

# Sodium Supplementation, Drinking Strategies and Weight Change in a 100-Mile Ultramarathon

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**Do we  
really need  
sodium?**

The background of the slide is a blue-tinted photograph of a mountainous landscape. In the foreground, a river flows through a valley, surrounded by dense evergreen forests. The middle ground shows a wide valley floor with some structures and a road. In the background, several large, rugged mountains with patches of snow or light-colored rock rise against a clear sky. The overall scene is serene and natural.

**How much weight  
change is appropriate?**

Glycogen utilization	~0.5 kg
Water release from glycogen	~1.5 kg
Fat utilization	~ <u>0.8 kg</u>
<b>TOTAL</b>	<b>~2.8 kg</b>

$$2.8 \text{ kg} / 70 \text{ kg} = 4\%$$

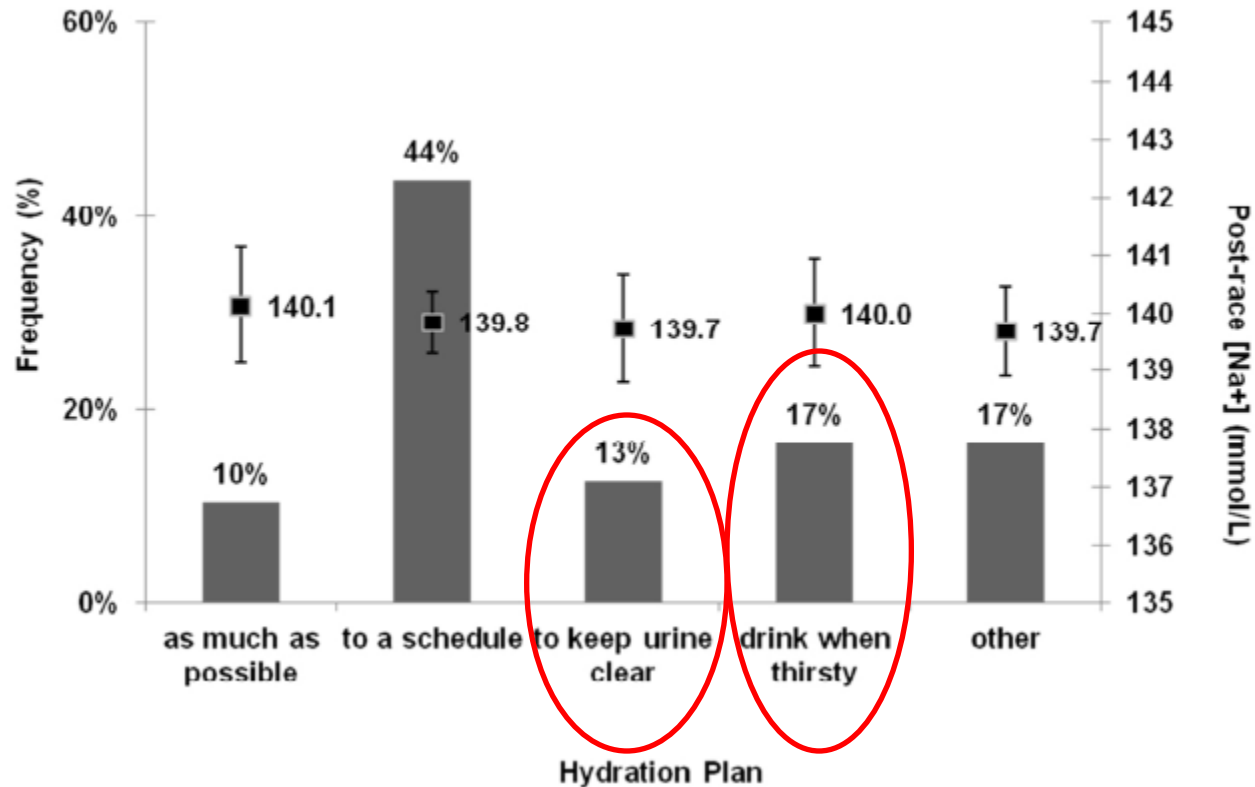
The background is a blue-tinted photograph of a mountainous landscape. In the foreground, a river flows through a valley. The middle ground shows a dense forest of evergreen trees. In the background, several large, rugged mountains with patches of snow or light-colored rock rise against a pale sky. The overall scene is serene and natural.

