to take part in the project without any disadvantage to yourself.

What Data or Information will be collected and what use will be made of it?

The questionnaire will ask questions regarding:
- Personal information (e.g. age, gender and ethnicity)
- Participation in or following/watching extreme sports.
- Quantity and frequency of energy drink consumption, if any.
- The effects consumption of energy drinks you believe have on performance and/or every day activities.
- Factors that influence your use of energy drinks.
- Contact information - if you would like to go into the prize draw.

This information will help determine energy drink usage in extreme sports and factors which influence this and perceptions. This will form part of a Master of Dietetics research project. Those who have access to the raw data are the three researchers, Dr Nancy Rehrer, Dr Tracy Perry, and Conrad Goodhew. Results of the study will be available for participants upon request.

The data collected will be securely stored in such a way that only the researchers will be able to gain access to it. Data obtained as a result of the research will be retained for at least 5 years in secure storage. Any personal information held on the participants may be destroyed at the completion of the research even though the data derived from the research will, in most cases, be kept for much longer or possibly indefinitely. The compiled results of the project may be presented at a conference and published in a journal. No individual results will be published or otherwise made public.

Can Participants change their mind and withdraw from the project?

You may withdraw from participation in the project at any time throughout completing the questionnaire without any disadvantage to yourself.

What if Participants have any Questions?

If you have any questions about our project, either now or in the future, please feel free to contact either:-

Conrad Goodhew  
MDiet Candidate  
Dept. of Human Nutrition  
Email: gooco431@student.otago.ac.nz

Dr Nancy Rehrer  
School of Physical Education  
Email: nancy.rehrer@otago.ac.nz  
Phone: 64 3 479 912

Dr Tracy Perry  
Department of Human Nutrition  
Email: tracy.perry@otago.ac.nz  
Phone: 64 3 479 750

This study has been approved by the Department stated above. However, if you have any concerns about the ethical conduct of the research you may contact the University of Otago Human Ethics Committee through the Human Ethics Committee Administrator (ph 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.
EXTREME SPORT AND ENERGY DRINKS
ONLINE CONSENT FORM FOR
PARTICIPANTS

I have read and understood the information sheet concerning this project. I understand that I am free to withdraw from the survey at any stage without consequence.

By participating in this survey, I know that:-

1. My participation in the project is entirely voluntary;

2. I have to complete the survey and meet the participant criteria outlined in the information sheet to be eligible for the prize draw;

3. I do not have to enter the prize draw, but if I do, I am to provide contact details;

4. Personal identifying information (contact details) will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years;

5. The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

By clicking the next button, I agree to take part in this project.
EXTREME SPORT AND ENERGY DRINKS

The aim of this research project is to determine the consumption and perception of energy drinks in extreme sport athletes and followers. More specifically, we are looking at factors which influence when, why and how energy drinks are used.

Eligibility for the study are extreme sport athletes or people that follow and watch extreme sports.

All individuals who complete questionnaires will have the opportunity to go into a draw to win: a $300 USD Amazon voucher, 1 of 2 double pass nitro circus tickets or an AJ Hackett International Bungy. Contact details will be required for you to enter.

This research will require the participant to complete an online questionnaire. This will take approximately 5 minutes to complete.

For more information, please email Conrad Goodhew at gooco431@student.otago.ac.nz

Questionnaire link: https://otago.au1.qualtrics.com/SE/?SID=SV_9qvyygi7s1xzDSZ

This project has been reviewed and approved by the School of Physical Education, Sport and Exercise Sciences, University of Otago
APPENDIX H: DRAFT QUESTIONNAIRE WITH COMMENTS

EXTREME SPORT AND ENERGY DRINKS
ONLINE CONSENT FORM FOR PARTICIPANTS

I have read and understood the Information Sheet (below). I understand that I am free to withdraw from the survey at any stage without consequence.

