



Estrogen-Treated Rats Alter Salt Intake after Repeated Episodes of Dietary Sodium Deficiency



E. Ehresman*, K.S. Curtis

Department of Pharmacology & Physiology, Oklahoma State University Center for Health Sciences, Tulsa, OK 74107 USA

INTRODUCTION

- Millions of Americans are diagnosed with hypertension
- Blood pressure increases in women after menopause
- A low salt diet is the first recommendation for management of hypertension
- The low salt diet is difficult to maintain, and the consequences of “yo-yo” salt dieting are unclear, especially for females

GOALS

- To determine the effects of estrogen on
- behavioral responses to repeated sodium deprivations
 - long term effects after a single sodium deprivation

METHODS

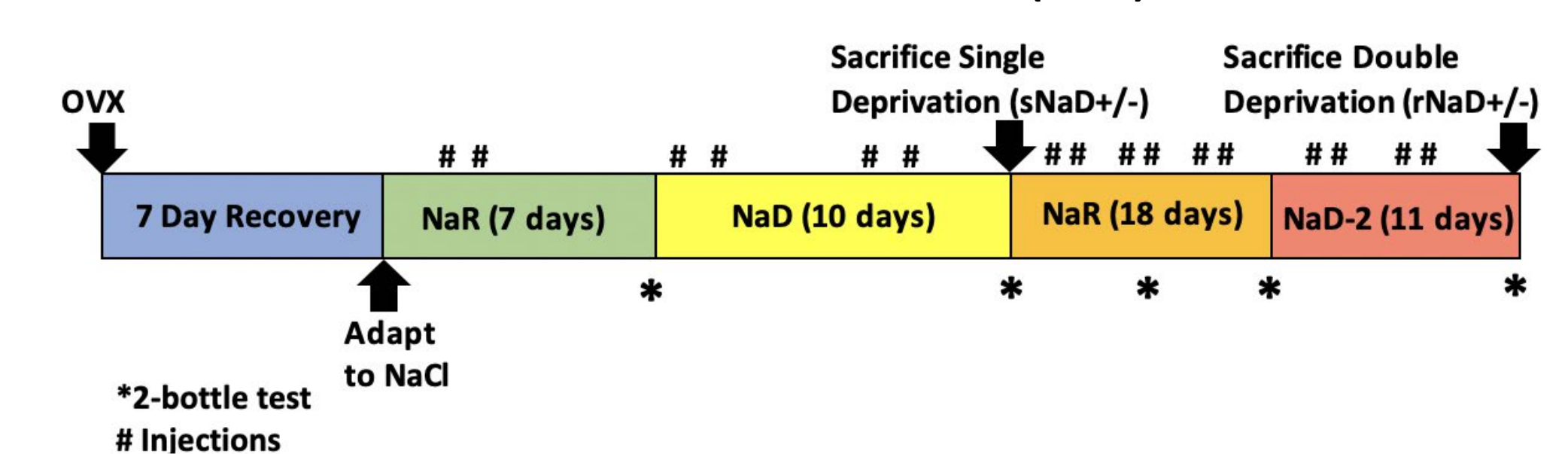
Ovariectomized (OVX) adult Sprague-Dawley rats 1 wk recovery, then s.c. injections on Tuesday & Wednesday each week (indicated by #)

- 17- β -estradiol-3-benzoate (EB); 10 μ g/0.1 ml oil (n = 12) or
- Oil vehicle (OIL); 0.1 ml (n=13)