**What are ultrarunners  
thinking?**

# What is your drinking plan for the race?

2011 WSER finishers

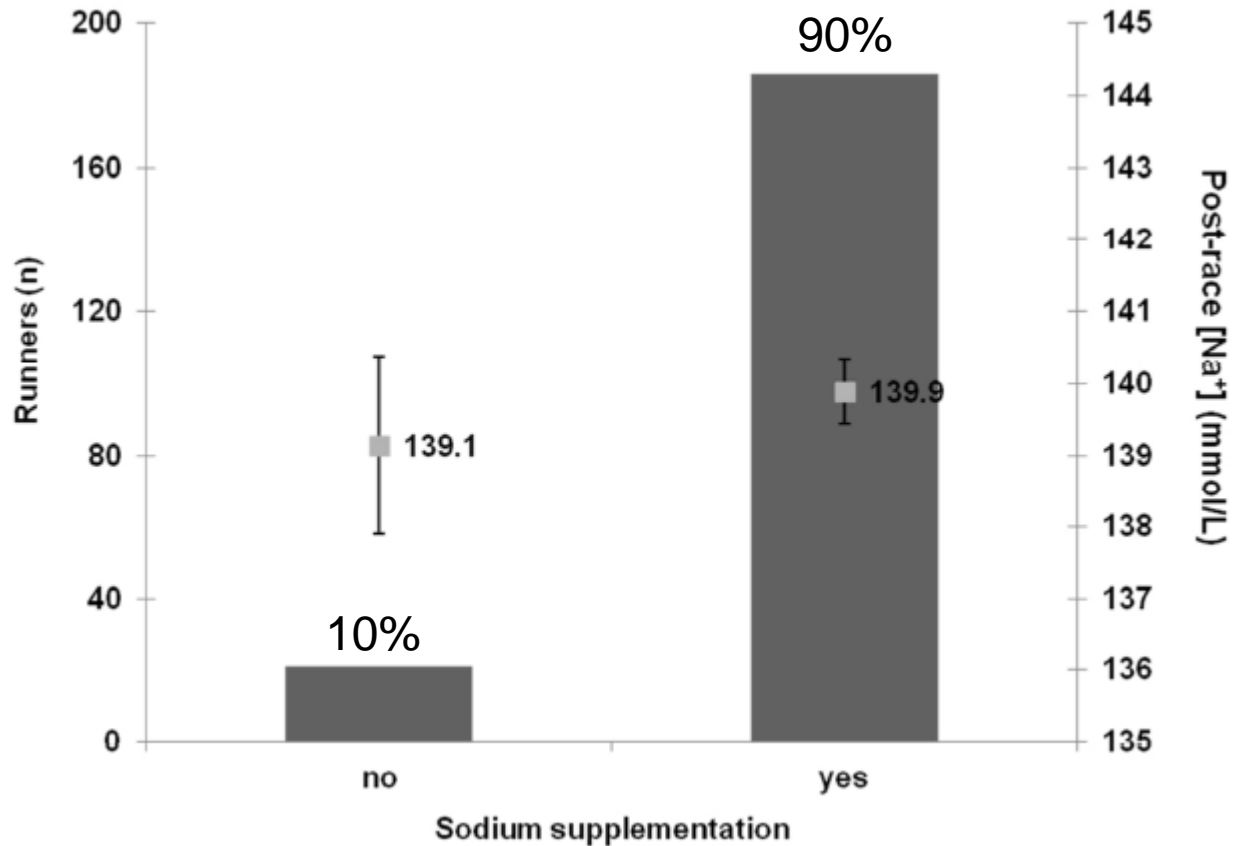
n=309 (of 310 finishers)



# Do you plan to use sodium supplements during the race?

2011 WSER finishers

n=207 (of 310 finishers)





Percent of runners indicating use of different hydration strategies during four segments of the race. Data are from the 2013 WSER.

Hydration Strategy	0-30 miles	30-56 miles	56-78 miles	78-100 miles	Overall
Drinking					
Thirst	52.6	44.5 <sup>a</sup>	51.5	57.6 <sup>a</sup>	67.0 <sup>1,2</sup>
Maximum tolerated	13.3 <sup>a</sup>	23.0 <sup>a</sup>	22.0	18.9	34.4 <sup>1,3</sup>
Pre-determined schedule	27.4 <sup>a,b</sup>	15.8 <sup>a</sup>	14.5 <sup>b</sup>	12.4 <sup>a</sup>	29.6 <sup>2,4</sup>
Change in body weight	3.7 <sup>a,b,c</sup>	12.5 <sup>a</sup>	10.0 <sup>b</sup>	11.1 <sup>c</sup>	18.1 <sup>1</sup>
Urine color	6.3	7.2	6.2	4.1	10.0 <sup>2,3</sup>
Other	5.2	3.0	3.3	1.4	7.0 <sup>1,4</sup>
Sodium Supplementation	82.7 <sup>a</sup>	95.5 <sup>a,b</sup>	90.6	84.1 <sup>b</sup>	95.6

p<0.05 between race segments with same letter considering the given hydration strategy