By participating in this survey, I know that:
- My participation in the project is entirely voluntary;
- I have to complete the survey and meet the participant criteria outlined in the Information Sheet to be eligible for the prize draw;

I do not have to enter the prize draw, but if I do, I am to provide contact details; Personal identifying information (contact details) will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for at least five years;
- The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity;
- The survey will close on the 5pm 20th February 2017 (GST +13). All partially completed surveys will not be counted and removed from data collection.

By clicking the next button, I agree to take part in this project.

Commented (CG1): Changed to ‘Agree’ or ‘Do Not Agree’.
Commented (CG2): Information sheet was a hyperlink, and participants did not click on it.
What is your current age? (slide the bar to choose)

_____ Age (1)

Gender:
- Male (1)
- Female (2)
- Prefer not to say (3)

Please specify your ethnicity:
- Main Ethnicity (1)
- Other (2)
- Other (3)
- Prefer not to say (4)

What is your highest level of schooling?
- Some secondary (high school) education (1)
- Completed secondary (high school) education (2)
- Some post-secondary education (3)
- Completed university undergraduate degree (4)
- Completed post-graduate degree (e.g. Masters, PhD) (5)

Profession or Work?:
- Professional athlete (1)
- Student (2)
- Heath professional (e.g. Dr, Physio) (3)
- Fitness industry (e.g. Personal Trainer) (4)
- Trades person (e.g. Plumber, Electrician) (5)
- Unemployed (7)
- Office Work (10)
- Other (please specify) (8)

Do you participate in extreme sports?
- Yes (4)
- No (5)

Please specify the extreme sport(s) you participate in.
Why do you participate in {{qID41/ChoiceTextEntryValue}}? Choose those that apply:
- Have been brought up with the sport (4)
- For an adrenaline rush (6)
- A close friend or family compete in it (7)
- Popularity (3)
- Motivation or inspiration (2)
- It’s part of my work (1)
- I love it (12)
- Other (please specify) (9)

Please rank why do you participate in {{qID41/ChoiceTextEntryValue}}, 1 bring the most important reason:
- Have been brought up with the sport (1)
- For an adrenaline rush (2)
- A close friend or family compete in it (3)
- Popularity (4)
- Motivation or inspiration (5)
- It’s part of my work (6)
- I love it (7)
- Other (please specify) (8)

Are you sponsored for any of these sport(s)?
- Yes (1)
- No (2)

Who are your sponsors for this/these extreme sport(s)? Choose those that apply:
- Energy drink company (1)
- Sports drink company (2)
- Nutrition supplements (5)
- Event day sponsorship (e.g., invitations to compete, free product or gear you get on the day) (3)
- Equipment and clothing company (4)
- Other (please specify) (6)

Do you follow extreme sports?
- Yes (1)
- No (2)

In which extreme sports do you follow? Please list up to 5 sports with detail (e.g., big wave surfing, or freestyle mountain bike):
- Sport 1 (1)
- Sport 2 (2)
- Sport 3 (3)
- Sport 4 (4)
- Sport 5 (5)
Why do you watch and/or follow these extreme sports? Choose those that apply:
- Have been brought up with the sport (1)
- For an adrenaline rush (2)
- A close friend or family compete in it (4)
- My favorite person competes in extreme sports (5)
- Motivation or inspiration (7)
- I love it (8)
- It's part of my work (10)
- Other (please specify) (9)

How often do you follow extreme sports?
- Daily (1)
- 4-6 times a week (2)
- 2-3 times a week (3)
- Once a week (4)
- Occasionally (5)
- Seasonally (6)

How do you follow extreme sports? Choose those that apply:
- Social media (11)
- Reading a magazine/newspaper (12)
- Websites (other than social media) (13)
- T.V. (15)
- Other (please specify) (16)

Which social media sites?
- Instagram (11)
- Youtube (12)
- Twitter (13)
- Facebook (14)
- Other (please specify) (4)

