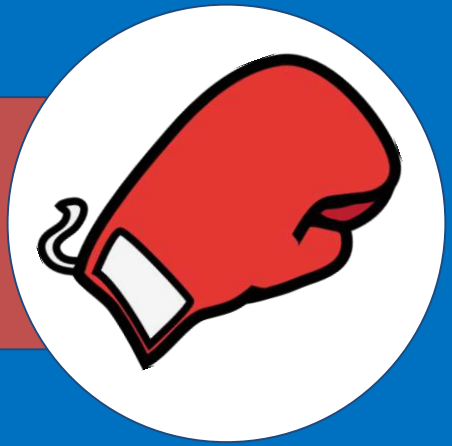
Making Weight in Boxing

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]

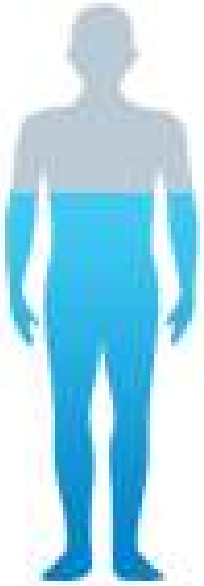
Elite Male and Youth Male boxers 10 weight categories		
Weight Division	**Over – kg**	**Under – kg**
Light-Fly	46	49
Fly	49	52
Bantam	52	56
Light	56	60
Light-Welter	60	64
Welter	64	69
Middle	69	75
Light-Heavy	75	81
Heavy	81	91
Super-Heavy	+91	

Image from: Boxing Canada Articles and Rules (2015)

- Decreasing body mass to move to a lower class than the person's normal weight
- **Chronic Weight Loss** (CWL)
  - Regulated & slow
- **Rapid Weight Loss** (RWL)
  - Unregulated & fast
- 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

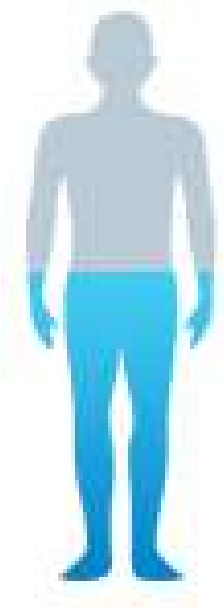
What happens to your body after RWL[3,4,5]

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 practices[2,6]

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 i**ncreased focus and commitment**

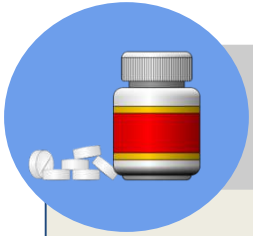
Cultural

- **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[7]

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.

Cautionary tales

RWL Case studies

Duk Koo Kim, 1982[8]

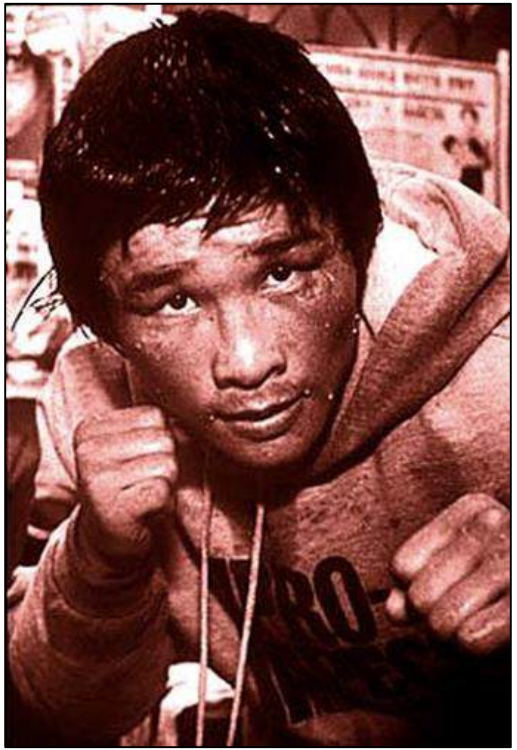


Image from: http://boxrec.com/boxer/12186

- 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

Gary Russell Jr., 2008[9]

Image from:
http://boxrec.com/boxer/479775

- 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

Kieran Farrell, 2012[10]

- 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

Image from: Action Images

Jose Aguiniga, 2013[11]

- Rushed to the hospital from gym after severe dehydration
- Pulled out from competition as a result

Image from: Oxnard, Ca Press Conference (2012)

The consequences of RWL

Fluid levels, muscle glycogen, sport performance...