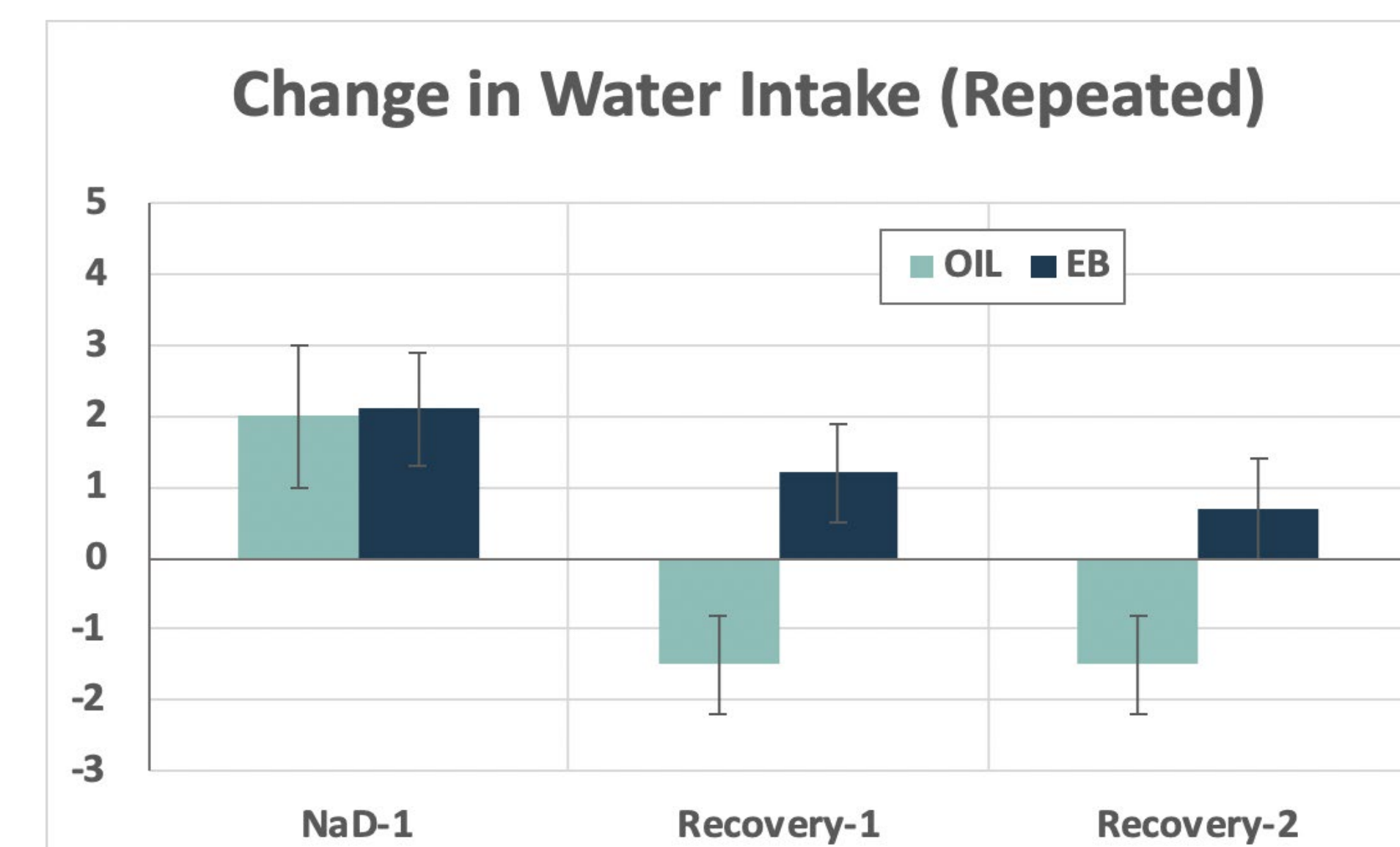
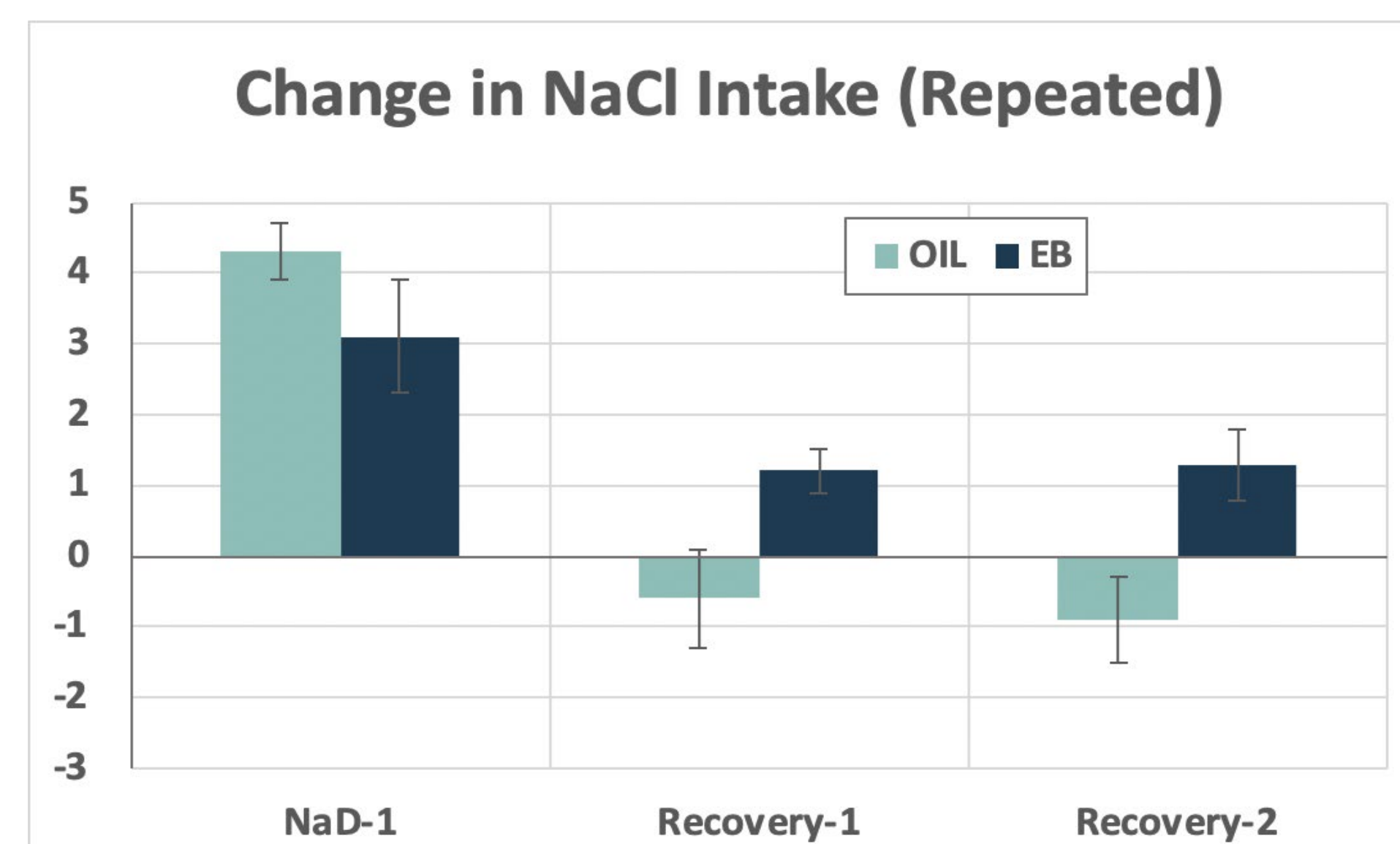
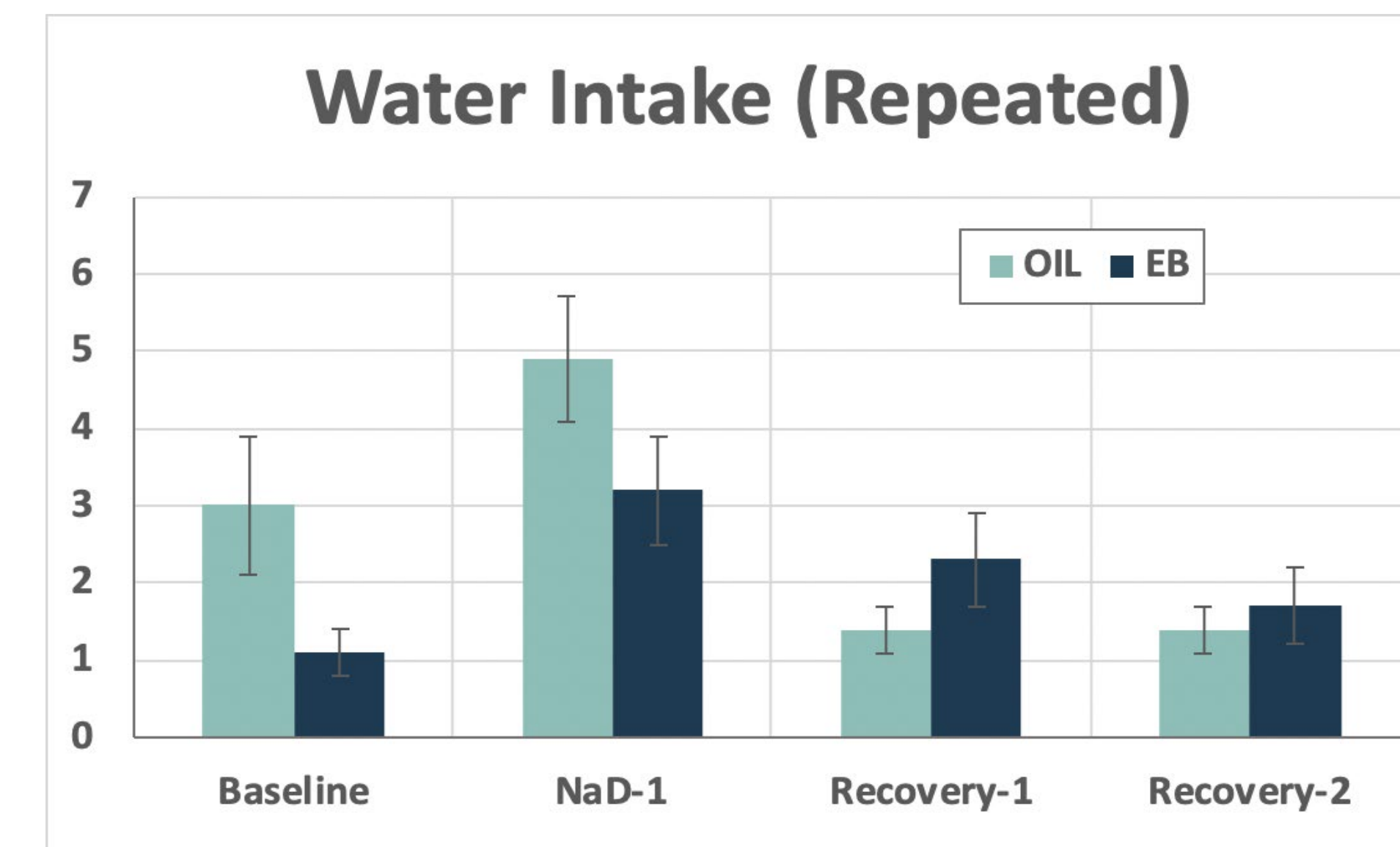
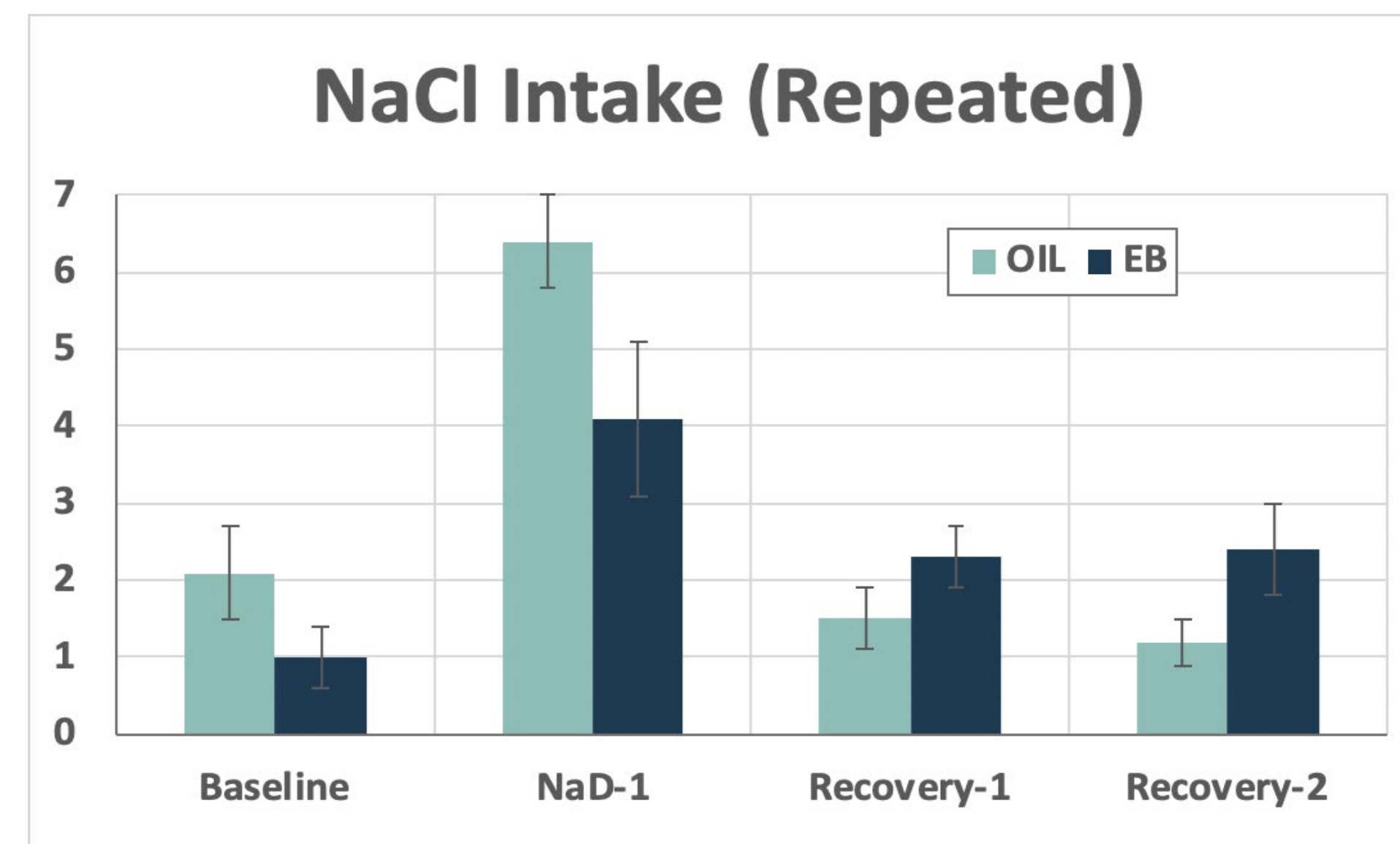
Some EB- and OIL-treated rats had received two 10-day periods of sodium deficient chow separated by two weeks of regular chow (rNaD); control EB- and OIL-treated rats remained on regular chow throughout (rCon)