Do you consume energy drinks?
- Yes (1)
- No (2)
Why don't you use energy drinks? Choose those that apply:
- I don't like the taste (1)
- I don't like the feeling it creates after consumption (2)
- I try to avoid caffeine in general (3)
- I lose sleep when I use it (4)
- It makes me shake and/or tingle (5)
- It makes me dehydrated (6)
- Weight gain (7)
- It gives me vomiting, nausea and/or abdominal pain (8)
- I get chest pains and/or heart problems after consumption (9)
- I get headaches after consumption (10)
- Other (please specify) (11)

Please rank the reasons why you consume energy drinks: 1 being the most important reason:
- I don't like the taste (1)
- I don't like the feeling it creates after consumption (2)
- I try to avoid caffeine in general (3)
- I lose sleep when I use it (4)
- It makes me shake and/or tingle (5)
- It makes me dehydrated (6)
- Weight gain (7)
- It gives me vomiting, nausea and/or abdominal pain (8)
- I get chest pains and/or heart problems after consumption (9)
- I get headaches after consumption (10)
- Other (please specify) (11)

Age you started consuming energy drinks? (slide the bar to choose)
- Age (1)

How often do you consume energy drinks?
- Daily (1)
- 4-5 times a week (2)
- 2-3 times a week (3)
- Once a week (4)
- Occasionally and/or seasonally (6)

What is the typical amount of energy drink that you would have in a sitting?
- 250mL (small can) (1)
- 330mL (bottle or medium can) (2)
- 500mL (large can) (3)
- 720mL (extra large can) (4)
- Other (please specify) (5)
Why do you use energy drinks? Choose those that apply:

- Helps increase sport performance (1)
- Helps to keep me awake (2)
- Aids you to study or complete a major project (4)
- Helps with long distance driving (5)
- For weight loss purposes (6)
- When partying (7)
- It was advertised (8)
- Stress relief (9)
- Refreshment/taste (10)
- I get it for free (12)
- Energy Boost (14)
- Other (please specify) (11)

Please rank the reasons why do you use energy drinks, 1 being the most important:

1. Helps increase sport performance (1)
2. Helps to keep me awake (2)
3. Aids you to study or complete a major project (3)
4. Helps with long distance driving (4)
5. For weight loss purposes (5)
6. When partying (6)
7. It was advertised (7)
8. Stress relief (8)
9. Refreshment/taste (9)
10. I get it for free (12)
11. Energy Boost (11)
12. Other (please specify) (11)

When do you consume energy drinks for physical activity or sport? Choose those that apply:

- Before physical activity (1)
- During physical activity (2)
- After physical activity (3)
- No particular time (4)

Have you experienced the following from consuming energy drinks at any time? Choose those that apply:

- Fatigue (1)
- Dehydration (2)
- Headaches (3)
- Uncontrolled Shaking (4)
- Muscle stiffness and aches (5)
- Vomiting, nausea and abdominal pain (6)
- Sleep disturbance (e.g. wakfulness, trouble to get to sleep) (7)
- Have trouble focusing on tasks (8)
- No adverse effects (10)
- Other (please specify) (11)
Have you had any of these symptoms during physical activity or sport?
- Yes (1)
- No (2)

Do you use a specific brand of energy drink?
- Yes (1)
- No (2)

Why do you use this particular brand of energy drink? Choose those that apply:
- I am sponsored by this energy drink brand (1)
- My favorite extreme sports person uses this energy drink brand (2)
- They sponsor an event I compete at or watch (3)
- Because of the benefits this particular brand offers (4)
- Value for money (5)
- Tastes good (6)

Please rank the reasons why you use this particular brand of energy drink? 1 being the most important reason:
- I am sponsored by this energy drink brand (1)
- My favorite extreme sports person uses this energy drink brand (2)
- They sponsor an event I compete at or watch (3)
- Because of the benefits this particular brand offers (4)
- Value for money (5)
- Tastes good (6)

What are the main ingredients in Energy Drinks? Choose up to 4:
- Ingredient 1 (1)
- Ingredient 2 (2)
- Ingredient 3 (3)
- Ingredient 4 (5)
- I don’t know (4)

