Making Weight in Boxing
How to do it better

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Introduction to weight cutting

What it is, why people do it, and how they do it
What is “Making Weight”?1,2

1. Decreasing body mass to move to a lower class than the person’s normal weight
2. **Chronic Weight Loss (CWL)**
   - Regulated & slow
3. **Rapid Weight Loss (RWL)**
   - Unregulated & fast
4. Theorized that the athlete can put back on the weight by rehydrating after the weigh-in
   - Thus allowing the athlete to be 10–15 pounds overweight

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**Elite Male and Youth Male boxers 10 weight categories**

<table>
<thead>
<tr>
<th>Weight Division</th>
<th>Over – kg</th>
<th>Under – kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light-Fly</td>
<td>46</td>
<td>49</td>
</tr>
<tr>
<td>Fly</td>
<td>49</td>
<td>52</td>
</tr>
<tr>
<td>Bantam</td>
<td>52</td>
<td>56</td>
</tr>
<tr>
<td>Light</td>
<td>56</td>
<td>60</td>
</tr>
<tr>
<td>Light-Welter</td>
<td>60</td>
<td>64</td>
</tr>
<tr>
<td>Welter</td>
<td>64</td>
<td>69</td>
</tr>
<tr>
<td>Middle</td>
<td>69</td>
<td>75</td>
</tr>
<tr>
<td>Light-Heavy</td>
<td>75</td>
<td>81</td>
</tr>
<tr>
<td>Heavy</td>
<td>81</td>
<td>91</td>
</tr>
<tr>
<td>Super-Heavy</td>
<td>+91</td>
<td></td>
</tr>
</tbody>
</table>

Image from: Boxing Canada Articles and Rules (2015)
What happens to your body after RWL 3,4,5

**Regular water levels**

- 60% of water
- Regular aerobic performance
- Regular anaerobic performance
- Regular water maintenance
  - Regular perspiration
  - Regular urine output
  - Regular water absorption

**Dehydrated**

- As little as 1-2% of reduced body mass can lead to impairments
- Decreased aerobic performance
- Decreased anaerobic performance
- Compensatory water maintenance
  - Decreased perspiration
  - Decreased urine output
  - Increased water absorption
Motivation behind weight-cutting practices²,⁶

- **Physical**
  - Allows athlete to compete against smaller, lighter, and weaker opponents
  - *Increased leverage, power, and size*

- **Mental**
  - Qualitative evidence dating from 2013 suggesting a coping strategy for *increased focus and commitment*

- **Cultural**
  - *Feeling of belonging*
  - “Nobody at the venue pays any special attention, because it is all part of the sport. Nobody thinks that it is strange whatsoever”
Methods of making weight

Most Common Methods
- Dieting or starving
- Fluid restriction
- Passive dehydration
- Active dehydration

Least Common Methods
- Diuretics
- Laxatives
- Self-induced vomiting
- Blood draws

Please note: these methods predominantly describe means of rapid weight loss.
Duk Koo Kim, 1982

- Korean boxer declared dead 4 days after bout
- Underwent RWL to prepare for fight
- Received repeated blows to head causing subdural hematoma
- Underwent a coma and died during surgery

Image from: http://boxrec.com/boxer/12186
Gary Russell Jr., 2008

- One of the top USA prospects for the 2008 Olympic Games
- Dehydrated from cutting weight
- Heat exhaustion
- Collapsed and was no longer able to compete

Image from:
http://boxrec.com/boxer/479775
- USA boxer dangerously dehydrated before bout
- Collapsed after bout
- Brain found with serious bleeding
- 30% of his brain was unrecoverable
- Unable to box again nor function similarly pre-bout
Rushed to the hospital from gym after severe dehydration
Pulled out from competition as a result
The consequences of RWL

Fluid levels, muscle glycogen, sport performance...
Main consequences of RWL

Fluid Levels

- Drop in fluid levels contribute to various **consequences to your body**
  - Impairs circulatory function
    - Blood flow
    - Oxygen uptake
    - Waste removal
    - Heat dissipation

Exchange of oxygen, nutrients, and wastes in a typical system
Main consequences of RWL

Muscle Glycogen

- Combined glucose molecules derived from sources of carbohydrates

- Further dehydration due to glycogen coupling to water (2.7:1 ratio)

Main consequences of RWL\textsuperscript{13,14}

**Sport Performance**

*Population-specific evidence*

1. Study featuring 16 amateur boxers found that RWL is associated with poor performance; increased anger, fatigue, and tension; and reduced vigour.

