

Langan-Evans, C, Crighton, B, Kasper, A, Martin, D and Wilson, G

Current practices in weight making sport

<https://researchonline.ljmu.ac.uk/id/eprint/22477/>

Article

Citation (please note it is advisable to refer to the publisher's version if you intend to cite from this work)

Langan-Evans, C ORCID logoORCID: <https://orcid.org/0000-0003-1120-6592>, Crighton, B, Kasper, A, Martin, D and Wilson, G (2017) Current practices in weight making sport. *The Sport and Exercise Scientist* (54). pp. 8-9.

LJMU has developed **LJMU Research Online** for users to access the research output of the University more effectively. Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in LJMU Research Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain.

The version presented here may differ from the published version or from the version of the record. Please see the repository URL above for details on accessing the published version and note that access may require a subscription.

For more information please contact researchonline@ljmu.ac.uk

Current practices in weight making sport

Carl Langan-Evans, Ben Crighton, Andreas Kasper, Dan Martin and Dr George Wilson highlight some of the body mass loss practices employed by athletes across a range of sports and demonstrate the impact that this has on psychophysiological health.

All combat and a number of non-combat sports follow differing degrees of weight categorisation (see Table 1) and there are also a number of aesthetically judged sports where it is considered advantageous to have the lowest fat mass possible, including gymnastics, body building, bikini modelling, etc.

The rationale for weight categorisation is to promote fairer competition between competitors of equal size/body mass and stature/height (Langan-Evans *et al.*, 2011). However, many weight categorised athletes lose large amounts of body mass to gain a competitive advantage in either height, limb length or power to mass ratio. Several studies have shown these athletes employ short duration or ‘rapid weight loss’ (RWL) techniques, whereas others maintain low energy availability over prolonged periods of time. As such, a recent article has called for RWL to be banned (Artioli *et al.*, 2016) and others have highlighted the dangers of consistently reduced energy availability (Mountjoy *et al.*, 2014). This article highlights some of the body mass loss practices employed by athletes across a range of sports and demonstrate the impact that this has on psychophysiological health.

Professional horseracing

Perhaps the most challenging weight making sport is professional horseracing as, unlike combat sports, weight verification occurs only a few minutes (rather than several hours) prior to competition, meaning there is no opportunity to rehydrate or restore muscle glycogen. Furthermore, jockeys are required to have their body mass re-verified upon completion of the race, with any body mass gain in excess of 2lb resulting in sanction. Such regulation leads to jockeys competing in a high-risk sport with compromised physical and cognitive faculties.

Excessive periods of low energy availability combined with the use of RWL dehydration techniques to facilitate weight making amongst jockeys are commonplace, with methods including the use of saunas, salt baths, laxatives and self-induced vomiting. Using such hazardous practices on a frequent basis influences multiple facets of health including low bone mineral density, hormonal disruption and impaired psychological profiles.

Recent work by our Research Group has devised a high protein, moderate carbohydrate diet, with calorie intake equivalent to resting metabolic rate which is made specific to the lifestyle demands of jockeys (Wilson *et al.*, 2015). This approach enabled significant fat mass loss whilst maintaining fat free mass. Whilst this evidence-based approach to weight management has worked for many jockeys,

low energy availability and dehydration are still the most common weight-making strategies due, in part, to the strong cultural and organisational influences within the sport (Martin *et al.*, 2017).

Mixed martial arts

Mixed martial arts (MMA) is unique in that it allows athletes to utilise techniques from a number of combat sports (including striking and grappling) and has existed with its current ruleset since 2001. A culture has developed within the sport whereby athletes are ‘cutting’ larger amounts of body mass than has previously been documented in any other sport, in part due to the long timeframe (24+ hours) between weigh-ins and competition. Many athletes combine a number of RWL methods including novel techniques, such as water loading and the use of rubbing alcohol or other substances on the skin in order to increase sweat rate (Crighton *et al.*, 2015).

Two MMA athletes in the flyweight division have died and several athletes have been forced to retire due to health problems as a result of their body mass losses. Recently, two MMA athletes were forced to withdraw from championship title fights within the largest current promotion in the sport, the Ultimate Fighting Championship (UFC), as both were admitted to hospital due to ‘weight cutting issues’ the day before weigh-in.

Our Research Group has recently provided an insight into the weight cutting process via a British Broadcasting Corporation (BBC) documentary *The Weight Cut: Extreme Weight Loss*, highlighting the methods these athletes use to lose body mass. We have also recently observed and documented the renal and hormonal implications of utilising these RWL practices, which, in brief, showed acute kidney damage, vastly altered hormonal profiles and rebound hyperphagia.

Taekwondo

Taekwondo is a striking Olympic combat sport of which there are up to 10 kg gaps between weight categories in both male and female divisions. To achieve these weight category limits there is widespread practice of losing body mass and this is performed in both acute and chronic timeframes as weigh-ins are held the day before (up to 24 hours) competition.