How often would you see an energy drink advertised?
- Daily (1)
- 4-6 times a week (2)
- 2-3 times a week (3)
- Once a week (4)
- Occasionally (6)
- Never (5)
What are some of the claims and warnings you have heard or read about energy drinks? Choose those that apply:
- Increases concentration and memory recall (1)
- It can cause sleep disturbance (2)
- It can increase the speed and accuracy of decision-making (3)
- It gives you extra energy (4)
- Helps with sporting performance (5)
- I don’t agree with any claims or warnings (6)
- It is not appropriate for pregnant or lactating women (7)
- It is not appropriate for children (8)
- Other (please specify) (9)

Have you ever searched for information on energy drinks?
- Yes (1)
- No (2)

Where have you searched for information on energy drinks? Choose those that apply:
- Reading and academic journal/book (1)
- Reading a magazine/newspaper (hard copy or on the internet) (2)
- Energy drink website (3)
- From a friend or relative (4)
- T.V. (5)
- Social media (6)
- Other athlete(s) (7)
- Coach (8)
- Extreme sport mentor (9)
- Other (please specify) (10)

What social media sites have you searched for information? Choose those that apply:
- Instagram (5)
- Facebook (6)
- YouTube (9)
- Twitter (10)
- Other (please specify) (8)
Would you like to start the Energy Drink Survey?

Once completed, you will have an opportunity to go into the draw to win some awesome prizes! More information and a consent form will be available on the next couple of pages.

Yes

No

Thank you for showing an interest in this project. Please read the information sheet carefully before deciding whether or not to participate.

Do I meet the criteria?

We are seeking individuals, both male and female, who:

- Are 18 years of age and over.
- Participate in, or enjoy, watching extreme sports.

What is the questionnaire about?

You will be asked to complete a short online questionnaire regarding personal use of energy drinks.

The questionnaire will take ~5 minutes to complete. The questionnaire will be anonymous, however, your full name and email will be required for entry to the prize draw. This will not be linked to your answers.
EXTREME SPORT AND ENERGY DRINKS
INFORMATION SHEET FOR PARTICIPANTS

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part, there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?

The aim of the project is to determine the consumption and perception of energy drinks, and how they are influenced, by both extreme sport athletes and those who follow or watch extreme sports.

This project is undertaken as part of Conrad Gatherwood's thesis requirements for a Master of Dietetics.

What Types of Participants are being sought?

We are seeking individuals, both male and female, aged 18 years of age, who participate in extreme sports.

I have read and understood the information sheet concerning this project. I understand that I am free to withdraw from the survey at any stage without consequence.

By participating in this survey, I know that:

- My participation in the project is entirely voluntary;
- I have to complete the survey and meet the participant criteria outlined in the information sheet to be eligible for the prize draw;
- I do not have to enter the prize draw, but if I do, I am to provide contact details;
- Personal identifying information (contact details) will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained for secure storage for at least five years;
- The results of the project may be published and will be available at the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity;
- The survey will close on the 29th February 2017 (5:01+13) all partially completed
Appendices
Please specify the extreme sport(s) you participate in. Choose those that apply:

- BMX (big jump/ freestyle)
- BMX/Mountain bike (sti jump)
- Base jumping
- Climbing
- F1 racing (inc. WEC)
- Flying (sailplane)
- Flying (wingsuit)
- Free climbing
- Hang gliding
- Kayaking (white water expeditions)
- Kitesurfing (kite surfing)
- Motocross (quad bike)
- Motorbike (trail racing)
- Mountain bike (downhill)
- Mountain bike (freestyle/ air)
- NASCAR
- Paragliding
- Rally (e.g. WRC)
- Rally (airborne)
- Ski jumping
- Skiing - nordic (sig mountain)
- Skiing - nordic (freestyle)
- Skiing - snow (jumper)
- Snowboarding
- Snowboarding (big mountain)
- Snowboarding (freestyle)
- Snowmobile (snowmobile)
- Snowboarding (cross country)
- Snowboarding (racing)
Why do you participate in Surfing (big wave)? Choose those that apply:

- For an adrenaline rush
- Have been brought up with the sport
- Fitness
- Motivation or inspiration
- Sense of accomplishment
- Other (please specify)

Are you sponsored for any of these sport(s); Surfing (big wave)?