p<0.01 between overall drinking strategies with same number



Welcome to Michigan Bluff  
**Medical Aid Station**

**Mile 55**

# What Color is Your Pee?



Coors Light™

**GOOD**



Pale Ale

**Hydrate**



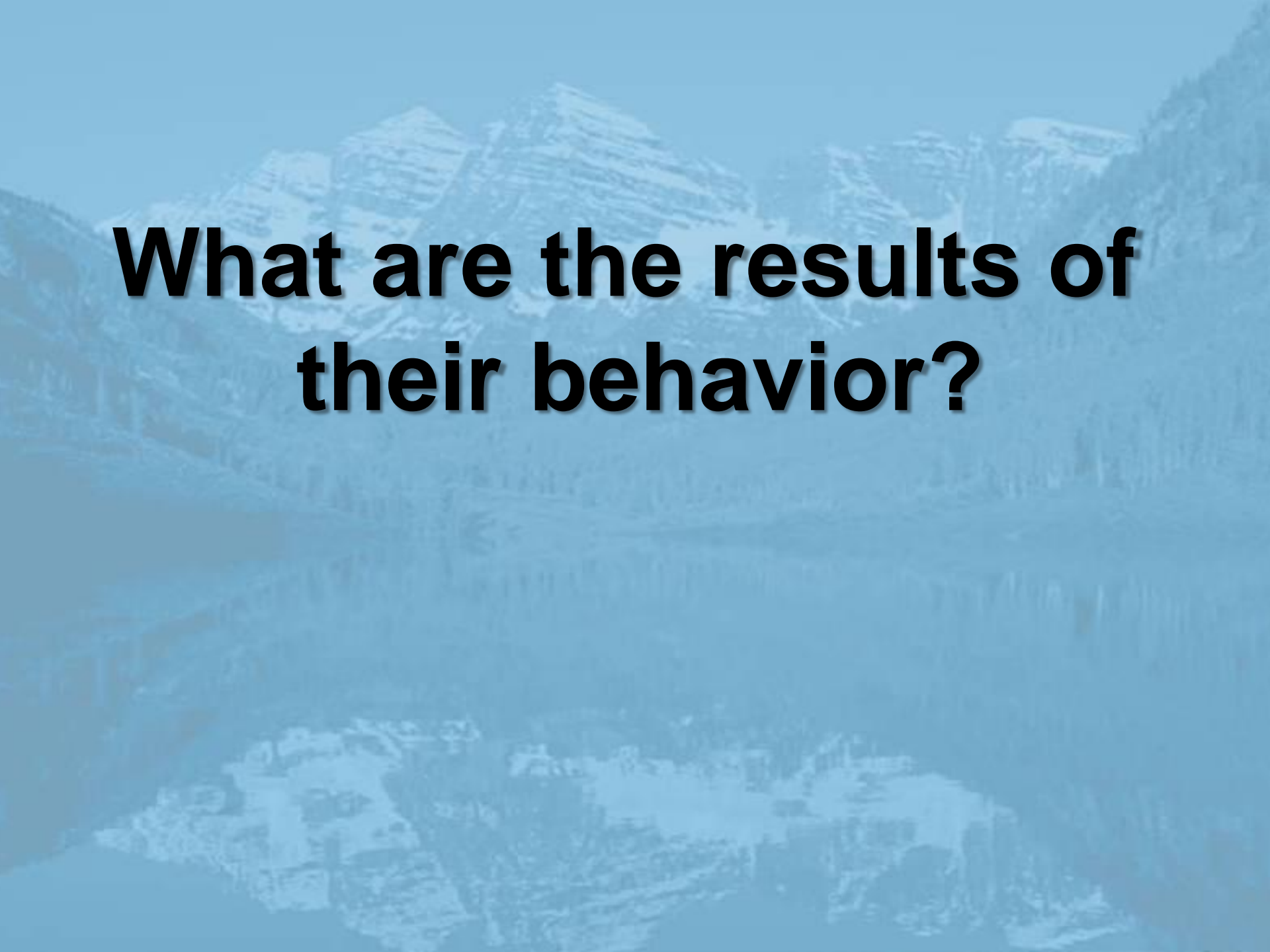
