

NIR Analysis of Stomach:

Purpose of Study: The purpose of this study was to duplicate and study the stability and pH effects of creatine monohydrate, effervescent creatine, creatine fruit-flavored powder, and Kre-Alkalyn on the stomach.

The Study: A stomacher (glass vessel used to duplicate the stomach) was stabilized to room temperature. A hydrochloric acid solution (similar to the acid in our stomach) was made to a pH 3 to duplicate the average pH of our stomach.

In the same way we would ingest a powder substance, the liquid creatine mixtures were added to the stomach to simulate digestion. pH was monitored throughout the entire experiment. **(See figure: 1)**

Figure: 1

*Stomacher:	Creatine Monohydrate	Effervescent Creatine	Fruit-Flavored CrM	Kre-Alkalyn
Acid simulator	Hydrochloric acid solution	Hydrochloric acid solution	Hydrochloric acid solution	Hydrochloric acid solution
Starting simulated pH level	3	3	3	3
Amount of creatine	1.5g	1.5g	1.5g	1.5g
Solution mixed with creatine	120ml tap water	120ml tap water	120ml tap water	120ml tap water
Elapsed time in stomacher	10 Minutes	10 Minutes	10 Minutes	10 Minutes

*The creatine mixtures remained in the stomacher for 10 minutes before they were taken out.

FTNIR Test Results: Liquid creatine mixes were tested as is and added to a glass curette and placed in a Buchii FTNIR testing machine to measure pH, creatine levels, and creatinine levels.

Test 1 - Creatine Monohydrate: After mix was added stomach pH was raised to 3.5. After 10 minutes, mix was measured. 1.5 grams of creatinine was found with 0% creatine present.

Test 2 - Effervescent Creatine: Stomach pH was raised to 3.9. After 10 minutes, mix was measured. 1.5 grams of creatinine was found with 0% creatine present.

Test 3 - Fruit-Flavored Powder Creatine: Stomach pH was raised to 3.4. After 10 minutes, mix was measured. 1.5 grams of creatinine was found and 0% creatine present.

Test 4 - Kre-Alkalyn: Stomach pH was raised to 9.0. After 10 minutes, mix was measured. 0% creatinine was found and 1.5g of creatine was present.

(pH Measurements See figure: 2)

(Creatinine Measurements See figure: 3)

(Creatine Measurements See figure: 4)

Figure: 2

pH Levels:

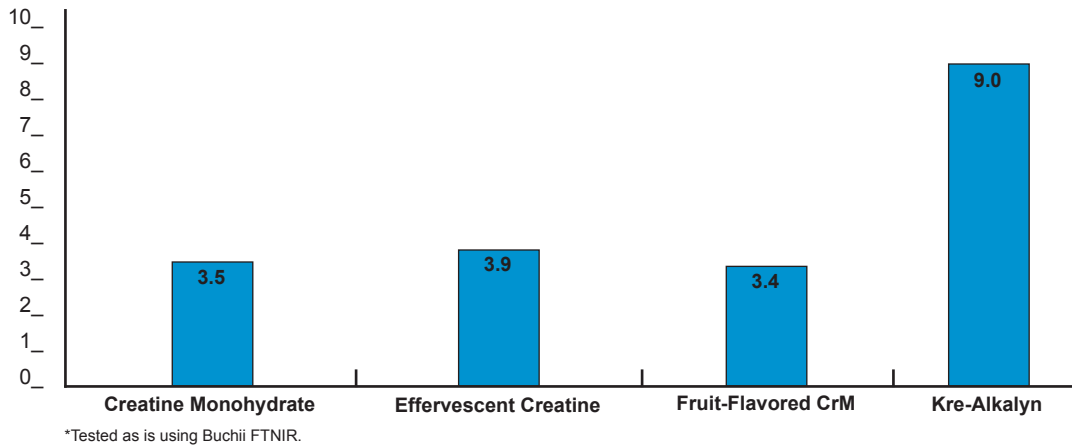


Figure: 3

Creatinine Levels:

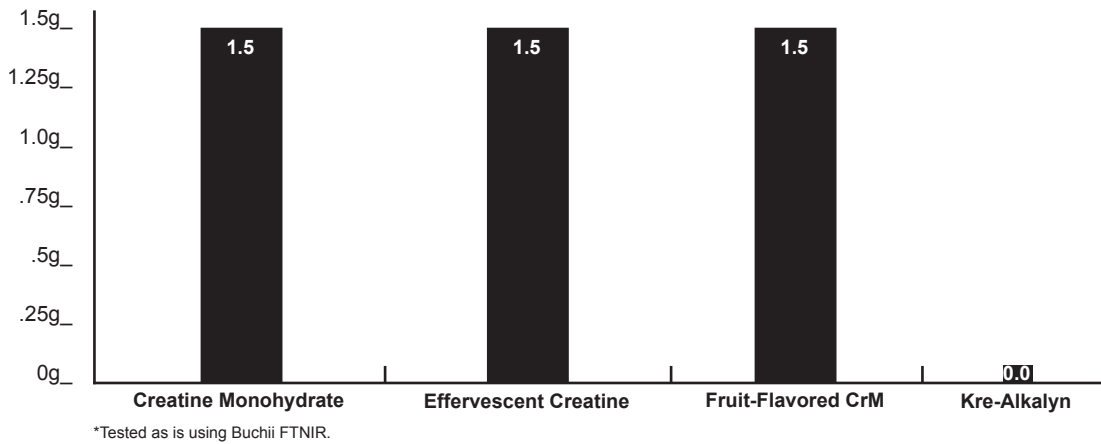
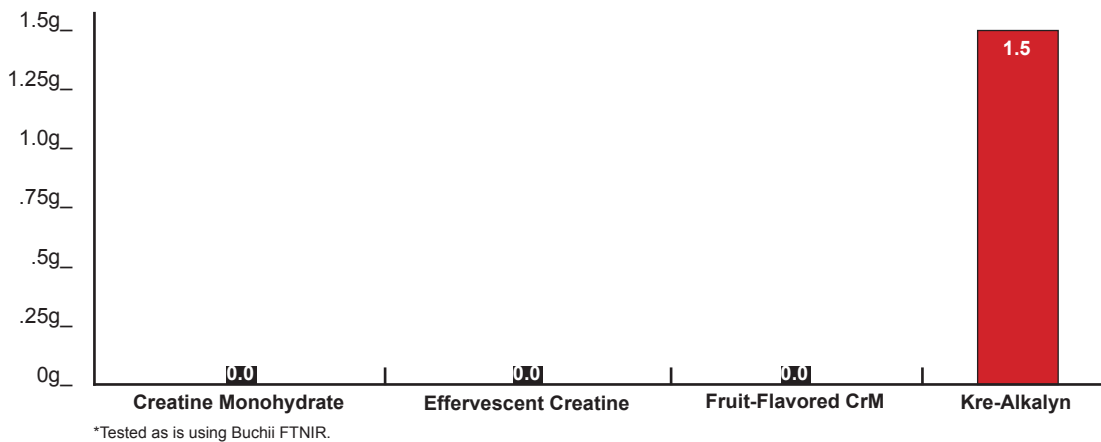


Figure: 4

Creatine Levels:



Conclusion: Regular creatine products are unstable in liquid and once added to the stomach the remainder of the creatine that did not convert in the first mixing is converted in the stomach to creatinine.

Kre- Alkalyn is stable and buffers stomach acid long enough to deliver a stable creatine to the bloodstream.