- Yes
- No
Who are your sponsors for this/these extreme sport(s)? Choose those that apply:

- Energy drink company
- Nutrition supplements
- Sports drink company
- Equipment and clothing company
- Event day sponsorship (e.g., invitations to compete, free product or gear you get on the day)
- Other (please specify)

Do you follow extreme sports?

- Yes
- No
In which extreme sports do you follow? Choose those that apply:
- BMX (big jump/freeestyle)
- BMX/Mountain bike (dirt jump)
- BASE Jumping
- Drifting
- F1 racing (inc. WEC)
- Flying (aerostatic)
- Flying (rope)
- Free climbing
- Hang gliding
- Kayaking/kayak rafting
- Kitboarding/kitesurfing
- Motobike (enduro/motocross)
- Motosik/motocross
- Motorycle (track racing)
- Motorycle (roadrace)
- Skydiving (skydive)
- Water-skiing/snowboard
- Wakeboarding/water-ski

Why do you follow these extreme sports? Choose those that apply:
- Exciting to watch
- It’s part of my life
- A close friend or family member competes in it
- Watching and learning from an expert
- Other (please specify)

For an adrenaline rush:
- Motivation or inspiration to participate in the sport
- Have been brought up with the sport
- My favourite person competes in extreme sports

How often do you follow extreme sports?
- Daily
- 4-5 times a week
- 2-3 times a week
- Once a week
- Occasionally
- Seasonally
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Appendices

Age you started consuming energy drinks? (slide the bar to choose)

How often do you consume energy drinks?
- Daily
- 4-6 times a week
- 2-3 times a week
- Once a week
- Occasionally and/or seasonally

What is the typical amount of energy drink that you would have in a sitting?
- 250mL (small can)
- 330mL (bottle or medium can)
- 500mL (large can)
- 720mL (extra large can)
- Other (please specify)

Why do you use energy drinks? Choose those that apply:
- Increases energy for physical activity or sport
- I was advertised
- Helps to keep me awake
- Helps with long-distance driving
- Refreshment/stimulant
- Aids you to study or complete a major project
- I get it for free
- Other (please specify)
When do you consume energy drinks for physical activity or sport? Choose those that apply:

- Before physical activity
- During physical activity
- After physical activity
- No particular time

Have you experienced the following from consuming energy drinks at any time? Choose those that apply:

- Vomiting, nausea, and abdominal pain
- Jittery or shaking
- Reduced accuracy of movement
- Sleep disturbance (e.g., wakefulness trouble to get to sleep)
- Muscle stiffness and ache
- Dehydrated
- Headache
- No adverse effects
- Other (please specify)

Have you had any of these symptoms during physical activity or sport?

Yes

No

Have you experienced the following from consuming energy drinks at any time? Choose those that apply:

- Fatigue
- Sleep disturbance (e.g., wakefulness trouble to get to sleep)
- Jittery or shaking
- Reduced accuracy of movement
- Vomiting, nausea, and abdominal pain
- Muscle stiffness and ache
- Dehydrated
- Headache
- No adverse effects
- Other (please specify)

Have you had any of these symptoms during physical activity or sport?

Yes

No
Why do you use this particular brand of energy drink? Choose those that apply:

- Because of the benefits this particular brand offers
- Value for money
- Tastes good
- I get it for free
- I am sponsored by this energy drink brand

What do you mainly use: Standard or sugar-free energy drink?

- Standard energy drink
- Sugar free
- No preference
- Depends on why I am using it
- I don't know

How often would you see an energy drink advertised?