There have been a limited number of studies conducted that have examined the prevalence and magnitude of body mass loss practises in Taekwondo athletes of varying age divisions and competitive levels (Ferreira da Silva Santos *et al.*, 2016). Collectively these studies have demonstrated that both male and female

Taekwondo athletes achieve their target body mass by a means of both chronic low energy availability and acute dehydration, where athletes lose 1-6 kg (1.1-9.3%) of body mass to compete.

Recently our Research Group has examined these practices in a cohort of Taekwondo athletes competing in the elite Cadet (10-13 years old), Junior (14-17 years old) and Senior (18+ years old) divisions of the British National Championships. The study showed both an increasing prevalence and magnitude of body mass loss congruent with the increasing weight category gaps across the age divisions. Senior athletes in the Olympic divisions reported losing up to 18% of body mass and utilising RWL methods such as diuretics, laxatives and self-induced vomiting. Research investigating the psychophysiological effects of these practices is limited.

Judo/wrestling

The weigh-in for both wrestling (Freestyle/Greco-Roman) and judo is conducted the day before competition. Judo is unique in comparison to many of the other combat sports given that a random weigh in is also conducted 1 hour preceding the start of competition and athletes found to have a body mass higher than 5% of their weight category are disqualified.

Due to the death of a judo athlete in 1996 and three wrestlers in 1997 there has been a plethora of research examining the body mass loss practices of judo and wrestling athletes across a number of populations (Alderman *et al.*, 2004; Artioli *et al.*, 2010). Current research has highlighted that both judo and wrestling athletes utilise acute means of body mass loss (in excess of 5% in many cases) mainly through RWL techniques, which involve acute dehydration in limited timeframes (as little as 3 days). Given the large volume of research in these demographics there have been a number of attempts to introduce protocols to reduce these practices. Numerous studies have examined their psychophysiological effects including marked changes in biochemical lipid and endocrine function, inverted iceberg profile of mood states (POMS) and decreased performance in sports-related tasks such as grip strength and jumping power.

Boxing

Boxing is contested in both amateur and professional governing bodies with differing rulesets regulating the two codes. In amateur boxing, athletes are required to weigh-in on the day of each bout of a competition (not less than 3 hours prior), whereas in professional boxing promotions weigh-ins are held the day before. As such, the body mass loss practices of both amateur and professional boxing athletes are disparate based upon the timescale given to recover prior to competition.

Recent research by Reale *et al.* (2017) highlighted that amateur boxers in the 2015 Australian National Championship reported habitually losing 3.6 ± 2.1% of body mass utilising RWL via exercise induced dehydration techniques, which, in contrast to the aforementioned sport practices, is relatively low. Despite this, studies have shown the negative impact that as little as 3% exercise induced dehydration can have on boxing-related tasks and profile of mood states.


Research into the body mass loss practices of professional boxers is extremely limited. A case study reported from our Research Group (Morton *et al.*, 2010) has characterised these practices in a professional boxer, which included chronic low energy availability (including total energetic and fluid restriction 48 hours prior to weigh-in) and extreme dehydration methods including exercise in a sweat suit. The case study introduced an alternative approach to body mass loss to achieve target weight, which was similar in approach to Wilson *et al.* (2015), which required the loss of fat free mass, yet allowed the athlete to make weight without the need to acutely dehydrate.

Conclusion and a call for action

What is clear is that across a range of weight categorised sports there is a systematic culture of losing body mass, utilising


techniques that are detrimental to psychophysiological health and performance. Each sport presents a uniquely different cultural approach to these practices, however, and, as such, interventions employed to tackle these issues need to be approached on an individualised basis (Langan-Evans *et al.*, 2011). There is a considerable requirement for a wider breadth of research across a number of weight categorised sports to help identify the issues some athletes face on a daily basis and to create strong messages that will ultimately influence policies and procedures. ■

We would like to thank our academic supervisors Dr James P. Morton and Prof Graeme L. Close FBASES for their support in preparing this article and for all they do in guiding our academic careers.




Carl Langan-Evans

Carl is the Head of Strength & Conditioning at Liverpool John Moores University and is undertaking a PhD investigating *The effects of acute and chronic weight loss methods on the physiological, metabolic and hormonal profile of elite international Taekwondo athletes.*




Ben Crighton

Ben is a martial arts instructor and former amateur mixed martial arts competitor and is undertaking a PhD investigating issues that affect the health and well-being of mixed martial arts fighters.




Andreas Kasper

Andreas is a Performance Nutritionist working in Rugby with both England Rugby Union and England Rugby League, and in football with Blackburn Rovers Football Club.



Dan Martin

Dan is in his final year of his PhD and is the Performance Nutritionist for the Professional Jockeys Association working with some of the UK's leading jockey athletes on weight management and performance.



George Wilson

George completed his Doctoral studies at Liverpool John Moores University with a thesis entitled *The effects of weight-making on the physical and mental health of professional jockeys.*

References:

Alderman, B.L. et al. (2004). Factors related to rapid weight loss practices among international-style wrestlers. *Medicine & Science in Sports & Exercise*, 36, 249-252.

Artioli, G.G. et al. (2010). Prevalence, magnitude, and methods of rapid weight loss among judo competitors. *Medicine & Science in Sports & Exercise*, 42(3), 436-442.