IPA

**Hydrate More**

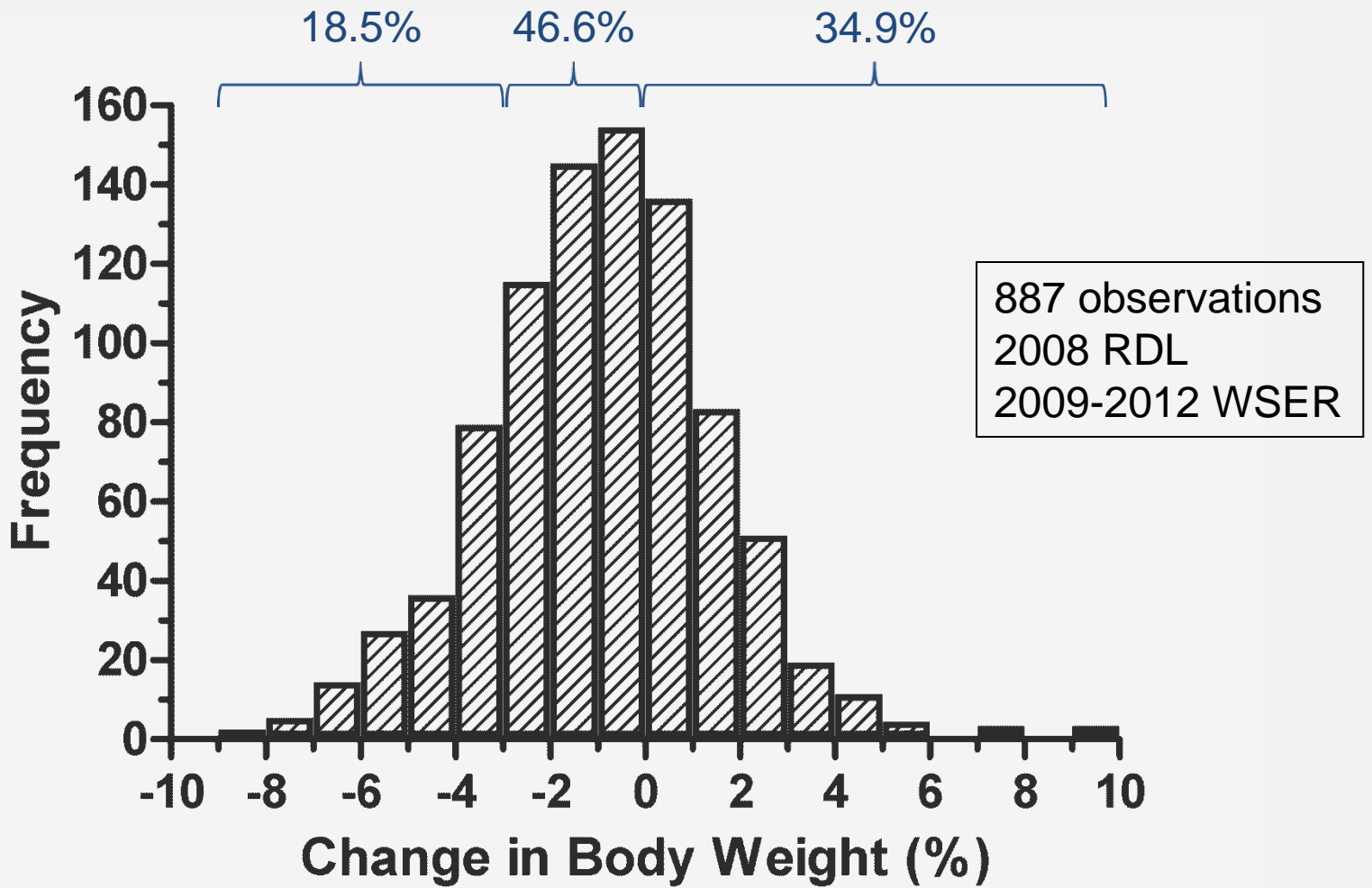


Guinness™

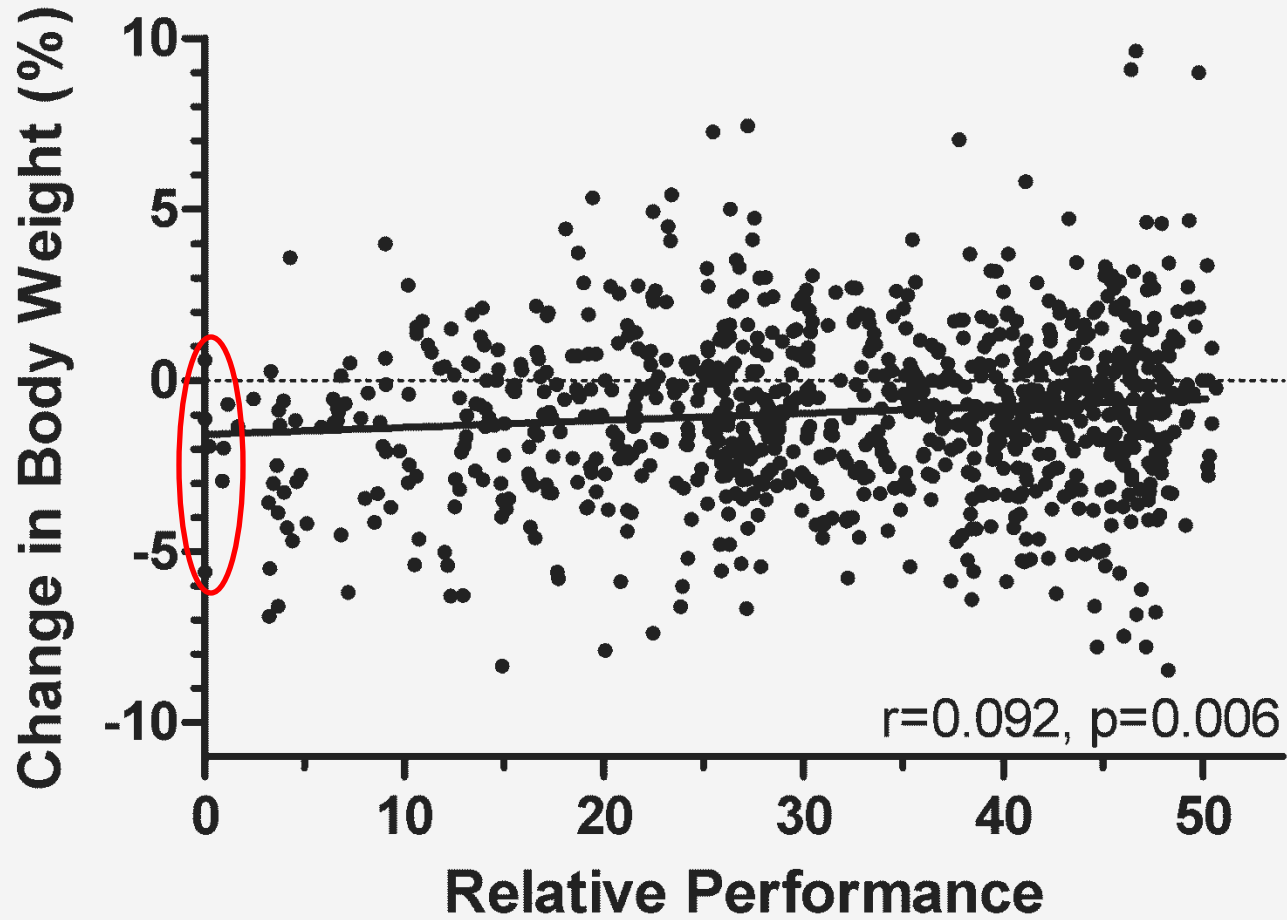
**SEE MEDICAL!**

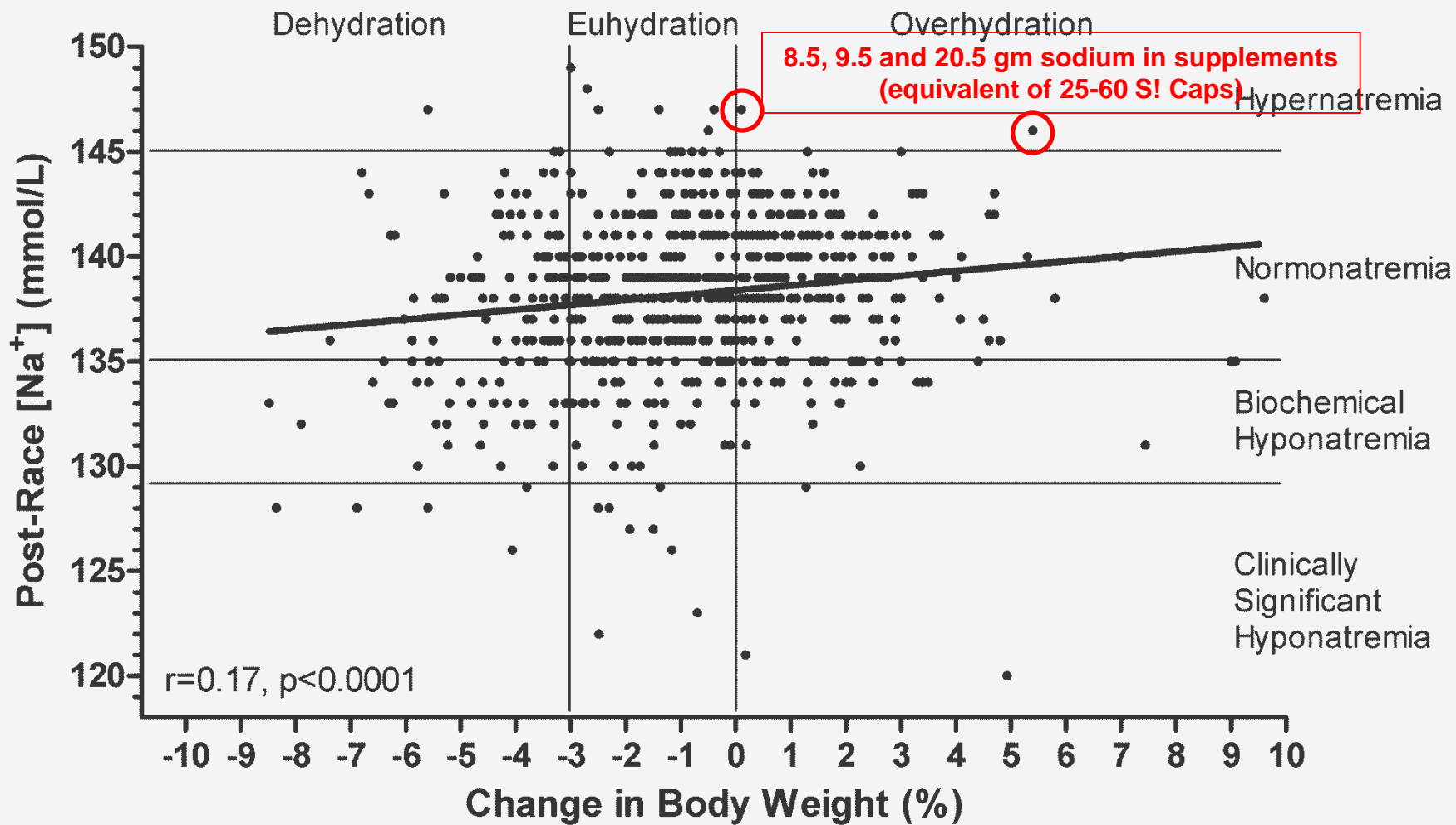
A blue-tinted background image of a mountain range with