- Daily
- 4-6 times a week
- 2-3 times a week
- Once a week
- Occasionally
- Never
Where do you see energy drinks advertised? Choose those that apply:

- Social media
- TV
- Reading a magazine/newspaper
- Websites (other than social media)
- Youtube
- Other (please specify)

Which social media sites did you see energy drinks advertised?

- Facebook
- Twitter
- Instagram
- Other (please specify)
### What are some of the claims and warnings you have heard or read about energy drinks? Choose those that apply

<table>
<thead>
<tr>
<th>Claim / Warning</th>
<th>Applies</th>
</tr>
</thead>
<tbody>
<tr>
<td>It can increase the speed and accuracy of decision-making</td>
<td></td>
</tr>
<tr>
<td>It can cause sleep disturbance</td>
<td></td>
</tr>
<tr>
<td>It gives you extra energy</td>
<td></td>
</tr>
<tr>
<td>It is not appropriate for pregnant or lactating women</td>
<td></td>
</tr>
<tr>
<td>It is not appropriate for children</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
</tr>
</tbody>
</table>

### Have you ever searched for information on energy drinks?

- [ ] Yes
- [ ] No

### Where have you searched for information on energy drinks in general? Choose those that apply:

<table>
<thead>
<tr>
<th>Source of Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme sport mentor</td>
</tr>
<tr>
<td>Reading a magazine/newspaper (hard copy or on the internet)</td>
</tr>
<tr>
<td>From a friend or relative</td>
</tr>
<tr>
<td>Energy drink website</td>
</tr>
<tr>
<td>Social media</td>
</tr>
<tr>
<td>Youtube</td>
</tr>
<tr>
<td>Reading and academic journal/book</td>
</tr>
<tr>
<td>Internet/web search</td>
</tr>
<tr>
<td>Coach</td>
</tr>
<tr>
<td>Other athlete(s)</td>
</tr>
<tr>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>

### What are some of the claims and warnings you have heard or read about energy drinks? Choose those that apply

<table>
<thead>
<tr>
<th>Claim / Warning</th>
<th>Applies</th>
</tr>
</thead>
<tbody>
<tr>
<td>It can increase the speed and accuracy of decision-making</td>
<td></td>
</tr>
<tr>
<td>It can cause sleep disturbance</td>
<td></td>
</tr>
<tr>
<td>It gives you extra energy</td>
<td></td>
</tr>
<tr>
<td>It is not appropriate for pregnant or lactating women</td>
<td></td>
</tr>
<tr>
<td>It is not appropriate for children</td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
</tr>
</tbody>
</table>
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Appendices
Thank you for your participation in the Extreme Sports and Energy Drinks survey.

Reminder: you are eligible to go into our prize draw and will receive your name and email for this. Your contact information will not be associated with your responses in this survey.

There is no requirement to go into the prize draw.

You may go into the draw for any of the following, not limited to one choice:

- A $300 USD Amazon.com Gift Card
- Double VIP ticket to Cirque Du Soleil (Australia, New Zealand – 9/14/19)
- Double VIP ticket to Cirque Du Soleil (Canada, New Zealand – 10/19)
- An Air New Zealand International Business Class ticket from any of the following locations: Samoa, Australia, New Zealand, China, Korea, Russia, Hamadee, France, Singapore.

Please note that Singapore is subject to a new flight connection and deals will be available soon.

There is no requirement to go into the prize draw.

You may go into the draw for any of the following, not limited to one choice:

- A $300 USD Amazon.com Gift Card
- Double VIP ticket to Cirque Du Soleil (Australia, New Zealand – 9/14/19)
- Double VIP ticket to Cirque Du Soleil (Canada, New Zealand – 10/19)
- An Air New Zealand International Business Class ticket from any of the following locations: Samoa, Australia, New Zealand, China, Korea, Russia, Hamadee, France, Singapore.

Please note that Singapore is subject to a new flight connection and deals will be available soon.

Would you like to go into the prize draw?

Yes

No
Appendix J: Contact Information

Please provide us with your name and email if you would like to go into the prize draw.