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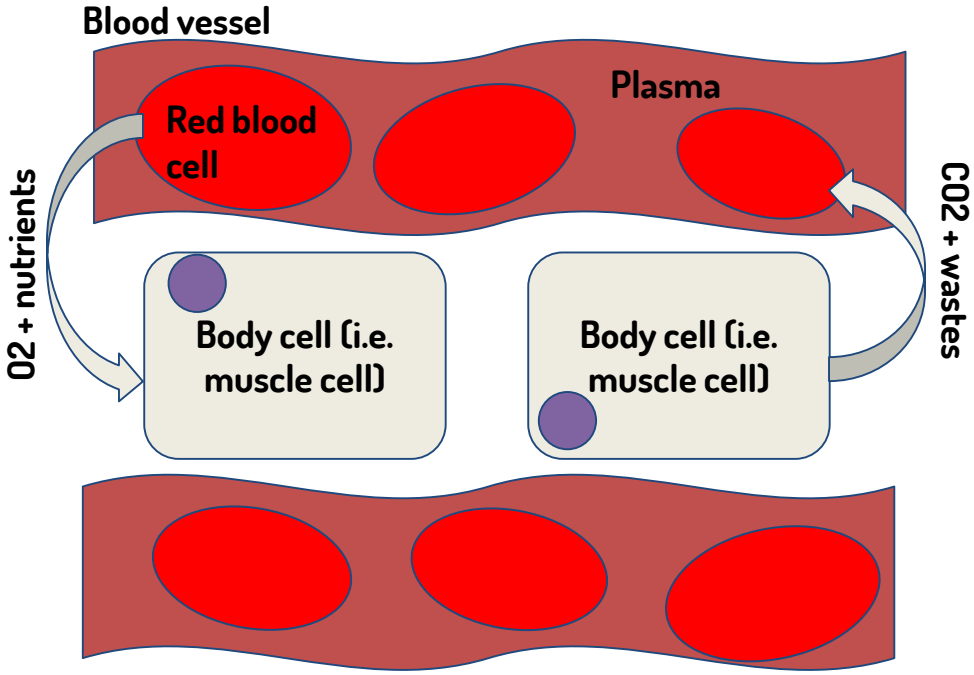
Main consequences of RWL[2,4,5,12]

Fluid Levels

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

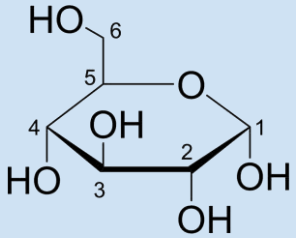


Exchange of oxygen, nutrients, and wastes in a typical system

Main consequences of RWL[7]