Other EB- and OIL-treated rats had one 10-day period of sodium deficient chow (sNaD); control rats remained on regular chow (sCon)

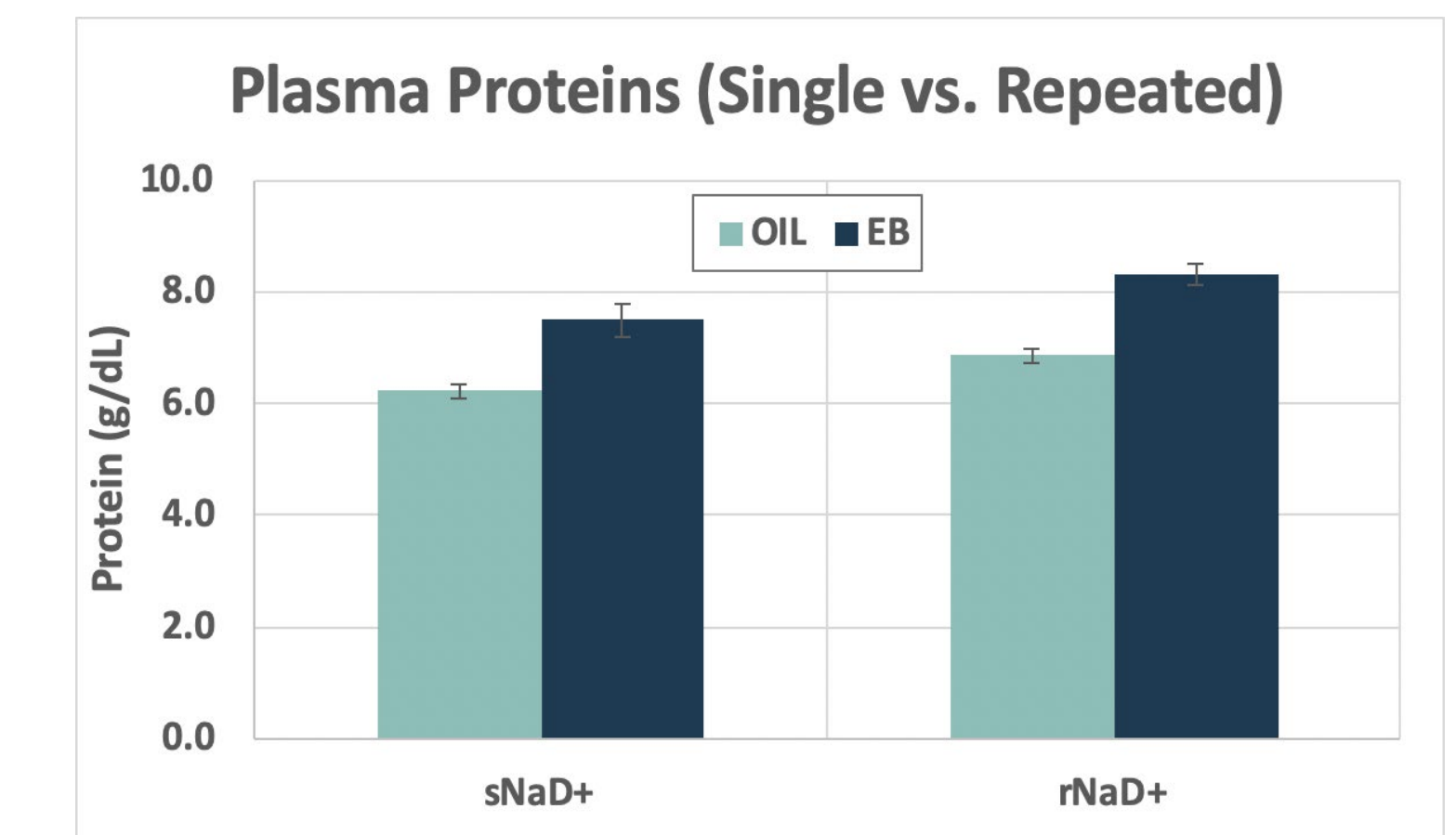
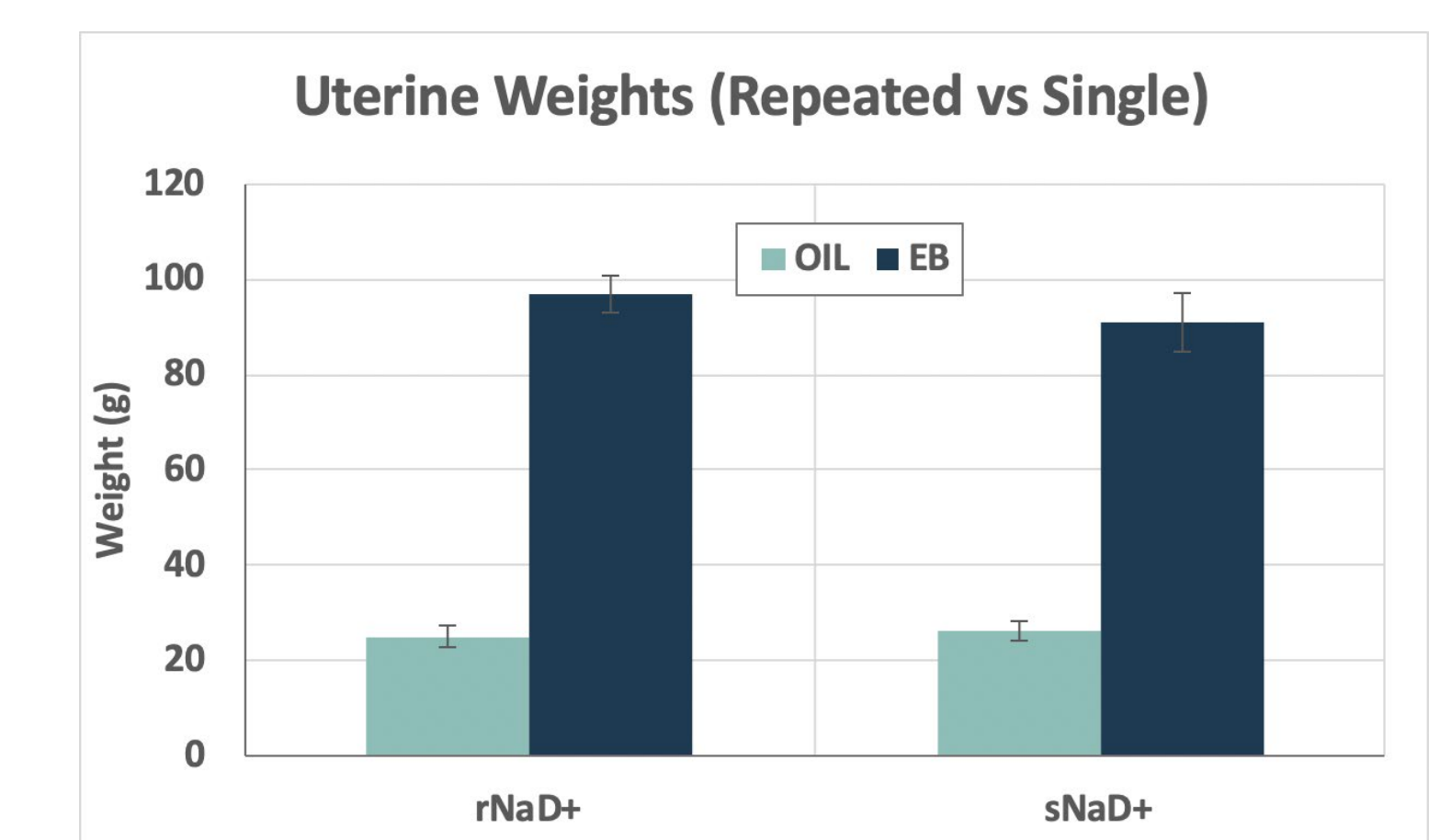