First Name
Last Name
Email Address

What would you like to go into the draw for? (Feel free to choose all of them all if you are able to attend.)

1. $100 USD Amazon.com voucher
2. Nitro Circus VIP Double Pass Ticket (Irvine, CA - 04/03/16)
3. Nitro Circus VIP Double Pass Ticket (Tauranga, NZ - 11/2/16)

An AJ Hackett International Bungy. Your choice of one of the following locations: Canoe, Astoria, Idaho; China; Stok; France; Singapore; Brazil; Tokyo; Egypta. 2 Condominiums and 2 tickets to a single entry this in pase. See the AJ Hackett International Bungy for more information. Your email address
Thank you for completing the survey, you are entered into the prize draw.

If you would like to get results for the survey, please email us. Overall results will be available in June 2017.

Contact us:
Email: energystandardsdata@gmail.com
Facebook: www.facebook.com/energystandardsdata
Instagram: @energystandardsdata

Sincerely,
Conted Goodnew
Dr Nancy Reinr
Dr Tracy Rady

***Please Click NEXT to submit your details***
**Appendix K: Evaluating ‘Other (please specify)’ Extreme Sports**

Table 9.1: If an ‘Other (please specify)’ sport was participated in

<table>
<thead>
<tr>
<th>Was ‘Other’ sport participated in ‘Extreme’?</th>
<th>Did they participate in any of the other 42 sports in the list?</th>
<th>Did they follow any of the 42 sports in the list?</th>
<th>What happens with respondent’s answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Doesn’t matter</td>
<td>Doesn’t matter</td>
<td>Respondent categorised into participate in extreme sport major groups</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>Doesn’t matter</td>
<td>Respondents ‘other’ sport removed, all other answers stay the same</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Respondents no longer indicated as ‘participating in’ extreme sport so all associated answers removed</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Respondent is not an extreme sport enthusiast and removed from analysis</td>
</tr>
</tbody>
</table>

Table 9.2: If an ‘Other (please specify)’ sport was followed

<table>
<thead>
<tr>
<th>Was ‘Other’ sport followed ‘Extreme’?</th>
<th>Did they follow any of the other 42 sports in the list?</th>
<th>Did they participate in any of the 42 sports in the list?</th>
<th>What happens with respondent’s answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Doesn’t matter</td>
<td>Doesn’t matter</td>
<td>Respondent categorised into followed extreme sport major groups</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>Doesn’t matter</td>
<td>Respondents ‘other’ sport removed, all other answers stay the same</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Respondents no longer indicated as ‘following’ extreme sport so all associated answers removed</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Respondent is not an extreme sport enthusiast and removed from analysis</td>
</tr>
</tbody>
</table>
APPENDIX L: REMOVAL OF RESPONDENTS

Participants that clicked on the anonymous link. Downloaded from Qualtrics (n=394)

- Participants that did not want to enter the survey (n=5)
- Participants removed for not meeting the criteria. Either not following or participating in extreme sports, or under the age of 18 at the time they took the survey (n=17)
- Participants that completed less than 84% of the survey (missed location questions) (n=120)

Further analysis of answers to meet criteria (n=252)

- Participant removed as they had the same IP address and answers (n=1)
- Participant participated in ‘horse riding’ and another watched and/or followed ‘Boxing’. Both sports are not considered ‘Extreme’ (n=2)
- Participants removed as they indicated Powerade as ‘Energy Drink’. Not sure if they did consumed Energy drinks so removed form survey (n=2)

Participants included in final analysis (n=247)
## APPENDIX M: ADDITIONAL RESULTS

Table 9.3: How the respondents found the survey (n=246)