Muscle Glycogen

- Combined glucose molecules derived from sources of carbohydrates



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

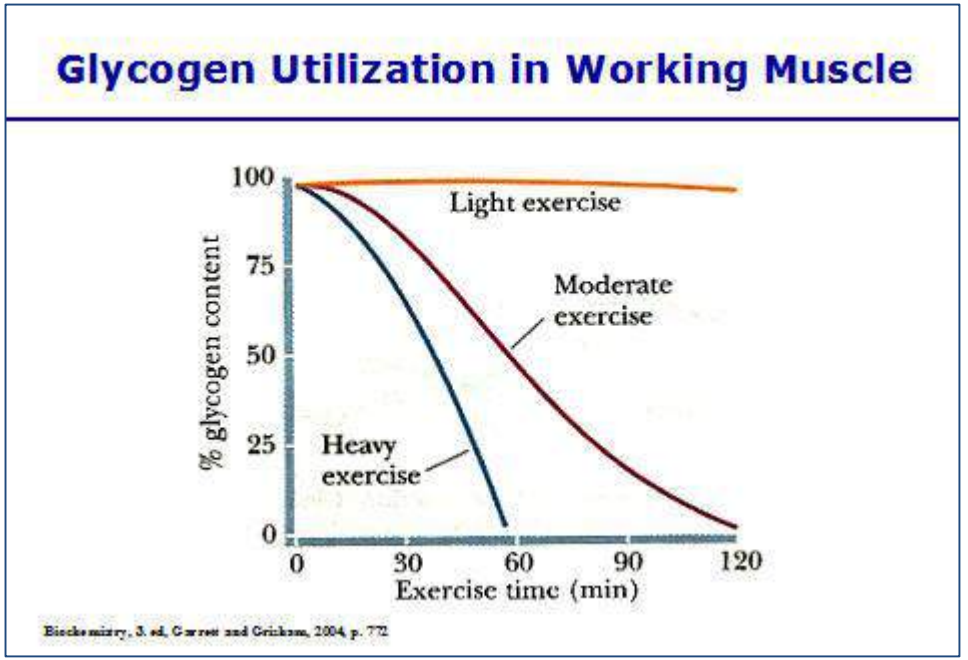


Image from: http://www.medbio.info/Horn/PDF%20files/muscle_metabolism_march_2007.pdf

Main consequences of RWL[13,14]

Sport Performance

Population-specific evidence

1

Br J Sports Med 2001;35:390-395 doi:10.1136/bjsm.35.6.390

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

C J Hall[1], A M Lane[2]

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

2

Eur J Appl Physiol. 2000 Sep;83(1):34-9.

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

Smith MS[1], Dyson R, Hale T, Harrison JH, McManus P.

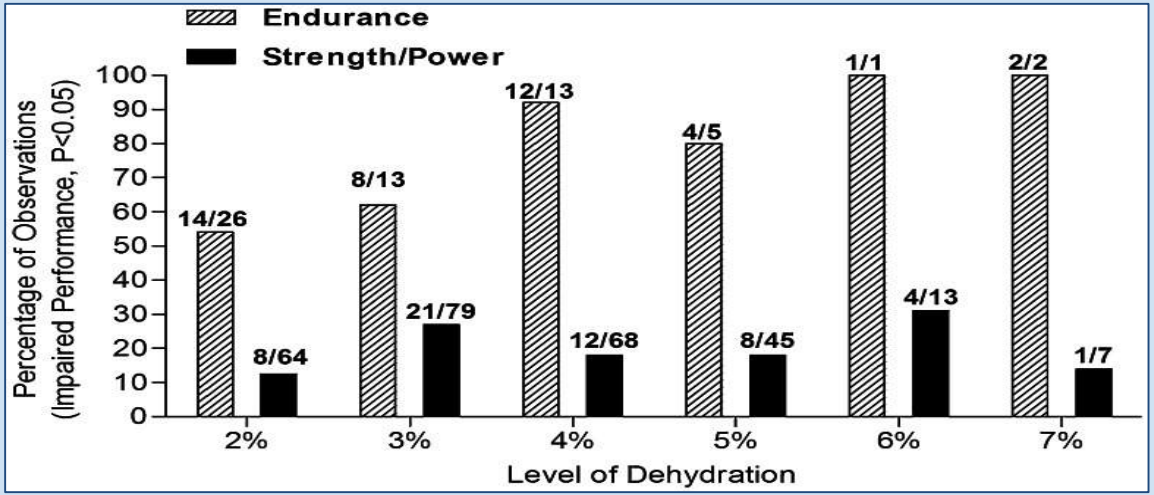
- Study featuring 7 amateur boxers found an average decrease in performance by 26.8% 2
- Limitations to studies with regard to sample size and risk of bias unknown

Main consequences of RWL[15,16]

Sport Performance

Generalizable evidence

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



The following figure depicts the 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

Signs and symptoms

How to identify RWL

What the medical staff see

Note: this is just an example of what the ringside physician may see. It is not reflective of all individuals.