a valley and a river. The mountains are in the background, and a river flows through the valley in the foreground. The text is overlaid on the image.

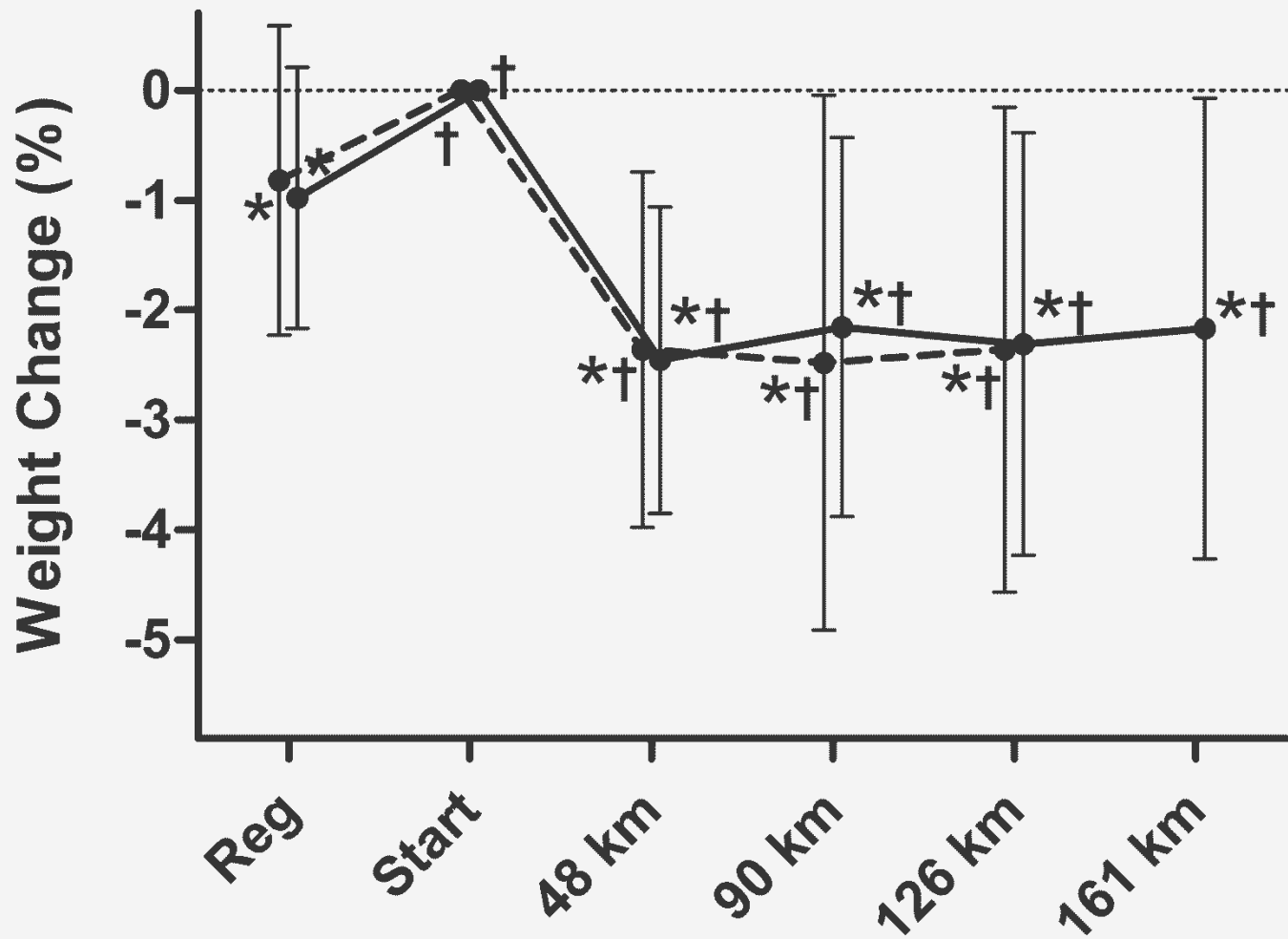
**What are the results of  
their behavior?**