<table>
<thead>
<tr>
<th>How you found the survey</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw it on social media</td>
<td>178</td>
<td>72.4</td>
</tr>
<tr>
<td>Friend/Colleague email</td>
<td>45</td>
<td>18.3</td>
</tr>
<tr>
<td>Organisation/club email</td>
<td>19</td>
<td>7.7</td>
</tr>
<tr>
<td>Word of mouth</td>
<td>17</td>
<td>6.9</td>
</tr>
<tr>
<td>Saw a website</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>Poster</td>
<td>2</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Table 9.4: Reasons for participation in and following extreme sports, including, energy drink consumption rates within each extreme sports group (n=247)

<table>
<thead>
<tr>
<th>Extreme sport categoriesa</th>
<th>Reason</th>
<th>n</th>
<th>%</th>
<th>Consume energy drinks</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why do you participate in extreme sport</td>
<td>I enjoy participating in it</td>
<td>118</td>
<td>86.1</td>
<td>65</td>
<td>55.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For an adrenaline rush</td>
<td>86</td>
<td>62.8</td>
<td>53</td>
<td>61.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fitness</td>
<td>65</td>
<td>47.4</td>
<td>39</td>
<td>60.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sense of accomplishment</td>
<td>49</td>
<td>35.8</td>
<td>27</td>
<td>55.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have been brought up with the sport</td>
<td>49</td>
<td>35.8</td>
<td>32</td>
<td>65.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Motivation or Inspiration</td>
<td>37</td>
<td>27.0</td>
<td>23</td>
<td>62.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A close friend or family compete in it</td>
<td>22</td>
<td>16.1</td>
<td>15</td>
<td>68.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It's part of my work</td>
<td>9</td>
<td>6.6</td>
<td>5</td>
<td>55.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Popularity</td>
<td>3</td>
<td>2.2</td>
<td>1</td>
<td>33.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other (lifestyle and exploration)</td>
<td>2</td>
<td>1.5</td>
<td>1</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td>Why do you follow extreme sport</td>
<td>Exciting to watch</td>
<td>215</td>
<td>93.9</td>
<td>125</td>
<td>58.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Motivation or inspiration to participate in the sport</td>
<td>87</td>
<td>38.0</td>
<td>54</td>
<td>62.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Watching and learning from an expert</td>
<td>69</td>
<td>30.1</td>
<td>39</td>
<td>56.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have been brought up with the sport</td>
<td>48</td>
<td>21.0</td>
<td>29</td>
<td>60.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For an adrenaline rush</td>
<td>35</td>
<td>15.3</td>
<td>28</td>
<td>80.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A close friend or family compete in it</td>
<td>34</td>
<td>14.8</td>
<td>21</td>
<td>61.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My favourite person competes in extreme sports</td>
<td>27</td>
<td>11.8</td>
<td>16</td>
<td>59.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It's part of my work</td>
<td>6</td>
<td>2.6</td>
<td>3</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Used to competea</td>
<td>2</td>
<td>0.9</td>
<td>1</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other (please specify)</td>
<td>3</td>
<td>1.3</td>
<td>1</td>
<td>33.3</td>
<td></td>
</tr>
</tbody>
</table>

*a Respondent could choose multiple answers.
Table 9.5: Where energy drinks have been seen advertised (n=247)

<table>
<thead>
<tr>
<th>Location of advertising</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the local shop</td>
<td>189</td>
<td>76.8</td>
</tr>
<tr>
<td>Social media</td>
<td>189</td>
<td>76.8</td>
</tr>
<tr>
<td>While watching and extreme sport</td>
<td>179</td>
<td>72.8</td>
</tr>
<tr>
<td>On tv</td>
<td>163</td>
<td>66.3</td>
</tr>
<tr>
<td>Websites (other than social media)</td>
<td>81</td>
<td>32.9</td>
</tr>
<tr>
<td>YouTube™</td>
<td>80</td>
<td>32.5</td>
</tr>
<tr>
<td>Reading a newspaper</td>
<td>64</td>
<td>26.0</td>
</tr>
<tr>
<td>Vehicles*</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>Other (Radio &amp; On athletes)</td>
<td>2</td>
<td>0.8</td>
</tr>
</tbody>
</table>

* Respondent could choose multiple answers.