   **Effects of rapid weight loss on mood and performance among amateur boxers**

   C.J. Hall\textsuperscript{1}, A.M. Lane\textsuperscript{2}

2. Study featuring 7 amateur boxers found an average decrease in performance by 26.8%\textsuperscript{2}

   **The effects in humans of rapid loss of body mass on a boxing-related task.**

   Smith MS\textsuperscript{1}, Dyson R, Hale T, Harrison JH, McManus P.

   Limitations to studies with regard to sample size and risk of bias unknown.
Main consequences of RWL\textsuperscript{15,16}

**Sport Performance**

*Generalizable evidence*

- Given the energy profile is **aerobic** and **anaerobic**:

![Graph depicting percentage of individuals found with impaired performance after RWL of varying degrees. There are 34 studies and 43 studies on hypohydration effects on aerobic and anaerobic parameters, respectively. Retrieved from Sawka 2015](image-url)
Signs and symptoms

How to identify RWL
What the medical staff see

Common signs of dehydration

Lower blood pressure from lower blood volume

Fast heart rate as a compensatory mechanism for low blood volume ----> Ensures regular blood flow

Test for orthostatic hypotension

- Have the athlete lay down for a given time
- Have the athlete stand and immediately take the athlete’s blood pressure reading
- If there is a significant drop in blood pressure, the athlete is likely dehydrated
- More sensitive for identifying dehydration

Note: this is just an example of what the ringside physician may see. It is not reflective of all individuals.
• Ideally, compare current urine concentration and body mass to average
• Typical but not specific signs and symptoms include:
  ○ Thirst and dry mouth
  ○ Fatigue
  ○ Dizziness
  ○ Nausea
  ○ Irritable
  ○ Trouble concentrating
  ○ Increased heart rate
  ○ Low blood pressure
“But I eat and drink after the weigh-in”

There is not enough time to fully replenish what was lost.

Weigh-ins and bouts are on the same day.

<table>
<thead>
<tr>
<th>Store</th>
<th>Time it takes to fully recover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid levels</td>
<td>24-48 hours</td>
</tr>
<tr>
<td>Muscle glycogen</td>
<td>&gt;72 hours</td>
</tr>
<tr>
<td>Lean muscle tissue</td>
<td>Even longer</td>
</tr>
</tbody>
</table>
The better way: maintaining weight
Maintaining weight 2,4,5,7,12,16

What this means

- Easiest way is the ensure weight is closest to fighting weight
  - Stay within 2% of fighting weight
  - Restricted diet and nutrition plan
  - Continue to stay active

How to do it

- Athlete should weigh-in once a week in similar conditions
- Immediately after pre-bout weigh-in, drink at least 16 ounces of water and eat high energy foods
Maintaining weight

- Avoid:
  - Sauna suits
  - Rubber suits
  - Enemas
  - Diuretics
  - Purposely dehydrating

- Decrease in performance linked to:
  - Quantity of RWL
  - Time duration of RWL
    - RWL over 48 hours is less detrimental than 24 hours
<table>
<thead>
<tr>
<th>Season</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-season</td>
<td>Determine best weight class</td>
</tr>
<tr>
<td>In-season</td>
<td>Maintain weight near weight class and train for sport</td>
</tr>
<tr>
<td>Post-season</td>
<td>Minimize fat increase, gain muscle, and stay lean</td>
</tr>
</tbody>
</table>
Losing weight safely\textsuperscript{19,20}

- **SLOW:**
  - Approximately 1kg per week
  - Avoid quick methods
- Choose appropriate weight
- Moderate food restrictions
- Increase exercise
- Monitor weight regularly
Losing weight safely\textsuperscript{19,20}

- 5-6 small meals a day, every 2-3 hours
- Low glycemic carbs, lean meats for high protein, and nuts for mono and polyunsaturated fats
- Eat less without starving
- Eat before you get hungry, stop before you get full
- Drink water until urine runs clear
DO NOT PARTICIPATE IN RWL

Use a standardized growth curve for strategic tracking

Image from: Centres for Disease Control and Prevention (2010)
Final take homes

- Rapid weight loss is an **unsafe practice** for athlete health
  - There is evidence that suggests that it is also bad for performance
- Athletes should consider striving towards **maintaining weight** rather than making weight
- Youth **should not** participate in rapid weight loss strategies
- Short-term consequences include **inability to compete**
- Long-term consequences include **coma or death**