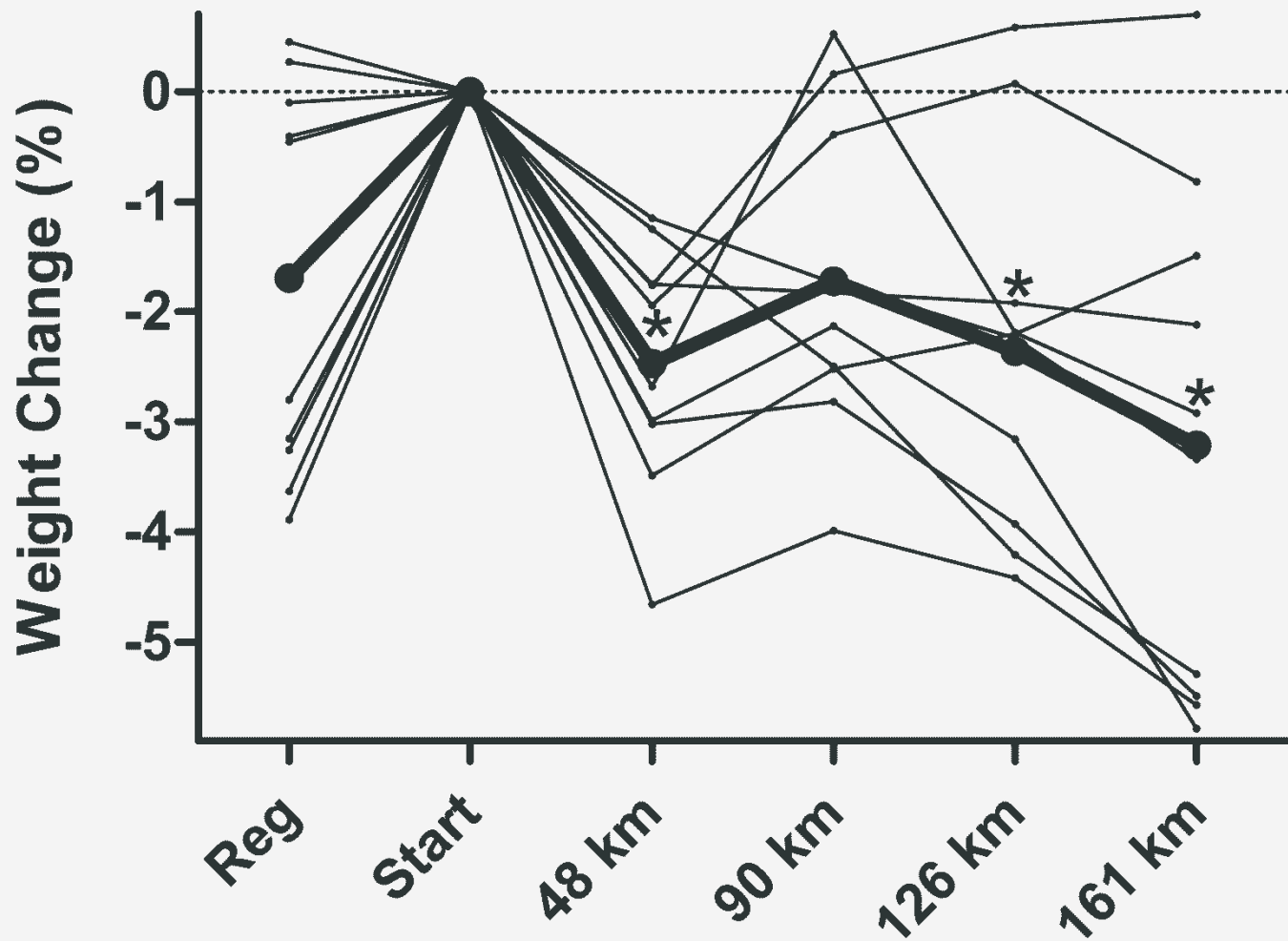


887 observations  
2008 RDL  
2009-2012 WSER

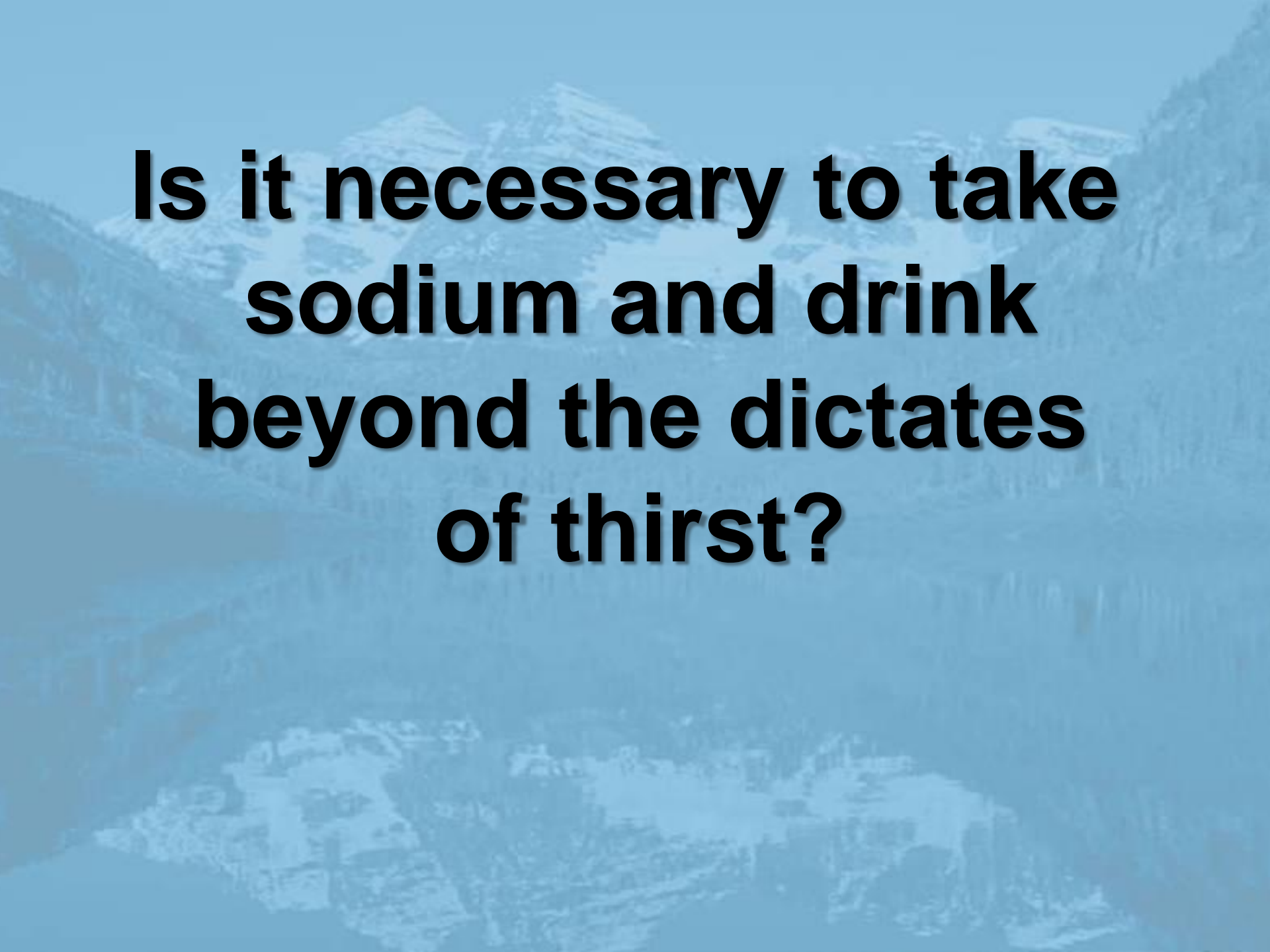




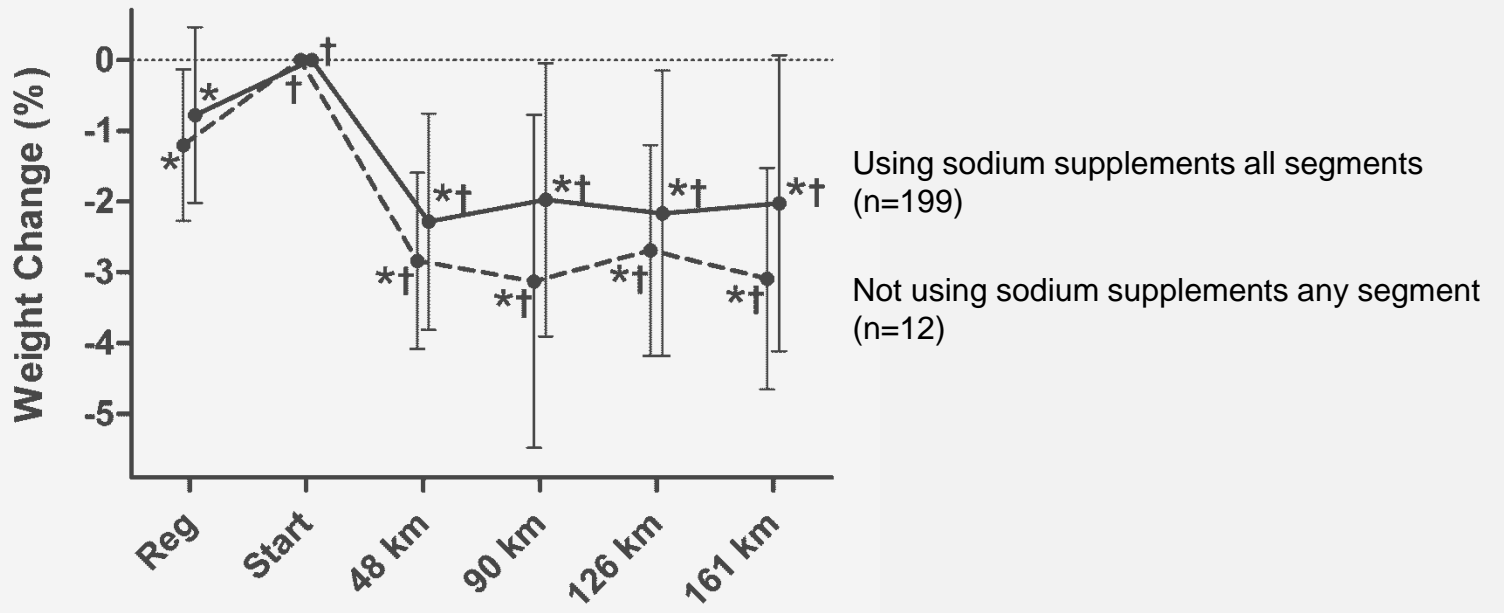


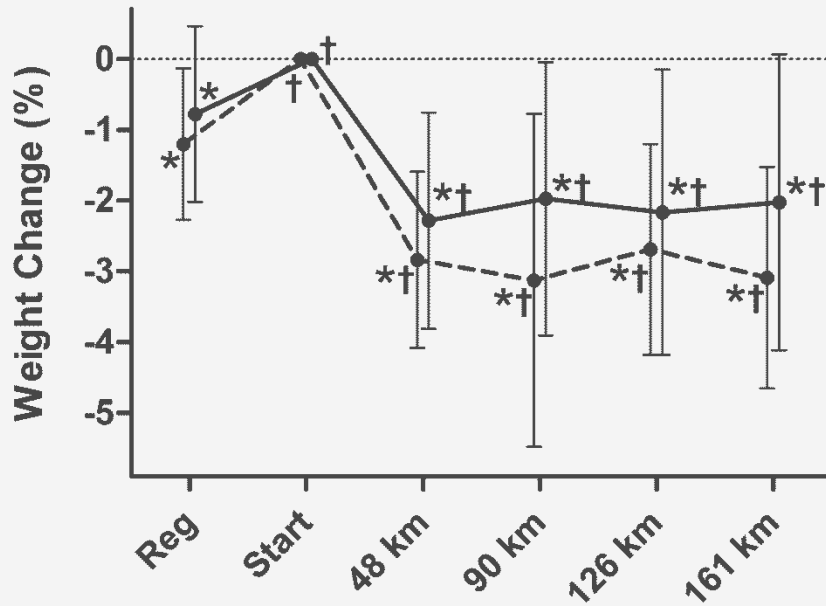






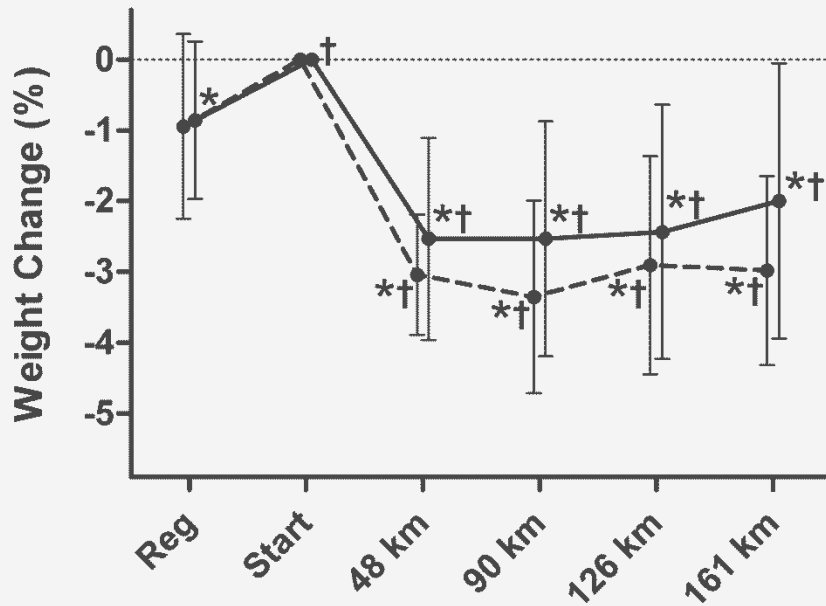
**Is it necessary to take  
sodium and drink  
beyond the dictates  
of thirst?**





Using sodium supplements all segments  
(n=199)

Not using sodium supplements any segment  
(n=12)



Using sodium supplements and drinking  
max tolerated or to pre-determined schedule  
all segments (n=48)

Not using sodium supplements and drinking  
to thirst all segments (n=7)

The background is a monochromatic blue-tinted photograph of a mountainous landscape. In the foreground, a river flows through a valley, surrounded by dense evergreen forests. The middle ground shows a wide valley floor with some structures and more trees. In the background, several large, rugged mountains with snow-capped peaks rise against a clear sky. The overall scene is serene and natural.

**What do we recommend?**

# Weight Change Guidelines

Implemented 2010