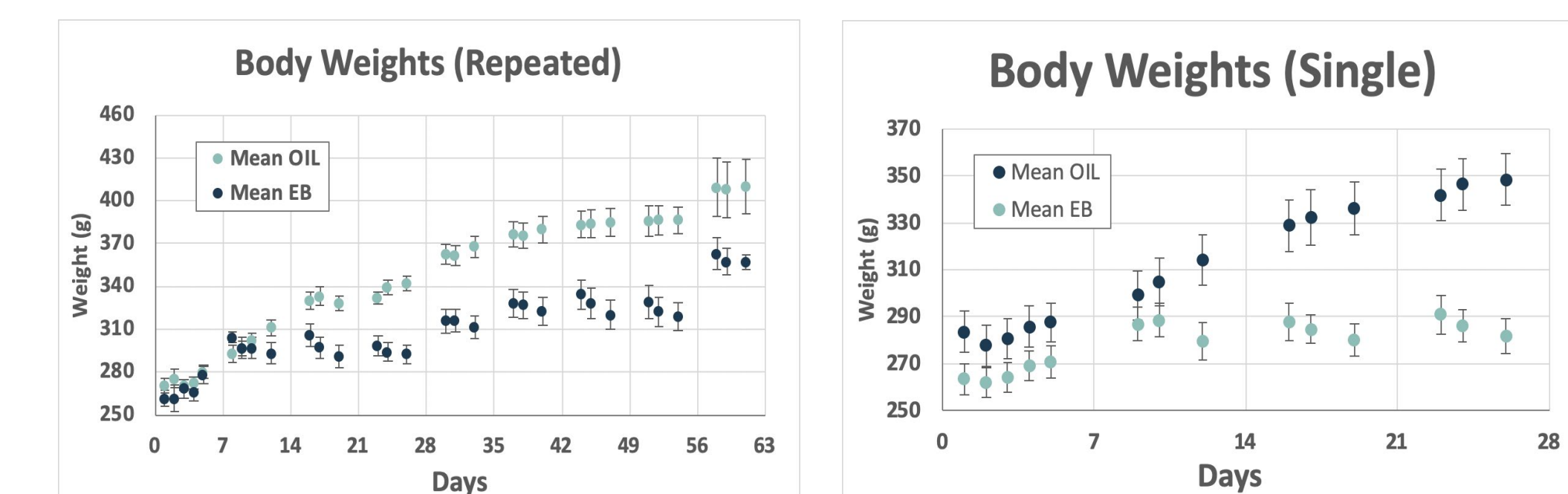
2-bottle tests (0.5M NaCl and ddH₂O) were conducted on Fridays (indicated by *); on the day of sacrifice, some rats had access to 0.5M NaCl and water, while others did not (+/-)