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

Signs and symptoms[17]

- 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”[2,4,5,7,12,16]

There is not enough time to fully replenish what was lost

Weigh-ins and bouts are on the same day

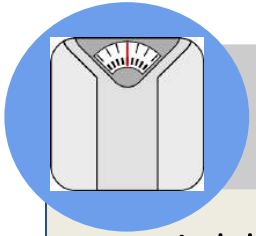
Store	**Time it takes to fully recover**
Fluid levels	24-48 hours
Muscle glycogen	>72 hours
Lean muscle tissue	Even longer

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[18]

- 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

Year-Round Weight Plan[19,20]

Pre-season	Determine best weight class
In-season	Maintain weight near weight class and train for sport
Post-season	Minimize fat increase, gain muscle, and stay lean

Losing weight safely[19,20]

- **SLOW:**
  - Approximately 1kg per week
  - Avoid quick methods
- Choose appropriate weight
- Moderate food restrictions
- Increase exercise
- Monitor weight regularly

Losing weight safely[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

Weight management for youth[21]

DO NOT PARTICIPATE IN RWL

Use a standardized growth curve for strategic tracking

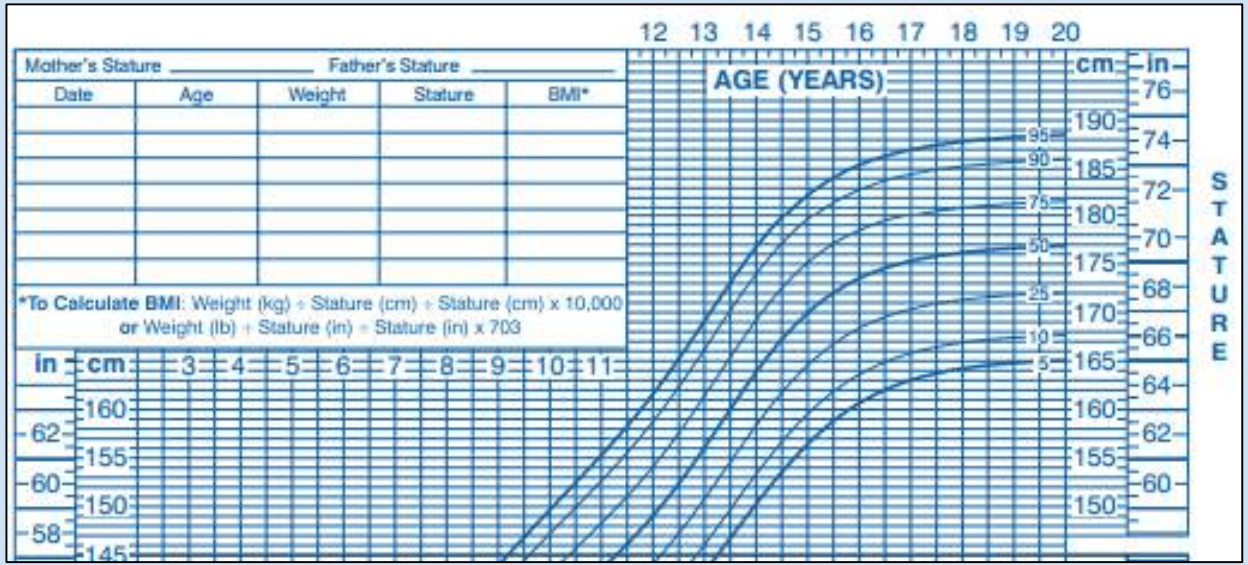


Image from: Centres for Disease Control and Prevention (2010)

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**

Thank you! Any questions?

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