Artioli, G.G. et al. (2016). It is Time to Ban Rapid Weight Loss from Combat Sports. *Sports Medicine*, 46(11), 1579-1584.

Crighton, B. et al. (2015). Alarming weight cutting behaviours in mixed martial arts: a cause for concern and a call for action. *British Journal of Sports Medicine*, 50(8), 446-447.

Ferreira da Silva Santos, J. et al. (2016). Weight loss practices in Taekwondo athletes of different competitive levels. *Journal of Exercise Rehabilitation*, 12(3), 202-208.

Langan-Evans, C. et al. (2011). Making Weight in Combat Sports. *Strength & Conditioning Journal*, 33(6), 25-39.

Martin, D. et al. (2017). The horseracing industry's perception of nutritional and weight-making practices of professional jockeys. *Qualitative Research in Sport, Exercise and Health*, 9(5), 568-582.

Morton, J.P. et al. (2010). Making the weight: a case study from professional boxing. *International Journal of Sport Nutrition and Exercise Metabolism*, 20(1), 80-85.

Mountjoy, M. et al. (2014). The IOC consensus statement: beyond the Female Athlete Triad-Relative Energy Deficiency in Sport (RED-S). *British Journal of Sports Medicine*, 48(7), 491-497.

Reale, R. et al. (2017). Weight Management Practices of Australian Olympic Combat Sport Athletes. *International Journal of Sports Physiology and Performance*, 1-26. E-pub.

Wilson, G. et al. (2015). Fasted Exercise and Increased Dietary Protein Reduces Body Fat and Improves Strength in Jockeys. *International Journal of Sports Medicine*, 36(12), 1008-1014.

Table 1. Classifications of various weight categorised sports																			
Professional Boxing		Amateur Boxing		Judo		Taekwondo		Wrestling (Freestyle)		Wrestling (Greco-Roman)	Karate		Weightlifting		Lightweight Rowing		Mixed Martial Arts (MMA)	Professional Horseracing (UK)	
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male Only	Male	Female	Male	Female	Male	Female	Male & Female	Male & Female	
-47.6 kg	-46.3 kg	46-49 kg	45-48 kg	-60 kg	-48 kg	-54 kg	-46 kg	-57 kg	-50 kg	-55 kg	-60 kg	-50 kg	-56 kg	-48 kg	Crew average 70 kg	Crew average 57 kg	-52.2 kg	Flat racing 50.8 kg to 63.5 kg	
-48.9 kg	-47.6 kg	-52 kg	-51 kg	-66 kg	-52 kg	-58 kg	-49 kg	-61 kg	-53 kg	-60 kg	-67 kg	-55 kg	-62 kg	-53 kg	-63 kg	-58 kg	-56.7 kg		
-50.8 kg	-48.9 kg	-56 kg	-54 kg	-73 kg	-57 kg	-63 kg	-53 kg	-65 kg	-55 kg	-63 kg	-75 kg	-61 kg	-69 kg	-61 kg	-69 kg	-63 kg	-61.2 kg	Jump racing 63.5 kg to 76.0 kg	
-52.2 kg	-50.8 kg	-60 kg	-57 kg	-81 kg	-63 kg	-68 kg	-57 kg	-70 kg	-57 kg	-67 kg	-84 kg	-68 kg	-77 kg	-63 kg	-63 kg	-57 kg	-65.8 kg		
-53.5 kg	-52.2 kg	-64 kg	-60 kg	-90 kg	-70 kg	-74 kg	-62 kg	-74 kg	-59 kg	-72 kg	+84 kg	+68 kg	-85 kg	-69 kg	no rower over	no rower over	-70.3 kg		
-55.2 kg	-53.5 kg	-69 kg	-64 kg	-100 kg	-78 kg	-80 kg	-67 kg	-79 kg	-62 kg	-77 kg	-94 kg	-75 kg	-105 kg	-90 kg	72.5 kg incl.	59 kg incl.	-74.8 kg		
-57.2 kg	-55.3 kg	-75 kg	-69 kg	+100 kg	+78 kg	-87 kg	-73 kg	-86 kg	-65 kg	-82 kg	-105 kg	-90 kg	+105 kg	+90 kg	single sculls	59 kg incl.	-83.9 kg		
-58.9 kg	-57.2 kg	-81 kg	-75 kg			+87 kg	+73 kg	-92 kg	-68 kg	-87 kg							-79.4 kg		
-61.2 kg	-58.8 kg	-91 kg	-81 kg					-97 kg	-72 kg	-97 kg							-88.5 kg		
-63.5 kg	-61.2 kg	+91 kg	+81 kg			+80 kg	+67 kg	-125 kg	-76 kg	-130 kg							-93.0 kg		
-66.7 kg	-63.5 kg																-102.1 kg		
-69.9 kg	-66.7 kg																-120.2 kg		
-72.6 kg	-69.9 kg																+120.2 kg		
-76.2 kg	-72.6 kg																		
-79.4 kg	-76.2 kg																		
-90.9 kg	-79.4 kg																		
+90.9 kg	+79.4 kg																		

Weight categories highlighted in bold are those included in the Olympic Games. All weight category information has been pertained from the relevant world governing body.