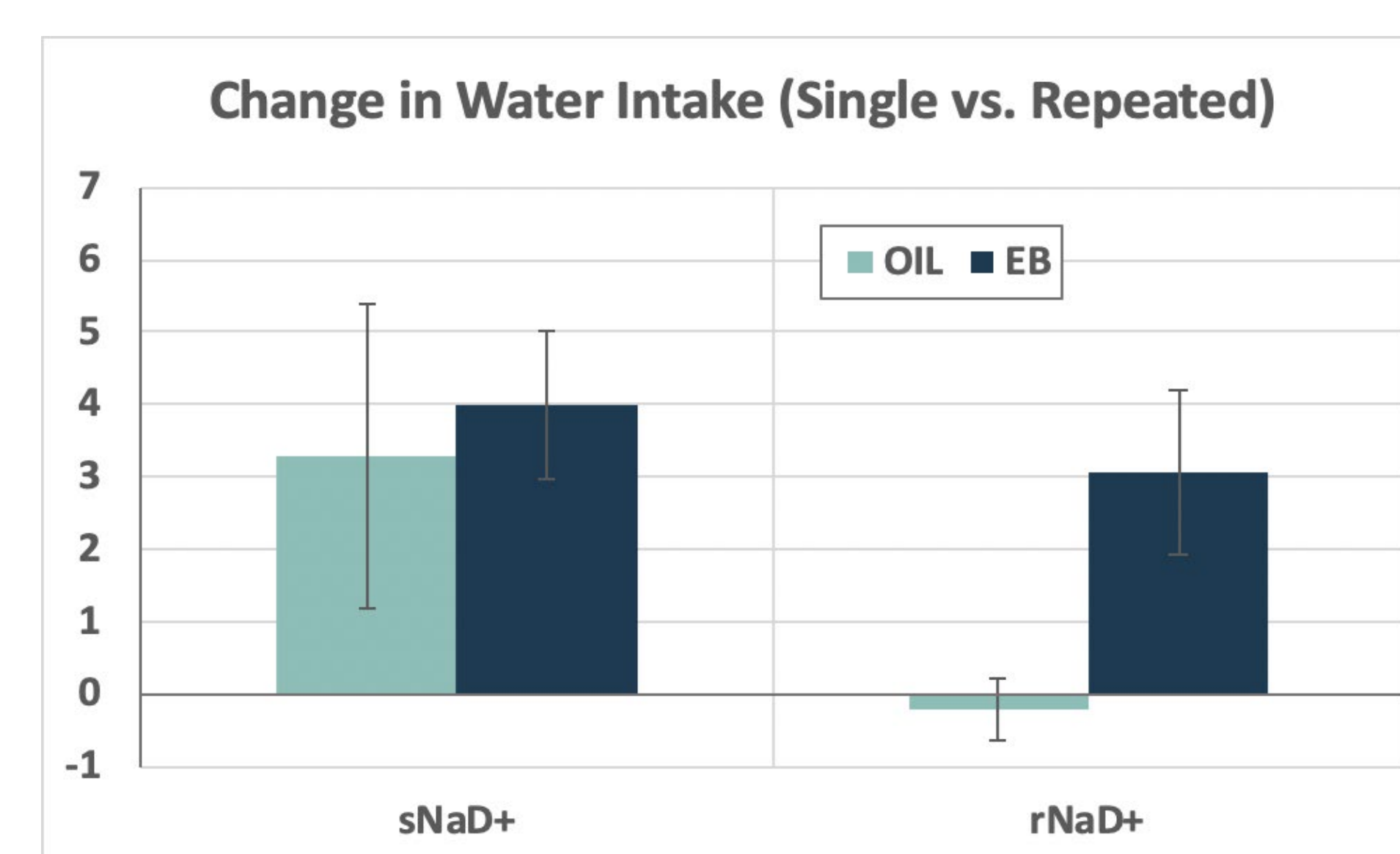
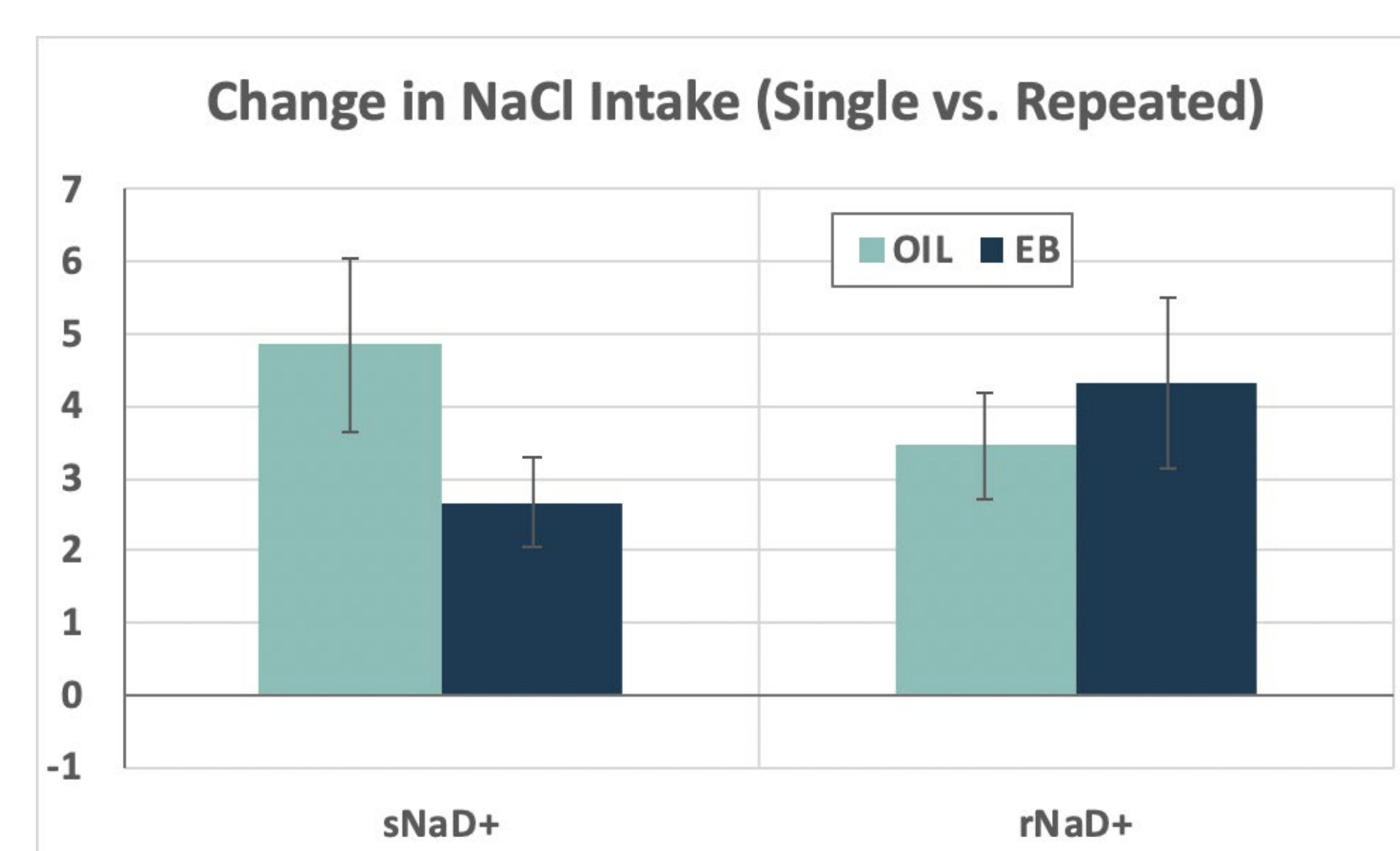
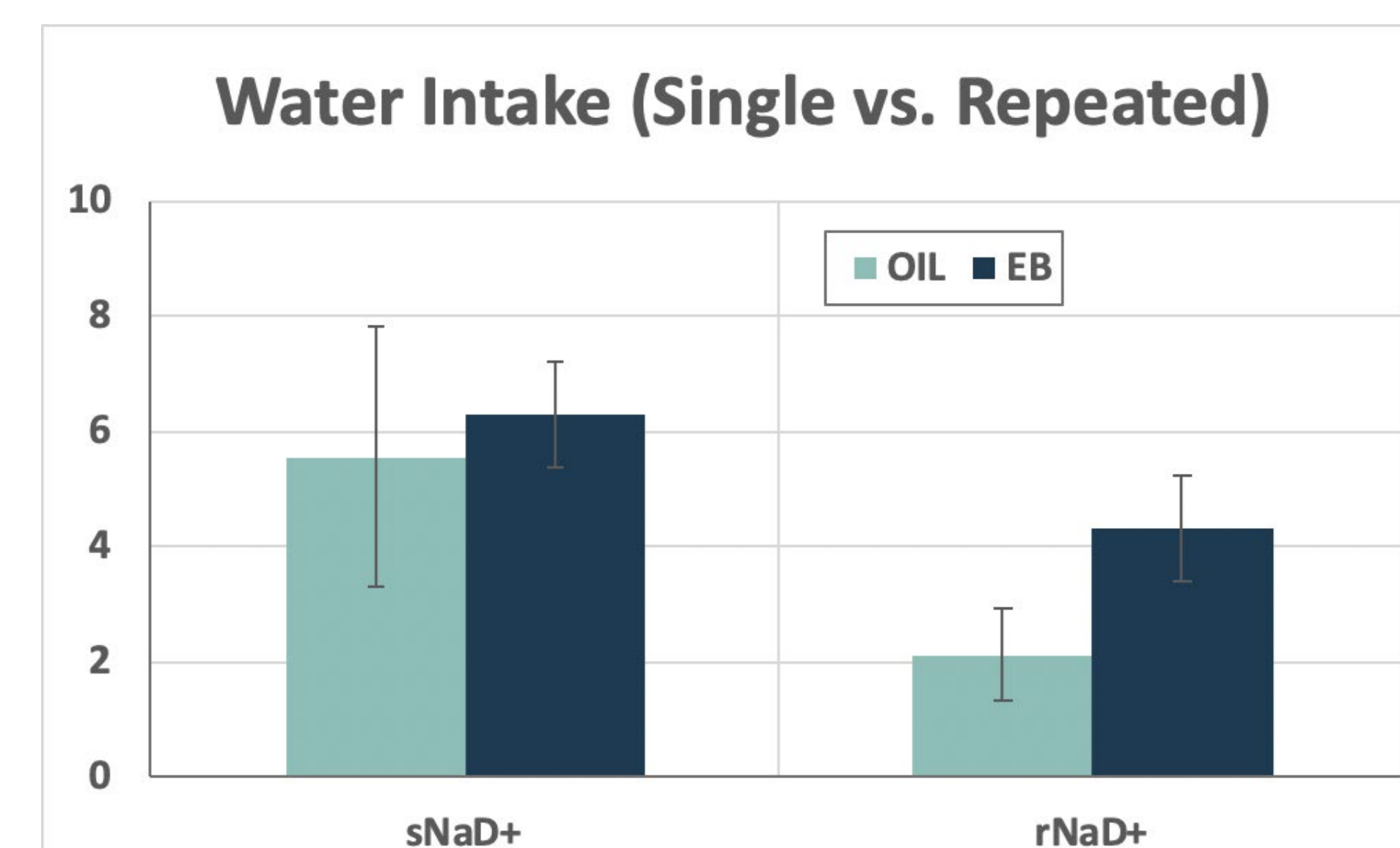
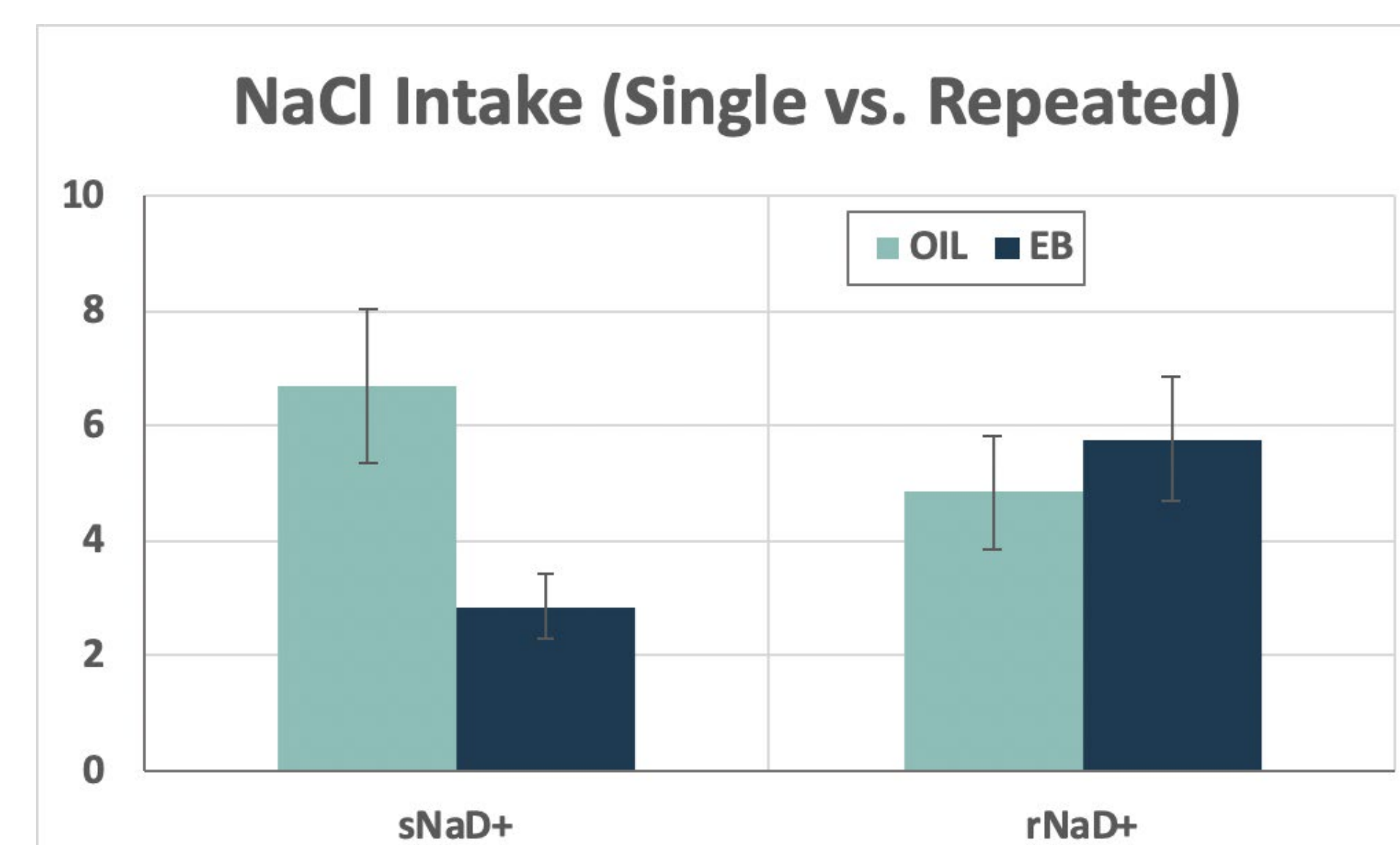
Long Term Effects after Single Sodium Deprivation



Efficacy of Estrogen Treatment



Acute Effects of Single vs. Repeated Sodium Deprivation



CONCLUSIONS

Repeated episodes of sodium deprivation may have long-term consequences on behaviors associated with sodium homeostasis that depend on estrogen

- Estrogen-treated rats tend to consume more salt and water despite sodium repletion
- Estrogen-treated rats also consume more salt and water during subsequent sodium deficiencies

These persistent behavioral changes associated with ‘yo-yo’ salt dieting may ultimately impact blood pressure.

Physicians may want to be aware of this potential complication for females on a low salt diet so that they may best advise female patients