- **Weight gain or <2-3% weight loss** – weigh runner, inform about their weight status; advise to reduce fluid intake until urinating if their weight has consistently been elevated above starting weight, particularly if there are signs of swelling (rings are tight, feels puffy); **allow to continue**.
- **3-5% weight loss** - weigh runner and inform about percentage of weight loss; **allow him or her to continue**.
- **5-7% weight loss** - weigh runner and inform about percentage of weight loss; encourage to increase fluid and consider salt intake if weight has consistently been in this range; **allow him or her to continue**.
- **≥7% weight loss** - weigh runner and inform about percentage of weight loss; assess mental status and if lucid, advise to increase fluid, consider salt intake and **allow to continue**. If vomiting or the inability to rehydrate is evident, the runner can remain at the aid station until he/she recovers, and then can continue only after the medical director feels it is safe to continue, but not beyond the absolute cutoff time for that aid station. We would encourage runners NOT to have their wristbands removed until at least one to two hours have elapsed, since many runners have been able to continue after rest, food, and rehydration.

# WSER WEIGHT CHANGE GUIDELINES

(implemented 2010)

## What should I do if my runner has...

### **Weight gain or less than 2-3% loss:**

Weight gain is a potential problem. It indicates the runner is taking in too much fluid and may also be taking in too much sodium. Note that weight gain cannot be used to diagnose hyponatremia. **The solution for weight gain is to reduce fluid and sodium intake until urination is adequate to reduce weight to appropriate levels.**

### **Up to 3% loss:**

This is an appropriate weight loss by midway through the race.

### **3-5% loss:**

This is an appropriate weight loss by the latter stages of the race. **If early in the race, fluid intake should be increased. Some added sodium may be appropriate.**

### **5-7% loss:**

If weight has consistently been at this range, then the runner is getting dehydrated. **Fluid intake should be increased. Some added sodium is probably appropriate.**

### **7% or more loss:**

If weight has consistently been at this range, then the runner is dehydrated. This level of dehydration is probably not an issue at the very final stages of the race, but should be corrected if earlier in the race. **Fluid intake should be increased. Some added sodium is probably appropriate.**

**Thirsty?** *Drink!*

**Craving salt?**  
*Eat something salty!*

**Feeling bloated?**  
*Stop drinking!*